Dominion Energy®

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

Before the State Corporation Commission of Virginia

230 kV Line #2090 Extension and Tributary Switching Station

Application No. 342

Case No. PUR-2024-00181

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Volume 3 of 3

Environmental Routing Study

230 kV Line #2090 Extension and Tributary Switching Station

PREPARED FOR

Dominion Energy Virginia

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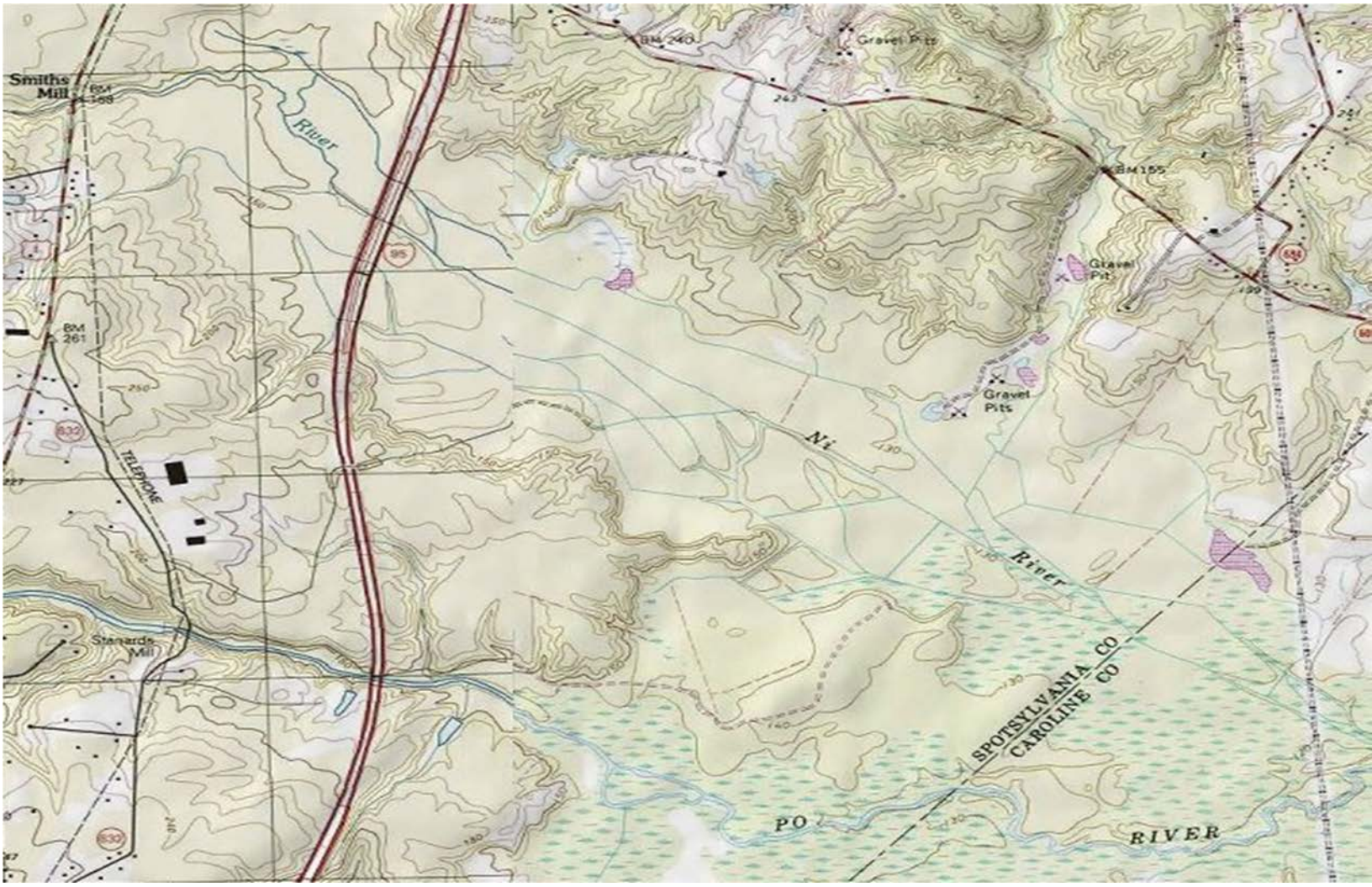

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Environmental Routing Study

230 kV Line #2090 Extension and Tributary Switching Station

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ACRONYMS AND ABBREVIATIONS

Acronyms	Description
A-3	Agricultural/Residential Zoning District
AADT	annual average daily traffic
ABPP	American Battlefield Protection Program
AIOD	Airport Impact Overlay District
AMSL	above mean sea level
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
CWA	Clean Water Act
dB	decibel
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
HUC	hydrologic unit code
I-1	Industrial/Research Park Zoning District
ID	Identification
IP	Industrial Park Zoning District
IPaC	Information for Planning and Consultation
IVMP	Integrated Vegetation Management Plan
KOP	key observation point
kV	kilovolt

Acronyms	Description
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
NLEB	northern long-eared bat
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
SCC	State Corporation Commission
SCUs	stream conservation units
TCB	tri-colored bat
T&E	rare, threatened, and endangered (i.e., species)
TERPS	Terminal instrument procedures
TOYRs	Time-of-year restrictions
USACE	US Army Corps of Engineers
U.S.C.	US Code
USFWS	US Fish and Wildlife Service
USEPA	US Environmental Protection Agency
USGS	US Geological Survey
Va. Code	Code of Virginia

Acronyms	Description
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
vpd	Vehicles per day
VSR	visually sensitive resource
WERMS	Wildlife Environmental Review Map Service

1. INTRODUCTION

This report presents the findings of the pre-application analysis for Virginia Electric and Power Company's (Dominion Energy Virginia, Dominion, or the Company) proposed new 230 kilovolt (kV) line extension and Tributary Switching Station (Tributary Station) in Spotsylvania County, Virginia. The Tributary Station and the 230 kV Line #2090 extension are collectively referred to as the Project. The purpose and need for the Project is to provide transmission service to Rappahanock Electric Company (REC; the Customer), with the request being prompted by the growing data center development in the area; to maintain reliable service for the overall load growth in the area; and to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards. To meet the Project purpose and need, Dominion proposes to:

- Construct a new 230 kV delivery point switching station (Tributary Station), which will provide interconnection to REC to serve its customer, the SpotsyTech Campus, a planned mixed-use technology park development which includes a data center; and
- Extend the Company's existing 230 kV Fredericksburg – Ladysmith CT Line #2090 by constructing a new double circuit overhead 230 kV line on new approximately 100-foot-wide right-of-way by cutting the Company's existing 230 kV Fredericksburg – Ladysmith CT Line #2090. The cut in will result in (i) new 230 kV Line #2404, and (ii) 230 kV Line #2090 from Ladysmith CT to the proposed Tributary Station.[1]

ERM identified three overhead alternative routes (Route 2, Route 3, and Route 4), as discussed in the Environmental Routing Study that will be attached to the Virginia State Corporation Commission (SCC) application for the Project.

This pre-application analysis assesses potential impacts on previously recorded historic and archaeological resources in relation to each alternative route. Impacts from the proposed Tributary Station are also considered, although they would be the same for all of the alternative routes. 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 pre-application analysis is a required study for transmission line projects regulated by the Virginia 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).

[1] Segments of Line #2090 (Fredericksburg – Ladysmith CT) will be renumbered several times as a result of other projects in the Fredericksburg – Ladysmith CT corridor. Line #2090 will be renumbered to 230 kV Line #2301 between Fredericksburg and Lee's Hill Substations, and to 230 kV Line #2335 between Lee's Hill and New Post Substations. After this Project is completed, 230 kV Line #2090 will again be renumbered to Line #2404 between New Post and Tributary Stations, with existing 230 kV Line #2090 extending between Tributary Station and Ladysmith CT only. See SCC Appendix Attachments I.A.3, I.A.4, and I.A.5 for one-line diagrams of: (i) the existing transmission system in the Project load area, (ii) the Project load area after the New Post and Lee's Hill Substations are built, and (iii) the Project load area after the Project is energized.

1.2 STRUCTURE TYPES AND RIGHT-OF-WAY WIDTHS

The proposed Tributary line would be constructed entirely in new right-of-way measuring approximately 100-feet-wide. Dominion Energy Virginia would use multiple structure configurations for the Project (see the proposed structure types in Appendix B, Structural Drawings). The new structures would be weathering steel monopoles with heights ranging from 100 to 140 feet and an average height of approximately 109 feet based on preliminary conceptual design, excluding foundation reveal, and subject to change based on final engineering. Two circuits would be supported on each structure. Structures would be installed at approximately 500 to 700 ft intervals along the right-of-way for the Project.

1.3 CONSTRUCTION, OPERATION, AND MAINTENANCE PROCESS

Construction of new overhead transmission lines would involve 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 cleanup and land restoration.

All required materials for the Project's 230 kV structures would be delivered and assembled at each structure location within the proposed right-of-way. Detailed foundation design would be completed prior to construction. The 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 and final design. Structures would be erected with a crane and anchored to the foundation during final assembly. Excess soil from foundation construction (if any) would be evenly distributed at each structure, and the vegetation would be replanted and exposed soils stabilized. In wetland areas, excess soil would be removed and evenly distributed on an upland site within Dominion's proposed right-of-way. Typical construction equipment may include hole diggers or drilling equipment, cranes, wire stringing rigs, tensioners, backhoes, and trucks.

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

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 line and the right-of-way; occasional replacement of hardware as necessary; periodic clearing of vegetation, either mechanically or by selective, low-volume application of approved herbicides within the corridor; and the cutting of danger trees outside the right-of-way. Danger trees are trees outside the

cleared corridor that are sufficiently tall enough that they could impact the transmission line should the trees fall into the right-of-way. Periodic inspections would occur through both aerial and walking patrols. Normal operation and maintenance would require only infrequent visits by Dominion Energy Virginia or its contractors.

Most maintenance activities would 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 herbicides approved by the US 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 filings.[3]

1.4 OBJECTIVES OF THE STUDY

The Company requested ERM's services to complete the following: a) define and collect information within a study area; b) identify and compare route alternatives for the new transmission lines within the study area, and c) document this information in a report. More specifically, ERM's scope of work consisted of the following:

- 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 public outreach efforts for the Project (e.g., public open house and agency meetings) to gather information from stakeholders, agency staff, and the public regarding constraints in the study area;

[3] *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 (August 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 (June 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 route alternatives for the proposed transmission lines meeting the siting criteria provided in the Code of Virginia (Va. Code) and included in the Virginia State Corporation Commission's (SCC's) minimum filing guidelines for transmission projects;
- Comparing the route alternatives based on an analysis of environmental impacts and use of routing opportunities; and
- Recommending preferred routes.

2 METHODOLOGY

The process of routing a new electric transmission line begins with the definition of a study area encompassing and surrounding the beginning and end points for the new line. This is followed by evaluating routing opportunities and constraints within the area, such as collocation opportunities (e.g., roads, existing utility lines, or other linear infrastructure), land uses, planned developments, and environmental, visual, recreational, and cultural features. The study area is adjusted as needed based on constraints and opportunities, and viable route alternatives are developed to avoid constraints and utilize opportunities to the extent practicable. Communication with stakeholders and analysis of impacts results in adjustments to routes throughout the process.

The fundamental goals of the routing process are to 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 efficient and equitable. Route viability is assessed through consideration of permitting risk, constructability, right-of-way acquisition, and cost after the least impactful alternatives are identified.

The routing process steps, outlined below, provide 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 to define a geographic study area based on the Company's electric transmission and service obligations specific to a project—encompassing the beginning and end points of the route—that will allow for a reasonable range of potential 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. The study area for the Project is described in Section 3.1.

2.2 MAPPING AND 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, this step results in an inventory of routing constraints and opportunities in the study area, including but not limited to:

- Locations of delivery points;
- 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;
- Schools, cemeteries, and places of worship or other public gatherings;
- Natural heritage resources (e.g., conservation sites and habitat for rare, threatened and endangered [T&E] species);
- Visually sensitive receptors (VSRs)—locations where views are protected by regulation, or where higher quality views are an expected condition, regardless of regulatory status; and
- Archaeological and historic sites and other nationally or locally significant cultural resources.

2.3 IDENTIFYING AND ASSESSING ROUTE ALTERNATIVES

The third step in the routing process is the identification of potential route corridors—swaths of the study area feasible for routing new transmission infrastructure—and the exclusion of areas where transmission line routing is impracticable due to land use or other constraints. This step is critical in larger, heavily developed or developing areas, where planned developments or protected lands, like parks, can limit potential routes. This step can also aid in the refinement of the study area. Agencies such as the Virginia Department of Transportation (VDOT) and county and city staff are engaged at this stage by the Company to provide insight on current and future developments and land use planning. The viability 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.

After a route corridor is identified, potential route alternatives or variations within that corridor are developed using geographic information system (GIS) software, and field reconnaissance is conducted to better inform the understanding of the area. To the extent practicable, routes are developed that avoid constraints and utilize opportunities. Throughout this step, the Project team continues to collect and assess data on constraints, obtained through desktop sources, field reconnaissance, and ongoing stakeholder/public engagement activities (e.g., photography, targeted mailings, a Project website, open houses, and virtual and in-person meetings). Information obtained from these sources is used to qualify and better understand resources that could be affected and to refine routes to avoid or reduce potential impacts.

Public engagement opportunities for the Project are discussed in Section 3.3. Routes considered but rejected and the viable routes developed for the Project are described in Section 3.4.

2.4 ROUTE ALTERNATIVE ANALYSIS AND ROUTE RECOMMENDATION

Using data gathered and stakeholder outreach feedback, 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 or route variations, if applicable, are presented for notice in the SCC Application for the Project. Routes deemed too impactful and/or infeasible or impracticable are not carried forward for notice.

3 ROUTING PROCESS

3.1 STUDY AREA DESCRIPTION

The study area identified for the Project encompasses approximately 9.5 square miles within Spotsylvania and Caroline Counties, Virginia (approximately 8.5 square miles in Spotsylvania County and 1.0 square mile in Caroline County). The Project origin is the Company's existing 230 kV Fredericksburg-Ladysmith CT Line (Line #2090), terminating at the proposed Tributary Station located on the west side of Interstate 95 (I-95). There are no incorporated cities within the study area. The limits of the study area, depicted on Figure 1.1-1, are generally defined by the following features:

- Patriot Highway (US Route 1 or US 1) and North Roxbury Mill Road to the west;
- The Po River to the south;
- Massaponax High School and Heartland Way to the north; and
- Existing Line #2090 to the east.

3.2 GIS MAPPING AND INVENTORY OF ROUTING CONSTRAINTS AND OPPORTUNITIES

In accordance with the Guidelines for Transmission Line Applications Filed Under Title 56 of the Va. Code, ERM assessed opportunities for routing the Project. Sources used by the ERM team to identify constraints and opportunities within the study area include:

- Spotsylvania County Interactive Data Portal GIS datasets (Spotsylvania County n.d.);
- ESRI World Elevation Terrain 2-foot contours (ESRI et al. 2024);
- VDOT Northern Virginia District project website (VDOT 2024);
- VDCR Conservation Lands Database (VDCR 2024a);
- Virginia Geographic Information Network (VGIN) statewide land cover dataset (VGIN 2023)
- U. S. Census Bureau American Community Survey, 5-Year Estimates (2018–2022);
- US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping (USFWS 2023a);
- Virginia Cultural Resources Information System (VCRIS; VDHR 2023);
- National Agricultural Imagery Program (NAIP) aerial imagery flown October 2023 (NAIP 2023);
- Google Earth Aerial Imagery (Google LLC 2024); and
- Existing utility transmission and distribution lines (Rextag 2023).

ERM researched, studied, mapped, and incorporated resources identified through these sources into GIS, where the layers were organized by resource type.

3.3 FIELD RECONNAISSANCE AND STAKEHOLDER ENGAGEMENT

ERM and Company staff conducted field reconnaissance of the study area and potential route corridors from public roads and rights-of-way in the spring and summer of 2024. During these

visits, ERM took photographs to aid in the analysis of impacts, particularly on visual and cultural resources.

After identifying preliminary routes, Dominion met with Spotsylvania County Planning and Zoning staff in spring of 2024 to review the Project and potential alternatives. Dominion gathered feedback on the routes through engagement with the public, elected officials, regulatory and planning groups, and land managing agencies. Dominion announced the Project via mail and on their website[4] in early April 2024 and also held two in-person open houses to share information and receive feedback in April and June of 2024. To serve the most widely spoken non-English language speakers in the study area, the Project website included Spanish translations. Dominion maintained the website with up-to-date Project information and an interactive public comment map. Feedback obtained through stakeholder engagement resulted in ERM making adjustments to optimize routes and helped inform the Company's decision to reject others.

3.4 IDENTIFYING AND ASSESSING ROUTE ALTERNATIVES

Within the study area, ERM initially identified four potential cut-in locations along the Company's existing Line #2090, and five potential route alternatives associated with these cut-ins. Of these, three potential cut-in locations and their associated routes (Routes 2, 3, and 4) were retained for further analysis, while the others were eliminated. Descriptions of the routes are provided in the subsections below. The routes are shown in Figure 3.4-1.

3.4.1 ROUTES REJECTED FROM FURTHER CONSIDERATION

3.4.1.1 ELIMINATED ROUTE 1

Eliminated Route 1 originates at a tap along the Company's existing Line #2090, approximately 0.6 mile south of its intersection with Guinea Station Road. From there, it heads directly west for about 2.4 miles, crossing forested and agricultural land before crossing I-95 and turning into the proposed Tributary Station.

Eliminated Route 1 measures approximately 2.4 miles long. The right-of-way for this alternative (28.7 acres) and the proposed Tributary Station site (2.2 acres) would encompass a combined 30.9 acres.

The route would require crossing a large expanse of forested wetlands and was rejected due to the quantity of wetland impacts compared to other route alternatives.

3.4.1.2 ELIMINATED ROUTE 5

Eliminated Route 5 originates at a tap along the Company's existing line #2090, approximately 0.4 mile south of the intersection of the line with Guinea Station Road. From there, the route heads northwest/west for about 0.9 mile, crossing forested lands and a portion of the Fredericksburg/Washington DC South Kampgrounds of America Holiday campground (KOA campground). The route then turns southwest/south for about 0.2 mile before turning and heading northwest for about 0.5 mile, turning southwest before an aquatic impoundment for about 0.3 mile and crossing the Ni River. Just south of the Ni River crossing the route turns

[4] https://dominionenergy.com/tributary.

northwest for about 0.4 mile. From here the route turns southwest again for about 0.3 mile before turning west to cross I-95 and turning south into the proposed Tributary Station.

Eliminated Route 5 is approximately 2.8 miles long. The right-of-way for this alternative (34.1 acres) and the proposed Tributary Station site (2.2 acres) would encompass a combined 36.3 acres.

Eliminated Route 5 was routed to enter the proposed Tributary Station from the north and avoid the majority of NWI-mapped wetlands, particularly those associated with NHD-mapped tributaries to the Ni River. To avoid these wetlands, this route bisects three large, undeveloped, privately owned parcels. This route was eliminated due to its longer length, impacts on privately owned parcels, and the large quantity of total wetland impacts (including NWI-mapped wetlands desktop-delineated wetlands[5]), compared to other route alternatives.

3.4.2 ROUTE ALTERNATIVES

The route alternatives carried through for evaluation in this Routing Study are described below and are shown on Figure 3.4-2.

3.4.2.1 ROUTE 2

Route 2 extends from a tap along the Company's existing Line #2090 to the proposed Tributary Station. The tap is approximately 0.5 mile south of where the existing transmission line crosses Guinea Station Road along the southern boundary of the study area. From there, Route 2 heads west/northwest for about 0.4 mile, passing through forested land before angling southwest through forest for about 0.7 mile, passing through a portion of the KOA campground and crossing the Ni River. On the south side of the Ni River, the route turns west, crossing agricultural and forested land for about 1.2 miles and crossing I-95. On the west side of I-95 the route turns north for about 0.1 mile and enters the Tributary Station.

Route 2 measures approximately 2.4 miles long. The right-of-way for this alternative (28.1 acres) and the proposed Tributary Station site (2.2 acres) would encompass a combined 30.3 acres.

3.4.2.2 ROUTE 3

Route 3 extends from the same point as Route 2 (a tap along the Company's existing Line #2090 about 0.5 mile south of Guinea Station Road) to the proposed Tributary Station. From here, Route 3 heads west/northwest for about 0.4 mile before turning north/northwest for about 0.3 mile. At this point the route turns west and crosses the KOA campground. On the west edge of the campground, the route turns southwest/south for about 0.5 mile, paralleling an undeveloped, forested parcel boundary and crossing the Ni River. On the south side of the river, the route turns west, intersecting and following the same alignment as Route 2 for the remaining 1.3 miles to the Tributary Station.

Route 3 measures approximately 2.8 miles long. The right-of-way for this alternative (33.5 acres) and the proposed Tributary Station site (2.2 acres) would encompass a combined 35.7 acres.

[5] See section 4.2.1 for details on desktop delineation methodology.

3.4.2.3 ROUTE 4

Route 4 extends from a tap along the Company's existing Line #2090 approximately 0.7 mile north of the intersection of the existing transmission line and Guinea Station Road along the southern boundary of the study area. From here, Route 4 heads southwest/south for about 1.1 mile, passing through forested land and crossing Guinea Station Road. Just west of the KOA campground, the route intersects with and shares an alignment with Routes 2 and 3, turning west/southwest for about 0.5 mile and then west for about 1.2 mile, crossing I-95 and turning north into the Tributary Station.

Route 4 measures approximately 3.0 miles long. The right-of-way for this alternative (35.4 acres) and the proposed Tributary Station site (2.2 acres) would encompass a combined 37.6 acres.

4 RESOURCES AND IMPACTS

ERM developed a list of features to consider and assess as part of the routing process to provide a basis for comparing route alternatives (Table 4-1). 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.

The features in the study area and along the route alternatives are discussed by subsection below, with a summary of the features crossed by each route provided in the Features Crossing Table, attached as Appendix C.

TABLE 4-1 FEATURES CONSIDERED FOR ROUTING

Feature Type	Description
Existing Corridors	
Existing electric facilities	Transmission or distribution lines and switching station
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 • 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 • T&E 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; T&E = rare, threatened, and endangered; VDCR = Virginia Department of Conservation and Recreation; VDHR = Virginia Department of Historic Resources; VOF = Virginia Outdoors Foundation.

4.1 LAND USE

4.1.1 LAND OWNERSHIP

ERM reviewed land ownership information in the study area using publicly available GIS databases and digital parcel data obtained from Spotsylvania and Caroline Counties (Spotsylvania County n.d.; Caroline County 2024a). These data indicate that most parcels are privately owned, with four parcels owned by Spotsylvania County located in the southwest corner of the study area. Parcels are mainly forested and undeveloped, with some commercial use west of Patriot Highway and schools located between Patriot Highway and I-95 in the northwest and southwest corners of the study area. All parcels crossed by the Project are privately owned.

Table 4.1-1 summarizes the number of parcels crossed by each route alternative. Figure 4.1.1-1 depicts land ownership within the study area.

TABLE 4.1-1 PARCELS CROSSED BY THE ROUTE ALTERNATIVES

Land Ownership	Unit	Route 2	Route 3	Route 4
Total parcels crossed by right-of-way [a]	Number	9	10	11

Note:
[a] All parcels crossed are privately owned.

4.1.1.1 FEDERAL AND STATE LANDS

There are no federal lands within the study area or within 0.25 mile of the route alternatives (Spotsylvania County n.d.; Caroline County 2024a). For state lands, VDOT maintains the I-95 right-of-way passing north/south along the western half of the study area. There are no other state lands within the study area.

4.1.1.2 LOCAL LANDS

Lands within the study area owned by local government include seven Spotsylvania County-owned parcels associated with Massaponax High School, Riverview Elementary School, Thornburg Middle School, Spotsylvania County Fleet Services, and undeveloped parcels, described below and in Table 4.1-2 (Spotsylvania County n.d.). Of these properties, only the Riverview Elementary School and Thornberg Middle School are located within 0.25 mile of the Project infrastructure. School resources are discussed further in Section 4.1.7.

TABLE 4.1-2 LOCAL LANDS WITHIN THE STUDY AREA

Facility	Parcel Owner	Description	Distance and Direction from Route Alternatives
Massaponax High School	Spotsylvania County School Board	102.3-acre parcel containing Massaponax High School, located southeast of the intersection of Patriot Highway and Guinea Station Road	About 1.4 mile north of the proposed Tributary Station
Undeveloped Parcel	Spotsylvania County School Board, co-owned with Future Farmers of America	4.3-acre undeveloped, forested parcel adjacent to the southwest of Massaponax High School off of Guinea Station Road	About 1.3 mile north of the proposed Tributary Station
Riverview Elementary School	Spotsylvania County School Board	29.7-acre parcel containing Riverview Elementary School, located off of North Roxbury Mill Road	0.2 mile southwest of the proposed Tributary Station
Thornburg Middle School	Spotsylvania County School Board	56.-acre parcel containing Thornburg Middle School, located off North Roxbury Mill Road	0.2 mile southwest of Routes 2, 3, and 4 (approximate MPs 2.2, 2.7, and 2.8, respectively)
Spotsylvania County Fleet Services	Spotsylvania County School Board & Spotsylvania County Board of Supervisors	30.0-acre parcel adjacent to and south of Thornburg Middle School, containing county transportation fleet parking and associated buildings.	0.4 mile southwest of Routes 2, 3, and 4 (approximate MPs 2.2, 2.7, and 2.8, respectively)

Facility	Parcel Owner	Description	Distance and Direction from Route Alternatives
Undeveloped parcel	Spotsylvania County School Board	31.2-acre vacant, forested parcel with a crossing of the Po River, located adjacent to the Spotsylvania County Fleet Services to the north, I-95 to the east, South Roxbury Mill Road to the west, and bounded by the Po River to the south	0.4 mile south of Routes 2, 3, and 4 (approximate MPs 2.2, 2.7, and 2.8, respectively)
Undeveloped parcel	Spotsylvania County	About 4.6 acres of a 31-acre vacant, forested parcel located west of Patriot Highway and adjacent to the north of the Ni River.	About one mile northwest of the proposed Tributary Station

4.1.1.3 IMPACT ASSESSMENT

Because the route alternatives would only cross privately owned lands, no public lands would be physically impacted by the Project and no direct impacts on the use of public properties would occur. Public lands could be visually impacted by the new transmission line during construction and operation of the Project depending on the route selected. The severity of these impacts would depend on factors such as surrounding tree cover, landscaping, orientation of development toward/away from the transmission infrastructure, topography, and screening from other structures. Section 4.3 describes the Project's visual impacts.

4.1.2 LAND USE AND LAND COVER

ERM identified land use and land cover in the study area based on the VGIN statewide land cover dataset (VGIN 2023). Figure 4.1.2-1 depicts land use/land cover within the study area. Table 4.1-3Table summarizes the acreage of land use/land cover within the right-of-way for each route alternative. Land use classifications are broken into the five main categories described below.[6]

- Developed lands: These are areas characterized by medium to high density constructed buildings, such as certain residential subdivisions, industrial uses, commercial areas, and impervious services.
- Open space: These are areas primarily covered by planted grasses, including vegetation planted in developed settings for erosion control or aesthetic purposes but also natural herbaceous vegetation and undeveloped land, parks, and open space recreational facilities.
- Forested lands: These are areas where land cover consists of natural or semi-natural woody vegetation.
- 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, and natural and artificial ponds.

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

The predominant land use and land cover type in the study area is forested land. Areas of developed land include low-density residential and educational uses along Patriot Highway, as well as low-density residential uses in the northeastern and north-central portions of the study area. The southern half of the study area is largely undeveloped forest and wetlands crossed by the Ni and Po Rivers and their floodplains. Smaller pockets of agricultural lands, used for commercial farming and grazing, are found along Patriot Highway, Guinea Station Road, and between the Ni and Po Rivers.

Each of the route alternatives predominantly cross forested lands, an area of agricultural land south of the Ni River, and small amounts of developed and open space. All route alternatives cross the Ni River, which is not classified as open water by the VGIN landcover data. Each route crossing of the Ni River would affect less than 0.1 acre of open water, based on recent (2023) aerial imagery.

TABLE 4.1-3 LAND USE/LAND COVER CROSSED BY THE ROUTES (ACRES)

Land Use/Land Cover [a]	Unit	Route 2	Route 3	Route 4
Total right-of-way	Miles	2.4	2.8	3.0
	Acres	30.3	35.7	37.6
Forest	Acres	23.6	29.3	31.0
Agricultural	Acres	6.4	6.2	6.2
Developed	Acres	0.2	0.2	0.3
Open Space	Acres	0.1	0.1	0.1
Open Water [b]	Acres	0.0	0.0	0.0

Source: VGIN landcover (VGIN 2023)

Notes:

[a] Data are inclusive of the proposed Tributary Station.

[b] All routes cross the Ni River, which is not classified as open water by the VGIN land use data. Each route crossing of the Ni River would affect less than 0.1 acre of open water.

4.1.2.1 IMPACT ASSESSMENT

The primary impact on land use and cover for each alternative would be the conversion of forested land to herbaceous land in the maintained right-of-way. Some of the forested land crossed by each route is within the proposed SpotsyTech Campus development, which would be cleared by the developer prior to construction of the Project. The SpotsyTech Campus development is described in Section 4.1.5. Except for the placement of transmission structures and the Tributary Station, the Project would not directly impact open space, developed land, and open water. Impacts on waterbodies and forested lands are discussed in Sections 4.2.1 and 4.2.3, respectively. All parcels crossed by all three route alternatives are privately owned.

Route 2

Route 2 crosses 2.4 miles of land encompassing 30.3 acres of right-of-way, including the proposed 2.2-acre Tributary Station site. Land use and land cover types along Route 2 consist

predominantly of forest and agriculture, with minimal areas of developed lands and open space. If Route 2 is selected for the Project, the primary land use/land cover impact would be the conversion of forested land to open space within the maintained right-of-way. Of the 23.6 acres of forest within the Route 2 right-of-way, approximately 3.3 acres (inclusive of the proposed Tributary Station) are within the proposed SpotsyTech Campus development (described in Section 4.1.5), which would be cleared by the developer prior to construction of the Project.

Route 3

Route 3 crosses 2.8 miles of land encompassing 35.7 acres of right-of-way, including the proposed 2.2-acre Tributary Station site. Land use and land cover types along Route 3 consist predominantly of forest and agriculture, with minimal areas of developed lands and open space. If Route 3 is selected for the Project, the primary land use/land cover impact would be the conversion of forested land to open space within the maintained right-of-way. Of the 29.3 acres of forest within the Route 3 right-of-way, approximately 3.3 acres (inclusive of the proposed Tributary Station) are within the proposed SpotsyTech Campus development (described in Section 4.1.5), which would be cleared by the developer prior to construction of the Project.

Route 4

Route 4 crosses 3.0 miles of land encompassing 37.6 acres of right-of-way, including the proposed 2.2-acre Tributary Station site. Land use and land cover types along Route 4 consist predominantly of forest and agriculture, with minimal areas of developed lands and open space. If Route 4 is selected for the Project, the primary land use/land cover impact would be the conversion of forested land to open space within the maintained right-of-way. Of the 31.0 acres of forest within the Route 4 right-of-way, approximately 3.3 acres (inclusive of the proposed Tributary Station) are within the proposed SpotsyTech Campus development (described in Section 4.1.5), which would be cleared by the developer prior to construction of the Project.

4.1.3 LAND USE PLANNING AND ZONING

Section 15.2-2223 of the Va. Code requires local planning commissions to adopt comprehensive plans for guiding development of the territories within their respective jurisdictions. Comprehensive plans assess existing and future land uses, anticipate development trends, and make recommendations for guiding the long-term development decisions of a city or county. As discussed in Section 3.0, the Project is primarily located in Spotsylvania County, Virginia, with the southeast portion of the study area located within Caroline County, Virginia. Spotsylvania County and Caroline County have adopted Comprehensive Plans to guide their long-term development and vision for their respective counties.

Spotsylvania County Comprehensive Plan

The *Spotsylvania County Comprehensive Plan* (Spotsylvania County Plan) was originally adopted in December 2021 and updated in July 2022 and July 2023 (Spotsylvania County 2023). The Spotsylvania County Plan identifies areas within the County where growth is desirable and serves as a guide for development proposals. The Spotsylvania County Plan also address transportation, housing, public facilities, infrastructure, and natural and cultural resources.

The Spotsylvania County Plan's Future Land Use Map and Future Land Use Recommendations identify the type of development in each land use designation. The predominant future land use designations in the study area are Employment Central Light (light industrial and commercial activities), Agricultural and Forestal, and Open Space, with smaller areas of Rural, Mixed-Use Light, and Institutional land uses.

The development goals in the Spotsylvania County Plan are framed around target industries and economic development zones, as well as the continued value of agricultural and forestal resources as industry and scenic amenities. The county's Primary Development Boundary (PDB) defines the area in which public utilities are provided and where higher residential density and more intensive non-residential uses are encouraged. The intent is to produce efficient development and growth within the PDB while maintaining the rural character and agricultural and forestal viability outside the PDB.

Outside of the PDB, the Spotsylvania County Plan encourages the maintenance of the County's rural agricultural and forestal character through preservation of existing forested areas and use of vegetative buffers to prevent visual impacts from developments. The county has also established a Technology Zone Program, which uses tax incentives to attract business, growth, and employment opportunities. The Spotsylvania County Plan recognizes the potential fiscal benefits and limited transportation impacts of data centers and includes a preference for data centers to be sited near existing infrastructure to minimize the extension of new electric transmission lines. Specific guidance for the siting of new transmission lines within the County, including the Technology Zone of PDB is not included in the Plan.

The Spotsylvania County Plan's Transportation chapter acts as a guides transportation investment decisions in the County, identifies future transportation needs, and helps implement local, regional, and statewide transportation plans. Within the study area, Guinea Station Road is a Virginia Byway, a road designated by VDOT in partnership with the VDCR to recognize natural, historical, recreational, and archaeological amenities of scenic roads in the state. This road is also a Civil War Trail, which connects visitors with campaigns and sites of the Civil War. The Project would not affect any proposed transportation improvements. Section 4.1.9 discusses the Project's transportation impacts, and visual impacts are discussed in Section 4.3.

Caroline County Comprehensive Plan

The *Caroline County 2030 Comprehensive Plan* (Caroline County Plan) was originally adopted in January 2010 and amended through June 2023 (Caroline County, 2023a). The Caroline County Plan identifies areas within the County where growth is desirable and serves as a guide for development proposals. The Caroline County Plan also address transportation, housing, public facilities, infrastructure, and natural and cultural resources.

The Caroline County Plan's Future Land Use Map and Future Land Plan identify the desired type of development in each land use designation. Future land use in the study area is predominantly categorized as Flood Plain and Agricultural Preservation (AP). The AP designation is intended to encourage economic development while preserving and promoting agricultural land for the County's agricultural production activities (crops, livestock, dairy, and poultry operations). Flood Plain land use is located along the Poni and Ni Rivers. There are no primary growth areas or

specific community land use plans identified within the Caroline County portion of the study area. Guidance for the siting of new transmission lines within the County is not included in the Caroline County Plan.

The Caroline County Plan's Transportation chapter guides transportation investment decisions in the County, particularly the road system, while encouraging the development of a multimodal transportation system that includes rail, water, road, bicycle, and pedestrian modes. No proposed transportation improvements are located within the study area. Section 4.1.9 discusses the Project's transportation impacts.

4.1.3.1 ZONING

Local governments use zoning ordinances to formally designate land use districts, identify intended and compatible land uses in those districts, establish standards to guide orderly and efficient land use and development, and implement objectives of their comprehensive plans. A zoning ordinance may be modified by the local Board of Supervisors and governing bodies or through requests from residents or businesses to change zoning designations. Under Virginia law, public utilities planning to construct any transmission line of 138 kV or higher may either obtain a Certificate of Public Convenience and Necessity (Certificate, or CPCN) from the SCC or obtain the applicable local zoning ordinance approvals. The SCC's issuance of a Certificate preempts local zoning ordinances.

The study area is subject to the relevant Code of Ordinances for each county, which include zoning regulations (Spotsylvania County, 2024a and Caroline County, 2024c). The zoning districts within the study area (Figure 4.1.3-1; Table 4.1-4**Error! Reference source not found.**) are primarily rural and agricultural, with some industrial and commercial districts in the eastern and northeast portions of the study area, along I-95 and Patriot Highway.

Spotsylvania County Zoning

Most of the study area is subject to the Spotsylvania County Code of Ordinances, which includes the zoning regulations (Spotsylvania County, 2024a). The zoning districts within the study area (defined in the Plan) include Rural (Ru), Agricultural (A-2 and A-3), Industrial (I-1 and I-2), Village (mixed-use) (V) Planned Development and medium-density Commercial (PDC andC-2).

Caroline County Zoning

The southeast portion of the study area located in Caroline County is subject to the Caroline County Code of Ordinances, which includes their zoning regulations (Caroline County, 2024c). The only zoning district present in the southeast portion of the study area in Caroline County is Rural Preservation (RP). The RP district intends to maintain the predominant rural character of Caroline County by facilitating existing and future crop farms and non-intensive agricultural operations, conserving of natural resources, and limiting suburban sprawl.

4.1.3.2 ZONING OVERLAY DISTRICTS

Overlay zoning districts add requirements or identify additional permitted uses (Spotsylvania County, 2024a, Caroline County 2024c). None of the route alternatives would cross lands within these overlay districts.

Spotsylvania County Overlay Districts

The Spotsylvania County Zoning Ordinance identifies the following overlay districts within the study area:

- Historic Overlay District is intended to help preserve, protect, and promote important historical sites within Spotsylvania County. One historic overlay district in the study area contains one parcel that is located south of Guinea Station Road.
- The Highway Corridor Overlay District is intended to foster high quality site design and signage standards along important road corridors within Spotsylvania County, including a portion of Patriot Highway within the study area.

Caroline County Overlay Districts

Only one overlay district is present in the Caroline County portion of the study area: the Chesapeake Bay Preservation Area Overlay District (Caroline County, 2024c). The CBPA Overlay District establishes performance standards to minimize erosion, limit land disturbance, and preserve indigenous vegetation. Most of the Caroline County portion of the study area is within this overlay district.

4.1.3.3 IMPACT ASSESSMENT

The Project would not change any zoning district types it passes through, although the Project's right-of-way could affect future development or land uses in those districts. As a result, transmission lines and associated facilities on or crossing industrial zoning districts are generally less impactful to a community than those on or crossing residential or rural zoning districts (visual impacts notwithstanding; see Section 4.3). Table 4.1-4 summarizes the extent of each Spotsylvania County zoning district crossed by each route alternative. None of the route alternatives cross land in Caroline County.

TABLE 4.1-4 SPOTSYLVANIA COUNTY ZONING DISTRICTS CROSSED BY THE ROUTE ALTERNATIVES

Zoning District	Route 2		Route 3		Route 4	
	Miles [a]	Acres [b]	Miles [a]	Acres [b]	Miles [a]	Acres [b]
Agricultural (A-2)	1.2	14.0	1.1	13.8	1.1	13.8
Industrial (I-1) with Agricultural (A-2)	0.1	3.3	0.1	3.3	0.1	3.3
Rural (RU)	1.0	12.1	1.5	17.9	1.6	19.7

Notes

[a] Linear miles crossed by the centerline of the route alternative.

[b] Acreage within the right-of-way for the route alternative, including the proposed Tributary Station site

All of the route alternatives are within the Technology Zone and PDB around North Roxbury Mill Road and I-95. All three route alternatives cross the same extent of industrial (I-1) lands (including the Tributary Station site) and similar extents of Agricultural (A-2) lands. Route 2 crosses the smallest extent of Rural land, while Route 4 crosses the largest.

To implement a new use in a zoning district, an application for a Conditional Use Permit is typically submitted to the zoning department for review and approval. As noted above, under Virginia law, public utilities planning to construct a transmission line of 138 kV or higher are required to obtain a CPCN from the SCC or obtain any and all applicable local zoning ordinance approvals. Because Dominion is applying to the SCC for a CPCN for the Project, local zoning and local zoning requirements would not apply to the selected route.

4.1.4 RESIDENTIAL AND NON-RESIDENTIAL BUILDINGS

ERM identified residences, commercial structures, and other non-residential buildings within 60 feet of the rights-of-way and within 100, 250, and 500 feet of the centerline of each route through review of digital datasets, maps, and recent (2023) digital aerial photography. There are no buildings within the rights-of-way, within 60 feet of the rights-of-way, or within 100 feet of the centerline of the route alternatives. Only Route 4 has residential or non-residential structures within 250 or 500 feet of the centerline (Table 4.1-5Table 4.1-5). The locations of existing buildings along the routes are depicted on Figure 4.1.4-1. The subsections below provide additional information on the residential areas along each route alternative.

TABLE 4.1-5 RESIDENTIAL, COMMERCIAL, AND OTHER BUILDINGS WITHIN 100, 250, AND 500 FEET OF THE ROUTE ALTERNATIVES

Environmental Feature	Route 2	Route 3	Route 4
Dwellings within 250 feet of centerline [a]	0	0	1
Dwellings within 500 feet of centerline [a]	0	0	2
Non-residential buildings within 250 feet of centerline [b]	0	0	1
Non-residential buildings within 500 feet of centerline [b]	0	0	1

Notes
[a] Dwellings in this context refers to single-family detached residences.
[b] Non-residential buildings include commercial structures, outbuildings, and non-residential structures on residential-use parcels (sheds, barns, garages, etc.).

Most buildings within the study area are single-family dwellings on privately owned parcels, particularly along Patriot Highway and in the northeastern and north-central portions of the study area along Guinea Station Road, Church Pond Road, Riparian Court, Bridlepath Court, South Woods Drive, Brookside Lane, Graves Road, and Flippo Drive. There are no dwellings located within the rights-of-way of any of the route alternatives.

Commercial, industrial, and institutional (public schools) areas in the study area are concentrated mainly along Patriot Highway and I-95. Uses in these areas include, but not limited to, construction and black top manufacturing, meat processing, party equipment rental, bookkeeping and tax services, automobile sales and repair, logging, fitness services, and a racetrack facility. The relatively small extent of commercial and industrial activity within the study area reflect the predominantly rural and agricultural zoning in the study area.

4.1.4.1 IMPACT ASSESSMENT

In accordance with SCC Guidelines, routing through commercial and industrial areas, when practicable, is preferred to crossing residential areas to minimize potential conflicts with existing and planned land uses. Only Route 4 passes within 500 feet of commercial and/or non-residential structures; however, none of those structures are within the right-of-way for (or within 100 feet of the centerline of) Route 4.

Except for temporary impacts such as noise or traffic during construction, the Project would have no direct impacts on the operation or use of commercial and other non-residential buildings. Regardless of the route selected, in the event of temporary access impacts on commercial businesses, Dominion would coordinate directly with the affected business owners to plan for and mitigate effects.

In developing the routes and route variation, the Company attempted to minimize visual impacts to residences and residential areas to the extent practicable by using existing tree cover to visually obscure transmission infrastructure from existing residences. There are no buildings within the rights-of-way of any of the route alternatives, and all route rights-of-way would be greater than 100 feet from any existing residential dwellings or non-residential buildings. Potential impacts on residential and other buildings are discussed below. Section 4.3 discusses the Project's visual impacts.

The closest structures to each route alternative are described below.

Route 2

The nearest existing dwelling to Route 2 is a single-family residence approximately 0.25 mile north of MP 0.2, separated by forested land which would provide a vegetative screen between the home and the proposed transmission line infrastructure.

Route 3

The nearest existing structures to Route 3 are non-residential structures associated with a ranch approximately 0.1 mile northeast of MP 0.7, separated by open field and approximately 180 feet of forested land, which would provide a vegetative screen between the ranch and the proposed transmission line infrastructure.

Route 4

The nearest structures to Route 4 are a small outbuilding and a home located approximately 200 feet east of the centerline near approximately MP 0.7. The right-of-way would pass adjacent to the driveway to the home, with approximately 130 feet of forest between the front yard of the home and the right-of-way. In addition, two homes are within 500 feet of Route 4, approximately adjacent to existing Line #2090. One home is south of Braxton Street while the other is at the end of Whittaker Street, west of Flippo Drive. Both homes would be separated from the Route 4 right-of-way by approximately 400 feet of forested land.

4.1.5 PLANNED DEVELOPMENTS

ERM obtained information about planned future developments through publicly available data on county websites, the county development services website, and consultations with county

planning officials and other stakeholders. Planned developments in the study area (shown on Figure 4.1.5-1) are west of I-95 and include:

- Ni Village: a mixed-use development for multi-family and commercial use
- Roxbury Commons: a single-family residential development (Roxbury Commons)
- Thornburg Industrial Park: an industrial warehouse/distribution center
- Gateway Commerce Center: an industrial warehouse/distribution center
- SpotsyTech Campus: industrial park with multiple building types, including data centers

Except for the SpotsyTech Campus, no planned developments are located within 0.25 mile of the route alternatives.

The SpotsyTech Campus development is located on an approximately 315-acre parcel east of Patriot Highway and west of I-95, just north of the Riverview Elementary School. This development would include multiple industrial buildings including data centers. As of this routing study, this development is in the pre-application phase. No formal site plan or documentation for this development is publicly available.

4.1.5.1 IMPACT ASSESSMENT

The only planned development within 0.25 mile of the Project infrastructure is the proposed SpotsyTech Campus development, which would be served by the Project. All route alternatives would cross I-95 and would occupy the same right-of-way (including the Tributary Station) through this planned development. This shared right-of-way would avoid the proposed data center buildings or an associated drainage pond within the campus; therefore, the Project would have no impacts on this development.

There are no other planned developments within 0.25 mile of the route alternatives or the proposed Tributary Station; therefore, the Project would have no impacts on any planned developments within the study area.

4.1.6 RECREATIONAL RESOURCES

ERM collected information on recreational resources from digital datasets and maps, recent digital aerial photography, publicly available information on County websites, and consultation with county officials and other stakeholders. ERM identified three recreational resources (two existing and one planned) in the study area: the KOA Campground, US Bike Route 1, and the planned Spotsylvania County Trailway. Unless otherwise noted, the information on recreational resources provided below is from Spotsylvania County (2023, n.d.), VDOT (2024), and KOA (2024).

Figure 4.1.6-1 depicts recreational resources within 0.25 mile of the routes. Table 4.1-6 provides a description of these resources.

TABLE 4.1-6 RECREATIONAL RESOURCES WITHIN 0.25 MILE OF PROJECT

Recreational Resource	Description	Distance to Project
Fredericksburg/ Washington DC South (KOA)	Approximately 113.4-acre private, active campground located south of Guinea Station Road, north of Ni River, and west of Graves Road. Activities within the property include tent and recreational vehicle (RV) camping, fishing, swimming, and biking. The resource is surrounded to the north, west, and south by forested lands, and to the east by farmland. The southern half of the parcel is located within the NWI-mapped wetland complex surrounding the Ni River to the south. Based on aerial imagery, this part of the resource is undeveloped forest, not in use by campers.	Crossed by Route 2 between MP 0.6 and 0.9 Crossed by Route 3 between MP 0.7 and 1.0 About 50 feet west of Route 4 near MP 1.2
US Bike Route 1	Active, public, on-road bike trail established by the American Association of State Highway and Transportation Officials and maintained by VDOT, located along Church Pond Road and Guinea Station Road for approximately 2.5 miles through the study area. Guinea Station Road and Church Pond Road are two-lane, local roads with unpaved shoulders. The trail is used recreationally for biking. It passes through predominantly low-density residential development, agricultural land, and forested land.	Crossed by Route 4 between MP 0.4 and 0.5
Planned Spotsylvania County Trailway Improvement	Approximately 3.4 miles of proposed paved shoulder improvements along Church Pond Road and Guinea Station Road identified in the Spotsylvania County Comprehensive Plan. After completion, recreational uses within the improved area would include walking, running, and biking (portions of the proposed improvements be within the existing US Bike Route 1 resource).	Crossed by Route 4 between MP 0.4 and 0.5
Civil War Trails Lee vs. Grant Driving Route	The Lee vs Grant Civil War Trail Driving Route is located along Guinea Station Road within the study area, which offers interpretive signs and map guides for interpretation of events from the Civil War.	Crossed by Route 4 between MP 0.4 and 0.5
Guinea Station Virginia Byway	Guinea Station Road is a designated Virginia Byway. Roads designated under the scenic byway program have high aesthetic or cultural values and link historic, natural, and/or recreational sites. Land use along Guinea Station Road within the study area is primarily forested, with some residential development and agricultural land.	Crossed by Route 4 between MP 0.4 and 0.5
Riverview Elementary School Athletic Field	Approximately 3.5-acre athletic field on the Riverview Elementary School property. Land use to the north, east, and south of the field is forested, with the school to the west.	About 0.24 mile southwest of Routes 2, 3, and 4
Thornburg Middle School Athletic Field	Approximately 12 acres of open space including a track and baseball field on the Thornburg Middle school property. Land use to the north, east, and south of the field is forested, with the school to the west.	About 0.2 mile southwest of Routes 2, 3, and 4

Sources: Spotsylvania County 2023; Spotsylvania County n.d.; VDOT 2024; and KOA 2024

4.1.6.1 IMPACT ASSESSMENT

Route 2

Route 2 crosses the KOA Campground between approximate MPs 0.6 and 0.9 about 0.1 mile from the southern edge of the campground parcel. Based on aerial imagery, the right-of-way would be about 0.4 mile south of the portion of the parcel in active use by campground visitors. If this route alternative is selected, the transmission line would cross approximately 0.2 miles of forested land within the campground. Existing vegetation would be removed within the right-of-way. Impacts to schools are discussed in Section 4.1.7. Section 4.3 discusses visual impacts.

Route 3

Route 3 crosses the KOA Campground between approximate MPs 0.7 and 1.0, approximately through the middle (measured north to south) of the parcel. Based on aerial imagery, the right-of-way would be just south of the extent of the parcel in active use by campground visitors. If this route alternative is selected, the transmission line would cross approximately 0.3 of forested land within the campground. Existing vegetation would be removed within the right-of-way. Impacts to schools are discussed in Section 4.1.7. Section 4.3 discusses visual impacts.

Route 4

Route 4 crosses the segment of Guinea Station Road designated for US Bike Route 1, the planned Spotsylvania County Trailway improvement, and the Civil War Trails Lee vs. Grant Driving Route between approximate MPs 0.4 and 0.5 where the route intersects with Guinea Station Rd. The right-of-way would be cleared at this crossing and transmission structures would span the width of the road. The proposed transmission infrastructure would not prevent or meaningfully alter recreational use of these recreational sites. The Route 4 right-of-way is about 50 feet from the KOA Campground property near MP 1.2; however, no impacts to the campground are not anticipated due to the distance from the portion of the campground that is actively used. Impacts to schools are discussed in Section 4.1.7. Section 4.3 discusses visual impacts.

4.1.7 CEMETERIES, SCHOOLS, AND PLACES OF WORSHIP

ERM reviewed the following sources to identify cemeteries, schools, and places of worship within 0.25 mile of the right-of-way of each route alternative: US Geological Survey (USGS) topographic quadrangles (USGS 2022), recent (2023) digital aerial photography, and publicly accessible county datasets (Spotsylvania County VA GeoHub). Figure 4.1.7-1 shows existing cemeteries, schools, and places of worship within the study area.

4.1.7.1 CEMETERIES

Four cemeteries were identified within the study area: one located west of Patriot Highway, one north of Guinea Station Road and west of I-95, and two off of Church Pond Road at the northern edge of the study area. All four cemeteries are located more than one mile from the route alternatives and the proposed Tributary Station; therefore, the Project would have no impacts on cemeteries.

4.1.7.2 SCHOOLS

Three schools are located within the study area: Massaponax High School, Riverview Elementary School, and Thornburg Middle School. Massaponax High School is approximately 1.4 mile north of the proposed Tributary Station; therefore, the Project would have no impact on this school.

Riverview Elementary School is a public elementary school for pre-kindergarten through grade 5 located off North Roxbury Road west of I-95. Thornburg Middle School is a public middle school for grades 6-8 located off North Roxbury Mill Road, adjacent to the south of Riverview Elementary School and west of I-95. Both schools are approximately 0.2 mile southwest of the proposed Tributary Station. All three route alternatives and the proposed Tributary Station would use the same right-of-way near these schools.

Impact Assessment

Due to distance, the Project's impacts on the schools would be limited to visual impacts. The schools will be adjacent to the proposed SpotsyTech Campus development, which is likely to have required landscaping as a visual buffer between the school and the development. Section 4.3 discusses visual impacts.

4.1.7.3 PLACES OF WORSHIP

Two places of worship were identified within the study area: River of Life Church west of Patriot Highway and Fresh Wind Outreach Ministries between Roxbury Mill Road and Patriot Highway. Both places of worship are more than 0.5 mile from the route alternatives and the proposed Tributary Station; therefore, the Project would have no impacts on any places of worship.

4.1.8 CONSERVATION EASEMENTS

Land conservation easements help preserve Virginia's heritage, provide recreational opportunities, and improve 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, keeping an inventory of protected lands, and providing grants and information on easements and land protection. The agency also helps by identifying important open space and lands rich with plant and animal diversity.

Based on the VDCR's Managed Conservation Lands Database, two conservation easements are present within the study area (VDCR, 2024a). A review of DCR's Natural Heritage sites indicates that there are no Virginia Natural Area Preserves in the study area. Figure 4.1.8-1 shows existing roads within the study area.

One VDHR conservation easement is located north of Guinea Station Road and east of Patriot Highway. Approximately 27.0 acres of the 109.0-acre easement are within the study area. This land appears to be a farmstead with an agricultural field, outbuildings, and some forested land.

Approximately 75.0 acres of a 635-acre Virginia Outdoors Foundation (VOF) easement is located on the southern edge of the study area on the south bank of the Po River and north of Mudd Tavern Road/Stonewall Jackson Road. The portion of this easement within the study area is mainly forested, with a small amount of cleared land.

4.1.8.1 IMPACT ASSESSMENT

Because the two easements are greater than 0.25 mile from the route alternatives and the proposed Tributary Station, the Project would have no impacts on any conservation easements. Dominion understands that properties are placed under easements throughout the year, and that 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.

4.1.9 TRANSPORTATION INFRASTRUCTURE

4.1.9.1 EXISTING CONDITIONS

The road network in the study area includes a variety of road types ranging from interstates (such as I-95) to principal arterials (Patriot Highway/US Rt. 1), to local roads (such as Guinea Station Road, Flippo Drive, Church Pond Road, North Roxbury Mill Road, and South Woods Drive). As discussed in Section 4.1.3, Guinea Station Road within the study area is a designated Virginia Byway and a Civil War Trail. Patriot Highway and I-95 run approximately parallel along the western side of the study area. Each route alternative would cross I-95, which is maintained by VDOT within the study area. No existing or planned railroads are within the study area. Airports are addressed in Section 4.1.10.

Based on the Project start (Existing Line #2090) and end point (Tributary Station west of I-95), the transmission line is required to route westward, with the potential to collocate with existing roads limited to Guinea Station Road. Due to residential developments around and along Guinea Station Road, collocation with the road was not possible.

ERM reviewed publicly available information, including the Spotsylvania County Transportation & Thoroughfare Plan and the VDOT Northern Virginia District project website, to identify future road projects. VDOT is in the process of installing field devices for a variable speed limit system on I-95 within the Project study area, with completion expected in 2024 (VDOT 2024). None of the route alternatives are expected to impact this project. Additionally, the Company corresponded with VDOT, who did not express concerns about the proposed route alternatives.

4.1.9.2 IMPACT ASSESSMENT

Project impacts on transportation infrastructure would include temporary road closures and traffic during construction, and visual impacts from the installation of transmission structures and conductors along and across roads, which are discussed in Section 4.3. All routes would require crossing I-95. VDOT and Spotsylvania County guidelines indicate a preference for perpendicular road crossings, which reduce the distance spanned and the visual impacts of a crossing. VDOT also prefers that transmission structures are placed outside their rights-of-way to avoid conflicts with future road improvements.

Routes 2 and 3 each cross only one road (I-95). Route 4 crosses three roads (Guinea Station Rd, Beechwood Dr, and I-95), with acute (rather than perpendicular) crossings at Guinea Station Road and Beechwood Drive. All route alternatives would cross I-95 at a perpendicular angle.

4.1.10 AIRPORTS AND HELIPORTS

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

4.1.10.1 AIRPORT FACILITIES

ERM reviewed the FAA's website to identify public use airports, airports operated by a federal agency or the US Department of Defense, airports or heliports with at least one FAA-approved instrument approach procedure, and public use or military airports under construction (FAA n.d.-a, FAA n.d.-b). Based on this review, there are 6 airports, private airstrips, or heliports within 10 nautical miles (nm) of the proposed Project infrastructure (Figure 4.1.10-1). Table 4.1-7 lists the airports, heliports, and private airstrips in the Project vicinity, including airport identification number, and the distance and direction from the nearest Project infrastructure to the nearest runway or heliport, type of use, and maximum runway length.

TABLE 4.1-7 AIRPORTS AND HELIPORTS LOCATED WITHIN 10 NAUTICAL MILES OF THE PROJECT

Airport/Heliport Name	Use	FAA Identifier	Approximate Distance and Direction to Nearest Project Facility (nautical miles)	Maximum Runway Length (feet)
Robbie Campbell Memorial Airfield Airport	Private	4VG8	1.2 nautical miles (nm) southwest (All route alternatives, Tributary Switching Station)	2,384
Spotsylvania Regional Medical Center Heliport	Private	03VA	2.9 nm north of Route 4	NA
Woodford Airpark Airport	Private	20VA	4.4 nm south of all route alternatives	NA
Shannon Airport	Public	EZF	5.5 nm north of Route 4 (MP 0.0) to nearest existing runway Primary Surface	2,902
Mary Washington Hospital Heliport	Private	6VA7	8.3 nm north of Route 4 (MP 0.0)	NA
Mary Walker LZ Airport	Private/ Military	APH	8.6 nm southeast of Route 2 and 3 (MP 0.0)	2,202

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

4.1.10.2 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.

The FAA only regulates public use and federally operated (military use) airports and heliports. Of the airports identified in Table 4.1-7, the only public use airports within 10 nm of any route is Shannon Airport. Private use airports are not required to be evaluated as part of 14 CFR Part 77.

4.1.10.3CIVIL AIRPORT IMAGINARY SURFACES

Civil airport imaginary surfaces have been established with relation to each airport and each runway, pursuant to 14 CFR Part 77. Imaginary surfaces are intended 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.

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.

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.

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).

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.

None of the route alternatives discussed in this report would overlap with the civil airport imaginary surfaces of the public airport identified in Table 4.1-7.

4.1.10.4TERMINAL INSTRUMENT PROCEDURES

In addition to the civil airport imaginary surfaces, FAA Order 8260.3G establishes imaginary surfaces associated with terminal instrument procedures (TERPS), which are procedures for instrument approach and departure of aircraft to and from civil and military airports. TERPS

establish restrictions on the height of buildings, antennas, trees, and other objects, as necessary, to protect the airspace needed for aircraft during 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 4.1-7.

4.1.10.5FEDERAL AVIATION ADMINISTRATION NOTICE REQUIREMENTS AND TIMING

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

- Any construction or alteration is more than 200 feet above ground level at its site;
- Any construction or alteration exceeding an imaginary surface as defined in 14 CFR Part 77; including 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.
    - 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.
    - 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway that is more than 3,200 feet in actual length.
- If requested by the FAA.

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

None of the route alternatives discussed in this report would overlap with the civil airport imaginary surfaces of the public airports identified in Table 4.1-7. The proposed transmission line structures for the Project would not exceed 200 feet in height. Temporary cranes would likely be required to install the structures; however, based on the typical maximum crane height needed for tower construction (approximately 35 feet above the structure height), temporary cranes are also unlikely to exceed the FAA notification thresholds.

4.1.10.6STATE AND LOCAL REGULATIONS

It is unlawful 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 from the Board of Aviation (Va Code §5.1-25.1). This requirement does not apply to any structure erected in a jurisdiction that has an ordinance regulating the height of such structures to prevent the penetration of zones and surfaces established in 14 CFR Part 77 and Rule 19 of the Virginia Department of Aviation.

State law (Va. Code §15.22280, 15.22282, 15.22293, and 15.22294) gives local jurisdictions the power to establish and regulate zoning districts, make airspace subject to their zoning ordinance, and establish airport safety zoning. Spotsylvania County has enacted an Airport Protection Overlay

District as part of their zoning ordinance (Article 7, Division 7), with the goal of minimizing safety hazards specifically within 9,000 feet of Shannon Airport. The project is located approximately 33,000 feet south of Shannon Airport; therefore, no structure associated with the Project would overlap the Airport Protection Overlay District. Caroline County has no special zoning or airspace restriction ordinances associated with airports.

4.1.10.7IMPACT ASSESSMENT

ERM conducted an airport analysis to review the height limitations associated with the FAA-defined imaginary surfaces for all runways at the airports identified in Table 4.1-7. As part of a typical airport analysis, ERM conducts preliminary evaluations of transmission infrastructure heights and locations using the FAA-defined Civil and Department of Defense airport imaginary surfaces, and applies standard GIS tools, including ESRI's ArcGIS Pro software with Spatial Analyst, 3D Analyst, and Aviation Airports Extensions, to create and georeference imaginary surfaces in space and in relationship to transmission structures.

Of the 6 airports and heliports identified within 10 nautical miles of all the route alternatives, one airport is public use (Shannon Airport), and one is a military-use airport (Mary Walker LZ Airport). Private airports and heliports are not regulated by the FAA, and none of the private facilities listed in Table 4.1-7 are anticipated to have a conflict with the proposed route alternative locations.

Shannon Airport is located approximately 5.5 nautical miles north of the Route 4 cut-in of existing Line #2090 (MP 0.0) and the Mary Walker LZ Airport located approximately 8.6 nautical miles southeast of the Route 2 and 3 existing Line #2090 cut-in location (MP 0.0). Based on a review of runways and approach procedures, neither facility is close enough to any of the route alternatives to create overlap between a transmission structure and an FAA-defined civil or military use imaginary surface. In addition, none of the proposed structures associated with any of the route alternatives would exceed 200 feet above ground surface, nor would the cranes used during Project construction .

As such, the Project would not penetrate any FAA notification thresholds. Unless specifically requested by the FAA, notification to the FAA would not be required. If the FAA were to request additional information regarding the proposed project for any reason, Dominion may be required to submit FAA Form 7460-1, Notice of Proposed Construction or Alteration, pursuant to 14 CFR Part 77 for FAA notification. Any such submittal would occur after a route is selected by the SCC during the permitting phase of the Project.

4.2 NATURAL RESOURCES

4.2.1 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 October of 2023 (NAIP 2023);
- Caroline County Virginia Mapping Web Site (Caroline County 2024a);
- Spotsylvania County Interactive Data Portal GIS datasets (Spotsylvania County n.d.);

- Google Earth Aerial Imagery (Google LLC 2024);
- ESRI World Elevation Terrain 2-foot contours (ESRI et al. 2024);
- NWI maps from the USFWS online data mapping portal (USFWS 2021);
- The National Hydrography Dataset (NHD) Plus High Resolution (USGS 2024);
- Soils data from the US Department of Agriculture-Natural Resources Conservation Service; and
- 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 4.2.1-1.

4.2.1.1 WATERSHEDS

Watersheds define the geographic area within the boundaries of drainage divides throughout the country. The United States is divided into four levels of hydrologic units—regions, subregions, accounting units, and cataloging units—each of which may contain an entire or part of a watershed. Each unit is identified by a hydrologic unit code (HUC). The first level of the code, 2-digit HUCs identify major geographic areas or regions, each of which contains several rivers or the drainage area of a major river. Subsequent levels (the 4-, 6-, 8-, and 10-digit HUCs) identify progressively smaller areas based on the drainage divides of lower order waterbodies.

The study area is within the following HUC areas:

- the Mid-Atlantic 2-digit HUC region (02), which discharges into the Atlantic Ocean, Long Island Sound, and the Riviere Richelieu, a tributary of the St. Lawrence River;
- the Lower-Chesapeake 4-digit HUC subregion (0208), which drains about 18,500 square miles within the Chesapeake Bay watershed, including Washington DC, Maryland, Pennsylvania, Virginia, and West Virginia;
- the lower-Chesapeake 6-digit HUC watershed (020801), which drains about 8,320 square miles into the Chesapeake Bay (USGS 2019); and
- the Mattaponi 8-digit HUC watershed (02080105), which drains approximately 901-square miles into the Chesapeake Bay.

The Mattaponi HUC 8 further divides into the Poni River 10-digit HUC watershed. Within the study area, the named waterbodies of the HUC 10 are the Ni River, moving northwest to southeast across the middle of the study area, and the Po River, moving west to east across the southern edge of the study area. Aquatic resources in the study area generally flow into the Ni River and its associated wetlands.

4.2.1.2 WETLANDS

Wetlands within the rights-of-way for the route alternatives (inclusive of the proposed Tributary Station) were identified based on ERM's desktop wetland and waterbody probability analysis, described in the Wetland and Waterbody Desktop Summary (Appendix D). ERM did not conduct an onsite delineation of wetlands or waterbodies along the route alternatives. Wetlands and waterbodies have been classified based on the Cowardin classification system as 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) open waters: characterized by bottom substrate particles smaller than stones (less than 10 inches diameter) covering greater than 25 percent of the area, with plants covering less than 30 percent of the area; and
- Riverine streams: channels containing periodically or continuously moving water (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 n.d.; USDA 2007).

Most wetlands in the study area are adjacent to or contiguous with streams and associated tributaries regulated by the US Army Corps of Engineers (USACE) and Virginia Department of Environmental Quality (VDEQ) under Sections 404 and 401 of the Clean Water Act (CWA), respectively.

Table 4.2-1 summarizes the calculated acres of wetlands and waterbodies identified within the right-of-way of each route alternative. These are areas of high, medium-high, or medium probability of containing wetlands or waterbodies, based on the probability analysis described in Appendix D. Maps in Attachment 2 of Appendix D depict these wetlands and waterbodies.

TABLE 4.2-1 HIGH, MEDIUM-HIGH, AND MEDIUM PROBABILITY WETLANDS AND WATERBODIES WITHIN THE PROJECT FOOTPRINT

Surface Waters Crossed [a]	Unit	Route 2	Route 3	Route 4
Total	Acres	14.1	14.4	13.8
Palustrine Forested (PFO)	Acres	7.3	7.9	7.4
Palustrine Scrub-shrub (PSS)	Acres	6.4	6.1	6.1
Palustrine Emergent (PEM)	Acres	NA	NA	NA
Palustrine Unconsolidated Bottom (PUB)	Acres	NA	NA	NA
Riverine	Acres	0.4	0.3	0.3

NA = Not applicable due to absence of a wetland type within the Project footprint; PEM = palustrine emergent; PFO = palustrine forested; PSS = palustrine scrub-shrub; PUB = palustrine unconsolidated bottom.
Note:

[a] Acreages have been rounded to the tenths; as a result, the totals may not reflect the sum of the addends.

Wetlands in the study area are predominantly forested and are concentrated around the Ni and Po Rivers in a large wetland/waterbody complex in the central and southern areas of the study area, as well as around perennial tributaries to the Ni River in the northeast portion of the study area. Riverine (stream) and PUB (open water features) are described in the Waterbody Crossings section below. Wetland types crossed by the route alternatives are mainly PFO and PSS.

No wetlands were identified within the footprint of the Tributary Station.

Route 2

The Route 2 right-of-way encompasses approximately 14.1 acres of wetlands and waterbodies. Approximate locations of larger areas of wetlands along Route 2 include:

- PFO wetlands associated with Ni River between MPs 0.0 and 0.3, MPs 0.5 and 1.0, and MPs 1.7 and 1.9.
- PSS wetlands associated with Ni River between MPs 1.0 and 1.6.

If Route 2 is selected for the Project, construction and operation of the transmission line would convert the approximately 7.3 acres of PFO to PSS/PEM-type wetlands within the maintained right-of-way.

Route 3

The Route 3 right-of-way encompasses approximately 14.4 acres of wetlands and waterbodies, including the same segments of wetlands identified above between Route 2 MPs 0.0 and 0.4 and 1.1 to the Tributary Station. From MP 0.4 to MP 1.5, the approximate locations of larger areas of wetlands along Route 3 include PFO wetlands between MPs 0.6 and 0.8, and between MPS 1.0 and 1.5.

If Route 3 is selected for the Project, construction and operation of the transmission line would convert the approximately 7.9 acres of PFO to PSS/PEM-type wetlands within the maintained right-of-way.

Route 4

The Route 4 right-of-way encompasses approximately 13.8 acres of wetlands and waterbodies, including the same segments of wetland identified above for Route 3 between MPs 1.1 and 1.5, and for Route 2 from MP 1.1 and the proposed Tributary Switching Station site. In addition, Route 4 crosses PFO wetlands at approximate MP 0.4.

If Route 4 is selected for the Project, construction and operation of the transmission line would convert the approximately 7.4 acres of PFO to PSS/PEM-type wetlands within the maintained right-of-way.

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. Due to residential areas in the northern part of the study area and the locations of start and endpoints of

the Project (Line #2090 and the Tributary Station), all routes would require crossing the Ni River and the wetland complex around it, limiting the Company's ability to span all wetlands in the rights-of-way.

Most potential direct impacts on wetlands due to Project construction would be temporary in nature. The Company would use temporary timber matting for construction equipment to travel over wetlands. 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 pre-existing conditions.

Permanent direct impacts to wetlands would be limited to placement of structures within wetlands, if unavoidable, and the permanent conversion of PSS/PFO wetlands within the right-of-way to PSS or PEM-type wetlands due to the necessity of removing trees and shrubby vegetation from the right-of-way. 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.

Portions of the route alternatives within the wetland/waterbody complex around the Ni River would cross forested wetlands and mapped hydric soils. Limited availability of open upland areas may result in the need for additional tree clearing along the proposed right-of-way for staging of construction materials and tree removal. Tree removal within forested wetland areas could result in muddy conditions due to hydric soils and hydrology when trees are removed and may require additional access roads to be constructed for tree removal. If staging areas adjacent to the right-of-way are required, this could result in additional forested wetland conversion and/or additional potential soil disturbance adjacent to the waterbody/wetland complex and resultant sediment deposition into the aquatic resource, particularly due to its contiguous nature.

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.

No change in the contours of wetlands and waterbodies or redirection of the flow of water is anticipated and the amount of spoil from foundation and structure placement would be minimal. Excess spoil in wetlands generated through foundation construction would be controlled through construction best management practices (e.g., the implementation erosion and sediment controls).

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

4.2.1.3 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. Waterbody crossings are regulated by the USACE and VDEQ under Sections 404 and 401 of the CWA and the Virginia Water Protection permit program. No navigable waters are crossed by the route alternatives; therefore, no authorization from the USACE pursuant to Section 10 of the Rivers and Harbors Act (Title 33, US Code [U.S.C.] §401) would be required for the Project.

All route alternatives would cross the perennial Ni River and unnamed perennial and intermittent tributaries to the Ni River. Table 4.2-2 shows the number of waterbody crossings for each route alternative. The locations of those waterbodies are described below. Appendix D provides a general location map illustrating waterbodies crossed by each route.

TABLE 4.2-2 WATERBODIES CROSSED BY THE ROUTE ALTERNATIVES

Waterbodies Crossed [a]	Unit	Route 2	Route 3	Route 4
NHD-Mapped Perennial Streams/Rivers	Number	7	5	5
NHD-Mapped Intermittent Streams/Rivers	Number	5	6	6
Total	Number	12	11	11

Source: USGS NHD (NHD 2023)

Note:
[a] Inclusive of the proposed Tributary Switching Station.

Route 2

Route 2 crosses 12 NHD-mapped waterbodies, as listed in Table 4.2-2. Based on ERM's desktop wetland and waterbody analysis, the right-of-way for Route 2 would encompass approximately 0.4 acre of riverine streams. Approximate locations of waterbodies crossed by Route 2 are summarized below.

- Unnamed, perennial tributaries to the Ni River at MP 0.3, between MPs 0.5 and 0.7, and between MPs 0.8 and 0.9; and
- Perennial Ni River and unnamed, perennial and intermittent tributaries to the Ni River between MPs 0.9 and 1.6.

Route 3

Route 3 crosses 11 NHD-mapped waterbodies, as listed in Table 4.2-2. Based on ERM's desktop wetland and waterbody analysis, the right-of-way for Route 3 would encompass approximately 0.3 acre of riverine streams. Approximate locations of waterbodies crossed by Route 3 are summarized below.

Unnamed, perennial tributaries to the Ni River at MPs 0.3 and 0.7, and between MPs 1.2 and 1.3

- Perennial Ni River and unnamed, perennial and intermittent tributaries to the Ni River between MPs 1.4 and 2.0.

Route 4

Route 3 crosses 11 NHD-mapped waterbodies, as listed in Table 4.2-2. Based on ERM's desktop wetland and waterbody analysis, the right-of-way for Route 4 would encompass approximately 0.3 acre of riverine streams. Approximate locations of waterbodies crossed by Route 3 are summarized below.

- Unnamed, perennial and intermittent tributaries to the Ni River at MPs 0.1, 0.4, and 1.4
- Perennial Ni River and unnamed, perennial and intermittent tributaries to the Ni River between MPs 1.6 and 2.2.

Impact Assessment

Waterbodies crossed by the route alternatives would be spanned as practicable, with permanent waterbody impacts limited to riparian buffer transition from tree cover to herbaceous vegetation within the maintained right-of-way. All route alternatives cross the Ni River wetland/waterbody complex, which is characterized by perennial and intermittent streams interwoven with PFO wetland systems. Transmission line structure placement along the routes would be designed to avoid direct impacts and placement within perennial streams, but due to the cohesive nature of the Ni River ecosystem, structures placed outside waterbodies in adjacent wetlands may result in indirect impacts. 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.

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 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 into adjacent surface waters during rain events. Increased turbidity and localized sedimentation of stream bottoms may occur from 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 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 USACE and VDEQ for work within wetlands and waterbodies to ensure full compliance with Section 404 and 401 of the CWA and minimize potential impacts on aquatic resources within the approved transmission line corridor.

4.2.2 NATURAL HERITAGE RESOURCES

The Virginia Natural Area Preserves Act of 1989 defines natural heritage resources (NHRs) as habitats of rare, threatened, or endangered plant and animal species; rare or state-significant natural communities or geologic sites; and similar features of scientific interest benefiting the welfare of the citizens of the Commonwealth (Va. Code § 10.1-209 through 217). ERM consulted the VDCR's Natural Heritage Program (NHP) and requested an environmental review of the routes to identify NHRs along and near each alternative. ERM also reviewed ecological datasets provided via the NHP for the area within 1.0 mile of what would be the rights-of-way for each route alternative. Resources reviewed included natural area preserves, conservation sites, stream conservation sites, and ecological cores (VDCR 2024c).

The VDCR responded to ERM's request for environmental review of the Project in a letter dated May 31, 2024 (attached as Appendix E). The VDCR letter indicates that no natural area preserves, stream conservation sites, or state-listed insects are present along the routes; therefore, no further discussion of these resource types is provided in this study. However, the VDCR's review did identify ecological cores as a NHR along the routes.

4.2.2.1 ECOLOGICAL CORES

Ecological cores are areas of at least 100 acres of continuous, interior, natural cover (*e.g.*, forests or woodlands) 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. Smaller areas of continuous interior cover (*i.e.*, 10 to 99 acres), called habitat fragments, support ecological cores and provide similar functions and values. Ecological cores and habitat fragments together provide natural and economic benefits of open space, recreation, water quality (including erosion prevention and drinking water recharge and protection), and air quality (including carbon sequestration and oxygen production). The integrity of ecological cores is ranked from C1 to C5 using nine prioritization criteria, including the habitats of the natural heritage resources the cores contain. Habitat fragments are similarly classified, though none are ranked above C3. 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

Generally, the VDCR assigns a higher ranking (*e.g.*, C1, C2, and C3) to larger and more biologically diverse ecological cores. Ecological integrity is considered 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 are typically connected by extended landscape corridors with forests that comprise a statewide network of natural lands. Therefore, the VDCR recommends avoidance of ecological cores ranked C1 or C2 and a formal impact analysis to minimize impacts if they are unavoidable. Lower ranked ecological cores may have smaller

fragments of forested habitat (10 to 99 acres of contiguous forest); however, the VDCR notes that habitat fragments can also provide important ecological functions and values and recommends avoiding impacts to habitat fragments when feasible. For this study, only ecological cores will be discussed in detail.

The VDCR review of the Project found that the study area contains ecological cores of outstanding (C1) and high (C3) ranking, generally associated with the Ni and Po Rivers and their tributaries (Appendix E; VDCR 2024c). Moderate (C4) and general (C5) ecological cores and habitat fragments are found in the northeastern, northwestern, and southwestern portions of the study area. Route 4 crosses one approximately 90-acre C5-ranked habitat fragment (Core ID 47909). This patch is not evaluated further because it is less than 100 acres of continuous natural cover, and no formal analysis is required. Ecological cores crossed by the routes are summarized in TABLE 4.2-3. Figure 4.2.2-1 depicts the location of the cores relative to the routes.

TABLE 4.2-3 VDCR-MAPPED ECOLOGICAL CORES CROSSED BY THE ROUTE ALTERNATIVES

Ecological Cores [a]	Unit	Route 2	Route 3	Route 4
Outstanding (C1)	acres	25.0	30.1	26.7
Very High (C2)	acres	0.0	0.0	0.0
High (C3)	acres	1.2	1.2	1.2
Moderate (C4)	acres	0.0	0.0	0.0
General (C5)	acres	0.0	0.0	3.3

Note:
[a] This table represents both ecological cores (greater than 100 acres of contiguous interior cover) and habitat fragments (small patches with 10 to 99 acres of interior cover)

As shown on Figure 4.2.2-1, all of the route alternatives cross the same approximately 3,434-acre ecological core, ranked C1 (Core ID 48062). Core ID 48062 is generally bounded by the Company's existing Line #2090 to the east, I-95 to the west, Stonewall Jackson Road to the south, and Guinea Station Road to the north. Based on recent (2023) aerial imagery this core is almost completely forested. Cleared areas include a portion that has been clear cut where it abuts the 2090 line, confirmed in a visit by the Company on July 25, 2024, small amounts of cleared land on its northern and eastern edges, and the approximately 119-acre Dominion Raceway & Entertainment property adjacent to I-95 and Mudd Tavern Road.

Route 2

Route 2 crosses approximately 25.0 acres of Core ID 48062 between MPs 0.0 and 2.1. Between MPs 0.0 and 0.3, the core is cleared and used for managed timber production. Land use data classify the approximately 0.5-mile segment between MP 1.0 and 1.6 as agricultural land, although the area appears to be vegetated with shrubs or trees based on recent (2023) aerial imagery (NAIP 2023). The remainder of the core crossed by the route is forested.

Route 3

Route 3 crosses approximately 30.1 acres of Core ID 48062 between MPs 0.0 and 2.6. Route 3 shares an alignment with Route 2 between MPs 0.0 and 0.4 and between MPs 1.5 and 2.6, crossing the same approximately 0.3 mile of managed timber and 0.5 mile of agricultural land described under Route 2. The remainder of the core crossed by the route is forested.

Route 4

Route 4 crosses approximately 26.7 acres of Core ID 48062 between MPs 0.5 and 2.8. Route 4 shares an alignment with Routes 2 and 3 between MPs 1.7 and 2.8, crossing the same approximately 0.5 mile of agricultural land described above. The remainder of the core crossed by the route is forested.

Tributary Station

About 1.2 acre of the Tributary Station is located on the perimeter of an approximately 681-acre rank C2 (High) ecological core (Core ID 47899). Core ID 47899 is within the proposed SpotsyTech Campus center development and is bounded by I-95 on the east, Patriot Highway on the west, Guinea Station Road to the north, and Riverview Elementary School to the south. It is completely forested apart from the Ni River and its tributaries and some commercial and residential properties in the eastern edge, adjacent to Patriot Highway.

Impact Assessment

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 2024c).

Based on a review of recent aerial imagery (2023), all the route alternatives would bisect C1-ranked Core ID 48062. For all route alternative crossings, the remaining two core segments would each be greater than 100 interior acres and would therefore still be considered ecological cores per the VDCR. Impacts on the area of Core ID 48062 crossed by the route alternatives would be limited to structure placement and conversion of forest cover to open, vegetated space within the maintained right-of-way.

The developer would clear and grade the portions of Ecological Core ID 47899 within the Tributary Station footprint prior to Project construction, eliminating any habitat associated with the area. The Company will work with the appropriate jurisdictional agencies to minimize any impacts on ecological cores and protected species during implementation of the Project.

4.2.3 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 T&E 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" (33 U.S.C. §1532). 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 (33 U.S.C. §1532). 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 (33 U.S.C. §1532).

Virginia has adopted separate codes for protecting animals and plants in the state. The Virginia ESA (Va. Code, §§ 29.1-563 through -570) designates the Virginia Department of Wildlife Resources (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 the taking, transportation, processing, sale, or offer for sale of those species.

Under the Virginia Endangered Plant and Insect Species Act (Title 2, Virginia Administrative Code [VAC], Agency 5 §320-10 [2VAC5-320-10), 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 2024a);
- VDCR NHP (VDCR 2024b);
- 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 Tricolored Bat (TCB) Winter Habitat and Roost Tree Application (VDWR 2024c); and
- 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. ERM obtained digital data from the VDCR to identify locations within the potential rights-of-way of the routes and substation (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 IPaC include species that may occur in the study area (USFWS 2024a). Query results from VaFWIS include species known to occur or likely to occur within a 2.0-mile radius of the Project study area (VDWR 2024b). Data for species known to occur within the Project route alternative rights-of-way using queries of the VDWR WERMS.

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

4.2.3.1 FEDERAL- AND STATE-LISTED THREATENED AND ENDANGERED SPECIES

Database queries identified multiple federal- and state-listed T&E species within and adjacent to the study area. Each federal- and state-listed species was reviewed for its potential occurrence within and adjacent to the route alternatives, variation, and substation site.

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, including species of concern, based on rarity and conservation status. Species ranked "G1" (global rank 1/critically imperiled) or "G2" (global rank 2/imperiled) are most at risk (NatureServe n.d.).

Threatened and Endangered Species Waters (T&E Waters) are waterbodies that have documented occurrences of federal- and state-listed species and habitats. The Po River (along the southern edge of the study area) and the Matta River (approximately 2.1 mile southeast of the edge of the study area) have been designated T&E Waters.

Table 4.2-4 provides information on the federal and state-listed species with potential to occur in the study area.

TABLE 4.2-4 FEDERAL AND STATE LISTED SPECIES POTENTIALLY OCCURRING IN THE STUDY AREA

Common Name	Scientific Name	Status	Global Rank	Habitat	Source
Mammals					
Indiana bat	*Myotis sodalis*	FE, SE	G2	Hibernates in medium to large sized caves or abandoned mines that remain stable in temperature (below 50 degrees Fahrenheit). Roosts in forested areas in the summer, generally under dead or dying trees. Maternity roosts occur in forest areas, bottomland and floodplain habitats, riparian zones, wooded wetlands, and upland communities.	IPaC USFWS
Northern long-eared bat	*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
Yellow lance	*Elliptio lanceolata*	FT, ST	G2	Found in clean waters with moderate flow rates, high dissolved oxygen content, and coarse to medium sandy bottoms.	IPaC VaFWIS USFWS
Fish					
Atlantic sturgeon	*Acipenser oxyrinchus*	FE, SE	G3	Migrate from the ocean to freshwater rivers to reproduce in the Spring or Fall. Deposit eggs among solid substrates within clean rivers.	VaFWIS
Plants					
Small whorled pogonia	*Isotria medeoloides*	FT, ST	G2	Variety of woodland habitats. Prefers mid-aged woodland habitats on north/northeast-facing slopes within small draws.	IPaC VDCR

Sources: USFWS 2024a; VDCR 2024a, 2024b; VDWR 2024b, 2024c, 2024d

IPaC = Information for Planning and Consultation; USFWS = US Fish and Wildlife Service; 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
FC	Federally listed as candidate				

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

ERM identified six federally listed species and one species with a proposed federal listing, each of which is also state-listed that may potentially occur in the study area. Of the federally listed species, the VaFWIS database identified the Dwarf wedgemussel, the Yellow lance, and the Atlantic sturgeon as species that have confirmed occurrences within a two-mile buffer around the study area (VDWR 2024b).

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

The NLEB can be found in the western portion of the state during winters and throughout the entire state during the summer and fall months (VDWR 2024c). Winter hibernacula for these bats consist of tight areas in caves, mines, and artificial structures (*e.g.*, barns) that are high in humidity, stable in temperature, and have little to no air currents. During summers, NLEBs are found roosting in tree cavities/crevices either singly or in colonies. These bats rely on forested habitat not only for roosting purposes, but also for foraging and commuting between seasonal habitats (USFWS 2024b).

The Indiana bat favors underground hibernacula such as caves and abandoned mines where temperatures remain stable and above freezing. In the summer, this species prefers roost sites located in forested areas where dead or dying trees are present. These bats forage along forest edges, in riparian areas, and semi-open to closed forests (USFWS 2024c).

Potential summer foraging habitat for the TCB, NLEB, and Indiana bat includes multiple forested areas along each route. A review of the VDWR winter habitat and roost trees online mapping system did not show winter habitat (*i.e.*, hibernacula) or roost trees for TCB, NLEB, or Indiana bat within the Project footprint (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). Suitable habitat for the Dwarf wedgemussel may be present within the Project study area, and the VaFWIS database confirmed the presence of the species within the Po River.

The Yellow lance is a freshwater mussel that prefers clean, moderate flowing waters with high dissolved oxygen content (USFWS 2019). The species is typically found in aggregations and sandy areas that are downstream of sand/gravel bars (USFWS 2019). The species range extends into the Project study area (USFWS 2021); therefore, suitable habitat is likely also present within the Project study area. The VaFWIS database confirmed the presence of the Yellow lance within the Po River and Matta River.

The Atlantic sturgeon, an anadromous fish, spends most of its life in the ocean and migrates into the freshwaters of Chesapeake Bay tributaries in Virginia. It lays eggs in clean rivers on solid substrates during the breeding season in the spring or fall (VDWR 2024b). The Atlantic sturgeon has been confirmed as present within the Po River and Matta River.

The Small whorled pogonia is a perennial orchid that can be found in a variety of woodland habitats, although this species prefers mid-aged woodland habitats on north/northeast-facing, gentle hillslopes within small draws. This species can remain dormant in the soil for an extended period of time, making habitat loss and ground disturbance a leading contributor to the decline of this species (VDCR, 2024b). Based on the VDCR's May 31, 2024, correspondence (Appendix E), there is potential suitable habitat for the Small whorled pogonia throughout the study area.

State-Listed Species

Seven state-listed species (Indiana bat, NLEB, TCB, Dwarf wedgemussel, Yellow lance, Atlantic sturgeon, and Small whorled pogonia) were identified as potentially occurring within the study area. Each of these species are also federally listed or proposed to be listed as described above.

Impact Assessment

Potential habitat for all seven federal- and state-listed or proposed species exists in and/or within a 2.0-mile radius of the study area. The VaFWIS and WERMS data show that only the Dwarf wedgemussel, Yellow lance, and Atlantic sturgeon have been confirmed within the study area or 2.0-mile radius of the study area boundary. The Matta River, which is classified as a T&E Water for the Yellow lance and Atlantic sturgeon, is approximately 3.4 miles south of the route alternatives. The Po River, which is classified as a T&E Water for the Dwarf wedgemussel and Yellow lance, is approximately 0.7 mile south of the route alternatives. No impact is anticipated to the Dwarf wedgemussel, Yellow lance, or Atlantic sturgeon due to the distance between the Project and the T&E Waters.

VDWR data show that summer foraging habitat for the bat species is likely present within forested habitats crossed by each route alternative. Although tree clearing would impact potential bat habitat, no impacts on these species are anticipated for any route alternative if trees are cleared during the winter, pursuant to VDWR time-of-year restrictions (TOYRs).

The Company is actively monitoring the regulatory changes and requirements associated with the NLEB and how they could potentially impact construction timing associated with TOYRs. The USFWS previously indicated that it planned to issue final NLEB guidance to replace the interim guidance by April 1, 2024; however, the interim guidance has been extended by USFWS until late summer 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 Dwarf wedgemussel, Yellow lance, and Atlantic sturgeon species were documented within the Po and/or Matta Rivers. Because the Po and Matta Rivers are located within the study area or within 2.0 miles of the study area boundary, the VaFWIS and WERMS databases identified them as

features that could be impacted by the Project (VDWR 2024a, 2024b). However, because no route alternatives cross either river, and due to the distance from these rivers (greater than 1.0 mile), the Project would not impact the T&E waters or these species.

Tree removal associated with Project construction would eliminate habitat of the Small whorled pogonia. Table 4.2-5 summarizes the acreage of Small whorled pogonia habitat crossed by the route alternatives. Route 2 would not cross any Small whorled pogonia habitat. Route 3 crosses three small (between 0.4 and 2.3 acres), isolated areas of potential habitat for the Small whorled pogonia at approximate MPs 0.8, 0.9, and 2.1. Route 4 crosses through the edge of a larger area of potential habitat for the Small whorled pogonia between MPs 0.0 and 0.3. The impact of Route 4 is mitigated by being located at the edge of the habitat rather than bisecting the center.

TABLE 4.2-5 SMALL WHORLED POGONIA HABITAT CROSSED BY THE ROUTE ALTERNATIVES

	Route 2 (acres)	Route 3 (acres)	Route 4 (acres)
Small Whorled Pogonia Habitat	0.0	0.8	1.5

Source: VDCR Response Letter (Appendix E)

Regardless of the route alternative selected for the Project, Dominion will coordinate with state and federal agencies as needed to determine if surveys, construction TOYRs, or other mitigation would be required to mitigate potential impacts on threatened or endangered species. If any T&E species are encountered during Project construction, Dominion will work with the VDWR and other appropriate jurisdictional agencies to minimize any impacts on the species.

4.2.3.2 BALD EAGLES

The Bald eagle (*Haliaeetus leucocephalus*) is no longer federally listed under the ESA, although it remains 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 ST1501) is approximately 6.0 miles northeast of the study area. According to the CCB, the nest was last observed to be occupied in 2016 (CCB 2022). The next closest nest (Nest ID SP1601) is approximately 7.7 miles west of the study area.

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.

4.2.4 VEGETATION

4.2.4.1 LOCAL VEGETATION CHARACTERISTICS

The study area is situated between the Northern Piedmont and Coastal Plain physiographic provinces. Vegetation in both provinces has been altered by clearing as part of ongoing agricultural and silvicultural practices as well as residential and non-residential development occurring since European settlement. Prior to the effects of European settlement, vegetation was influenced by the practices of Native Americans. Literature from early explorers, for example, indicates that parts of the Piedmont province 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 the Northern Piedmont and the Coastal Plain have undergone a cycle of clearing, farming, and regenerating. Fallow farmlands, if left unattended, undergo a successional regeneration process that generally results in a prevalence of early successional trees such as Virginia pine (*Pinus virginiana*) and Tulip poplar (*Liriodendron tulipifera*). Over time, early successional communities in these provinces 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. However, the study area lies in a highly forested portion of Spotsylvania County with small tracts of developed land along the major roadways (i.e., Guinea Station Road, I-95, and Patriot Highway). Forest clearing has occurred across much of the study area in the last 20 years; thus, much of the vegetation in the study area consists of immature mixed pine (*Pinus* spp.), hardwood forest communities, and forested "edge" communities that border larger forested tracts. Small areas of open space within the study area are generally associated with lawns on residential parcels. Table 4.2-6 summarizes the acreage of vegetation types crossed by the route alternatives.

TABLE 4.2-6 VEGETATED LAND USE CROSSED BY THE ROUTE ALTERNATIVES

Vegetation Crossed	Units	Route 2	Route 3	Route 4
Agriculture	Acres	6.4	6.2	6.2
Forest	Acres	23.6	29.3	31.0
Open Space	Acres	0.1	0.1	0.1
Total [a]	Acres	30.2	35.7	37.5

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

Forested vegetation within the study area consists of woody wetlands and deciduous and mixed forest. Vegetation assemblages present in the study area are dominated by Sweetgum (*Liquidambar styraciflua*), White oak (*Quercus alba*), Silver maple (*Acer saccharinum*), American beech (*Fagus grandifolia*), Virginia Pine (*Pinus virginiana*), Eastern cottonwood (*Populus deltoides*), Northern Red oak (Quercus rubra), and Tulip tree (Liriodendron tulipifera) (Compliance Professionals 2023).

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 (VDOF 2020). 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

ERM reviewed the VDCR FCV model data (Table 4.2-7) to assess the value of forest resources crossed by the route alternatives (VDOF 2020). Most forest within the study area is ranked as 5 (Outstanding), with smaller amounts of 1 (Average) and 2 (Moderate).

TABLE 4.2-7 FCVS CROSSED BY THE ROUTE ALTERNATIVES

FCV	Unit [a]	Route 2 [b]	Route 3	Route 4
Average (1)	Acres	5.5	9.1	13.5
Moderate (2)	Acres	2.9	4.5	9.0
High (3)	Acres	2.4	5.0	2.0
Very High (4)	Acres	1.8	1.8	0.9
Outstanding (5)	Acres	16.5	14.3	10.7

FCV = Forest Conservation Value
Notes:
[a] Data are inclusive of the proposed Tributary Station.
[b] The sum of the addends may not equal the totals due to rounding.

Impact Assessment

Loss of habitat presents the greatest risk to biodiversity (VDCR 2024b). When development alters the landscape and fragments large natural tracts of land into smaller, scattered pieces, the biodiversity of the area declines. Large, contiguous patches of land have more benefits than the same area of land split among smaller fragmented pieces, including:

- A progressive increase in the number and diversity of species as contiguous habitat size increases;
- Increased protection from adjacent developed areas; and
- Greater ecosystem services (i.e., the direct or indirect benefits to people) (VDCR 2024b).

As shown in Table 4.2-7, forested land would be the vegetation resource primarily affected by the route alternatives. Trees within the right-of-way would be cleared and converted to maintained herbaceous vegetation. All three route alternatives would cross FCV 5 (Outstanding) ranked forest, and all routes would bisect areas of contiguous forest. All three routes would cross and terminate on 3.3 acres of forested land in the proposed SpotsyTech Campus development (along the same right-of-way), which would be cleared prior to Project construction (see Section 4.1.5).

Impacts on vegetation within open space or agricultural land would be limited to required structure footprints along the routes, temporary construction impacts, and intermittent mowing required for maintenance access.

Route 2

Route 2 would require clearing of approximately 23.6 acres of forest and would cross approximately 6.4 acres of agricultural land and 0.1 acre of open space.[7] Of the forested impacts, the majority (16.5 acres) is FCV 5 around the Ni and Po River between MPs 0.0 and 1.7. Smaller amounts of amount of FCV 1, 2, 3, and 4 are crossed between MPs 1.7 and the Tributary Station.

Route 3

Route 3 would require clearing of approximately 29.3 acres of forest and would cross approximately 6.2 acres of agricultural land, and 0.1 acres of open space. Of the forested impacts, the majority (14.3 acres) is FCV 5 around the Ni and Po Rivers between MPs 0.0 and 0.5 and MPs 1.1 and 2.2. Smaller amounts of FCV 1, 2, 3, and 4 are crossed between MPs 0.5 and 1.2 and between MPs 2.2 and the Tributary Station.

Route 4

Route 4 would require clearing of approximately 31.0 acres of forest and would cross approximately 6.2 acres of agricultural land and 0.1 acres of open space. Of the forested impacts, there are about equal amounts of FCV 1 (13.5 acres), FCV 5 (10.7 acres), and FCV 2 (9.0 acres). Smaller amounts of FCV 3 and FCV 4 are crossed around the Po Rivers between MPs 1.3 and 2.3.

4.3 VISUAL RESOURCES

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

- Identification of VSRs through the review of recent (2023) digital aerial photography;
- Site reconnaissance and local outreach;

[7] Sum of FCV acreages may not equal the sum of forest land classification due to difference in data layers.

- Definition of potential viewer groups (i.e., groups of people, such as residents or tourists who experience views) within the study area;
- Descriptions of existing conditions from key observation points (KOPs) along the route options;
- Preparation and review of visual simulations or renderings of the proposed transmission infrastructure from KOPs in the study area; and
- Evaluation of the Project with respect to visual impacts.

4.3.1 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 4.3-1 lists and describes the VSRs identified by ERM along and near the route options, including the proposed Tributary Station site while Figure 4.3.1-1 depicts the location of each VSR relative to the Project.

The perception of visual resources by the primary viewer groups in a study area provides additional context in assessing the potential impacts of a project on the visual elements and features of a landscape. Common examples of viewer groups include area residents, workers, commuters and other travelers, recreationists, and tourists. Sensitivity and potential impacts tend to vary by setting and viewer group. There are many factors that influence viewer sensitivity and the perception of impacts. In general, users with static, direct, frequent, or longer duration views (e.g., area residents, some workers, etc.), as well as those viewers engaged in setting-dependent activities (e.g., some types of recreation, tourism, etc.) tend to have higher levels of sensitivity to change compared to others. Table 4.3-1 lists the primary viewer groups who are most likely to be sensitive to changes in the visual conditions of each VSR.

TABLE 4.3-1 VISUALLY SENSITIVE RESOURCES AND VIEWER GROUPS

VSR #	VSR Name	VSR Description	Primary Viewer Group(s)
Scenic Resources			
1	Guinea Station Road (Rt. 607)	Two-lane local road also designated US Bike Route 1. Guinea Station Road carries an AADT of 1,400 vpd. Guinea Station Road is a designated Virginia Byway and Civil War Trail.	Local residents, workers, and bicyclists
Educational Facilities			
2	Riverview Elementary School	Spotsylvania County public elementary school (kindergarten through 5th grade) with associated playground and athletic fields. The school is located on the east side of North Roxbury Mill Road, north of Larkin Chew Road.	Local residents (including students), workers (school employees), and recreationists (e.g., organized sports participants and spectators)
3	Thornburg Middle School	Spotsylvania County public middle school (6th through 8th grade) with associated athletic fields. The school is located on the east side of North Roxbury Mill Road, south of Larkin Chew Road.	Local residents (including students), workers (school employees), and recreationists (e.g., organized sports participants and spectators)
Recreational Resources			
4	KOA Holiday Campground—Fredericksburg/ Washington, DC South	Year-round campground with 115 sites for RVs, tents, and cabins featuring a fishing pond, swimming pool, and playground. The campground is located on Brookside Lane, south of Guinea Station Road.	Recreationists (e.g., campers, swimmers, playground users) and workers (campground employees)
5	US Bike Route 1 (Guinea Station Road)	Within the Project vicinity, Guinea Station Road is designated US Bike Route 1. Refer to Guinea Station Road under Primary Road Corridors.	Bicyclists
Places of Worship			
6	River of Life Church	Church located on the west side of US-1 (Patriot Highway), opposite North Roxbury Mill Road.	Local residents and workers (church employees)
7	Vertical Life Community	Church located on the east side of US-1 (Patriot Highway), north of Larkin Chew Road.	Local residents and workers (church employees)

VSR #	VSR Name	VSR Description	Primary Viewer Group(s)
	Church—Fresh Wind Outreach Ministries		
Primary Road Corridors			
8	Flippo Drive (Rt. 634)	Two-lane local road. Flippo Drive carries an annual average daily traffic (AADT) volume of 580 vehicles per day (vpd).	Local residents and workers
9	Interstate 95 (I-95)	Six-lane, controlled access, interstate highway that is the east coast's major thoroughfare. I-95 in the vicinity of the Project carries an AADT of 101,000 vpd (total, both directions).	Local residents, workers, commuters, and through-travelers
10	North Roxbury Mill Road (Rt. 632)	Two-lane local road. North Roxbury Mill Road carries an AADT of 370 vpd.	Local residents and workers
11	Patriot Highway (US 1)	Four-lane, undivided highway with at-grade intersections. US-1 carries an AADT of 17,000 vpd.	Local residents, workers, and commuters
Areas of High Public Concentration			
12	Ni River Station	Subdivision consisting of single-family homes accessed via River Crest Court and located on the south side of Guinea Station Road.	Local residents and workers
13	Nyland and Pine Grove Subdivisions	Subdivisions on the north and south sides of Guinea Station Road consisting of single-family homes. On the north side, the properties are located along Flippo Drive and Nyland Road (Nyland Subdivision). Several residential properties and the Pine Grove Subdivision are also present to the south of Guinea Station Road in this area.	Local residents and workers
14	South Woods Neighborhood	Subdivision consisting of single-family homes accessed via South Woods Drive, east of Church Pond Road.	Local residents and workers

Sources: VDOT 2024 (AADT data)

AADT = annual average daily traffic; Rt. = Virginia State Route; vpd = vehicles per day; VSR = visually sensitive resource

4.3.2 KEY OBSERVATION POINTS

In addition to considering the existing landscape characteristics across broader geographic areas (i.e., VSRs), ERM visual resource specialists also chose four specific, publicly accessible KOPs to document point-specific existing conditions and anticipated changes to these conditions from the Project (Table 4.3-2). These KOPs are representative of the VSRs and primary viewer 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 potentially be visible by the primary viewer groups.
Figure 4.3.2-1 shows the locations and viewing directions the KOPs identified for the Project.

TABLE 4.3-2 KEY OBSERVATION POINTS

KOP #	Location	Reason for Inclusion	Project Component Represented
001	View looking north from Flippo Drive in Nyland Subdivision (within existing Dominion transmission ROW)	Example of the proposed right-of-way (with clearing) through a suburban landscape. Affected viewer groups include local residents and workers. Representative of VSRs Nyland Subdivision and Flippo Drive.	Route 4
003	View looking west from intersection of Guinea Station Road and Brookside Lane (entrance to KOA Campground)	Example of the proposed right-of-way (with clearing) through a forested landscape. Affected viewer groups include local residents, recreationists, workers, and bicyclists. Representative of VSRs US Bike Route 1/Guinea Station Road and KOA Campground.	Route 4
004	One view looking west and another south from the KOA Campground	Example of the proposed right-of-way (with clearing) through a forested landscape near a campground. Affected viewer groups include recreationists and workers. Representative of VSR KOA Campground.	Routes 3 and 4
007	View looking northeast from athletic field at Riverview Elementary School	Example of the proposed right-of-way (with clearing) through a forested landscape north and east of Riverview Elementary School. Affected viewer groups include local residents, students, workers, and recreationists. Representative of VSR Riverview Elementary School.	Routes 2, 3, and 4; Tributary Station

KOP = key observation point; VSR = visually sensitive resource

The remainder of this section provides descriptions of the existing visual conditions and the anticipated changes to these conditions at each KOP. Photographs of existing conditions, as well as simulations of the proposed Project infrastructure from each KOP are provided in Appendix F.

4.3.2.1 KOP 001

Existing Conditions

KOP 001 is located on the northwest side of Flippo Road to the north of Guinea Station Road at Dominion's Existing 230 kV Line #2090 corridor. The view from this KOP is oriented to the north and provides an extensive view of the cleared transmission line right-of-way. Dense stands of mixed deciduous and coniferous trees on both sides of the cleared right-of-way block more distant views in these areas. In the foreground, an unpaved driveway of light gray gravel bordered by tan and medium green low groundcover runs to the northwest into the dense tree cover. One white, single story home is visible to the east of the transmission line corridor. The corridor itself is dominated by mowed, bright medium green grass. There are two sets of transmission structures in the corridor. Both are H-frames (wooden to the left and weatherized steel to the right) with paired conductors associated with the left corridor and single conductors associated with the right corridor. The structures are partially skylined and generally appear taller than the forested areas on either side.

The primary viewer group at KOP 001 is residents who live along and in the vicinity of the existing transmission line right-of-way. These residents would have medium to high sensitivity to visual changes at this KOP. This sensitivity may be somewhat muted due to the presence of the existing transmission line corridor.

Visual Simulation

Route 4 is located about 0.4 mile northwest of KOP 001 at its closest point. The proposed route exits a forested area and ties into Dominion's Existing Line #2090. Dominion plans to upgrade this existing line prior to the proposed Tributary project. As a result the simulation for this KOP shows the planned upgrade from H-frame to monopole structures on this existing transmission line (note: upgrade of Existing Line #2090 is not part of the Tributary Project; therefore, any potential visual impacts from the upgrade of Line #2090 should be considered separately from the Tributary Project).

Most of the Route 4 structures would be screened by the forested area to the west of the existing transmission corridor. Additional poles would be visible at the tie-in location where Route 4 would connect into the existing transmission line. These additional vertical poles would appear clustered together but would generally be visually consistent with the upgraded monopole structures of Existing Line #2090 . The Route 4 conductors would not be discernable from this distance. Several trees would be removed within the Route 4 right-of-way, although the remaining dense tree cover in this area would minimize the visual impact of tree removal as viewed from this KOP. Given the visual similarity of the proposed route structures with the existing transmission lines, remaining dense forest cover, and distance, Route 4 is anticipated to have a minor impact on the overall visual conditions at KOP 001.

4.3.2.2 KOP 003

Existing Conditions

KOP 003 is located on the southern side of Guinea Station Road near the entrance to the Fredericksburg/Washington DC South KOA Campground. The view from this KOP is oriented to the west. At this KOP, dense vegetation and tree cover creates a canopied landscape that limits views beyond the foreground. The vegetation is characterized by vibrant greens interspersed with tans and light browns. The tall, linear tree trunks provide structure and irregular, repetitive vertical features that are perpendicular to the horizontal lines of the road. Guinea Station Road cuts through the forest cover and appears as a flat, smooth strip that contrasts with the highly textured roadside vegetation in the area. The road's bright double-yellow centerline and a yellow roadside sign add pops of vibrant color to the otherwise gray to black colors of the road. Brookside Lane (the entrance road to the KOA Campground) is a lighter gray than Guinea Station Road and is bordered by a short, wooden split rail fence on the eastern side of the roadway.

The primary viewer groups at KOP 003 would be motorists, residents, and recreationists. These viewers groups would have medium to high sensitivity to visual changes at this KOP. Given its location on Guinea Station Road, the primary views from this KOP would be dynamic, with the duration of the view dependent on the direction and speed of travel of the viewer.

Visual Simulation

Route 4 crosses Guinea Station Road approximately 0.1 mile to the west of KOP 003. While the dense vegetation in this area will screen most of the transmission line structures, the conductors will be visible as they span the road. These conductors would appear as thin, black, horizontal lines that partially blend into the forested backdrop. Project construction would result in a noticeable decrease in vegetation density along the route's cleared right-of-way on both sides of Guinea Station Road. The remaining dense vegetation would help minimize the visual impact of the cleared right-of-way and would also screen views of most of the route's structures. Due to the amount of remaining vegetation and dense forest cover, as well as the limited number of visible features, Route 4 would have a minor impact on the overall visual conditions at KOP 003.

4.3.2.3 KOP 004

Existing Conditions

KOP 004 is located in the KOA Campground, and includes two separate views: one facing to the west and another facing to the south, based on where the proposed routes would potentially be visible. Both views generally include the campsites, internal roads, grassy areas interspersed with trees and shrubs, and the denser forest that surrounds the campground. Because both views include portions of the campground, there are transient elements of the landscape that will change over time, such as RVs, other vehicles, tents, and other campsite equipment. These elements add color and variety to the visual setting. While individual elements (for example, a specific RV) are transient, the overall presence of such elements is assumed to be constant.

The view to the west from this location includes several campsites, part of a campground building, and a forested area that frames the landscape. The vibrant green canopy of the forested area to

the west of the campground creates an irregular, jagged horizontal skyline. The trees are the tallest landscape features in this location and create a wall that encloses the campground, limits more distant views, and focuses views on the internal features of the campground.

In the foreground, graveled roads and RV pads at the individual campsites introduce linear elements and geometric forms that encircle the more organic shapes found in the grassy spaces between campsites. A flat, paved road that splits the campground into separate loops is also partially visible. The roads, campsite parking spaces, and ground vegetation (grass) are lightly textured with shades of grays and greens and soft transitions between these features. Small patches of shrubs and ornamental plantings, including some flowering shrubs with bright red flowers, add visual interest and amorphous forms to the landscape. The tan, light brown colors of the geometric, single story campground building complement the other colors of the natural and built features visible from this location.

The view to the south from KOP 004 is similar to the view to the west, although the orientation provides a more extensive view of the campground. The deciduous trees in this view vary in height, introduce a rich palette of greens to the landscape, and create a strong but irregular line against the sky. In the foreground, there is a large, open grassy area that transitions into gray gravel roads and RV pads. Similar to the western orientation, these gravel roads and RV pads introduce straight lines and geometric forms that border the organic forms of the grassy spaces between campsites. Clumps of shrubs and shorter trees are interspersed throughout the campground and help soften the transition between built features, transient features, and the natural surroundings at this location. Typical campground amenities (e.g., picnic tables, site posts and signs) and other built features (e.g., light poles, communication towers) are visible but generally fit within and do not detract from the visual context of the campground.

The primary viewer group at KOP 004 would be recreationists. These viewers would have medium to high sensitivity to visual changes at this KOP, because the scenic quality of the area is likely one of the reasons people chose this campground.

Visual Simulation—Western View

Route 4 is located less than 0.2 mile to the west of this KOP. The dense, forested vegetation between this location and Route 4 obscures all views of the route; therefore, no changes in existing conditions are anticipated for west-facing views from KOP 004.

Visual Simulation—Southern View

Routes 2 would be about 0.5 mile south of KOP 004 (Route 3), while Route 3 would be about 0.2 mile south of the KOP. Similar to the western view orientation, existing dense forest vegetation would block all views of the proposed route options; therefore, no changes in existing conditions are anticipated at KOP 004.

4.3.2.4 KOP 007

Existing Conditions

KOP 007 is located behind Riverview Elementary School in a grassy field, with a northeast-facing view. The foreground is dominated by a grassy field that extends across the entire field of view.

There is a mix of green, tan, and white colors in the lightly textured field. A covered picnic shelter with a white roof and blue and white picnic tables is located at the northern end (to the left in the photo) of the field and a small, white bird house on top of a brown post is also visible to the right of the shelter. A gray chain-link fence delineates the edges of the field and creates a clear barrier between the field and forested area beyond. The fence creates a horizontal line in front of the bottom portion of the adjacent trees. Similar to other KOPs, the mix of deciduous and coniferous trees in the forested area creates a wall of vegetation that is taller than other visible landscape features and blocks more distant views. There is an irregular, horizontal line across the tree canopies that delineates the tops of the trees from the sky. While the leaf cover is dense, several tall, vertical tree trunks are visible and run perpendicular to the horizontal lines that dominate this view. The trees also add a range of vibrant to deep greens that contrast with the muted colors of the grassy field.

Visual Simulation

All three of the route options converge at the Tributary Station about 0.2 mile to the northeast of KOP 007. Existing vegetation and topography would block views of any of the route options or Tributary Station. Therefore no changes in existing conditions are anticipated at this KOP.

4.3.3 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 and color, 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, which contribute to a range of potential influences and impacts across the study area from the proposed Project. The anticipated impacts from the Project to the existing visual resource conditions in each VSR are described in Table 4.3-3. This table also indicates a potential impact rating (major, moderate, minor, or negligible) based on the anticipated magnitude of change to landscape features and elements for each VSR.

TABLE 4.3-3 SUMMARY OF ANTICIPATED IMPACTS BY VISUALLY SENSITIVE RESOURCE AND KEY OBSERVATION POINT

VSR #	VSR Name	KOP #	Relevant Route(s)	Description of Impact	Potential Impact Rating/ Visual Sensitivity
Scenic Resources					
1	Guinea Station Road (Rt. 607)	003	Route 4 (MPs 0.4 to 0.5)	Route 4 crosses the road 0.1 mile northwest of the Beechwood Dr/Guinea Station Rd intersection.	Impact: Minor Visual sensitivity would be medium due to the dynamic nature of their views and the primary focus on roadway travel.
Educational Resources					
2	Riverview Elementary School	007	Tributary Station Route 2 (MP 2.3) Route 3 (MP 2.7) Route 4 (MP 2.9)	All measurements are taken from the walkway on the eastern side of the primary school building. All routes and the switching station installation would require vegetation clearing. • Tributary Station is approximately 0.1 mile to the northeast and surrounded by existing dense woodland. • All route alternatives share the same corridor and are approximately 0.2 mile northeast, running northwest-southeast from the Tributary Station.	Impact: Minor to Moderate Visual sensitivity is medium due to students and staff being primarily indoors but taking into consideration outdoor activities and sporting events.
3	Thornburg Middle School	NA	Tributary Station Route 2 (MPs 2.2 to 2.3) Route 3 (MP 2.7) Route 4 (MPs 2.8 to 2.9)	All measurements are taken from the northeastern corner of the walkway on the eastern side of the primary school building. Installation of all routes and the switching station would require vegetation clearing. • Tributary Station is approximately 0.2 mile to the northeast and surrounded by existing dense woodland. • All route alternatives share the same corridor and are approximately 0.3	Impact: Minor to Moderate Visual sensitivity is medium due to students and staff being primarily indoors but taking into consideration outdoor activities and sporting events.

VSR #	VSR Name	KOP #	Relevant Route(s)	Description of Impact	Potential Impact Rating/ Visual Sensitivity
				mile northeast, running northwest-southeast from the Tributary Station.	
Recreational Resources					
4	KOA Holiday Campground - Fredericksburg / Washington, DC South	004	Route 2 (MPs 0.5 t0 1.0) Route 3 (MPs 0.6 to 1.0) Route 4 (MPs 0.5 to 1.7)	All measurements are taken from the KOA main building on the east side of Brookside Lane. Route 2 is approximately 0.5 mile to the south. The corridor runs slightly southwest through dense trees and would require vegetation clearing. The route corridor bisects the KOA Campground parcel but not within the primary use area. Routes 3 is approximately 0.3 mile south. The route corridor runs northwest/ southeast through dense trees and would require vegetation clearing. The route corridor bisects the KOA Campground parcel but not within the primary use area. Route 4 runs northeast/southwest approximately 0.2 mile west through dense woodland and would require vegetation clearing. The route is as close as 100 feet from the KOA Campground parcel toward MP 1.1.	Impact: Minor to Moderate Visual sensitivity is medium to high due to setting-dependent outdoor activities, which are primarily focused away from the route corridors.
5	US Bike Route 1 (Guinea Station Road)	003	Route 4 (MPs 0.4 to 0.5)	Route 4 crosses the bike route 0.1 mile northwest of the Beechwood Dr/Guinea Station Rd intersection.	Impact: Minor to Moderate Visual sensitivity is medium, due to recreational use of the route and primary focus on roadway travel.

VSR #	VSR Name	KOP #	Relevant Route(s)	Description of Impact	Potential Impact Rating/ Visual Sensitivity
Places of Worship					
6	River of Life Church	NA	Tributary Station Route 2 (MP 2.3) Route 3 (MP 2.7) Route 4 (MP 2.9)	All measurements are taken from the eastern edge of the parking lot. All routes run through dense trees, and vegetation removal would be required for all routes and the switching station installation. All routes would terminate at Tributary Station, which sits about 0.6 mile to the southeast and would be surrounded by dense mature trees. All route alternatives share the same corridor in this area and run northwest-southeast on the eastern side of Tributary Station.	Impact: Negligible to Minor Visual sensitivity is low to medium because most activities likely occur inside the building and views would be stationary.
7	Vertical Life Community Church - Fresh Wind Outreach Ministries	NA	Tributary Station Route 2 (MP 2.3) Route 3 (MP 2.7) Route 4 (MP 2.9)	All measurements are taken from the access door on the north side of the church. All routes run through dense trees, and vegetation removal is required for all routes and the substation installation. All routes would terminate at Tributary Station about 0.6 mile to the east. All route alternatives share the same corridor at this end of the project and run northwest-southeast on the eastern side of Tributary Station.	Impact: Negligible to Minor Visual sensitivity is low to medium because most activities likely occur inside the building and views would be stationary.
Primary Road Corridors					
8	Flippo Drive (Rt. 634)	001	Route 4 (MPs 0 to 0.2)	Route 4 ties in to Existing Line #2090 about 0.4 mile north of the roadway. The route runs southwest from the tie-in location through dense trees and would require vegetation clearing.	Impact: Minor Visual sensitivity would be high for residents, who would have stationary views from their homes. Visual sensitivity would be low for

VSR #	VSR Name	KOP #	Relevant Route(s)	Description of Impact	Potential Impact Rating/ Visual Sensitivity
					drivers, due to the dynamic nature of their views and the primary focus on roadway travel.
9	Interstate 95 (I-95)	NA	Tributary Station Route 2 (MPs 2.1 to 2.2) Route 3 (MPs 2.6 to 2.7) Route 4 (MP 2.8)	Routes 2 through 4 share the same corridor along this segment. All routes and Tributary Station would require vegetation clearing. All measurements are taken from the center of the I-95 bridges crossing the Ni River: • Tributary Station would be on the west side of I-95, 0.5 mile to the southwest. • Routes 2 through 4 cross the highway 0.7 mile to the southwest.	Impact: Minor to Moderate Visual sensitivity would be medium because most users are in cars traveling at high speeds along the roadway.

VSR #	VSR Name	KOP #	Relevant Route(s)	Description of Impact	Potential Impact Rating/ Visual Sensitivity
10	North Roxbury Mill Road (Rt. 632)	NA	Tributary Station Route 2 (MP 2.3) Route 3 (MP 2.7) Route 4 (MP 2.9)	All route alternatives would run through dense trees, and vegetation removal would be required for all routes and the switching station installation. Measurements taken from Larkin Chew Rd/North Roxbury Mill Rd intersection: • Tributary Station would be 0.3 mile northeast on the east side of Riverview Elementary School. • All routes terminate within Tributary Station, 0.4 mile to the northeast.	Impact: Minor Visual sensitivity would be low, because most users are in cars traveling along the roadway, which is perpendicular from the project and screened by existing trees.
11	Patriot Highway (US 1)	NA	Tributary Station Route 2 (MP 2.3) Route 3 (MP 2.7) Route 4 (MP 2.9)	All route alternatives run through dense trees, and vegetation removal would be required for all routes and the switching station installation. Measurements taken US 1/North Roxbury Mill Rd intersection: • Tributary Station would be 0.5 mi southeast on the east side of Riverview Elementary School. • All routes terminate within Tributary Station, 0.6 mile southeast.	Impact: Minor Visual sensitivity would be low, because most users are in cars traveling along the roadway, which is perpendicular from the project and screened by existing trees.
Areas of High Public Concentration					
12	Nyland and Pine Grove Subdivisions	001	Route 2 (MP 0) Route 3 (MP 0) Route 4 (MPs 0 to 0.3)	This subdivision includes the homes on the east side of Flippo Dr and several homes on the north side of Guinea Station Rd. Dense trees on the west side of the Existing Line #2090 right-of-way screen views. Construction of the proposed route corridor would require vegetation clearing. Routes 2 and 3 tie-in to Existing Line #2090 approximately 0.5 mile south of the Flippo Rd/Guinea Station Rd	Impact: Minor Visual sensitivity would be high due to residences having stationary views from their homes.

VSR #	VSR Name	KOP #	Relevant Route(s)	Description of Impact	Potential Impact Rating/ Visual Sensitivity
				intersection. Routes 2 and 3 head west/northwest from the tie-in location. Route 4 ties in to Existing Line #2090 approximately 0.6 mile north of the Flippo Rd/Guinea Station Road intersection. The route angles to the southwest through dense trees.	
13	South Woods Neighborhood	NA	Route 4 (MPs 0.2 to 0.5)	Route 4 angles southwest through dense woodland and would require vegetation clearing. Route 4 is approximately 0.4 mile southeast of the South Woods Dr/ Willowbrook Ct intersection at the southern end of the neighborhood.	Impact: Minor Visual sensitivity would be high, due to residents having stationary views from their homes. Several homes are on a rise and may have views of skylined structures.

CDP = Census Designated Place; Dr = Drive; MP(s) = Milepost(s); NA = not applicable; Rd = Road; Rt. = Virginia State Route; St = Street; VSR = visually sensitive resource

Table 4.3-4 summarizes the anticipated impacts on visual conditions from Routes 2, 3, and 4. This table also provides a potential impact rating (major, moderate, minor, or negligible) for each route.

4.3.4 IMPACT ASSESSMENT

TABLE 4.3-4 IMPACT ASSESSMENT

Route or Variation	Potentially Impacted VSRs	Description of Impact	Potential Impact Rating
Route 2	1, 2, 5, 6, 9, 10, 11, and 13 **Total 8**	Road crossings: • New right-of-way—1 crossing • Total—1 crossing Sensitive VSRs: • North Roxbury Mill Road (Rt. 632) • Nyland Subdivision • Patriot Highway (US 1) • River of Life Church • Riverview Elementary School • Thornburg Middle School • US Interstate 95 (I-95) • Vertical Life Community Church – Fresh Wind Outreach Ministries Impacted User Groups: • Local residents/workers • Commuters/through-travelers • Recreationalists/tourists	Road Impact: Minor to Moderate VSR Impact: Minor to Moderate User Group Impact: Minor **Overall Rating: Minor**
Route 3	1, 2, 3, 5, 6, 9, 10, 11, and 13 **Total 9**	Road crossings: • New right-of-way— 1 crossing • Total— 1 crossing Sensitive VSRs: • KOA Holiday Campground • North Roxbury Mill Road (Rt. 632) • Nyland Subdivision • Patriot Highway (US 1) • River of Life Church • Riverview Elementary School • Thornburg Middle School • US Interstate 95 (I-95) • Vertical Life Community Church – Fresh Wind Outreach Ministries Impacted User Groups: • Local residents/workers • Commuters/through-travelers • Recreationalists/tourists	Road Impact: Minor to Moderate VSR Impact: Minor to Moderate User Group Impact: Minor **Overall Rating: Minor**

Route or Variation	Potentially Impacted VSRs	Description of Impact	Potential Impact Rating
Route 4	1 through 11, 13, and 14 **Total 13**	Road crossings: • New right-of-way— 3 crossings • Total— 3 crossings Sensitive VSRs: • Flippo Drive • Guinea Station Road • KOA Holiday Campground • North Roxbury Mill Road (Rt. 632) • Nyland Subdivision • Patriot Highway (US 1) • River of Life Church • Riverview Elementary School • South Woods Neighborhood • Thornburg Middle School • US Bike Route 1 (Guinea Station Road) • US Interstate 95 (I-95) • Vertical Life Community Church – Fresh Wind Outreach Ministries Impacted User Groups: • Local residents/workers • Commuters/through-travelers • Recreationalists/tourists	Road Impact: Minor VSR Impact: Minor to Moderate User Group Impact: Minor to Moderate **Overall Rating: Minor to Moderate**

DWR = Virginia Department of Wildlife Resources; Rt. = Virginia State Route; US = United States; VSR = visually sensitive resource

4.3.4.1 TRIBUTARY ROUTE ALTERNATIVES

Route 2

From its tie-in with Existing Line #2090 to Tributary Station, Route 2 is entirely within a dense woodland/timber production area on the east side of I-95. This vegetation would screen views from residences to the north. Route 2 would require extensive vegetation clearing along most of the route, and would be visible to motorists on an approximately 1-mile segment of I-95.

Route 3

Route 3 shares the same corridor as Route 2 except for the segment between MPs 0.4 and 1.7. Route 3 would also require extensive vegetation clearing, because the corridor is primarily located within dense woodland/timber production areas. While this route is closer to the residences on the south side of Guinea Station Road, as well as the KOA Holiday Campground, the buffer of mature trees that would be retained after clearing would screen most views of the route structures. During leaf-off conditions, the transmission structures and associated conductors from MP 0.4 to 1.0 may be partially visible through the trees. Otherwise, the visibility and impacts of Route 3 would be the same as Route 2.

Route 4

Route 4 ties in to Existing Line #2090 north of Guinea Station Road, approximately 1.0 mile north of the tie-in for Routes 2 and 3. From the tie-in, the route runs southwest for approximately 1.1 miles before intersecting with Route 3, and another 0.6 mile before intersecting Route 2. Route 4 would be visible at the tie-in and where it crosses Beechwood Drive, and Guinea Station Road. The western portion of Route 4, including the I-95 crossing would be the same as Routes 2 and 3. Similar to the above routes, the Route 4 corridor crosses dense woodland/timber production areas. The route would require extensive vegetation clearing, but the remaining tall, mature trees would generally screen most views with the exception of the roadway crossings.

Summary

All route alternatives would cross extensive woodland/timber production areas and would generally be screened from view except at road crossings and at tie-in locations. Residents and campground visitors may have partially obscured views of structures for Routes 3 or 4 during leaf-off conditions. Overall, while the transmission line structures are anticipated to result in changes to existing visual conditions, their adverse impacts would be minor or less because:

- Human influences and built structures (modifications to the landscape), including transmission and distribution line infrastructure, are common in the area;
- The study area has grown and continues to grow with a mix of commercial, industrial, and residential development and related infrastructure (e.g., travel corridors, distribution lines, lights, signs, cell towers, etc.); and
- Opportunities for foreground views (where the transmission route structures are most noticeable) are limited due to vegetated areas; foreground views would occur most frequently along travel corridors where there is already a higher level of visual disturbance and where most viewers are in moving vehicles.

4.4 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;
- Properties listed on the National Register of Historic Places (NRHP), 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 0.5-mile radius of the route centerline; and
- All of the above qualifying resources and archaeological sites within any route alternative right-of-way.

ERM obtained data on previously recorded cultural resources within each study tier from the Virginia Cultural Resources Information System (VCRIS). ERM also collected information from the Stafford County Historical Society (2023) and the Stafford County Historical Commission (2023) to find locally significant resources within a 1.0-mile radius of each proposed route centerline.

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 route alternatives (including the proposed Tributary Station, where appropriate). ERM then prepared visual simulations depicting the proposed Project infrastructure as it would appear in views from the considered resources to assess potential visual effects on those resources. For the previously recorded archaeological sites under consideration, ERM examined aerial photographs 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 4.4.1 and 4.4.2, as appropriate.

As discussed in more detail below, ERM identified no previously recorded archaeological sites within the right-of-way for each route. With regard to historic architectural resources, ERM identified five previously recorded sites and/or districts within the study tiers described above. Of these, one is listed in the NRHP, one was determined eligible for the NRHP, and three have not been formally evaluated but are being considered locally significant for purposes of this report.

4.4.1 ARCHAEOLOGICAL SITES AND FINDINGS

No archaeological sites were identified proximate to the routes.

4.4.2 ABOVEGROUND HISTORIC RESOURCES AND ARCHITECTURAL SITES AND FINDINGS

Each route alternative reviewed in this study has the potential to affect a number of historic architectural sites and districts. This section of the report presents information on known aboveground cultural resources in the vicinity of each route alternative using the VDHR's tiered study area model described above. The locations of resources relevant to the routes are depicted on Figure 4.4.2-1. Individual descriptions of the resources are provided in the Pre-application Analysis Report, which is attached as Appendix H. Some of these resources could be affected regardless of the route selected by the SCC for the Project.

Table 4.4-1 provides a comparison of the number of resources that would be impacted and the degree of impact on these resources for each route alternative. Routes 2 and 3 pass near five

historic resources meeting the VDHR criteria for inclusion in the study, while Route 4 passes near three resources meeting the VDHR criteria for inclusion.

As discussed in more detail below, ERM recommends that:

- Route 2 would have no impact on four resources and a minimal impact on one resource.
- Route 3 would have no impact on four resources and a moderate impact on one resource.
- Route 4 would have no impact on two resources and a minimal impact on one resource.

Based on the above discussion, ERM recommends that Route 4 would have the smallest impact on cultural resources, with only three considered historic resources near the route. Routes 2 and 3 both have the same five considered historic resources near their routes with the same impact findings except for one resource: 088-0256. Route 3 would have a moderate impact on 088-0256 while Route 2 would have a minimal impact on the resource. Thus, Route 4 appears to present the best possible route for the Project with respect to known cultural resource impacts. Route 2 would be the second-best possible route for the Project; while it has the same considered historic resources as Route 3, its impacts do not exceed minimal. The specific resources affected for each route are discussed in the following subsections.

TABLE 4.4-1 COMPARISON OF PROJECT IMPACTS ON HISTORIC RESOURCES IN THE STUDY TIERS FOR EACH ROUTE

Route Alternative	Number of Considered Resources in Each Impact Category				
	No Impact	Minimal Impact	Moderate Impact	Severe Impact	Total
Route 2	4	1	0	0	5
Route 3	4	0	1	0	5
Route 4	2	1	0	0	3

4.4.2.1 ROUTE 2

Table 4.4-2 provides information on the five considered resources that lie within the VDHR study tiers for Route 2. ERM conducted a field reconnaissance at each of these resources to assess conditions and take photographs to support the preparation of simulations. Construction and operation of new transmission infrastructure along this route is predicted to have no impact on four resources (016-0094, 088-0100, 088-0143, and 088-0297) and a minimal impact on one locally significant resource (088-0256).

There would be no visibility of the Project infrastructure along Route 2 due to intervening vegetation and distance from the following resources:

- Spring Grove (016-0094), which lies about 0.4 mile to the southeast of Route 2 at approximate MP 0.0;
- Nyland (088-0100), which lies about 0.5 mile to the northeast of Route 2 at approximate MP 0.0;

- La Vista (088-0143), which lies about 0.8 mile to the north of Route 2 at approximate MP 1.3;
- Coates House (088-0297), which lies about 0.7 mile to the northwest of Route 2 and the proposed Tributary Station at approximate MP 2.3.

Consequently, construction and operation of Route 2 would have no impact on these resources.

Westwood (088-0256) lies about 0.4 mile to the north of Route 2 at approximate MP 0.4. The route uses a greenfield alignment until it connects to Dominion's existing Line #2090. The area between the resource and the route is densely wooded. Construction of the new transmission line is likely to be visible from the resource. Transmission line structures could be visible above the treeline from the dwelling to the north, toward the road. The top of one structure could be visible from the dwelling, while the tops of two or three structures could be visible from the front yard and a very small portion of the parcel near the road could have views of four to eight structures. Project structures would only be visible slightly above the treeline in the distance and would appear small from within the parcel boundary. The outbuildings (to the south of the dwelling) would have no visibility to Route 2 and no other views would be altered by the route. While the change is minor, the construction would add a modern element to the southern viewshed where there currently is dense vegetation and forest. Thus, ERM recommends that Route 2 would have a Minimal Impact on 088-0256.

TABLE 4.4-2 HISTORIC RESOURCES IN VDHR TIERS FOR ROUTE 2

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	NA	None identified	NA
0.5 to 1.0	National Register Properties (listed)	088-0143	La Vista	None
	Locally Significant	088-0297 [a]	Coates House	None
0.0 to 0.5	National Register—eligible	088-0100	Nyland	None
	Locally Significant	016-0094	Spring Grove	None
		088-0256	Westwood	Minimal
0.0 (within ROW)	National Historic Landmarks, National Register Properties (listed and eligible)	NA	None identified	NA

NA = not applicable; ROW = right-of-way
Note:
[a] Resource is within the designated tiers for the proposed Tributary Station.

4.4.2.2 ROUTE 3

Table 4.4-3 provides information on the five considered resources that lie within the VDHR study tiers for Route 3. ERM conducted a field reconnaissance at each of these resources to assess conditions and take photographs to support the preparation of simulations. Construction and operation of new transmission infrastructure along this route is predicted to have no impact on four resources (016-0094, 088-0100, 088-0143, and 088-0297) and a moderate impact on one locally significant resource (088-0256).

There would be no visibility of the Project infrastructure along Route 2 due to intervening vegetation and distance from the following resources:

- Spring Grove (016-0094), which lies about 0.4 mile to the southeast of Route 3 at approximate MP 0.0;
- Nyland (088-0100), which lies about 0.5 mile to the northeast of Route 3 at approximate MP 0.0;
- La Vista (088-0143), which lies about 0.5 mile to the northwest of Route 3 at approximate MP 1.0; and
- Coates House (088-0297), which lies about 0.7 mile to the northwest of Route 3 and the proposed Tributary Station at approximate MP 2.7.

Consequently, construction and operation of Route 3 would have no impact on these resources.

Westwood (088-0256) lies about 0.2 mile to the northeast of Route 3 at approximate MP 0.7. The area between the resource and the route consists of dense forest and vegetation. Construction of the new transmission line is likely to be visible from the resource. According to the analysis, some structures could be visible from the northern half of the parcel. Structures could be visible above the treeline from the dwelling to the north, toward the road. The top of one structure could be visible from the dwelling, while the tops of two to eight structures could be visible from the northern edge of the parcel, near the road. Although the tops of the structures would only be visible when looking to the south from the dwelling and front yard, larger portions of the structures may be visible through the trees from the southern edge of the parcel during leaf-off season. This would add more prominent modern infrastructure to the southern viewshed than it would for Route 2. Thus, ERM recommends that Route 3 would have a Moderate Impact on 088-0256.

TABLE 4.4-3 HISTORIC RESOURCES IN VDHR TIERS FOR ROUTE 3

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	NA	None identified	NA
0.5 to 1.0	National Register Properties (listed)	088-0143	La Vista	None
	Locally Significant	088-0297 [a]	Coates House	None
0.0 to 0.5	National Register—eligible	088-0100	Nyland	None
	Locally Significant	016-0094	Spring Grove	None
		088-0256	Westwood	Moderate
0.0 (within ROW)	National Historic Landmarks, National Register Properties (listed and eligible)	NA	None identified	NA

NA = not applicable; ROW = right-of-way
Note:
[a] Resource is within the designated tiers for the proposed Tributary Station.

4.4.2.3 ROUTE 4

Table 4.4-4 provides information on the three considered resources that lie within the VDHR study tiers for Route 4. ERM conducted a field reconnaissance at each of these resources to assess conditions and take photographs to support the preparation of simulations. Construction and operation of new transmission infrastructure along this route is predicted to have no impact on two resources (088-0143 and 088-0297) and a minimal impact on one locally significant resource (088-0256).

There would be no visibility of the Project infrastructure along Route 4 due to intervening vegetation and distance from the following resources:

- La Vista (088-0143), which lies about 0.5 mile to the northwest of Route 4 at approximate MP 0.9;
- Coates House (088-0297), which lies about 0.7 mile to the northwest of Route 4 and the proposed Tributary Station at approximate MP 2.9.

Consequently, construction and operation of Route 4 would have no impact on these resources.

Westwood (088-0256) lies about 0.4 mile to the southeast of Route 4 at approximate MP 0.9. The construction of the new transmission line may be visible from portions of the eastern half of the parcel. However, only the top of one structure would be visible above the treeline from these locations when looking to the west. The vast majority of the resource would experience no viewshed change, including all of the structures associated with the resource. In addition, the view of the route would be in the distance and would appear small from within the parcel boundary. While the change is minor, the construction would add a modern element to the western viewshed where there currently is dense vegetation and forest. Thus, ERM recommends that there would be a Minimal Impact to this resource from Route 4.

TABLE 4.4-4 HISTORIC RESOURCES IN VDHR TIERS FOR ROUTE 4

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	NA	None identified	NA
0.5 to 1.0	National Register Properties (listed)	088-0143	La Vista	None
	Locally Significant	088-0297 [a]	Coates House	None
0.0 to 0.5	National Register—eligible	NA	None identified	NA
	Locally Significant	088-0256	Westwood	Minimal
0.0 (within ROW)	National Historic Landmarks, National Register Properties (listed and eligible)	NA	None identified	NA

NA = not applicable; ROW = right-of-way
Note:
[a] Resource is within the designated tiers for the proposed Tributary Substation.

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

Some portions of the route alternatives and associated facilities were previously surveyed for cultural resources. Research indicates that three prior Phase I cultural surveys have been conducted within 1.0 mile of the route alternatives. However, none overlap portions of the Project. Table 4.4-5 provides information on the previous surveys within 1.0 mile of the route alternatives; these survey areas are also shown on Figure 4.4.2-1.

TABLE 4.4-5 CULTURAL RESOURCE SURVEYS WITHIN 1.0 MILE OF THE PROJECT

VDHR Survey #	Title	Author(s)	Date
CE-147	Phase I Archaeological Survey TRILEAF Corporation Site# 604207 (Claiborne), DSS Site# 44CE0725, Woodford, Caroline County, Virginia	Rachael Fowler and Kenneth Basalik	2013
SP-154	Phase I Archaeological Identification Survey of the Massaponax Self Support Telecommunications Tower Site, Spotsylvania County, Virginia	Lyle Torp	1999
SP-206	A Phase I Archaeological Survey of Portions of the Proposed Dominion Raceway Tract, Spotsylvania County, Virginia	Clifton Huston and Richard Francisco	2013

4.5 ENVIRONMENTAL JUSTICE

4.5.1 IDENTIFICATION OF ENVIRONMENTAL JUSTICE POPULATIONS

4.5.1.1 FEDERAL AND STATE LAWS, POLICIES, AND GUIDELINES

Federal guidelines for environmental justice (EJ) studies define potential EJ communities based on the share of minority and low-income populations of a given area, compared to the minority or low-income population in the state or county that contains the community.[8]

The guidelines established in the Virginia Environmental Justice Act (VEJA) of 2021 (Va. Code § 2.2-234 through 235) are more stringent than federal guidelines. As such, this report uses the Commonwealth's guidelines. 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.

[8] For more information on the federal guidelines for EJ analysis, please see the March 2016 report from the Federal Interagency Working Group on Environmental Justice and NEPA Committee "Promising Practices for EJ Methodologies in NEPA Reviews" accessible at: https://www.epa.gov/sites/default/files/2016-08/documents/nepa_promising_practices_document_2016.pdf.

- "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 the requirements 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.

Based on the VEJA guidelines, EJ communities are identified in this report using the following guidelines:

Racial/Ethnic Composition:

- The percent of individuals in an EJ analysis area who identify as a race and ethnicity other than "white alone, not Hispanic or Latino" is greater than 40 percent of the total population (the Commonwealth average) (i.e., a "community of color"); OR
- The percent of any racial or ethnic group that is not "white alone, not Hispanic or Latino" in the population for the analysis area is greater than the Commonwealth average for that racial or ethnic group (i.e., "population of color"); OR
- The percent of the population in the analysis area considered linguistically isolated (individuals in households where nobody speaks English at least "very well") is greater than the Commonwealth average of 3 percent; OR

Low-Income:

- The share of households with total earnings less than 200 percent of the Federal poverty level and less than or equal to 80 percent of the median household income of the analysis area is greater than 30 percent (Virginia Law 2024).

ERM used US Census block groups (CBGs) as the analysis area for this study, because the CBG is the smallest unit for which US Census Bureau demographic data are available. ERM's desktop review for the Project suggest that construction of the proposed facilities could potentially affect populations of color in the review area. Based on the EJ criteria thresholds identified in the review, five of the six CBGs within 1-mile of the route alternatives contain EJ communities, including the two CBGs crossed by each of the three route alternatives. Table 4.5-1 summarizes relevant data for these six CBGs.

All three of the route alternatives cross the same two CBGs, Census Tract (CT) 202.06 Block Group (BG) 1 and CT 203.11 BG 1. Due to differences in exact paths, not all CBGs within 1-mile of one route are within 1-mile of another; however, combined there are six distinct CBGs within 1-mile of the routes.

Two CBGs contain a population of low-income residents greater than 30 percent, including Census Tract 203.11 CBG 1 and CT 304 CBG 1. All the CBGs except for CT 203.15 CBG 1 have populations or communities of color, although CT 203.15 CBG 1 has fewer than 10 permanent residents. The

area is largely wooded, containing mostly industrial and commercial sites and Massaponax High School. Except for CT 304 BG 1 and CT 203.15 BG 2, the CBGs in the 1-mile radius are majority white alone, not Hispanic or Latino. Most of the people of color within the 1-mile radius are Black or African American, followed by Hispanic or Latino. CT 203.11 CBG 1 is the only CBG with a significant limited English-speaking population. Eight percent, compared to a state average of 3 percent, of the households in this CBG speak English less than "very well". The second most common language after English in this CBG is Spanish.

TABLE 4.5-1 DEMOGRAPHC AND SOCIOECONOMIC INDICATORS IN THE 1-MILE ENVIRONMETAL JUSTICE ANALYSIS AREA

Geography	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 (%) [d]	Population Under Age 5 [e] (%)	Population Over Age 64 [e] (%)	Applicable Route(s)
Virginia	8,624,511	40	60	19	0.1	7	0.1	0.5	4	10	23	3	9	6	16	n/a
Caroline County	31,181	37	63	24	0.4	1	0.0	0.8	5	6	23	0	11	6	16	n/a
CT 301, CBG 2	1,954	30	70	18	0.8	2	0.0	0.0	1	8	11	0	10	4	21	2,3
CT 304, CBG 1	887	56	44	35	0.0	0	0.0	0.5	4	16	46	1	24	7	17	3
Spotsylvania County	141,097	35	65	16	0.1	3	0.1	0.3	4	11	19	2	9	6	15	n/a
CT 202.06, CBG 1	**1,368**	**28**	**72**	**9**	**0.0**	**3**	**1.2**	**0.0**	**8**	**6**	**14**	**2**	**8**	**3**	**20**	**2, 3, 4**
CT 203.11, CBG 1	**1,038**	**27**	**73**	**15**	**0.0**	**0**	**0.0**	**0.0**	**0**	**12**	**33**	**8**	**19**	**6**	**18**	**2, 3, 4**
CT 203.15, CBG 1	6	0	100	0	0.0	0	0.0	0.0	0	0	0	0	0	0	0	2, 3, 4
CT 203.15, CBG 2	406	53	47	34	0.0	1	7.4	0.0	11	0	0	0	6	5	24	2, 3, 4

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

CBG = US Census block group; CT = US Census tract

Notes:

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

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

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

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

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

Bold font indicates a CBG crossed by the route.

Gray shaded cells indicate a reference population—Virginia, Spotsylvania County, and Caroline County.

Blue shaded cells indicate populations of color.
Pink shaded cells indicate that the community of color is 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 sensitive populations with language barriers.
Purple shaded cells indicate sensitive populations related to education status.

4.5.1.2 OTHER SENSITIVE POPULATIONS

Three other indicators were used to determine if additional socioeconomic factors contribute to overall burdens in EJ communities. 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 (the percent of people in a CBG under age 5 or over age 64). Children are particularly susceptible to environmental burdens for several reasons, encompassing physiological, developmental, and behavioral factors. People over 64 years of age are more susceptible to pollution due to several physiological, immunological, and health-related factors.

There is no equivalent VEJA definition for these groups; therefore, age-based communities are identified using the federal guidance of a "meaningfully greater" population. A CBG is considered to contain a potential education- or age-based vulnerable community when the percentage of the population below age 5, above age 64, or with less than a high school education exceeds twice the corresponding state average. These data are also provided in Table 4.5-1.

Less than a High School Education

The two CBGs with education-based vulnerabilities are also considered low-income communities.

Population Under Age 5

None of the CBGs in the 1-mile radius have populations under the age 5 that meet the criteria for age-related vulnerable populations.

Population Over Age 64

None of the CBGs in the 1-mile radius have a population over age 64 that meet the criteria for age-related vulnerable populations.

4.5.2 IMPACT ASSESSMENT

As described in Sections 2 and 3, Project route alternatives were identified through a systematic process that examined a variety of factors to identify constraints and opportunities. To ensure that stakeholder concerns regarding the potential direct and indirect impacts of the Project are understood and considered in routing decisions, Dominion designed and implemented a comprehensive outreach program early in the Project's development phase to identify and engage with all community stakeholders, including federally recognized tribes, regardless of EJ community status. The outreach program was designed to be consistent with VEJA and the Company's Environmental Justice Policy. As part of the outreach program, the Company shared Project materials through written and in-person methods (e.g., letters and open houses), documented comments provided by stakeholders, and responded to feedback by seeking ways to mitigate or avoid identified impacts, including any potential disproportionate impacts on vulnerable communities. As part of the outreach for the Project, the Company hosted two community meetings at Massaponax High School on June 13 and July 30, 2024.

As shown in Table 4.5-1, Route 3 has the largest number of potential EJ communities (all five CBGs with potential EJ communities); however, all route alternatives would be within 1-mile of at least three CBGs with potential EJ communities. its path, this difference is minor in context of

radius of effects, which is smaller than the 1-mile radius of analysis. Due to the limited nature of construction, residents beyond the immediate construction area are unlikely to experience any significant or noticeable impact to noise, emissions, and visual impacts. Generally, the routes are passing through densely wooded areas with limited development, residential or otherwise, surrounding the routes so slight variations between the routes will not yield a significantly greater or lesser impact to EJ communities crossed by the project.

In assessing whether a community would bear a disproportionately adverse impact from the Project, ERM considered construction impacts (specifically, noise and ground disturbance), visual impacts, property devaluation, and health impacts related to electric and magnetic fields discussed in the sections below. The various route options share many similarities; therefore, the impacts discussed below are general to all project routes, except where specific route alternatives would have different impacts, these are called out and discussed separately.

Overall, while both CBGs crossed by all project routes and most communities within the 1-mile radius of the site are potential EJ communities, impacts are not expected to be adverse or significant.

4.5.2.1 CONSTRUCTION ACTIVITIES

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

Various regulations, industry standards, and best management practices would guide construction and restoration of the right-of-way. The short-term impacts of construction could include equipment noise, dust, potential changes in traffic patterns, and ground disturbance. All of these impacts would be short-term and temporary.

Noise is generally defined as unwanted sound. The primary noise receptors in the study area would be limited to residences near the route alternatives and students and staff at Riverview Elementary and Thornburg Middle Schools. These two schools are within 0.3 mile of the proposed Tributary Station and serve as gathering places for young children, a sensitive population to adverse environmental effects. Exceedances of daytime noise limits are not expected; if any such exceedances occur, they 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 contours and maintain the right-of-way during operations with an herbaceous cover.

4.5.2.2 VISUAL IMPACTS

Section 4.3, Visual Resources, assesses visual impacts from the Project. Two of the KOPs used in that analysis are representative of views in nearby potential EJ communities. The visual effects on potential EJ communities at those KOPs are discussed below.

- KOP 001 (Route 4) represents views from homes along Guinea Station Road. Views from KOP 001 would be largely unchanged due to the existing presence of transmission lines in this area.
- KOP 007 (Tributary Station, Routes 2, 3, and 4) represents views from Riverview Elementary and Thornburg Middle, where many residents of the communities within one mile likely gather. Existing foliage would shield residents and students from views of the Project from KOP 007.

Overall, the project is not anticipated to produce a disproportionately high and adverse visual impact on EJ communities.

4.5.2.3 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 depend on proximity, visibility, size, and type of transmission structures; easement landscaping; and surrounding topography. Peer-reviewed articles and industry research published in peer-reviewed journals and trade journals finds that residential property values and sales prices are primarily affected by factors unrelated to the presence of a transmission line. Specifically, this research found that factors such as location, type, and condition of improvements to the property; neighborhood characteristics; and broader local real estate market conditions have a greater influence on the value of residential property than the presence of a transmission line (Jackson and Pitts 2010; Anderson 2017).

Generally, the route alternatives would pass through densely wooded areas with limited nearby development (residential or otherwise).No residences are within 500 feet of Routes 2 and 3. One residence is within 250 feet of and two residences are within 500 feet of Route 4.

The route alternatives were designed to be as far from dwellings and other sensitive receptors as practicable both within and outside of EJ communities. While the desktop review suggests that EJ populations live within 1-mile of the route alternatives, there are few homes in the immediate vicinity of the Project study area. As a result, it is unlikely that there would be a significant, or targeted, property value impact to potential EJ communities because of the Project.

4.5.2.4 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 transmission infrastructure, including the Project. 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 alternatives were designed to be as far from dwellings and other sensitive receptors as practicable both within and outside of EJ communities. While the desktop review suggests that EJ populations live within 1-mile of the route alternatives, there are few homes in the immediate vicinity of the Project study area; therefore, impacts on EJ communities from EMF associated with the Project are not anticipated.

4.6 GEOLOGIC AND MINERAL RESOURCES

4.6.1 GEOLOGICAL RESOURCES

The study area is within the transitional zone of the Piedmont and Coastal Plain geologic provinces. The Piedmont geologic province is characterized by strongly weathered bedrock due to the humid climate, thick soils overlying saprolite (weathered bedrock), and rolling topography that becomes more rugged to the west near the Blue Ridge mountains. The Coastal Plain province, located between the Piedmont province and the Atlantic Ocean, is defined by a terraced landscape consisting of unconsolidated sediment material deposited from fluctuating sea levels and the repetitive growth and retreat of large continental glaciers (William and Mary Department of Geology 2023).

Based on review of the Geologic Map of Virginia, each route alternative is located within sections of unconsolidated, undifferentiated sediments deposited during the Cenozoic Era (66 million years ago to present). Routes 2 and 3 both begin within gravel belonging to the Bacons Castle Formation before transitioning to an area of sedimentary detrital (fragments of pre-existing rock). From there, Route 2 and Route 3 diverge. Route 2 crosses an area of unconsolidated alluvium

before terminating within unconsolidated sand belonging to the Chesapeake Group. Route 3 reencounters gravel from the Bacons Castle Formation and a unit of sedimentary detrital, prior to reconnecting with Route 2 and passing through areas of unconsolidated alluvium and sand. Route 4 begins to the north of Routes 2 and 3 within areas of unconsolidated sand, prior to converging with Route 3 within the gravel of the Bacons Castle Formation, and eventually Route 2 within the unit of unconsolidated alluvium.

4.6.2 MINERAL RESOURCES

ERM reviewed publicly available Virginia Department of Energy datasets (2023), USGS topographic quadrangles, and recent (2023) digital aerial photographs to identify mineral resources in the study area. Based on this review, no active mineral resources were identified within 0.25 mile of the Tributary route alternatives. The closest active mineral resource is located approximately 1.3 miles northwest of the Tributary Switching Station. Three inactive mineral resource sites are within 0.25 mile of the Tributary route alternatives, with the closest site being a sand and gravel prospect located approximately 0.1 mile south of Route 3 near MP 0.7.

4.6.3 IMPACT ASSESSMENT

Because the Project construction will require minimal ground disturbance, no impacts to geological resources are anticipated. There are no active mineral resource sites near the Project routes.

5 ROUTE ALTERNATIVES ANALYSIS

ERM identified the route alternatives discussed in this report based on the geography of major constraints and routing opportunities in the study area. In accordance with the *Guidelines for Transmission Line Applications Filed Under Title 56 of the Va. Code* (specifically that existing rights-of-way should be given priority when adding additional facilities), ERM assessed opportunities for routing along existing rights-of-way, however, there were no opportunities for collocation with existing transmission infrastructure, public utilities, or roads within the study area. Major constraints within the study area were residential areas along Guinea Station Road in the central and northern portions of the study area and the Ni River and its surrounding wetland/waterbody complex in the southern half of the study area. Route alternatives that minimize impacts to residences and natural resources were evaluated, tapping in the northern and southern halves of the study area.

The remainder of this report provides a comparative analysis of the route alternatives to identify a preferred alignment. The resources crossed by each route are listed in the Features Crossing Table (Appendix C), while a comparison of impacts on resources by each route is provided below.

5.1 LAND USE

Impacts on land use from the Project include the placement of transmission structures on private property, clearing of trees within the right-of-way, potential visual impacts on resources (such as residences) within proximity of the transmission infrastructure, impacts on recreational resources, impacts on land cover types (especially forest), and temporary road closures associated with construction at road crossings. Potential impacts on land use from each route and the route variation are evaluated below.

Route Lengths and Footprints

Table 5.1-1 summarizes the lengths, right-of-way footprints, and number of parcels crossed by each route alternative.

TABLE 5.1-1 LENGTH AND ACREAGE OF THE ROUTE ALTERNATIVES

Environmental Feature	Unit [a]	Route 2	Route 3	Route 4
Route length	Miles	2.4	2.8	3.0
Construction footprint*	Acres	30.3	35.7	37.6
Total parcels crossed by right-of-way	Number	9	10	11

Note:
[a] Data include the proposed Tributary Station.

Route 4 is the longest of the routes with the largest footprint by 0.7 mile. Route 2 is the shortest route with the smallest footprint by about 0.4 mile and 5.4 acres.

Land Ownership

No federal, state, or public lands would be crossed by the Project. All parcels crossed by the routes are privately owned. Route 4 would cross the most parcels Route 2 would cross the fewest.

All routes would cross the parcel of the proposed SpotsyTech Campus development where the Customer's development would occur. Route 2 would be the least impactful with respect to private parcels crossed.

Land Use and Land Cover

Outside of the placement of transmission structures, the Project would have no direct impacts to open space, developed land, or open water land use types. The primary impact to land use would be the conversion of forested land to herbaceous land in the maintained right-of-way.

Based on recent (2023) aerial imagery, Route 4 would cross the most forested land (31.0 acres), followed by Route 3 (29.3 acres) and Route 2 (23.6 acres). Approximately 3.3 acres of forested land crossed by each route is within the proposed SpotsyTech Campus development, which would be cleared by the developer prior to construction of the Project. Impacts on forest are assessed further in Section 5.2.

Planning and Zoning and Planned Developments

No impacts to planning or zoning are anticipated from the Project. All routes would terminate on the proposed SpotsyTech Campus development.

Residential and Non-Residential Buildings

No buildings would be directly impacted by any route alternative. Routes 2 and 3 have no residences within the right-of-way, 60 feet from the right-of-way, or within 100, 250, or 500 feet of the right-of-way centerline. Route 4 has no residences within the right-of-way, within 60 feet of the right-of-way, or within 100 feet of the centerline, but has one residence within 250 and two residences within 500 feet of the centerline.

Routes 2 and 3 have the fewest residences within any proximity of the route alternatives.

Recreational Resources

Impacts on recreational resources would be limited to temporary impacts from construction, visual impacts from the transmission infrastructure, and clearing of trees within the right-of-way.

Routes 2 and 3 both cross the KOA Campground, with Route 2 passing through approximately 1.6 acre less than Route 3 and farthest from the area in use by campers. Both route crossings of the KOA campground would require tree clearing within the right-of-way; however, structures are not anticipated to be visible along Route 2 and visual impacts from Route 3 would be limited to partially obscured views of structures during leaf-off and no views during leaf-on conditions (see Section 4.3).

Route 4 would cross Guinea Station Road, a Virginia Byway, Civil War Trail, where it overlaps with US Bike Route 1 and the planned Spotsylvania County Trailway Improvement project. Tree clearing along the right-of-way would alter the view at its intersection with the right-of-way, but the function of the recreational resources crossed would not be impacted.

Route 2 would have the least impacts on recreational resources.

Cemeteries, Schools, and Places of Worship

The Project would have no impacts on cemeteries or places of worships. Impacts on Riverview Elementary School and Thornburg Middle Schools would be limited to visual impacts and would be the same for all route alternatives.

Conservation Easements

The Project would have no impacts conservation easements.

Transportation Infrastructure

Temporary road or lane closures or detours could be required during construction, regardless of the route selected for the Project. Each route would cross I-95 perpendicularly at the same location. VDOT and Spotsylvania County prefer perpendicular road crossings, which reduce the distance spanned and the visual impacts of a crossing. VDOT also prefers to avoid any structures placed within their rights-of-way to avoid conflicts with future road improvements. None of the routes or the variation would impact future road projects.

Routes 2 and 3 would only cross I-95, while Route 4 would also cross two local roads (including Guinea Station Road, a Virginia Byway) at acute angles. Routes 2 and 3 would impact the fewest number of roads.

Airports and Helipads

Based on structure height analysis, the Project would not impact airports or navigable airspace.

5.2 NATURAL RESOURCES

Each route alternative crosses natural resources, including wetlands, waterbodies, and habitat with natural vegetation (mainly forest), including areas ranked as ecological cores by the VDCR. Potentially impacted resources crossed by each route are discussed in Section 4.2 and summarized in Table 5.2-1.

TABLE 5.2-1 NATURAL RESOURCES CROSSED BY THE ROUTE ALTERNATIVES

Natural Resource	Unit	Route 2	Route 3	Route 4
Wetlands Total	Acres	14.1	14.4	13.8
PFO	Acres	7.3	7.9	7.4
PSS	Acres	6.4	6.1	6.1
Waterbodies Total	Acres	12	11	11
Perennial Waterbodies	Acres	7	5	5
Forest	Acres	26.3	29.3	31.0
Ecological Cores	Acres	26.3	31.3	27.9
Small whorled pogonia potentially suitable habitat	Acres	0.0	0.8	1.5

PFO = palustrine forested; PSS = palustrine scrub-shrub.

Direct impacts to natural resources would result from temporary impacts associated with construction of the Project, placement of structures, and required tree clearing within the right-of-way of the selected route. Tree clearing within the maintained right-of-way would result in the conversion of PFO/PSS wetlands to PSS/PEM-type wetland, reducing or eliminating functions such as peak flow reduction, water filtration, and habitat diversity, eliminating riparian buffer and riparian buffer functions at waterbody crossings, eliminating forested habitat, and bisecting ecological cores. The VDCR identified areas of potential habitat for the federally and state threatened Small whorled pogonia, which uses a variety of woodland as habitat. This forested habitat would also serve other species, such as the federally and state threatened NLEB and the federally potentially endangered and state endangered TCB, bald eagles, and other non-protected species.

Wetlands

All route alternatives would cross the Ni River and its associated wetland/waterbody complex, and would cross similar amounts of wetlands, including PFO and PSS wetlands. The Route 4 right-of-way would encompass the fewest total wetlands by about 0.3 acre (13.8 acres), followed by Routes 2 and 3 (14.1 and 14.4 acres, respectively). Route 2 would cross slightly less PFO type wetlands than Routes 3 and 4 (7.3 acres compared to 7.4 and 7.9 acres, respectively). Route 2 would cross 0.3 acre more PSS wetland than Routes 3 and 4.

Route 4 is the least impactful to total wetlands and PFO wetlands.

Waterbodies

Routes 3 and 4 both cross 11 waterbodies, including five perennial waterbodies each. Route 2 crosses 12 waterbodies, including seven perennial waterbodies.

Routes 3 and 4 would cross one less waterbody than Route 4 and would require the clearing of the least amount of riparian buffer.

Ecological Cores

All route alternatives cross the same two ecological cores, ranked C1 and C3, and all would bisect the C1 core. Route 2 would cross the fewest acres of the ecological cores (26.3 acres), followed by Route 4 (31.3 acres) and Route 3 (27.9 acres).

Route 2 would be the least impactful to ecological cores.

Potential Habitat for the Small whorled Pogonia

Route 2 would not cross any Small whorled pogonia habitat. Route 3 crosses three small, isolated areas of potential habitat (a total of 0.8 acre) and Route 4 crosses 1.5 acres along the edge of a larger area of potential habitat for the Small whorled pogonia.

Route 2 would have no impact on potential habitat for the Small whorled pogonia.

Vegetation (Forest)

The Route 2 right-of-way would affect the smallest extent of forested acres of the three alternatives by about 5.7 acres (23.6 acres total), followed by Route 3 (29.3), with Route 4 (31.0) crossing the largest amount of forest. Of the forested impacts, Route 2 would affect the largest extent of FCV 5 (outstanding) forest (16.5 acres), compared to Route 3 (14.3 acres) and Route 4 (10.7 acres). Route 4 also crosses the smallest amount of FCV 4 (Very High) forest—0.9 acre compared to 1.8 acres for Routes 2 and 3.

Route 2 would result in the smallest overall amount of forest clearing, while Route 4 would affect the smallest amount of FCV 5 and 4 (Outstanding and Very High) forest.

5.3 VISUAL RESOURCES

Routes 2 and 3 would have overall minor visual impacts, while Route 4 would have overall minor to moderate visual impacts on potentially impacted VSRs. All routes would cross through forested areas that would generally screen transmission route infrastructure from viewers. All routes would be visible at their crossing of I-95. During leaf-off conditions, transmission structures may be visible within the KOA campground along Route 3. Route 4 would be visible along Beechwood Drive and Guinea Station Road.

Route 2 would have the smallest visual impacts on VSRs.

5.4 CULTURAL RESOURCES

No archaeological sites were identified proximate to the routes.

Five aboveground historic resources were identified within VDHR study tiers for Routes 2 and 3. Route 2 would have a minimal and Route 3 would have a moderate impact on one locally significant resource within 0.5 mile of the route. Three aboveground historic resources were identified within VDHR study tiers for Route 4, and the route would have a minimal impact on one locally significant resource within 0.5 mile of the route.

Overall, Routes 2 and 4 would have the lowest impact ratings on resources.

5.5 ENVIRONMENTAL JUSTICE

ERM’s EJ assessment found that the Project would not result in a disproportionate, adverse, or significant impact on EJ communities.

6 CONCLUSIONS AND RECOMMENDATIONS

Based on the evaluation of each route alternative and the potential associated impacts on the human and natural environment within the study area, ERM and the Company recommend Route 2 as the preferred alternative.

All routes would cross through predominantly forested land. Route 2 would require clearing the least amount of forest.

Routes 2 and 3 are located south of Guinea Station Road, avoiding the majority of the residential areas in the study area. Neither route would pass within 500 feet of any residences. Route 4 would pass within 250 feet of one residence and within 500 feet of two residences.

All three route alternatives would cross I-95 at a perpendicular angle, as preferred by VDOT and Spotsylvania County. Routes 2 and 3 would not cross any other roads, while Route 4 would cross two other roads (including Guinea Station Road, a Virginia Byway) at angles rather than perpendicularly.

All route alternatives would require crossing the Ni River and its surrounding wetland/waterbody complex and would cross similar amounts of desktop-delineated wetlands. Route 3 crosses the fewest wetlands, while Route 4 would cross the second fewest total wetlands and the fewest PFO type wetlands.

Route 2 is not expected to have more than minor visual impacts.

Routes 2 and 4 are expected to have only a minimal impact on a locally significant historic resource, while Route 3 would have a moderate impact on the same resource.

In conclusion, after evaluating numerous routing constraints and opportunities identified through desktop study, stakeholder outreach, and fieldwork, ERM and the Company recommend Route 2 as the preferred alternative for this Project, as it avoids or reasonably minimizes adverse impacts to the greatest extent reasonably practicable on the scenic assets, historic and cultural resources, and environment of the area concerned.

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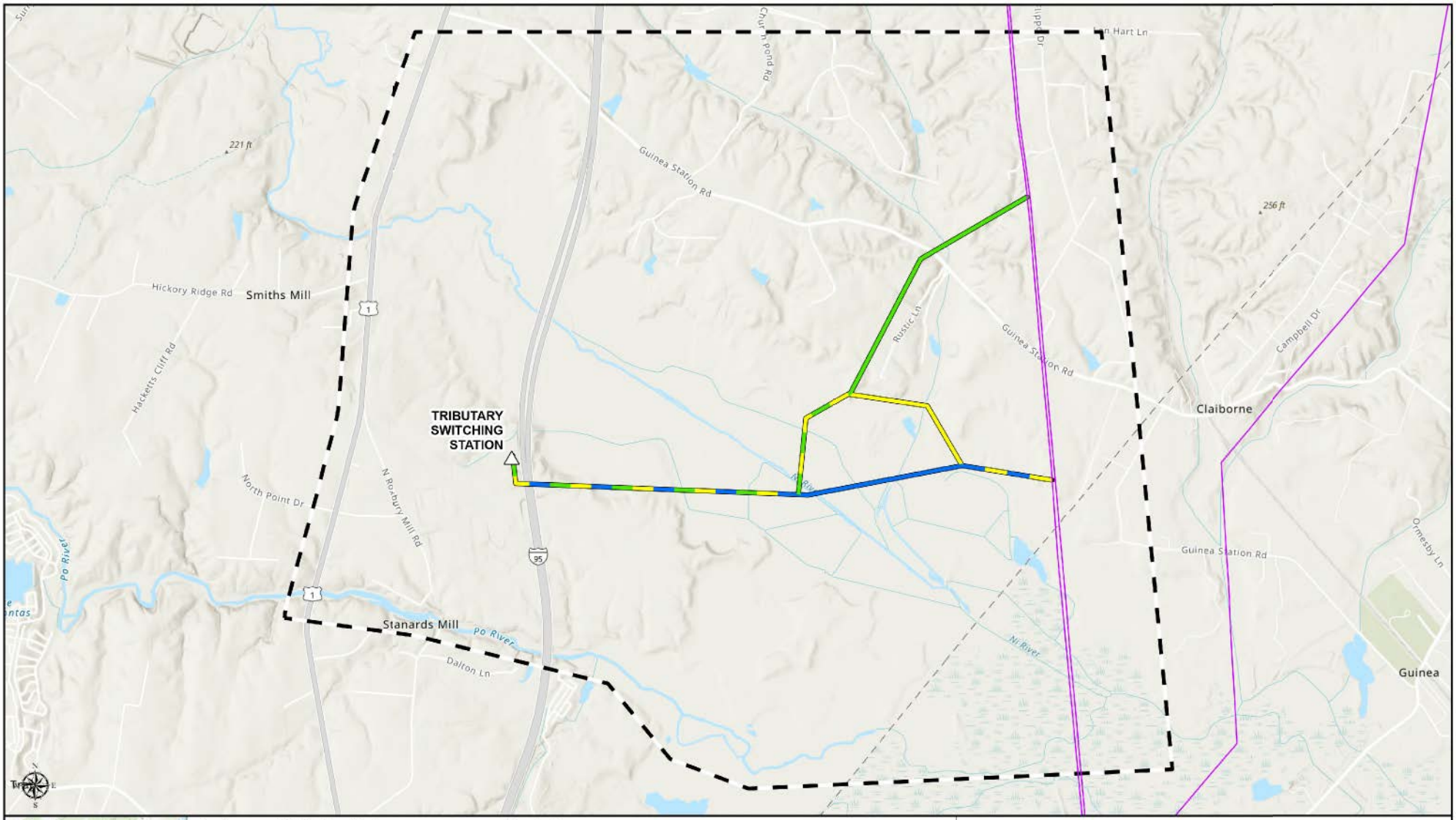
APPENDIX A FIGURES

FIGURE 1.1-1 PROJECT OVERVIEW MAP



Topographic Project Overview

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

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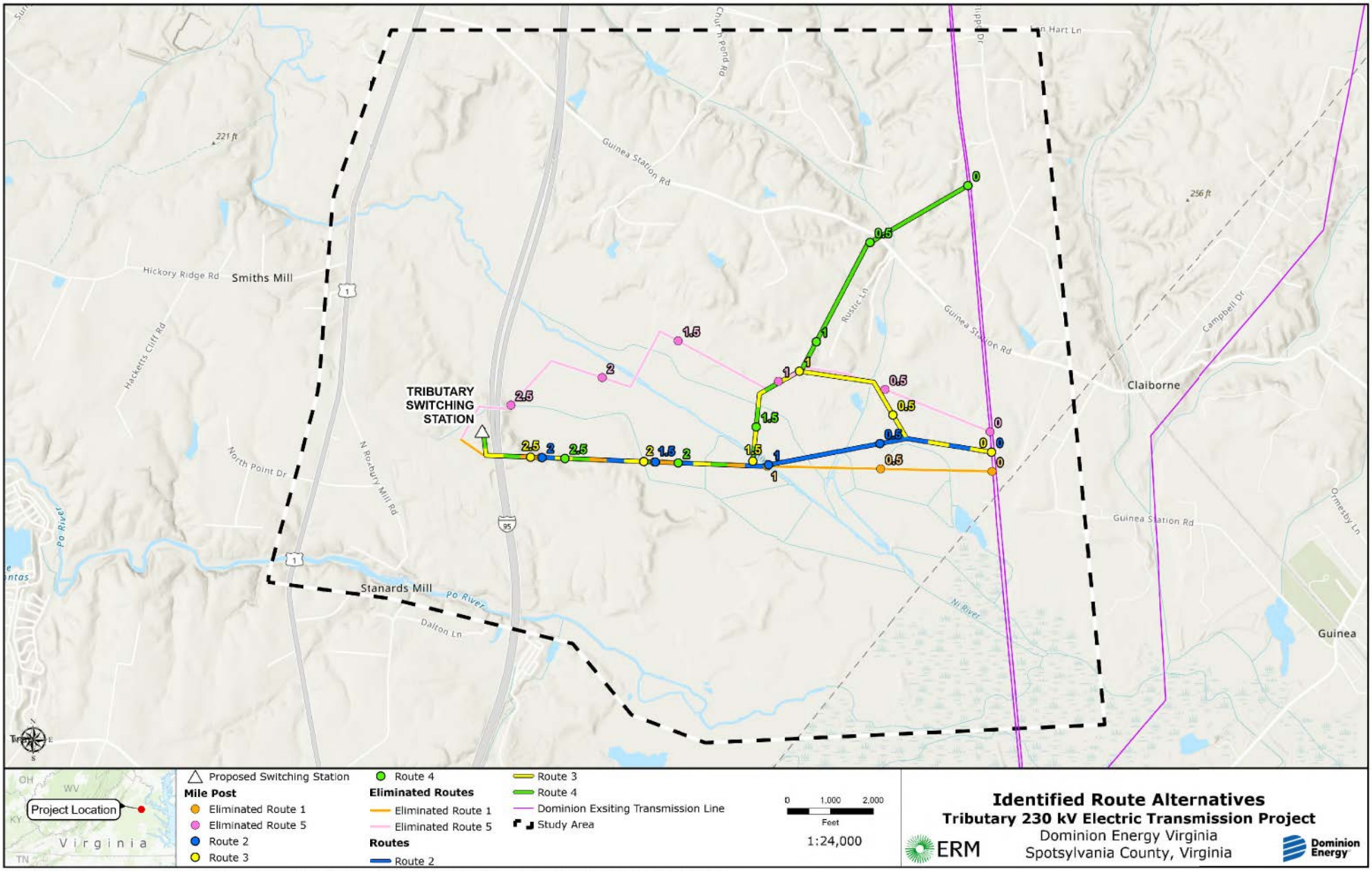
DRAWN BY: JDF

FIGURE 3.4-1 IDENTIFIED ROUTE ALTERNATIVES



Identified Route Alternatives

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

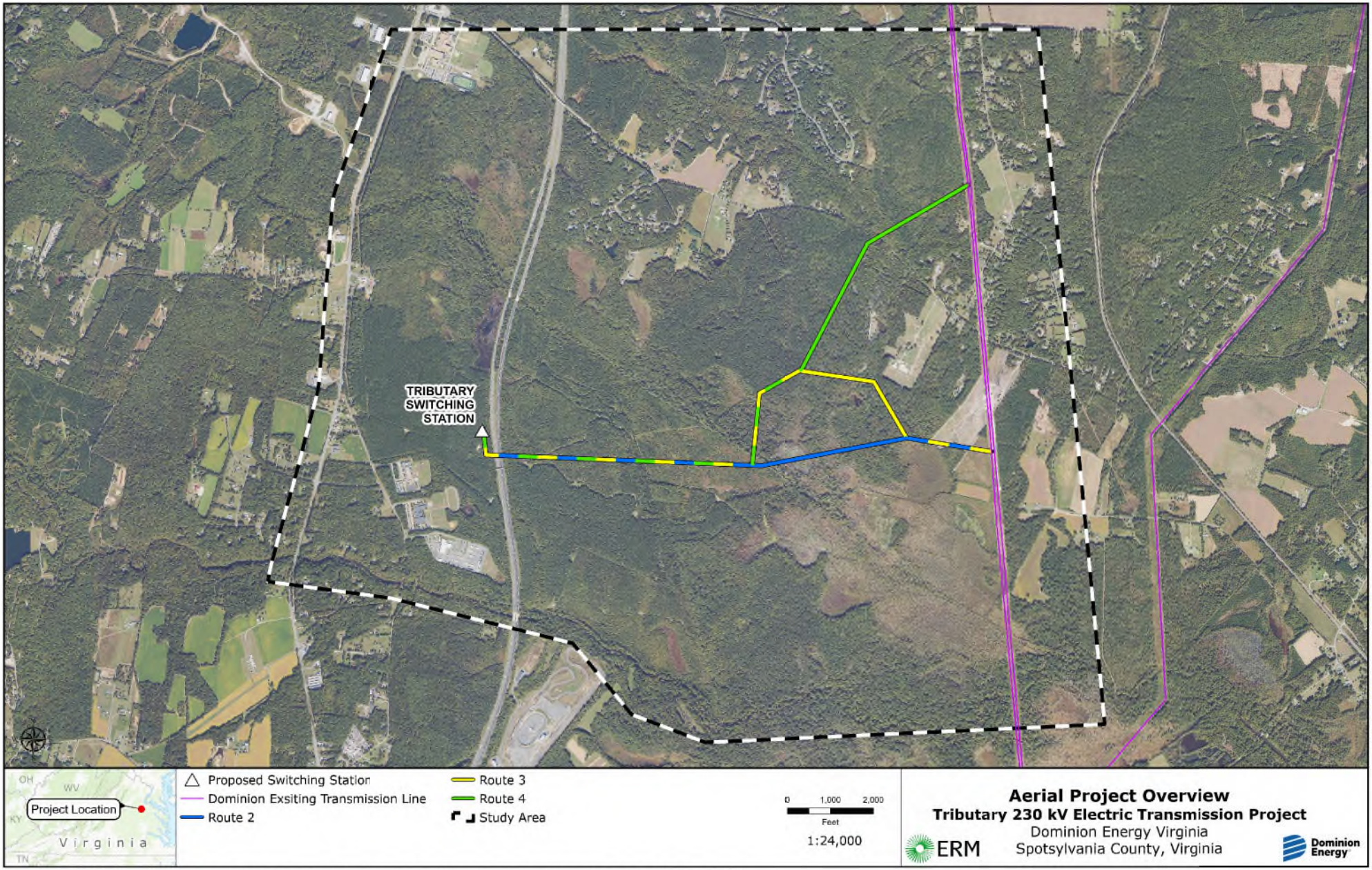
ERM

Dominion Energy

MPLS M:\US\Projects\D-F\Dominion\Tributary\ArcGIS\Routing_Study\DOM_Tributary_RoutingStudy\DOM_Tributary_RoutingStudy.aprx\DOM_TRIB_AltRoutes | REVISED: 09/12/2024 | SCALE: 1:24,000 when printed at 11x17

DRAWN BY: JDF

FIGURE 3.4-2 AERIAL OVERVIEW MAP



Aerial Project Overview

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

MPLS M:\US\Projects\D-F\Dominion\Tributary\ArcGIS\Routing_Study\DOM_Tributary_RoutingStudy\DOM_Tributary_RoutingStudy.aprx\DOM_TRIB_OverviewAerial | REVISED: 09/05/2024 | SCALE: 1:24,000 when printed at 11x17

DRAWN BY: JDF

FIGURE 4.1.1-1 LAND OWNERSHIP

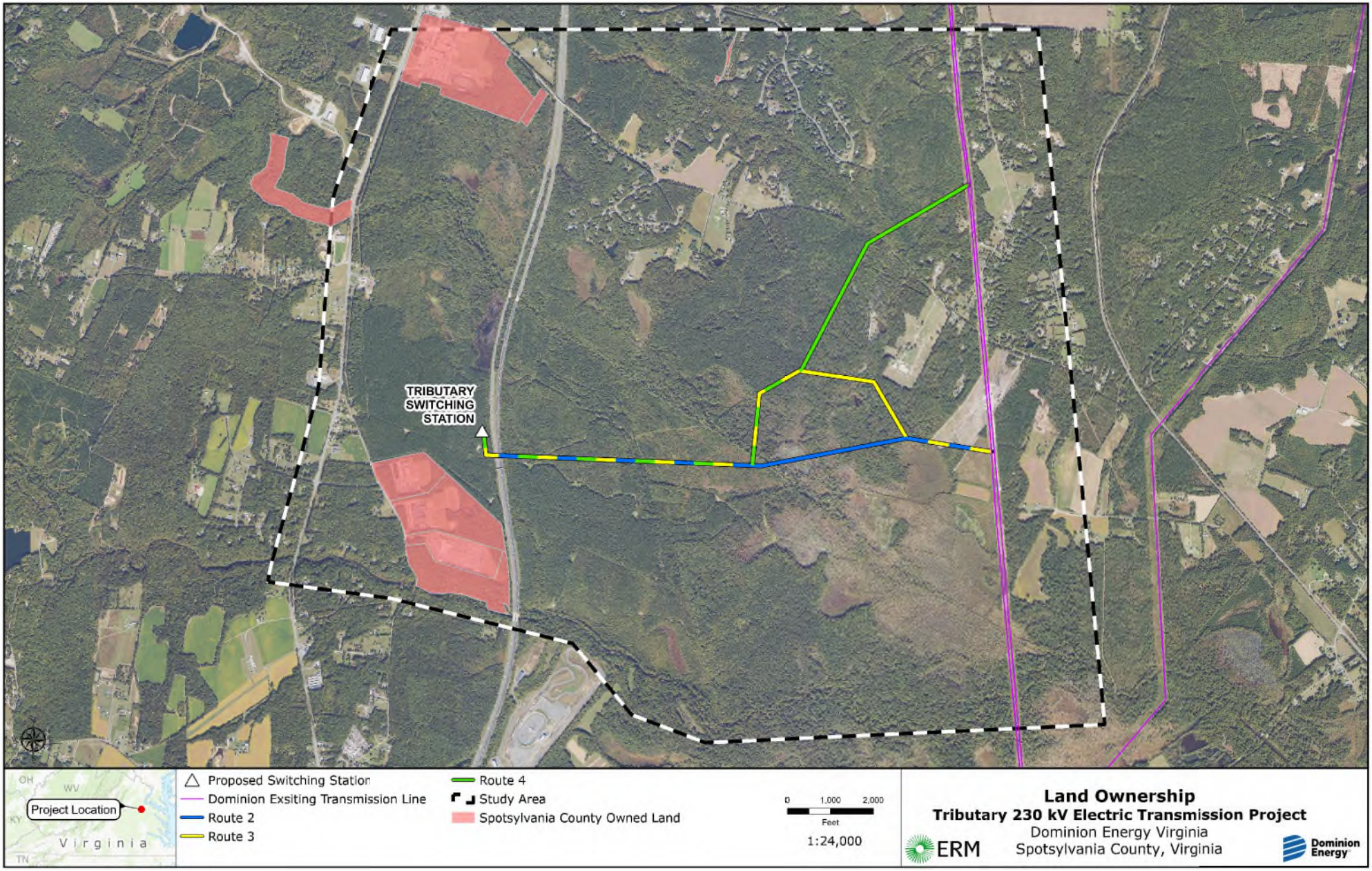
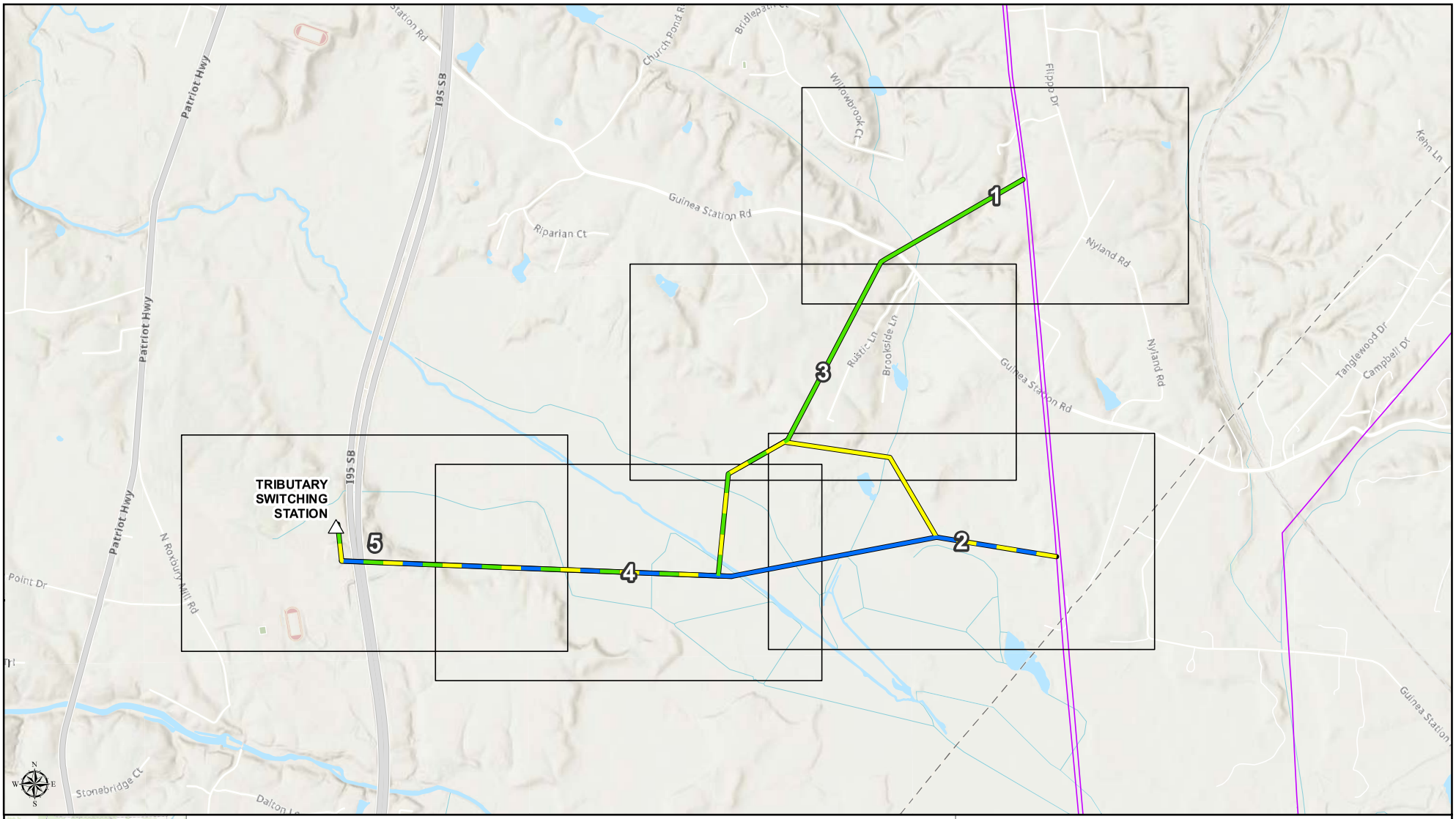

TRIBUTARY
SWITCHING
STATION
OH
WV
KY
Virginia
TN
Project Location
Proposed Switching Station
Dominion Exsiting Transmission Line
Route 2
Route 3
Route 4
Study Area
Spotsylvania County Owned Land
0
1,000
2,000
Feet
1:24,000
ERM
Land Ownership
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia
Dominion Energy

FIGURE 4.1.2-1 EXISTING LAND USE AND LAND COVER WITHIN 0.25 MILE OF THE ROUTE ALTERNATIVES



Index Page

Existing Land Use and Land Cover within 0.25 miles Index

Tributary 230 kV Electric Transmission Project

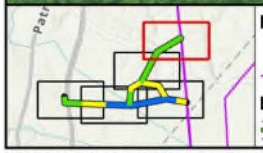
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

MPLS M:\US\Projects\D-F\Dominion\Tributary\ArcGIS\Routing_Study\DOM_Tributary_RoutingStudy\DOM_Tributary_RoutingStudy.aprx\DOM_TRIB_LandUse_Index | REVISED: 09/06/2024 | SCALE: 1:18,000 when printed at 11x17

DRAWN BY: JDF



Mile Post
- Route 4
- Dominion Exsiting Transmission Line

Route Alternatives
- Route 4

Land Use Types (ERM)
- Agriculture
- Developed
- Forest
- Open Space

- Study Area
- 0.25 Mile Buffer

0 250 500
Feet

1:4,800

Existing Land Use and Land Cover within 0.25 miles

Tributary 230 kV Electric Transmission Project

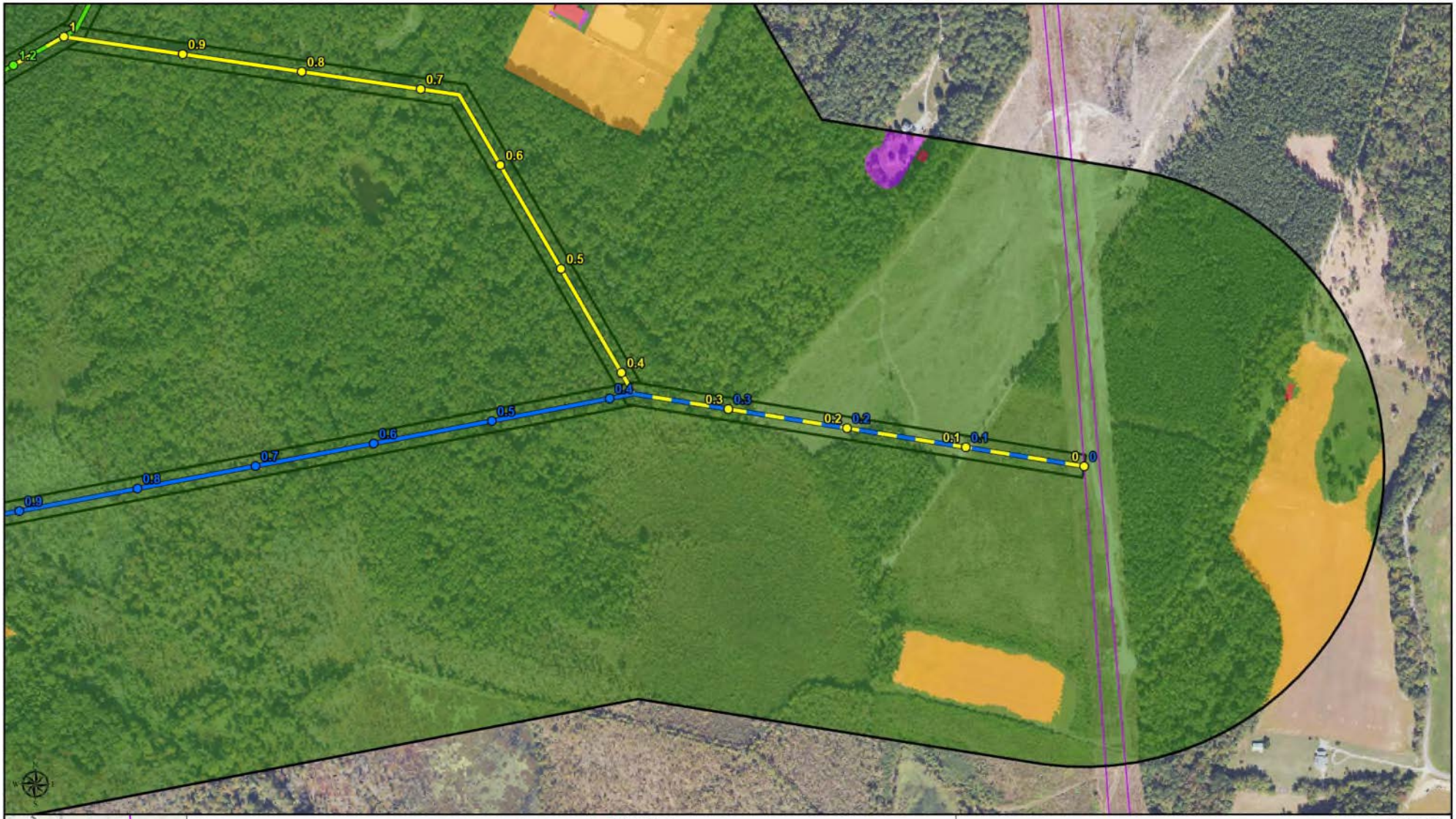
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

MPLS M:\US\Projects\D-F\Dominion\Tributary\ArcGIS\Routing_Study\DOM_Tributary_RoutingStudy\DOM_Tributary_RoutingStudy.aprx\DOM_TRIB_LandUse | REVISED: 09/06/2024 | SCALE: 1:4,800 when printed at 11x17

DRAWN BY: JDF



Page 2 of 5

Existing Land Use and Land Cover within 0.25 miles

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia

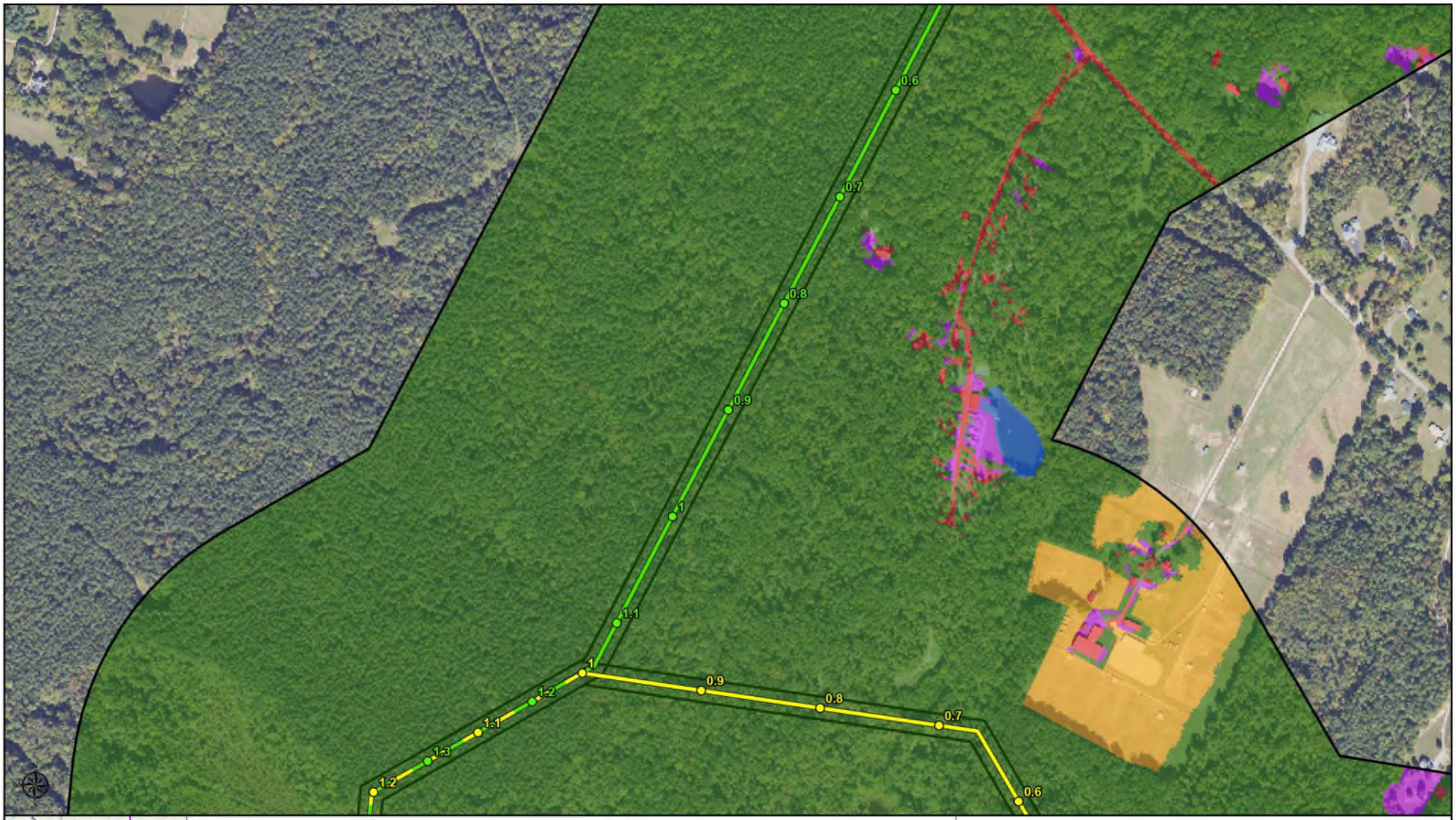
Spotsylvania County, Virginia

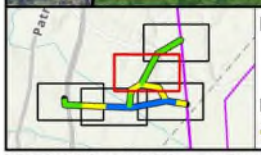
ERM

Dominion Energy

MPLS M:\US\Projects\D-F\Dominion\Tributary\ArcGIS\Routing_Study\DOM_Tributary_RoutingStudy\DOM_Tributary_RoutingStudy.aprx\DOM_TRIB_LandUse | REVISED: 09/06/2024 | SCALE: 1:4,800 when printed at 11x17

DRAWN BY: JDF





Mile Post
- Route 3
- Route 4

Route Alternatives
- Route 3
- Route 4

Land Use Types (ERM)
- Agriculture
- Developed
- Forest
- Open Space
- Open Water
- Study Area
- 0.25 Mile Buffer

0 250 500
Feet

1:4,800

Existing Land Use and Land Cover within 0.25 miles

Tributary 230 kV Electric Transmission Project

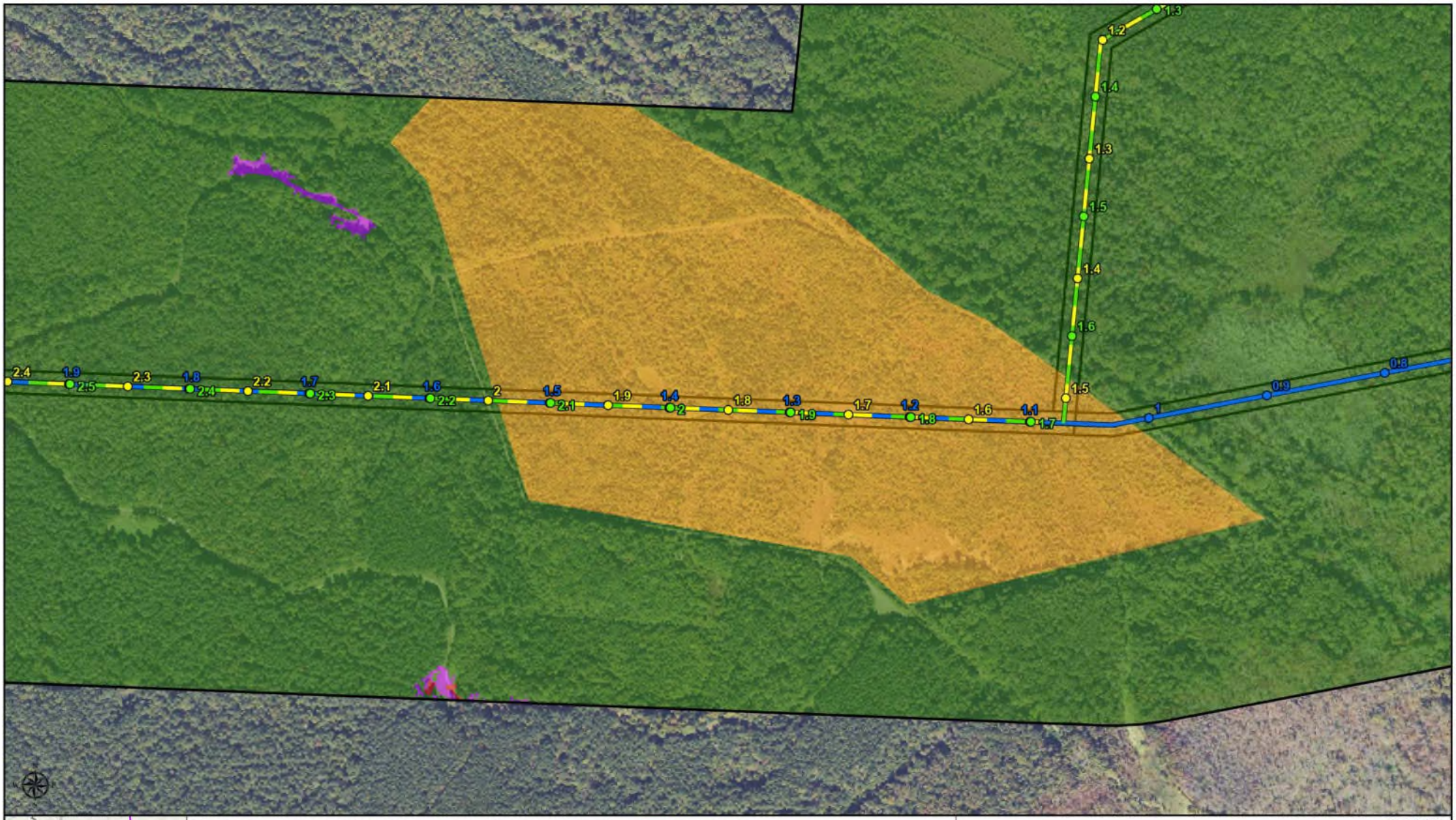
Dominion Energy Virginia
Spotsylvania County, Virginia

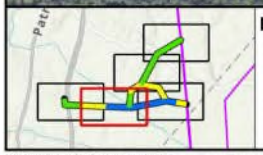
ERM

Dominion Energy

MPLS M:\US\Projects\D-F\Dominion\Tributary\ArcGIS\Routing_Study\DOM_Tributary_RoutingStudy\DOM_Tributary_RoutingStudy.aprx\DOM_TRIB_LandUse | REVISED: 09/06/2024 | SCALE: 1:4,800 when printed at 11x17

DRAWN BY: JDF





Mile Post
- Route 2
- Route 3
- Route 4

Route Alternatives
- Route 2
- Route 3
- Route 4

Land Use Types (ERM)
- Agriculture
- Developed
- Forest
- Open Space
- Study Area
- 0.25 Mile Buffer

0 250 500
Feet

1:4,800

Existing Land Use and Land Cover within 0.25 miles

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

MPLS M:\US\Projects\D-F\Dominion\Tributary\ArcGIS\Routing_Study\DOM_Tributary_RoutingStudy\DOM_Tributary_RoutingStudy.aprx\DOM_TRIB_LandUse | REVISED: 09/06/2024 | SCALE: 1:4,800 when printed at 11x17

DRAWN BY: JDF

Proposed Switching Station

Mile Post

- Route 2
- Route 3
- Route 4

Route Alternatives

- Route 2
- Route 3
- Route 4

Land Use Types (ERM)

- Agriculture
- Developed
- Forest
- Open Space
- Study Area
- 0.25 Mile Buffer

0 250 500
Feet

1:4,800

Existing Land Use and Land Cover within 0.25 miles

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

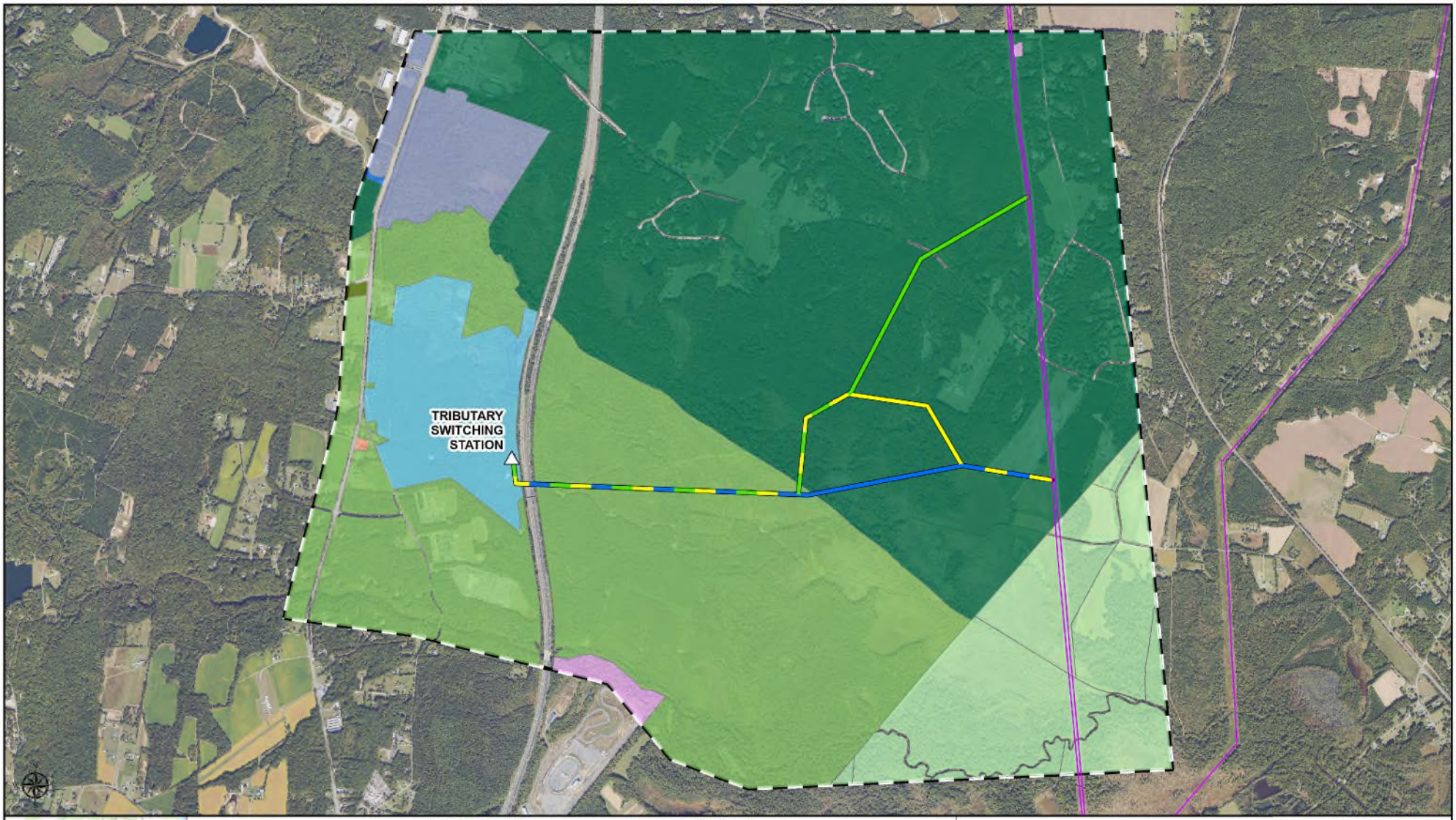
ERM

Dominion Energy

MPLS M:\US\Projects\D-F\Dominion\Tributary\ArcGIS\Routing_Study\DOM_Tributary_RoutingStudy\DOM_Tributary_RoutingStudy.aprx\DOM_TRIB_LandUse | REVISED: 09/06/2024 | SCALE: 1:4,800 when printed at 11x17

DRAWN BY: JDF

FIGURE 4.1.3-1 ZONING DISTRICTS WITHIN THE STUDY AREA



Zoning Districts Within the Study Area

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia

Spotsylvania County, Virginia

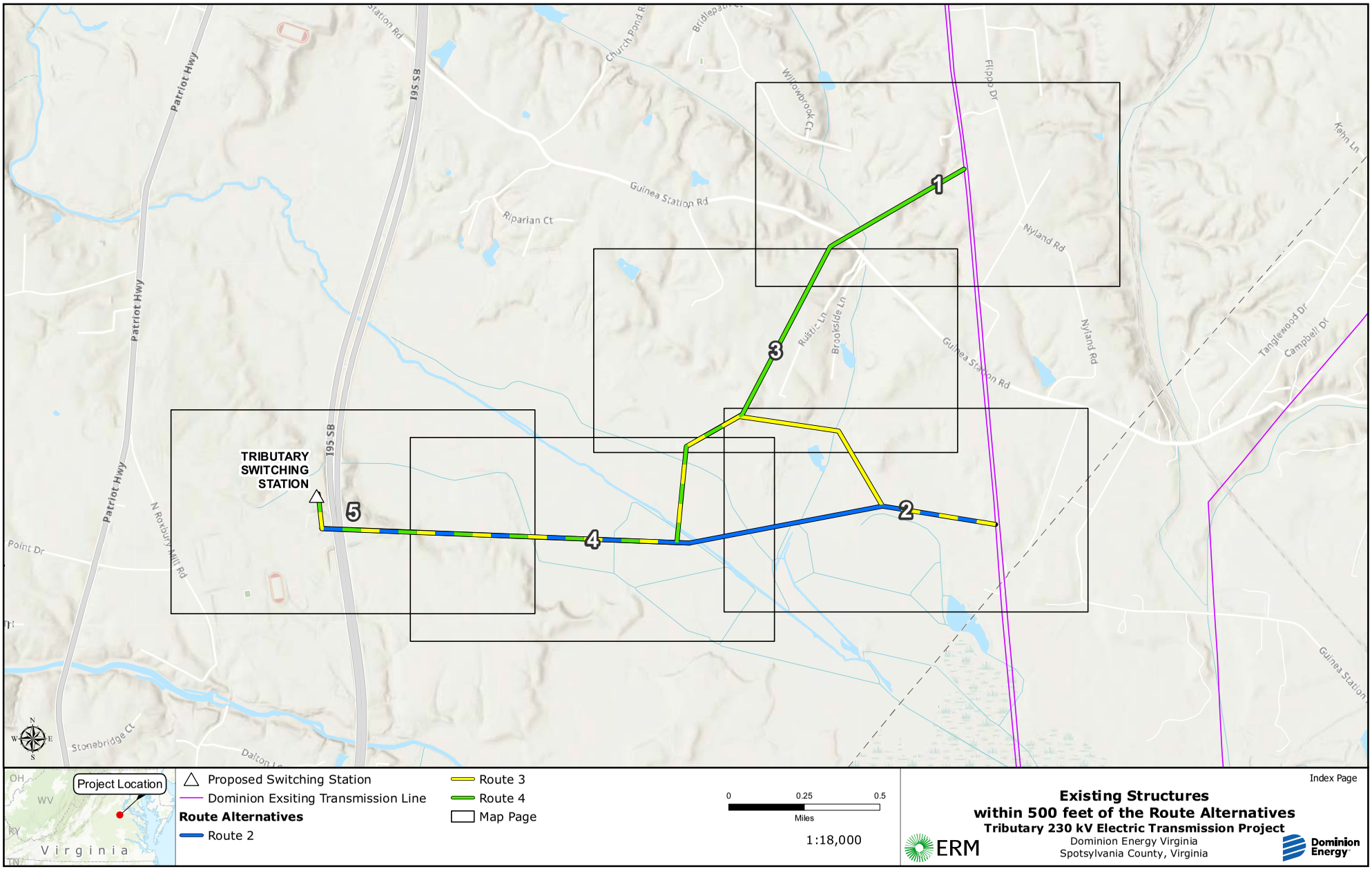
ERM

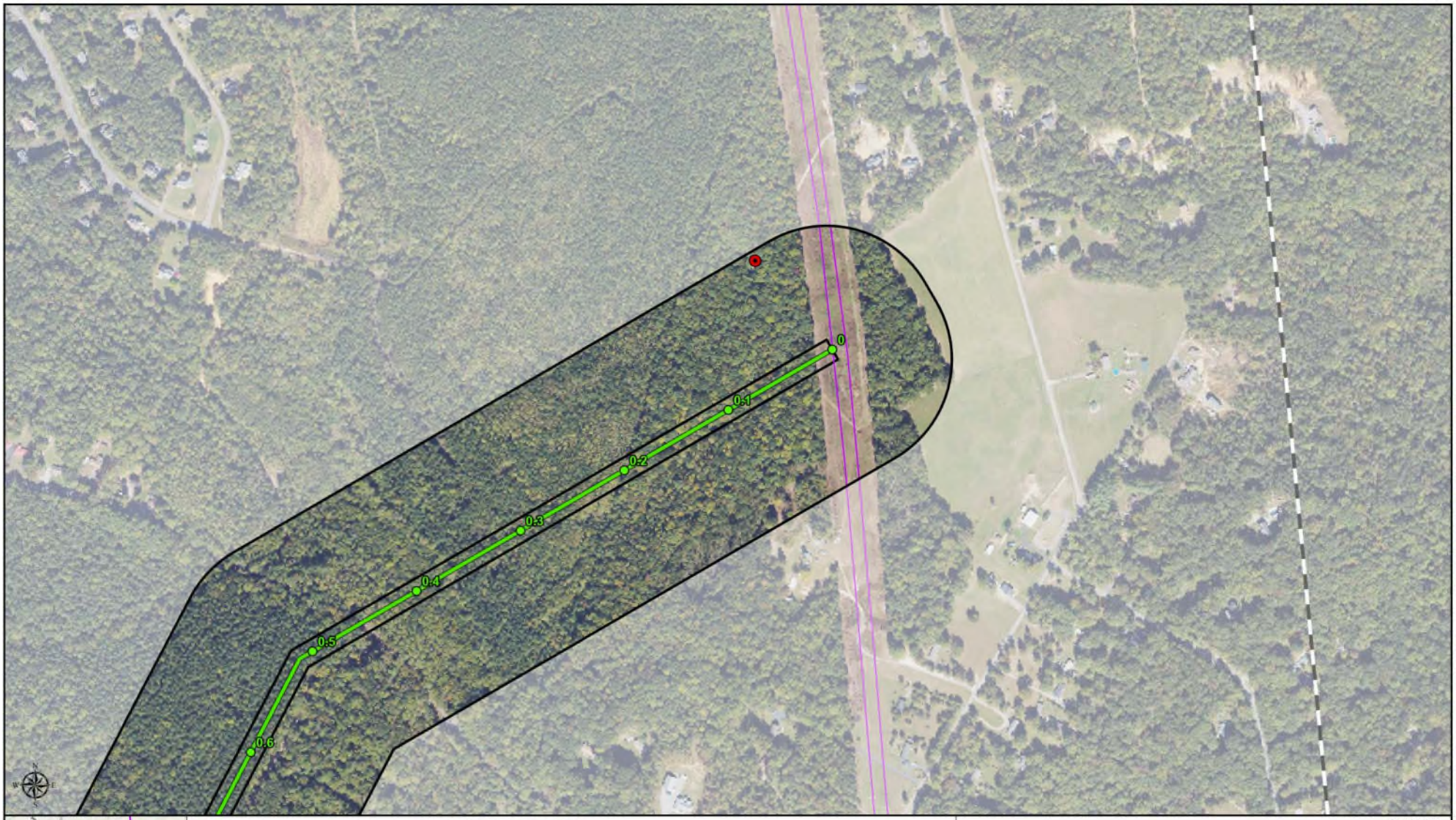
Dominion Energy

MPLS M:\US\Projects\D-F\Dominion\Tributary\ArcGIS\Routing_Study\DOM_Tributary_RoutingStudy\DOM_Tributary_RoutingStudy.aprx\DOM_TRIB_LandUsePlanningZoning | REVISED: 09/06/2024 | SCALE: 1:24,000 when printed at 11x17

DRAWN BY: JDF

FIGURE 4.1.4-1 EXISTING STRUCTURES WITHIN 500 FEET OF THE ROUTE ALTERNATIVES


TRIBUTARY
SWITCHING
STATION
1
2
3
4
5
Patriot Hwy
I95 SB
Guinea Station Rd
Riparian Ct
Nyland Rd
Brookside Ln
Tanglewood Dr
Campbell Dr
Flippo Dr
Willowbrook Ct
Kehn Ln
N Roxbury Mill Rd
Point Dr
Stonebridge Ct
Project Location
OH
WV
KY
TN
Virginia
Proposed Switching Station
Dominion Exsiting Transmission Line
Route Alternatives
Route 2
Route 3
Route 4
Map Page
0
0.25
0.5
Miles
1:18,000
Index Page
Existing Structures
within 500 feet of the Route Alternatives
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia
ERM
Dominion Energy



Structure Type
- Residential

Mile Post
- Route 4

- Dominion Exsiting Transmission Line

Route Alternatives
- Route 4
- Study Area

0 250 500
Feet

1:4,800

Existing Structures within 500 feet of the Route Alternatives

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

Structure Type
- Outbuilding

Mile Post
- Route 2
- Route 3
- Route 4

- Dominion Exsiting Transmission Line

Route Alternatives
- Route 2
- Route 3
- Route 4
- Study Area

0 250 500
Feet

1:4,800

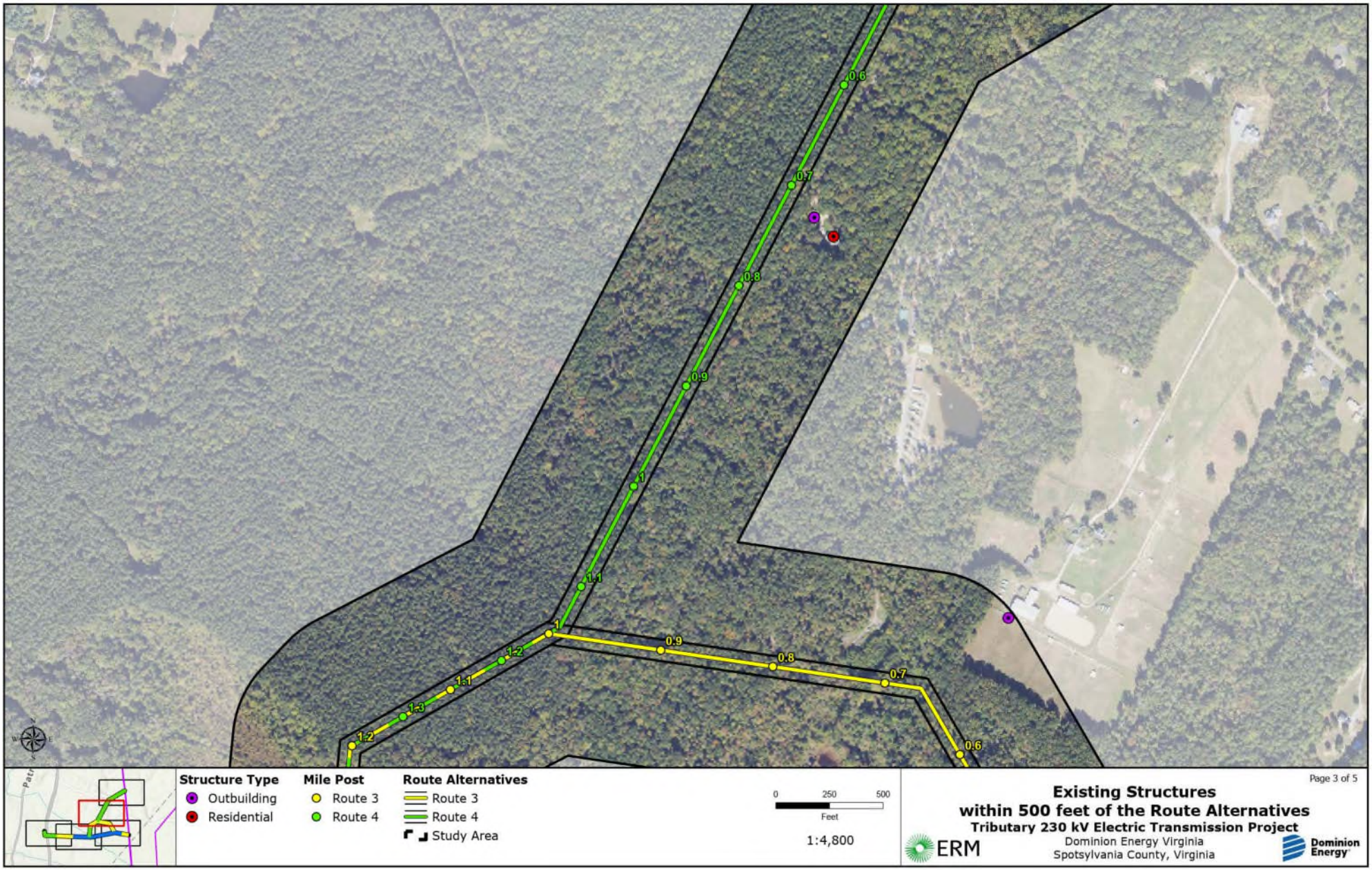
Existing Structures within 500 feet of the Route Alternatives

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy



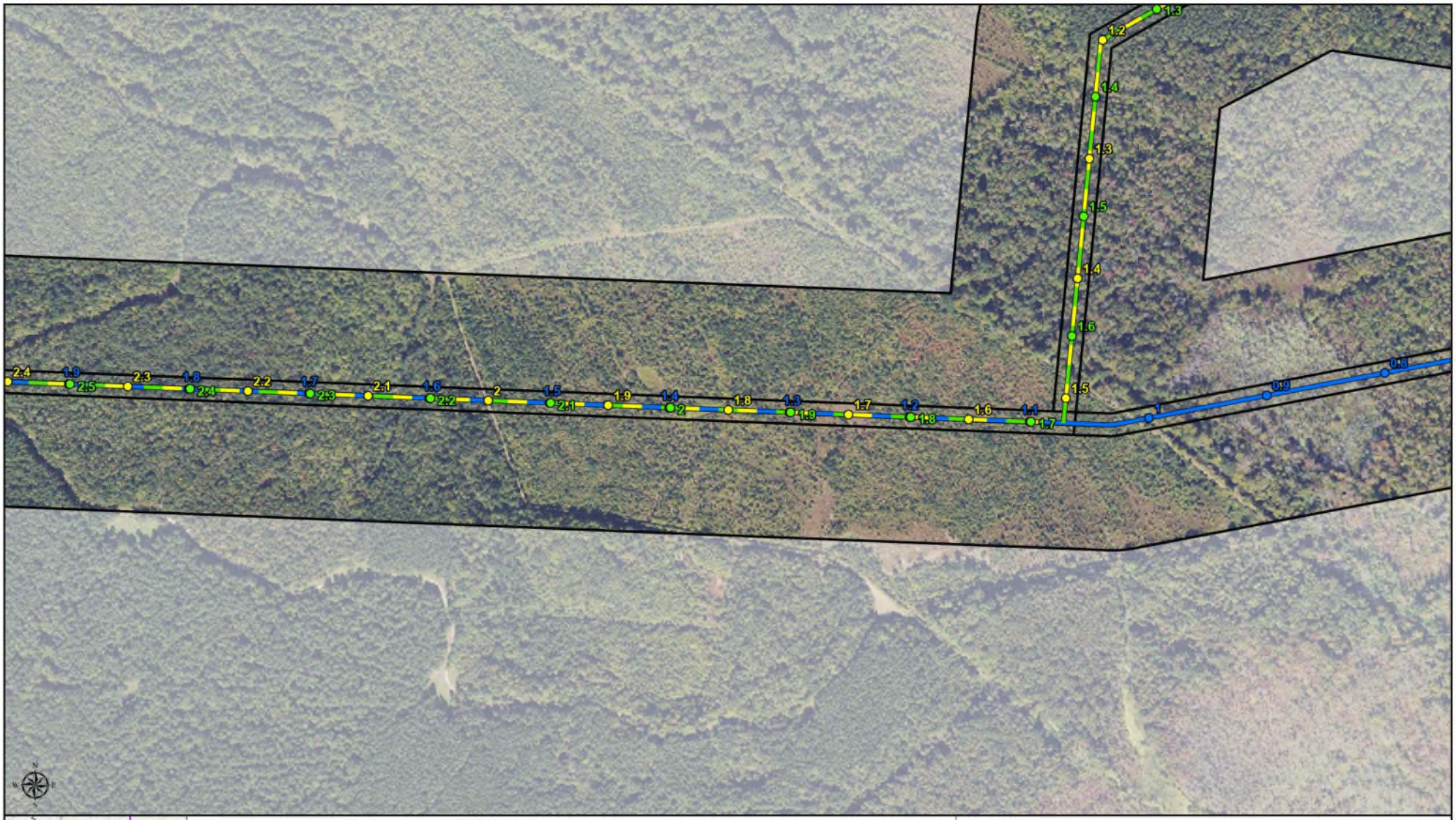
Existing Structures within 500 feet of the Route Alternatives

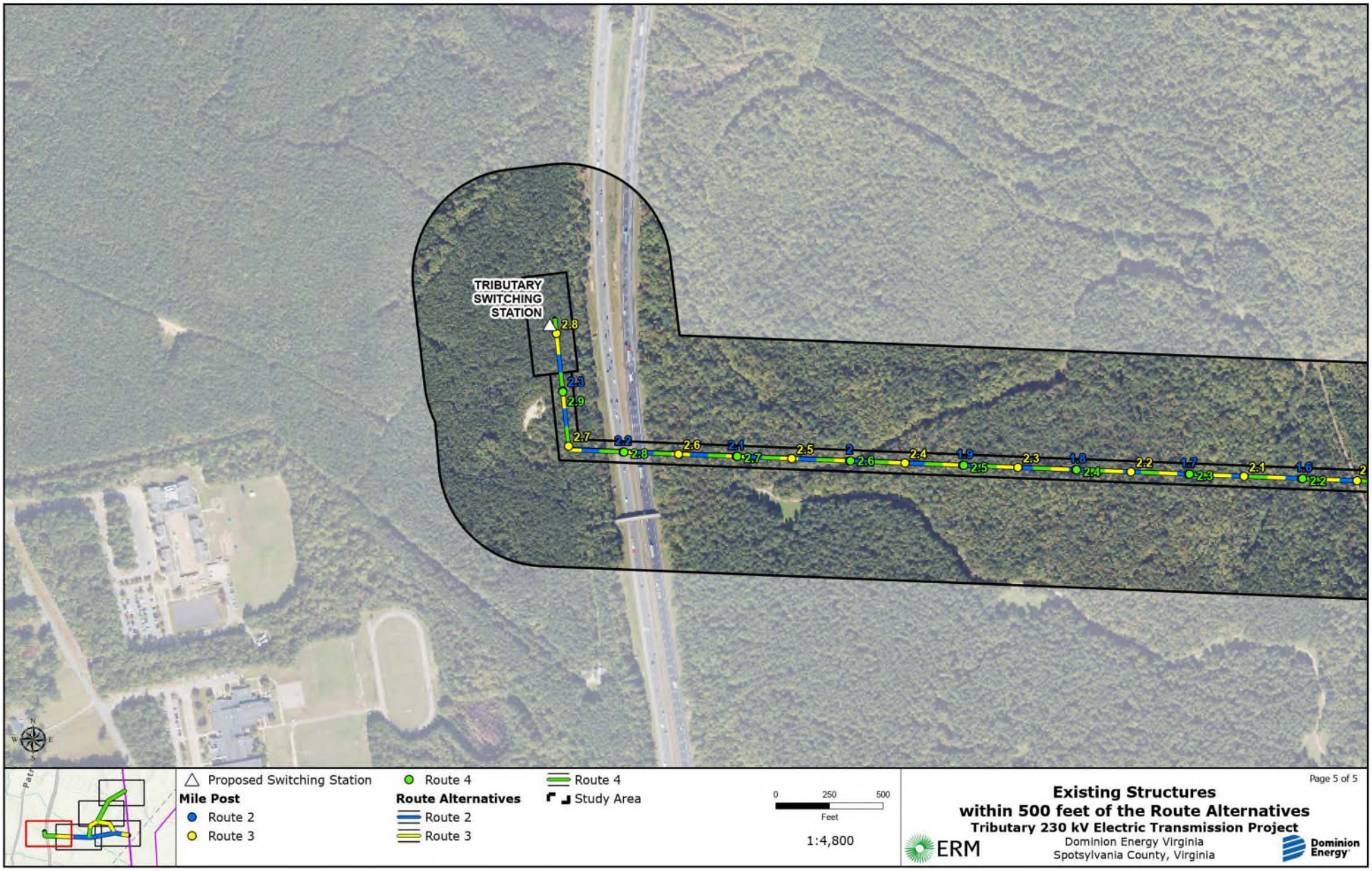
Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy


2.4
1.9
2.5
2.3
1.8
2.4
2.2
1.7
2.3
2.1
1.6
2.2
2
1.5
2.1
1.9
1.4
2
1.8
1.3
1.9
1.7
1.2
1.8
1.6
1.1
1.7
1
0.9
0.8
1.3
1.2
1.4
1.3
1.5
1.4
1.6
1.5
N
W
E
S
Mile Post
Route 2
Route 3
Route 4
Route Alternatives
Route 2
Route 3
Route 4
Study Area
0
250
500
Feet
1:4,800
Page 4 of 5
Existing Structures
within 500 feet of the Route Alternatives
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia
ERM
Dominion Energy



Proposed Switching Station

Mile Post

Route 2

Route 3

Route 4

Route Alternatives

Route 2

Route 3

Route 4

Study Area

0 250 500

Feet

1:4,800

Existing Structures within 500 feet of the Route Alternatives

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia

Spotsylvania County, Virginia

ERM

Dominion Energy

FIGURE 4.1.5-1 PLANNED DEVELOPMENTS WITHIN THE STUDY AREA

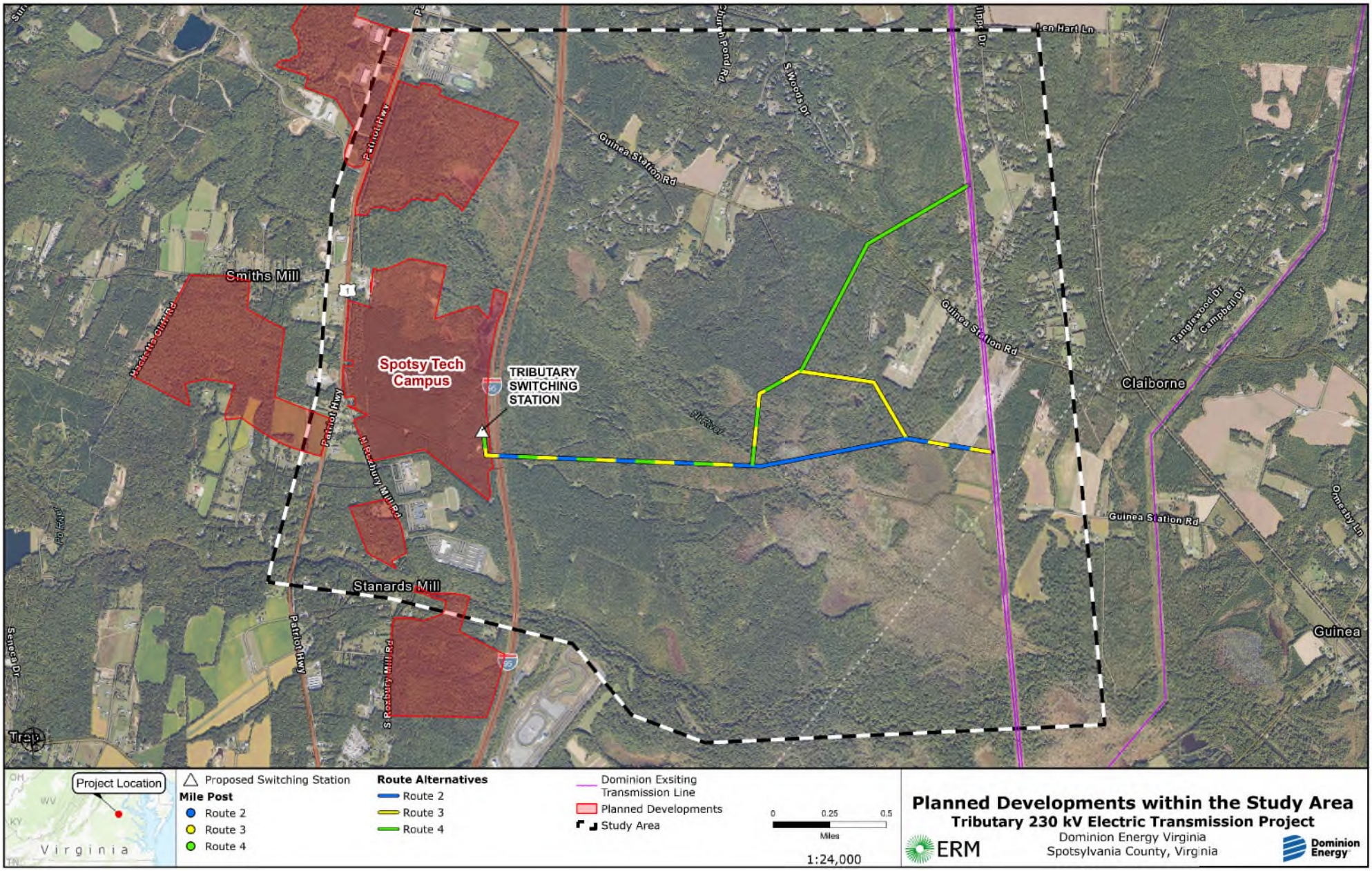
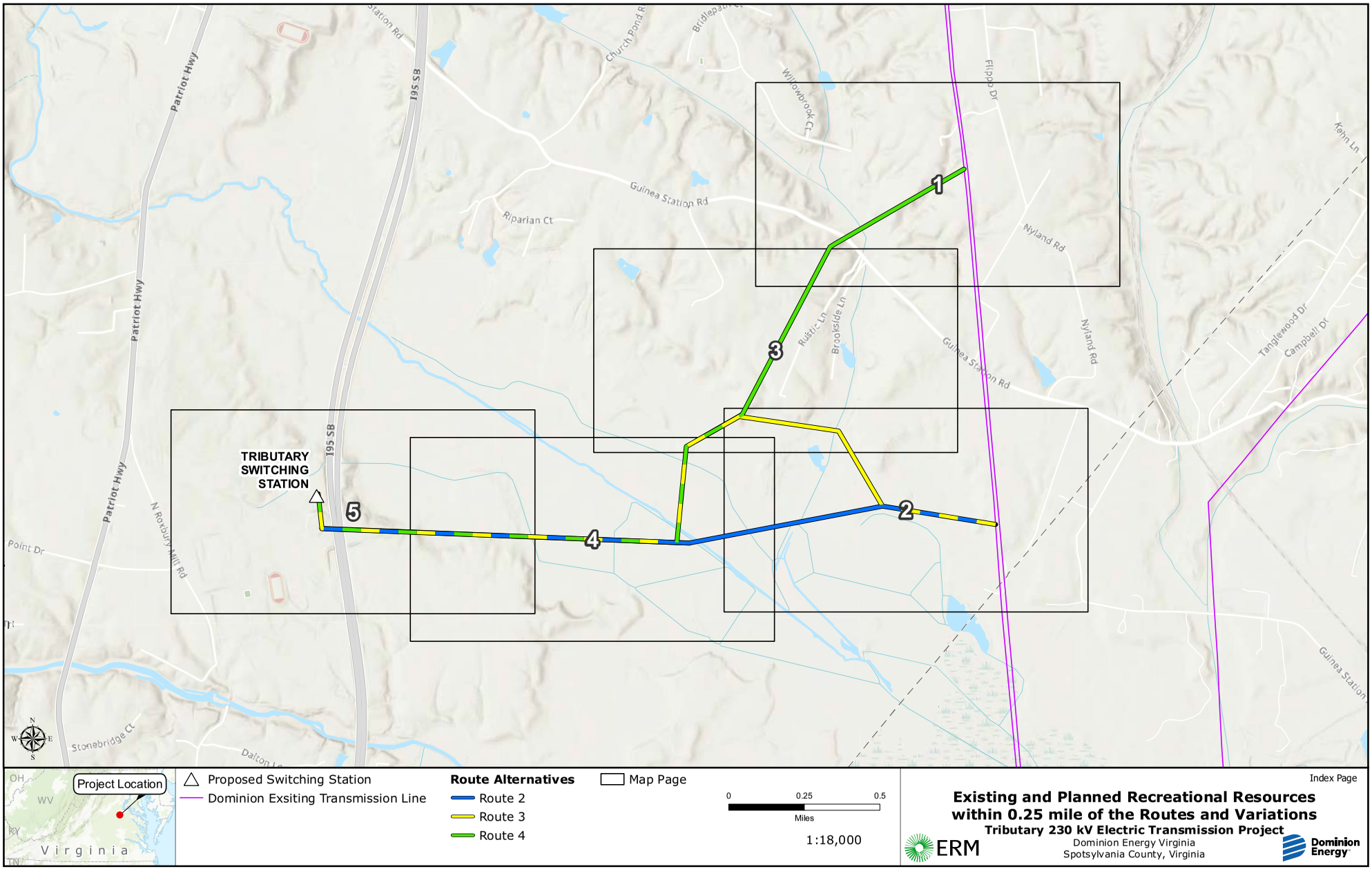
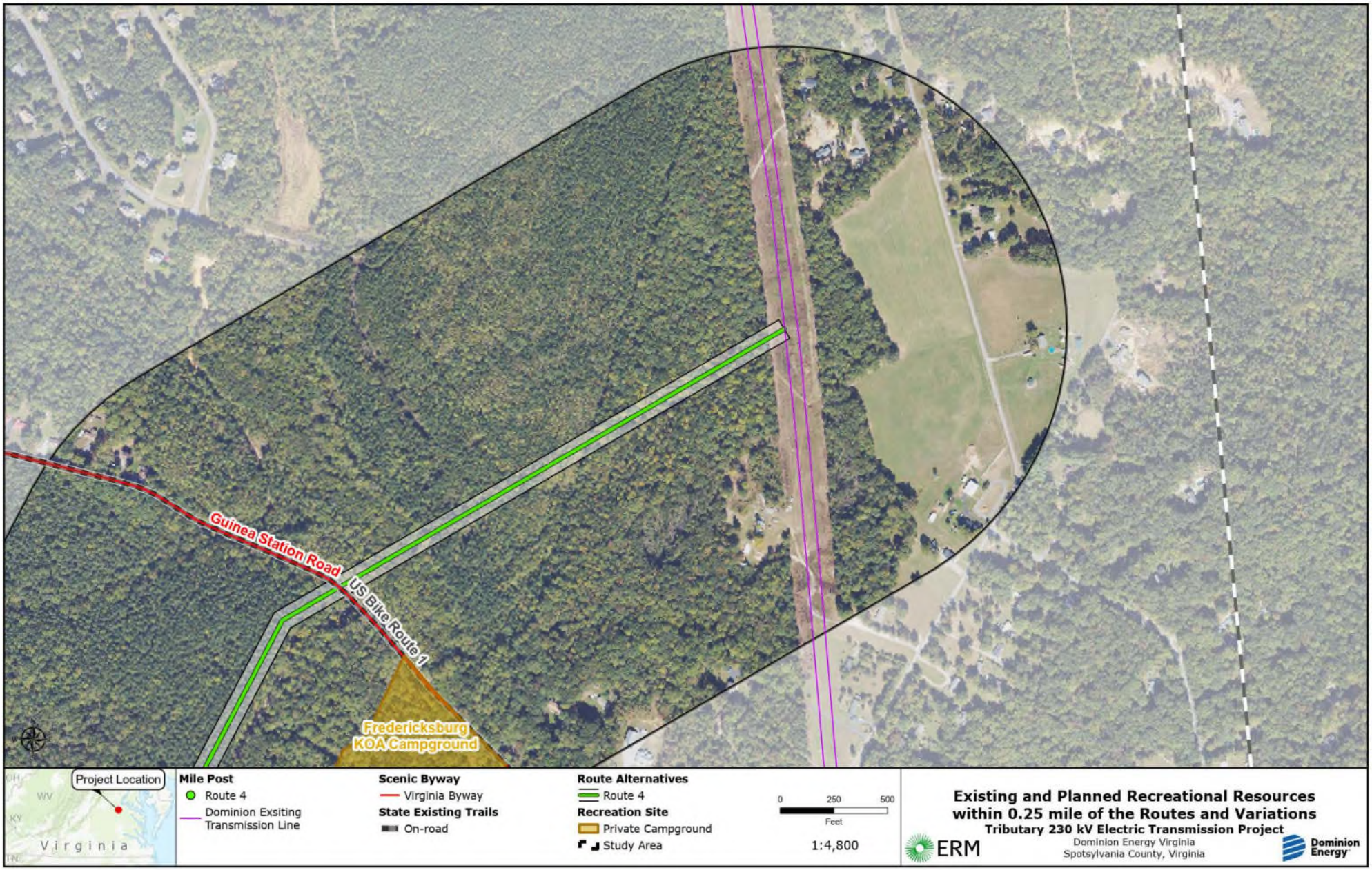
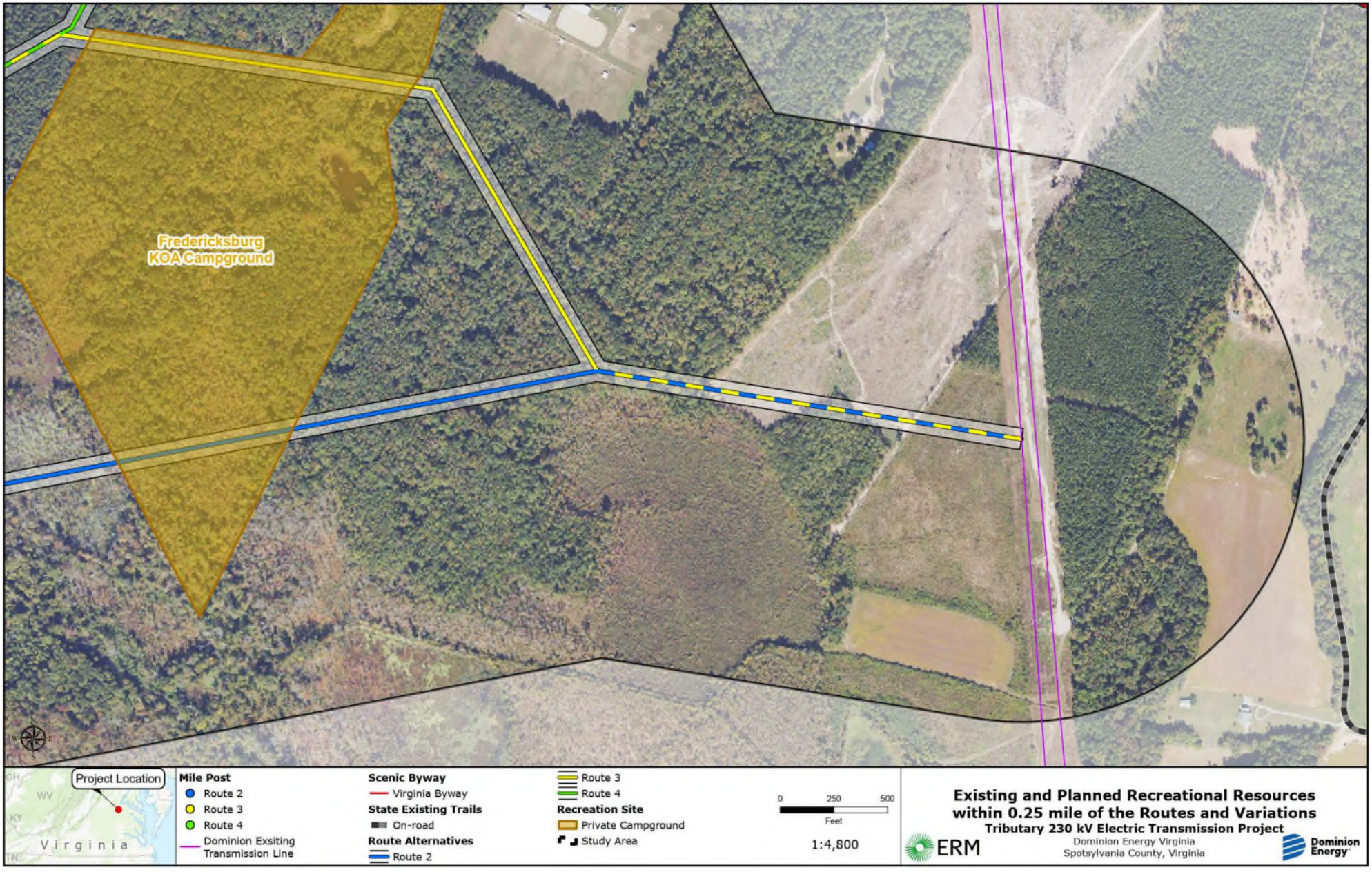
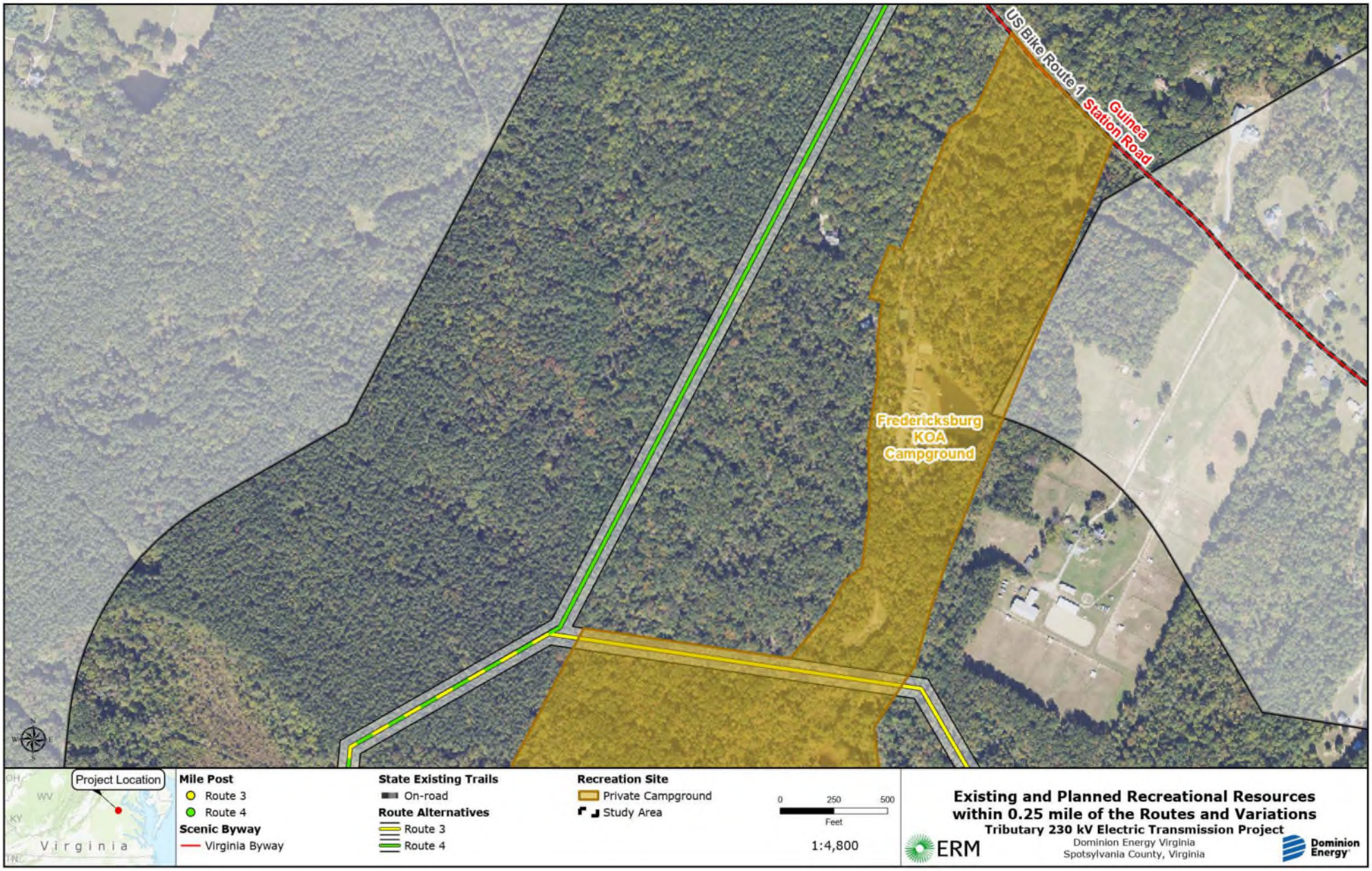

Smiths Mill
Spotsy Tech Campus
TRIBUTARY SWITCHING STATION
Stanards Mill
Claiborne
Guinea
Guinea Station Rd
Patriot Hwy
N Roxbury Mill Rd
S Roxbury Mill Rd
Len Hart Ln
S Woods Dr
Church Pond Rd
Tanglewood Dr
Campbell Dr
Omnesby Ln
Seneca Dr
Project Location
Virginia
Proposed Switching Station
Mile Post
Route 2
Route 3
Route 4
Route Alternatives
Route 2
Route 3
Route 4
Dominion Exsiting Transmission Line
Planned Developments
Study Area
0 0.25 0.5
Miles
1:24,000
Planned Developments within the Study Area
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia
ERM
Dominion Energy

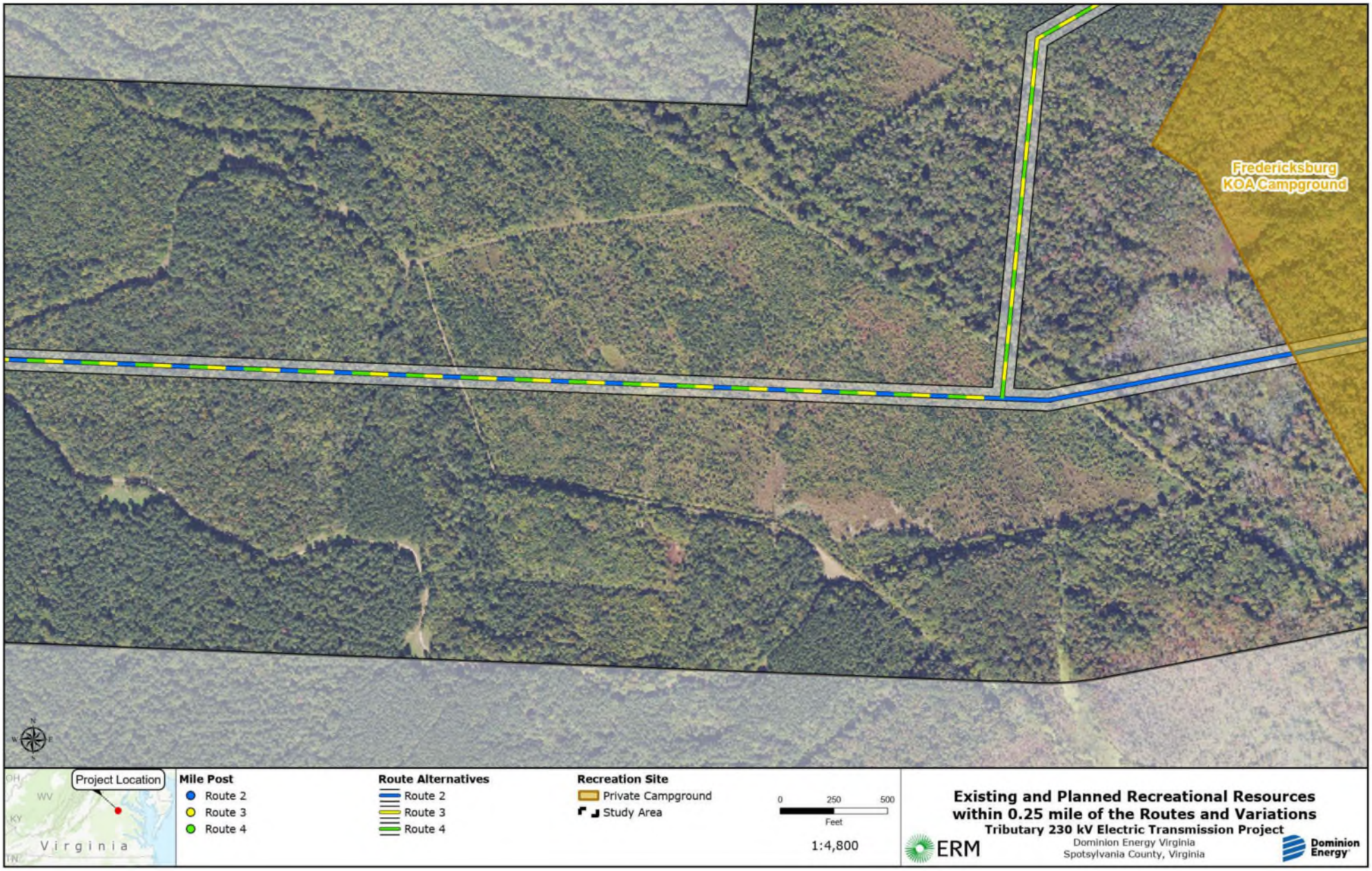
FIGURE 4.1.6-1 EXISTING AND PLANNED RECREATIONAL RESOURCES WITHIN 0.25 MILE OF THE ROUTE ALTERNATIVES


TRIBUTARY
SWITCHING
STATION
1
2
3
4
5
Patriot Hwy
I95 SB
Guinea Station Rd
Riparian Ct
Nyland Rd
Brookside Ln
Tanglewood Dr
Campbell Dr
Flippo Dr
Willowbrook Ct
Church Pond Rd
Point Dr
N Roxbury Mill Rd
Stonebridge Ct
Project Location
OH
WV
KY
TN
Virginia
Proposed Switching Station
Dominion Exsiting Transmission Line
Route Alternatives
Route 2
Route 3
Route 4
Map Page
0
0.25
0.5
Miles
1:18,000
Index Page
Existing and Planned Recreational Resources within 0.25 mile of the Routes and Variations
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia
ERM
Dominion Energy


Guinea Station Road
US Bike Route 1
Fredericksburg KOA Campground
Project Location
Virginia
Mile Post
Route 4
Dominion Exsiting Transmission Line
Scenic Byway
Virginia Byway
State Existing Trails
On-road
Route Alternatives
Route 4
Recreation Site
Private Campground
Study Area
0 250 500
Feet
1:4,800
Existing and Planned Recreational Resources within 0.25 mile of the Routes and Variations
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia
ERM
Dominion Energy


Fredericksburg
KOA Campground
Project Location
OH
WV
KY
TN
Virginia
Mile Post
Route 2
Route 3
Route 4
Dominion Exsiting Transmission Line
Scenic Byway
Virginia Byway
State Existing Trails
On-road
Route Alternatives
Route 2
Route 3
Route 4
Recreation Site
Private Campground
Study Area
0
250
500
Feet
1:4,800
Existing and Planned Recreational Resources within 0.25 mile of the Routes and Variations
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia
ERM
Dominion Energy


US Bike Route 1
Guinea Station Road
Fredericksburg KOA Campground
Project Location
Virginia
Mile Post
Route 3
Route 4
Scenic Byway
Virginia Byway
State Existing Trails
On-road
Route Alternatives
Route 3
Route 4
Recreation Site
Private Campground
Study Area
0 250 500
Feet
1:4,800
Existing and Planned Recreational Resources within 0.25 mile of the Routes and Variations
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia
ERM
Dominion Energy


Fredericksburg
KOA Campground
Project Location
OH
WV
KY
Virginia
TN
Mile Post
Route 2
Route 3
Route 4
Route Alternatives
Route 2
Route 3
Route 4
Recreation Site
Private Campground
Study Area
0
250
500
Feet
1:4,800
Existing and Planned Recreational Resources
within 0.25 mile of the Routes and Variations
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia
ERM
Dominion Energy

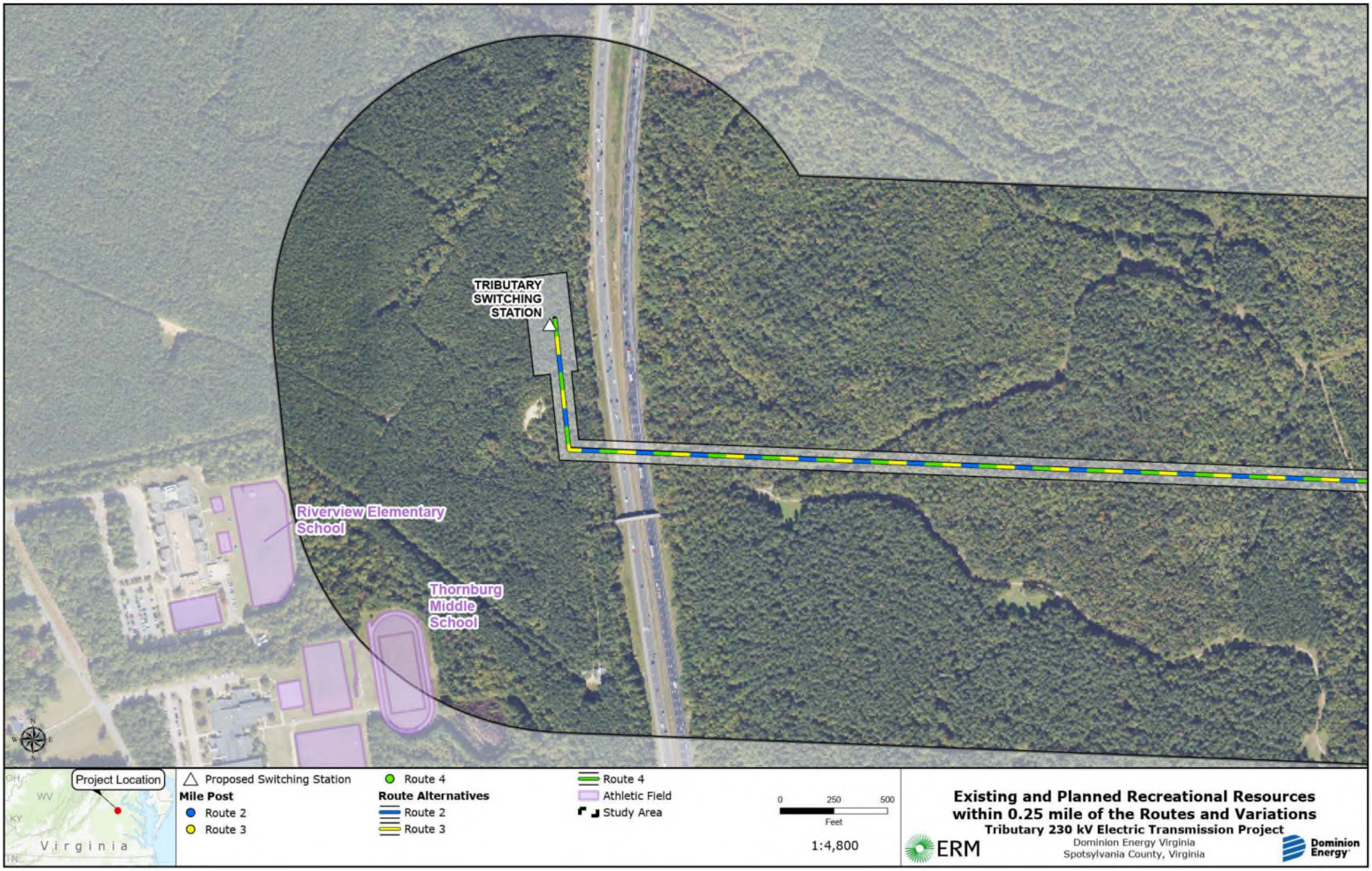
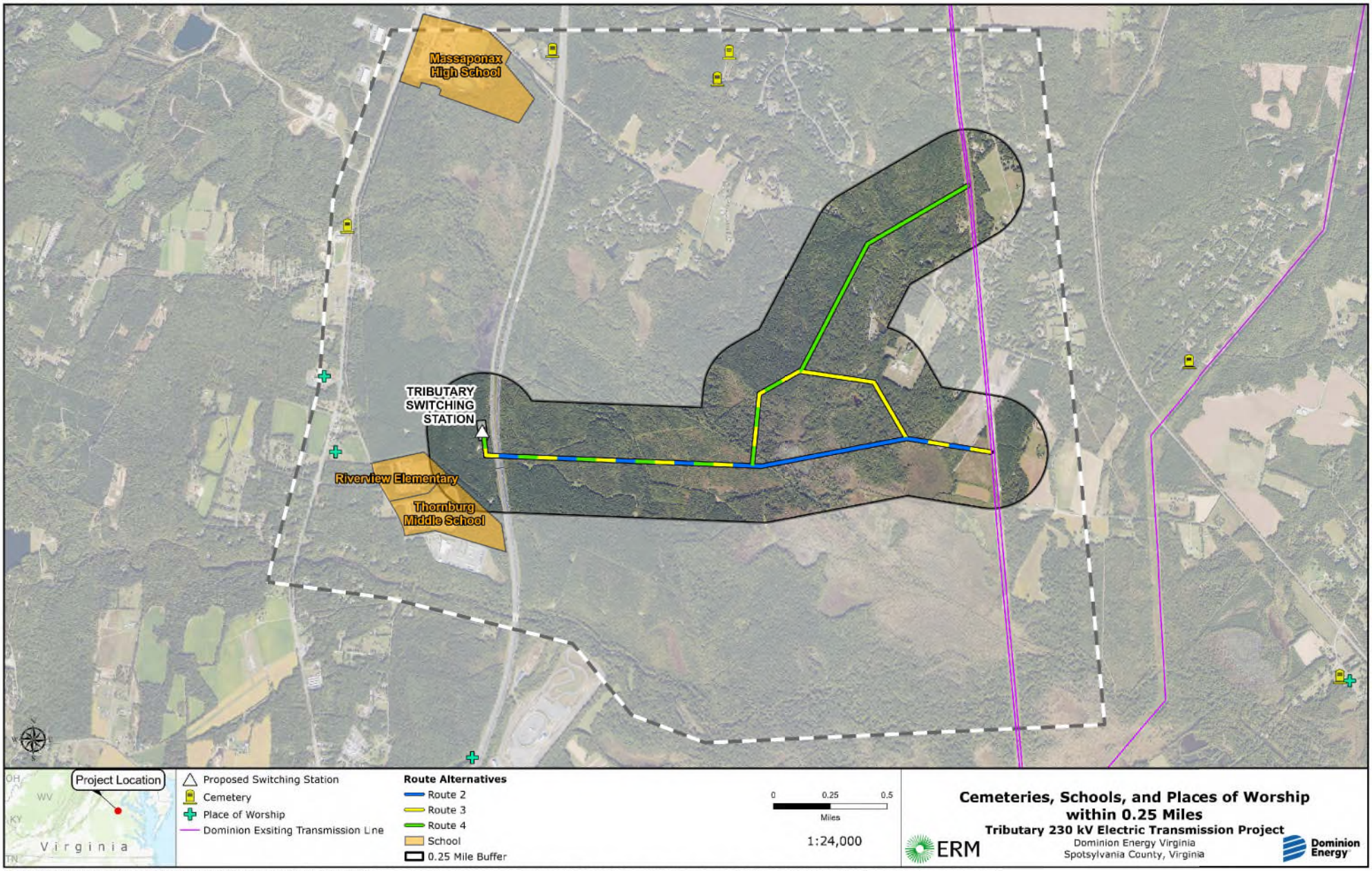

TRIBUTARY SWITCHING STATION
Riverview Elementary School
Thornburg Middle School
N
W
E
S
Project Location
OH
WV
KY
Virginia
TN
Proposed Switching Station
Mile Post
Route 2
Route 3
Route 4
Route Alternatives
Route 2
Route 3
Route 4
Athletic Field
Study Area
0
250
500
Feet
1:4,800
Existing and Planned Recreational Resources within 0.25 mile of the Routes and Variations
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia
ERM
Dominion Energy

FIGURE 4.1.7-1 CEMETERIES, SCHOOLS, AND PLACES OF WORSHIP WITHIN THE STUDY AREA



Cemeteries, Schools, and Places of Worship within 0.25 Miles

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

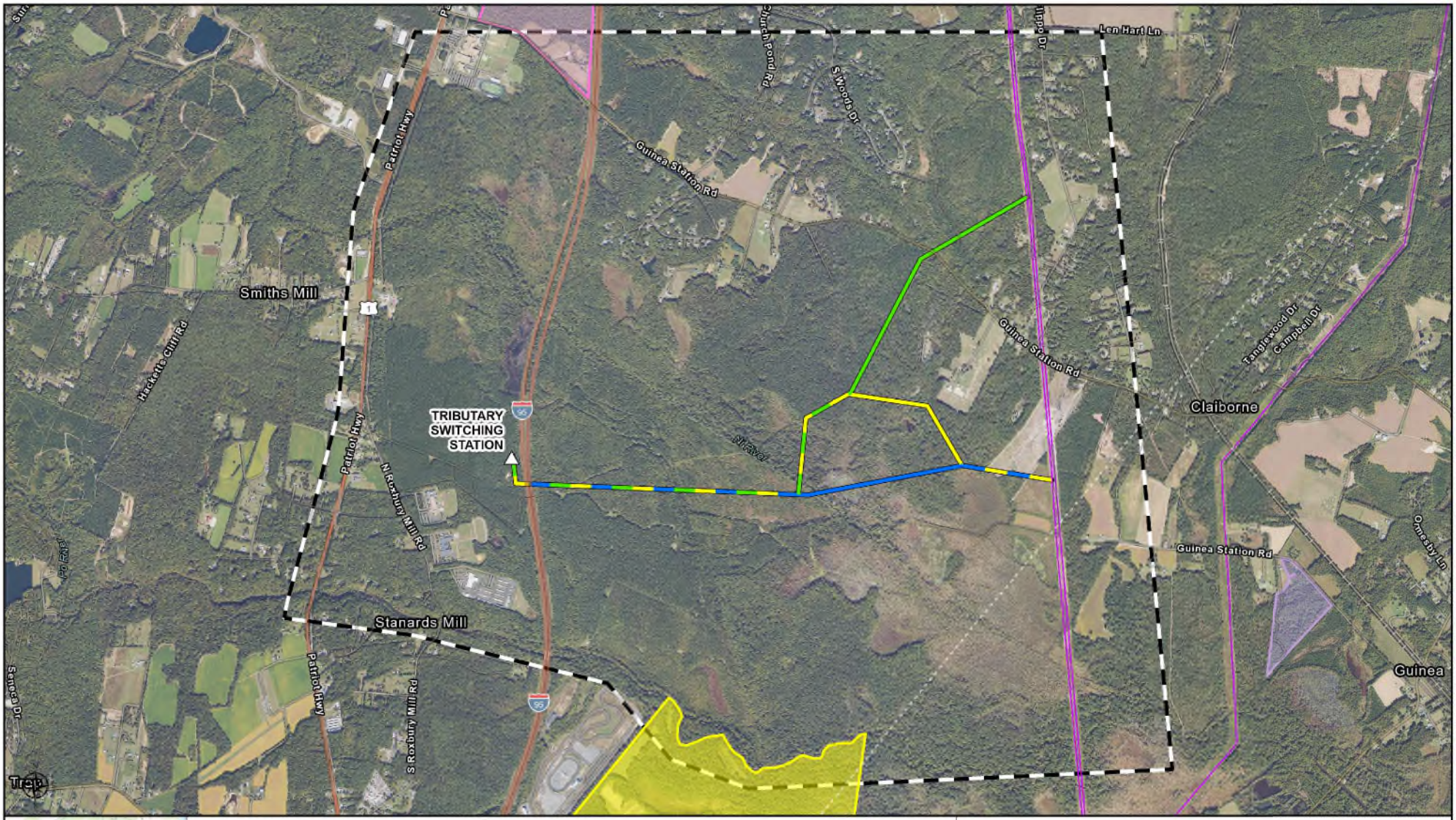
ERM

Dominion Energy

MPLS M:\US\Projects\D-F\Dominion\Tributary\ArcGIS\Routing_Study\DOM_Tributary_RoutingStudy\DOM_Tributary_RoutingStudy.aprx\DOM_TRIB_ChurchSchoolCemetery | REVISED: 09/06/2024 | SCALE: 1:24,000 when printed at 11x17

DRAWN BY: JDF

FIGURE 4.1.8-1 CONSERVATION EASEMENTS AND LANDS WITHIN THE STUDY AREA



Conservation Easements and Lands

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

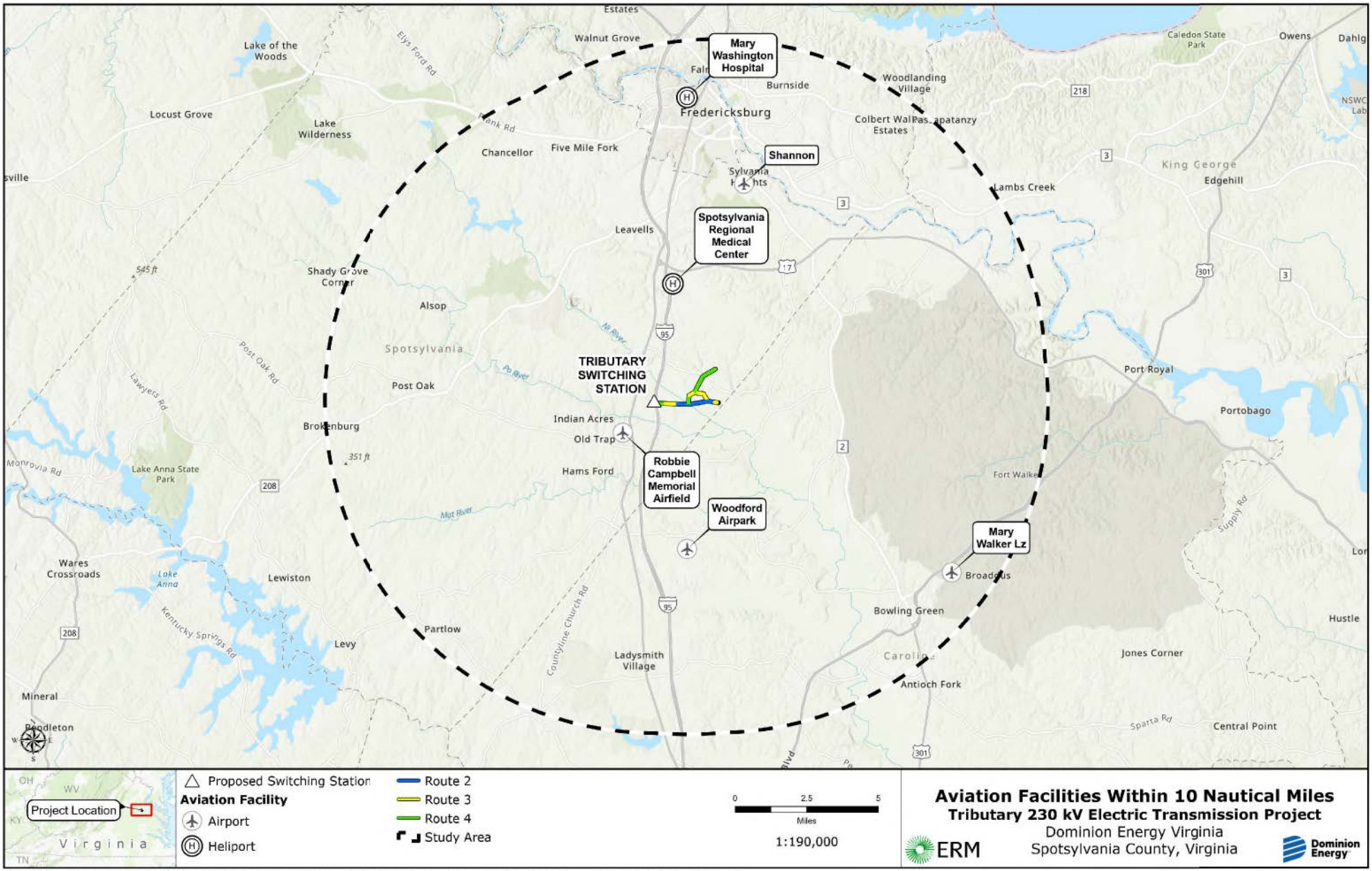
ERM

Dominion Energy

MPLS M:\US\Projects\D-F\Dominion\Tributary\ArcGIS\Routing_Study\DOM_Tributary_RoutingStudy\DOM_Tributary_RoutingStudy.aprx\DOM_TRIB_ConsrvEsmnt | REVISED: 09/05/2024 | SCALE: 1:24,000 when printed at 11x17

DRAWN BY: JDF

FIGURE 4.1.10-1 AIRPORTS AND HELIPORTS WITHIN 10 NAUTICAL MILES OF THE PROJECT



Aviation Facilities Within 10 Nautical Miles

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia

Spotsylvania County, Virginia

ERM

Dominion Energy

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FIGURE 4.2.1-1 NWI WETLANDS, NHD WATERBODIES, AND HUC 10 WATERSHEDS

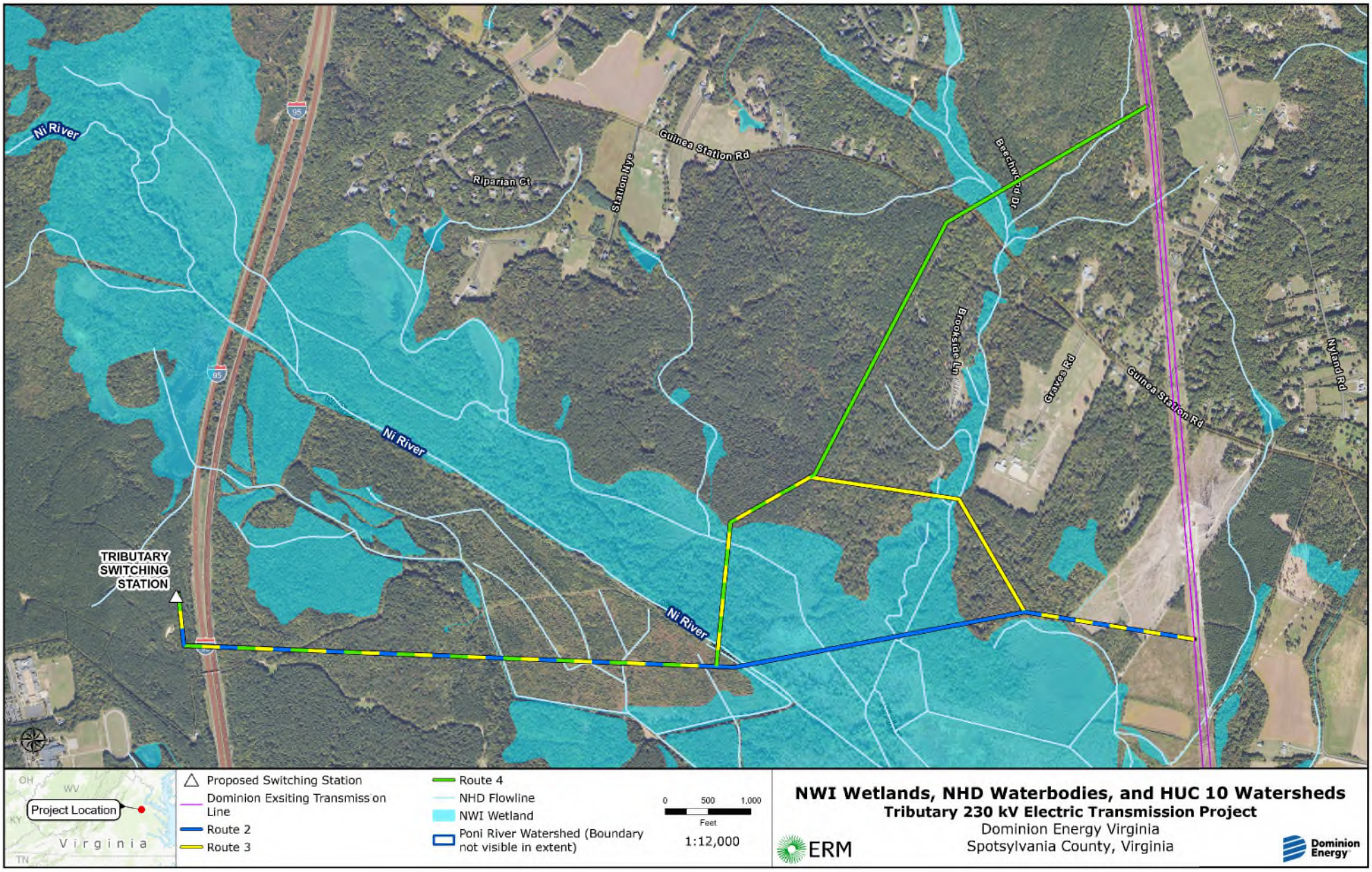
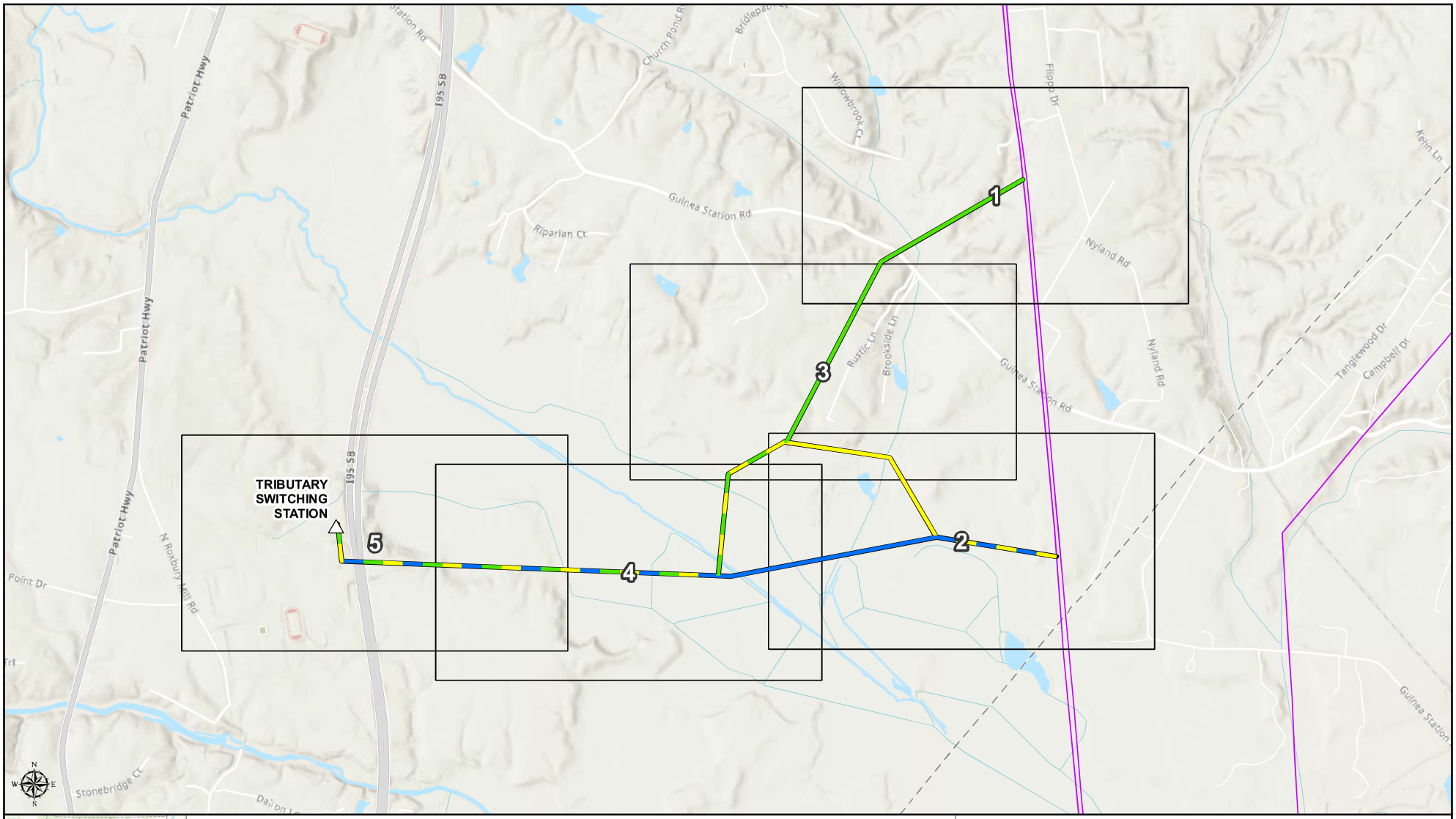

Ni River
Guinea Station Rd
Riparian Ct
Station Nye
Beechwood Dr
Brookside Ln
Graves Rd
Guinea Station Rd
Nyland Rd
Ni River
TRIBUTARY SWITCHING STATION
Ni River
95
95
Project Location
OH
WV
KY
Virginia
TN
Proposed Switching Station
Dominion Exsiting Transmiss on Line
Route 2
Route 3
Route 4
NHD Flowline
NWI Wetland
Poni River Watershed (Boundary not visible in extent)
0
500
1,000
Feet
1:12,000
ERM
NWI Wetlands, NHD Waterbodies, and HUC 10 Watersheds
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia
Dominion Energy

FIGURE 4.2.2-1 ECOLOGICAL CORES



Index Page

Ecological Cores Index

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

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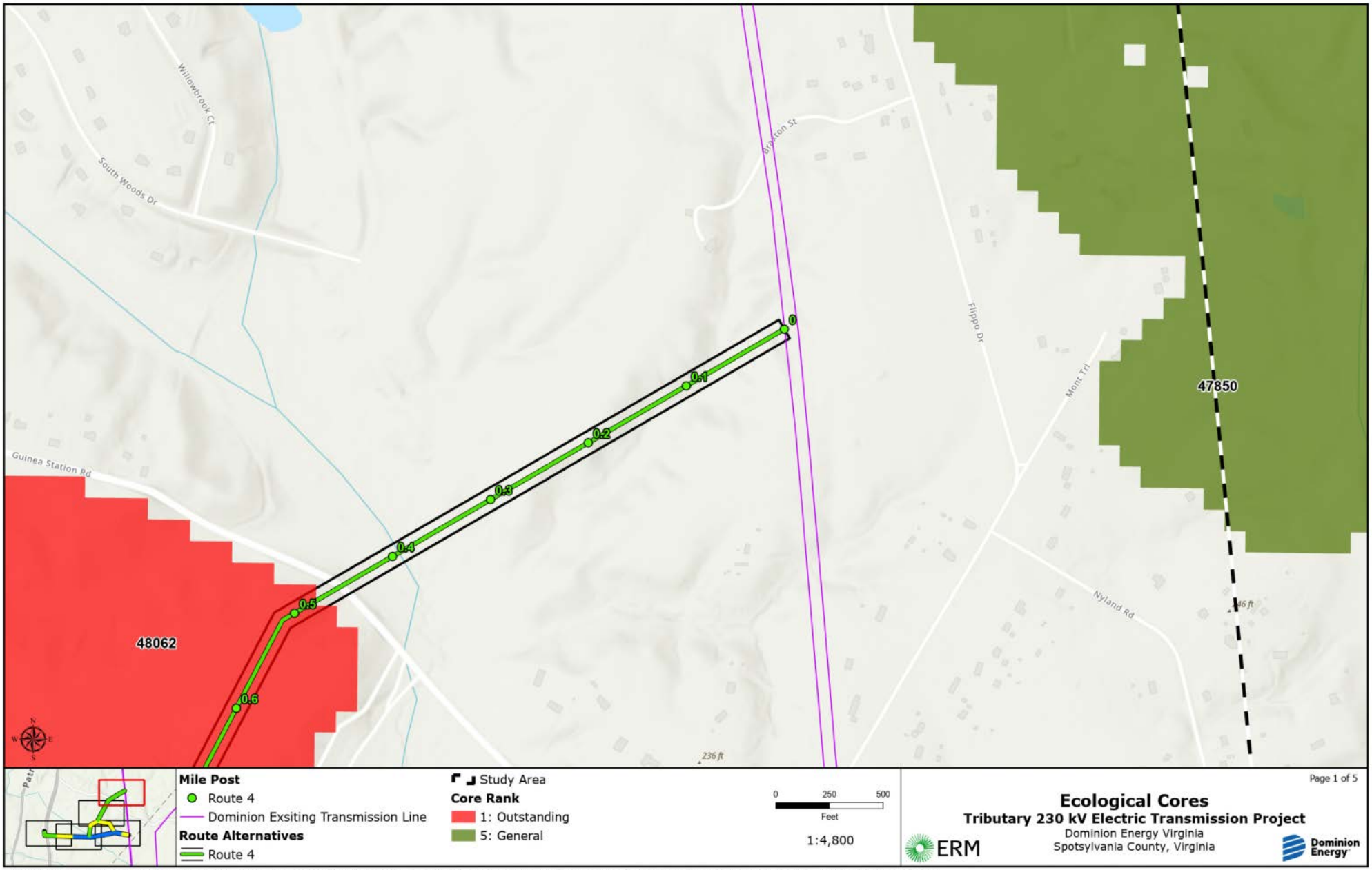

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Ecological Cores

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

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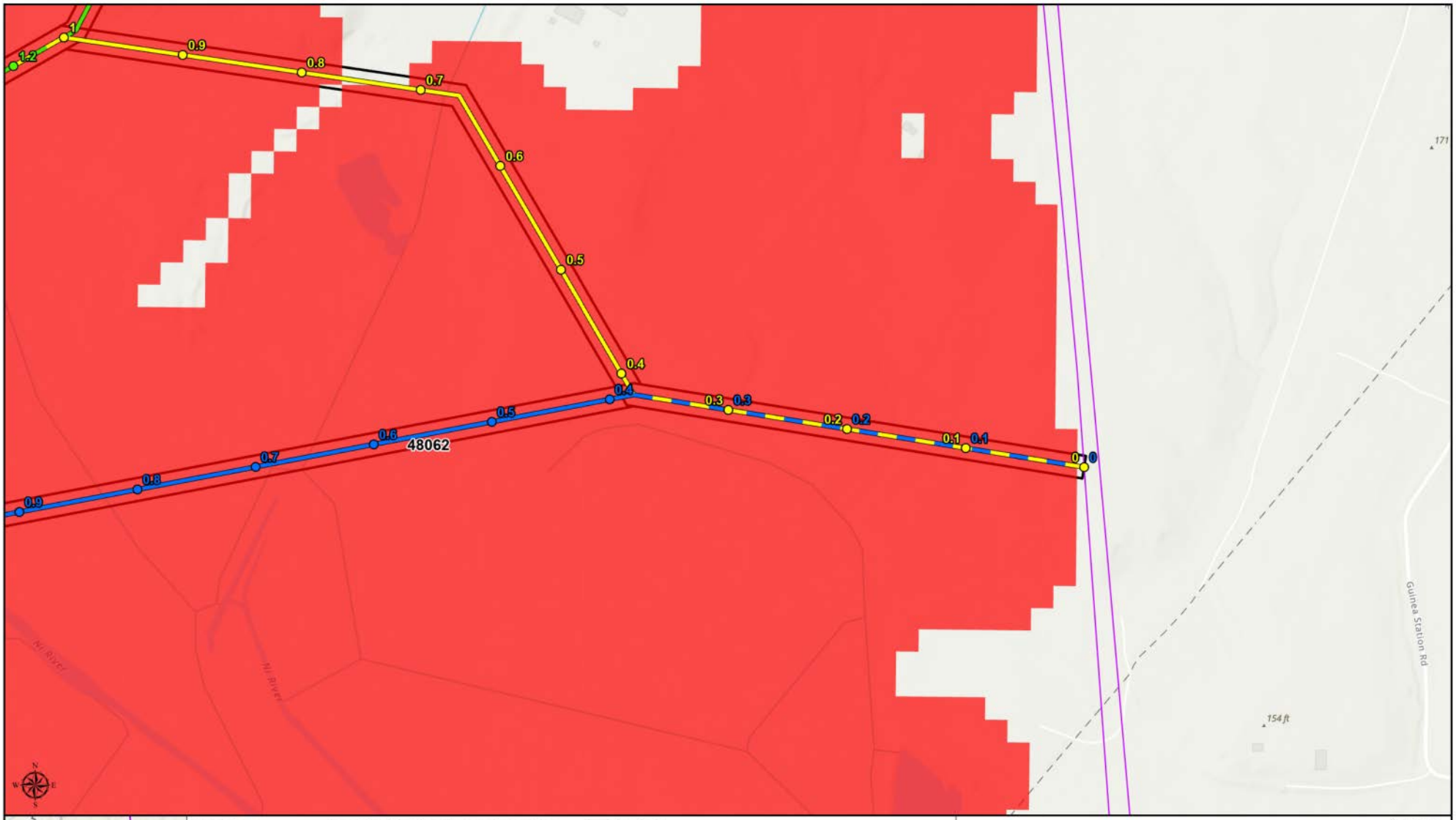

Mile Post
- Route 2
- Route 3
- Route 4

Route Alternatives
- Route 2
- Route 3
- Route 4

Dominion Exsiting Transmission Line

Study Area

Core Rank
- 1: Outstanding

0 250 500
Feet

1:4,800

Ecological Cores

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

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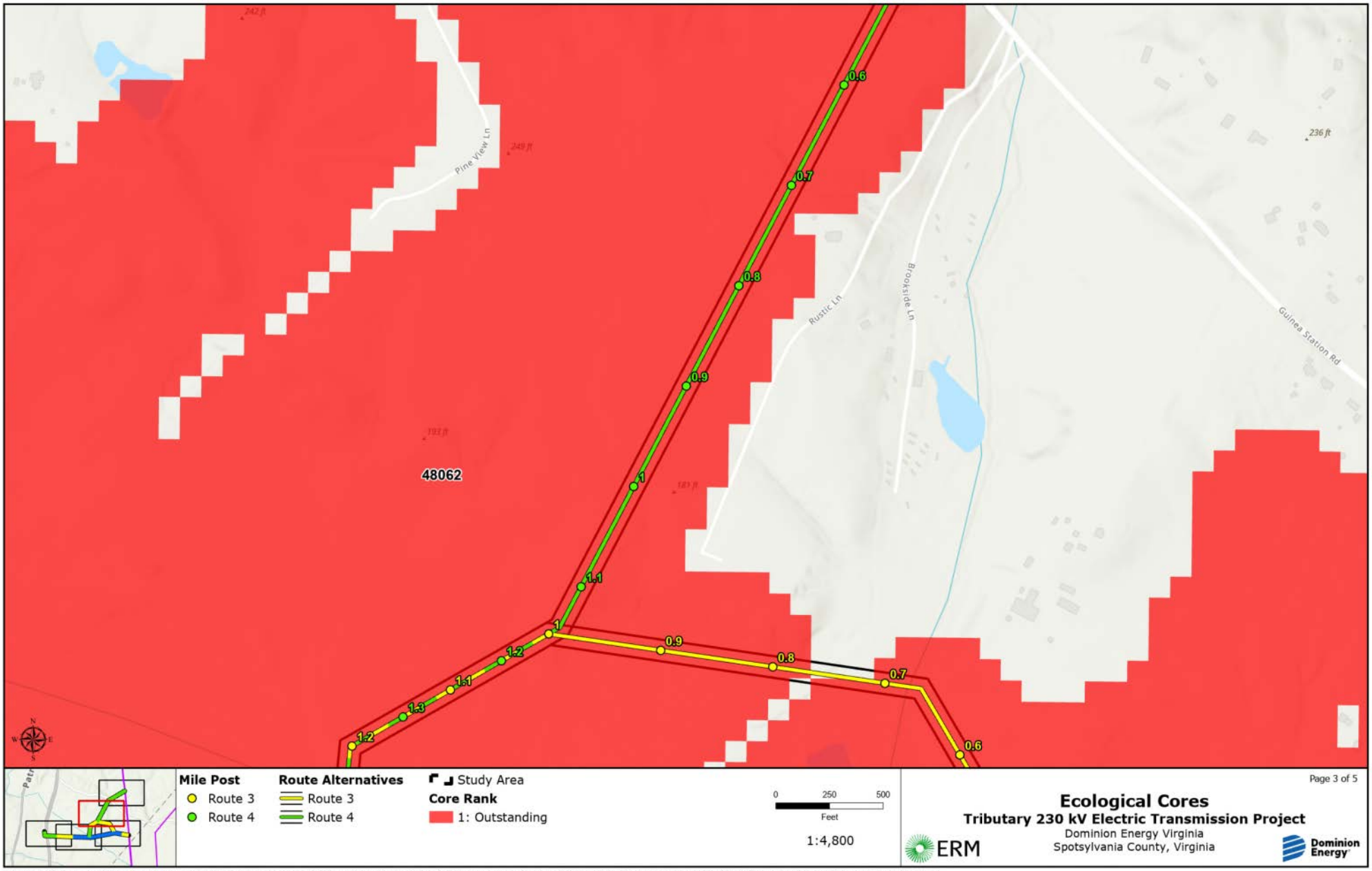

Mile Post
- Route 3
- Route 4

Route Alternatives
- Route 3
- Route 4

Study Area

Core Rank
- 1: Outstanding

0 250 500
Feet

1:4,800

Ecological Cores

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

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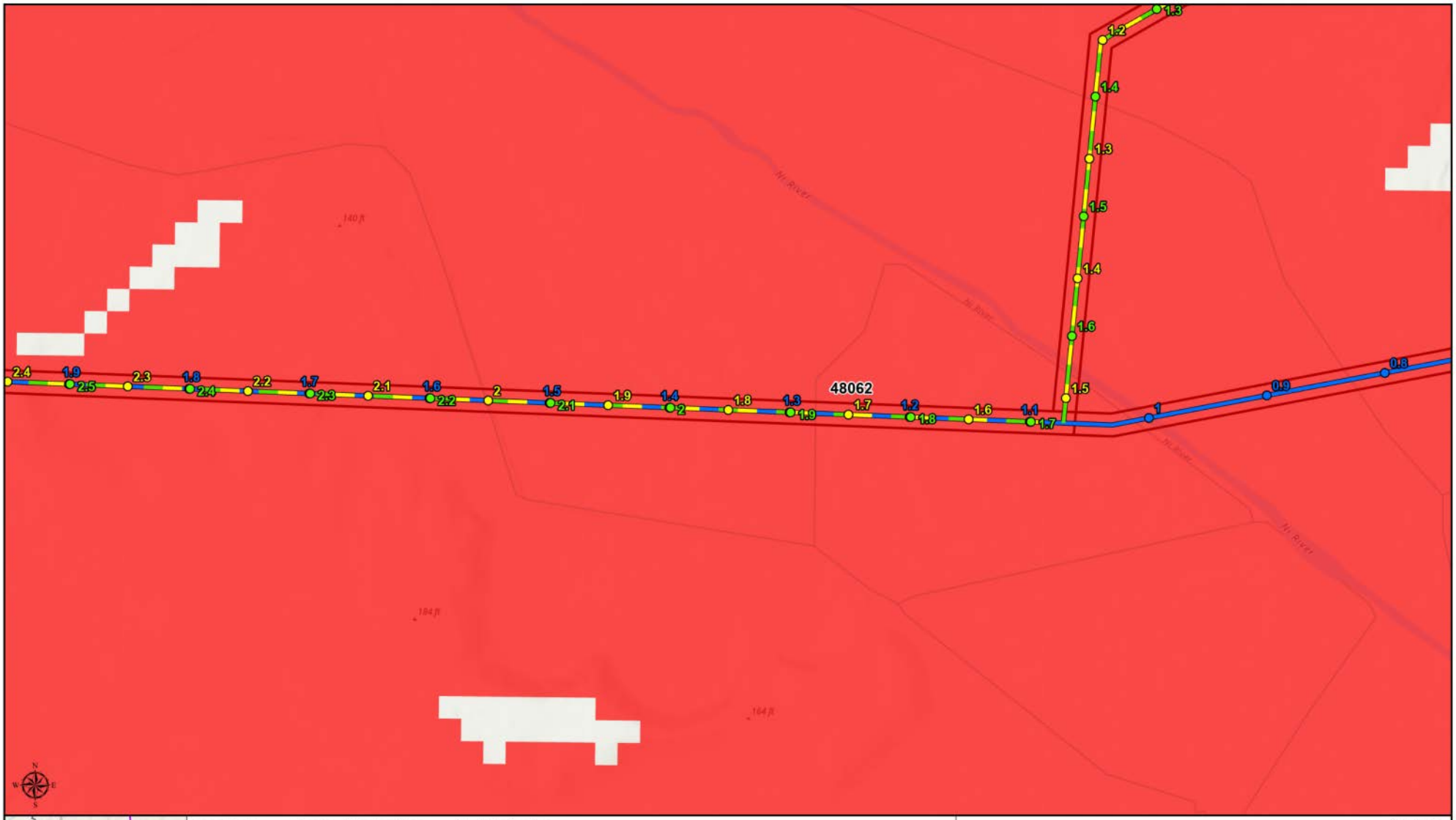

Ecological Cores

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

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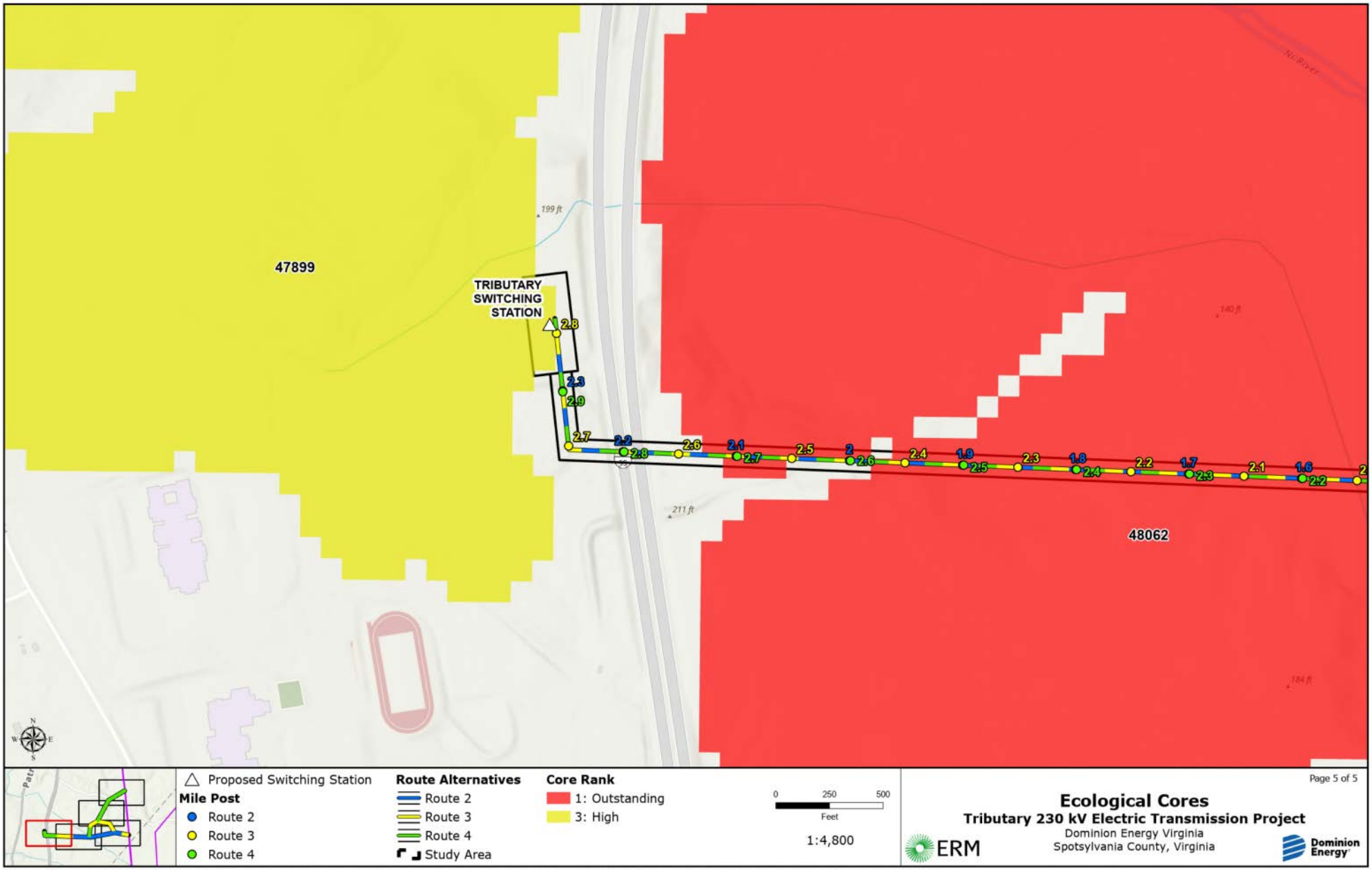

Ecological Cores

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

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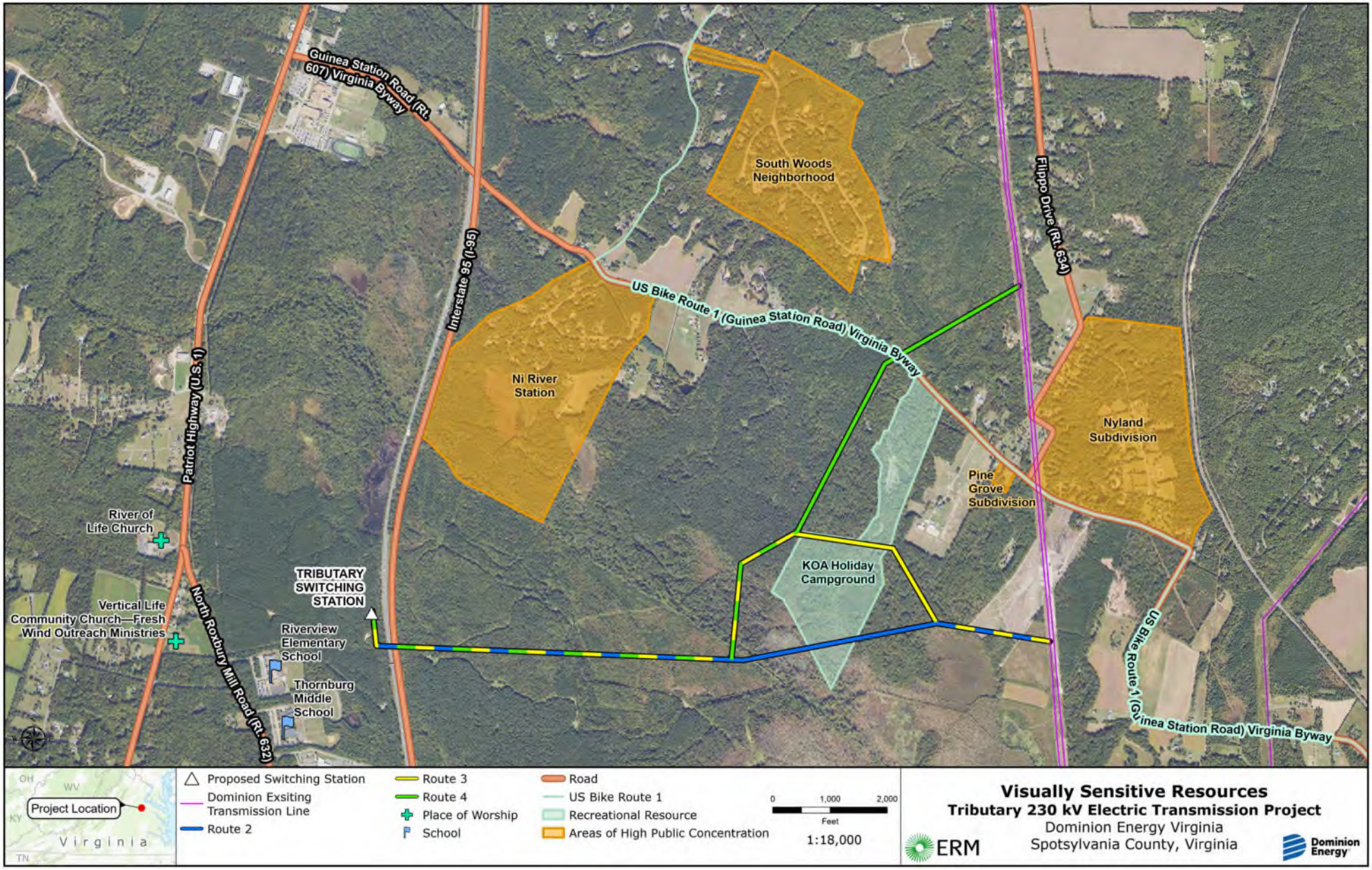
FIGURE 4.3.1-1 VISUALLY SENSITIVE RESOURCES

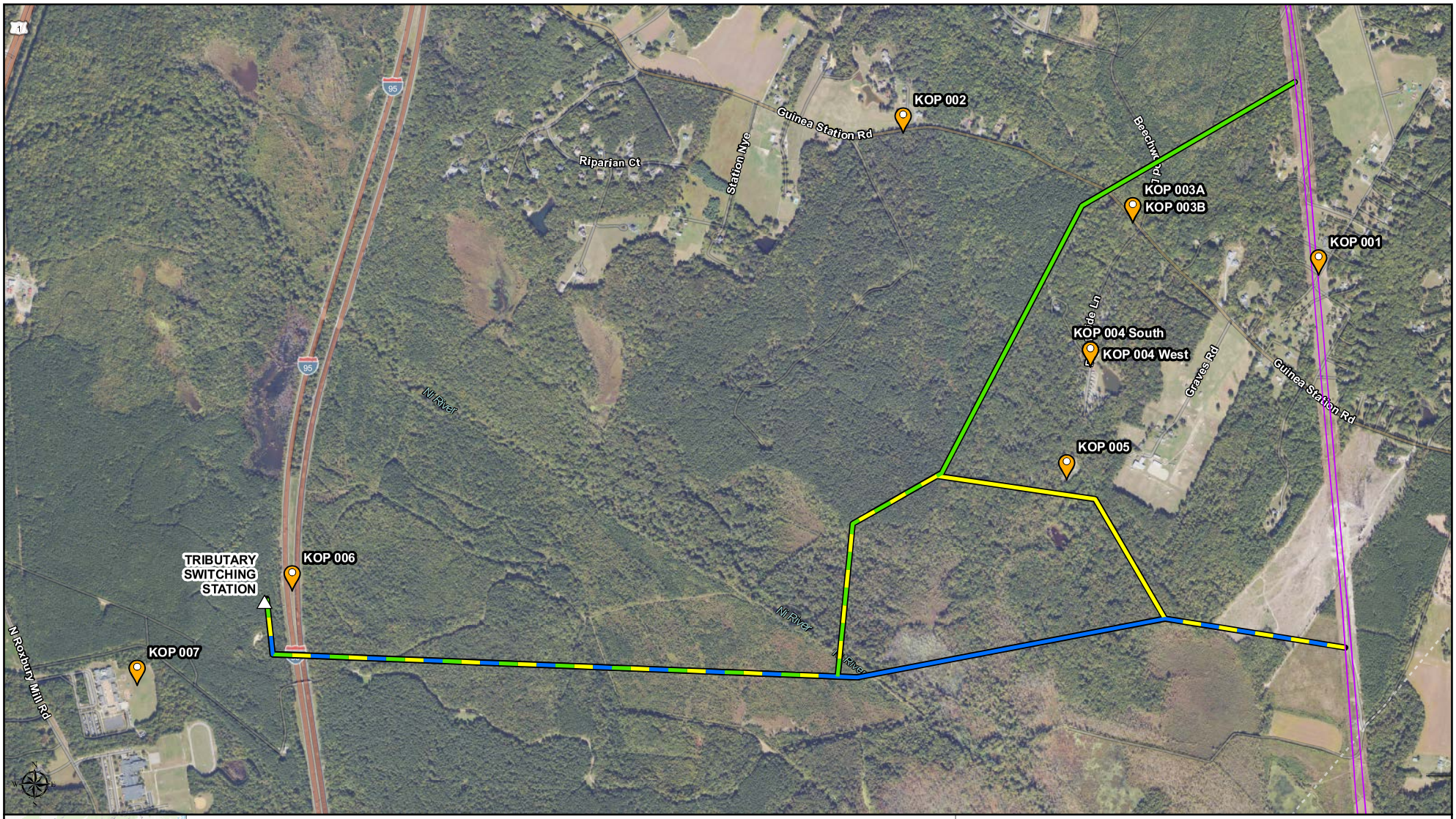


Visually Sensitive Resources
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

FIGURE 4.3.2-1 KEY OBSERVATION POINTS



△ Proposed Switching Station

Dominion Exsiting Transmission Line

Route 2

Route 3

Route 4

Key Observation Point

0 500 1,000

Feet

1:12,000

Key Observation Points

Tributary 230 kV Electric Transmission Project

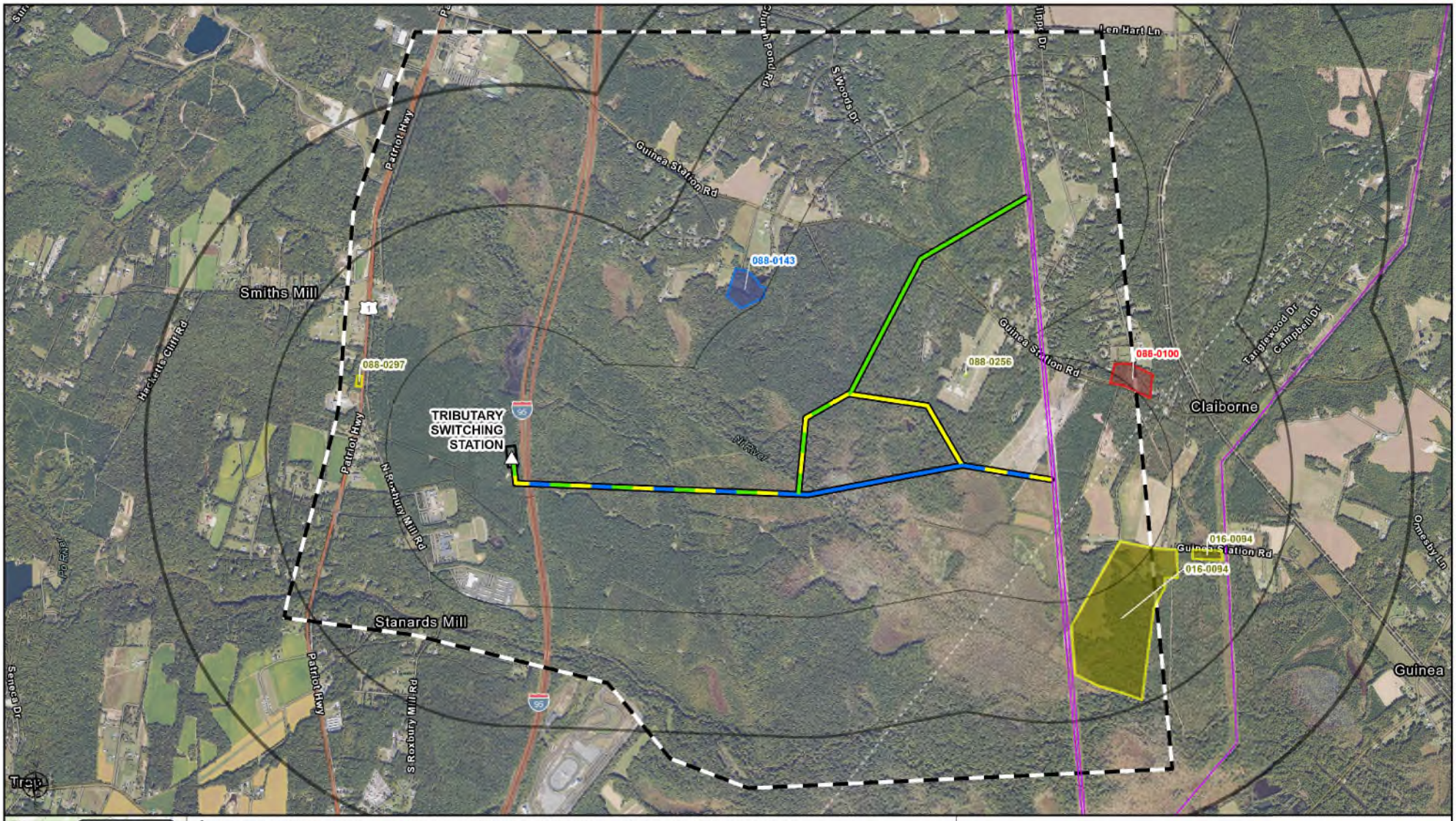
Dominion Energy Virginia

Spotsylvania County, Virginia

ERM

Dominion Energy

FIGURE 4.4.2-1 LOCATIONS OF CONSIDERED AND HISTORIC RESOURCES



Locations of Considered and Historic Resources

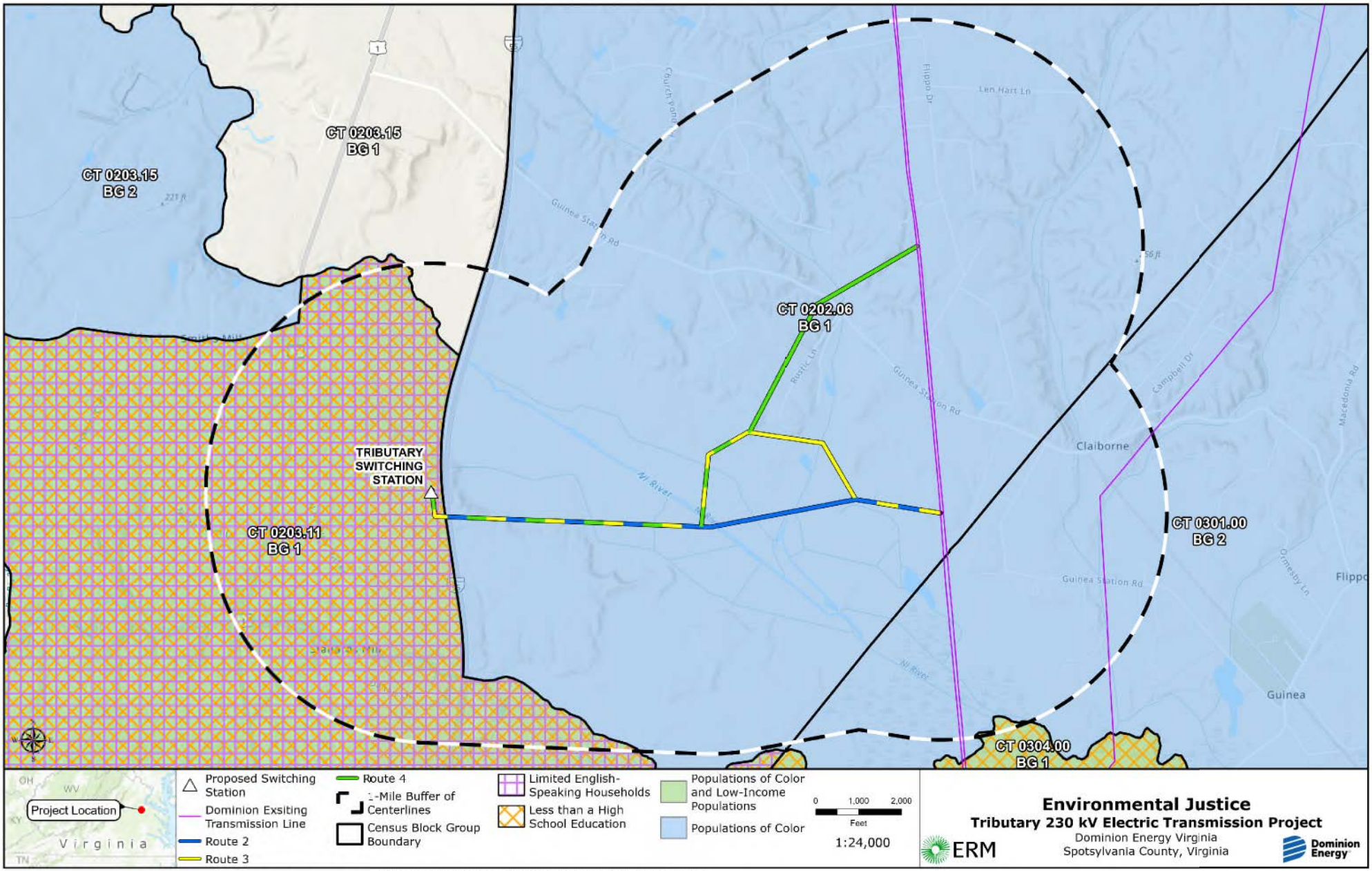
Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

FIGURE 4.5.2-1 DEMOGRAPHIC AND SOCIOECONOMIC INDICATORS WITHIN 1 MILE OF THE PROJECT



Environmental Justice
Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

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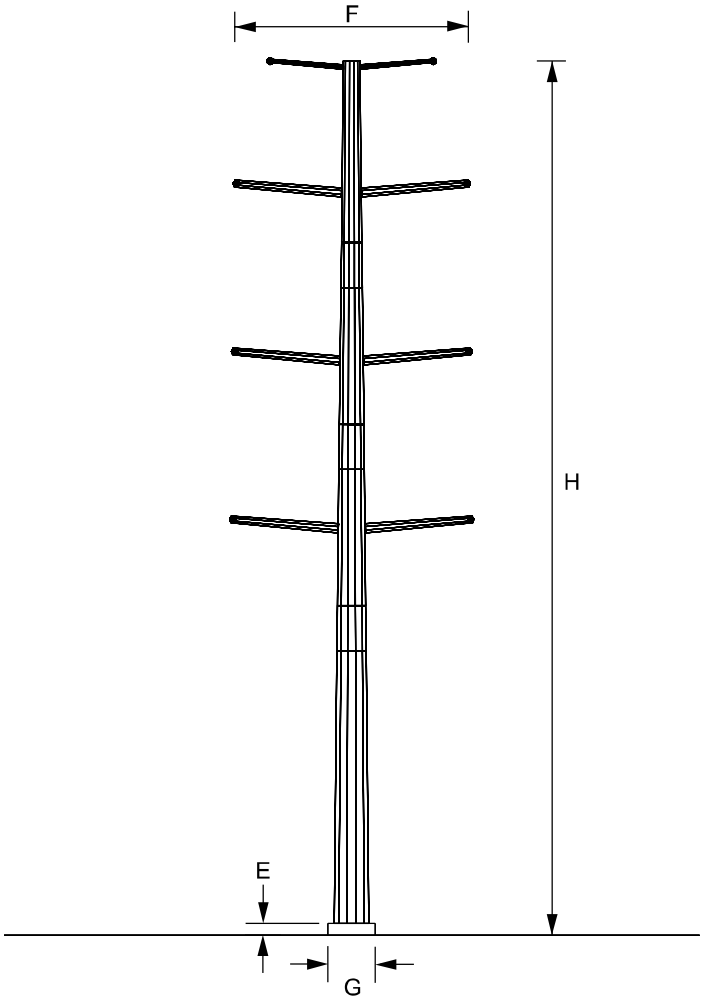
APPENDIX B STRUCTURAL DRAWINGS



TYPICAL DC ENGINEERED MONOPOLE DOUBLE DEADEND STRUCTURE

A. STRUCTURE MAPPING	N/A
B. RATIONALE FOR STRUCTURE TYPE:	MINIMIZES RIGHT OF WAY ACQUISITION
C. LENGTH OF R/W (STRUCTURE QTY):	2.3 MILES (3 STRUCTURES) - SEE NOTE 1
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	MATCH CURRENT STANDARDS8 AND EXISTING STRUCTURES IN THE AREA
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 2
F. AVERAGE WIDTH AT CROSSARM:	26'
G. AVERAGE WIDTH AT BASE:	SEE NOTE 3
H. MINIMUM STRUCTURE HEIGHT (SEE NOTE 4): MAXIMUM STRUCTURE HEIGHT (SEE NOTE 4): AVERAGE STRUCTURE HEIGHT (SEE NOTE 4):	110' 110' 110'
I. AVERAGE SPAN LENGTH (RANGE):	676' - SEE NOTE 5
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES:
1. ROW LENGTH & STRUCTURE QUANTITY ARE EXCLUSIVE OF COMPANY-OWNED SUBSTATION PROPERTIES
2. MINIMUM FOUNDATION REVEAL SHALL BE 1.5'
3. FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL ENGINEERING
4 THE SPAN LENGTHS ASSOCIATED WITH THIS STRUCUTRE TYPE ARE THE AHEAD SPANS

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

Dominion Energy
Dominion Energy
5000 Dominion Blvd.
Glen Allen, VA 23060

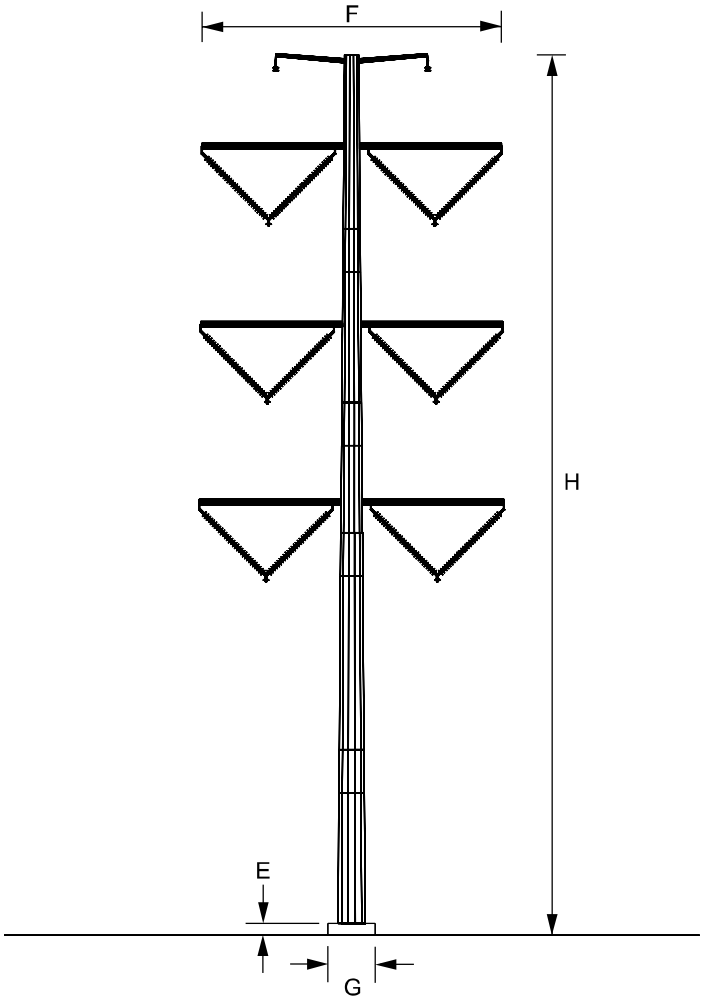
LINES 2404, 2090

TYPICAL DC ENGINEERED MONOPOLE DOUBLE DEADEND STRUCTURE

ATTACHMENT NO.

II.B.3.a

DRAWN BY: SDH



TYPICAL DC ENGINEERED MONOPOLE SUSPENSION STRUCTURE (V-STRING)

A. STRUCTURE MAPPING	N/A
B. RATIONALE FOR STRUCTURE TYPE:	MINIMIZES RIGHT OF WAY ACQUISITION; V-STRING INCREASES CLEARANCES AND OPTMIZES EXISTING ROW USAGE
C. LENGTH OF R/W (STRUCTURE QTY):	2.3 MILES (15 STRUCTURES) - SEE NOTE 1
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	MATCH CURRENT STANDARDS8 AND EXISTING STRUCTURES IN THE AREA
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 2
F. AVERAGE WIDTH AT CROSSARM:	34.5'
G. AVERAGE WIDTH AT BASE:	SEE NOTE 3
H. MINIMUM STRUCTURE HEIGHT (SEE NOTE 4): MAXIMUM STRUCTURE HEIGHT (SEE NOTE 4): AVERAGE STRUCTURE HEIGHT (SEE NOTE 4):	110' 110' 110'
I. AVERAGE SPAN LENGTH (RANGE):	620' - SEE NOTE 5
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES:
1. ROW LENGTH & STRUCTURE QUANTITY ARE EXCLUSIVE OF COMPANY-OWNED SUBSTATION PROPERTIES
2. MINIMUM FOUNDATION REVEAL SHALL BE 1.5'
3. FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL ENGINEERING
4. THE SPAN LENGTHS ASSOCIATED WITH THIS STRUCUTRE TYPE ARE THE AHEAD SPANS

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

Dominion Energy
Dominion Energy
5000 Dominion Blvd.
Glen Allen, VA 23060

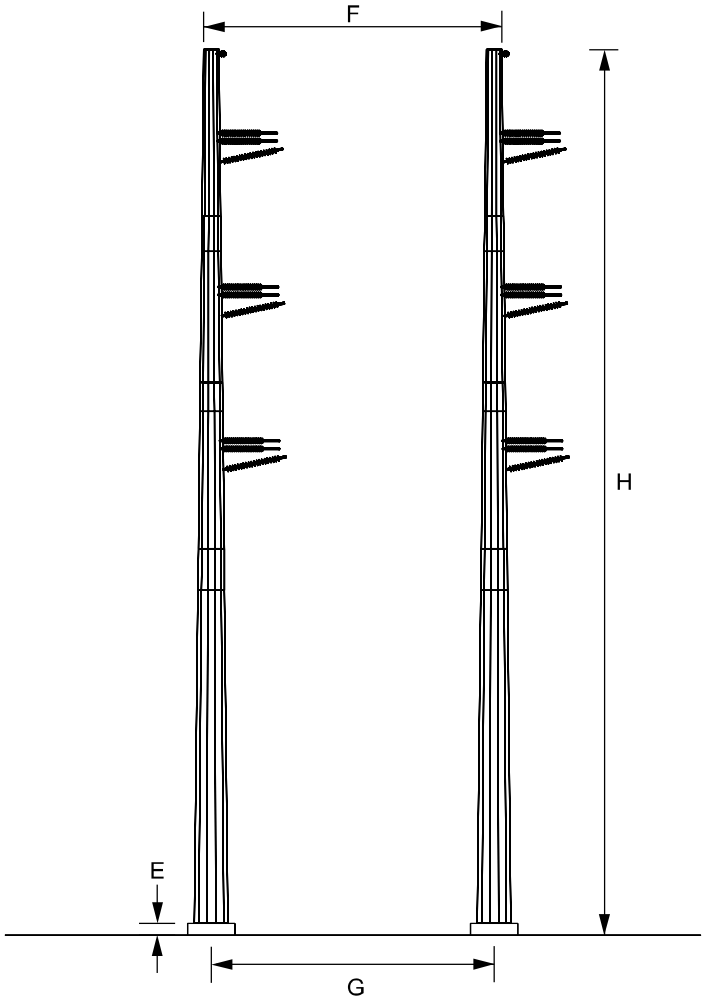
LINES 2404, 2090

TYPICAL DC ENGINEERED MONOPOLE SUSPENSION STRUCTURE (V-STRING)

ATTACHMENT NO.

II.B.3.b

DRAWN BY: SDH



TYPICAL DC ENGINEERED 2-POLE DOUBLE DEADEND STRUCTURE

A. STRUCTURE MAPPING	N/A
B. RATIONALE FOR STRUCTURE TYPE:	MINIMIZES RIGHT OF WAY ACQUISITION; 2-POLES USED FOR HEAVY ANGLES TO OPTIMIZE POLE/FOUNDATION SIZE AND COST
C. LENGTH OF R/W (STRUCTURE QTY):	2.45 MILES (5) - SEE NOTE 1
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	MATCH CURRENT STANDARDS8 AND EXISTING STRUCTURES IN THE AREA
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 2
F. AVERAGE WIDTH AT CROSSARM:	36'
G. AVERAGE WIDTH AT BASE:	SEE NOTE 3
H. MINIMUM STRUCTURE HEIGHT (SEE NOTE 4): MAXIMUM STRUCTURE HEIGHT (SEE NOTE 4): AVERAGE STRUCTURE HEIGHT (SEE NOTE 4):	105' 105' 105'
I. AVERAGE SPAN LENGTH (RANGE):	615' - SEE NOTE 5
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES:
1. ROW LENGTH & STRUCTURE QUANTITY ARE EXCLUSIVE OF COMPANY-OWNED SUBSTATION PROPERTIES
2. MINIMUM FOUNDATION REVEAL SHALL BE 1.5'
3. FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL ENGINEERING
4. THE SPAN LENGTHS ASSOCIATED WITH THIS STRUCUTRE TYPE ARE THE AHEAD SPANS

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

Dominion Energy
Dominion Energy
5000 Dominion Blvd.
Glen Allen, VA 23060

LINES 2404, 2090

TYPICAL DC ENGINEERED 2-POLE DOUBLE DEADEND STRUCTURE

ATTACHMENT NO.

II.B.3.c

DRAWN BY: SDH

APPENDIX C ENVIRONMENTAL FEATURE CROSSING TABLE

FEATURE CROSSING TABLE FOR TRIBUTARY ROUTE ALTERNATIVES*

Feature [a, b]	Unit	Route 2 (Blue)	Route 3 (Yellow)	Route 4 (Green)
ROUTE LENGTH AND CONSTRUCTION FOOTPRINT				
Route length	Miles	2.4	2.8	3.0
Construction footprint	Acres	30.3	35.7	37.6
LAND USE				
Land Ownership				
Total parcels crossed by right-of-way	Number	9	10	11
Private	Number	9	10	11
County	Number	0	0	0
Land Use/Land Cover [c]				
Forested	Acres	23.6	29.3	31.0
Agricultural	Acres	6.4	6.2	6.2
Developed	Acres	0.2	0.2	0.3
Open space	Acres	0.1	0.1	0.1
Open water [c]	Acres	0.0	0.0	0.0
Recreation Areas				
Fredericksburg KOA Campground	number	1	1	0
	acres	1.9	3.5	0.0
US Bike Route	number	0	0	1
Residences and Other Structures				
Dwellings within ROW	Number	0	0	0
Dwellings within 60 feet of ROW	Number	0	0	0
Dwellings within 100 feet of centerline	Number	0	0	0
Dwellings within 250 feet of centerline	Number	0	0	1
Dwellings within 500 feet of centerline	Number	0	0	2
Non-residential buildings (commercial and outbuildings) within 100 feet of centerline	Number	0	0	0

Feature [a, b]	Unit	Route 2 (Blue)	Route 3 (Yellow)	Route 4 (Green)
Non-residential buildings (commercial and outbuildings) within 250 feet of centerline	Number	0	0	1
Non-residential buildings (commercial and outbuildings) within 500 feet of centerline	Number	0	0	1
Cemeteries, Schools, and Places of Worship				
Cemeteries within 500 feet of centerline	Number	0	0	0
Schools within 500 feet of centerline	Number	0	0	0
Places of Worship within 500 feet of centerline	Number	0	0	0
Planned Developments				
Planned Developments - total	number	1	1	1
	acres	3.3	3.3	3.3
SpotsyTech Campus	acres	3.3	3.3	3.3
Easements				
Easements – total	Number	0	0	0
Transportation				
Roads	Number	1	1	3
Railroads	Number	0	0	0
NATURAL RESOURCES				
Wetlands				
Wetlands Affected—total [d]	Acres	14.1	14.4	13.8
Palustrine Forested (PFO)	Acres	7.3	7.9	7.4
Palustrine Scrub-shrub (PSS)	Acres	6.4	6.1	6.1
Palustrine Emergent (PEM)	Acres	NA	NA	NA
Palustrine Unconsolidated Bottom (PUB)	Acres	NA	NA	NA
Riverine	Acres	0.4	0.3	0.3
Waterbodies				
Waterbodies - Total [e]	Number	12	11	11
Perennial	Number	7	5	5
Intermittent	Number	5	6	6

Feature [a, b]	Unit	Route 2 (Blue)	Route 3 (Yellow)	Route 4 (Green)
Lake/Pond	Number	0	0	0
Ecological Cores				
Outstanding (1)	Acres	25.0	30.1	26.7
Very High (2)	Acres	0.0	0.0	0.0
High (3)	Acres	1.2	1.2	1.2
Moderate (4)	Acres	0.0	0.0	0.0
General (5)	Acres	0.0	0.0	3.3
Areas of Ecological Significance				
Stream Conservation Unit (SCU) or Conservation Sites	Number	0	0	0
Forest Conservation Values				
Average (1)	Acres	5.5	9.1	13.5
Moderate (2)	Acres	2.9	4.5	9.0
High (3)	Acres	2.4	5.0	2.0
Very High (4)	Acres	1.8	1.8	0.9
Outstanding (5)	Acres	16.5	14.3	10.7
Protected Species				
Bald eagle nests within 330 feet [f]	Number	0	0	0
Bald Eagle Nests within 660 Feet [f]	Number	0	0	0
NLEB Hibernacula within 1 mile [g]	Number	0	0	0
CULUTRAL RESOURCES				
Archaeological sites within ROW	Number	0	0	0
NRHP-eligible and NRHP-listed Properties, NHLs, Battlefields, and Historic Landscapes within ROW	Number	0	0	0
NRHP-eligible and NRHP-listed Properties, NHLs, Battlefields, and Historic Landscapes within 0.5 mile	Number	1	1	0
NRHP-listed Properties, NHLs, Battlefields, Historic Landscapes, and NHLs between 0.5 and 1.0 mile	Number	1	1	0
NHLs between 1.0 and 1.5 miles	Number	1	1	0
Historic Districts Crossed	Number	0	0	0

Feature [a, b]	Unit	Route 2 (Blue)	Route 3 (Yellow)	Route 4 (Green)
NRHP-listed Battlefields Crossed	Number	0	0	0
NRHP-eligible Battlefields Crossed	Number	0	0	0
VDHR Easements Crossed	Number	0	0	0
Battlefields (National Park Service ABPP) Crossed	Number	0	0	0
Routing Opportunities				
Collocation—total	Miles	0	0	0
Existing Transmission Lines	Miles	0	0	0
Existing Pipelines	Miles	0	0	0
Existing Roads	Miles	0	0	0
Existing Railroad	Miles	0	0	0

ABPP = American Battlefield Protection Program; NHL = National Historic Landmark; NRHP = National Register of Historic Places; SCU = stream conservation unit; VDHR = Virginia Department of Historic Resources

** Acreages are inclusive of the 2.2-acre Tributary Station footprint.*

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

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

[c] Based on VGIN statewide Land Cover dataset. All routes cross the Ni River, which is not classified as open water by the VGIN dataset. An approximate measurement of the acreage of the Ni River crossing using recent (2023) aerial imagery by the routes is less than 0.1 acre.

[d] Based on ERM's wetland desktop delineation methodology, as described in Appendix D.

[e] Based on the USGS NHD

[f] Based on the CCB Eagle Nest Locator

[g] Based on the NLEB Regulatory Buffer Interactive Tool

APPENDIX D WETLAND AND WATERBODY DESKTOP SUMMARY

222 South 9th Street
Suite 2900
Minneapolis, Minnesota 55402

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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
1 October 2024

SUBJECT
230 KV LINE #2090 EXTENSION AND TRIBUTARY SWITCHING STATION PROJECT

REFERENCE
0723442

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 new 230 kilovolt (kV) line extension and Tributary Switching Station facilities in Spotsylvania County, Virginia. The Tributary Station and the 230 kV Line #2090 extension are collectively referred to as the Project. This review was completed using desktop resources and methodology. A field delineation is required to verify the accuracy and extent of aquatic resource boundaries. Project route alternatives are shown in Attachment 1, with wetland boundaries identified in this desktop review shown in Attachment 2.

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

The purpose and need for the Project is to provide transmission service to Rappahanock Electric Company (REC; the Customer), with the request being prompted by the growing data center development in the area; to maintain reliable service for the overall load growth in the area; and to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards. To meet the Project purpose and need, Dominion proposes to:

- Construct a new 230 kV delivery point switching station (Tributary Station), which will provide interconnection to REC to serve its customer, the SpotsyTech Campus, a planned mixed-use technology park development which includes a data center; and
- Extend the Company's existing 230 kV Fredericksburg – Ladysmith CT Line #2090 by constructing a new double circuit overhead 230 kV line on new approximately 100-foot-wide right-of-way by cutting the Company's existing 230 kV Fredericksburg –

Ladysmith CT Line #2090. The cut in will result in (i) new 230 kV Line #2404, and (ii) 230 kV Line #2090 from Ladysmith CT to the proposed Tributary Station.[1]

The Project is necessary to assure that Dominion Energy Virginia is able to provide the service requested by REC in Spotsylvania County; maintain reliable service for the overall load growth in the area; and comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards.

The purpose of this desktop analysis is to identify and evaluate potential impacts of the Project on aquatic resources (wetlands, 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 that may indicate wetland location and type. This report is being submitted to the DEQ as part of the DEQ Wetland Impacts Consultation.

This assessment did not include field investigations required for wetland delineations, as defined in the U.S. Army Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987) and the 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0) or the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0), depending on the location of the wetland.

PROJECT STUDY AREA AND POTENTIAL ROUTES

A study area was developed encompassing the Project origin and termination points for the planned facilities (i.e., the proposed Project) as well as an area broad enough for the identification of reasonable route alternatives meeting the Project objectives. Additionally, and to the extent practicable, the limits of the study area were defined by reference to easily distinguishable landmarks, such as roads or other recognizable features.

Based on the above, ERM and Dominion defined the boundaries of the study area for the Project as follows:

- Patriot Highway and North Roxbury Mill Road to the west;
- The Po River to the south;

[1] Segments of Line #2090 (Fredericksburg – Ladysmith CT) will be renumbered several times as a result of other projects in the Fredericksburg – Ladysmith CT corridor. Line #2090 will be renumbered to 230 kV Line #2301 between Fredericksburg and Lee's Hill Substations, and to 230 kV Line #2335 between Lee's Hill and New Post Substations. After this Project is completed, 230 kV Line #2090 will again be renumbered to Line #2404 between New Post and Tributary Stations, with existing 230 kV Line #2090 extending between Tributary Station and Ladysmith CT only. See Appendix Attachments I.A.3, I.A.4, and I.A.5 for one-line diagrams of: (i) the existing transmission system in the Project load area, (ii) the Project load area after the New Post and Lee's Hill Substations are built, and (iii) the Project load area after the Project is energized.

- Massaponax High School and Heartland Way to the north; and
- Existing Line #2090 to the east.

The study area identified for the Project encompasses approximately 9.5 square miles within Spotsylvania County. The Project origin is the Company's existing 230 kV Fredericksburg-Ladysmith CT Line (Line #2090), terminating at the proposed Tributary Station located on the west side of Interstate 95 (I-95). There are no incorporated cities within the study area. Land use and land cover consists of a mix of industrial and commercial development, open land, and forested areas along Ni River and associated tributaries. The largest forested/undeveloped areas are associated with riparian areas along Ni River waterways. Commercial developments, including three recent or future data center campuses, are within the study area. The study area is shown in Attachment 1.

Dominion identified four potential cut-in locations along the Company's existing Line #2090, and five potential route alternatives associated with these cut-ins. Of these, three potential cut-in locations and their associated routes (Routes 2, 3, and 4) were retained for further analysis, while the others were eliminated. Descriptions of these routes are provided in the subsections below.

ROUTE ALTERNATIVES

ROUTE 2

Route 2 extends from a tap along the Company's existing Line #2090 to the proposed Tributary Station. The tap is approximately 0.5 mile south of where the existing transmission line crosses Guinea Station Road along the southern boundary of the study area. From there, Route 2 heads west/northwest for about 0.4 mile, passing through forested land before angling southwest through forest for about 0.7 mile, passing through a portion of the KOA campground and crossing the Ni River. On the south side of the Ni River, the route turns west, crossing agricultural and forested land for about 1.2 miles and crossing I-95. On the west side of I-95 the route turns north for about 0.1 mile and enters the Tributary Station.

Route 2 measures approximately 2.4 miles long. The right-of-way for this alternative (28.1 acres) and the proposed Tributary Station site (2.2 acres) would encompass a combined 30.3 acres.

ROUTE 3

Route 3 extends from the same point as Route 2 (a tap along the Company's existing Line #2090 about 0.5 mile south of Guinea Station Road) to the proposed Tributary Station. From here, Route 3 heads west/northwest for about 0.4 mile before turning north/northwest for about 0.3 mile. At this point the route turns west and crosses the KOA campground. On the west edge of the campground, the route turns southwest/south for about 0.5 mile,

paralleling an undeveloped, forested parcel boundary and crossing the Ni River. On the south side of the river, the route turns west, intersecting and following the same alignment as Route 2 for the remaining 1.3 miles to the Tributary Station.

Route 3 measures approximately 2.8 miles long. The right-of-way for this alternative (33.5 acres) and the proposed Tributary Station site (2.2 acres) would encompass a combined 35.7 acres.

ROUTE 4

Route 4 extends from a tap along the Company's existing Line #2090 approximately 0.7 mile north of the intersection of the existing transmission line and Guinea Station Road along the southern boundary of the study area. From here, Route 4 heads southwest/south for about 1.1 mile, passing through forested land and crossing Guinea Station Road. Just west of the KOA campground, the route intersects with and shares an alignment with Routes 2 and 3, turning west/southwest for about 0.5 mile and then west for about 1.2 mile, crossing I-95 and turning north into the Tributary Station.

Route 4 measures approximately 3.0 miles long. The right-of-way for this alternative (35.4 acres) and the proposed Tributary Station site (2.2 acres) would encompass a combined 37.6 acres.

DESKTOP EVALUATION METHODOLOGY

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

- National Agricultural Imagery Program (NAIP) aerial imagery flown December 2023, (NAIP 2023)
- USA NAIP Imagery: Color Infrared NAIP Infrared Images, Virginia, 1-meter pixel resolution (NAIP 2024)
- USA NAIP Imagery: Natural Color Images (2010-2022), Virginia, 1-meter pixel or better resolution (NAIP 2024a)
- Google Earth Aerial Imagery (Google LLC 2024)
- ESRI World Elevation Terrain 2-foot contours (ESRI et al. 2024)
- 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)
- The National Hydrography Dataset Plus High Resolution (NHD) (USGS 2024)

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 2024; ESRI et al., 2024).

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. In order to acknowledge ERM's adjustment of NWI classifications where appropriate, all the 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 2024). 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 proposed routes, as follows:

- 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.
- 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.
- 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 and waterbodies 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 in. or larger diameter at breast height (DBH);
- Palustrine Unconsolidated Bottom (PUB) open waters – 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 streams – channels containing periodically or continuously moving water (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 the interpreted wetlands displayed on color base map images.

RESULTS

Results of the probability analysis are presented in Table 2 below. Summaries are provided in the sections following the table. No wetlands or waterbodies were identified within the 2.2-acre Tributary Switching Station footprint.

TABLE 2: SUMMARY OF THE PROBABILITIES OF WETLAND AND WATERBODY OCCURRENCE ALONG THE ROUTE ALTERNATIVES [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 2						
High	1.4	NA	1.3	NA	NA	0.1
Medium/High	8.9	NA	4.5	4.2	NA	0.2
Medium	3.8	NA	1.5	2.2	NA	0.1
Medium/Low	NA	NA	NA	NA	NA	NA
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA
Route 3						
High	1.8	NA	1.7	NA	NA	0.0
Medium/High	8.1	NA	3.9	4.0	NA	0.2
Medium	4.5	NA	2.3	2.1	NA	0.1

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)
Medium/Low	NA	NA	NA	NA	NA	NA
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA
Route 4						
High	1.8	NA	1.7	NA	NA	0.0
Medium/High	8.2	NA	4.0	4.0	NA	0.2
Medium	3.8	NA	1.6	2.1	NA	0.1
Medium/Low	NA	NA	NA	NA	NA	NA
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 alternative route

a Numbers in this table have been rounded for presentation purposes; as a result, the totals may not reflect the sum of the addends.

b Acreages include the proposed 2.2-acre Tributary Switching Station.

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

Within the study area, most wetlands are forested and are generally concentrated around the Ni River that runs from the northwest portion of the study area to the southeast of the study area. In particular there is a large, contiguous forested wetland area mapped by the NWI between the existing line #2090 and I-95. Riverine (stream) and PUB (open water features) are described in the Waterbody Crossings section below.

ROUTE 2

The length of the corridor for Tributary Route 2 is approximately 2.4 miles and encompasses a total of approximately 30.3 acres (including the 2.2-acre Tributary Switching Station footprint). Based on the methodology discussed above, the right-of-way footprint will encompass approximately 46.5 percent (14.1 acres) of land with a medium or higher probability of containing wetlands and waterbodies. Based on ERM's desktop wetland and waterbody analysis, the Route 2 right-of-way would cross approximately 14.1 acres of wetlands and waterbodies, including 7.3 acres of PFO, 6.4 acres of PSS, 0.4 acres of RVR wetlands.

ROUTE 3

The length of the corridor for Tributary Route 3 is approximately 2.8 miles and encompasses a total of approximately 35.7 acres (including the 2.2-acre Tributary Switching Station footprint). Based on the methodology discussed above, the right-of-way footprint will encompass approximately 40.3 percent (14.4 acres) of land with a medium or higher probability of containing wetlands and waterbodies. Based on ERM's desktop wetland and waterbody analysis, the Route 3 right-of-way would cross approximately 14.4 acres of wetlands and waterbodies, including 7.9 acres of PFO, 6.1 acres of PSS, 0.3 acre of RVR wetlands.

ROUTE 4

The length of the corridor for Tributary Route 4 is approximately 3.0 miles and encompasses a total of approximately 37.6 acres (including the 2.2-acre Tributary Switching Station footprint). Based on the methodology discussed above, the right-of-way footprint will encompass approximately 36.8 percent (13.8 acres) of land with a medium or higher probability of containing wetlands and waterbodies. Based on ERM's desktop wetland and waterbody analysis, the Route 4 right-of-way would cross approximately 13.8 acres of wetlands and waterbodies, including 7.4 acres of PFO, 6.1 acres of PSS, 0.3 acre of RVR wetlands.

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. Waterbody counts crossed by the route alternatives are summarized in Table 3 below. Waterbodies crossed by the Tributary Routes include the Ni River and Po River, unnamed, intermittent tributaries to these waterbodies, and open waterbody features. No waterbodies were identified within the Tributary Switching Substation footprint. Based on field observations by qualified Dominion staff, the high number of streams present within the project area is attributable to prior land use. The geomorphology (e.g., lack of meanders, intervals across the floodplain) indicates

anthropogenic origins, likely resulting from efforts to drain the wetlands through which the streams currently flow.

TABLE 3: WATERBODIES CROSSED BY THE ROUTE ALTERNATIVES

Waterbodies Crossed	Unit	Route 2	Route 3	Route 4
NHD-Mapped Perennial Streams/Rivers [a]	Number	7	5	5
NHD-Mapped Intermittent Streams/Rivers [a]	Number	5	6	6
Total	**Number**	**12**	**11**	**11**

a Source: USGS NHD (NHD 2023)

ROUTE 2

Route 2 would have a total of twelve waterbody crossings that are NHD-mapped, including 7 perennial waterbodies (Ni River, 6 unnamed, perennial tributaries to Ni River), and 5 unnamed, intermittent streams. As described above, based on ERM's desktop wetland and waterbody analysis, the right-of-way for Route 2 would encompass approximately 0.4 acre of riverine streams.

ROUTE 3

Route 3 would have a total of eleven waterbody crossings that are NHD-mapped, including 5 perennial waterbodies (Ni River, 4 unnamed, perennial tributaries to Ni River), and 6 unnamed, intermittent streams. As described above, based on ERM's desktop wetland and waterbody analysis, the right-of-way for Route 3 would encompass approximately 0.3 acre of riverine streams.

ROUTE 4

Route 4 would have a total of eleven waterbody crossings that are NHD-mapped, including 5 perennial waterbodies (Ni River, 4 unnamed, perennial tributaries to Ni River), and 6 unnamed, intermittent streams. As described above, based on ERM's desktop wetland and waterbody analysis, the right-of-way for Route 4 would encompass approximately 0.3 acre of riverine streams.

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 and waterbodies where possible, keeping transmission structures outside of aquatic resources to the extent practicable.

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.

Direct impacts would be limited to placement of structures within wetlands, if unavoidable, and the permanent conversion of PSS/PFO wetlands within the proposed right-of-way to PSS or PEM type wetlands.

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

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, habitat diversity, and water temperature modification from shading. 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. Within the stream buffers (100 feet), and as needed to minimize impacts to wetlands, trees and vegetation will be hand felled and 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. 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.

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: https://www.dominionenergy.com/tributary.

If you have any questions regarding this wetland assessment, please contact me at 860-817-2972 or by email at jake.bartha@erm.com.

Sincerely,

Jake Bartha
Environmental Resources Management

cc: Lucas Dupont, Dominion Energy Virginia
Blair Parks, Dominion Energy Virginia

Enclosures: Attachments 1 and 2

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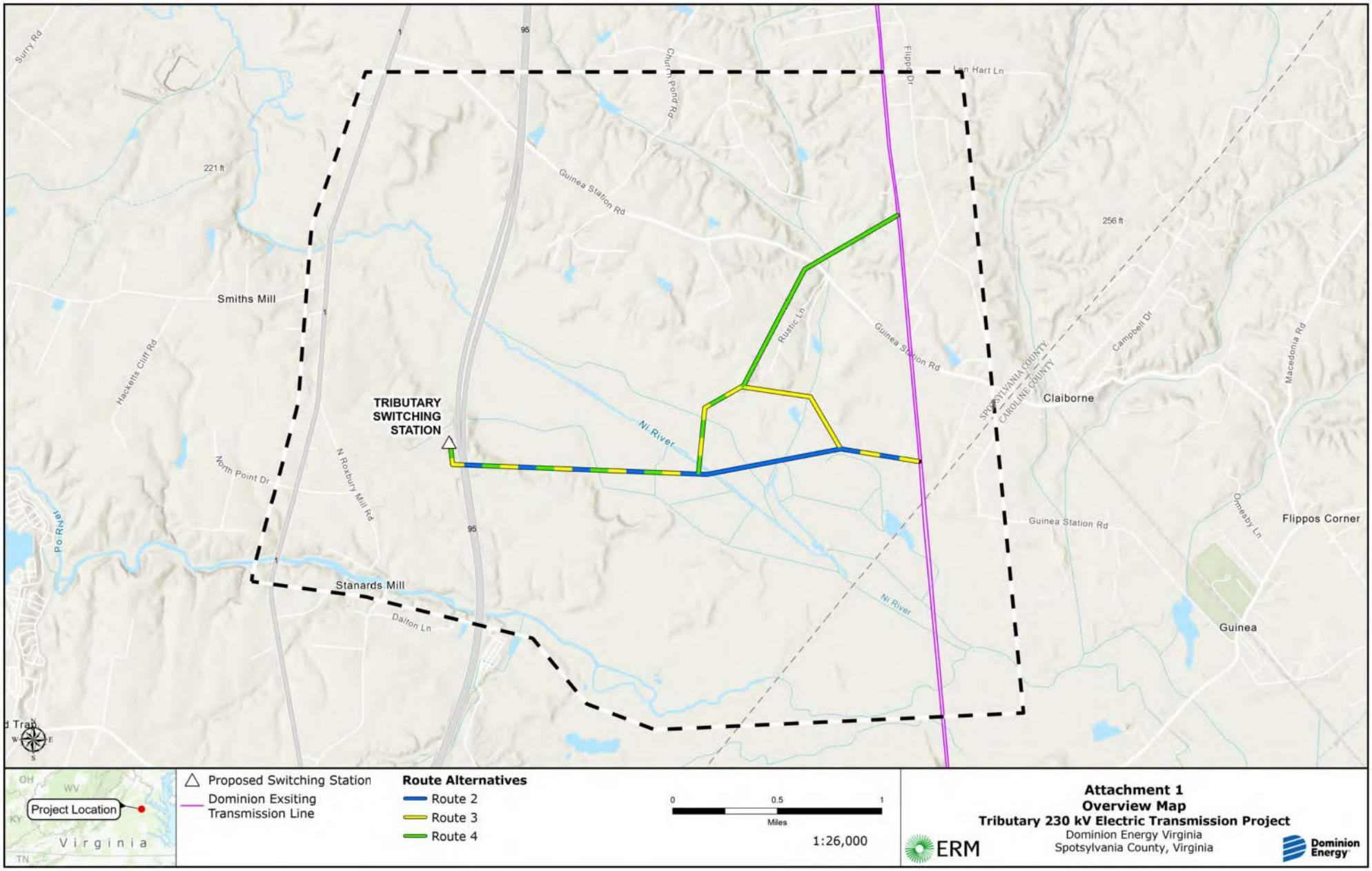
ATTACHMENT 1


Surry Rd
95
Church Pond Rd
Flippos Dr
Lan Hart Ln
221 ft
Guinea Station Rd
256 ft
Smiths Mill
Rustic Ln
Guinea Station Rd
Campbell Dr
Macedonia Rd
Hackets Cliff Rd
TRIBUTARY SWITCHING STATION
Claiborne
SPOTSYLVANIA COUNTY
CAROLINE COUNTY
Ni River
North Point Dr
N Roxbury Mill Rd
Po River
95
Guinea Station Rd
Ormesby Ln
Flippos Corner
Stanards Mill
Dalton Ln
Ni River
Guinea
Project Location
Virginia
OH
WV
KY
TN
Proposed Switching Station
Dominion Exsiting Transmission Line
Route Alternatives
Route 2
Route 3
Route 4
0
0.5
1
Miles
1:26,000
ERM
Attachment 1
Overview Map
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia
Dominion Energy

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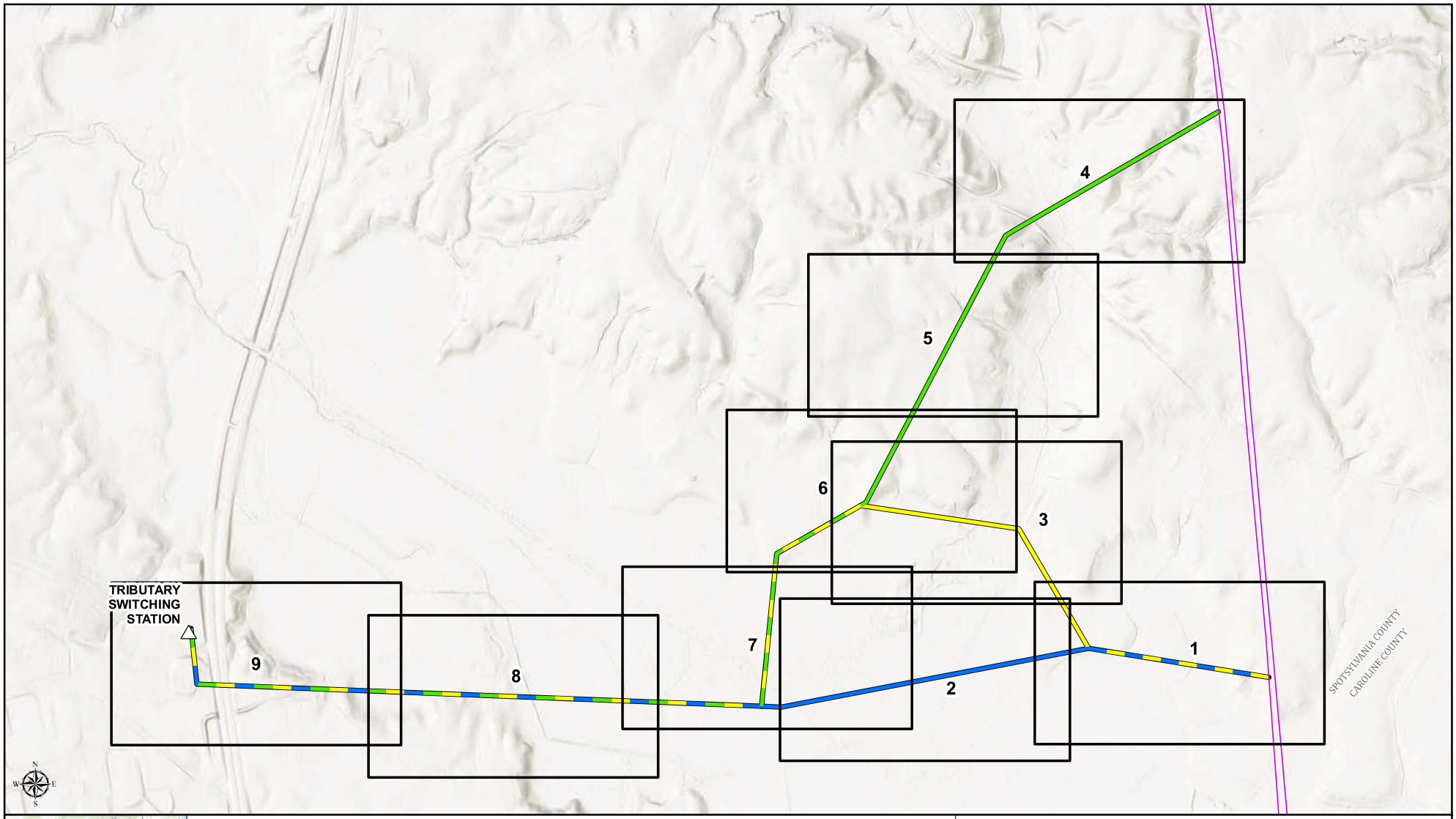
ATTACHMENT 2

The wetlands and waterbodies depicted on this map are an estimate of possible wetland and waterbody extent based on desktop data review only, and are subject to change in extent and location based on actual field delineation of wetlands and waterbodies



△ Proposed Switching Station

Dominion Exsiting Transmission Line

Route Alternatives

Route 2

Route 3

Route 4

0 500 1,000

Feet

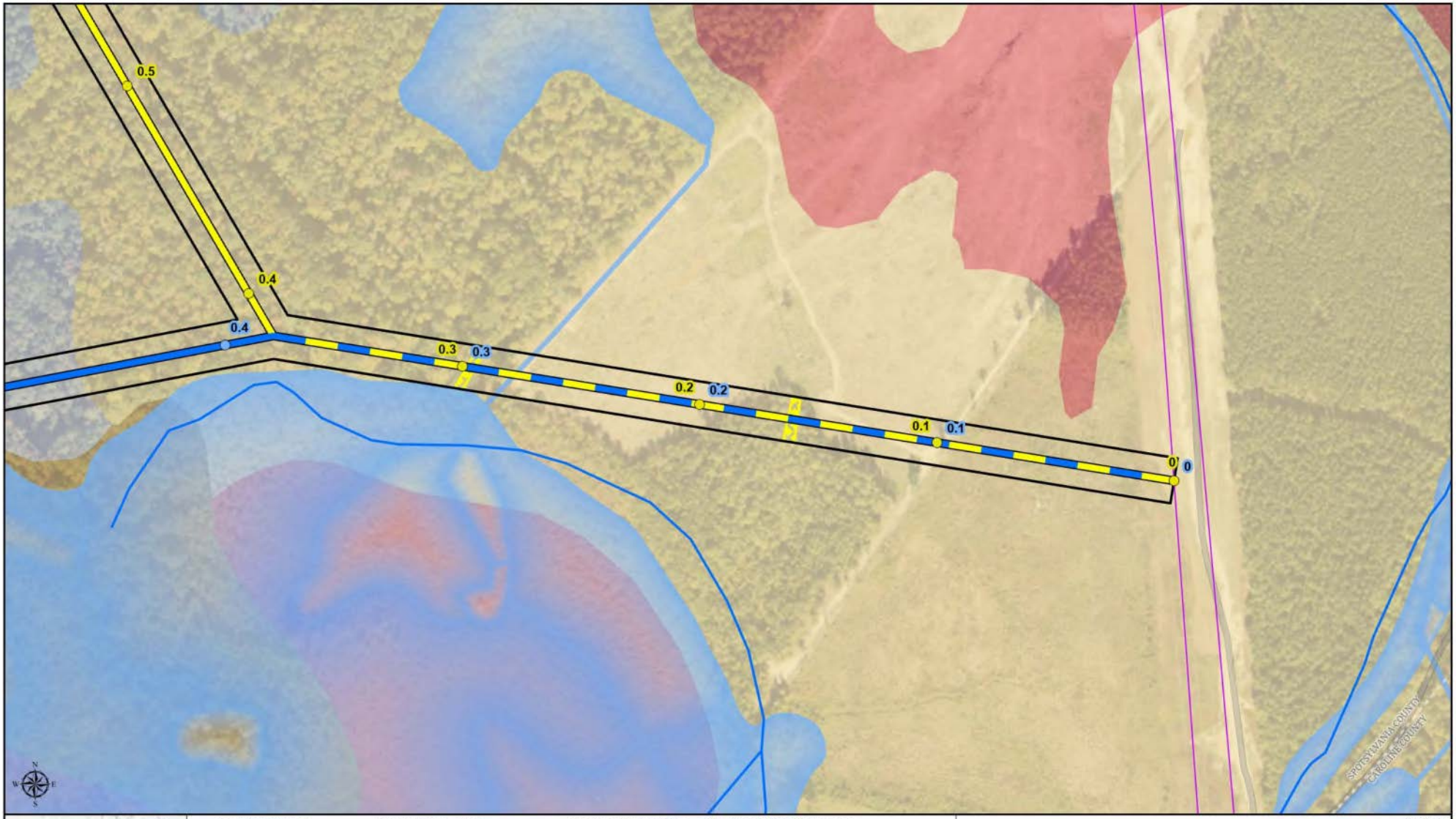
1:12,000

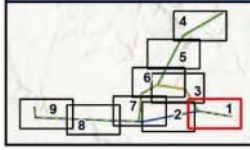
Attachment 2
Overview Map Index
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

The wetlands and waterbodies depicted on this map are an estimate of possible wetland and waterbody extent based on desktop data review only, and are subject to change in extent and location based on actual field delineation of wetlands and waterbodies





Dominion Exsiting Transmission Line
Route 2 MP
Route 3 MP

Route Alternatives
Route 2 (100ft Right-of-Way)
Route 3 (100ft Right-of-Way)

Wetland Probability
Medium
NHD Stream
NWI Wetland

SSURGO Hydric Soil Rating
Nonhydric
Predominantly nonhydric
Partially hydric
Predominantly hydric

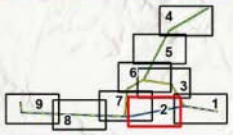
1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

The wetlands and waterbodies depicted on this map are an estimate of possible wetland and waterbody extent based on desktop data review only, and are subject to change in extent and location based on actual field delineation of wetlands and waterbodies



Route 2 MP
Route 3 MP

Route Alternatives
Route 2 (100ft Right-of-Way)
Route 3 (100ft Right-of-Way)

Wetland Probability
High
Medium
Medium/High
NHD Stream
NWI Wetland

SSURGO Hydric Soil Rating
Nonhydric
Predominantly nonhydric
Partially hydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

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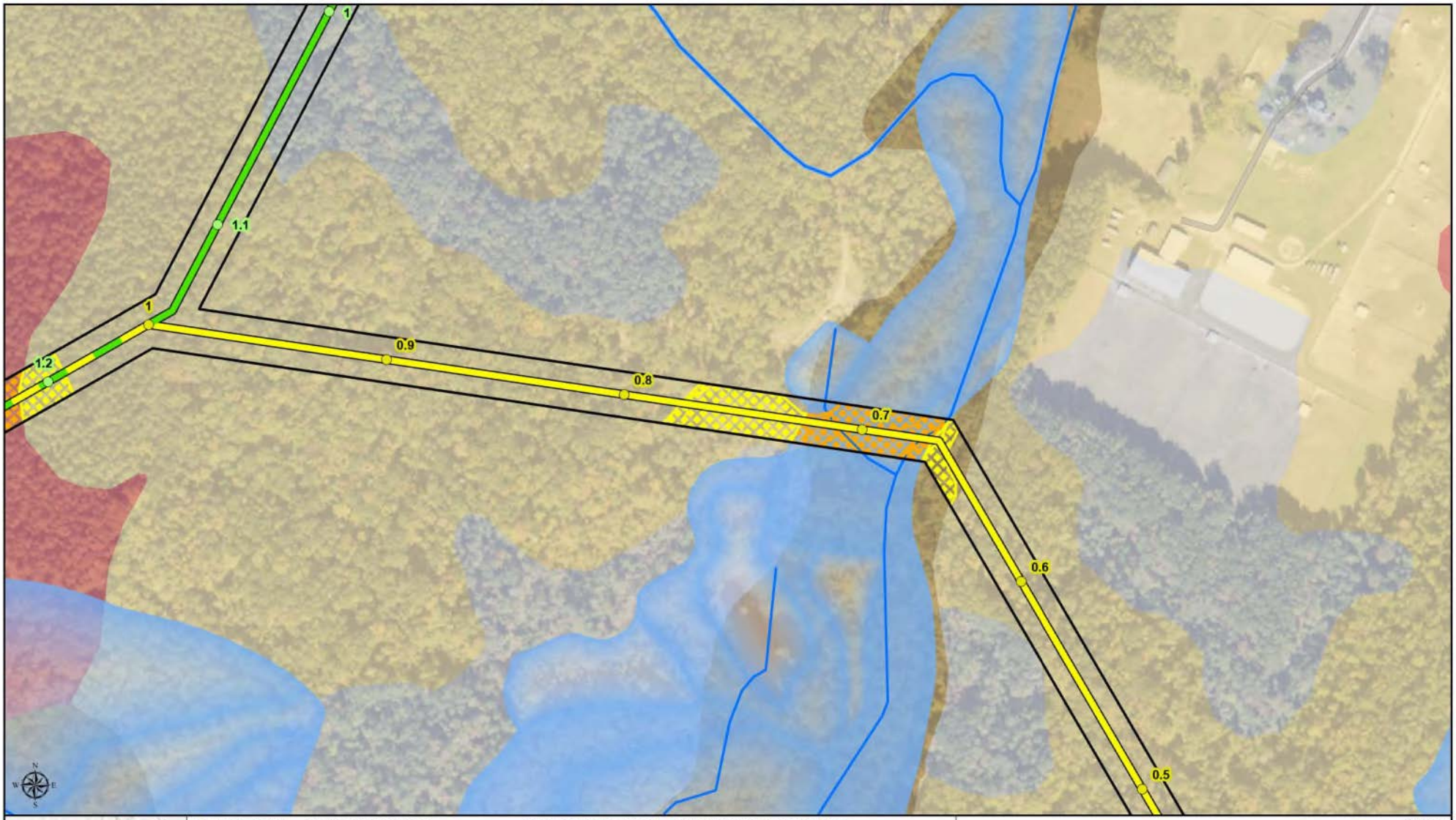

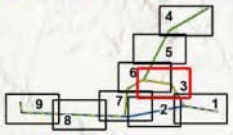

Route 3 MP
Route 4 MP

Route Alternatives
Route 3 (100ft Right-of-Way)
Route 4 (100ft Right-of-Way)

Wetland Probability
Medium
Medium/High
NHD Stream
NWI Wetland

SSURGO Hydric Soil Rating
Nonhydric
Predominantly nonhydric
Partially hydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM
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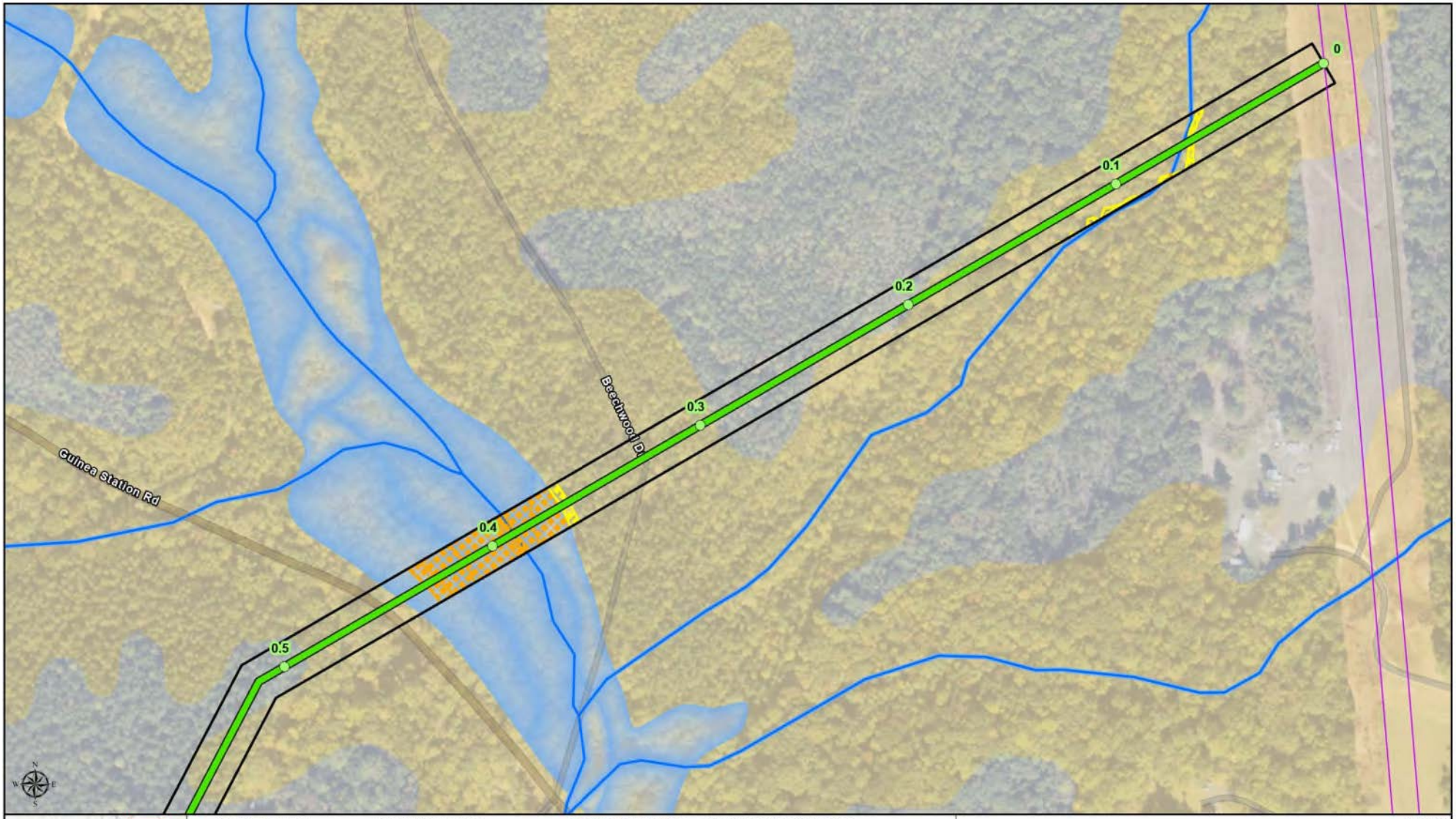

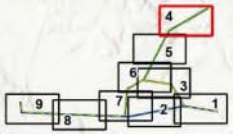

Dominion Exsiting Transmission Line

Route 4 MP

Route Alternatives

Route 4 (100ft Right-of-Way)

Wetland Probability

Medium

Medium/High

NHD Stream

NWI Wetland

SSURGO Hydric Soil Rating

Nonhydric

Predominantly nonhydric

1:2,400

0 100 200

Feet

Attachment 2

Wetland Probability Map Set - Probability

Tributary 230 kV Electric Transmission Project

Dominion Energy Virginia

Spotsylvania County, Virginia

ERM

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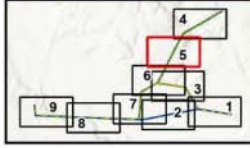

Route 4 MP

Route Alternatives
Route 4 (100ft Right-of-Way)

NHD Stream
NWI Wetland

SSURGO Hydric Soil Rating
Nonhydric
Predominantly nonhydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

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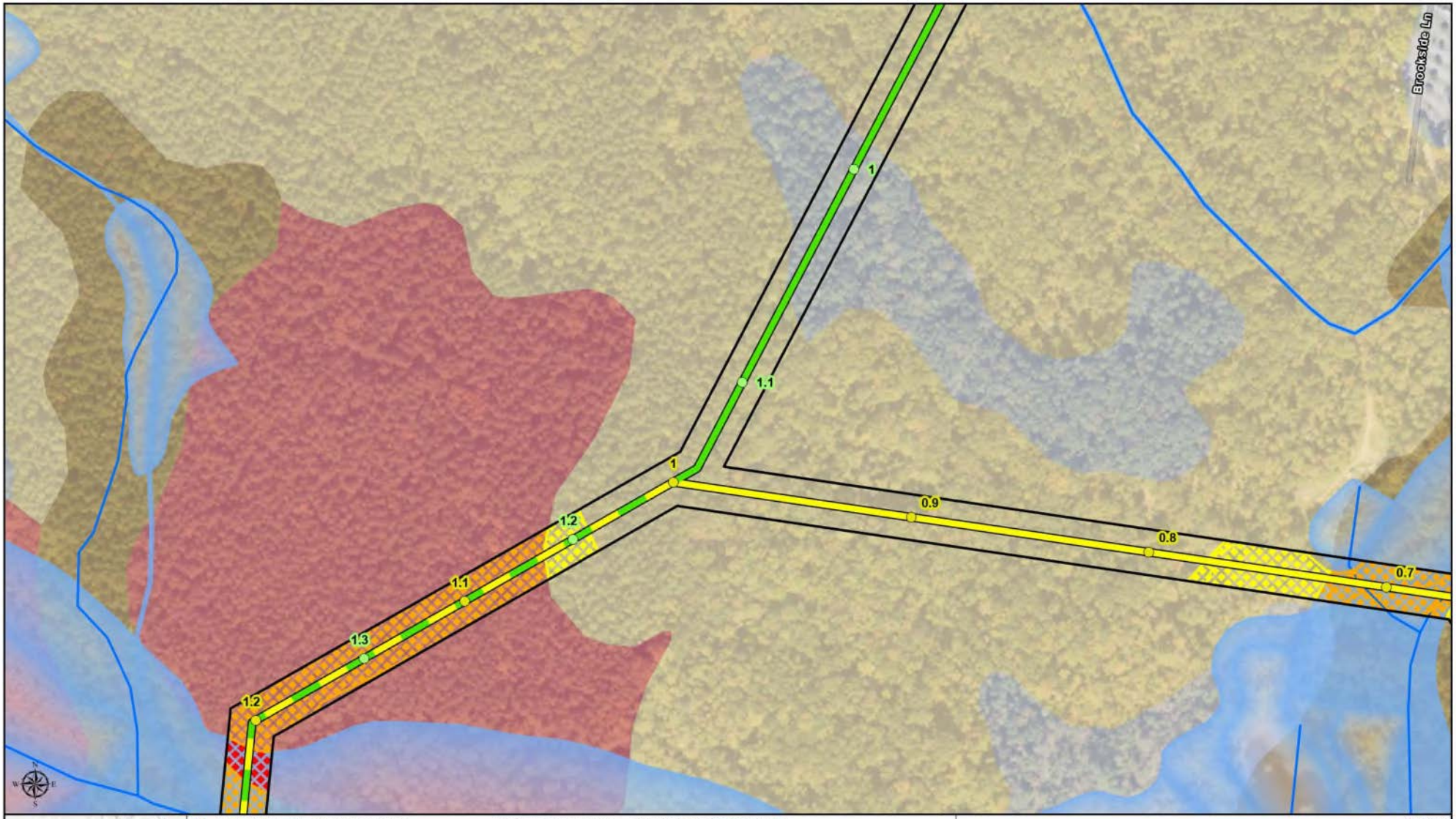

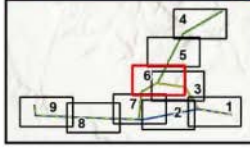

Route 3 MP
Route 4 MP

Route Alternatives
Route 3 (100ft Right-of-Way)
Route 4 (100ft Right-of-Way)

Wetland Probability
High
Medium
Medium/High
NHD Stream
NWI Wetland

SSURGO Hydric Soil Rating
Nonhydric
Predominantly nonhydric
Partially hydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM
Dominion Energy

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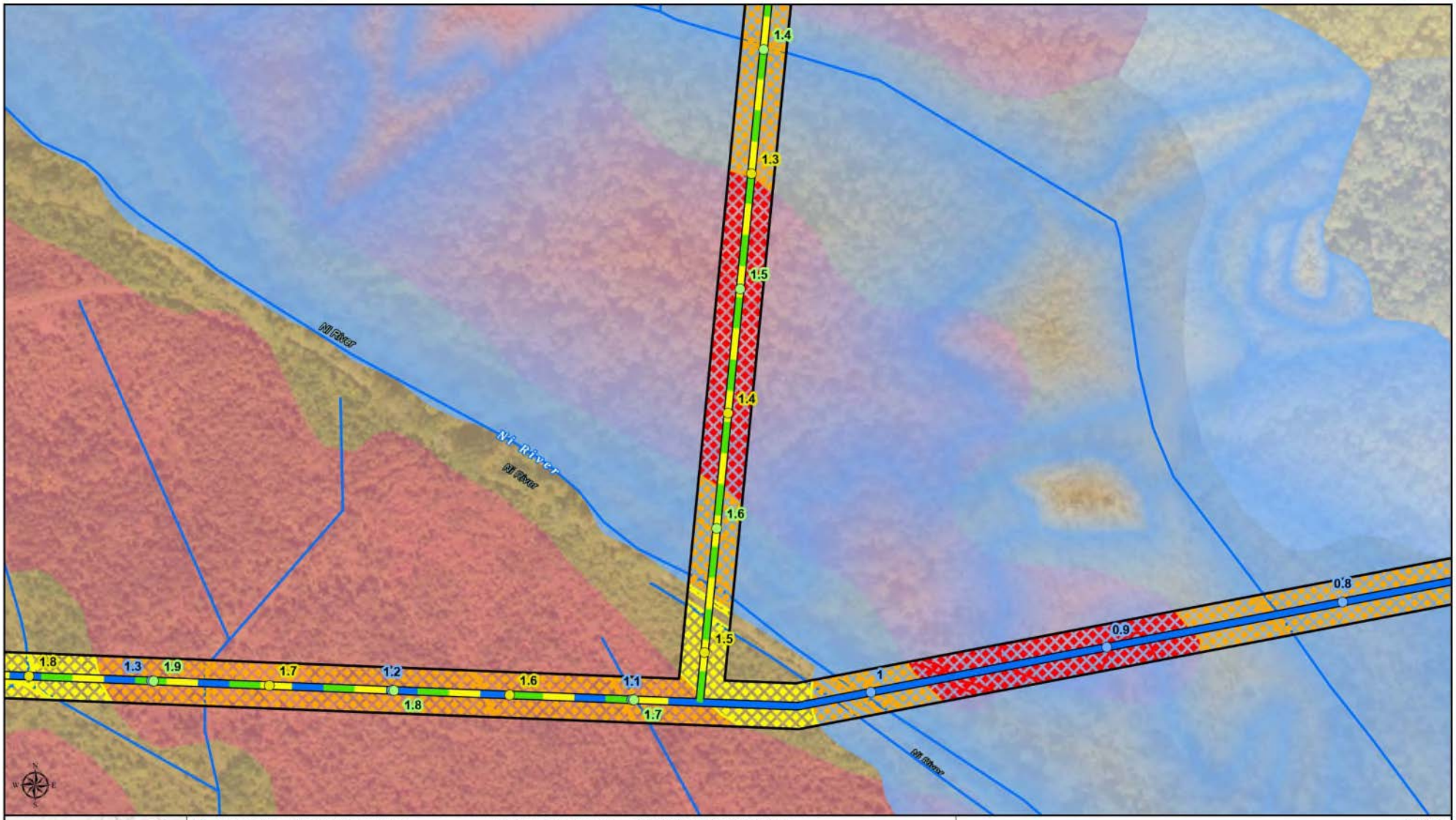

Attachment 2
Wetland Probability Map Set - Probability
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

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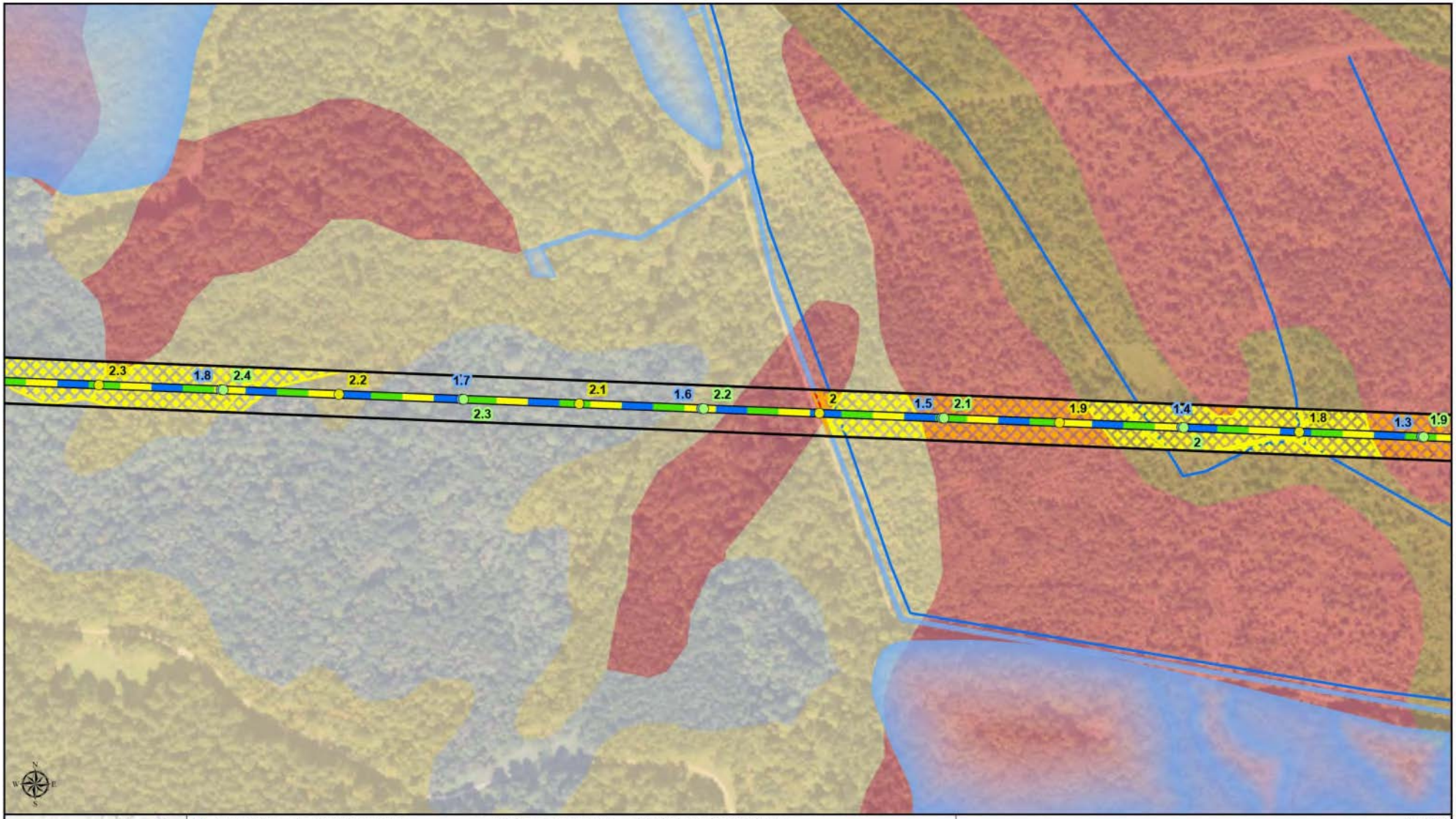

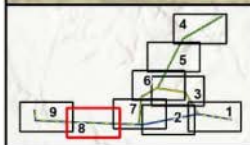

Route 2 MP
Route 3 MP
Route 4 MP

Route Alternatives
Route 2 (100ft Right-of-Way)
Route 3 (100ft Right-of-Way)
Route 4 (100ft Right-of-Way)

Wetland Probability
High
Medium
Medium/High
NHD Stream
NWI Wetland

SSURGO Hydric Soil Rating
Nonhydric
Predominantly nonhydric
Partially hydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

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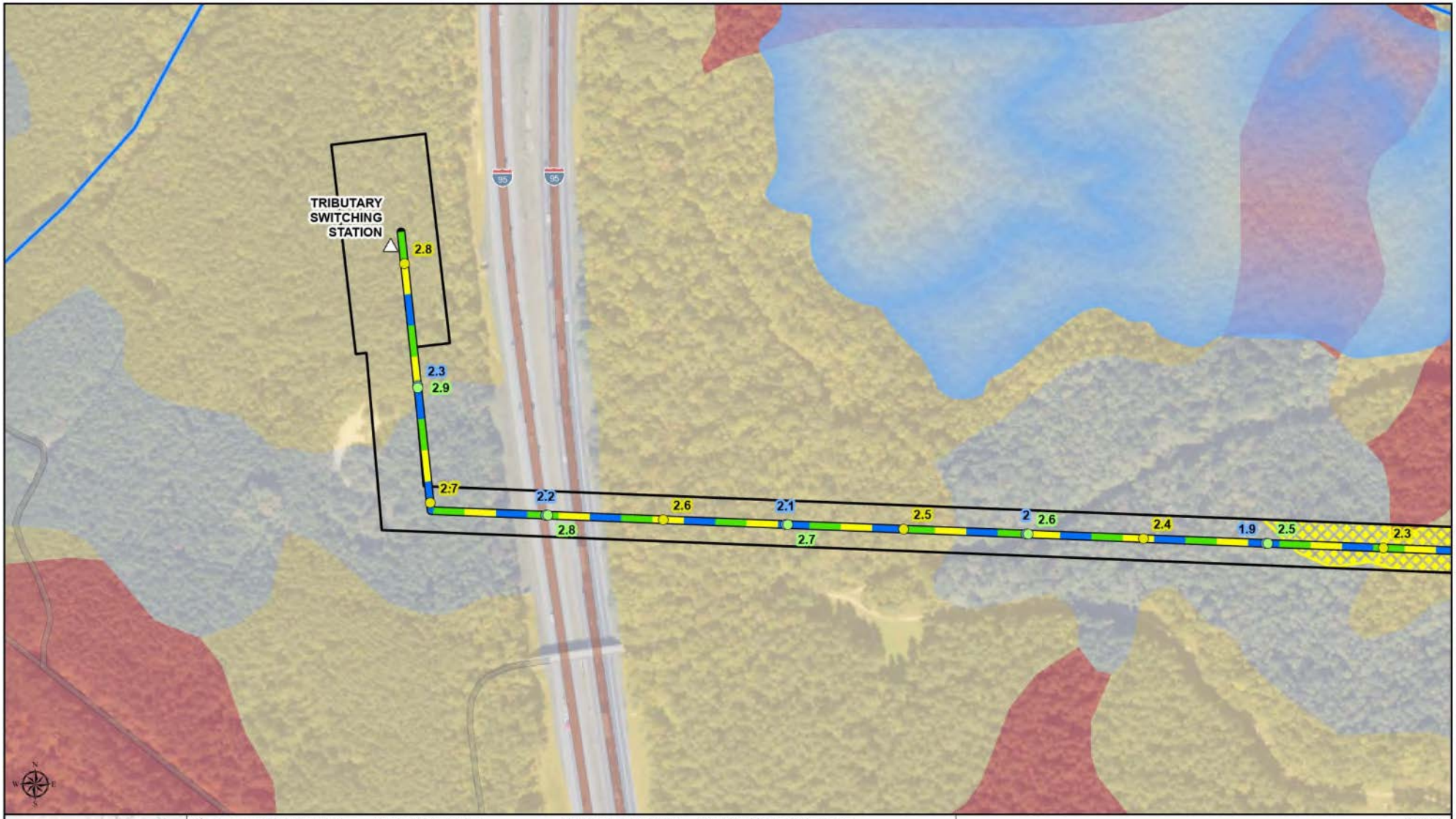

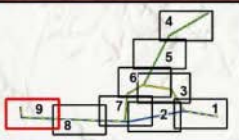

△ Proposed Switching Station
Route 2 MP
Route 3 MP
Route 4 MP

Route Alternatives
Route 2 (100ft Right-of-Way)
Route 3 (100ft Right-of-Way)
Route 4 (100ft Right-of-Way)

Wetland Probability
Medium
Medium/High
NHD Stream
NWI Wetland

SSURGO Hydric Soil Rating
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

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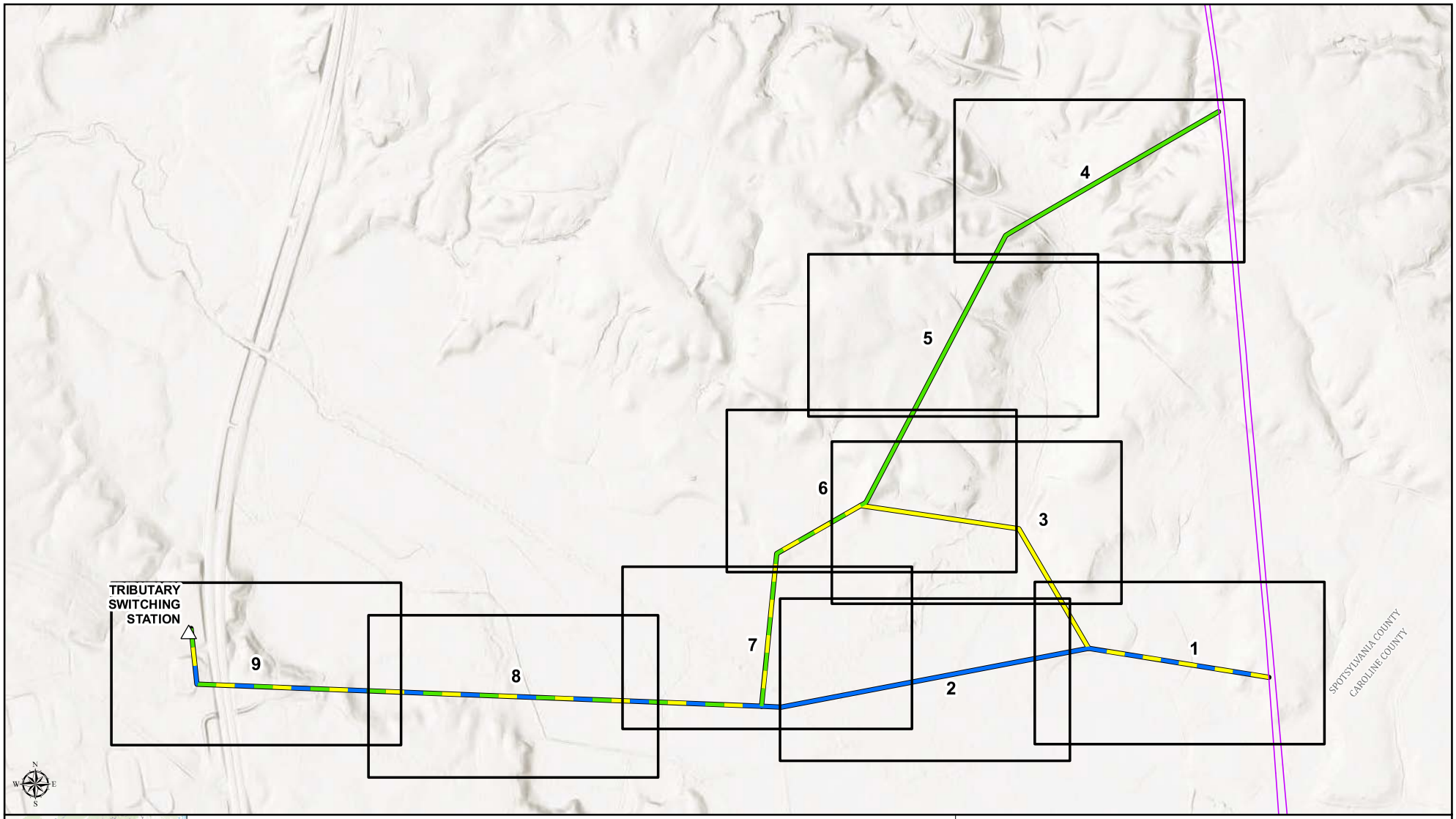

△ Proposed Switching Station

Dominion Exsiting Transmission Line

Route Alternatives

Route 2

Route 3

Route 4

0 500 1,000

Feet

1:12,000

Attachment 2
Overview Map Index
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

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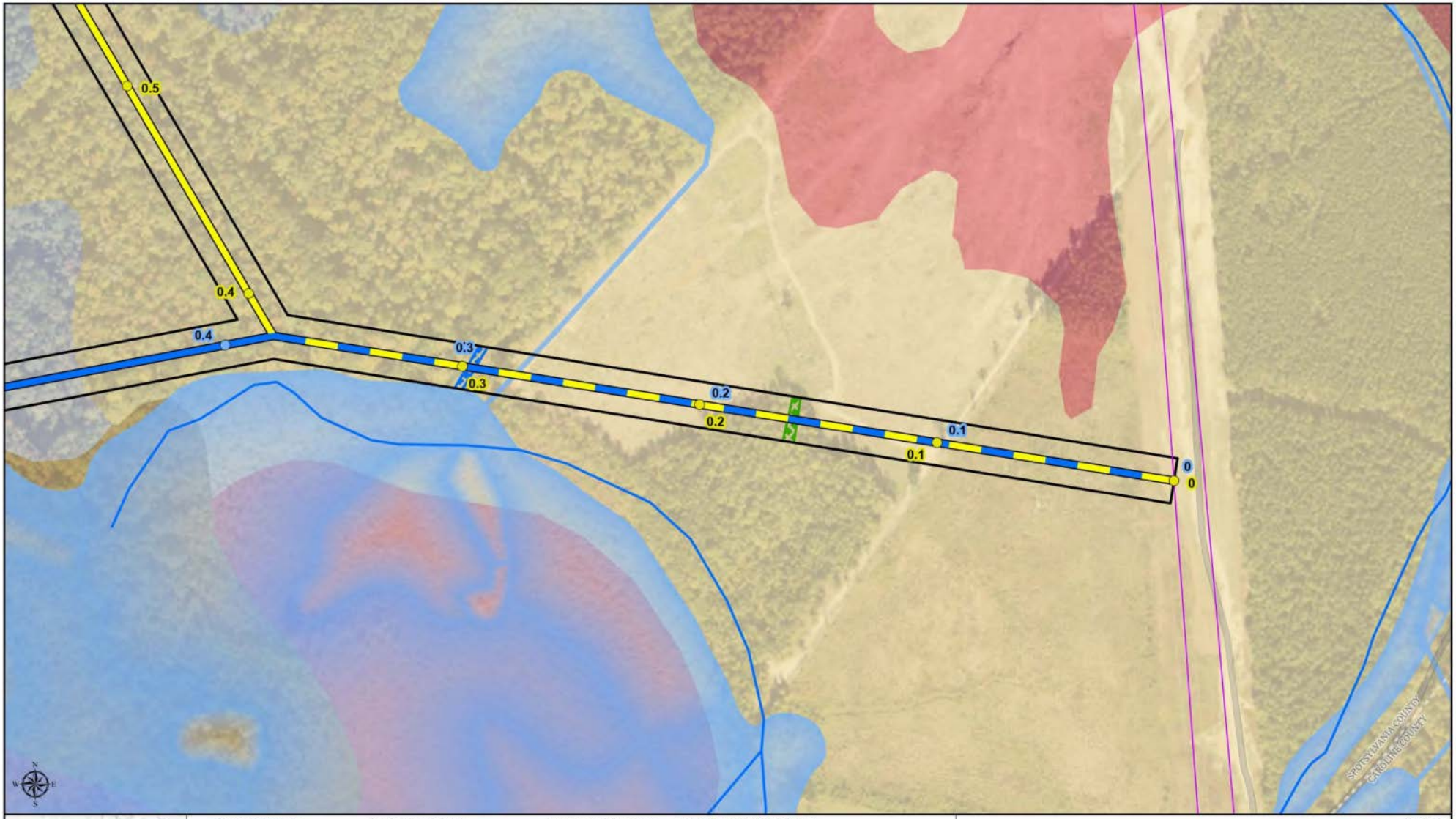

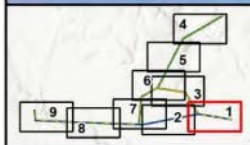

Dominion Exsiting Transmission Line
Route 2 MP
Route 3 MP

Route Alternatives
Route 2 (100ft Right-of-Way)
Route 3 (100ft Right-of-Way)

Wetland Cover Type
PFO
Riverine
NHD Stream
NWI Wetland

SSURGO Hydric Soil Rating
Nonhydric
Predominantly nonhydric
Partially hydric
Predominantly hydric

0 100 200
Feet
1:2,400

Attachment 2
Wetland Probability Map Set - Cowardin
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

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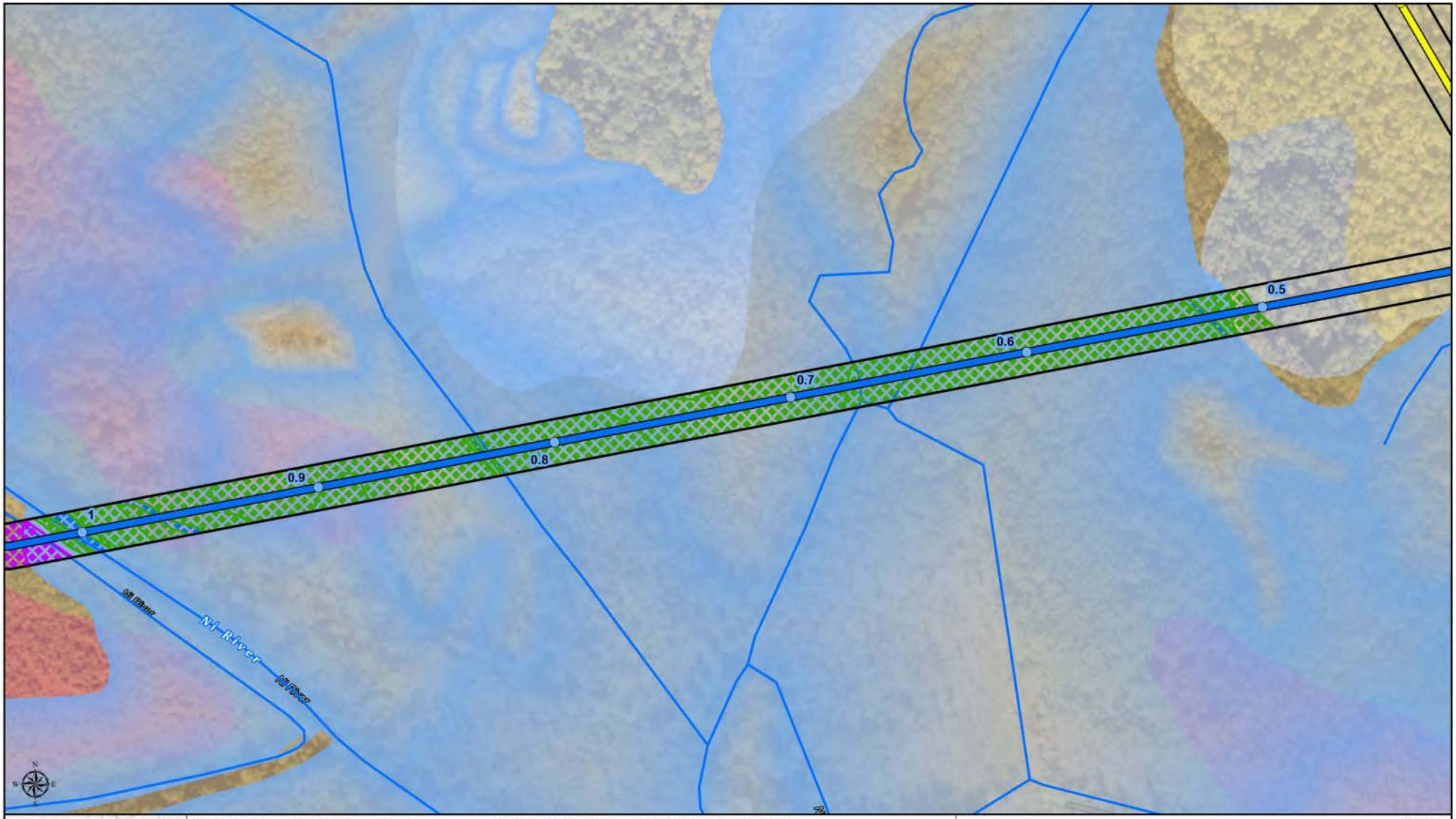

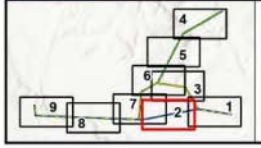

Route 2 MP
Route 3 MP

Route Alternatives
Route 2 (100ft Right-of-Way)
Route 3 (100ft Right-of-Way)

Wetland Cover Type
PFO
PSS
Riverine
NHD Stream
NWI Wetland

SSURGO Hydric Soil Rating
Nonhydric
Predominantly nonhydric
Partially hydric
Predominantly hydric

0 100 200
Feet
1:2,400

Attachment 2
Wetland Probability Map Set - Cowardin
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM
Dominion Energy

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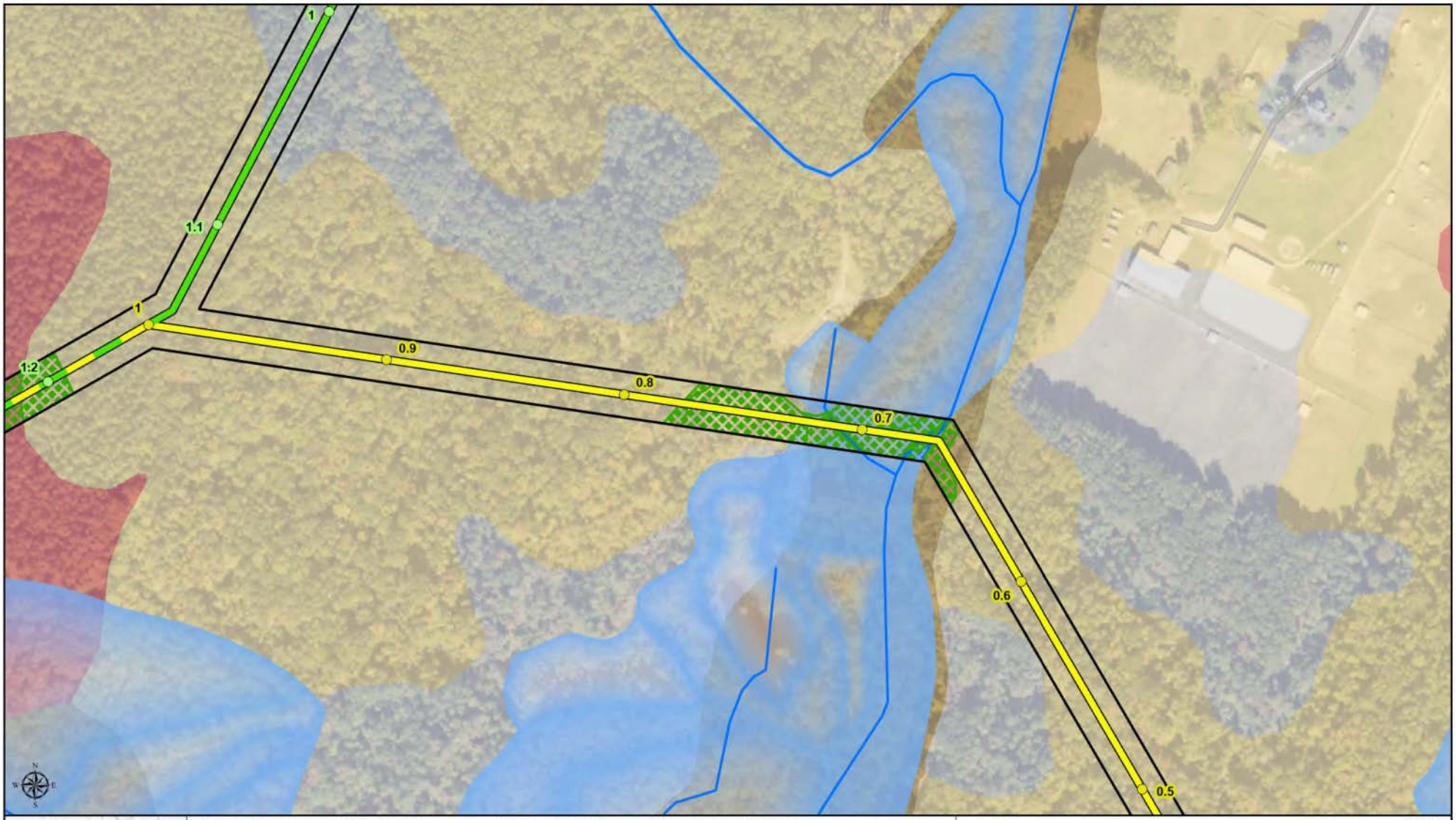

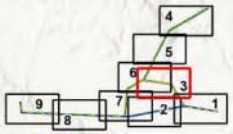

Route 3 MP
Route 4 MP

Route Alternatives
Route 3 (100ft Right-of-Way)
Route 4 (100ft Right-of-Way)

Wetland Cover Type
PFO
Riverine
NHD Stream
NWI Wetland

SSURGO Hydric Soil Rating
Nonhydric
Predominantly nonhydric
Partially hydric
Predominantly hydric

0 100 200
Feet
1:2,400

Attachment 2
Wetland Probability Map Set - Cowardin
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

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Dominion Energy

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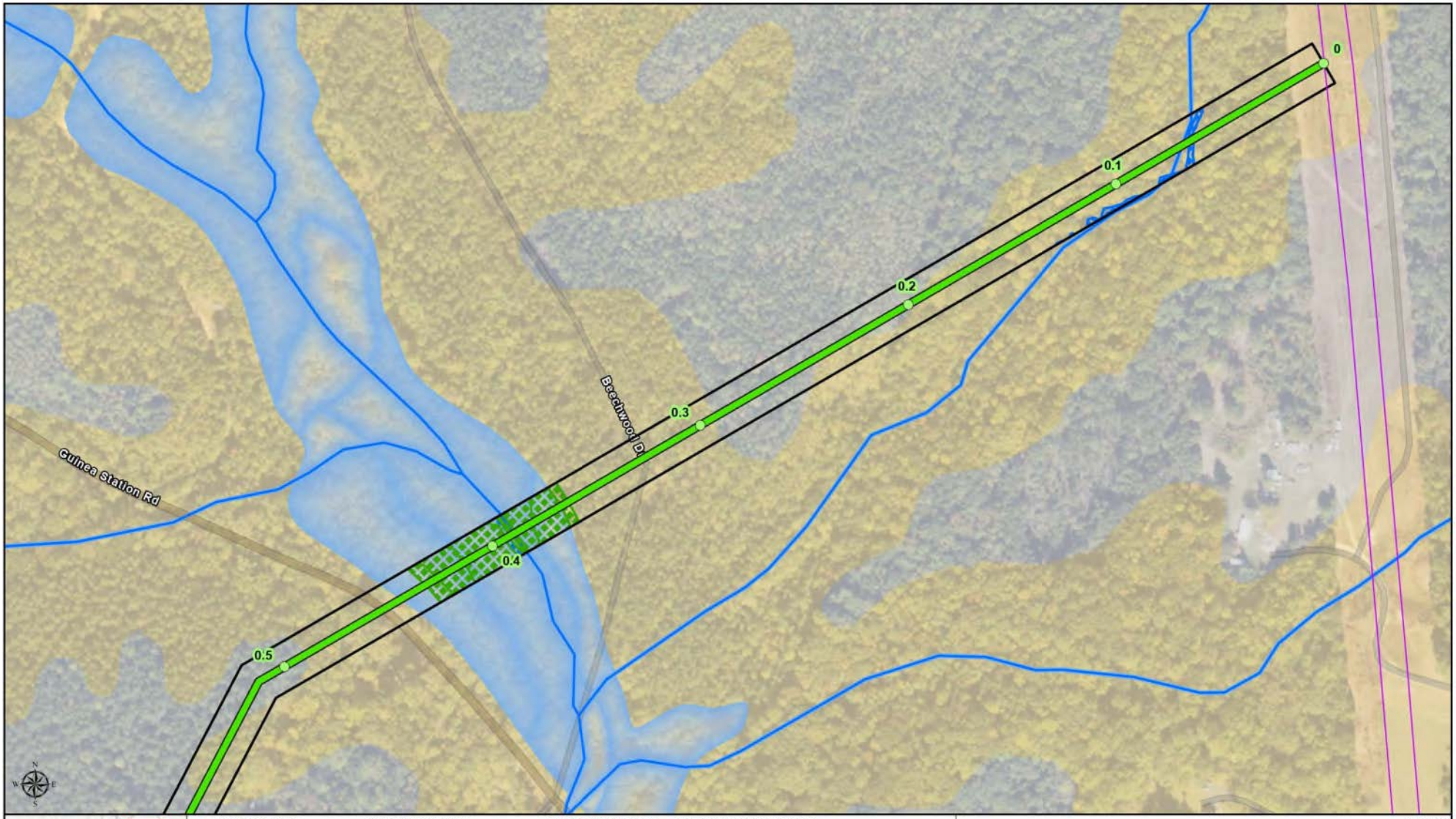

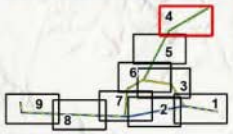

Dominion Exsiting Transmission Line
Route 4 MP

Route Alternatives
Route 4 (100ft Right-of-Way)

Wetland Cover Type
PFO
Riverine
NHD Stream
NWI Wetland

SSURGO Hydric Soil Rating
Nonhydric
Predominantly nonhydric

0 100 200
Feet
1:2,400

Attachment 2
Wetland Probability Map Set - Cowardin
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

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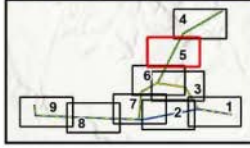

Route 4 MP

Route Alternatives
Route 4 (100ft Right-of-Way)

NHD Stream
NWI Wetland

SSURGO Hydric Soil Rating
Nonhydric
Predominantly nonhydric

0 100 200
Feet

1:2,400

Attachment 2
Wetland Probability Map Set - Cowardin
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

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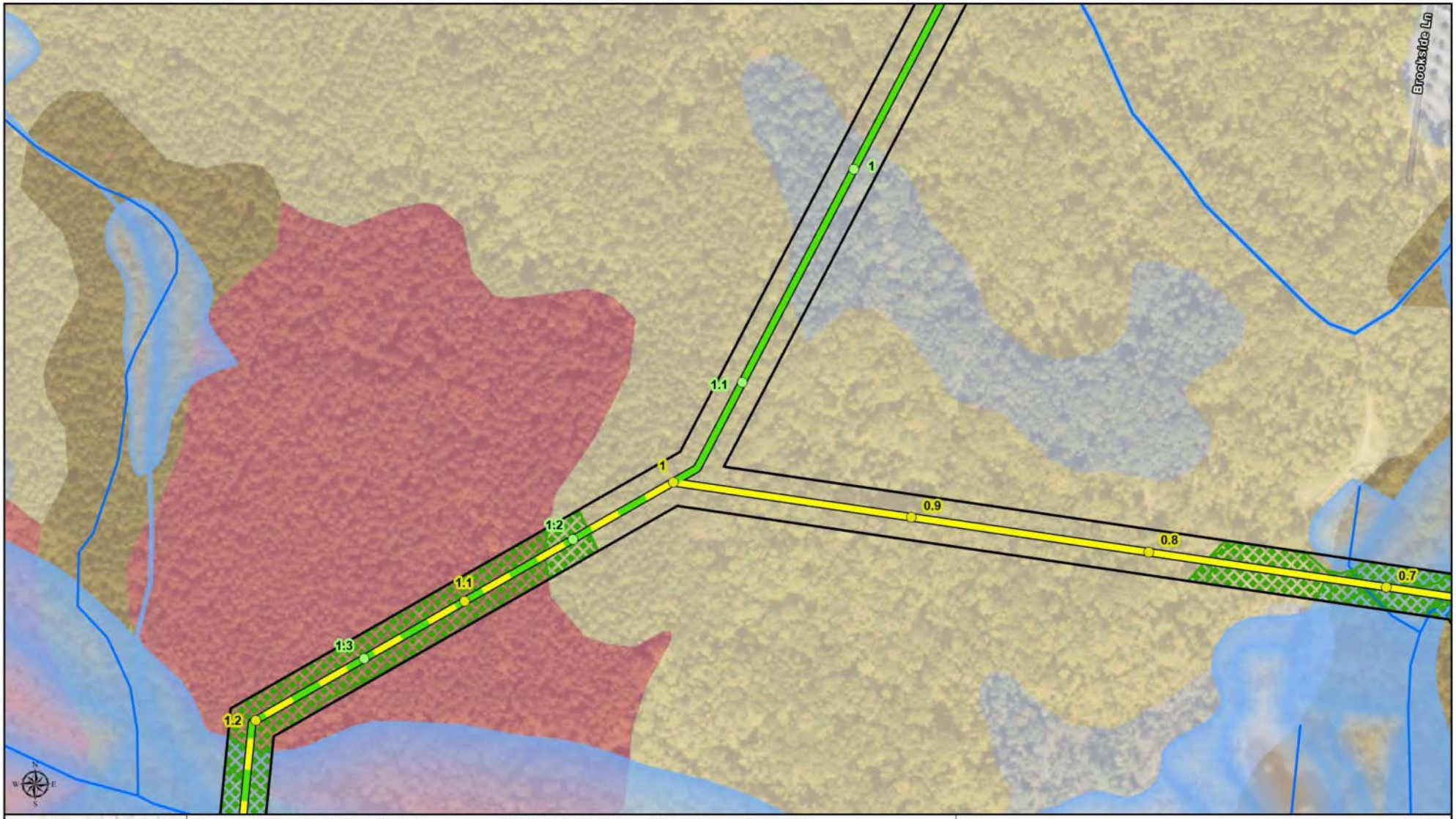

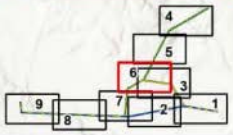

Route 3 MP
Route 4 MP

Route Alternatives
Route 3 (100ft Right-of-Way)
Route 4 (100ft Right-of-Way)

Wetland Cover Type
PFO
Riverine
NHD Stream
NWI Wetland

SSURGO Hydric Soil Rating
Nonhydric
Predominantly nonhydric
Partially hydric
Predominantly hydric

0 100 200
Feet
1:2,400

Attachment 2
Wetland Probability Map Set - Cowardin
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

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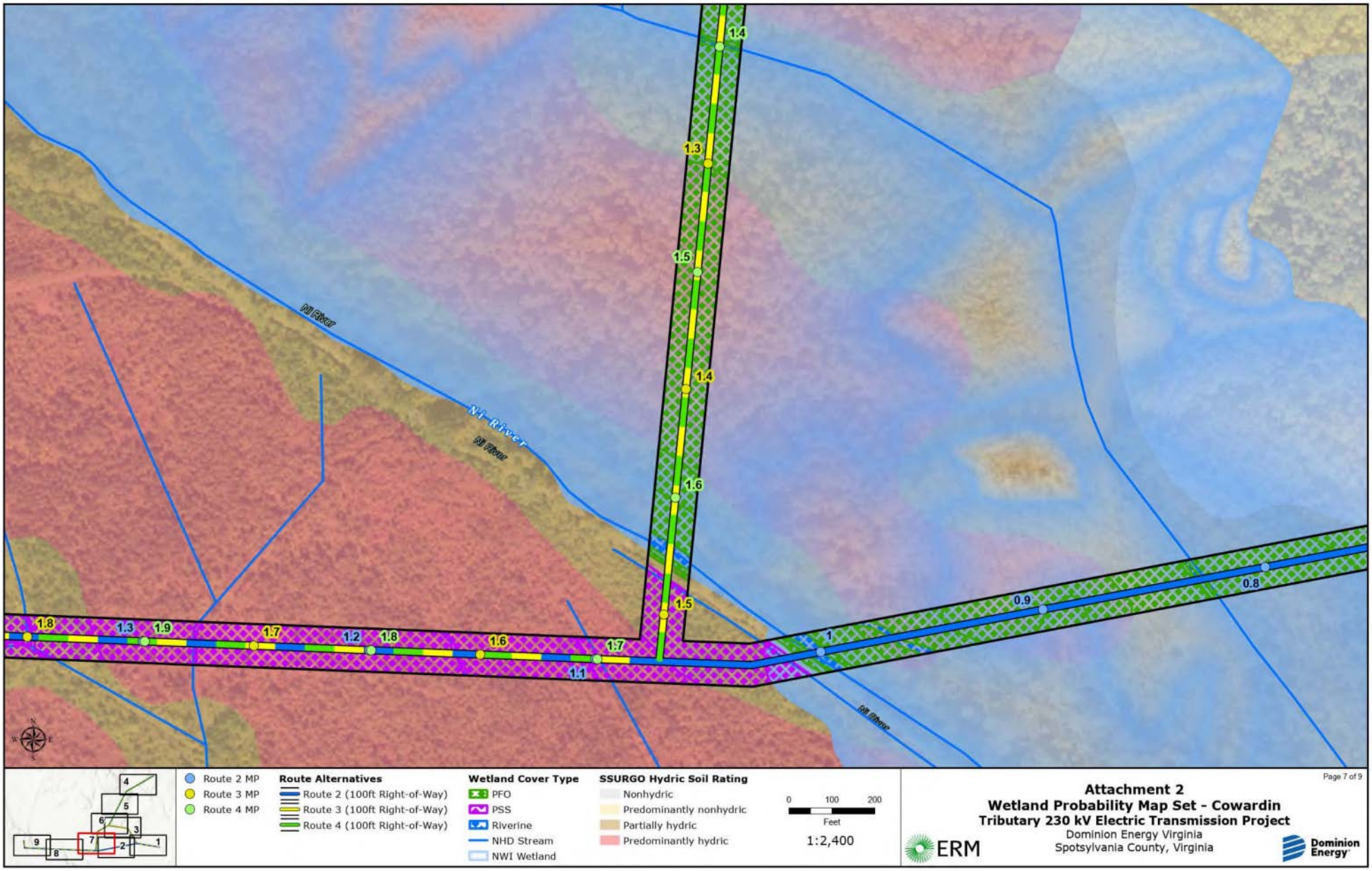

Attachment 2
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Dominion Energy Virginia
Spotsylvania County, Virginia

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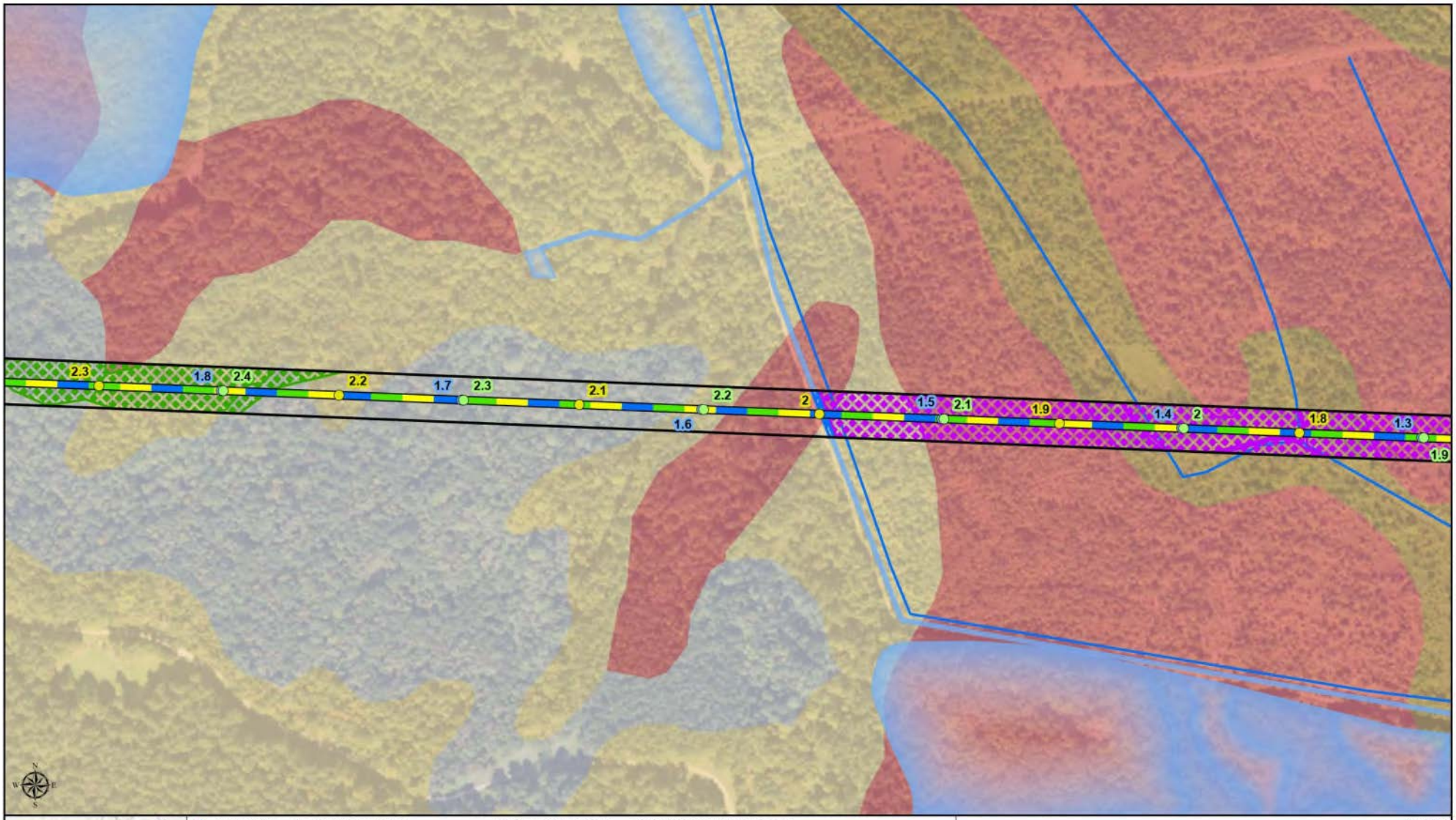

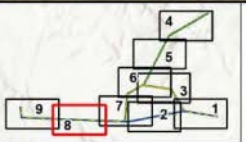

Route 2 MP
Route 3 MP
Route 4 MP

Route Alternatives
Route 2 (100ft Right-of-Way)
Route 3 (100ft Right-of-Way)
Route 4 (100ft Right-of-Way)

Wetland Cover Type
PFO
PSS
Riverine
NHD Stream
NWI Wetland

SSURGO Hydric Soil Rating
Nonhydric
Predominantly nonhydric
Partially hydric
Predominantly hydric

0 100 200
Feet
1:2,400

Attachment 2
Wetland Probability Map Set - Cowardin
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM
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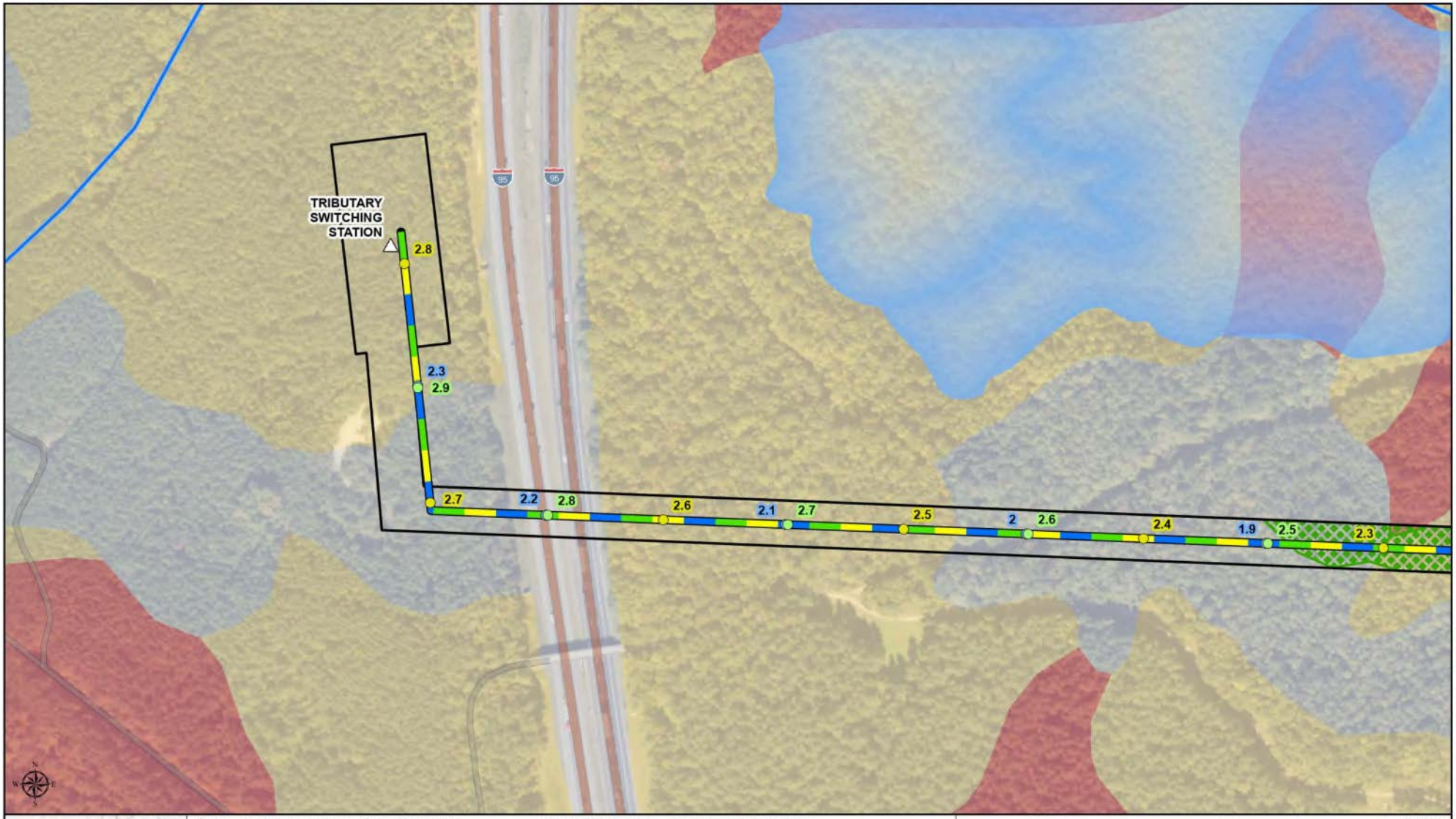
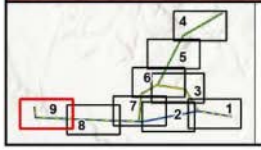




Proposed Switching Station
Route 2 MP
Route 3 MP
Route 4 MP

Route Alternatives
Route 2 (100ft Right-of-Way)
Route 3 (100ft Right-of-Way)
Route 4 (100ft Right-of-Way)

Wetland Cover Type
PFO
NHD Stream
NWI Wetland

SSURGO Hydric Soil Rating
Nonhydric
Predominantly nonhydric
Predominantly hydric

0 100 200
Feet

1:2,400

Attachment 2
Wetland Probability Map Set - Cowardin
Tributary 230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

ERM

Dominion Energy

APPENDIX E VDCR CORRESPONDENCE AND FEDERAL- AND STATE-LISTED SPECIES DATA

Travis A. Voyles
Secretary of Natural and Historic Resources

Matthew S. Wells
Director

Andrew W. Smith
Chief Deputy Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Frank N. Stovall
Deputy Director for Operations

Darryl Glover
Deputy Director for Dam Safety, Floodplain Management and Soil and Water Conservation

Laura Ellis
Deputy Director for Administration and Finance

May 31, 2024

Kathlynn Lewis
Environmental Resources Management, Inc.
919 E. Main Street, Suite 1701
Richmond, VA 23219

Re: Tributary Routing Study

Dear Ms. Lewis:

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 a DCR biologist and predicted suitable habitat modeling, there is potential for Small whorled pogonia (*Isotria medeoloides*, G2/S2/LT/LE) to occur in the project area if suitable habitat exists on site. Small whorled pogonia is a perennial orchid that grows in a variety of woodland habitats in Virginia, but tends to favor mid-aged woodland habitats on gently north or northeast facing slopes often within small draws. It is quite natural for plants of this species to remain dormant in the soil for long periods of time. Direct destruction, as well as habitat loss and alteration, are principal reasons for the species' decline (Ware, 1991). The Virginia Field Office of the U.S. Fish and Wildlife Service (USFWS) recommends that field surveys for this species be conducted in areas of Virginia south of Caroline County from May 25 through July 15 and in areas of Virginia from Caroline County and north from June 1 through July 20 (K. Mayne, pers. com. 1999). Please note that this species is currently classified as threatened by the USFWS and as endangered by the Virginia Department of Agriculture and Consumer Services (VDACS).

Due to the potential for this site to support populations of Small whorled pogonia, DCR recommends an inventory for the resource 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. For a list of USFWS-approved surveyors in Virginia visit https://www.fws.gov/media/collection-approved-surveyor-lists-project-review-process-virginia.

In addition, the proposed project may impact Ecological Cores **(C1, C3, C4, 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.

The proposed project may impact one or more cores with very high (C2) to outstanding (C1) ecological integrity. Further investigation of these impacts is recommended and DCR-DNH can conduct a formal impact analysis upon request. This analysis would estimate impacts to cores and habitat fragments, providing an estimate of the total acreage of direct and indirect impacts of the project. For more information about the analysis and service charges, please contact Joe Weber, DCR Chief of Biodiversity Information and Conservation Tools at Joseph.Weber@dcr.virginia.gov.

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 (https://www.dcr.virginia.gov/natural-heritage/document/nh-invasive-plant-list-2023.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 to the extent that it is consistent with erosion and sediment control requirements, robust monitoring, and an adaptive management plan to provide guidance if initial revegetation efforts are unsuccessful or if invasive species outbreaks occur.

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 and USFWS. 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.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

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 U.S. Fish and Wildlife Service (USFWS) utilizes an online project review process (https://www.fws.gov/office/virginia-ecological-services/virginia-field-office-online-review-process) to facilitate compliance with the Endangered Species Act (16 U.S.C. 1531-1544, 87 Stat. 884) (ESA), as amended. The process enables users to 1) follow step-by-step guidance; 2) access information that will allow them to identify threatened and endangered species, designated critical habitat, and other Federal trust resources that may be affected by their project; and 3) accurately reach determinations regarding the potential effects of their project on these resources as required under the ESA. If you have questions regarding the online review process, please contact Rachel Case at rachel_case@fws.gov.

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 at https://services.dwr.virginia.gov/fwis/ or contact Hannah Schul at Hannah.Schul@dwr.virginia.gov. According to the information currently in our files, the Po River, which has been designated by the VDWR as a "Threatened and Endangered Species Water" for the Atlantic sturgeon and the Dwarf wedgemussel, is within the submitted project boundary including a 100-foot buffer. Therefore, DCR recommends coordination with the USFWS, NOAA Fisheries and Virginia's regulatory authority for the management and protection of these species, the VDWR, to ensure compliance with protected species legislation.

Should you have any questions or concerns, please contact me at 804-225-2429. Thank you for the opportunity to comment on this project.

Sincerely,

Tyler Meader

Tyler Meader
Natural Heritage Locality Liaison

Cc: Brian Hopper, NOAA Fisheries-Protected Species Division
Hannah Schul, VDWR

Literature Cited

Ware, D.M.E. 1991. Small whorled pogonia. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia.

38,09,40.0 -77,29,23.5
is **the Search Point**

Show Position Rings
(•) Yes ( ) No
1 mile and 1/4 mile at the **Search Point**

Show Search Area
(•) Yes ( ) No
2 Search distance miles buffer

Search Point is at map center

Base Map Choices
Topography

Map Overlay Choices
Current List: Position, Search, BECAR, BAEANests, TEWaters, TierII, Habitat, Trout, Anadromous

Map Overlay Legend

T & E Waters
Federal
State

Predicted Habitat WAP Tier I & II
Aquatic
Terrestrial

Trout Waters
Class I - IV
Class V - VI

Anadromous Fish Reach
Confirmed
Potential

Impediment

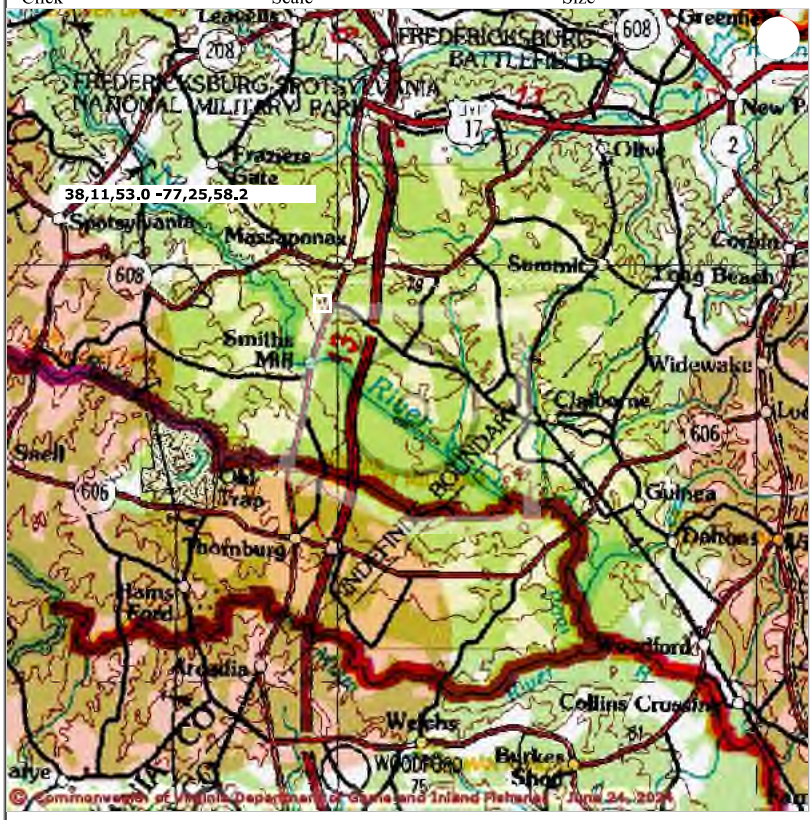
Position Rings 1 mile and 1/4 mile at the Search Point

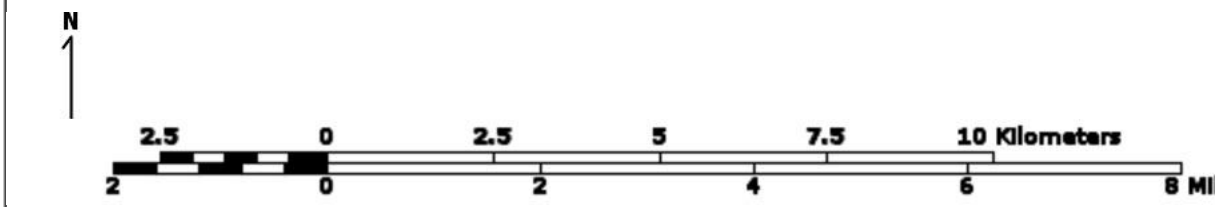
2 mile radius Search Area

Bald Eagle Concentration Areas and Roosts

Refresh Browser Page

Map Click Pan Id M Map Scale In Zoom Out Screen Size Small Size Big Help





Point of Search 38,09,40.0 -77,29,23.5
Map Location 38,09,39.8 -77,29,28.2

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

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

Map projection is UTM Zone 18 NAD 1983 with left 272147 and top 4236220. Pixel size is 20. . Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixles. The map display represents 19200 meters east to west by 19200 meters north to south for a total of 368.6 square kilometers. The map display represents 63002 feet east to west by 63002 feet north to south for a total of 142.3 square miles.

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

map assembled 2024-06-24 10:33:22 (qa/qc March 21, 2016 12:20 - tn=2195552.0 dist=3218 I)
$poi=38.1611300 -77.4898799

VaFWIS Search Report Compiled on 6/24/2024, 10:31:21 AM

Help

Known or likely to occur within a **2 mile buffer around polygon; center 38.1611300 -77.4898799** in **033 Caroline County, 177 Spotsylvania County, VA**

View Map of Site Location

493 Known or Likely Species ordered by Status Concern for Conservation (displaying first 25) (25 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
040228	FESE	Ia	Woodpecker, red-cockaded	Picoides borealis		BOVA
050023	FESE	Ia	Bat, Indiana	Myotis sodalis		BOVA
050022	FEST	Ia	Bat, northern long-eared	Myotis septentrionalis		BOVA,HU6
060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes	BOVA,TEWaters,Habitat,HU6
010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes	TEWaters
060029	FTST	IIa	Lance, yellow	Elliptio lanceolata	Yes	BOVA,TEWaters,HU6
050020	SE	Ia	Bat, little brown	Myotis lucifugus		BOVA,HU6
050027	FPSE	Ia	Bat, tri-colored	Perimyotis subflavus		BOVA,HU6
040293	ST	Ia	Shrike, loggerhead	Lanius ludovicianus		BOVA
040385	ST	Ia	Sparrow, Bachman's	Peucaea aestivalis		BOVA,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,HU6
010077		Ia	Shiner, bridle	Notropis bifrenatus	Yes	BOVA,Habitat,SppObs,HU6
100248		Ia	Fritillary, regal	Speyeria idalia idalia		BOVA,HU6
040052		IIa	Duck, American black	Anas rubripes		BOVA,HU6
040029		IIa	Heron, little blue	Egretta caerulea caerulea		BOVA
040036		IIa	Night-heron, yellow-crowned	Nyctanassa violacea violacea		BOVA
040181		IIa	Tern, common	Sterna hirundo		BOVA,HU6

040320		IIa	Warbler, cerulean	Setophaga cerulea		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
060175		IIb	Slabshell, Roanoke	Elliptio roanokensis		BOVA

To view **All 493 species** View 493

*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 (3 records)

View Map of All Anadromous Fish Use Streams

Stream ID	Stream Name	Reach Status	Anadromous Fish Species			View Map
			Different Species	Highest TE*	Highest Tier**	
P122	Po river	Potential	0			Yes
P123	Poni river	Potential	0			Yes
P98	Matta river	Potential	0			Yes

Impediments to Fish Passage (2 records)

View Map of All Fish Impediments

ID	Name	River	View Map
657	LAKE POCHAHONTAS	TR-PO RIVER	Yes
676	ROXBURY MILL DAM	PO RIVER	Yes

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters (48 Reaches - displaying first 20)

View Map of All Threatened and Endangered Waters

Stream Name	T&E Waters Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
Matta River (0134981)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Matta River (0138811)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Matta River (0139729)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Po River (0111858)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
Po River (0115787)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
Po River (0115878)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
Po River (0120003)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
		060029	FTST	IIa	Lance, yellow	Elliptio lanceolata	
Po River (0120303)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
		060029	FTST	IIa	Lance, yellow	Elliptio lanceolata	
Po River (0121297)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
Po River (0121311)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
Po River (0122017)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
		060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	
Po River (0123716)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
Po River (0127085)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
		060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	
Po River (0127726)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes

Po River (0130397)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
		060029	FTST	IIa	Lance, yellow	Elliptio lanceolata	
Po River (0131501)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
		060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	
Po River (0134510)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
Po River (0134980)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
		060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	
Po River (0135183)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
		060029	FTST	IIa	Lance, yellow	Elliptio lanceolata	
Po River (0138799)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
		060029	FTST	IIa	Lance, yellow	Elliptio lanceolata	
Po River (0142093)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
		060029	FTST	IIa	Lance, yellow	Elliptio lanceolata	
Po River (0142297)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
		060029	FTST	IIa	Lance, yellow	Elliptio lanceolata	
Poni River (0121106)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes

To view **All 48 Threatened and Endangered Waters records** View 48

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Species Observations (76 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**	
10183	SppObs	Oct 10 1983	W. and L. Starnes	13		I	Yes
337767	SppObs	Jan 1 1983	WCS-B-STARNES	13		I	Yes
15882	SppObs	Oct 23 1970	MILLSAPS ET AL.	14		I	Yes
333572	SppObs	Jan 1 1970	HSM-MILLSAPS	14		I	Yes
15885	SppObs	Jul 1 1969	VIMS	10		I	Yes
333454	SppObs	Jan 1 1969	VIMS-VA. INST. MAR. SCI.	14		I	Yes
15861	SppObs	Nov 11 1966	WOOLCOTT, LOOS, ET AL	17		I	Yes
333132	SppObs	Jan 1 1966	WSW-WOOLCOTT	21		I	Yes
624852	SppObs	May 17 2015	Brian ; Munford	2		III	Yes
621862	SppObs	Oct 15 2013	Wayne; Starnes	18		III	Yes
426195	SppObs	Jul 7 2005	VCU - INSTAR	4		III	Yes
426200	SppObs	Jul 7 2005	VCU - INSTAR	10		III	Yes
11568	SppObs	Jun 13 1989	ANGERMEIER ET AL	9		III	Yes
426235	SppObs	Jun 13 1989	VCU - INSTAR	9		III	Yes
10186	SppObs	Apr 18 1971	Gilbert and Seaman	17		III	Yes
333779	SppObs	Jan 1 1971	CRG-GILBERT	17		III	Yes
15860	SppObs	Oct 29 1969	WOOLCOTT	23		III	Yes
332526	SppObs	Jan 1 1958	WSW-WOOLCOTT	30		III	Yes
331188	SppObs	Jan 1 1934	CLH-HUBBS	17		III	Yes
29802	SppObs	Jan 1 1900	Mitchell, J. C.	1		III	Yes

Displayed 20 Species Observations

Selected 76 Observations View all 76 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					
Matta River (20801051)	FESE	010077		Ia	Shiner, bridle	Notropis bifrenatus	Yes

		060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	
Matta River (20801051)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
Mattaponi River (20801051)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
Ni River (20801051)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
Po River (20801051)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
tributary (20801051)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes
tributary (20801051)	FESE	060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon	Yes

Habitat Predicted for Terrestrial WAP Tier I & II Species

N/A

Virginia Breeding Bird Atlas Blocks (4 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**	
51143	Guinea, CW	30		III	Yes
51146	Guinea, SE	67		III	Yes
50144	Spotsylvania, CE	27		III	Yes
50146	Spotsylvania, SE	56		IV	Yes

Public Holdings: (1 names)

Name	Agency	Level
Fredericksburg & Spotsylvania National Military Park	National Park Service	Federal

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

FIPS Code	City and County Name	Different Species	Highest TE	Highest Tier
033	Caroline	374	FESE	I
177	Spotsylvania	379	FESE	I

USGS 7.5' Quadrangles:
Ladysmith
Spotsylvania

Woodford
Guinea

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
RA47	Massaponax Creek	53	SS	I
YO38	Ni River	54	FESE	I
YO41	Po River-Lake Pocahontas	54	FESE	I
YO42	Poni River	62	FESE	I
YO45	Matta River	58	FESE	I
YO47	Mattaponi River-Campbell Creek	64	FTSE	I

Compiled on 6/24/2024, 10:31:21 AM I2195552.0 report=all searchType= P dist= 3218 poi= 38.1611300 -77.4898799 siteDD= 38.1836000 -77.5153548;38.1485090 -77.5256548;38.1378890 -77.4906358;38.1390590 -77.4583628;38.1834200 -77.4633988;38.1836000 -77.5153548;

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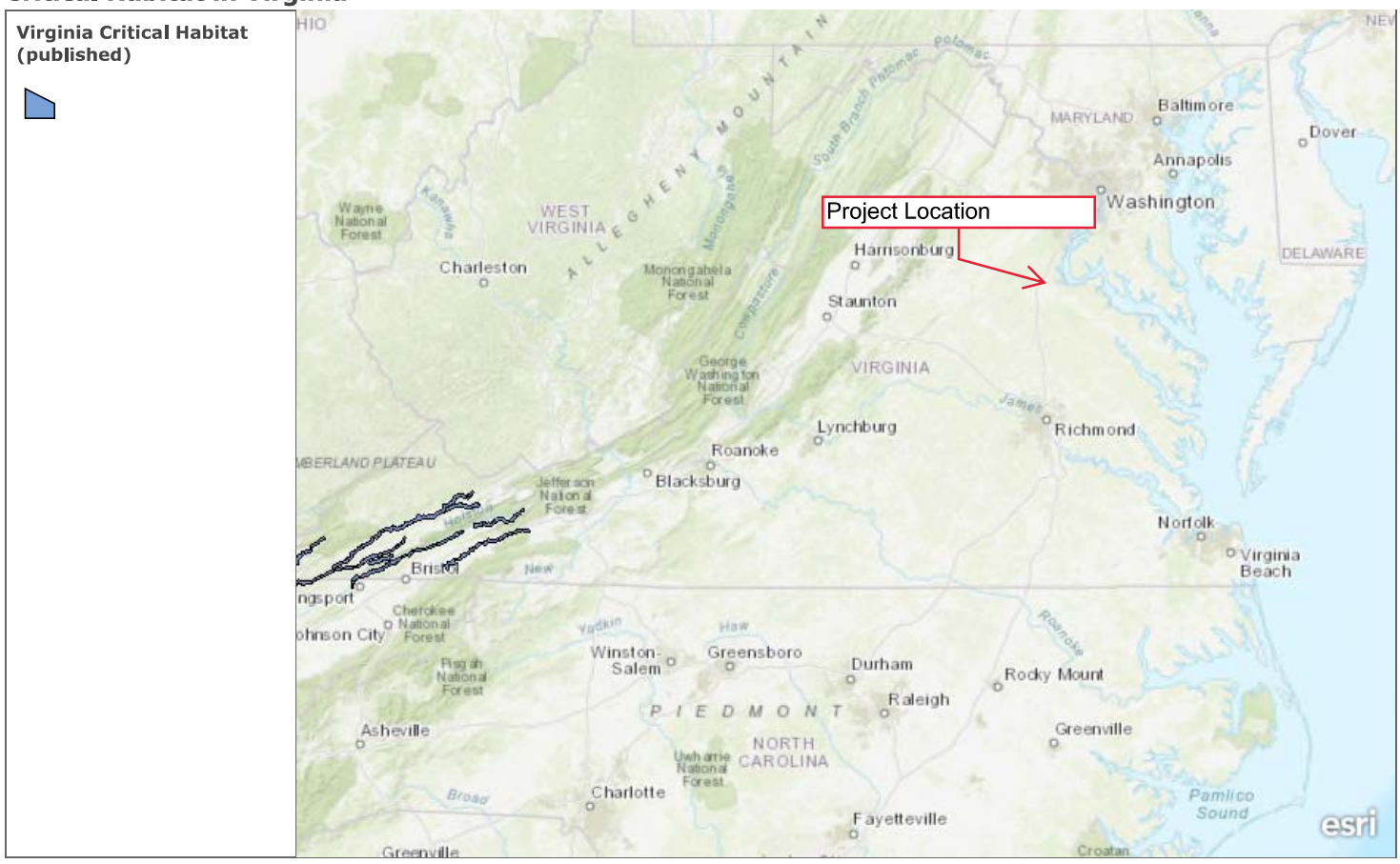
Critical Habitat in Virginia



Designated and proposed critical habitat in Virginia

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

In Reply Refer To: 08/23/2024 21:45:10 UTC
Project Code: 2024-0134822
Project Name: Tributary

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: 2024-0134822
Project Name: Tributary
Project Type: Transmission Line - New Constr - Above Ground
Project Description: The purpose of the project is to provide electrical service requested by a data center customer in Spotsylvania County

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@38.160779250000004,-77.4911840003966,14z

Counties: Caroline and Spotsylvania counties, Virginia

ENDANGERED SPECIES ACT SPECIES

There is a total of 7 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
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
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
Yellow Lance *Elliptio lanceolata* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4511	Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Small Whorled Pogonia *Isotria medeoloides* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890	Threatened

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: Private Entity
Name: Madison Adams
Address: 222 South 9th Street, Suite 2900
City: Minneapolis
State: MN
Zip: 55402
Email madisonkadams16@gmail.com
Phone: 2188397343

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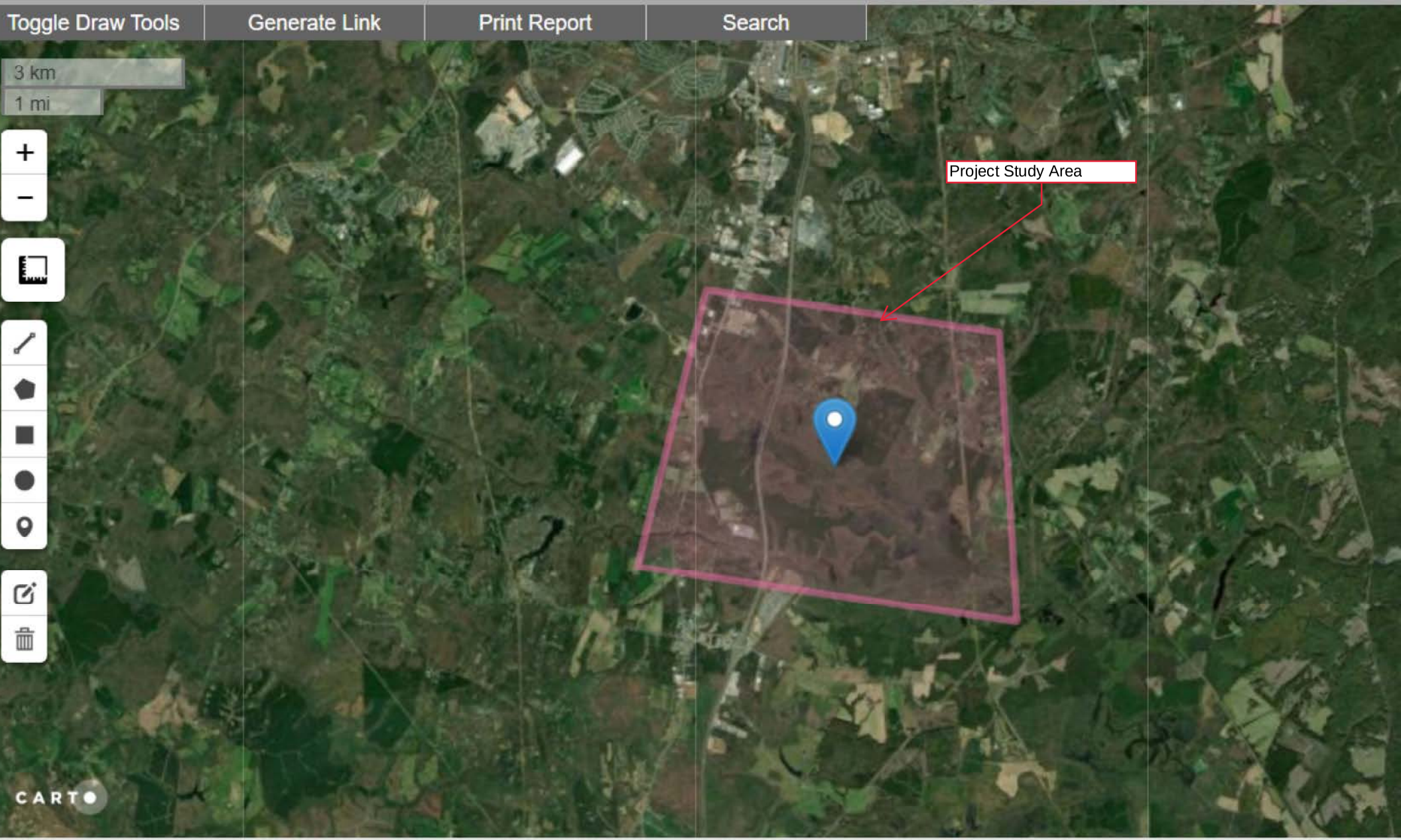
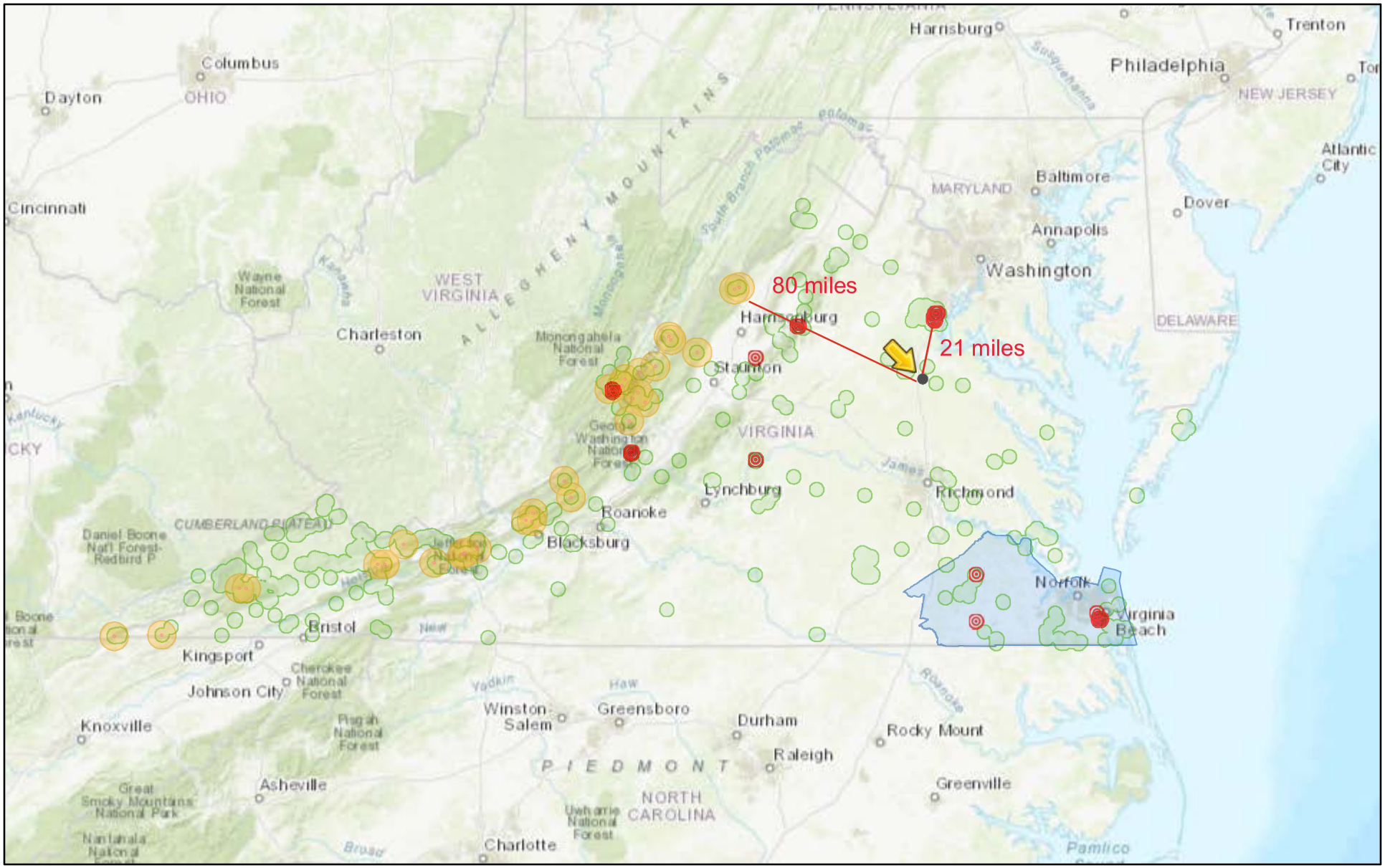
Help / FAQ



NLEB Locations and Roost Trees



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0 30 60 120 mi

0 50 100 200 km

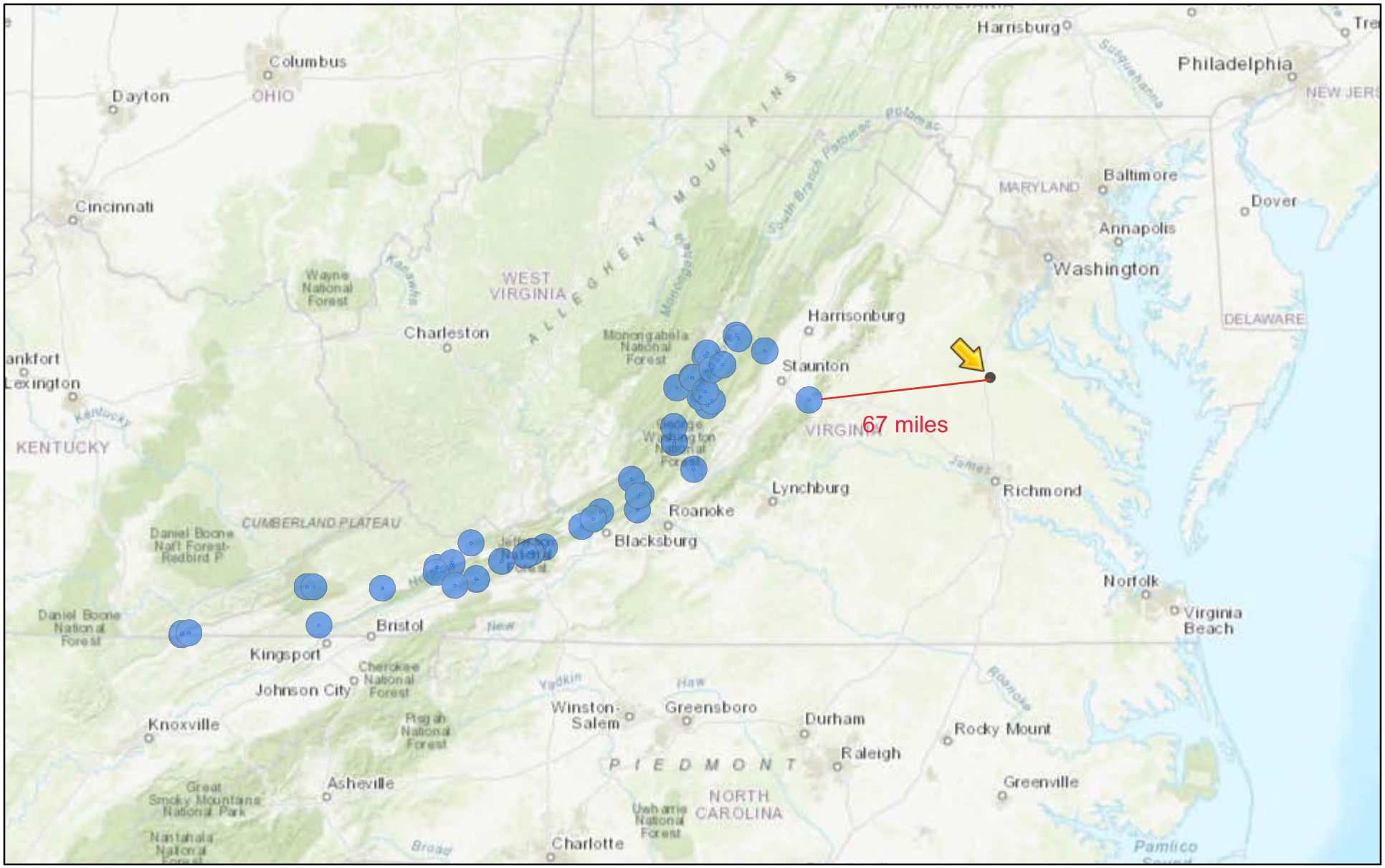
Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS

- NLEB Known Occupied Maternity Roost (Summer Habitat)
- NLEB Roost Tree 150-Foot Buffer
- NLEB Hibernaculum Half Mile Buffer
- NLEB Hibernaculum 5.5 Mile Buffer
- NLEB Capture 3 Mile Buffer
- NLEB Year-Round Presence

VA Dept. Game & Inland Fisheries

Virginia Geographic Information Network (VGIN), and the Census and Localities and Towns submitting data to the project | Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS |

ArcGIS Web Map



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Tri-colored and Little Brown Hibernaculum Half Mile Buffer

Tri-colored and Little Brown Hibernaculum 5.5 Mile Buffer

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0 50 100 200 km

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

Dept. Game and Inland Fisheries

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

APPENDIX F VISUAL SIMULATIONS

EXISTING CONDITIONS

PROPOSED CONDITIONS

TRIBUTARY

230 kV Electric Transmission Project
Dominion Energy Virginia
Spotsylvania County, Virginia

Dominion Energy

KOP 001

Flippo Dr

Route: 4
Date:05/21/2024
Time: 10:19 am
Viewing Direction: Northwest
Distance to closest feature: 0.3 miles

Legend

- Proposed Substation
- Dominion Existing Transmission Line
- KOP View Direction
- Route 4
- Route 4 100ft Right of Way

Note: This simulation shows the proposed conditions for the Tributary project and the Ladysmith – St John's – Lees Hill 230 kV rebuild project. Proposed conditions display structures are subject to changed based on SCC approval and final engineering.

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.

TRIBUTARY
230 kV Electric Transmission Project23
Dominion Energy Virginia
Spotsylvania County, Virginia

Dominion Energy

KOP 003A

KOA Campsite Entrance, Guinea Rd

Route: 4
Date:05/21/2024
Time: 10:46 am
Viewing Direction: Northwest
Distance to closest feature: 453 ft

Legend

- Proposed Substation
- Dominion Existing Transmission Line
- KOP View Direction
- Route 4
- Route 4 100ft Right of Way

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.

EXISTING CONDITIONS

YELLOW: PARTIALLY OR FULLY HIDDEN PROJECT INFRASTRUCTURE

TRIBUTARY

230 kV Electric Transmission Project23

Dominion Energy Virginia

Spotsylvania County, Virginia

Dominion Energy

KOP 004 West

KOA Campsite

Route: 3

Date:05/21/2024

Time: 11:29 am

Viewing Direction: West

Distance to closest feature: 0.27 miles

Legend

- Dominion Existing Transmission Line
- KOP View Direction
- Route 3
- Route 3 100ft Right of Way

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.

EXISTING CONDITIONS

YELLOW: PARTIALLY OR FULLY HIDDEN PROJECT INFRASTRUCTURE

TRIBUTARY

230 kV Electric Transmission Project23

Dominion Energy Virginia

Spotsylvania County, Virginia

Dominion Energy

KOP 004 West

KOA Campsite

Route: 4

Date:05/21/2024

Time: 11:29 am

Viewing Direction: West

Distance to closest feature: 906 ft

Legend

- Dominion Existing Transmission Line
- KOP View Direction
- Route 4
- Route 4 100ft Right of Way

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.

TRIBUTARY
230 kV Electric Transmission Project23
Dominion Energy Virginia
Spotsylvania County, Virginia

Dominion Energy

KOP 004 South

KOA Campsite

Route: 3
Date:05/21/2024
Time: 11:29 am
Viewing Direction: South
Distance to closest feature: 0.27 miles

EXISTING CONDITIONS

YELLOW: PARTIALLY OR FULLY HIDDEN PROJECT INFRASTRUCTURE

Legend

- Dominion Existing Transmission Line
- KOP View Direction
- Route 3
- Route 3 100ft Right of Way

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.

TRIBUTARY
230 kV Electric Transmission Project23
Dominion Energy Virginia
Spotsylvania County, Virginia

Dominion Energy

KOP 004 South

KOA Campsite

Route: 4
Date:05/21/2024
Time: 11:29 am
Viewing Direction: South
Distance to closest feature: 906 ft

EXISTING CONDITIONS

YELLOW: PARTIALLY OR FULLY HIDDEN PROJECT INFRASTRUCTURE

Legend

- Dominion Existing Transmission Line
- KOP View Direction
- Route 4
- Route 4 100ft Right of Way

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.

EXISTING CONDITIONS

YELLOW: PARTIALLY OR FULLY HIDDEN PROJECT INFRASTRUCTURE

TRIBUTARY

230 kV Electric Transmission Project23

Dominion Energy Virginia

Spotsylvania County, Virginia

Dominion Energy

KOP 007

Riverview Elementary School

Route: 2,3,4

Date:05/21/2024

Time: 4:04 pm

Viewing Direction: Northeast

Distance to closest feature: 0.21 miles

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 OF CULTURAL RESOURCES

230 kV Line #2090 Extension and Tributary Switching Station Project

Pre-Application Analysis

PREPARED FOR

Dominion Energy Virginia

DATE
30 September 2024

REFERENCE
0723442

DOCUMENT DETAILS

The details entered below are automatically shown on the cover and the main page footer. PLEASE NOTE: This table must NOT be removed from this document.	
DOCUMENT TITLE	230 kV Line #2090 Extension and Tributary Switching Station Project
DOCUMENT SUBTITLE	Pre-Application Analysis
PROJECT NUMBER	0723442
Date	30 September 2024
Version	01
Author	Mary Beth Derrick, Jeffrey Holland, Eric Johnson, MacKenzie Carroll, and Larissa A. Thomas, Ph.D.
Client name	Dominion Energy Virginia

DOCUMENT HISTORY

				ERM APPROVAL TO ISSUE		
VERSION	REVISION	AUTHOR	REVIEWED BY	NAME	DATE	COMMENTS
Version	001	Mary Beth Derrick			09.03.2024	
				Larissa Thomas	09.05.2024	
				Mariah Weitzenkamp	09.26.2024	

SIGNATURE PAGE

230 kV Line #2090 Extension and Tributary Switching Station Project

Pre-Application Analysis

0723442

Mary Beth Derrick
Senior Architectural Historian

Jeffrey Holland
Senior Historian

MacKenzie Carroll
Architectural Historian

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ERM
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Suite 300
Duluth, GA 30096

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

Acronyms	Description
3D	Three dimensional
CMOA	Complementary Metal Oxide Semiconductor
ERM	Environmental Resources Management
ESRI	Environmental Systems Research Institute
GNSS	Global Navigation Satellite System
ISO	International Organization for Standardization
JPEG	Joint Photographic Experts Group format
KOA	Kampgrounds of America
KOP	Key Observation Point
kV	Kilovolt
NHL	National Historic Landmark
NPS	National Park Service
NRHP	National Register of Historic Places
PBR	Physically Based Rendering
PDF	Portable Document Format
Project	Tributary 230 kV Electric Transmission Project
RAW	an unprocessed image
REC	Rappahannock Electric Company
ROW	Right-Of-Way
SCC	State Corporation Commission
SLR	Single-Lens Reflex
USDA	United States Department of Agriculture
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VCRIS	Virginia Cultural Resource Information System
VDHR	Virginia Department of Historic Resources
VLR	Virginia Landmarks Register

EXECUTIVE SUMMARY

This report presents the findings of the pre-application analysis for Virginia Electric and Power Company's (Dominion Energy Virginia, Dominion, or the Company) proposed new 230 kilovolt (kV) line extension and Tributary Switching Station (Tributary Station) in Spotsylvania County, Virginia. The Tributary Station and the 230 kV Line #2090 extension are collectively referred to as the Project. The purpose and need for the Project is to provide transmission service to Rappahanock Electric Company (REC; the Customer), with the request being prompted by the growing data center development in the area; to maintain reliable service for the overall load growth in the area; and to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards. To meet the Project purpose and need, Dominion proposes to:

- Construct a new 230 kV delivery point switching station (Tributary Station), which will provide interconnection to REC to serve its customer, the SpotsyTech Campus, a planned mixed-use technology park development which includes a data center; and
- Extend the Company's existing 230 kV Fredericksburg – Ladysmith CT Line #2090 by constructing a new double circuit overhead 230 kV line on new approximately 100-foot-wide right-of-way by cutting the Company's existing 230 kV Fredericksburg – Ladysmith CT Line #2090. The cut in will result in (i) new 230 kV Line #2404, and (ii) 230 kV Line #2090 from Ladysmith CT to the proposed Tributary Station.

ERM identified three overhead alternative routes (Route 2, Route 3, and Route 4), as discussed in the Environmental Routing Study that will be attached to the Virginia State Corporation Commission (SCC) application for the Project.

This pre-application analysis assesses and compares potential impacts on previously recorded historic and archaeological resources in relation to each alternative route. Impacts from the proposed Tributary Station are also considered, although they would be the same for all of the alternative routes. Environmental Resources Management, Inc. (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 pre-application 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).

No previously recorded archaeological sites are within the right-of-way for any of the three alternative routes.

Five 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 transmission line routes. The likely impacts on individual historic resources associated with each alternative route are presented in the table below.

Route 4 passes near the smallest number of considered historic resources (three), while Routes 2 and 3 each pass near five. ERM recommends that Route 2 would have no impact on four resources

and a minimal impact on one; that Route 3 would have no impact on four resources and a moderate impact on one; and that Route 4 would have no impact on two resources and a minimal impact on one. Route 4 appears to present the least impact on cultural resources, with the smallest number of considered historic resources near this alternative and only a minimal impact in one case. Route 3 appears to present the greatest impact on cultural resources, with a moderate impact on one of the resources.

TABLE 1 EXECUTIVE SUMMARY OF PROJECT IMPACTS TO CONSIDERED ABOVEGROUND HISTORIC RESOURCES IN THE STUDY AREA OF THE ALTERNATIVE ROUTES

Considered Resource	Alternative Routes		
	Route 2	Route 3	Route 4
016-0094	None	None	-
088-0100	None	None	-
088-0143	None	None	None
088-0256	Minimal	Moderate	Minimal
088-0297	None	None	None

VCRIS 2024

1. INTRODUCTION

This report presents the findings of the pre-application analysis for Virginia Electric and Power Company's (Dominion Energy Virginia, Dominion, or the Company) proposed new 230 kilovolt (kV) line extension and Tributary Switching Station (Tributary Station) in Spotsylvania County, Virginia. The Tributary Station and the 230 kV Line #2090 extension are collectively referred to as the Project. The purpose and need for the Project is to provide transmission service to Rappahanock Electric Company (REC; the Customer), with the request being prompted by the growing data center development in the area; to maintain reliable service for the overall load growth in the area; and to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards. To meet the Project purpose and need, Dominion proposes to:

- Construct a new 230 kV delivery point switching station (Tributary Station), which will provide interconnection to REC to serve its customer, the SpotsyTech Campus, a planned mixed-use technology park development which includes a data center; and
- Extend the Company's existing 230 kV Fredericksburg – Ladysmith CT Line #2090 by constructing a new double circuit overhead 230 kV line on new approximately 100-foot-wide right-of-way by cutting the Company's existing 230 kV Fredericksburg – Ladysmith CT Line #2090. The cut in will result in (i) new 230 kV Line #2404, and (ii) 230 kV Line #2090 from Ladysmith CT to the proposed Tributary Station.[1]

ERM identified three overhead alternative routes (Route 2, Route 3, and Route 4), as discussed in the Environmental Routing Study that will be attached to the Virginia State Corporation Commission (SCC) application for the Project.

This pre-application analysis assesses potential impacts on previously recorded historic and archaeological resources in relation to each alternative route. Impacts from the proposed Tributary Station are also considered, although they would be the same for all of the alternative routes. 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 pre-application analysis is a required study for transmission line projects regulated by the Virginia 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).

[1] Segments of Line #2090 (Fredericksburg – Ladysmith CT) will be renumbered several times as a result of other projects in the Fredericksburg – Ladysmith CT corridor. Line #2090 will be renumbered to 230 kV Line #2301 between Fredericksburg and Lee's Hill Substations, and to 230 kV Line #2335 between Lee's Hill and New Post Substations. After this Project is completed, 230 kV Line #2090 will again be renumbered to Line #2404 between New Post and Tributary Stations, with existing 230 kV Line #2090 extending between Tributary Station and Ladysmith CT only. See SCC Appendix Attachments I.A.3, I.A.4, and I.A.5 for one-line diagrams of: (i) the existing transmission system in the Project load area, (ii) the Project load area after the New Post and Lee's Hill Substations are built, and (iii) the Project load area after the Project is energized.

1.1 OVERVIEW

Three alternative routes (Routes 2, 3, and 4) are under consideration for the new overhead transmission lines. A map depicting each alternative route and the proposed Tributary Station is provided as Figure 1.

1.1.1 ROUTE 2

Route 2 extends from a tap along the Company's existing Line #2090 to the proposed Tributary Station. The tap is approximately 0.5 mile south of where the existing transmission line crosses Guinea Station Road along the southern boundary of the study area. From there, Route 2 heads west-northwest for about 0.4 mile, passing through forested land before angling southwest through forest for about 0.7 mile, passing through a portion of the Kampgrounds of America (KOA) campground and crossing the Ni River. On the south side of the Ni River, the route turns west, crossing agricultural and forested land for about 1.2 miles and crossing Interstate 95 (I-95). On the west side of I-95, the route turns north for about 0.1 mile and enters the Tributary Station.

Route 2 measures approximately 2.4 miles long. The right-of-way for this alternative (28.1 acres) and the proposed Tributary Station site (2.2 acres) would encompass a combined 30.3 acres.

1.1.2 ROUTE 3

Route 3 extends from the same point as Route 2 (a tap along the Company's existing Line #2090 about 0.5 mile south of Guinea Station Road) to the proposed Tributary Station. From here, Route 3 heads west-northwest for about 0.4 mile before turning north-northwest for about 0.3 mile. At this point, the route turns west and crosses the KOA campground. On the west edge of the campground, the route turns south-southwest for about 0.5 mile, paralleling an undeveloped, forested parcel boundary and crossing the Ni River. On the south side of the river, the route turns west, following the same alignment as Route 2 for the remaining 1.3 miles to the Tributary Station.

Route 3 measures approximately 2.8 miles long. The right-of-way for this alternative (33.5 acres) and the proposed Tributary Station site (2.2 acres) would encompass a combined 35.7 acres.

1.1.3 ROUTE 4

Route 4 extends from a tap along the Company's existing Line #2090 approximately 0.7 mile north of the intersection of the existing transmission line and Guinea Station Road along the southern boundary of the study area. From here, Route 4 heads south-southwest for about 1.1 mile, passing through forested land and crossing Guinea Station Road. Just west of the KOA campground, the route would use the same alignment as Routes 2 and 3, turning west-southwest for about 0.5 mile and then west for about 1.2 mile, crossing I-95 and turning north into the Tributary Station.

Route 4 measures approximately 3.0 miles long. The right-of-way for this alternative (35.4 acres) and the proposed Tributary Station site (2.2 acres) would encompass a combined 37.6 acres.

1.2 MANAGEMENT RECOMMENDATIONS

No archaeological sites were identified within or adjacent to the alternative routes' rights-of-way.

Five 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 transmission line routes. Route 4 passes near the smallest number of considered historic resources (three), while Routes 2 and 3 each pass near five.

ERM recommends that Route 2 would have no impact on four resources and a minimal impact on one, that Route 3 would have no impact on four resources and a moderate impact on one resource, and that Route 4 would have no impact on two resources, and a minimal impact on one resource.

Based on the above findings, ERM recommends that Route 4 would have the smallest impact on cultural resources, with only three considered historic resources near the route and only a minimal impact in one case. Routes 2 and 3 both have the same five considered historic resources near their routes with the same impact recommendations except for one resource: 088-0256. Route 3 would have a moderate impact on 088-0256, while Route 2 would have a minimal impact on the resource. Thus, Route 4 appears to present the best possible route for the Project with respect to known cultural resource impacts. Route 2 would be the second-best possible route in terms of cultural resource impacts because while it has the same considered historic resources as Route 3, its impacts do not exceed minimal. More information about each resource and the nature of potential impacts associated with the various alternative routes are found in the sections that follow.

FIGURE 1 OVERVIEW OF ALTERNATIVE TRANSMISSION LINE ROUTES

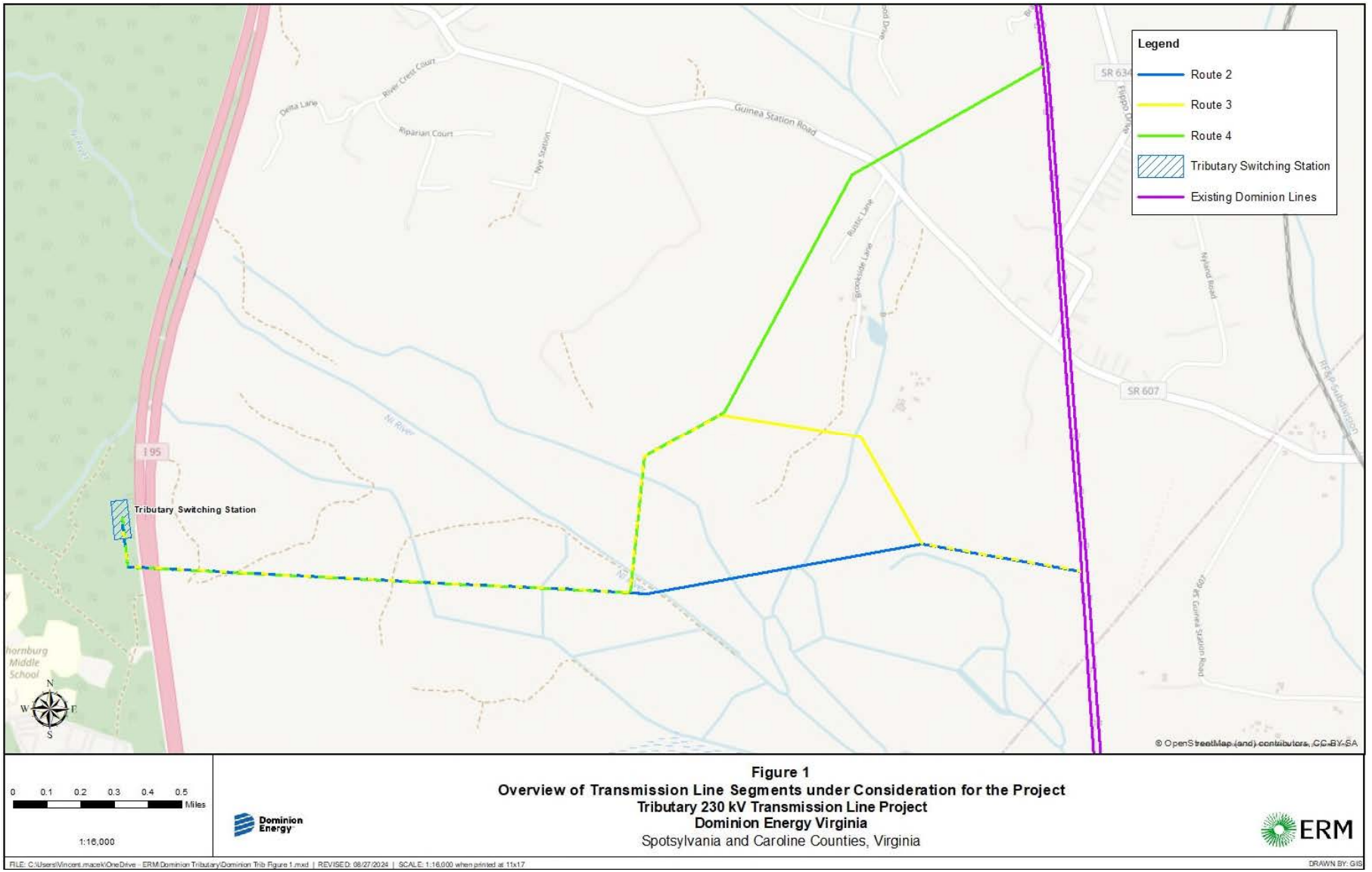


Figure 1
Overview of Transmission Line Segments under Consideration for the Project
Tributary 230 kV Transmission Line Project
Dominion Energy Virginia
Spotsylvania and Caroline Counties, Virginia

FILE: C:\Users\Vincent.macek\OneDrive - ERM\Dominion Tributary\Dominion Trib Figure 1.mxd | REVISED: 08/27/2024 | SCALE: 1:16,000 when printed at 11x17 DRAWN BY: GIS

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 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 each centerline;
- NRHP-listed properties, NHLs, battlefields, and historic landscapes within a 1.0-mile radius of each centerline;
- NRHP-eligible and NRHP-listed properties, NHLs, battlefields, and historic landscapes within a 0.5-mile radius of each centerline; and
- All of the above qualifying resources as well as archaeological sites within the right-of-way for each alternative route.

Information on the considered resources in each study tier was collected from the Virginia Cultural Resource Information System (VCRIS).

In addition to VCRIS, ERM collected information from the Spotsylvania Historical Association (2024), Visit Spotsylvania County (2024), and the African American Heritage Trail (2024) to identify locally significant resources within a 1.0-mile radius of the centerline for each route. ERM also included architectural resources within a 1.0-mile radius of each centerline that were mentioned in a May 21, 2024 letter to Dominion from Michele M. and Edward P. Schiesser about sensitive resources in their area. These resources were included in the locally significant category.

Along with the records review carried out for the four tiers as defined by VDHR, ERM also conducted field assessments of the considered aboveground resources for each alternative route in accordance with the Guidelines. Digital photographs were taken of each historic resource in addition to views from each resource towards the alternative routes. Photo simulations and vegetated visual analyses were then prepared to assess potential viewshed impacts from construction of the transmission line alternatives for each considered resource.

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). However, no known archaeological sites were identified within the right-of-way for any of the alternative transmission line routes.

2.3 HISTORIC RESOURCES

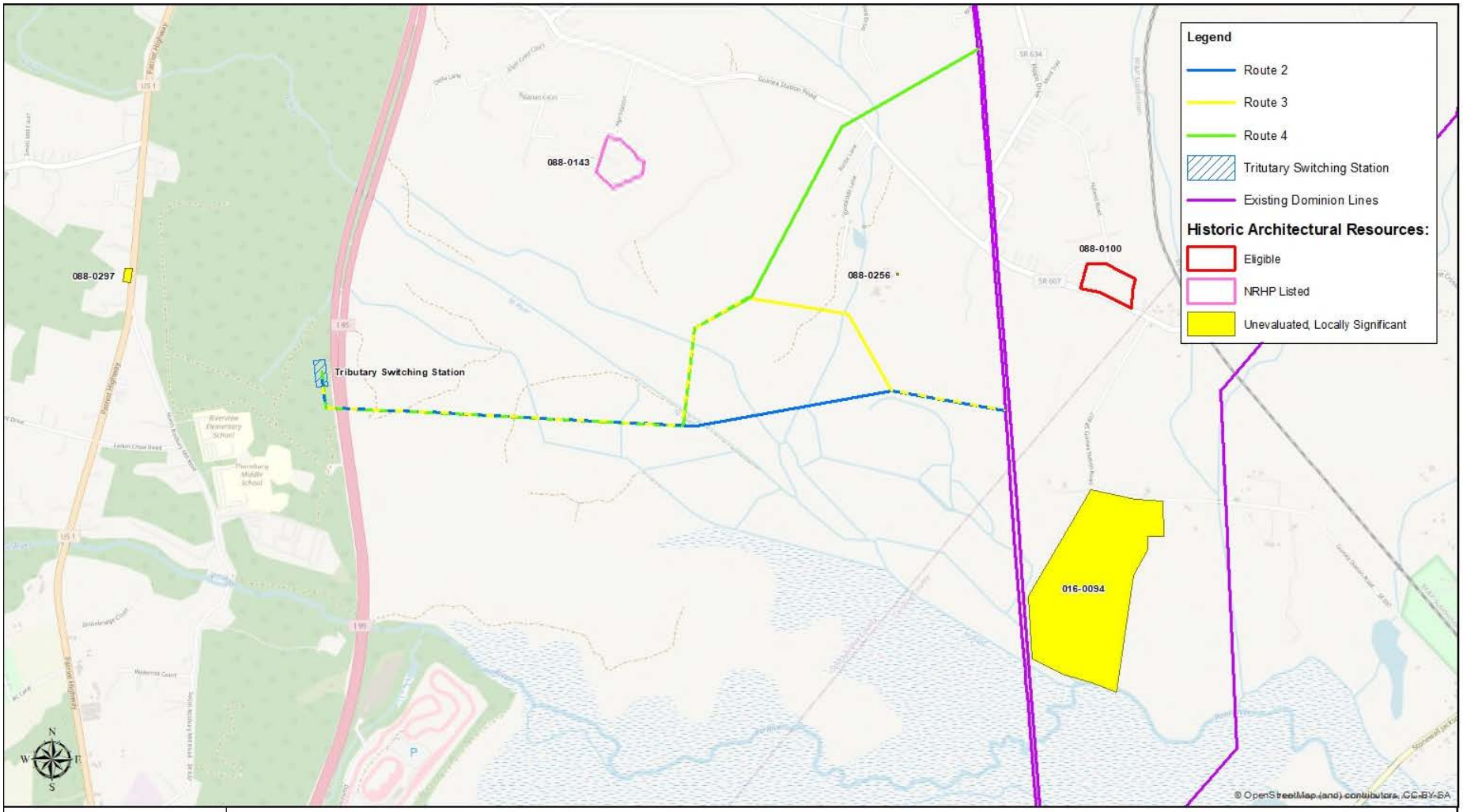
The following discussion summarizes the known resources in the vicinity of each Project alternative according to VDHR's tiered study area model. The locations of the considered historic resources and the alternative routes are shown in Figure 2. Individual maps for each alternative route are located in Attachment 1.

Resources located within the right-of-way of a route may be subject to both direct impacts from placement of the line across the property as well as visual impacts from a change to the viewshed due to the introduction of new transmission line structures and conductors. Resources in the 0.5-mile tier would not be directly impacted, but would likely be visually impacted, unless topography, vegetation, or the built environment obscures the view to the transmission lines. 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 lines. Beyond 1.0 mile, it becomes even less likely that a given resource would be within line-of-sight of a transmission line. In the case of the current Project, no qualifying NHL resources are located within 1.5 mile of the alternative routes, so no impacts were assessed at this distance.

Because portions of some routes share common alignments, some of the same resources occur in the same tier for more than one route, regardless of the route selected for the Project. The nature of the actual impacts to resources, while estimated in this study with the assistance of photo simulations, would depend on the final Project design in which the exact placement and height of transmission structures are determined. The purpose of the simulations and associated assessments in this report are to provide data on likely impacts and to compare those impacts to support the selection of a preferred route.

Once a route is selected for the Project, that route will be subject to a full historic architectural survey. Additional (as of yet, unrecorded) historic properties may be identified in the survey area at that time, and actual Project impacts will be assessed. The survey area will be defined based on the height of the proposed transmission line structures, topography, tree cover, and other factors impacting the line-of-sight from historic resources to the selected route.

FIGURE 2 LOCATIONS OF CONSIDERED HISTORIC RESOURCES ALONG AND NEAR ALTERNATIVE ROUTES



2.3.1 ROUTE 2

The considered resources that lie within the VDHR tiers for Route 2 are presented in Table 2 and depicted in the map provided as Attachment 1, Sheet 1. ERM identified five aboveground historic resources within the VDHR tiers for Route 2. The considered resources were subjected to field reconnaissance and a preliminary assessment of impact, discussed in the next chapter.

TABLE 2 HISTORIC RESOURCES IN VDHR TIERS FOR ROUTE 2

Buffer (miles)	Resource Category	Resource Number	Description
0.5 to 1.0	National Register Properties (Listed)	088-0143	La Vista
	Locally Significant	088-0297[a]	Coates House
0.0 to 0.5	National Register – Eligible	088-0100	Nyland
	Locally Significant	016-0094	Spring Grove
		088-0256	Westwood

Source: VDHR 2024

[a] Resource is within the designated tiers for the proposed Tributary Station.

2.3.2 ROUTE 3

The considered resources that lie within the VDHR tiers for Route 3 are presented in Table 3 and depicted in the map provided as Attachment 1, Sheet 2. ERM identified five aboveground historic resources within the VDHR tiers for Route 3. The considered resources were subjected to field reconnaissance and a preliminary assessment of impact, discussed in the next chapter.

TABLE 3 HISTORIC RESOURCES IN VDHR TIERS FOR ROUTE 3

Buffer (miles)	Resource Category	Resource Number	Description
0.5 to 1.0	National Register Properties (Listed)	088-0143	La Vista
	Locally Significant	088-0297[a]	Coates House
0.0 to 0.5	National Register – Eligible	088-0100	Nyland
	Locally Significant	016-0094	Spring Grove
		088-0256	Westwood

Source: VDHR 2024

[a] Resource is within the designated tiers for the proposed Tributary Station.

2.3.3 ROUTE 4

The considered resources that lie within the VDHR tiers for Route 4 are presented in Table 4 and depicted in the map provided as Attachment 1, Sheet 3. ERM identified three aboveground historic resources within the VDHR tiers for Route 4. The considered resources were subjected to field reconnaissance and a preliminary assessment of impact, discussed in the next chapter.

TABLE 4 HISTORIC RESOURCES IN VDHR TIERS FOR ROUTE 4

Buffer (miles)	Resource Category	Resource Number	Description
0.5 to 1.0	National Register Properties (Listed)	088-0143	La Vista
	Locally Significant	088-0297[a]	Coates House
0.0 to 0.5	Locally Significant	088-0256	Westwood

Source: VDHR 2024

[a] Resource is within the designated tiers for the proposed Tributary Station.

2.4 PREVIOUS SURVEYS

There have been no previous cultural resource surveys covering the alternative routes or Tributary Station. However, three prior surveys have been conducted within 1.0 mile of the alternative routes. 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 WITHIN 1.0 MILE OF THE PROPOSED PROJECT

VDHR Survey #	Title	Author(s)	Date
CE-147	Phase I Archaeological Survey TRILEAF Corporation Site# 604207 (Claiborne), Woodford, Caroline County, Virginia	Rachael E. Fowler and Kenneth J, Basalik	2013
SP-154	Phase I Archaeological Identification Survey of the Massaponax Self Support Telecommunications Tower Site, Spotsylvania County, Virginia	Lyle Torp	1999
SP-206	A Phase I Archaeological Survey of Portions of the Proposed Dominion Raceway Tract, Spotsylvania County, Virginia	Clifton A. Huston and Richard G. Francisco	2013

3. STAGE 1 PRE-APPLICATION ANALYSIS FINDINGS

3.1 METHODS OF ANALYSIS

Fieldwork for the pre-application analysis was conducted by Haley Hoffman and Emma Jennings under the direction of Secretary of the Interior Qualified architectural historian, Mary Beth Derrick on May 21, 2024 and July 24, 2424. The fieldwork involved photographing five resources requiring visual assessment according to the Guidelines and examining potential line-of-sight views from each resource toward the alternative routes. For resources where property owner approval was granted for historic resource documentation, photographs were taken toward the alternative route(s) from the property at the most prominent view of the landscape. When permission to access such locations was not available, photographs were taken from the public right-of-way (typically a road) nearest to the resource facing toward the applicable route(s).

Panoramic photographs were taken from each resource, with an effort to capture the direction with the clearest, most unobstructed view toward the applicable route or routes. 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 Key Observation Points (KOPs). Site visits to the KOPs 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 leveler
- 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 Energy Virginia, then edited for visualization and textured in Autodesk 3DS Max 2021. The position of each structure was provided by Dominion Energy Virginia for Routes 2 and 3. For Route 4, typical spacing was provided by Dominion, and iToo RailClone for Autodesk 3DS Max 2021 was used to project structure locations. The transmission structures along each route were rendered in Vray version 5.2 from each KOP camera location. 3D imagery was produced at the field of view using camera matching. Renderings for each route and each transmission line structure combination were then exported for use as an overlay.

Detailed, correctly dimensioned 3D computer models of the transmission structures along each route 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. These were textured using Vray PBR materials to simulate the weathering steel texture of the proposed structures. 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 each 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. The final images were then 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.

Additional viewshed renderings were conducted to assess the visibility from some of the resources to the alternative routes. In order to complete this, Digital Surface Model viewshed analyses were prepared using a Digital Elevation Model derived from National Elevation Dataset 1/3 arc second Elevation Dataset. Focal points were placed along the centerline at locations preliminarily assigned by engineering. Structure heights ranged from 105 feet (32.0 meters) to 125 feet (38.1 meters) above the ground, as noted in the structures' attributes. Vegetation data was derived by combining the Virginia Landcover data with the tree heights (in meters) from the USDA LANDFIRE dataset. The resulting visual analyses are presented in Attachment 6.

3.2 STRUCTURE TYPES AND RIGHT-OF-WAY WIDTHS

The proposed Tributary line would be constructed entirely in new right-of-way measuring 100-feet-wide. Dominion Energy Virginia would use multiple structure configurations for the Project (Attachment 3). The new structures would be weathering steel monopoles with heights ranging from 90 to 170 feet and an average height of approximately 121 feet based on preliminary conceptual design, excluding foundation reveal, and subject to change based on final engineering. Two circuits would be supported on each structure. Structures would be installed at approximately 500 to 700-foot intervals along the right-of-way for the Project. ERM will provide a revised assessment of Project impacts, if necessary, based on the final design.

3.3 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 (No Impact)** – 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.

3.4 HISTORIC RESOURCE DESCRIPTIONS

3.4.1 016-0094, SPRING GROVE

016-0094 is located at 8218 Guinea Station Road in Fredericksburg. The resource is set back from the road on a manicured landscape with scattered trees. The resource is accessible via a gravel driveway that loops around the dwelling before extending southeast through the outbuildings.

016-0094, Spring Grove includes a two-story, Federal style dwelling constructed in circa 1853 and eight outbuildings (Attachment 4, Figure 1). It was most recently surveyed by Robert Taylor on behalf of Dutton + Associates, LLC in March of 2024 (Taylor 2024). The dwelling rests on a raised English bond brick basement, features weatherboard siding, and has a side-gabled roof clad in standing seam metal. The dwelling includes a one-story addition clad in the same materials as the original two-bay block. The roof is pierced by a pair of interior brick chimneys with one each on the front and rear slope. The windows on the dwelling consist of individually set six-over-six, double-hung, wood sash windows. The primary entrance is off-center on the front façade, protected by a single-story hipped-roof portico. The portico is supported by square Doric columns resting on a brick floor. ERM revisited Spring Grove later in 2024 and did not note any significant differences. The entrance is accessible via a run of brick steps. The entrance is a paneled door flanked by sidelights and a transom light. The windows are all flanked by shutters.

In addition to the dwelling, a circa 1860 smokehouse noted as having a brick foundation, a pyramid roof, and a batten door at the center was included as part of the resource. A circa 1930 wood frame chicken coop clad in sheet metal is located east of the dwelling. To the rear of the dwelling is a circa 1940 two-car garage with a gabled roof. To the southwest is a circa 1980 prefabricated carport. Previous surveyors also noted a circa 1860 kitchen located east of the dwelling. Finally, the resource includes a circa 2000 stable clad in sheet metal and topped with a gabled roof. The kitchen was described as being built with 5-course American bond brick walls topped with a gable roof. It features an exterior end brick chimney. During ERM's survey, the kitchen and stable were visible from the public right-of-way, and no changes were noted.

016-0094 has not been formally determined eligible for listing on the NRHP. However, Spring Grove retains distinction as an intact example of the Federal style as applied to a side-passage form within rural Virginia. A letter from Michele M. and Edward P. Schiesser described this resource as architecturally significant in the community. Thus, ERM is including 016-0094 in this report as a locally significant resource. Resource 016-0094 lies within the half-mile study tier for Routes 2 and 3.

3.4.2 088-0100, NYLAND

088-0100 is located 3701 Guinea Station Road, accessible via a gravel driveway that travels up a hill to loop around the dwelling. The resource is heavily screened by trees.

088-0100, Nyland, includes a circa 1843 Greek Revival two-and-a-half-story symmetrical dwelling and an outbuilding (Attachment 4, Figure 2). It was last surveyed in June of 2015 by Dara Friedberg on behalf of Dutton + Associates, LLC (Friedberg 2015a). The dwelling rests on a brick foundation laid in a five-course American bond pattern. The dwelling is clad in beaded weatherboard and features a side-gabled roof with asphalt shingles. There are paired exterior brick chimneys on both ends of the dwelling. The fenestration throughout the dwelling consists of six-over-six, double-hung wood sash windows. The windows on the first floor are surrounded by five-light sidelights. The front façade has a single-story, one-bay wooden front porch with a flat roof supported by square columns. The porch provides protection to the single-leaf door with a transom and three-light sidelights. ERM revisited the resource on July 26, 2024, but could not

adequately see the dwelling from the nearest public right-of-way. What was discernable from the public right-of-way were two of the exterior end brick corbelled chimneys and their chimney caps.

Noted in a 1995 survey is a gable-roofed shed clad in weatherboard and wood shingles behind the dwelling. No other details were provided. ERM could not see a shed from the right-of-way during the 2024 survey.

Nyland was determined eligible for listing on the NRHP by the VDHR in December of 1996 under Criterion C. 088-0100 lies within the half-mile study tier for Routes 2 and 3.

3.4.3 088-0143, LA VISTA

088-0143 is located at 4420 Guinea Station Road. The dwelling is set far back from Guinea Station Road, but it accessible via a gravel driveway. The property consists of agricultural fields and forest, enclosed by a fence.

088-0143, La Vista, includes a two-story dwelling and three outbuildings (Attachment 4, Figure 3). The dwelling was built during two different periods that transition from the Federal style to Greek Revival. The main part of the dwelling was built in circa 1838, with a one-story wing added to the rear in circa 1932. The resource was last surveyed for a National Register nomination in 1997 by Helen Ross (Ross 1997). A non-historic two-story addition with a hipped roof clad in metal was added to the rear of the dwelling in circa 1990. The dwelling rests on a foundation of brick laid in five-course American bond. The dwelling features weatherboard siding and a hipped roof clad in metal. Bracketing the dwelling are exterior end brick chimneys. The front elevation is three bays wide with a central entrance. The two-story porch has an enclosed gable that features a wide band of trim along the edge of the pediment. A band of frieze trim divided into two parts separates the columns from the pedimented gable. Protected by the porch is a four-panel front door surrounded by a band of thirteen vertically-oriented rectangular lights in the transom and six-light side light panels with a dado panel below. The lights surrounding the door are encased in a decorative enframement of wood with a modern design. Acorn and oak leaf corner block moldings are arranged around the front door. The double-hung wood sash windows on the front elevation align vertically and horizontally. ERM revisited the resource in July of 2024, but could not photograph the dwelling fully from the nearest public right-of-way. What was visible was the standing seam metal clad roof and the wood sash double-hung windows bracketed by shutters.

A garage, smokehouse, and henhouse were noted in the 1997 nomination form (Ross 1997). The smokehouse, located west of the dwelling, was described as having a hipped roof and weatherboard siding. Its door and wood sash windows were located on the front and side elevations. The survey noted a brick interior chimney at the back of the smokehouse. The two-story garage was located west of the smokehouse and described as having a hipped roof. The henhouse was located to the east of the dwelling. No other details were provided for the garage or henhouse. ERM could not see these three outbuildings from the right-of-way during their 2024 visit.

In April of 1996, 088-0143 was determined eligible for listing on the NRHP at the local level for significance in the area of architecture and military history. Later in June of 1996, the State Review Board determined that La Vista met the criteria for listing on the Virginia Landmarks

Register (VLR) and NRHP. La Vista was formally added the NRHP in December of 1997 under reference number 97001508. 088-0143 lies within the 1-mile study tier for Routes 2, 3, and 4.

3.4.4 088-0256, WESTWOOD

088-0256 is located at 3918 Guinea Station Road in Fredericksburg, Virginia. The resource is set back from the road and is accessible via a gravel drive that cuts through to the back end of the property. The parcel consists of a manicured lawn and cultivated fields bounded by a wire and wood post fence. The dwelling is surrounded by mature trees. Likewise, the parcel is delineated by a forest to the northwest, southwest, and southeast.

088-0256, Westwood, includes a circa 1818, two-and-a-half story T-shaped Federal style dwelling and six outbuildings (Attachment 4, Figure 4). It was last surveyed in June of 2015 by Dara Friedberg on behalf of Dutton + Associates, LLC (Friedberg 2015b). The dwelling features a cross-gabled roof clad in asphalt shingles and weatherboard siding. It rests on a brick foundation. The dwelling includes an exterior end brick chimney at either end. The primary entrance is centrally located on the north elevation. The front door, accessed via a small brick stoop, includes a sidelight, pilasters, and a pediment. The fenestration throughout the dwelling is made up of six-over-six, double-hung wood sash windows flanked by shutters. There is an additional octagonal window centered in the front gable end. ERM revisited Westwood in July of 2024. The dwelling has not undergone any significant changes since it was surveyed in 2015.

088-0256 includes a stable, two sheds, and three barns. In the 1996 survey, the non-historic stable and sheds were described as having concrete block foundations, weatherboard siding, and gabled roofs. The barns were further described as being clad in metal siding with gabled roofs. During the July 2024 survey, one of the gabled sheds were noted to the northwest of the dwelling. The remaining outbuildings are located southwest of the dwelling.

Although 088-0256 has not formally been determined eligible for listing on the NRHP, the previous surveyors in 1996 and 2015 recommended the resource potentially eligible under Criteria C and D for its architectural distinction and use as a headquarters during the Civil War. A letter from Michele M. and Edward P. Schiesser described this resource as architecturally significant in the community. Thus, ERM has included it in this report as a locally significant resource. 088-0256 is located within the half-mile study tier for Routes 2, 3, and 4.

3.4.5 088-0297, COATES HOUSE

088-0297 is located at 7420 Jefferson Davis Highway in Fredericksburg, Virginia. The resource is situated roughly 20 feet from the road and is fully surrounded by trees.

088-0297, Coates House, is a two-story, circa 1896 Queen Anne style dwelling with classical influences (Attachment 4, Figure 5). The resource was last surveyed in July of 1996 by SFJ: Traceries (SFJ: Traceries 1996). The dwelling has a side-gabled wing situated perpendicular to the two small front-gable wings at opposite ends of the dwelling. The roof is clad in asphalt shingles and the dwelling features vinyl siding. It rests on a concrete pier foundation that has been infilled. The single-story front porch has been screened in. The two-over-two, double-hung wood sash windows on the front façade are arranged symmetrically. The dwelling is also adorned with a

diamond shaped window. The dwelling features cornice returns on the east, north, and south elevations. ERM revisited Coates House in July of 2024. The gable-and-wing dwelling includes an interior end brick chimney and a central chimney that pierces the roof behind the projected gable. The porch is accessible via a concrete step. Finally, the dwelling has a shed roof lean-to attached to the rear façade.

In addition to the Queen Anne style dwelling, the resource includes a metal carport and a shed constructed of concrete block and a metal clad roof. A third building on the property just south of the dwelling was built as a store; it a single-story side-gabled building.

088-0297 is not currently listed on the NRHP, nor has it been formally determined as eligible for listing on the NRHP. However, the Coates House was owned by an African American farmer who was one of the first African American teachers in the county. Due to its ties to local history, ERM is opting to include 088-0297 in this analysis as a locally significant resource. 088-0297 is located within the 1-mile tier for Routes 2, 3, and 4.

3.5 HISTORIC RESOURCE FINDINGS FOR ROUTE 2

3.5.1 016-0094, SPRING GROVE

Spring Grove is located approximately 0.37 mile to the southeast of Route 2, where the route uses a greenfield alignment until it connects to Dominion's existing Line #2090 (Attachment 5, Figure 1). The area between the route and the resource is heavily wooded and contains an agricultural field and associated dwelling.

One simulation was prepared from KOP 002-CR, which is located along Guinea Station Road, approximately 0.49 mile to the southeast of the route. This location was chosen because of safety concerns related to the point closest to the route from the resource. At this location, as illustrated in the simulation from KOP 002-CR, the new transmission structures would not be visible due to distance and intervening vegetation (Attachment 5, Figure 2).

As access to the resource boundary's point closest to the route was not available, ERM conducted additional modeling using the vegetated viewshed analysis. This analyzes vantage points across the resource and in the surrounding area looking towards Route 2. The model depicts where there is potential for any transmission structures to be visible and quantifies the number of structures likely to be visible. According to the analysis, the top of one structure, located above the tree line, could be visible from the northeastern edge of the resource boundary (Attachment 6, Figure 1). Although the northwestern corner shows no line of sight to Route 2 based on the viewshed analysis, the location where the KOP was taken shows visibility. It is important to note that the vegetated model is a low-resolution analysis that is best used as a predictive model and not a ground-truth survey of line-of-sight. While the KOP is located where the vegetated analysis shows visibility, the simulations themselves use ground truth vegetated conditions in an area. Thus, survey observations of vegetation suggest that this vegetated analysis is not precise enough at this location. As the simulation does not show visibility, ERM recommends that the route would have **No Impact** on 016-0094.

3.5.2 088-0100, NYLAND

Nyland is located approximately 0.46 mile to the northeast of Route 2, where the route uses a greenfield alignment until it connects to Dominion Energy Virginia's existing Line #2090 (Attachment 5, Figure 3). The area between the route and the resource consists of dense forest and vegetation. One simulation was prepared for the resource, from KOP 009-CR along Guinea Station Road/Route 607 (Attachment 5, Figure 4). As shown in the simulation, there would be no view to the route due to distance and intervening vegetation. Therefore, there would be **No Impact** on this resource from Route 2.

3.5.3 088-0143, LA VISTA

La Vista is located approximately 0.76 mile to the north of Route 2, where the route uses a greenfield alignment (Attachment 5, Figure 5). The area between the route and the resource consists of forest and the Ni River.

One simulation was prepared for the resource, from KOP 004-CR along Guinea Station Road. This location is located approximately 1.16 miles to the north of the route, and was chosen because it was the closest to Route 2 and the resource from the public right-of-way. As shown in the simulation, Route 2 would not be visible from this point due to distance and intervening vegetation (Attachment 5, Figure 6).

As access to the resource was not granted, ERM conducted additional modeling using the vegetated viewshed analysis. This analyzes vantage points across the resource and in the surrounding area looking towards Route 2. The model depicts where there is potential for any transmission structures to be visible and quantifies the number of structures likely to be visible. According to the analysis, no structures associated with Route 2 would be visible from 088-0143 (Attachment 6, Figure 2). Thus, ERM recommends there would be **No Impact** on this resource from Route 2

3.5.4 088-0256, WESTWOOD

Westwood is located approximately 0.36 mile to the north of Route 2, where the route uses a greenfield alignment until it connects to Dominion's existing Line #2090 (Attachment 5, Figure 7). The area between the resource and the route is densely wooded.

One simulation was prepared from KOP 003-CR, which is located along Guinea Station Road, approximately 0.62 mile to the north of Route 2. This point was chosen because it was the closest to Route 2 and the resource from the public right-of-way. As shown in the simulation, there would be no view from the KOP to the route due to distance and intervening vegetation (Attachment 5, Figure 8).

However, as access to the resource was not granted, ERM conducted additional modeling using the vegetated viewshed analysis. This analyzes vantage points across the resource and in the surrounding area looking towards Route 2. The model depicts where there is potential for any transmission structures to be visible and quantifies the number of structures likely to be visible. According to the analysis, some structures could be visible from the northern half of the parcel (Attachment 6, Figure 2). Although the resource boundary only includes the dwelling itself, the

resource actually encompasses the entire parcel (Spotsylvania County 2024). The analysis shows that structures could be visible above the tree line from the dwelling to the north, towards the road. The top of one structure could be visible from the dwelling, while the tops of two to three structures could be visible from the front yard, and a very small portion near the road could have a view of four to eight structures. However, the structures would only be visible slightly above the tree line, in the distance, and small from within the parcel boundary. The outbuildings (to the south of the dwelling) would have no view of the route and no other views would be altered by the route. While the change is minor, the construction would add a modern element to the southern viewshed where there currently is dense vegetation and forest. Thus, ERM recommends that Route 2 would have a **Minimal Impact** on 088-0256.

3.5.5 088-0297, COATES HOUSE

The Coates House is located approximately 0.70 mile to the northwest of Route 2, where the route uses a greenfield alignment, and approximately 0.65 mile to the northwest of the proposed Tributary Station (Attachment 5, Figure 9). The area between the route and the resource consists of dense forest and vegetation. One simulation was prepared for the resource, from KOP 008-CR along Patriot Highway/Highway 1 (Attachment 5, Figure 10). As shown in the simulation, there would be no view to the route due to distance and intervening vegetation. Therefore, there would be **No Impact** on this resource from Route 2.

3.6 HISTORIC RESOURCE FINDINGS FOR ROUTE 3

3.6.1 016-0094, SPRING GROVE

Spring Grove is located approximately 0.37 mile to the southeast of Route 3, where the route uses a greenfield alignment until it connects to Dominion's existing Line #2090 (Attachment 5, Figure 11). The area between the route and the resource is heavily wooded and contains an agricultural field and associated dwelling.

One simulation was prepared from KOP 002-CR, which is located along Guinea Station Road, approximately 0.49 mile to the southeast of the route. This location was chosen because of safety concerns related to the point closest to the route from the resource. At this location, as illustrated in the simulation from KOP 002-CR, the new transmission structures would not be visible due to distance and intervening vegetation (Attachment 5, Figure 12).

As access to the resource boundary's point closest to the route was not available, ERM conducted additional modeling using the vegetated viewshed analysis. This analyzes vantage points across the resource and in the surrounding area looking towards Route 3. The model depicts where there is potential for any transmission structures to be visible and quantifies the number of structures likely to be visible. According to the analysis, the top of one structure, located above the tree line, could be visible from the northeastern edge of the resource boundary (Attachment 6, Figure 3).

Although the northwestern corner shows no line of sight to Route 3 based on the viewshed analysis, the location where the KOP was taken shows visibility. It is important to note that the vegetated model is a low-resolution analysis that is best used as a predictive model and not a ground-truth survey of line-of-sight. While the KOP is located where the vegetated analysis shows

visibility, the simulations themselves use ground truth vegetated conditions in an area. Thus, survey observations of vegetation suggest that this vegetated analysis is not precise enough at this location. As the simulation does not show visibility, ERM recommends that the route would have **No Impact** on 016-0094.

3.6.2 088-0100, NYLAND

Nyland is located approximately 0.46 mile to the northeast of Route 3, where the route uses a greenfield alignment until it connects to Dominion Energy Virginia's existing Line #2090 (Attachment 5, Figure 13). The area between the route and the resource consists of dense forest and vegetation. One simulation was prepared for the resource, from KOP 009-CR, along Guinea Station Road/Route 607 (Attachment 5, Figure 14). As shown in the simulation, there would be no view to the route due to distance and intervening vegetation. Therefore, there would be **No Impact** on this resource from Route 3.

3.6.3 088-0143, LA VISTA

La Vista is located approximately 0.52 mile to the northwest of Route 3, where the route uses a greenfield alignment (Attachment 5, Figure 15). The area between the route and the resource consists of forest.

One simulation was prepared for the resource, from KOP 004-CR along Guinea Station Road. This location is located approximately 0.79 miles to the north-northwest of the route, and was chosen because it was the closest to Route 3 and the resource from the public right-of-way. As shown in the simulation, Route 3 would not be visible from this point due to distance and intervening vegetation (Attachment 5, Figure 16).

As access to the resource was not granted, ERM conducted additional modeling using the vegetated viewshed analysis. This analyzes vantage points across the resource and in the surrounding area looking towards Route 3. The model depicts where there is potential for any transmission structures to be visible and quantifies the number of structures likely to be visible. According to the analysis, no structures associated with Route 3 would be visible from 088-0143 (Attachment 6, Figure 4). Thus, ERM recommends there would be **No Impact** on this resource from Route 3

3.6.4 088-0256, WESTWOOD

Westwood is located approximately 0.19 mile to the northeast of Route 3, where the route uses a greenfield alignment (Attachment 5, Figure 17). The area between the route and the resource consists of dense forest and vegetation.

One simulation was prepared from KOP 003-CR along Guinea Station Road. This point is located approximately 0.46 mile to the north-northeast of the route, and was chosen because it was the closest to Route 3 and the resource from the public-right-of-way. As shown in the simulation, there would be a slight shift in the tree line to the west of the dwelling due to right-of-way clearing (Attachment 5, Figure 18). However, this is minor, and no transmission line structures would be visible from this location (Attachment 5, Figure 19).

However, as access to the resource was not granted, ERM conducted additional modeling using the vegetated viewshed analysis. This analyzes vantage points across the resource and in the surrounding area looking towards Route 3. The model depicts where there is potential for any transmission structures to be visible and quantifies the number of structures likely to be visible. According to the analysis, some structures would be visible from the northern half of the parcel (Attachment 6, Figure 4). Although the resource boundary only includes the dwelling itself, the resource actually encompasses the entire parcel (Spotsylvania County 2024). The analysis shows that structures could be visible above the tree line from the dwelling to the north, towards the road. The top of one structure could be visible from the dwelling, while the tops of two to eight structures could be visible from the northern edge, near the road. Although the tops of the structures would only be visible when looking to the south from the dwelling and front yard, there could be a view of the structures through the trees from the southern edge of the parcel during leaf-off season. This would add more prominent modern infrastructure to the southern viewshed than would be the case with Route 2. Thus, ERM recommends that Route 3 would have a **Moderate Impact** on 088-0256.

3.6.5 088-0297, COATES HOUSE

The Coates House is located approximately 0.70 mile to the northwest of Route 3, where the route uses a greenfield alignment, and approximately 0.65 mile to the northwest of the proposed Tributary Station (Attachment 5, Figure 20). The area between the route and the resource consists of dense forest and vegetation. One simulation was prepared for the resource, from KOP 008-CR along Patriot Highway/Highway 1 (Attachment 5, Figure 21). As shown in the simulation, there would be no view to the route due to distance and intervening vegetation. Therefore, there would be **No Impact** on this resource from Route 3.

3.7 HISTORIC RESOURCE FINDINGS FOR ROUTE 4

3.7.1 088-0143, LA VISTA

La Vista is located approximately 0.50 mile to the northwest of Route 4, where the route uses a greenfield alignment (Attachment 5, Figure 22). The area between the route and the resource consists of forest.

One simulation was prepared for the resource, from KOP 004-CR along Guinea Station Road. This location is located approximately 0.61 mile to the west of the route, and was chosen because it was the closest to Route 4 and the resource from the public right-of-way. As shown in the simulation, Route 4 would not be visible from this point due to distance and intervening vegetation (Attachment 5, Figure 23).

As access to the resource was not granted, ERM conducted additional modeling using the vegetated viewshed analysis (Attachment 6, Figure 5). This analyzes vantage points across the resource and in the surrounding area looking towards Route 4. The model depicts where there is potential for any transmission structures to be visible and quantifies the number of structures likely to be visible. According to the analysis, no structures associated with Route 4 would be

visible from 088-0143. Thus, ERM recommends there would be **No Impact** on this resource from Route 4.

3.7.2 088-0256, WESTWOOD

Westwood is located approximately 0.38 mile to the southeast of Route 4, where the route uses a greenfield alignment (Attachment 5, Figure 24). The area between the route and the resource consists of dense forest and vegetation.

One simulation was prepared from KOP 003-CR, which is located along Guinea Station Road, approximately 0.36 mile to the southeast of Route 4. This point was chosen because it was the closest to the route and the resource from the public right-of-way. As shown in the simulation, there would be no view to the route due to distance and intervening vegetation (Attachment 5, Figure 25).

However, as access to the resource was not granted, ERM conducted additional modeling using the vegetated viewshed analysis. This analyzes vantage points across the resource and in the surrounding area looking towards Route 4. The model depicts where there is potential for any transmission structures to be visible and quantifies the number of structures likely to be visible. According to the analysis, only one structure could be visible from portions of the eastern half of the resource (Attachment 6, Figure 5). Although the resource boundary only includes the dwelling itself, the resource actually encompasses the entire parcel (Spotsylvania County 2024). Only the top of one structure could be visible above the tree line from these locations when looking to the west, but the vast majority of the resource would experience no viewshed change, including all of the buildings associated with the resource. In addition, the view of the route would be in the distance, and small in scale from within the parcel boundary. While the change is minor, the construction would add a modern element to the western viewshed where there currently is dense vegetation and forest. Thus, ERM recommends that there would be a **Minimal Impact** to this resource from Route 4.

3.7.3 088-0297, COATES HOUSE

The Coates House is located approximately 0.70 mile to the northwest of Route 4, where the route uses a greenfield alignment, and approximately 0.65 mile to the northwest of the proposed Tributary Station (Attachment 5, Figure 26). The area between the route and the resource consists of dense forest and vegetation. One simulation was prepared for the resource, from KOP 008-CR along Patriot Highway/Highway 1 (Attachment 5, Figure 27). As shown in the simulation, there would be no view to the route due to distance and intervening vegetation. Therefore, there would be **No Impact** on this resource from Route 4.

3.8 ARCHAEOLOGY FINDINGS

No known archaeological sites are located in the right-of-way of the transmission line alternative routes.

4. 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.

No known archaeological sites were identified in or adjacent to the right-of-way of the transmission line routes reviewed in this study.

Five aboveground historic resources fall within the VDHR study tiers for the alternative routes under consideration. A comparison of the number of resources impacted and the degree of impact of route is presented in Table 6. The specific resources affected by each route are covered in the subsections that follow.

TABLE 6 COMPARISON OF PROJECT IMPACTS ON HISTORIC RESOURCES IN THE STUDY AREAS OF THE ALTERNATIVE ROUTES

Alternative Route	Number of Considered Resources in Each Impact Category				
	None	Minimal	Moderate	Severe	Total
Route 2	4	1	0	0	5
Route 3	4	0	1	0	5
Route 4	2	1	0	0	3

Final assessments of Project impacts will be dependent on the completion of identification-phase archaeological and historic structure surveys along the route selected by the SCC and 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 or signs; installation of vegetative screening; or contributions to historical preservation organizations or specific preservation projects. Additional mitigation measures could be identified through consultation with VDHR and other consulting parties.

4.1 ROUTE 2

Five previously recorded historic architectural resources meet the criteria specified in the Guidelines and fall within the VDHR study tiers for Route 2 (Table 7). The route would have no impact on four resources (016-0094, 088-0100, 088-0143, and 088-0297), and a minimal impact on one resource (088-0256).

TABLE 7 IMPACTS TO HISTORIC RESOURCES IN THE VDHR STUDY TIERS FOR ROUTE 2

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	-	-	-
0.5 to 1.0	National Register Properties (Listed)	088-0143	La Vista	None
	National Register – Eligible (Battlefields/Historic Landscapes)	-	-	-
	Locally Significant	088-0297	Coates House[a]	None
0.0 to 0.5	National Register – Eligible	088-0100	Nyland	None
	Locally Significant	016-0094	Spring Grove	None
		088-0256	Westwood	Minimal
0.0 (within ROW)	National Historic Landmarks, National Register Properties (Listed and Eligible)	-	-	-

Source: VDHR 2024

[a] Resource is within the designated tiers for the proposed Tributary Station.

4.2 ROUTE 3

Five previously recorded historic architectural resources meet the criteria specified in the Guidelines and fall within the VDHR study tiers for Route 3 (Table 8). The route would have no impact on four resources (016-0094, 088-0100, 088-0143, and 088-0297) and a moderate impact on one resource (088-0256).

TABLE 8 IMPACTS TO HISTORIC RESOURCES IN THE VDHR STUDY TIERS FOR ROUTE 2

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	-	-	-
0.5 to 1.0	National Register Properties (Listed)	088-0143	La Vista	None
	National Register – Eligible (Battlefields/Historic Landscapes)	-	-	-
	Locally Significant	088-0297	Coates House[a]	None
0.0 to 0.5	National Register – Eligible	088-0100	Nyland	None
	Locally Significant	016-0094	Spring Grove	None
		088-0256	Westwood	Moderate
0.0 (within ROW)	National Historic Landmarks, National Register Properties (Listed and Eligible)	-	-	-

Source: VDHR 2024

[a] Resource is within the designated tiers for the proposed Tributary Station.

4.3 ROUTE 4

Three previously recorded historic architectural resources meet the criteria specified in the Guidelines and fall within the VDHR study tiers for Route 4 (Table 9). The route would have no impact on two resources (088-0143 and 088-0297) and a minimal impact on one resource (088-0256).

TABLE 9 IMPACTS TO HISTORIC RESOURCES IN THE VDHR STUDY TIERS FOR ROUTE 4

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	-	-	-
0.5 to 1.0	National Register Properties (Listed)	088-0143	La Vista	None
	National Register – Eligible (Battlefields/Historic Landscapes)	-	-	-
	Locally Significant	088-0297	Coates House[a]	None
0.0 to 0.5	National Register – Eligible	-	-	-
	Locally Significant	088-0256	Westwood	Minimal
0.0 (within ROW)	National Historic Landmarks, National Register Properties (Listed and Eligible)	-	-	-

Source: VDHR 2024

[a] Resource is within the designated tiers for the proposed Tributary Station.

4.4 FUTURE RECOMMENDATIONS

The next stage of assessing impacts on cultural resources will be to conduct an identification-phase field survey to identify and assess resources along the route selected by the SCC for the Project. Survey of the approved alternative route will be conducted in accordance with the following guidelines:

- Guidelines for Assessing Impacts of Proposed Electrical Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia (VDHR 2008);
- Guidelines for Conducting Historic Resources Survey in Virginia (VDHR 2017);
- National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation (National Park Service [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 historic architectural resources and documenting additional as-of-yet unrecorded cultural resources in the survey area defined in the Guidelines for the 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 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 V-CRIS submittal along with full descriptions in

the technical report. The historic architectural survey will likewise adhere to VDHR standards. 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 in accordance with NPS guidance if they are integral parts of districts or have merit to be considered eligible for the NRHP on their own. Digital photographs will be taken to record 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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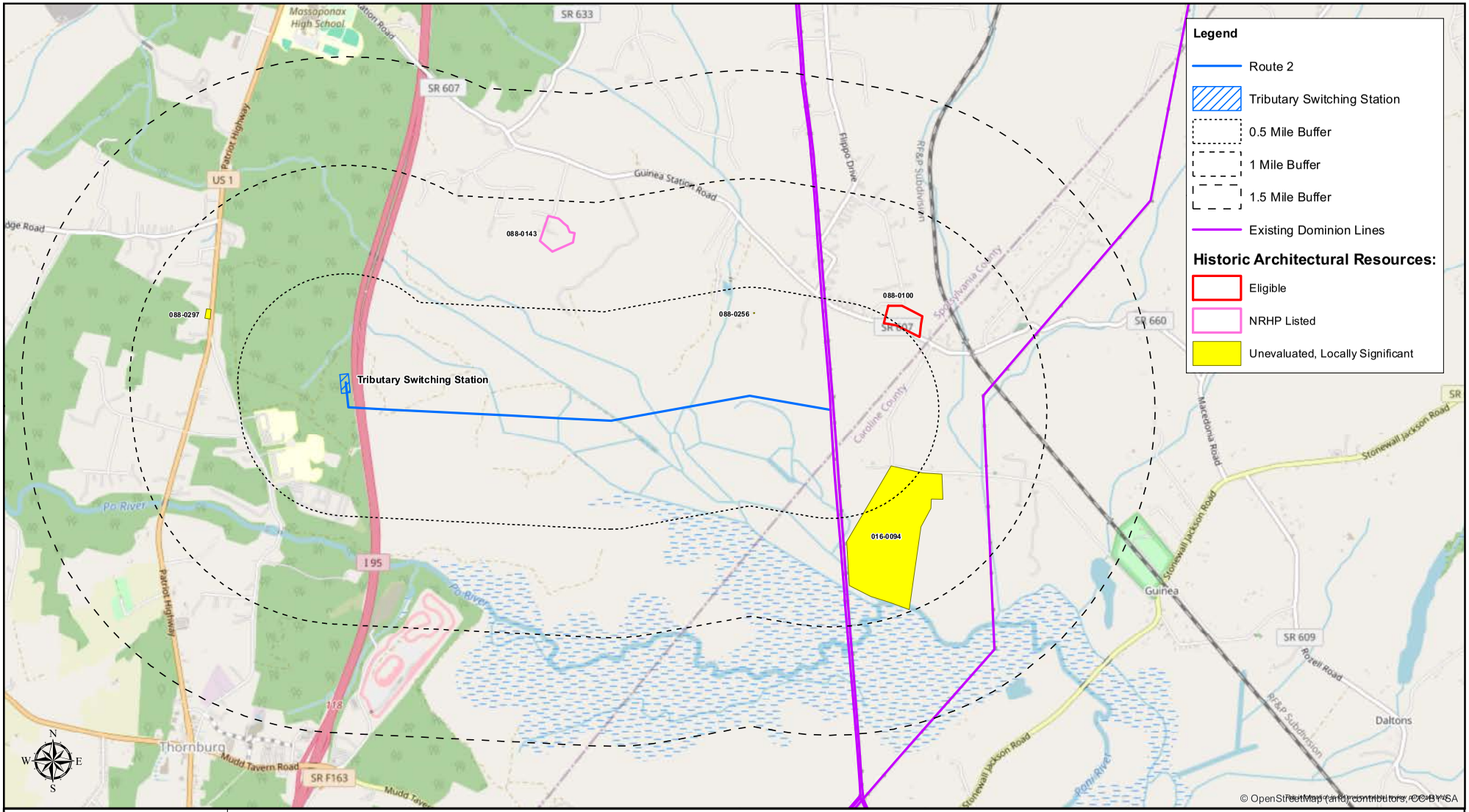
ATTACHMENT 1 LOCATIONS OF CONSIDERED HISTORIC RESOURCES ASSOCIATED WITH PROPOSED PROJECT ALTERNATIVES



Attachment 1, Sheet 1
Locations of Considered Historic Resources Associated with Project Alternatives - Tributary Route 2
Tributary 230 kV Transmission Line Project
Dominion Energy Virginia
Spotsylvania and Caroline Counties, Virginia

Dominion Energy

ERM

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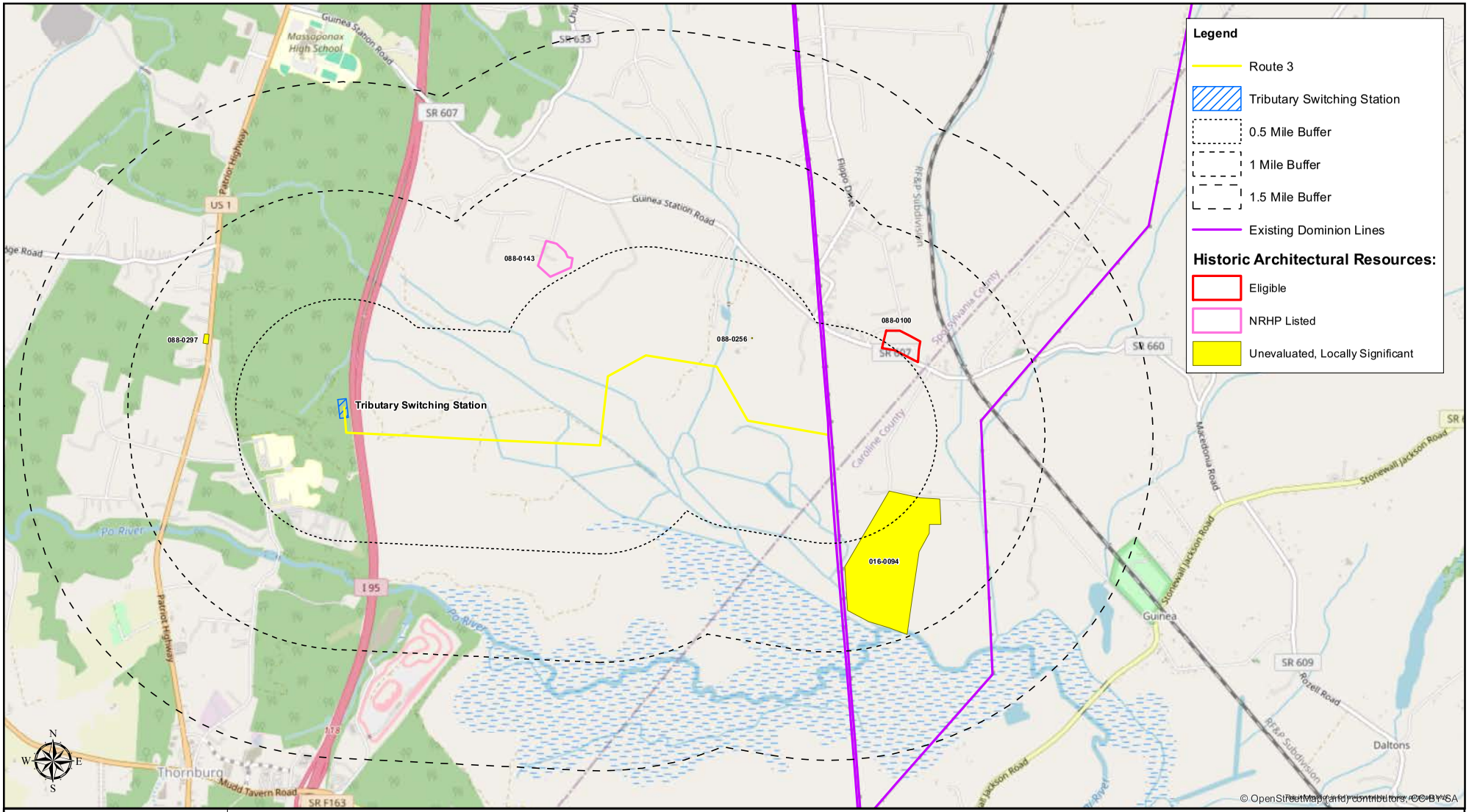

Attachment 1, Sheet 2
Locations of Considered Historic Resources Associated with Project Alternatives - Tributary Route 3
Tributary 230 kV Transmission Line Project
Dominion Energy Virginia
Spotsylvania and Caroline Counties, Virginia

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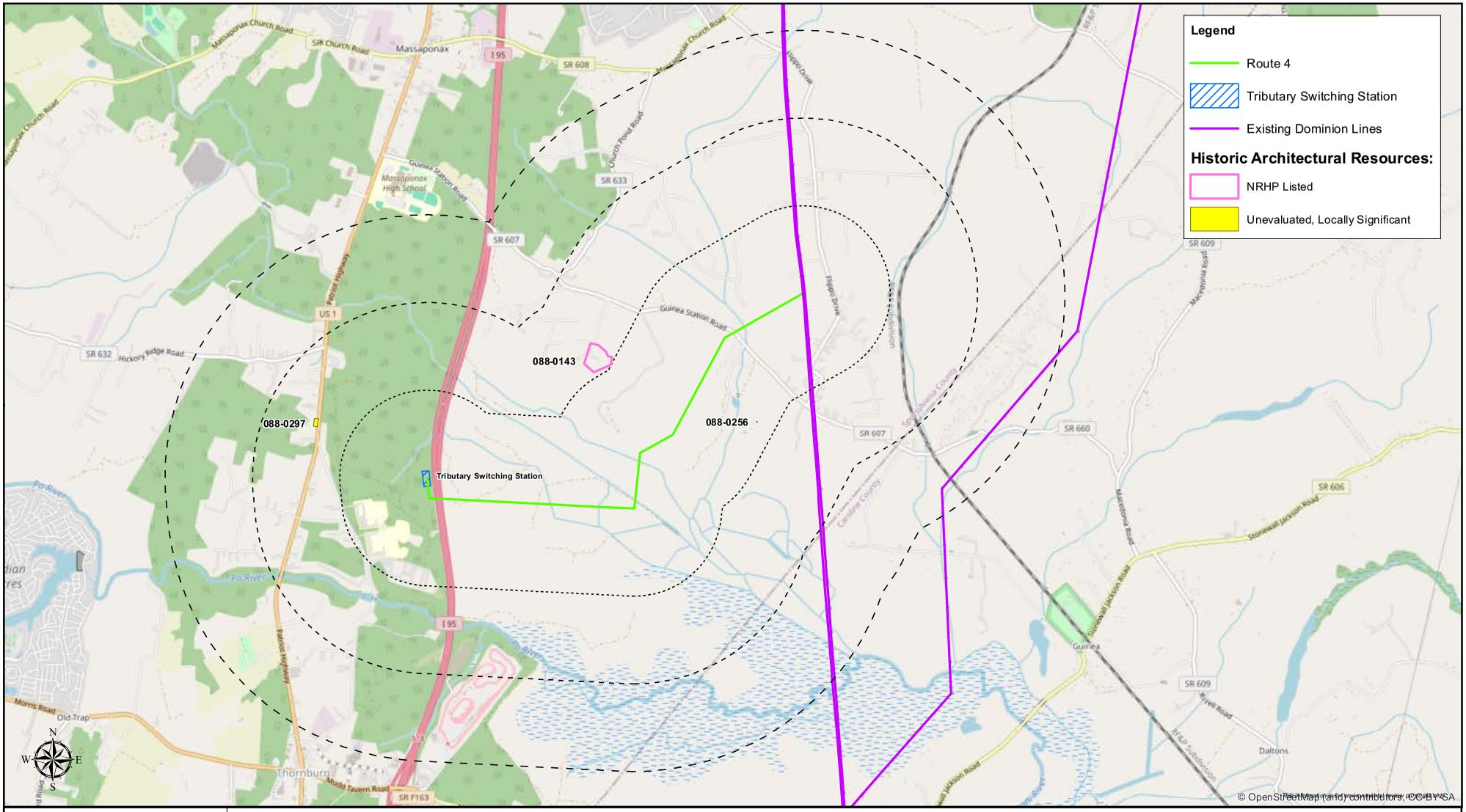

Attachment 1, Sheet 3
Locations of Considered Historic Resources Associated with Project Alternatives - Tributary Route 3
Tributary 230 kV Transmission Line Project
Dominion Energy Virginia
Spotsylvania and Caroline Counties, Virginia

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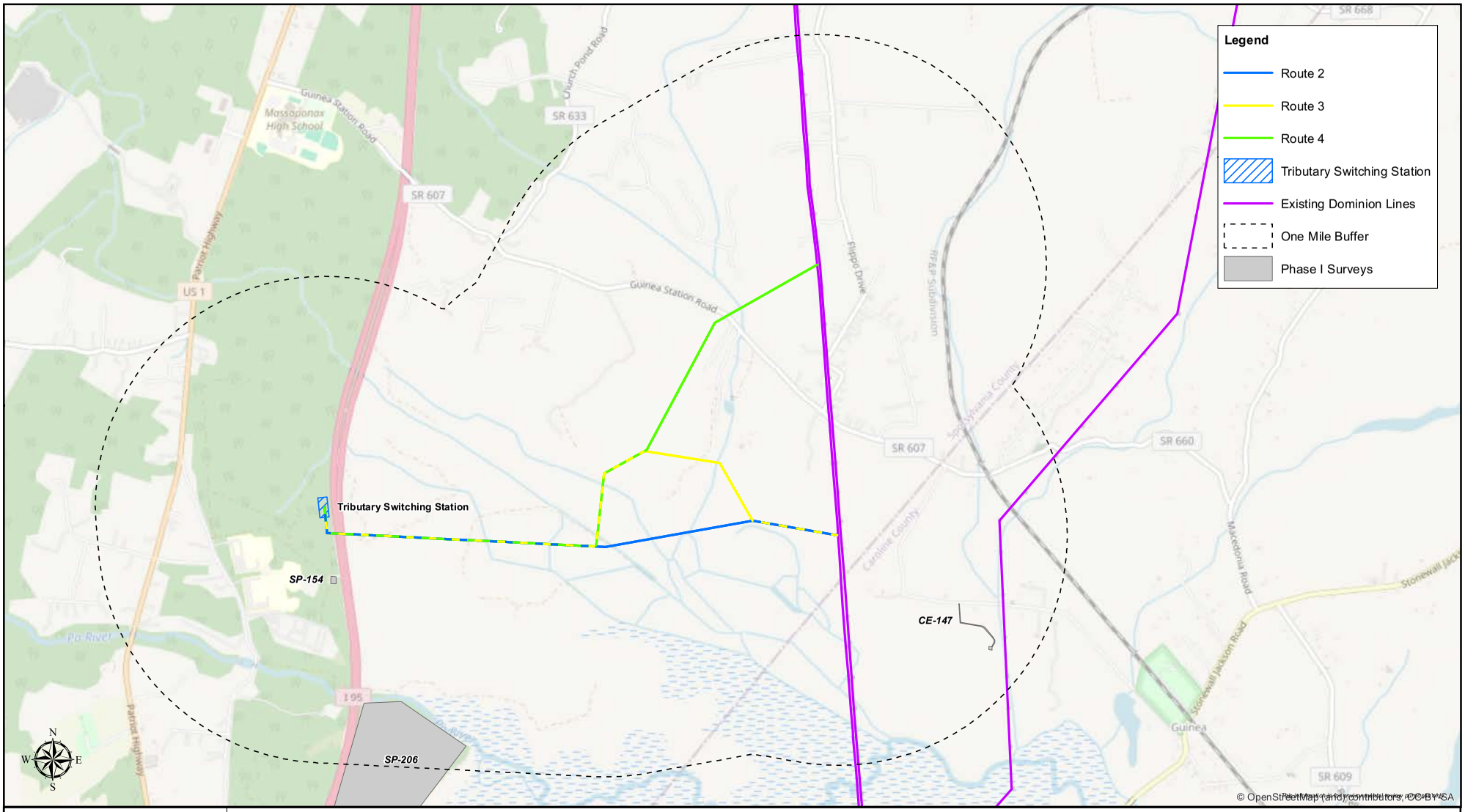
ATTACHMENT 2 CULTURAL RESOURCES SURVEY COVERING PORTIONS OF ALTERNATIVE ROUTES



Atatchment 2
Cultural Resources Surveys within 1 Mile of Alternative Routes
Tributary 230 kV Transmission Line Project
Dominion Energy Virginia
Spotsylvania and Caroline Counties, Virginia

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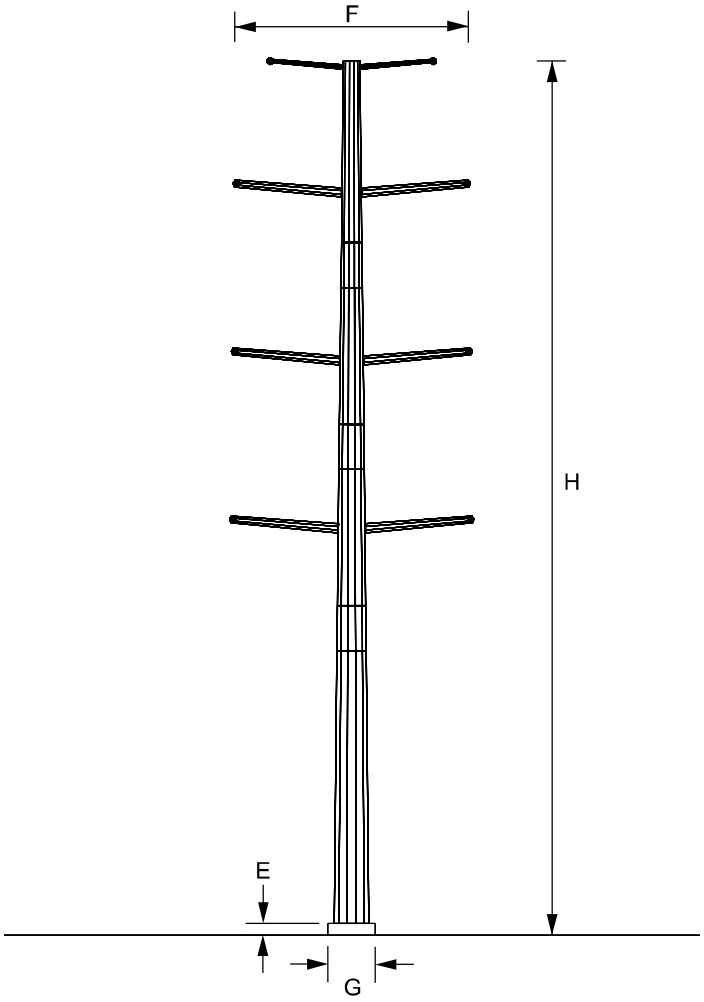
ATTACHMENT 3 TYPICAL DESIGN AND LAYOUT



TYPICAL DC ENGINEERED MONOPOLE DOUBLE DEADEND STRUCTURE

A. STRUCTURE MAPPING	N/A
B. RATIONALE FOR STRUCTURE TYPE:	MINIMIZES RIGHT OF WAY ACQUISITION
C. LENGTH OF R/W (STRUCTURE QTY):	2.3 MILES (3 STRUCTURES) - SEE NOTE 1
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	MATCH CURRENT STANDARDS8 AND EXISTING STRUCTURES IN THE AREA
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 2
F. AVERAGE WIDTH AT CROSSARM:	26'
G. AVERAGE WIDTH AT BASE:	SEE NOTE 3
H. MINIMUM STRUCTURE HEIGHT (SEE NOTE 4): MAXIMUM STRUCTURE HEIGHT (SEE NOTE 4): AVERAGE STRUCTURE HEIGHT (SEE NOTE 4):	110' 110' 110'
I. AVERAGE SPAN LENGTH (RANGE):	676' - SEE NOTE 5
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES:
1. ROW LENGTH & STRUCTURE QUANTITY ARE EXCLUSIVE OF COMPANY-OWNED SUBSTATION PROPERTIES
2. MINIMUM FOUNDATION REVEAL SHALL BE 1.5'
3. FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL ENGINEERING
4 THE SPAN LENGTHS ASSOCIATED WITH THIS STRUCUTRE TYPE ARE THE AHEAD SPANS

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

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Glen Allen, VA 23060

LINES 2404, 2090

TYPICAL DC ENGINEERED MONOPOLE DOUBLE DEADEND STRUCTURE

ATTACHMENT NO.

II.B.3.a

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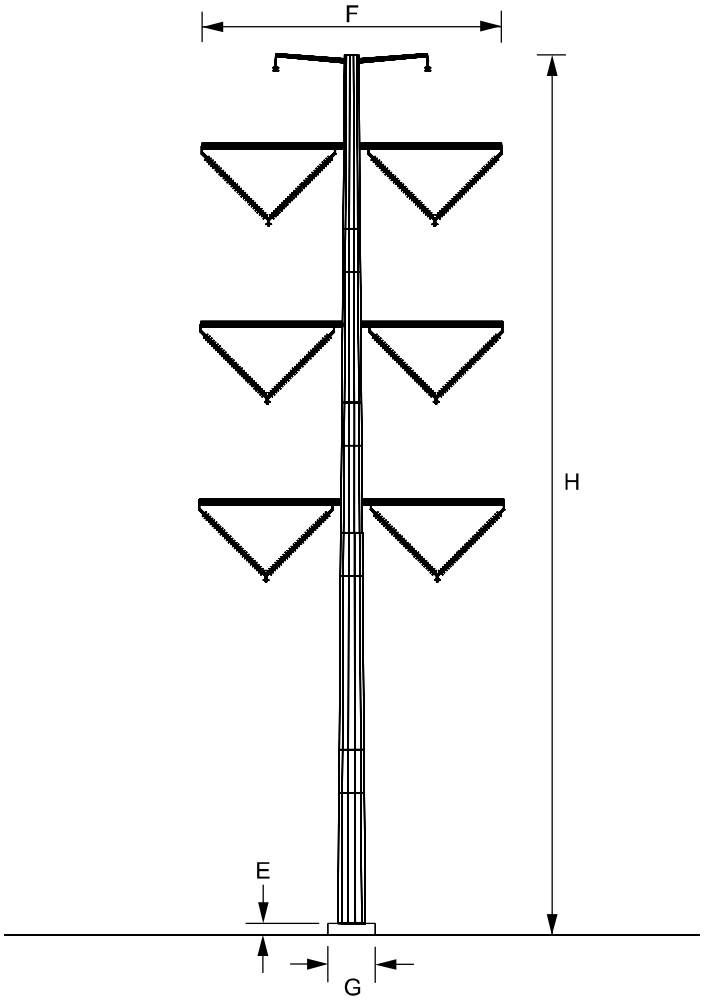

TYPICAL DC ENGINEERED MONOPOLE SUSPENSION STRUCTURE (V-STRING)

A. STRUCTURE MAPPING	N/A
B. RATIONALE FOR STRUCTURE TYPE:	MINIMIZES RIGHT OF WAY ACQUISITION; V-STRING INCREASES CLEARANCES AND OPTMIZES EXISTING ROW USAGE
C. LENGTH OF R/W (STRUCTURE QTY):	2.3 MILES (15 STRUCTURES) - SEE NOTE 1
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	MATCH CURRENT STANDARDS8 AND EXISTING STRUCTURES IN THE AREA
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 2
F. AVERAGE WIDTH AT CROSSARM:	34.5'
G. AVERAGE WIDTH AT BASE:	SEE NOTE 3
H. MINIMUM STRUCTURE HEIGHT (SEE NOTE 4): MAXIMUM STRUCTURE HEIGHT (SEE NOTE 4): AVERAGE STRUCTURE HEIGHT (SEE NOTE 4):	110' 110' 110'
I. AVERAGE SPAN LENGTH (RANGE):	620' - SEE NOTE 5
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES:
1. ROW LENGTH & STRUCTURE QUANTITY ARE EXCLUSIVE OF COMPANY-OWNED SUBSTATION PROPERTIES
2. MINIMUM FOUNDATION REVEAL SHALL BE 1.5'
3. FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL ENGINEERING
4. THE SPAN LENGTHS ASSOCIATED WITH THIS STRUCUTRE TYPE ARE THE AHEAD SPANS

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

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Glen Allen, VA 23060

LINES 2404, 2090

TYPICAL DC ENGINEERED MONOPOLE SUSPENSION STRUCTURE (V-STRING)

ATTACHMENT NO.

II.B.3.b

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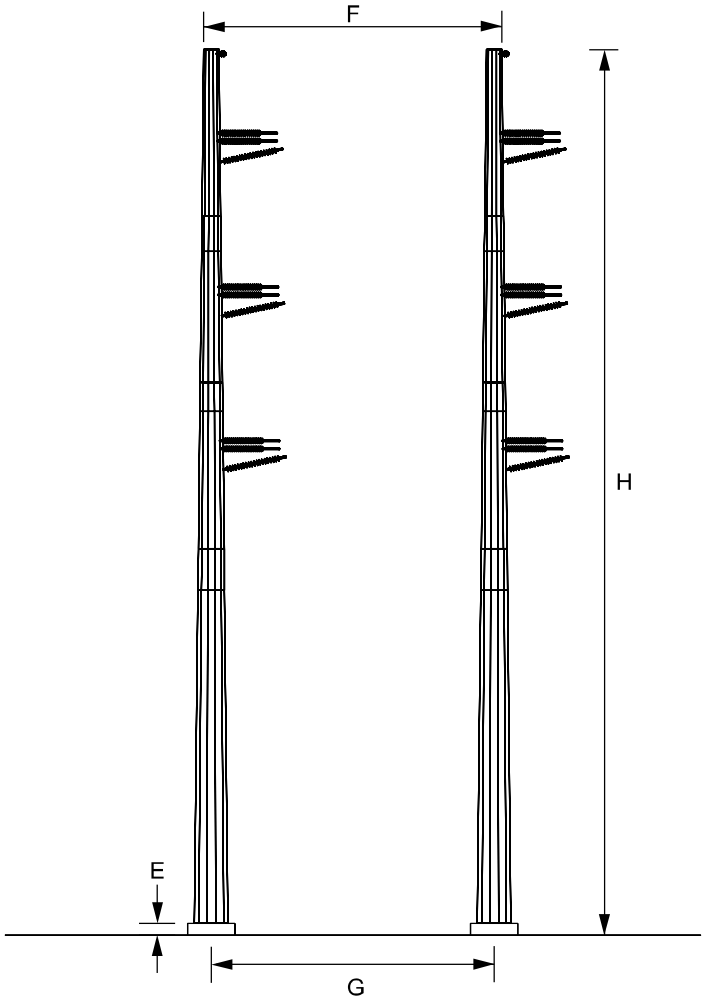

TYPICAL DC ENGINEERED 2-POLE DOUBLE DEADEND STRUCTURE

A. STRUCTURE MAPPING	N/A
B. RATIONALE FOR STRUCTURE TYPE:	MINIMIZES RIGHT OF WAY ACQUISITION; 2-POLES USED FOR HEAVY ANGLES TO OPTIMIZE POLE/FOUNDATION SIZE AND COST
C. LENGTH OF R/W (STRUCTURE QTY):	2.45 MILES (5) - SEE NOTE 1
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	MATCH CURRENT STANDARDS8 AND EXISTING STRUCTURES IN THE AREA
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 2
F. AVERAGE WIDTH AT CROSSARM:	36'
G. AVERAGE WIDTH AT BASE:	SEE NOTE 3
H. MINIMUM STRUCTURE HEIGHT (SEE NOTE 4): MAXIMUM STRUCTURE HEIGHT (SEE NOTE 4): AVERAGE STRUCTURE HEIGHT (SEE NOTE 4):	105' 105' 105'
I. AVERAGE SPAN LENGTH (RANGE):	615' - SEE NOTE 5
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES:
1. ROW LENGTH & STRUCTURE QUANTITY ARE EXCLUSIVE OF COMPANY-OWNED SUBSTATION PROPERTIES
2. MINIMUM FOUNDATION REVEAL SHALL BE 1.5'
3. FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL ENGINEERING
4. THE SPAN LENGTHS ASSOCIATED WITH THIS STRUCUTRE TYPE ARE THE AHEAD SPANS

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

Dominion Energy
Dominion Energy
5000 Dominion Blvd.
Glen Allen, VA 23060

LINES 2404, 2090

TYPICAL DC ENGINEERED 2-POLE DOUBLE DEADEND STRUCTURE

ATTACHMENT NO.

II.B.3.c

DRAWN BY: SDH

ATTACHMENT 4 HISTORIC RESOURCE PHOTOS

Figure 1. 016-0094, Spring Grove dwelling, north elevation, view to the south along Guinea Station Road.

Figure 2. 088-0100, Nyland, no access, view to the north along Guinea Station Road.

Figure 3. 088-0143, La Vista, no access, view to the south along Guinea Station Road.

Figure 4. 088-0256, Westwood, dwelling, northeast elevation, view to the southwest along Guinea Station Road.

Figure 5. 088-0297, Coates House, dwelling, east and south elevations, view to the northwest along Patriot Highway.

ATTACHMENT 5 PHOTO SIMULATIONS

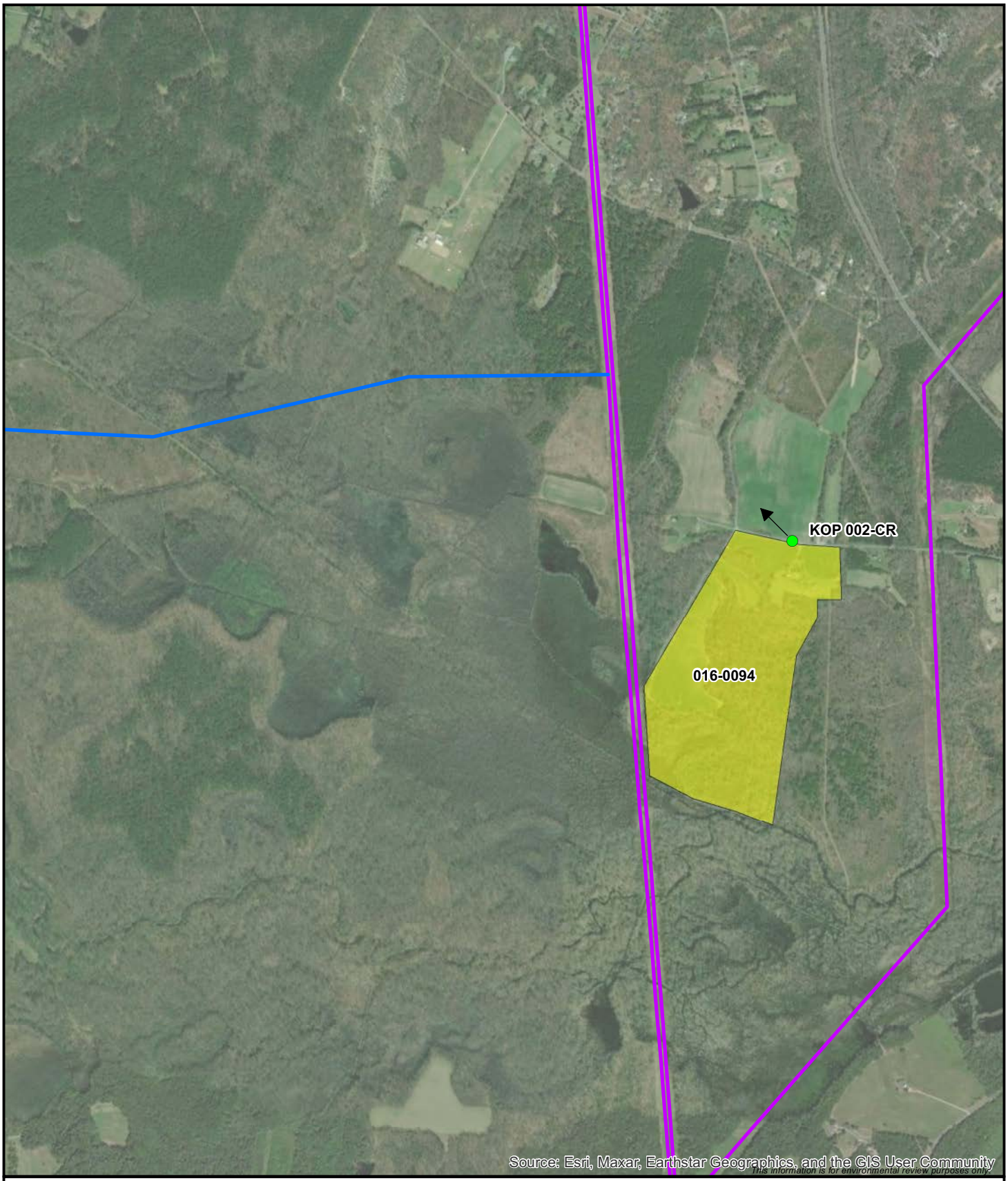

Figure 1. Aerial photograph depicting land use and photo view for 016-0094.

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	284477E 4225548N
View Direction:	321 degrees
Viewpoint Elevation:	140 feet
Distance to Development:	1396 feet
Horizontal Field of View:	95 degrees

Date of Photography:	24th July 2024 16:19
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	64 inches

VIEWPOINT CONTEXT

Figure 2
Viewpoint KOP 002-CR
Guinea Station Rd NW of Flippo Dr
016-0094

Pre-Application Analysis
Tributary

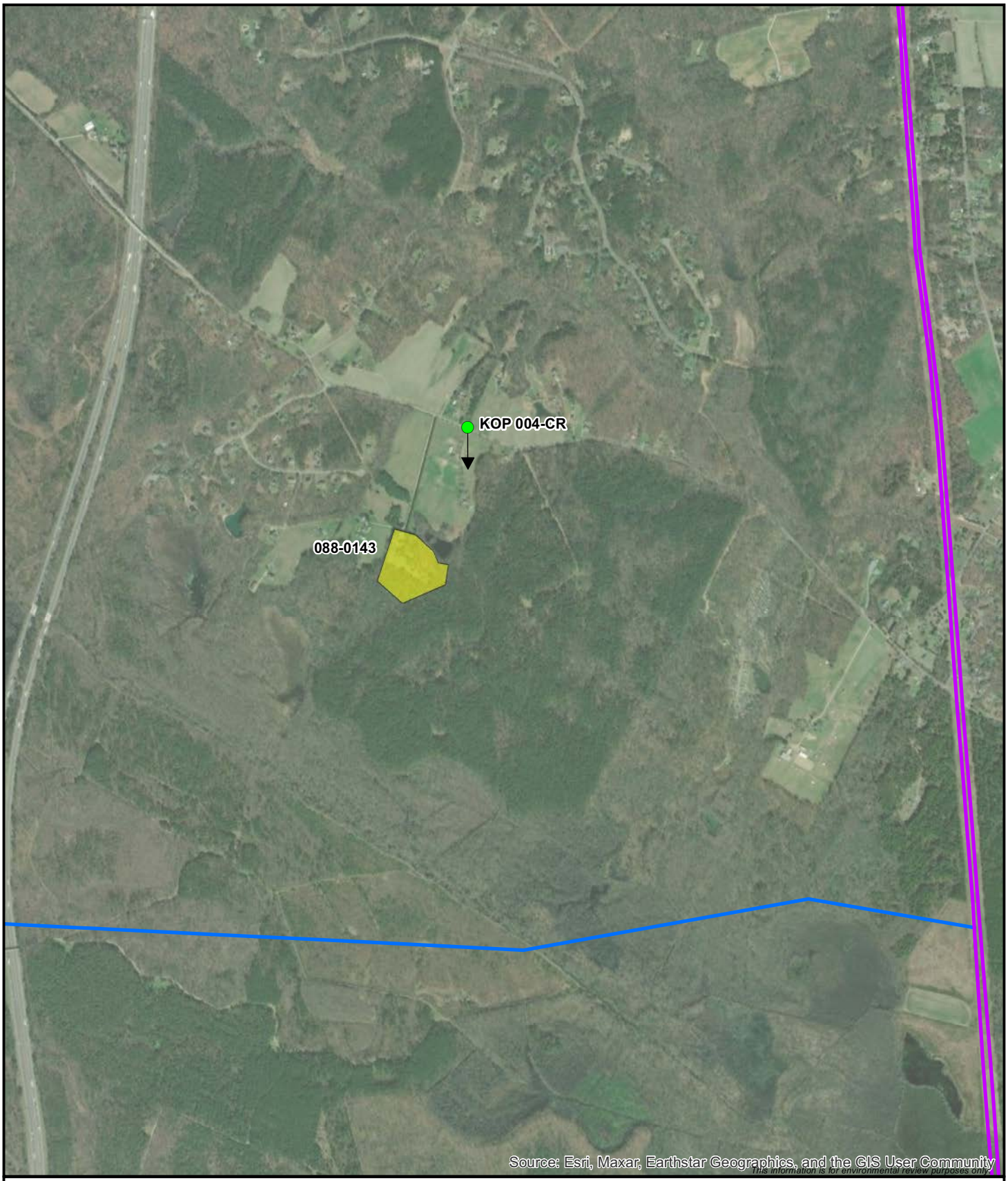

Figure 3. Aerial photograph depicting land use and photo view for 088-0100.

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	284295E 4226634N
View Direction:	235 degrees
Viewpoint Elevation:	196 feet
Distance to Development:	2519 feet
Horizontal Field of View:	95 degrees

Date of Photography:	21st May 2024 14:07
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	64 inches

VIEWPOINT CONTEXT

Figure 4
Viewpoint KOP 009-CR
Guinea Station Rd E of Nyland Rd
088-0100

Pre-Application Analysis
Tributary

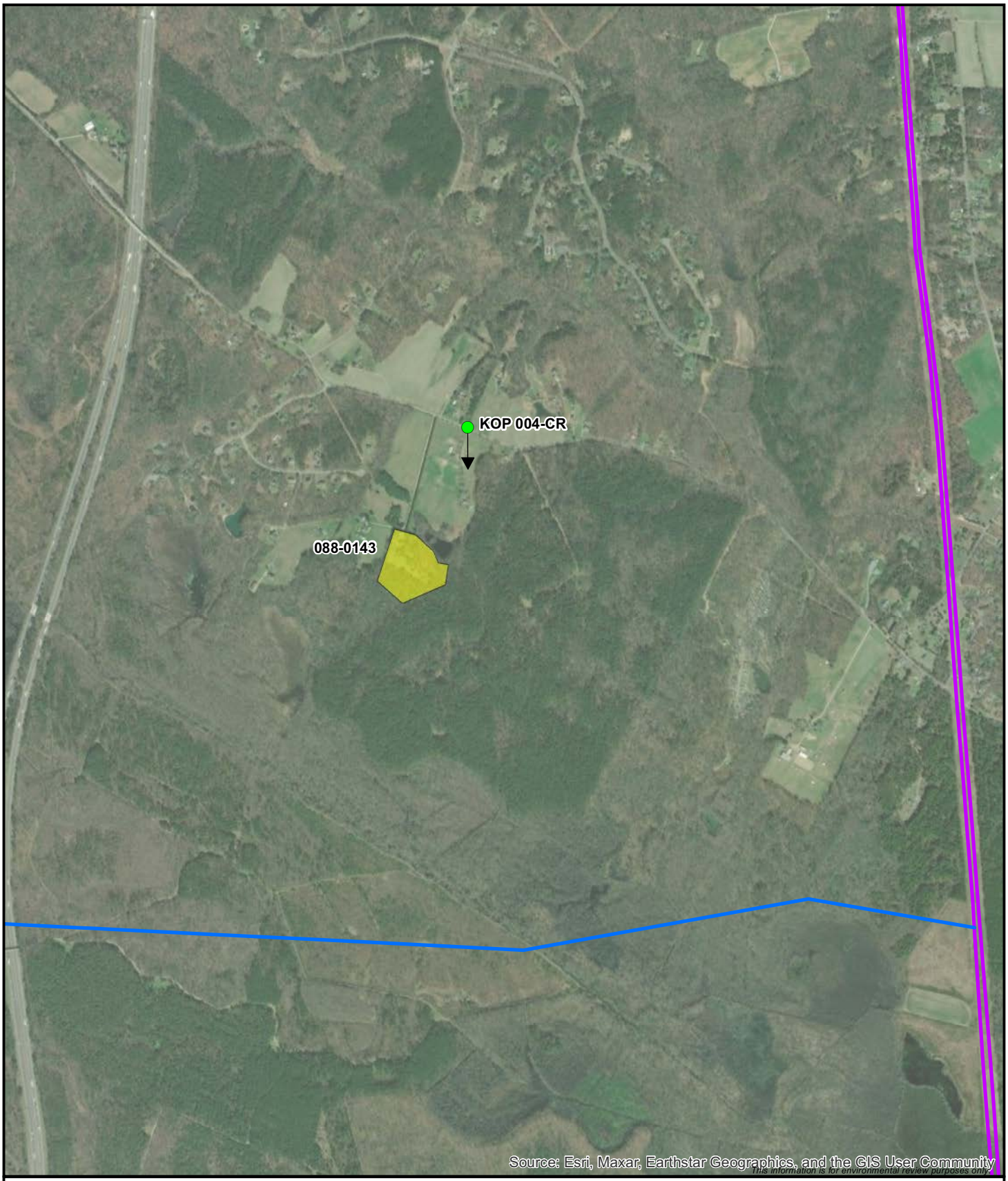

Figure 5. Aerial photograph depicting land use and photo view for 088-0143.

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	282043E 4227872N
View Direction:	190 degrees
Viewpoint Elevation:	268 feet
Distance to Development:	6016 feet
Horizontal Field of View:	95 degrees

Date of Photography:	21st May 2024 13:18
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	64 inches

VIEWPOINT CONTEXT

Figure 6
Viewpoint KOP 004-CR
Guinea Station Rd SE of Station Nye
088-0143

Pre-Application Analysis
Tributary

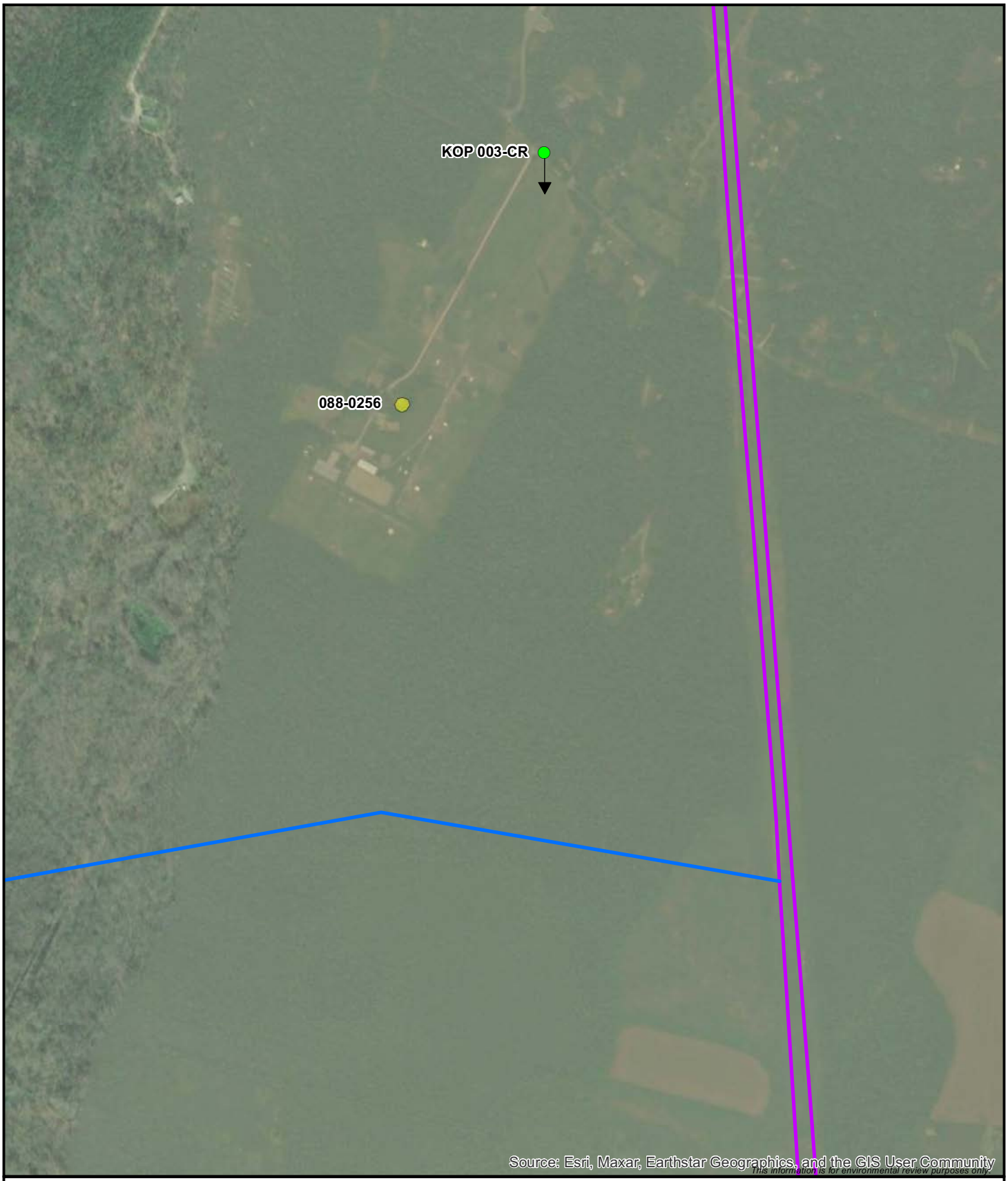

Figure 7. Aerial photograph depicting land use and photo view for 088-0256.

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	283504E 4227125N
View Direction:	204 degrees
Viewpoint Elevation:	229 feet
Distance to Development:	3273 feet
Horizontal Field of View:	95 degrees

Date of Photography:	21st May 2024 13:41
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	65 inches

VIEWPOINT CONTEXT

Figure 8
Viewpoint KOP 003-CR
Guinea Station Rd at Graves Rd
088-0256

Pre-Application Analysis
Tributary

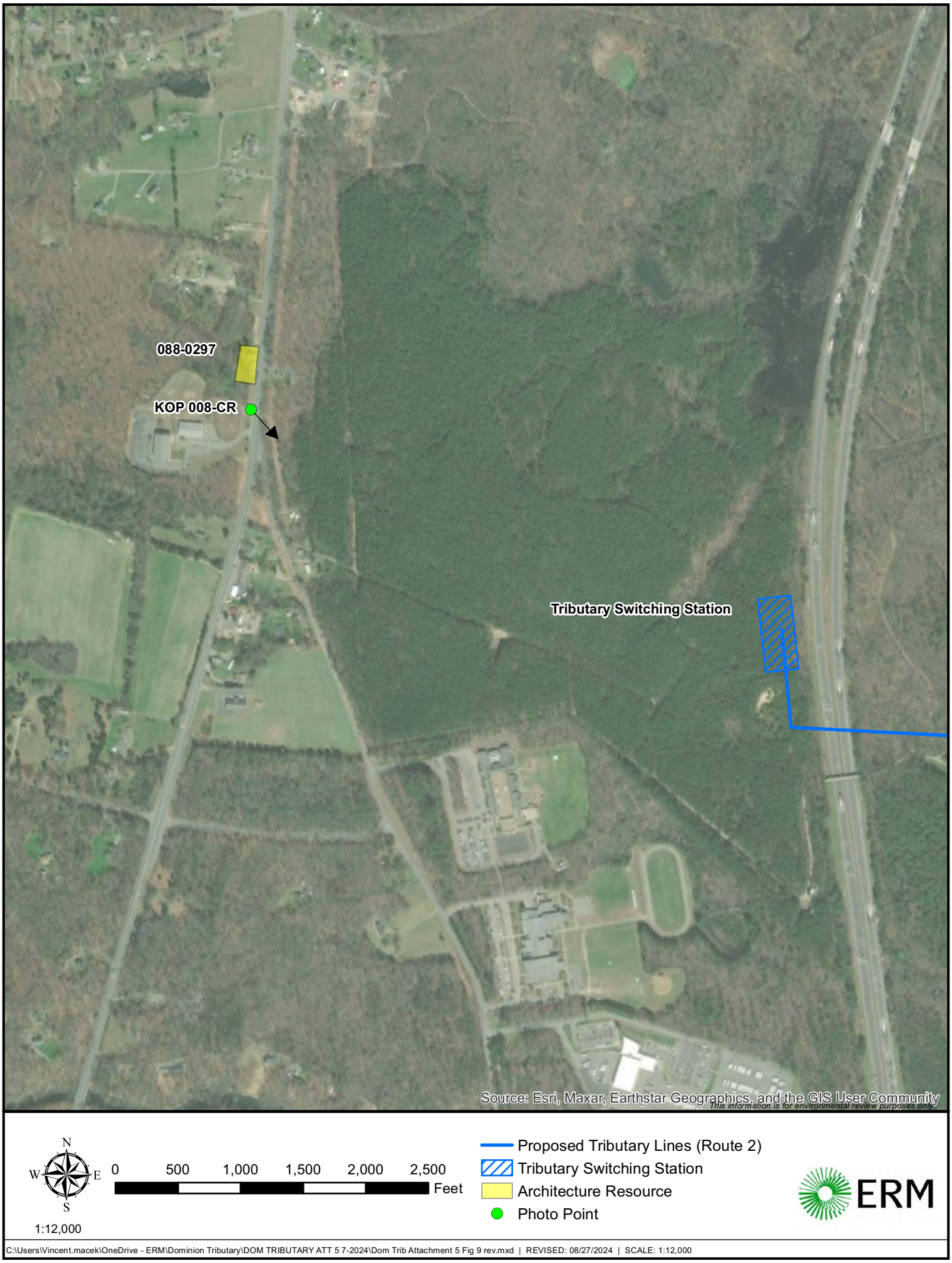

Figure 9. Aerial photograph depicting land use and photo view for 088-0297.

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	279222E 4226768N
View Direction:	116 degrees
Viewpoint Elevation:	267 feet
Distance to Development:	5406 feet
Horizontal Field of View:	95 degrees

Date of Photography:	21st May 2024 14:31
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	64 inches

VIEWPOINT CONTEXT

Figure 10
Viewpoint KOP 008-CR
Patriot Hwy N of Hickory Ridge Rd
088-0297

Pre-Application Analysis
Tributary

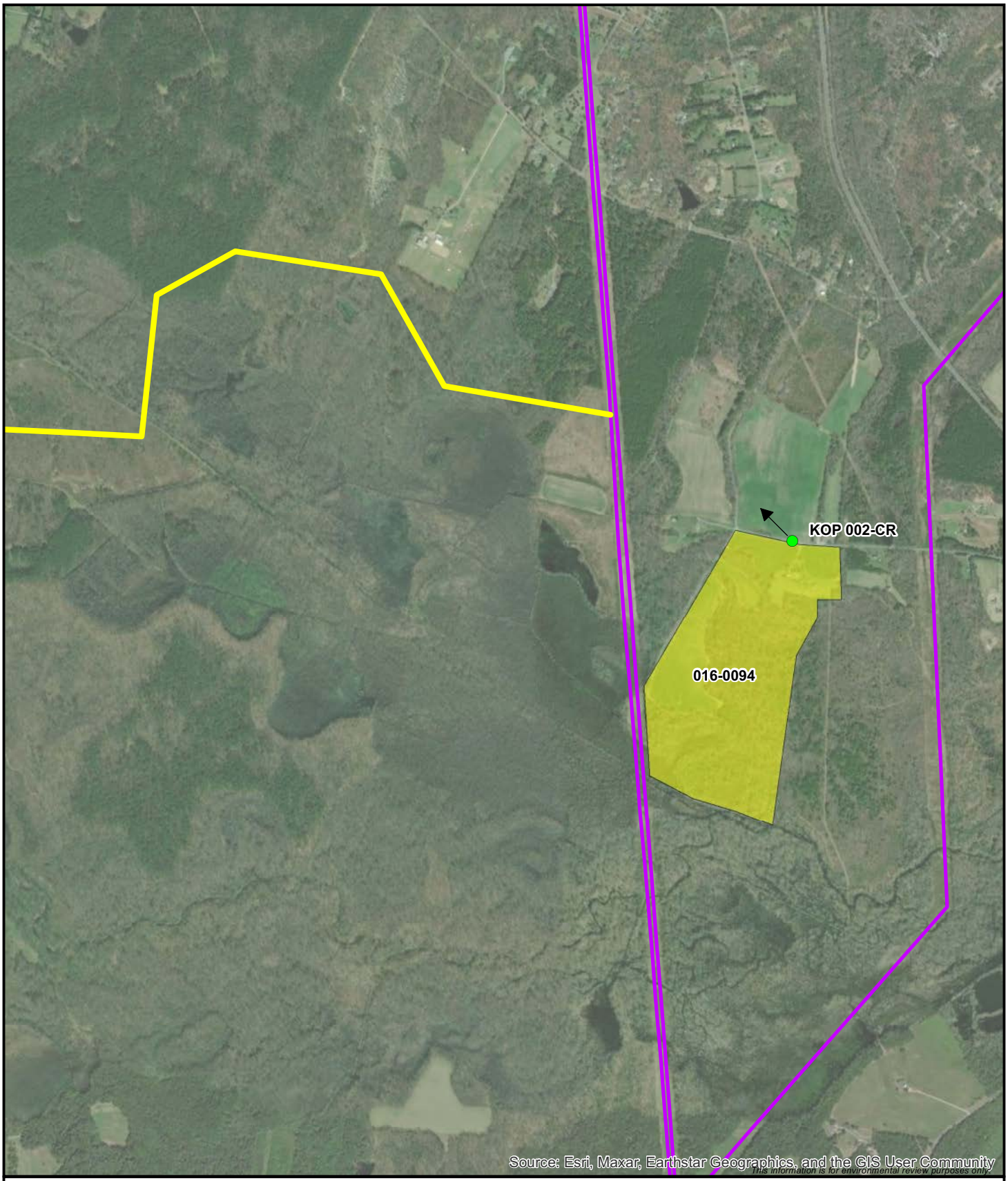

Figure 11. Aerial photograph depicting land use and photo view for 016-0094.

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	284477E 4225548N
View Direction:	321 degrees
Viewpoint Elevation:	140 feet
Distance to Development:	1396 feet
Horizontal Field of View:	95 degrees

Date of Photography:	24th July 2024 16:19
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	64 inches

VIEWPOINT CONTEXT

Figure 12
Viewpoint KOP 002-CR
Guinea Station Rd NW of Flippo Dr
016-0094

Pre-Application Analysis
Tributary

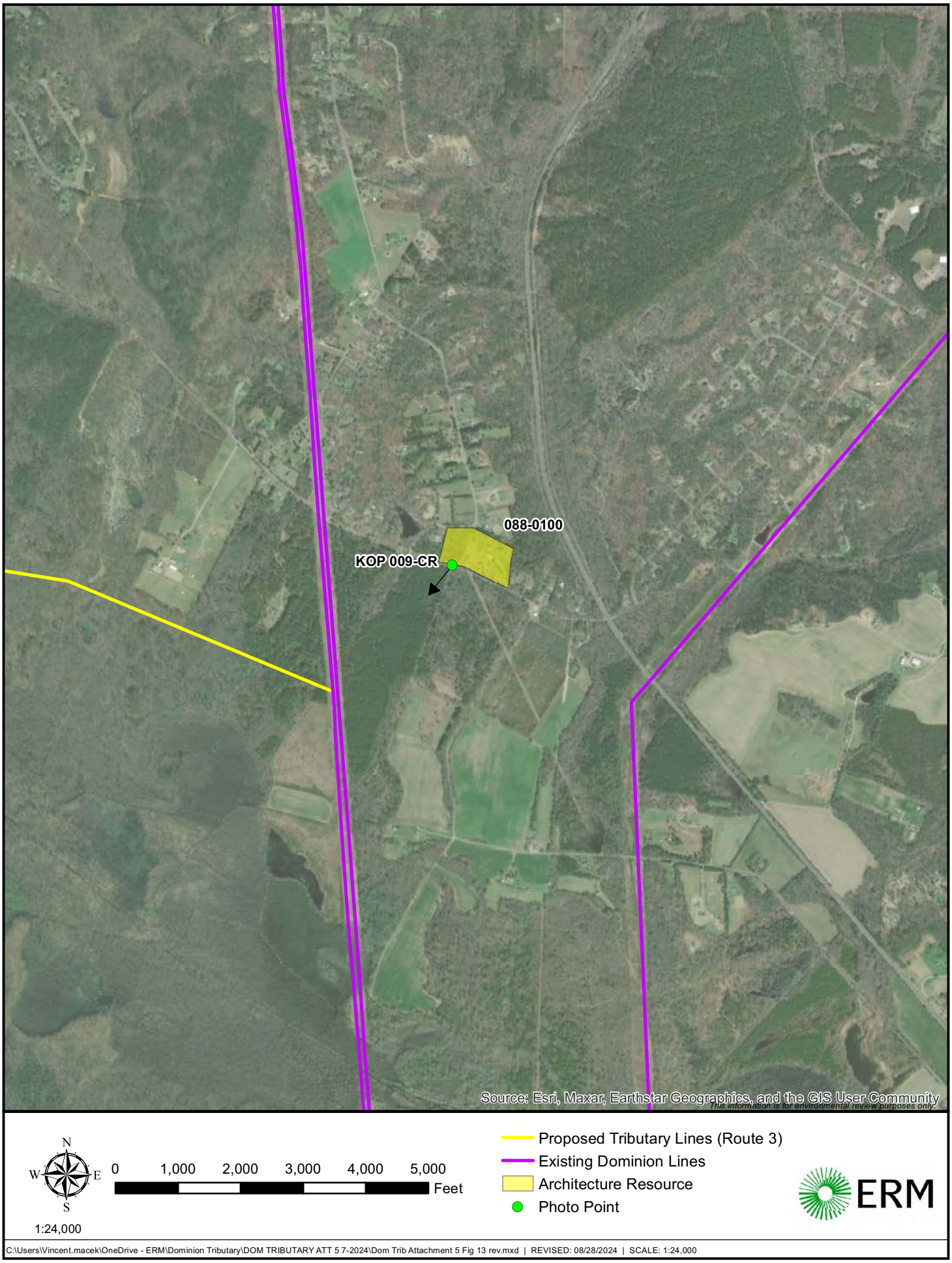

Figure 13. Aerial photograph depicting land use and photo view for 088-0100.

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	284295E 4226634N
View Direction:	235 degrees
Viewpoint Elevation:	196 feet
Distance to Development:	2519 feet
Horizontal Field of View:	95 degrees

Date of Photography:	21st May 2024 14:07
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	64 inches

VIEWPOINT CONTEXT

Figure 14
Viewpoint KOP 009-CR
Guinea Station Rd E of Nyland Rd
088-0100

Pre-Application Analysis
Tributary

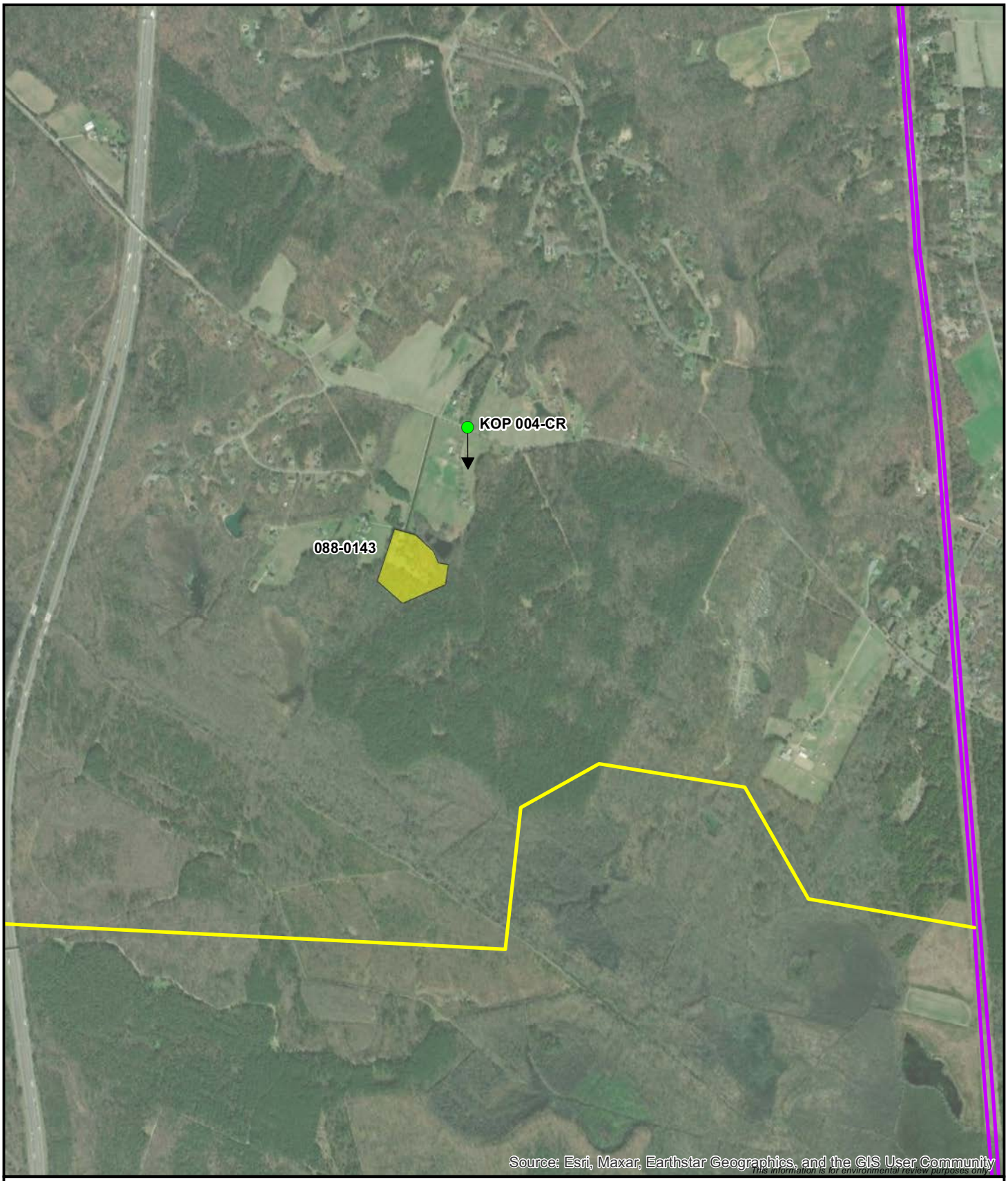

Figure 15. Aerial photograph depicting land use and photo view for 088-0143.

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	282043E 4227872N
View Direction:	190 degrees
Viewpoint Elevation:	268 feet
Distance to Development:	4135 feet
Horizontal Field of View:	95 degrees

Date of Photography:	21st May 2024 13:18
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	64 inches

VIEWPOINT CONTEXT

Figure 16
Viewpoint KOP 004-CR
Guinea Station Rd SE of Station Nye
088-0143

Pre-Application Analysis
Tributary

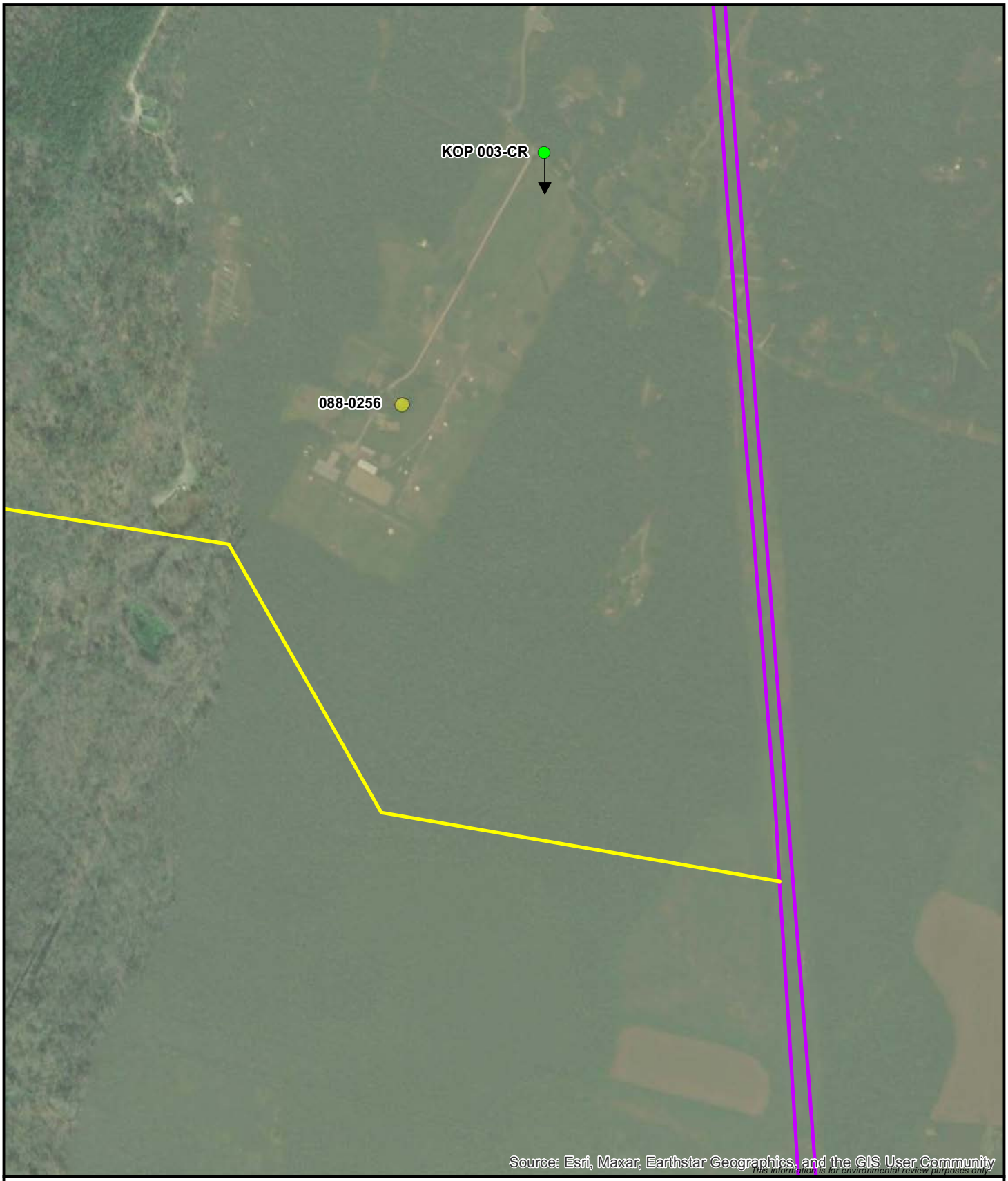

Figure 17. Aerial photograph depicting land use and photo view for 088-0256.

Existing View

Proposed view showing transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	283504E 4227125N
View Direction:	204 degrees
Viewpoint Elevation:	229 feet
Distance to Development:	2391 feet
Horizontal Field of View:	95 degrees

Date of Photography:	21st May 2024 13:41
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	65 inches

VIEWPOINT CONTEXT

Figure 18
Viewpoint KOP 003-CR
Guinea Station Rd at Graves Rd
088-0256

Pre-Application Analysis
Tributary

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	283504E 4227125N
View Direction:	204 degrees
Viewpoint Elevation:	229 feet
Distance to Development:	2391 feet
Horizontal Field of View:	95 degrees

Date of Photography:	21st May 2024 13:41
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	65 inches

Figure 19
Viewpoint KOP 003-CR
Guinea Station Rd at Graves Rd
088-0256

Pre-Application Analysis
Tributary

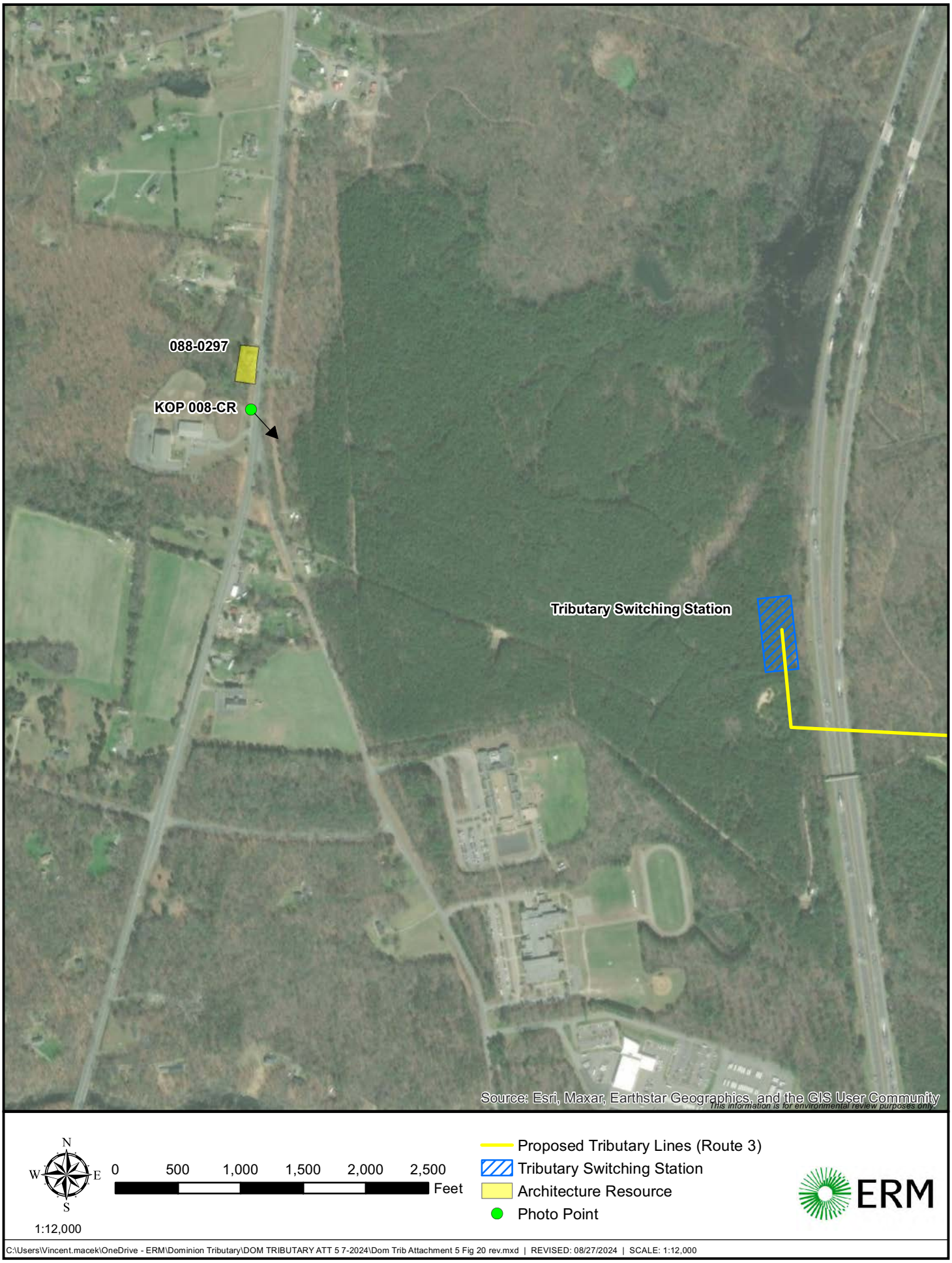

Figure 20. Aerial photograph depicting land use and photo view for 088-0297.

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	279222E 4226768N
View Direction:	116 degrees
Viewpoint Elevation:	267 feet
Distance to Development:	5406 feet
Horizontal Field of View:	95 degrees

Date of Photography:	21st May 2024 14:31
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	64 inches

VIEWPOINT CONTEXT

Figure 21
Viewpoint KOP 008-CR
Patriot Hwy N of Hickory Ridge Rd
088-0297

Pre-Application Analysis
Tributary

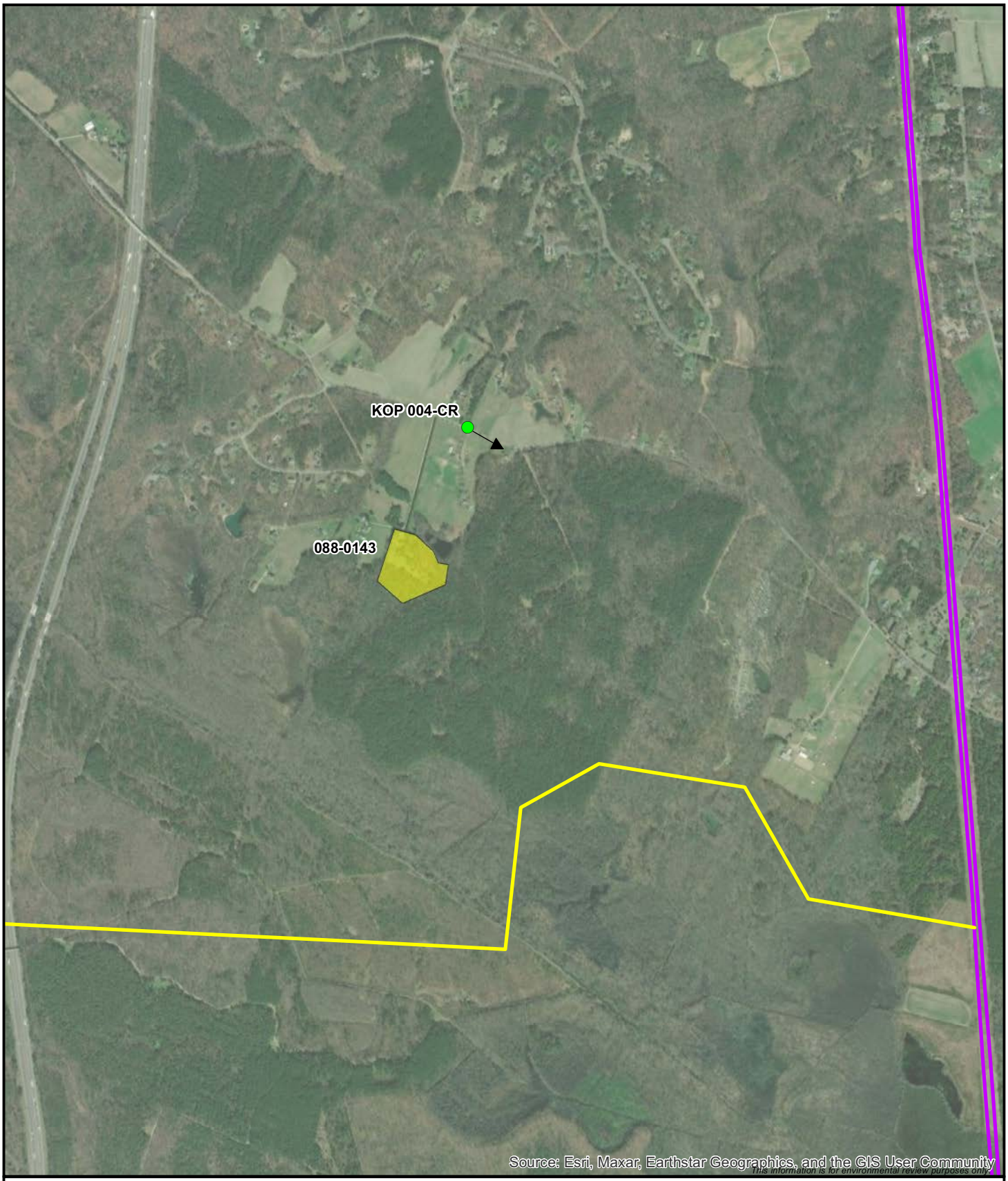

Figure 22. Aerial photograph depicting land use and photo view for 088-0143.

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	282043E 4227872N
View Direction:	190 degrees
Viewpoint Elevation:	268 feet
Distance to Development:	3173 feet
Horizontal Field of View:	95 degrees

Date of Photography:	21st May 2024 13:18
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	64 inches

VIEWPOINT CONTEXT

Figure 23
Viewpoint KOP 004-CR East
Guinea Station Rd SE of Station Nye
088-0143

Pre-Application Analysis
Tributary

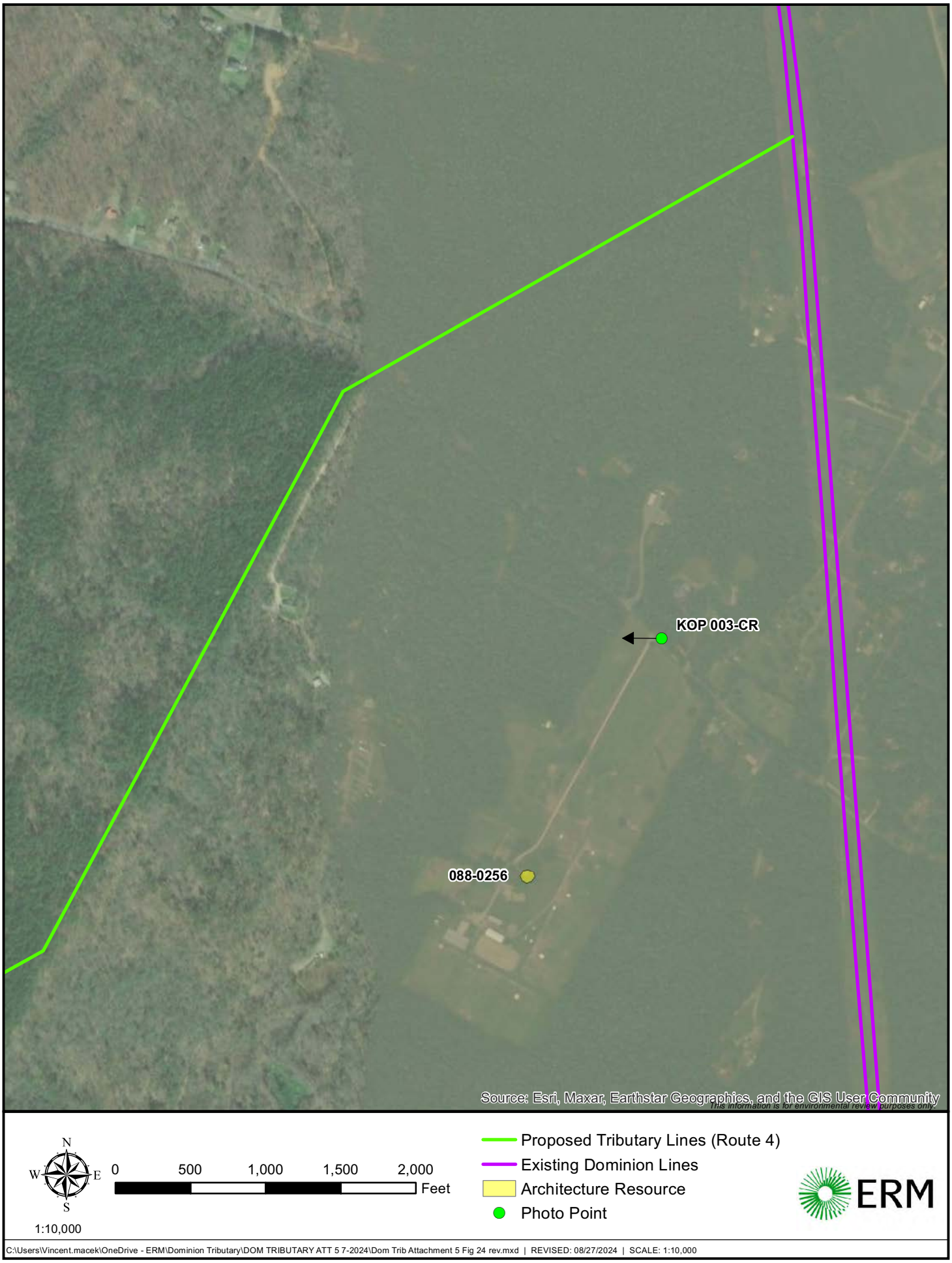

Figure 24. Aerial photograph depicting land use and photo view for 088-0256.

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	283504E 4227125N
View Direction:	273 degrees
Viewpoint Elevation:	229 feet
Distance to Development:	1887 feet
Horizontal Field of View:	95 degrees

Date of Photography:	21st May 2024 13:41
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	65 inches

VIEWPOINT CONTEXT

Figure 25
Viewpoint KOP 003-CR West
Guinea Station Rd at Graves Rd
088-0256

Pre-Application Analysis
Tributary

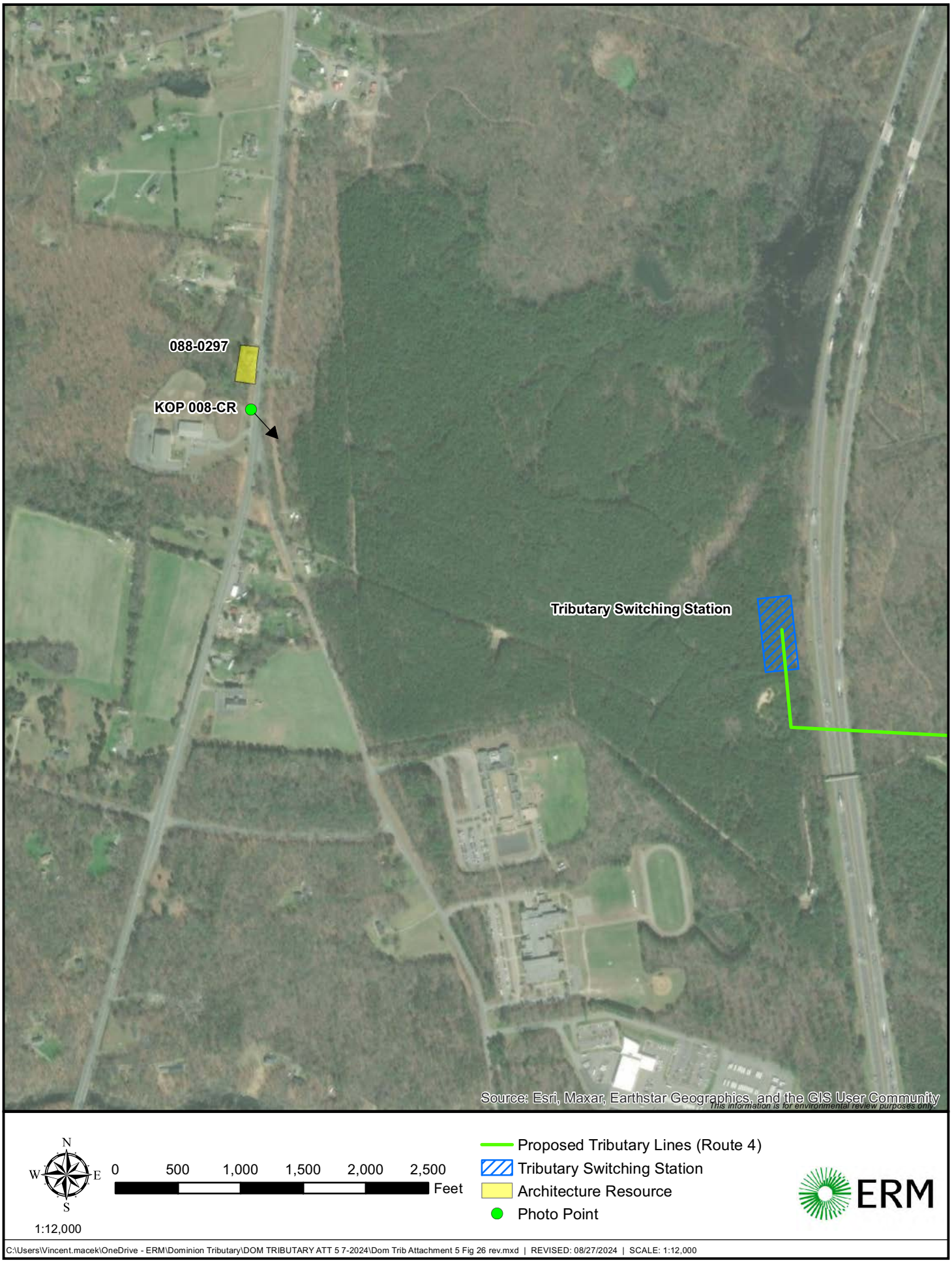

Figure 26. Aerial photograph depicting land use and photo view for 088-0297.

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	279222E 4226768N
View Direction:	116 degrees
Viewpoint Elevation:	267 feet
Distance to Development:	5406 feet
Horizontal Field of View:	95 degrees

Date of Photography:	21st May 2024 14:31
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	64 inches

VIEWPOINT CONTEXT

Figure 27
Viewpoint KOP 008-CR
Patriot Hwy N of Hickory Ridge Rd
088-0297

Pre-Application Analysis
Tributary

ATTACHMENT 6 VEGETATED VISUAL ANALYSIS

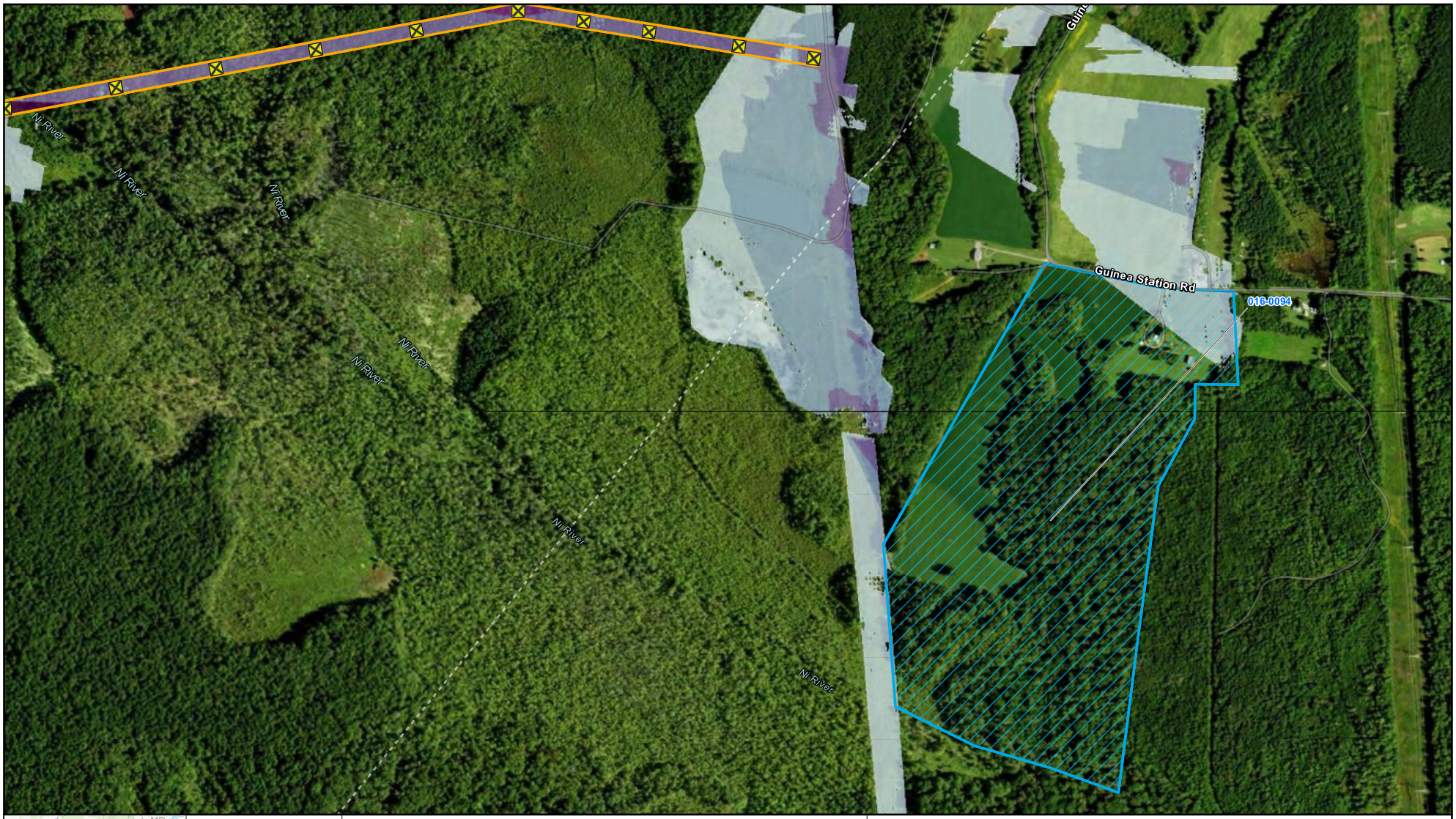

Figure 1: Vegetated Visibility Analysis - Route 2
016-0094
Tributary 230 kV Electric Transmission Project
Spotsylvania County, Virginia

ERM

Dominion Energy

MPLS M:\US\Projects\D-F\Dominion\Tributary\ArcGIS\2024\08\Tributary_Cultural_VSA\Tributary_Cultural_VSA.aprx\DOM_Tributary_VSA_Route 2 | REVISED: 08/28/2024 | SCALE: 1:7,200 when printed at 11x17

DRAWN BY: RMR

Figure 2: Vegetated Visibility Analysis - Route 2
088-0143 and 088-0256
Tributary 230 kV Electric Transmission Project
Spotsylvania County, Virginia

ERM

Dominion Energy

MPLS M:\US\Projects\D-F\Dominion\Tributary\ArcGIS\2024\08\Tributary_Cultural_VSA\Tributary_Cultural_VSA.aprx\DOM_Tributary_VSA_Route 2 | REVISED: 08/28/2024 | SCALE: 1:7,200 when printed at 11x17

DRAWN BY: RMR

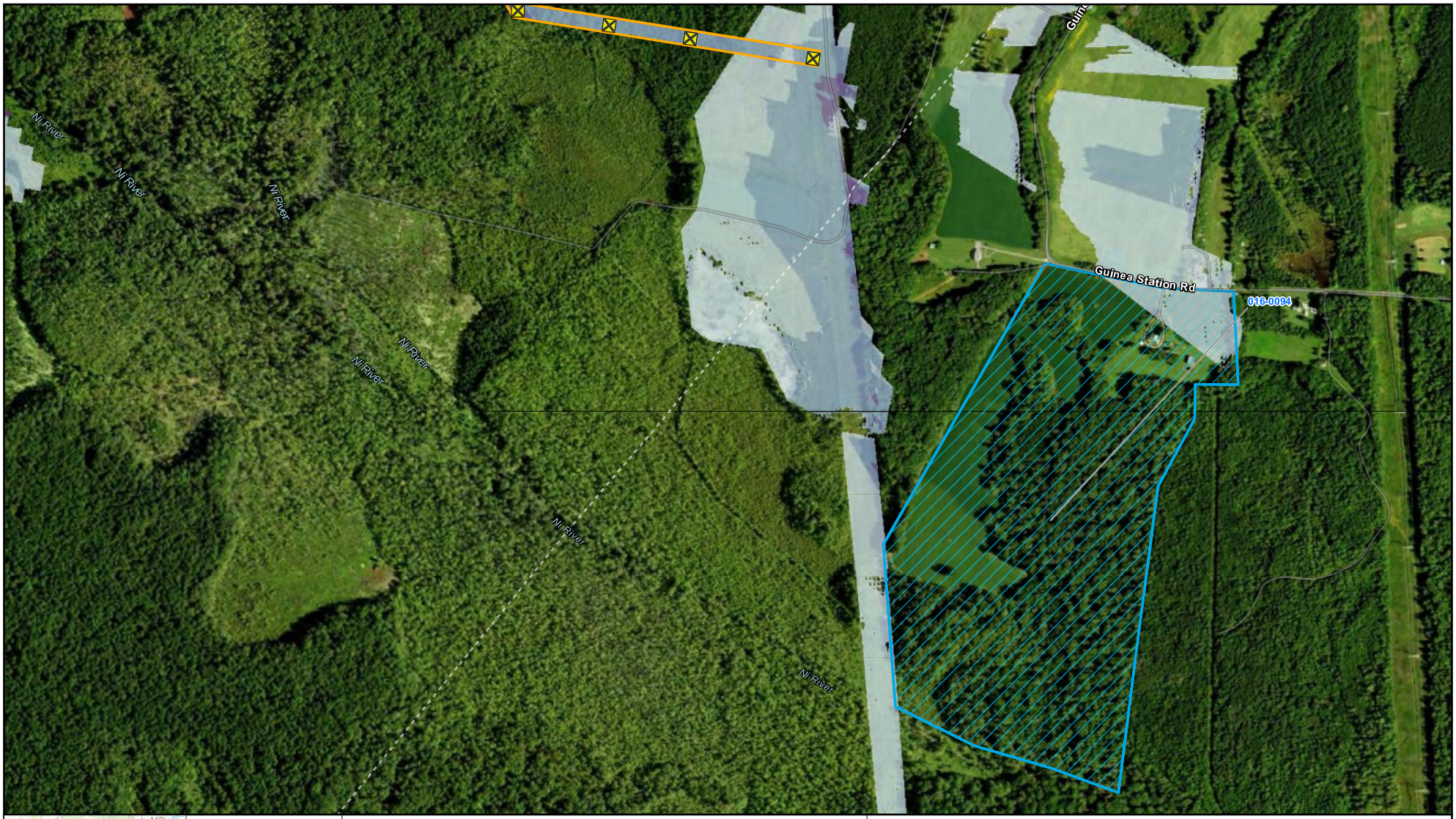

Figure 3: Vegetated Visibility Analysis - Route 3
016-0094
Tributary 230 kV Electric Transmission Project
Spotsylvania County, Virginia

ERM

Dominion Energy

MPLS M:\US\Projects\D-F\Dominion\Tributary\ArcGIS\2024\08\Tributary_Cultural_VSA\Tributary_Cultural_VSA.aprx\DOM_Tributary_VSA_Route 3 | REVISED: 08/28/2024 | SCALE: 1:7,200 when printed at 11x17

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Figure 4: Vegetated Visibility Analysis - Route 3
088-0143 and 088-0256
Tributary 230 kV Electric Transmission Project
Spotsylvania County, Virginia

ERM

Dominion Energy

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Figure 5: Vegetated Visibility Analysis - Route 4
088-0143 and 088-0256
Tributary 230 kV Electric Transmission Project
Spotsylvania County, Virginia

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Dominion Energy

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DRAWN BY: RMR

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