Dominion Energy®

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

Before the State Corporation Commission of Virginia

Carmel Church and Ruther Glen 230 kV Transmission Line Projects

Application No. 344

Case No. PUR-2024-00221

Filed: December 12, 2024

Volume 2 of 4

COMMONWEALTH OF VIRGINIA

BEFORE THE

STATE CORPORATION COMMISSION

APPLICATION OF

VIRGINIA ELECTRIC AND POWER COMPANY

FOR APPROVAL AND CERTIFICATION
OF ELECTRIC TRANSMISSION FACILITIES

Carmel Church and Ruther Glen 230 kV Transmission Line Projects

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DEQ Supplement

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Based on consultations with the Virginia Department of Environmental Quality ("DEQ"), Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company") has developed this DEQ Supplement to facilitate review and analysis of the proposed Projects by DEQ and other relevant agencies.

1. Project Description

In order to provide service requested by Rappahannock Electric Cooperative ("REC") for REC to provide service to its two new load additions in Caroline County, Virginia, 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, Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company") proposes in Caroline County, Virginia, to:

(i) **Ruther Glen Loop**: Cut the Company's existing 230 kilovolt ("kV") Line # 256 (Ladysmith CT – Four Rivers) near St. John's Substation between existing structures #256/180 and #256/181 and construct a new double circuit overhead 230 kV line approximately 4.0 miles in and out of a proposed new switching station, Ruther Glen Switching Station, resulting in (i) 230 kV Ladysmith CT – Ruther Glen Line #256 and (ii) 230 kV Ruther Glen – Carmel Church Line #2410 (the "Ruther Glen Loop"). From the proposed cut-in location within existing right-of-way, Lines #256 and #2410 will extend approximately 4.0 miles within a new 160-foot-wide right-of-way, supported by weathering steel double circuit monopoles and utilizing three-phase twin-bundled 768.2 Aluminum Conductor Steel Supported/Trapezoidal Wire/High Strength ("ACSS/TW/HS") conductor with a summer transfer capability of 1,573 MVA.

(ii) **Ruther Glen Switching Station**: Construct a new 230 kV switching station in Caroline, County, Virginia on property owned by the Customer (the "Ruther Glen Switching Station").

(iii) **Carmel Church Loop**: From the proposed Ruther Glen Switching Station, extend a new double circuit overhead 230 kV transmission line approximately 2.5 miles in and out of the proposed new switching station, Carmel Church Switching Station resulting in (i) 230 kV Ruther Glen - Carmel Church Line #2410 and (ii) 230 kV Carmel Church - Four Rivers Line #2422 (the "Carmel Church Loop"). As proposed, existing 230 kV Ladysmith CT – Four Rivers Line #256 will be cut at Structure #256/227, and to effectuate the cut-in location, the Company will remove one single circuit H-frame tangent structure and install one two-pole double dead-end structure within the existing right-of-way. From the proposed cut-in location within existing right-of-way, Lines #2410 and 2422 will extend approximately 2.5miles within a new predominantly 100-foot-wide right-of-way, supported by weathering steel double circuit monopoles and utilizing three-phase twin-bundled 768.2 ACSS/TW/HS conductor with a summer transfer capability of 1,573 MVA.

(iv) **Carmel Church Switching Station**: Construct a new 230 kV switching station in Caroline, County, Virginia on property owned by the Customer (the "Carmel Church Switching Station").

The Ruther Glen Loop and the Ruther Glen Switching Station are referred to as the "Ruther Glen Project." The Carmel Church Loop and the Carmel Church Switching Station are referred to as the "Carmel Church Project." The Ruther Glen Project and the Carmel Church Project are referred to together as the "Projects." While the Projects have separate need drivers, the project areas are geographically in close proximity to each other. For this reason, the Projects are combined for this filing.

The Projects are necessary to assure that Dominion Energy Virginia can provide requested service to the Customer for the Customer to provide service to two new data center developments in Caroline County, Virginia, to maintain reliable service for the overall growth in the Project area, and to comply with mandatory NERC Reliability Standards for transmission facilities and the Company's mandatory planning criteria ("Planning Criteria").

REC's Ruther Glen DP request projects a summer peak of 170 MW in 2027 and in 2028, and 300 MW in 2029, which is full build out of REC's customer's data center campus. REC's Carmel Church DP request projects a summer peak of 18 MW in 2027, 80 MW in 2028, and 125 MW in 2029, with 300 MW at full build out of REC's customer's data center campus. Both developments are in a rural area where additional load cannot be added without constructing additional transmission and distribution infrastructure.

Ruther Glen Loop Route: The Company identified an approximately 4.0-mile overhead proposed route for the Ruther Glen Loop ("Ruther Glen Proposed Route" or "Ruther Glen Route 5"), as well as an approximately 3.7-mile overhead alternative route ("Ruther Glen Alternative Route 4" or "Ruther Glen Route 4"), and an approximately 3.9-mile overhead alternative route ("Ruther Glen Alternative Route 6" or "Ruther Glen Route 6").

Carmel Church Loop Route: The Company identified an approximately 2.5-mile overhead proposed route for the Carmel Church Loop ("Carmel Church Proposed Route" or "Carmel Church Route 1") and an approximately 2.8-mile overhead alternative route ("Carmel Church Alternative Route 2" or "Carmel Church Route 2").

The Company is proposing all the Proposed and Alternative Routes identified above for notice and Commission consideration. Discussion of the routes that the Company studied but ultimately rejected, is provided in Section II of the Appendix and in the Environmental Routing Study (or "Routing Study") included with the Application.

The proposed 230 kV Ruther Glen Switching Station will be constructed with four 230 kV 4000 ampere ("A") breakers with an ultimate design of six breakers arranged in a breaker-and-a-half configuration. The total area of the Ruther Glen Station is approximately 7.5acres.

The proposed 230 kV Carmel Church Switching Station will be constructed with four 230 kV 4000 A breakers with an ultimate design of nine breakers arranged in a breaker-and-a-half configuration. The total area of the Carmel Church Station is approximately 10.0 acres.

For these Projects, the Company retained the services of Environmental Resources Management ("ERM") to help collect information within the study areas, identify potential routes, perform a routing analysis comparing the route alternatives, and document the routing efforts in the respective environmental routing studies.

A description of the Proposed Route and Alternative Routes for each Project is as follows.

Ruther Glen

Ruther Glen Proposed Route (Route 5)

The Ruther Glen Proposed Route cuts the Company's existing Line #256 approximately 0.8 mile due north of Golansville Road and extends west for approximately 1.1 miles across agricultural fields, forested land, a Columbia Gas Natural Gas easement and Balty Road. At this point, the Ruther Glen Proposed Route turns north to cross Bath Road/Pond Road and extends north for approximately 0.80 mile through forested parcels and along the eastern edge of an agricultural parcel. The Ruther Glen Proposed Route then turns west to run parallel to and south of the existing REC 115 kV easement for approximately 0.8 mile through agricultural and then forested land. The Ruther Glen Proposed Route then crosses and runs parallel to the north side of the REC easement for approximately 0.4 mile through forested land before entering the Ruther Glen Switching Station. The Ruther Glen Switching Station will sit approximately 0.6 miles southwest of the intersection of Ladysmith Road and Bull Church Road.

The Ruther Glen Proposed Route will be constructed on new right-of-way primarily supported by double circuit weathering steel monopoles. For the Ruther Glen Proposed Route, the minimum structure height is 100 feet, the maximum structure height is 114 feet, and the average structure height is 145 feet, based on preliminary conceptual design, not including foundation reveal, and subject to change based on final engineering design.

Ruther Glen Alternative Route 4

Alternative Route 4 cuts the Company's existing Line #256 approximately 0.8 mile due north of Golansville Road and extends west for approximately 1.1 miles across agricultural fields, forested land, a Columbia Gas Natural Gas easement and Balty Road. Following property lines west of Balty Road, Alternative Route 4 passes through forested parcels and crosses Dejarnette Mill Run twice before turning southwest to cross Boxley Road approximately 0.6 mile north of Golansville Road. West of Boxley Road, Alternative Route 4 turns northwest for a approximately 1.1 miles through forested land east of Reedy Swamp and west of rural residential properties before turning west to enter the proposed Ruther Glen Switching Station. The Ruther Glen Switching Station will sit

approximately 0.6 miles southwest of the intersection of Ladysmith Road and Bull Church Road.

Alternative Route 4 will be constructed on new right-of-way primarily supported by double circuit weathering steel monopoles. For Alternative Route 4, the minimum structure height is 90 feet, the maximum structure height is 140 feet, and the average structure height is 111 feet, based on preliminary conceptual design, not including foundation reveal, and subject to change based on final engineering design.

Ruther Glen Alternative Route 6

Alternative Route 6 cuts the Company's existing Line #256 in the same location as Alternative Route 4 and follows the same path as Alternative Route 4 for the first approximately 1.5 miles. At this point, Alternative Route 6 turns south for approximately 0.3 mile and then west for approximately 0.6 mile before crossing Boxley Road. This segment of Alternative Route 6 runs through forested land and crosses Dejarnette Mill Run three times, including two crossings north of Boulware Pond. After crossing Boxley Road, Alternative Route 6 turns northwest for approximately 1.2 miles through forested areas east of Reedy Swamp and west of rural residential properties along Boxley Road. Alternative Route 6 then crosses the existing REC 115kV easement and turns west to enter the proposed Ruther Glen Switching Station. The Ruther Glen Switching Station will sit approximately 0.6 miles southwest of the intersection of Ladysmith Road and Bull Church Road.

Alternative Route 6 will be constructed on new right-of-way primarily supported by double circuit weathering steel monopoles. For Alternative Route 6, the minimum structure height is 90 feet, the maximum structure height is 140 feet, and the average structure height is 111 feet, based on preliminary conceptual design, not including foundation reveal, and subject to change based on final engineering design.

Ruther Glen Switching Station

The Ruther Glen Switching Station will be sited on approximately 7.5 acres and will sit approximately 0.6 miles southwest of the intersection of Ladysmith Road and Bull Church Road. Impacts associated with the switching station footprint are included in the impacts for each route alternative.

<u>Carmel Church</u>

Carmel Church Proposed Route (Route 1)

The Carmel Church Proposed Route (Route 1) is approximately 2.5 miles in length. The cut in is approximately 100 feet south of the Line #256 crossing of Old CC Road. From there, Route 1 extends west-northwest across primarily

forested land for approximately 0.7 mile, then turns west-southwest, continuing through primarily forested land. The easternmost 1.0 mile of Route 1 is within Caroline County's Planned Innovation, Research, and Technology (PIRT) District. Approximately 1.2 miles west of the tap point, the Carmel Church Proposed Route crosses portions of Reedy Creek, a Columbia Natural Gas easement, and the CSX Railroad line. Following those crossings, the route continues west-southwest for approximately 1.1 miles, passing behind existing industrial development and crossing Ruther Glen Road. The remaining 0.5 mile of the route extends west across forested property held by AVAOI Digital, across I-95, and into the proposed Carmel Church Switching Station. The Carmel Church Switching Station will sit to the southwest of the intersection of I-95 and Rogers Clark Boulevard.

The Carmel Church Proposed Route will be constructed on new right-of-way primarily supported by double circuit weathering steel monopoles. For the Carmel Church Proposed Route, the minimum structure height is 90 feet, the maximum structure height is 135 feet, and the average structure height is 109 feet, based on preliminary conceptual design, not including foundation reveal, and subject to change based on final engineering design.

Carmel Church Alternative Route 2

Alternative Route 2 extends from a tap along the Company's existing Line #256 to the proposed Carmel Church Switching Station at the northern end of the Washington DC South development. The tap is approximately 0.5-mile north of the existing line's crossing of Ruther Glen Road. From there, Alternative Route 2 travels west-northwest through forested land for approximately 0.5 mile, parallelling south of Granny's Way, then approximately 0.2 mile west-southwest along the edge of an agricultural field (also to the south of Granny's Way) before crossing Ruther Glen Road. Alternative Route 2 continues west for about 0.5 mile through forested land between residential parcels before turning northwest for approximately 0.4 mile through forested property held by AVAOI Digital. Alternative Route 2 crosses I-95 and then continues north paralleling the western edge of I-95 for approximately 1.0 mile. Alternative Route 2 crosses a Columbia Natural Gas easement and the CSX Railroad line approximately 0.5 mile before connecting into the Carmel Church Switching Station. The Carmel Church Switching Station will sit to the southwest of the intersection of I-95 and Rogers Clark Boulevard.

Alternative Route 2 will be constructed on new right-of-way primarily supported by double circuit weathering steel monopoles. For Alternative Route 2, the minimum structure height is 85 feet, the maximum structure height is 135 feet, and the average structure height is 111 feet, based on preliminary conceptual design, not including foundation reveal, and subject to change based on final engineering design.

Carmel Church Switching Station

The Carmel Church Switching Station will be sited on approximately 10.0 acres and will sit to the southwest of the intersection of I-95 and Rogers Clark Boulevard. Impacts associated with the switching station footprint are included in the impacts for each route alternative.

2. Environmental Analysis

The Company has conducted an environmental analysis on the proposed Projects. Please see the following subsections of this DEQ Supplement for pertinent details about the proposed Projects.

A. Air Quality

For the Projects, the Company will control fugitive dust during construction in accordance with DEQ regulations. During construction, if the weather is dry for an extended period, there will be airborne particles from the use of vehicles and equipment within the right-of-way. However, minimal earth disturbance will take place and vehicle speed, which is often a factor in airborne particulate, will be kept to a minimum. Erosion and sedimentation control is addressed in Section 2.H of this Supplement. Equipment and vehicles that are powered by gasoline or diesel motors will be used during the construction of the line so there will be exhaust from those motors. Exhaust from those motors will result in minimal air pollution.

Tree clearing within the new rights-of-way will be required as part of these Projects. The Company does not expect to burn cleared material, but, if necessary, the Company will coordinate with the responsible locality to obtain the appropriate permits and will comply with any conditions set forth by the locality or take actions in accordance with the Company's property rights. The Company's tree clearing methods are described in Section 2.L.

B. Water Source

No water source is required for transmission lines. This discussion focuses on waterbodies that will be crossed by the proposed transmission lines.

On behalf of the Company, ERM identified and mapped waterbodies in the vicinity of the routes using publicly available geographic information system ("GIS") databases, U.S. Geological Survey ("USGS") National Hydrography Dataset Plus High Resolution ("NHD"), ESRI World Elevation Terrain 2-foot contours, the United States Fish and Wildlife Service ("USFWS") National Wetland Inventory ("NWI"), recent (2023) and historic digital aerial photography (National Agricultural Imagery Program, VGIN Most Recent Imagery, and Google Earth).

All route alternatives for both Projects utilize an overhead configuration that would span waterbodies; no transmission structures are planned to be installed within waterbodies. The distance between transmission line structures proposed by Dominion Energy

Virginia will be adequate to span the waterbodies identified along both Projects' route alternatives. Tree clearing would be required within forested riparian areas at waterbody crossing locations. The removal of forested riparian areas adjacent to waterbodies will 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 at these locations. Impacts to surface waters and riparian habitat will be limited by minimizing rights-of-way at crossings to the extent possible, leaving roots and stumps in place, and implementing erosion control best management practices during construction.

According to U.S. Army Corps of Engineers ("Corps") documentation, no waters considered navigable under Section 10 of the Rivers and Harbors Act are crossed by the Proposed or Alternative Routes for the Projects. Waterbodies in the vicinity of the Projects' routes, inclusive of the proposed Ruther Glen Switching Station and Carmel Church Switching Station footprints, are shown on Attachment 2 of the Wetland and Waterbody Desktop Summaries for the Projects, which are included in Attachment 2.D.1 (Ruther Glen) and Attachment 2.D.2 (Carmel Church). For waterbody acreage crossed, as identified in the Wetland and Waterbody Desktop Summary, see Tables D-2 and D-3 below.

Ruther Glen Project

Ruther Glen Proposed Route (Route 5)

The Ruther Glen Proposed Route (Route 5) crosses six NHD-mapped waterbodies: one crossing of perennial Reedy Swamp and five unnamed, intermittent streams.

Ruther Glen Alternative Route 4

Ruther Glen Alternative Route 4 crosses seven NHD-mapped waterbodies: two perennial streams (DeJarnette Mill Run and Reedy Swamp) and five intermittent streams.

Ruther Glen Alternative Route 6

Ruther Glen Alternative Route 6 crosses nine NHD-mapped waterbodies: two perennial lakes/ponds and seven unnamed, intermittent streams.

Carmel Church Project

Carmel Church Proposed Route (Route 1)

The Carmel Church Proposed Route crosses six NHD-mapped waterbodies: one perennial lake/pond associated with Reedy Creek and five unnamed, intermittent streams.

Carmel Church Alternative Route 2

Carmel Church Alternative Route 2 crosses four NHD-mapped waterbodies, all of which are unnamed, intermittent streams.

During construction, proper drainage of waterbodies will be maintained using culverts and/or other crossing devices, as needed, according to the Company's standard policies. Where clearing of trees and/or woody shrubs is required, clearing within 100 feet of a stream will be conducted by hand. Vegetation will be cut at or slightly above ground level, and stumps will not be grubbed. To protect waterways from soil erosion and sedimentation during construction, the Company will use sediment barriers along waterways and steep slopes. If a section of line cannot be accessed from existing roads, the Company may need to install a culvert or temporary bridge to cross small streams. In such cases, temporary fill material may be required that would be placed on erosion control fabric and removed when work is completed, returning the surface to original contours.

If necessary, a Joint Permit Application ("JPA") will be submitted for review by the Virginia Marine Resources Commission ("VMRC"), DEQ, and the Corps to authorize jurisdictional crossings and for any impacts to jurisdictional features.

C. Discharge of Cooling Waters

No discharge of cooling waters is associated with the Projects.

D. Tidal and Non-tidal Wetlands

No tidal wetlands were identified within the Projects' areas. Non-tidal wetlands are summarized below.

On behalf of the Company, ERM identified wetlands along the Projects' routes, inclusive of the proposed Ruther Glen Switching Station and Carmel Church Switching Station sites, using GIS and remote sensing data sources to conduct an offsite desktop wetlands delineation. A copy of ERM's Wetland and Waterbody Desktop Summary for the Ruther Glen Project and the Carmel Church Project are included in Attachment 2.D.1 and Attachment 2.D.2, respectively. Sources for the desktop summaries include the USFWS NWI, the USGS NHD, the Natural Resources Conservation Service Web Soil Survey, ESRI World Elevation Terrain 2-foot contours, National Agricultural Imagery Program Digital Ortho-Rectified Infrared Images dating from 2024, recent (2023) and historic digital aerial photography (National Agricultural Imagery Program, VGIN Most Recent Imagery and Google Earth).

ERM did not field delineate wetlands along the Projects' routes. Field wetland delineations were completed by external parties, however, on the new data center parcels for the Projects. Specifically, a field delineation was completed by WSP USA, Inc. in July 2024 on the parcel containing the proposed Carmel Church Switching Station. Additionally, a field delineation was completed by Wetland Studies and Solutions, Inc.

in the summer (between July and August) of 2024 on the parcels of the proposed data center associated with the proposed Ruther Glen Switching Station, which are crossed by the Ruther Glen Proposed and Alternative Routes. Data from these delineations was provided to Dominion Energy Virginia and was used to identify boundaries of aquatic resources where they overlap with the Ruther Glen and Carmel Church Proposed and Alternative Routes, described in detail in Attachments 2.D.1 and Attachment 2.D.2, respectively. Further, field wetland delineations will be completed for the approved route alignments selected by the Commission upon the Company receiving a final order on the Projects.

In those areas that have not undergone previous field-delineations, ERM used a stepwise process to identify probable wetland and waterbody areas along the alternative transmission line routes as follows:

1. Infrared and natural color aerial photography was used in conjunction with USGS topographic maps, soils maps, and other data sources to identify potential wetland areas. Boundaries were assigned to the areas that appeared to exhibit wetland signatures based on this review (referred to here as "Interpreted Wetlands"), and a cover type was determined based on aerial photo interpretation.

2. To further determine the probability of a wetland occurring within a given location, polygon shapefiles for Interpreted Wetlands were digitally layered with NWI and NHD mapping and hydric soils information from the Natural Resources Conservation Service ("NRCS") soil survey database.

3. ERM assigned a probability of wetland occurrence based on the number of overlapping data layers (*i.e.*, indicators of potential wetland presence) in any given area (Table D-1).

Table D-1
Ruther Glen and Carmel Church 230 kV Transmission Line Projects
Wetland Probability Criteria

Probability Class	Criteria
High	Areas where layers of hydric soils, Interpreted Wetlands, and NWI data overlap
Medium/High	Areas where 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

Using the above criteria, wetland and waterbody occurrence probabilities ranging from very low to high were identified for the Projects' routes, with acres of affected wetland calculated by probability class and cover type. The probability of wetland and

waterbody occurrence increases as multiple indicators overlap toward the "high" end of the probability spectrum as shown in Table D-1. The medium to high probability categories were selected as the most reliable representation of in-situ conditions due to overlapping data sets. Results for these wetland probability classes are presented below.[1]

As explained further below and in Attachment 2.D.1, the majority of wetlands crossed by the Ruther Glen Project infrastructure are forested and are generally concentrated around the South River and its tributaries in the northern part of the study area and Polecat Creek and its tributaries in the southern part of the study area.

As explained further below and in Attachment 2.D.2, the majority of wetlands crossed by the Carmel Church Project infrastructure are forested and are generally concentrated around Reedy Creek and its tributaries in the northeastern part of the study area and North Anna River and its tributaries in the southwestern part of the study area.

For ease of reference, wetlands and waterbodies of medium or higher probability crossed by the Proposed and Alternative Routes for both Projects are summarized in Tables D-2 (Ruther Glen) and D-3 (Carmel Church).

Ruther Glen Project

Table D-2
Ruther Glen 230 kV Transmission Line Project
Desktop-Delineated Wetlands Crossed by the Ruther Glen Proposed and Alternative Routes [a,b]

Aquatic Resource Classification	Alternative Route 4 (acres)	Ruther Glen Proposed Route (Route 5) (acres)	Alternative Route 6 (acres)
Palustrine Forested (PFO)	2.9	2.9	2.9
Palustrine Scrub-shrub (PSS)	NA	NA	NA
Palustrine Emergent (PEM)	0.7	0.7	0.8
Palustrine Unconsolidated Bottom (PUB)	0.5	1.1	0.8
Riverine	0.2	0.2	0.5
Total	**4.4**	**4.9**	**5.1**

a Inclusive of the Ruther Glen Switching Station
b The sum of the addends may not equal the totals due to rounding.

[1] Note that the sum of the wetland type addends presented for the Proposed and Alternative Routes for each Project may not equal the totals due to rounding.

Ruther Glen Proposed Route (Route 5)

Based on the wetland desktop delineation method described above, the Ruther Glen Proposed Route right-of-way encompasses approximately 4.9 acres of wetlands and waterbodies, including approximately 2.9 acres of PFO, 0.7 acre of PEM wetlands, 1.1 acres of PUB open water features, and 0.2 acre of riverine features.

Ruther Glen Alternative Route 4

Based on the wetland desktop delineation method described above, Ruther Glen Alternative Route 4 right-of-way encompasses approximately 4.4 acres of wetlands and waterbodies, including approximately 2.9 acres of PFO, 0.7 acre of PEM wetlands, 0.5 acre of PUB open water features, and 0.2 acre of riverine features.

Ruther Glen Alternative Route 6

Based on the wetland desktop delineation method described above, the Ruther Glen Alternative Route 6 right-of-way encompasses approximately 5.1 acres of wetlands and waterbodies, including approximately 2.9 acre of PFO, 0.8 acre of PEM wetlands, 0.8 acre of PUB open water features, and 0.5 acre of riverine features.

Carmel Church Project

Table D-3
Carmel Church 230 kV Transmission Line Project
Desktop-Delineated Wetlands and Waterbodies Crossed by the Carmel Church Proposed and Alternative Routes [a,b]

Aquatic Resource Classification	Proposed Route (Route 1) (acres)	Alternative Route 2 (acres)
Palustrine Forested (PFO)	0.9	1.6
Palustrine Scrub-shrub (PSS)	NA	NA
Palustrine Emergent (PEM)	0.4	NA
Palustrine Unconsolidated Bottom (PUB)	1.3	NA
Riverine	0.1	0.1
Total	**2.8**	**1.7**

a Inclusive of the Carmel Church Switching Station
b The sum of the addends may not equal the totals due to rounding.

Carmel Church Proposed Route (Route 1)

Based on the wetland desktop delineation method described above, the Carmel Church Proposed Route right-of-way encompasses approximately 2.8 acres of wetlands and waterbodies, including 0.9 acres of palustrine forested ("PFO"), 0.4 acre of palustrine emergent ("PEM") wetlands, 1.3 acres of palustrine

unconsolidated bottom ("PUB") open water features, and 0.1 acre of riverine features.

Carmel Church Alternative Route 2

Based on the wetland desktop delineation method described above, the Carmel Church Alternative Route 2 right-of-way encompasses approximately 1.7 acres of wetlands and waterbodies, including 1.6 acres of PFO wetlands and 0.1 acre of riverine features.

All wetlands will require protective matting to be installed to support construction vehicles, equipment, and materials during construction. While most wetlands are anticipated to be spanned, with impacts limited to temporary construction impacts, permanent impacts would include any necessary structure placement within wetlands and clearing and conversion of PFO/PSS-type wetlands to PSS or PEM wetland types after construction is complete. This conversion would reduce riparian buffer benefits 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. Construction impacts from the transmission lines on PEM and riverine wetlands would be temporary and would be restored to pre-construction conditions when construction is complete. Within PFO and PSS wetlands, vegetation will be allowed to return to maintained right-of-way heights, consistent with open meadow and/or shrub-scrub habitat, after construction is completed, which would provide some filtration and stabilization to protect waterbodies from runoff.

Prior to construction, the Company will delineate wetlands and other waters of the United States using the *Routine Determination Method*, as outlined in the *1987 Corps of Engineers Wetland Delineation Manual* and methods described in 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 wetlands. The Company will obtain any necessary permits to impact jurisdictional resources. The Company has sited structures to avoid wetlands and streams to the extent practicable. Temporary impacts will be restored to pre-existing conditions, and permanent impacts will be compensated for in accordance with all applicable federal and state regulations and laws. The Projects are expected to require a Virginia Water Protection general permit and a Nationwide Permit 57. A JPA will be submitted for further evaluation and final permit need determination by DEQ, VMRC, and the Corps.

E. Floodplains

As depicted on the Federal Emergency Management Agency's ("FEMA") online Flood Insurance Rate Maps # 51033C0475C (effective date 3/1/2009), 51085C0100B and 51085C0060B (effective dates 12/1/2008), 51177C0375D (effective date 5/8/2023), 51033C0210D, 51033C0205D, 51033C0200D, 51033C0215D, 51033C0220D, 51033C0360D, 51033C0350D, 51033C0345D, 51033C0365D, 51033C0370D, and

51033C0460D (effective dates 5/22/2023), and 51085C0070C, 51085C0090C, 51085C0095C, 51085C0185C, 51085C0180C, and 51085C0160C (effective dates 6/19/2024), the Project study areas contains flood zone hazard area Zone A, the 100-year floodzone, and Zone AE, around the South River and its tributaries, the Motto River and its tributaries, Lake Caroline and its tributaries, Polecat Creek and its tributaries, and Bull Run and its tributaries. The Company will coordinate with the local floodplain coordinators as required.

F. Solid and Hazardous Waste

ERM identified environmentally regulated sites that use and/or store hazardous materials or waste-producing facilities operating under regulatory permits in the study area using publicly available GIS databases obtained from the U.S. Environmental Protection Agency ("EPA") and the DEQ. These databases provide information about facilities, sites, or places subject to environmental regulation or of environmental interest. These include sites that use and/or store hazardous materials; waste producing facilities operating under permits from the EPA or other regulatory authorities; Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA" or "Superfund") sites; Resource Conservation and Recovery Act ("RCRA") sites; Brownfield sites; petroleum storage and petroleum release sites; and solid waste sites. The identification of a site in the databases does not mean that the site necessarily has contaminated soil or groundwater.

Sites regulated by the EPA under the Clean Air Act ("CAA") Compliance Monitoring Program, Toxic Release Inventory ("TRI"), National Pollutant Discharge Elimination System ("NPDES"), and RCRA, and sites regulated by the DEQ under the Air, Solid Waste, Virginia Pollutant Discharge Elimination System ("VPDES"), Voluntary Response Program ("VRP"), and Registered Petroleum Tank Facilities programs not associated with a petroleum leak, site assessment, remediation, corrective action or emergency response case are anticipated to have no effect on, and will not be affected by the Projects. These sites are not discussed further.

Below are summaries for information from the EPA and DEQ databases within a 0.5-mile buffer of the centerlines of the Ruther Glen and Carmel Church routes, provided in Table F-1 and Table F-2, respectively. The locations of the sites are depicted in Attachment 2.F.1 (Ruther Glen) and Attachment 2.F.2 (Carmel Church).

TABLE F-1
Ruther Glen 230kV Transmission Line Project [a]
Environmental Regulated Facilities and Hazardous Waste/Petroleum Release Sites within 0.5 Mile

Site Type	Alternative Route 4	Proposed Route (Route 5)	Alternative Route 6
Waste	0	0	0
Toxics	0	0	0
Land	0	0	0
Air	0	0	0
Water	0	1	0

Solid Waste Facilities	0	0	0
Petroleum Facilities	0	0	0
Petroleum Releases	0	0	0
Total [b]	**0**	**1**	**0**

[a] The Ruther Glen Switching Station is included in the route analysis.

[b] Note that a single facility may be associated with multiple environmental permits; as such, the total number reflects the number of permits and releases within the specified distance from the Project.

Notes

Waste (Active and Inactive RCRA Facilities that handle or generate hazardous wastes)
Toxics (TRI Regulated facilities that handle and release toxic substances to the environment)
Land (Site cleanup under Superfund, RCRA or Brownfield programs, and/or DEQ VRP or Pollution Response program)
Air (EPA and DEQ regulated facilities with a release of pollutants to the air)
Water (EPA and DEQ regulated facilities that discharge or process water to surface water)
Solid Waste Facilities (Former and existing landfills)
Petroleum Facilities (Regulated petroleum storage facilities)
Petroleum Releases (Typically associated with storage tank releases)

TABLE F-2
Carmel Church 230kV Transmission Line Project [a]
Environmental Regulated Facilities and Hazardous Waste/Petroleum Release Sites within 0.5 Mile

Site Type	Proposed Route (Route 1)	Alternative Route 2
Waste	2	1
Toxics	0	0
Land	3	3
Air	1	0
Water	5	3
Solid Waste Facilities	0	0
Petroleum Facilities	1	1
Petroleum Releases	9	8
Total [b]	**21**	**16**

[a] The Carmel Church Switching Station is included in the route analysis.

[b] Note that a single facility may be associated with multiple environmental permits; as such, the total number reflects the number of permits and releases within the specified distance from the Project.

Notes

Waste (Active and Inactive RCRA Facilities that handle or generate hazardous wastes)
Toxics (TRI Regulated facilities that handle and release toxic substances to the environment)
Land (Site cleanup under Superfund, RCRA or Brownfield programs, and/or DEQ VRP or Pollution Response program)
Air (EPA and DEQ regulated facilities with a release of pollutants to the air)
Water (EPA and DEQ regulated facilities that discharge or process water to surface water)
Solid Waste Facilities (Former and existing landfills)
Petroleum Facilities (Regulated petroleum storage facilities)
Petroleum Releases (Typically associated with storage tank releases)

To evaluate the potential impact to the routes, ERM further assessed the sites within 1,000 feet of the Ruther Glen and Carmel Church routes (Table F-3 and Table F-4, respectively).

TABLE F-3
Ruther Glen 230kV Transmission Line Project [a]
Environmental Regulated Facilities and Hazardous Waste/Petroleum Release Sites within 1,000 Feet

Site Type	Alternative Route 4	Proposed Route (Route 5)	Alternative Route 6
Waste	0	0	0
Toxics	0	0	0
Land	0	0	0
Air	0	0	0
Water	0	0	0
Solid Waste Facilities	0	0	0
Petroleum Facilities	0	0	0
Petroleum Releases	0	0	0
Total [b]	**0**	**0**	**0**

[a] The Ruther Glen Switching Station is included in the route analysis.

[b] Note that a single facility may be associated with multiple environmental permits; as such, the total number reflects the number of permits and releases within the specified distance from the Project.

Notes

Waste (Active and Inactive RCRA Facilities that handle or generate hazardous wastes)
Toxics (TRI Regulated facilities that handle and release toxic substances to the environment)
Land (Site cleanup under Superfund, RCRA or Brownfield programs, and/or DEQ VRP or Pollution Response program)
Air (EPA and DEQ regulated facilities with a release of pollutants to the air)
Water (EPA and DEQ regulated facilities that discharge or process water to surface water)
Solid Waste Facilities (Former and existing landfills)
Petroleum Facilities (Regulated petroleum storage facilities)
Petroleum Releases (Typically associated with storage tank releases)

TABLE F-4 Carmel Church 230kV Transmission Line Project[a] Environmental Regulated Facilities and Hazardous Waste/Petroleum Release Sites within 1,000 Feet		
Site Type	Proposed Route (Route 1)	Alternative Route 2
Waste	0	0
Toxics	0	0
Land	1	1
Air	1	0
Water	1	0
Solid Waste Facilities	0	0
Petroleum Facilities	0	0
Petroleum Releases	1	1
Total [b]	**4**	**2**

[a] The Carmel Church Switching Station is included in the route analysis.

[b] Note that a single facility may be associated with multiple environmental permits; as such, the total number reflects the number of permits and releases within the specified distance from the Project.

Notes

Waste (Active and Inactive RCRA Facilities that handle or generate hazardous wastes)
Toxics (TRI Regulated facilities that handle and release toxic substances to the environment)
Land (Site cleanup under Superfund, RCRA or Brownfield programs, and/or DEQ VRP or Pollution Response program)
Air (EPA and DEQ regulated facilities with a release of pollutants to the air)
Water (EPA and DEQ regulated facilities that discharge or process water to surface water)
Solid Waste Facilities (Former and existing landfills)
Petroleum Facilities (Regulated petroleum storage facilities)
Petroleum Releases (Typically associated with storage tank releases)

EPA Regulated Sites

Based on the most recent available data in the EPA's "Cleanups in My Community" database, no Brownfield or Superfund sites are located within 0.5 mile of the Proposed or Alternative Routes for either Project. Additionally, no EPA regulated sites are located within 200 feet of the routes. As such, no further review of EPA regulated sites was conducted for the Projects.

DEQ Regulated Sites

ERM reviewed DEQ Petroleum Release, VRP, and PREP databases to identify sites within 200 feet of the routes for both Projects. No Petroleum Release, VRP, or PREP sites were identified within 200 feet of the routes. As such, no further review of DEQ regulated sites was conducted for the Projects.

Summary

Although no EPA or DEQ regulated sites were identified within 200 feet of the Ruther Glen or Carmel Church Project routes, proper procedures will be followed to safely identify, manage, and dispose of any suspected hazardous and contaminated media that

may be encountered during Project activities in accordance with applicable federal, state, and local regulations.

Although the Projects are constructing overhead lines, minor subsurface work is required during installation. This disturbance occurs at discrete locations along the route, with temporary spoils contained as they are generated. The Company has a procedure in place to safely identify, manage, and dispose of any suspected hazardous or contaminated media encountered during construction. If contaminated soil or groundwater are identified, the Company will coordinate with the associated regulatory agency, and the soils will be disposed of in accordance with applicable regulations.

Care will be taken to operate and maintain construction equipment to prevent any fuel or oil spills. Any waste created by the construction crews will be disposed of in a proper manner and recycled where appropriate and will be further detailed in the Company's stormwater pollution prevention plan, a component of the Virginia Stormwater Management Program, which falls under the purview of the DEQ.

G. Natural Heritage, Threatened and Endangered Species

On behalf of the Company, ERM conducted online database searches for threatened and endangered species in the vicinity of the Projects, including the Virginia Department of Conservation and Recreation ("DCR") Natural Heritage Data Explorer ("NHDE"). The NHDE Screening Layer includes two components: Conservation Sites and Stream Conservation Sites. ERM also obtained query results from the Virginia Department of Wildlife Resources ("DWR") Fish and Wildlife Information Service ("VaFWIS"), and the USFWS Information for Planning and Consultation ("IPaC") System to identify federal- and state-listed species that may occur within the study area. Digital data were obtained from the DCR-NHDE to identify locations within the study area that potentially support protected species. Results of these queries are provided in Attachment 2.G.1 and Attachment 2.G.2.

The review accounted for regulatory changes and requirements associated with the USFWS uplisting of the Northern long-eared bat ("NLEB," *Myotis septentrionalis*) from federally threatened to federally endangered. On October 15, 2024, USFWS issued the NLEB Final Guidance for development projects. The USFWS Interim Guidance for the NLEB expired on November 30, 2024, and the Final Guidance for NLEB took effect.

The review also accounted for regulatory changes and requirements associated with Tricolored bat ("TCB," *Perimyotis subflavus*) and the proposed USFWS listing of this species as federally endangered. The Company is anticipating the TCB will be listed; therefore, it assumes any regulatory changes associated with the potential listing of the TCB will affect these Projects. On September 14, 2022, the TCB was proposed to be listed as Endangered by the USFWS. USFWS extended its Final Rule issuance target from September 2023 to the end of 2024. At this time, the TCB Final Rule has not been issued.

In October 2024 USFWS issued a final NLEB and TCB Range-wide Determination Key ("Dkey") to allow project proponents to assess project impacts, practicable avoidance and minimization measures, and consultation requirements under the final NLEB guidance and the eventual TCB listing ahead of the final decision. The Company will utilize the DKey to further assess project impacts and determine appropriate avoidance and minimization measures to ensure compliance with state and federal regulations when the project enters permitting.

To obtain the most current eagle nest data, ERM reviewed the Center for Conservation Biology ("CCB") Virginia Eagle Nest Locator mapping portal, which provides information about the Virginia Bald eagle (*Haliaeetus leucocephalus*) population, including the results of the CCB's annual eagle nest survey. Based on the CCB Virginia Eagle Nest Locator mapping portal, the study area is not located within an Eagle Concentration Area, and the Ruther Glen and Carmel Church Projects' Proposed or Alternative Routes, inclusive of the switching stations, do not intersect any Primary or Secondary Buffers of currently documented Bald eagle nests as identified in The Bald Eagle Protection Guidelines for Virginia (2012). According to the CCB database, the eagle nest nearest to the Ruther Glen Project is Nest ID CA1901, which was last observed to be occupied in 2019. This nest is approximately 6.0 miles southeast of the Ruther Glen Alternative Route 4 at MP 0.0. The eagle nest nearest the Carmel Church Project is Nest ID CA1601, which is along the North Anna River and was last observed to be occupied in 2016. This nest is approximately 4.3 miles west of where both Carmel Church routes terminate at the Carmel Church Switching Station. None of the route alternatives are within the 660-foot management buffer for the nest. The Company will work with the appropriate jurisdictional agencies to minimize impacts on this species.

Ruther Glen Project

Based on queries of the above referenced sources, eight federal- and/or state-listed or proposed threatened and endangered species have the potential to occur within the Ruther Glen Project study area (Table G-1). For additional information, see Section 3.2.5 of the Ruther Glen Project Environmental Routing Study.

TABLE G-1
Ruther Glen 230 kV Transmission Line Project
Potential Federal-and State-Listed Species in the Project Area

Species	Status	Database	Habitat	Results
Northern long-eared bat (*Myotis septentrionalis*)	FE, ST	USFWS IPaC, DWR Winter Habitat and Roost Tree Map, DWR NLEB Regulatory Buffer Interactive Tool	Generally associated with old growth or late successional interior forests. Use partially dead or decaying trees for breeding, summer day roosting, and foraging. Hibernation occurs primarily in caves, mines, and tunnels.	Species not confirmed as present. Summer foraging habitat present, but no known hibernacula or maternity roost trees are documented within the Project area. The Project would require clearing of forested areas; however, given the lack of confirmed species presence, impacts are not anticipated.

TABLE G-1 Ruther Glen 230 kV Transmission Line Project Potential Federal-and State-Listed Species in the Project Area				
Species	Status	Database	Habitat	Results
Tricolored bat (*Perimyotis subflavus)*	FPE, SE	USFWS IPaC, VaFWIS, DWR Winter Habitat and Roost Tree Map	Typically roost in trees near forest edges during summer. Hibernate deep in caves or mines in mountainous areas with warm, stable temperatures during winter.	Species not confirmed as present. Summer foraging habitat present, but no known hibernacula or maternity roost trees are documented within the Project area. The Project would require clearing of forested areas; however, given the lack of confirmed species presence, impacts are not anticipated.
Indiana bat *(Myotis sodalist)*	FE, SE	USFWS IPaC	Roost in the summer generally under exfoliating bark of dead or dying trees. Maternity roosts occur in forest areas, bottomland and floodplain habitats, riparian zones, wooded wetlands, and upland communities. Hibernate in medium to large sized caves or abandoned mines that remain stable in temperature (below 50 degrees Fahrenheit).	Species not confirmed as present. Summer foraging habitat present, but no known hibernacula or maternity roost trees are documented within the Project area. The Project would require clearing of forested areas; however, given the lack of confirmed species presence, impacts are not anticipated.
Yellow lance *(Elliptio lanceolata)*	FT, ST	USFWS IPaC, VaFWIS	Depend on clean, moderately flowing water with high dissolved oxygen and found in medium-sized rivers to smaller streams. Bury deep into coarse to medium sand substrate and sometimes gravel. Move with shifting sand and settles in downstream end of stable sand and gravel bars.	Species confirmed within a 2.0-mile radius of the study area within the South River. No routes cross the South River, and no instream work will be performed. No impacts are anticipated.
Atlantic sturgeon *(Acipenser oxyrinchus)*	FE, SE	VaFWIS	Migrate from the ocean to freshwater rivers to reproduce in the Spring or Fall. Deposit eggs among solid substrates within clean rivers.	Species confirmed within a 2.0-mile radius of the study area within the Mattaponi River. Due to the distance from the river, (approximately 2.1 mile east of the route alternatives) no impacts are anticipated.
Small whorled pogonia *(Isotria medeoloides)*	FT, ST	USFWS IPaC, DCR	Woodland areas, particularly mid-aged woodland areas on gently north- or northeast-facing slopes within small draws.	DCR identified the potential for this species to occur within the study area with potential habitat likely present. However, no alternative routes cross Ladysmith North Conservation Site, the likely habitat for the species, so no impacts are anticipated.

TABLE G-1 Ruther Glen 230 kV Transmission Line Project Potential Federal-and State-Listed Species in the Project Area				
Species	Status	Database	Habitat	Results
Swamp pink (*Helonias bullata*)	FT, SE	USFWS IPaC	Perennially saturated, spring-fed, nutrient-poor, shrub swamps and forested wetlands. Thrive when water levels are stable, and flooding is infrequent.	No occurrences of the species were confirmed by the database queries in the study area; however, potential habitat for the species includes multiple seepage wetlands and swamps along the alternative routes. Coordination with DCR may be needed to determine if surveys are warranted in the study area.
New Jersey rush (*Juncus caesariensis*)	ST	DCR	Acidic hardwood swamps, seeps, swales, pond edges, and seepages (*e.g.*, transmission line rights-of-way).	DCR identified the potential for this species to occur within the along the alternative routes with potential habitat likely present. Coordination with DCR may be needed to determine if surveys are warranted in the study area
Federal/State Status: FE Federally listed as endangered SE State listed as endangered		FT Federally listed as threatened ST State listed as threatened		FPE Federally proposed as endangered

Within the Ruther Glen study area and/or within a 2.0-mile radius of the study area, database queries identified six federally listed species and one species with a federally proposed listing under the Endangered Species Act ("ESA"), each of which are also state-listed species, that could potentially occur in the study area: NLEB, TCB, Indiana bat, Yellow lance, Atlantic sturgeon, Small whorled pogonia (*Isotria medeoloides*), and Swamp pink. The federal listing of the TCB has been proposed but have not been officially listed. New Jersey rush is a state-listed species, which is not federally listed, identified by a database query as well.

All eight of these species were identified by the DWR, the DCR Division of Natural Heritage ("DNH"), and/or USFWS databases as having potential occurrence within the Project study area, and the VaFWIS database identified the Yellow lance and the Atlantic sturgeon as species that have confirmed occurrences within a 2.0-mile buffer around the study area.

On behalf of the Company, ERM submitted the Projects to DCR-DNH for review. DCR-DNH conducted an official review dated September 20, 2024 (see Attachment 2.G.1 (Ruther Glen) and Attachment 2.G.2 (Carmel Church)). According to DCR-DNH's official review, a DCR biologist identified suitable habitat for New Jersey rush within the Ruther Glen Project study area. Based on the DCR-DNH predicted suitable habitat model, ERM quantified the following approximate acreage in Table G-2 of predicted suitable habitat where the New Jersey rush might exist along each Ruther Glen route. Coordination with the DCR may be needed to determine if surveys are warranted for the New Jersey rush.

TABLE G-2 Ruther Glen 230 kV Transmission Line Project Predicted Suitable Habitat for the New Jersey Rush	
Ruther Glen Route	**Predicated Suitable Habitat (acres)**
Alternative Route 4	10.4
Proposed Route (Route 5)	12.5
Alternative Route 6	13.3

DCR did not provide any predicted suitable habitat data for the New Jersey Rush associated with the Carmel Church Project.

The DCR-DNH review identified ecological cores within the study area, ranking from C4 (moderate integrity) to C5 (general ecological integrity). No ecological cores ranked C1, C2, or C3 are crossed by the route alternatives, so no formal impact analysis is provided for the cores crossed, per the recommendation of DCR[2] (see Attachment 2.G.2). Ecological cores crossed by the Ruther Glen Proposed and Alternative Routes are summarized in the Table G-3 below.

Table G-3 Ruther Glen 230 kV Transmission Line Project Ecological Cores Crossed by the Proposed and Alternative Routes				
Core Rank	**Core ID**	**Total Core Acres**	**Acres Crossed**	**Miles Crossed**
Alternative Route 4				
C4 (Moderate)	50579	322	10.7	0.6
	50533	576	21.5	1.1
C5 (General)	50663	116	9.3	0.5
	50532	69	0.7	<0.1
	50449	118	3.4	0.2
Proposed Route (Route 5)				
C4 (Moderate)	50579	322	10.7	0.6
	50533	576	25.9	1.3
C5 (General)	50449	118	5.6	0.4
Alternative Route 6				
C4 (Moderate)	50579	322	10.7	0.6
	50533	576	22.1	1.1
C5 (General)	50663	116	10.5	0.5
	50532	69	0.7	<0.1
	50449	118	3.4	0.2
Ruther Glen Switching Station				
C5 (General)	50449	118	6.8	-

[2] Nicki Gustafson, DCR e-mail message to ERM, May 23, 2024.

The Ruther Glen Proposed Route (Route 5) would create the least impact on ecological cores at 42.2 acres, and Alternative Route 6 would have the greatest impact on cores at 47.4 acres. The Company will work with the appropriate jurisdictional agencies to minimize any impacts on ecological cores and protected species during implementation of the Ruther Glen Project.

DCR indicated that three Conservation Sites are present within the Ruther Glen study area – (1) Ladysmith North Conservation Site, (2) Wright's Corner Conservation Site, and (3) Wright's Corner South Conservation Site.

Ladysmith North Conservation Site

The Ladysmith North Conservation Site consists of approximately 551 acres of land with a conservation rating of B3, indicating a site of high significance. One threatened and endangered ("T&E") species is documented by the DCR within the Ladysmith North Conservation Site, the federally threatened ("FT") and state-endangered ("SE") plant called Small whorled pogonia. Small whorled pogonia is a perennial orchid that grows in forested areas, particularly mid-aged woodland habitats, and often can remain dormant in the soil for long periods of time. Field surveys are recommended by the Virginia Field Office of the USFWS from June 1 to July 20 in Caroline County. No routes cross Ladysmith North Conservation Site, and given the distance from the routes, no impacts are anticipated to the conservation site or T&E species (Small whorled pogonia) within the site.

Wright's Corner Conservation Site

The Wright's Corner Conservation Site consists of approximately 615 acres of land with a conservation rating of B3, indicating a site of high significance. One T&E plant species and two rare plant species are documented by the DCR within this site, including New Jersey rush, Sheep laurel, and Purple pitcher plant. New Jersey rush is listed as ST. While it is not listed federally, New Jersey rush is classified as a Species of Concern ("SOC") by the USFWS, which provides no federal legal protection. This rush species inhabits acidic wetlands like hardwood swamps, seeps, swales, pond edges, and seepages (*e.g.*, transmission line rights-of-way). Field surveys are recommended during the plant's fruiting period from August through October. Both Sheep laurel and Purple pitcher plant are classified by the DCR as rare in Virginia, but neither are federal- or state-listed species. Both species have been documented within the study area. No routes cross Wright's Corner Conservation Site, and given the distance from the routes, no impacts are anticipated to the conservation site.

Wright's Corner South Conservation Site

The Wright's Corner South Conservation Site consists of approximately 72 acres of land with a conservation rating of B3, indicating a site of high significance.

The T&E or rare species associated with the Wright's Corner Conservation Site listed above (New Jersey rush, Sheep laurel, and Purple pitcher plant) are the same resources associated with Wright's Corner South Conservation Site. No routes cross Wright's Corner South Conservation Site, and given the distance from the routes, no impacts are anticipated to the conservation site.

Rare species are not classified as endangered or threatened, so are not protected by any regulations, and a requirement to inventory these resources prior to construction would result in significant delay to the construction schedule, potentially increasing project costs. Suitable habitat for these species may be present along the routes, so the Company will work with the DWR and other appropriate jurisdictional agencies to minimize any impacts on this species.

Carmel Church Project

Based on the queries of the above-referenced sources, nine federal- and/or state-listed or proposed threatened and endangered species have the potential to occur within the Carmel Church Project study area (Table G-4). For additional information, see Section 3.2.5 of the Carmel Church Project Environmental Routing Study.

TABLE G-4
Carmel Church 230 kV Transmission Line Project
Potential Federal-and State-Listed Species in the Project Area

Species	Status	Database	Habitat	Results
Northern long-eared bat (*Myotis septentrionalis*)	FE, ST	USFWS IPaC, DWR Winter Habitat and Roost Tree Map, DWR NLEB Regulatory Buffer Interactive Tool	Generally associated with old growth or late successional interior forests. Use partially dead or decaying trees for breeding, summer day roosting, and foraging. Hibernation occurs primarily in caves, mines, and tunnels.	Species not confirmed as present. Summer foraging habitat present, but no known hibernacula or maternity roost trees are documented within the Project area. The Project would require clearing of forested areas; however, given the lack of confirmed species presence, impacts are not anticipated.
Tricolored bat (*Perimyotis subflavus)*	FPE, SE	USFWS IPaC, VaFWIS, DWR Winter Habitat and Roost Tree Map	Typically roost in trees near forest edges during summer. Hibernate deep in caves or mines in mountainous areas with warm, stable temperatures during winter.	Species not confirmed as present. Summer foraging habitat present, but no known hibernacula or maternity roost trees are documented within the Project area. The Project would require clearing of forested areas; however, given the lack of confirmed species presence, impacts are not anticipated.

TABLE G-4 Carmel Church 230 kV Transmission Line Project Potential Federal-and State-Listed Species in the Project Area				
Species	Status	Database	Habitat	Results
Indiana bat *(Myotis sodalist)*	FE, SE	USFWS IPaC	Roost in the summer generally under exfoliating bark of dead or dying trees. Maternity roosts occur in forest areas, bottomland and floodplain habitats, riparian zones, wooded wetlands, and upland communities. Hibernate in medium to large sized caves or abandoned mines that remain stable in temperature (below 50 degrees Fahrenheit).	Species not confirmed as present. Summer foraging habitat present, but no known hibernacula or maternity roost trees are documented within the Project area. The Project would require clearing of forested areas; however, given the lack of confirmed species presence, impacts are not anticipated.
Dwarf wedgemussel (*Alasmidonta heterodon*)	FE, SE	USFWS IPaC	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.	Species not confirmed as present, and no instream work would be performed. However, shading along streambanks could be reduced due to tree clearing. Indirect impacts are anticipated if streambank shade is significantly reduced.
Green floater (*Lasmigona subviridis*)	FPT, ST	USFWS IPaC	Small to medium creeks and streams that other mussel species do not occupy; clean, fast-flowing streams and firm rubble, gravel, and sand substrates that lack siltation.	Species not confirmed as present, and no instream work would be performed. However, shading along streambanks could be reduced due to tree clearing. Indirect impacts are anticipated if streambank shade is significantly reduced.
Yellow lance *(Elliptio lanceolata)*	FT, ST	USFWS IPaC, VaFWIS	Depend on clean, moderately flowing water with high dissolved oxygen and found in medium-sized rivers to smaller streams. Bury deep into coarse to medium sand substrate and sometimes gravel. Move with shifting sand and settles in downstream end of stable sand and gravel bars.	Species not confirmed as present, and no instream work would be performed. However, shading along streambanks could be reduced due to tree clearing. Indirect impacts are anticipated if streambank shade is significantly reduced.
Atlantic sturgeon *(Acipenser oxyrinchus)*	FE, SE	VaFWIS	Migrate from the ocean to freshwater rivers to reproduce in the Spring or Fall. Deposit eggs among solid substrates within clean rivers.	Species confirmed within a 2.0-mile radius of the study area within the Mattaponi and North Anna Rivers. Due to the distance from the river, (approximately 4.4 miles northeast and 1.4 mile south of the route alternatives, respectively) impacts are not anticipated.

TABLE G-4 Carmel Church 230 kV Transmission Line Project Potential Federal-and State-Listed Species in the Project Area				
Species	Status	Database	Habitat	Results
Swamp pink (*Helonias bullata*)	FT, SE	USFWS IPaC	Perennially saturated, spring-fed, nutrient-poor, shrub swamps and forested wetlands. Thrive when water levels are stable, and flooding is infrequent.	No occurrences of the species were confirmed by the database queries in the study area; however, potential habitat for the species includes multiple seepage wetlands and swamps along the alternative routes. Coordination with DCR may be needed to determine if surveys are warranted in the study area.
New Jersey rush (*Juncus caesariensis*)	ST	DCR	Acidic hardwood swamps, seeps, swales, pond edges, and seepages (e.g., transmission line rights-of-way).	Species confirmed within a 2.0-mile radius of the study area. Coordination with DCR may be needed to determine if surveys are warranted in the study area
Federal/State Status:				
FE Federally listed as endangered		FT Federally listed as threatened		FPE Federally proposed as endangered
SE State listed as endangered		ST State listed as threatened		FPT Federally proposed as threatened

Within the Carmel Church Project study area and/or within a 2.0-mile radius of the study area, database queries identified six federally listed species and two species with a federally proposed listing under the Endangered Species Act ("ESA"), each of which are also state-listed species, that could potentially occur in the study area: NLEB, TCB, Indiana bat (*Myotis sodalist*), Dwarf wedgemussel (*Alasmidonta heterodon*), Green floater (*Lasmigona subviridis*), Yellow lance (*Elliptio lanceolata*), Atlantic sturgeon (*Acipenser oxyrinchus*), and Swamp pink (*Helonias bullata*). The federal listing of the TCB and the Green floater has been proposed but they have not been officially listed. New Jersey rush (*Juncus caesariensis*) is a state-listed species, which is not federally listed, identified that has the potential to occur within the study area and/or within a 2.0-mile radius of the study area.

All nine of these species were identified by the DWR, the DCR Division of Natural Heritage ("DNH"), and/or USFWS databases as having potential occurrence within the Project study area, and the DWR, VaFWIS, and DCR data identified Atlantic sturgeon and New Jersey rush as species that have confirmed occurrences within a 2.0-mile buffer around the study area.

On behalf of the Company, ERM submitted the Project to DCR-DNH for review. DCR-DNH conducted an official review dated September 20, 2024 (see Attachment 2.G.2). According to DCR-DNH's official review, there is a documented occurrence of New Jersey rush in the study area and in the Reedy Creek Seeps Conservation Site. The nearest observations of New Jersey rush are within the existing Line #256 right-of-way, and the routes do not intersect the locations of these confirmed populations. Coordination with the DCR may be needed to determine if surveys are warranted for this species in the study area.

Ecological cores (cores) are areas of 100-acres or more of contiguous natural land cover associated with areas of high ecological value. They are ranked from C1 (Outstanding) to C5 (General). Smaller areas of continuous interior cover (*i.e.*, 10 to 99 acres), called habitat fragments, support ecological cores and provide similar functions and values. As part of its official review, DCR-DNH also found that the Carmel Church Project intersects ecological cores of ranks C3 (high integrity), C4 (moderate integrity), and C5 (general integrity); and the Ruther Glen Project intersects ecological cores of ranks C4 and C5.

During the Project routing process, ERM attempts to avoid higher-ranking ecological cores to the extent practicable, while also taking into consideration other routing constraints. When avoidance is not possible, ERM attempts to minimize the crossing length of higher-ranking cores, collocate with existing linear corridors, cross previously cleared or disturbed areas, and to minimize fragmentation by following ecological core boundaries to the extent practicable. Where cores are crossed, the habitat is not fully lost as the transmission lines are maintained as open meadow/shrub habitat that is consistent with successional habitat.

The DCR-DNH review identified ecological cores within the study area, ranking from C3 (high ecological integrity) to C5 (general ecological integrity). No ecological cores ranked C1 or C2 are crossed by the route alternatives, so no formal impact analysis is provided for the cores crossed, per the recommendation of DCR[3] (see Attachment 2.G.2). Ecological cores crossed by the Carmel Church Proposed and Alternative Routes are summarized in the Table G-5 below.

Table G-5
Carmel Church 230 kV Transmission Line Project
Ecological Cores Crossed by the Proposed and Alternative Routes

Core Rank	Core ID	Total Core Acres	Acres Crossed	Miles Crossed
Proposed Route (Route 1)				
C3 (High)	51653	918	10.5	0.9
C5 (General)	51781	111	2.6	0.2
	51853	128	5.1	0.4
	51879	315	<0.1	0.1
Alternative Route 2				
C4 (Moderate)	52116	125	4.2	0.4
	52048	380	8.6	0.7
	52021	487	0.4	<0.1
C5 (General)	51879	315	0.9	0.1
Carmel Church Switching Station				

[3] Nicki Gustafson, DCR e-mail message to ERM, May 23, 2024.

C5 (General)	51879	315	6.7	-

Alternative Route 2 would create the least impact on ecological cores at 14.2 acres, and the Proposed Route would have the greatest impact on cores at 18.3 acres. The Proposed Route would also have the greatest impact on the highest ranked cores (C3) impacted by the Project, while Alternative Route 2 would not impact cores ranked C3. The Company will work with the appropriate jurisdictional agencies to minimize any impacts on ecological cores and protected species during implementation of the Project.

DCR indicated that two Conservation Sites are present within the Carmel Church study area – (1) Reedy Creek Seeps Conservation Site and (2) North Anna Bluffs Conservation Site.

Reedy Creek Seeps Conservation Site

The Reedy Creek Seeps Conservation Site consists of 1,116 acres of land with a conservation rating of B3, indicating a site of high significance. The rare or T&E species associated with this conservation site are seven rare plants, an amphibian called the Lesser siren (*Siren intermedia*), and the state-listed plant New Jersey rush. The seven rare plants associated with the conservation site include: Little-leaf sensitive-brier (*Mimosa microphylla*), Northern white beaksedge (*Rhynchospora alba*), Curtiss' yellow-eyed grass (*Xyris curtissii*), Velvet sedge (*Carex vestita*), Sheep laurel (*Kalmia angustifolia*), Purple pitcher plant (*Sarracenia purpurea*), and Small white fringed orchid (*Platanthera blephariglottis*). The Lesser siren is not listed as threatened or endangered but is classified as a Species of Greatest Conservation Need (Tier 3a) on the Virginia Wildlife Action Plan. This aquatic salamander prefers shallow freshwater wetlands (*e.g.*, beaver ponds, swamps, slow moving streams, ditches) where it can forage for crayfish, worms, mollusks, and vegetation. These plants and animal species are typically associated with either swamp-like areas, forested wetlands, or dry woodlands in Virginia.

Both the Carmel Church Proposed Route (Route 1) and Alternative Route 2 cross Reedy Creek Seeps Conservation Site. The Proposed Route crosses the northern half of the site between approximate MPs 0.0 and 0.9. The land within the site that is crossed by the Proposed Route has all been cleared at some point between 2006 and now, so it is possible that any rare or T&E species associated with the conservation site would have been impacted by previous land disturbance. Approximately 0.3 mile of the site crossing by the Proposed Route is managed timber, approximately 0.2 mile of the crossing is through cleared land, and approximately 0.5 mile of the crossing is through mostly recovered forest that was cleared sometime between 2006 and 2007. Alternative Route 2 crosses the southern half of Reedy Creek Seeps Conservation Site between approximate MPs 0.0 and 0.2. The area of the site that Alternative Route 2 crosses was cleared sometime between 2012 and 2014 and is still recovering as a forested area.

The Lesser siren is an aquatic salamander that is found primarily in and breeds in waterbodies. Though two tributaries of Reedy Creek are crossed by the Proposed Route within the Reedy Creek Seeps Conservation Site, no instream construction would be required for the Project. Additionally, there are no waterbodies crossed by Alternative Route 2. No impact to the Lesser siren is anticipated for either route.

According to DCR, suitable habitat may be present for New Jersey rush within the Reedy Creek Seeps Conservation Site, and as mentioned previously, the DCR has confirmed the presence of New Jersey rush within the study area and within the conservation site. The nearest observations of New Jersey rush are within the existing Line #256 right-of-way, and the routes do not intersect the locations of these confirmed populations. See Section 4.4.3.1 of the Carmel Church Project Environmental Routing Study for additional information on the state-listed New Jersey rush and the potential impacts to the species.

Coordination with the DCR may be needed to determine if surveys are warranted for the New Jersey rush due to its state listing. Rare species are not classified as endangered or threatened, so the other seven rare plant species are not protected by any regulations, and a requirement to inventory these resources prior to construction could result in a significant delay to the construction schedule, potentially increasing project costs. However, suitable habitat for these rare plant species may be present along the routes, so the Company will work with the DWR and other appropriate jurisdictional agencies to minimize any impacts on this species.

North Anna Bluffs Conservation Site

The North Anna Bluffs Conservation Site consists of 3,829 acres of land with a conservation rating of B2, indicating a site of very high significance. There are four natural community types associated with the North Anna Bluffs Conservation Site: Coastal Plain / Outer Piedmont Basic Mesic Forest, Coastal Plain / Piedmont Floodplain Swamp (Green Ash - Red Maple Type), Piedmont / Coastal Plain Hemlock - Hardwood Forest, and Water-Willow Rocky Bar and Shore (see Section 4.4.2.1 of the Carmel Church Project Environmental Routing Study for additional information on these natural communities). No routes cross North Anna Bluffs Conservation Site. Alternative Route 2 at about MP 1.7 is the closest, lying approximately 2.1 miles northeast of the site. Given this distance, no impacts are anticipated to the conservation site or natural heritage resources within the site.

DCR indicated that one Stream Conservation Site (SCS) is present within the study area – Little River at Rt. 688 SCS. SCSs are given a biodiversity ranking on a scale of 1 through 5, with 1 being the most significant. This ranking is based on the rarity, quality, or number of natural heritage resources.

Little River at Rt. 688 SCS

The Little River at Rt. 688 SCS has been given a biodiversity rating of B3, indicating a site of high significance. The natural heritage resource associated with this site is an Aquatic Natural Community (NP-Pamunkey Fourth Order Stream). Aquatic Natural Communities are determined by Virginia Commonwealth University's INSTAR (Interactive Stream Assessment Resource) database. With their aquatic community composition and present-day conditions of other regional streams in mind, the VCU-Center for Environmental Sciences (CES) has classified the streams within the Little River at Rt. 688 SCS Aquatic Natural Communities as grade B ("Healthy"), indicating their relative regional significance. Based on a number of native/non-native, pollution-tolerant/intolerant and rare, T&E fish and macroinvertebrate species present, the streams within this SCS contribute to high Biological Integrity at the watershed level (6th order).

No routes cross the Little River at Rt. 688 SCS. Alternative Route 2 at about MP 1.7 is the closest, lying approximately 3.9 miles northeast of the site. Given this distance, no impacts are anticipated to the SCS or natural heritage resources within the site.

The Company will work with the appropriate jurisdictional agencies to minimize any impacts on Conservation Sites, SCSs, ecological cores, and protected species during implementation of the Projects. Additional analysis on ecological core impacts can be found in the Environmental Routing Studies for the Projects.

Construction and maintenance of the new transmission line facilities could have minor effects on wildlife; however, impacts on most species will be short-term in nature, and limited to the period of construction.

For impacts on wildlife habitat (forested, agricultural, open space, and open water/waterbodies), see Section K.

No other natural heritage resources (habitat of rare, threatened, or endangered species, unique or exemplary natural communities, or significant geological formations) were identified within the Projects' study areas by the DCR. Additionally, DCR-DNH concluded that the Projects do not cross any State Natural Area Preserves under DCR's jurisdiction. See Attachment 2.G.1 and Attachment 2.G.2.

New and updated information is continually added to DCR's Biotics database. The Company shall re-submit Project information and a map for an update on this natural heritage information if the scope of the Projects change and/or six months have passed before this information is utilized.[4]

[4] The Company updated this commitment consistent with discussions held between Company and DCR-DNH representatives on August 23, 2022.

H. Erosion and Sediment Control

The DEQ approved the Company's *Standards & Specification for Erosion & Sediment* Control *and Stormwater Management for Construction of Linear Electric Transmission Facilities (TE VEP 8000).* These specifications are given to the Company's contractors and require erosion and sediment control measures to be in place before construction of the line begins and specifies the requirements for rehabilitation of the right-of-way. A copy of the current DEQ approval letter dated February 27, 2024, is provided as Attachment 2.H.1. According to the approval letter, coverage is effective from February 27, 2024, through February 26, 2025.

I. Archaeological, Historic, Scenic, Cultural or Architectural Resources

ERM conducted a Stage I Pre-Application Analysis ("Stage I Analysis") of potential impacts on cultural resources for the Proposed and Alternative Routes for both Projects in accordance with the Virginia Department of Historic Resource's ("VDHR") *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (VDHR 2008). Copies of the Stage I Analyses, which were provided to VDHR on December 11, 2024, are included as Attachments 2.I.1 (Ruther Glen) and Attachment 2.I.2 (Carmel Church). For each route alternative, the analyses identified and considered previously recorded resources within the following study tiers as specified in the Guidelines:

- National Historic Landmark ("NHL") properties located within a 1.5-mile radius of each route centerline.
- National Register of Historic Places ("NRHP")-listed properties, NHLs, battlefields, and historic landscapes within a 1.0-mile radius of each route centerline.
- NRHP-eligible and -listed properties, NHLs, battlefields, and historic landscapes within a 0.5-mile radius of each route centerline.
- Qualifying architectural resources and archaeological sites located within the right-of-way for each alternative route.

Information on cultural resources within each of the above study tiers was obtained from the Virginia Cultural Resource Information System.

Due to the lack of previously recorded resources in the area, ERM additionally collected information by contacting several potentially interested parties (Caroline County, Caroline Historical Society, Hanover County, Hanover County Historical Society, Hanover County Black Heritage Society, Virginia Department of Transportation ("VDOT"), DHR, Northern Virgnia Conservation Trust, Preservation Virginia, Virginia Genealogical Society, Virginia Museum of History and Culture, Woodfork Genealogy, and the American Battlefield Trust) to find locally significant resources within a 1.0-mile radius of each proposed route centerline. One locally significant resource was identified within the relevant Ruther Glen study tiers for the various route options during the data collection effort. Relatedly, two locally significant resources were identified

within the relevant Carmel Church study tiers for the various route options during the data collection effort.

ERM additionally collected information on battlefields surveyed and assessed by the National Park Service's American Battlefield Protection Program ("ABPP") (NPS 2023). One ABPP study area, core area, or potential NRHP boundary for battlefields was identified within the relevant study tiers for the various route alternatives through this source.

Along with a records review carried out for the four tiers as defined by VDHR, ERM also conducted field assessments of the considered aboveground resources for the Alternative Routes in accordance with the VDHR Guidelines. Digital photographs of each resource and views to the proposed transmission line were taken. All photographs were taken from the public right-of-way or where access to the property was granted. Photo simulations were prepared to assess potential viewshed impacts from construction of the proposed transmission line for each considered resource and relevant route. For previously recorded archaeological sites under consideration, aerial photographs were examined to assess the current land condition and the spatial relationship between the sites and any existing or planned transmission lines.

A summary of the considered resources identified in the vicinity of the Proposed and Alternative Routes, inclusive of the proposed Ruther Glen Switching Station and Carmel Church Switching Station footprints, and recommendations concerning Project effects are provided in the following discussion. The information presented here derives from existing records and does not purport to encompass the entire suite of historic and archaeological resources that may ultimately be affected by the undertaking.

Resources located within the right-of-way of the Proposed and Alternative Routes may be subject to both direct impacts from placement of the transmission line structures across the property as well as indirect visual impacts from changes to the viewshed introduced by the new transmission infrastructure. Resources in the 0.0 to 0.5-mile study tier would not be directly impacted but would likely be visually impacted unless topography or vegetation obscures the view from the resource to the transmission line. At a distance over 0.5-mile, it becomes less likely that a resource would be within line-of-sight of the new transmission facilities. Beyond 1.0-mile, it becomes even less likely that a given resource would be within line-of-sight of the Projects. A complete architectural survey is necessary to determine which resources would be visually impacted and to survey for additional unrecorded resources. This survey would be completed after the Commission approves the Projects.

The nature of the impacts on cultural resources from construction and operation of the Projects, while estimated in the study with the assistance of photo simulations, will depend on the final project design in which the exact placement and height of transmission line structures are confirmed. As part of the forthcoming architectural survey, project impacts on these and any newly identified resources would be assessed. The study area for the survey would be defined based on the height of the

transmission line structures, topography, tree cover, and other factors impacting line-of-sight from resources to the route.

Ruther Glen Project

Ruther Glen Proposed Route (Route 5)

One aboveground historic resource was identified within the VDHR study tiers for the Ruther Glen Proposed Route (Table I-2). Construction and operation of the new facilities along this route would have a minimal impact on 016-5243.

Olive Cemetery (016-5243) is a circa 1850 African American community cemetery located approximately 183 feet north of the Ruther Glen Proposed Route at MP 3.3 and approximately 0.7 mile to the east-northeast of the proposed switching station. The route is collocated with Dominion's existing Line #256 in this area and is closer to the resource than the Ruther Glen Proposed Route. Although the resource is surrounded by thick vegetation, there is a possibility for visibility of the route due to its proximity to the resource. Because the route could add additional modern infrastructure to the resource's southern viewshed, ERM recommends that the Ruther Glen Proposed Route would have a Minimal Impact on 016-5243.

TABLE I-2
Ruther Glen 230 kV Transmission Line Project
Resources in VDHR Tiers for Proposed Route (Route 5)

Buffer (miles)	Considered Resources	VDHR #	Description	Impact
1.0-1.5	National Historic Landmarks	NA	NA	NA
0.5-1.0	National Register—Listed	NA	NA	NA
	Battlefields/Historic Landscapes	NA	NA	NA
	Locally Significant	NA	NA	NA
0.0- 0.5	National Register—Eligible	NA	NA	NA
	Locally Significant	016-5243	Olive Cemetery	Minimal
0.0 (within right-of-way)	National Historic Landmarks, National Register Properties (Listed and Eligible)	NA	NA	NA

NA = not applicable; VDHR = Virginia Department of Historic Resources

The Stage I Analysis also considered the potential effects to archaeological resources. However, no archaeological resources were identified within the right-of-way for the Ruther Glen Proposed Route.

Ruther Glen Alternative Route 4

One aboveground historic resource was identified within the VDHR study tiers for Alternative Route 4 (Table I-1). Construction and operation of the new facilities along this route would have a no impact on this one resource (016-5243).

Olive Cemetery (016-5243) is a circa 1850 African American community cemetery located approximately 0.4 mile east-northeast of Alternative Route 4 near MP 3.4 and approximately 0.7 mile to the east-northeast of the proposed switching station. Olive Cemetery would not have any visibility towards Alternative Route 4 or the proposed switching station due to distance and intervening vegetation. Thus, Alternative Route 4 and the proposed switching station would have no impact on 016-5243.

TABLE I-1
Ruther Glen 230 kV Transmission Line Project
Resources in VDHR Tiers for Alternative Route 4

Buffer (miles)	Considered Resources	VDHR #	Description	Impact
1.0-1.5	National Historic Landmarks	NA	NA	NA
0.5-1.0	National Register—Listed	NA	NA	NA
	Battlefields/Historic Landscapes	NA	NA	NA
	Locally Significant	NA	NA	NA
0.0- 0.5	National Register—Eligible	NA	NA	NA
	Locally Significant	016-5243	Olive Cemetery	None
0.0 (within right-of-way)	National Historic Landmarks, National Register Properties (Listed and Eligible)	NA	NA	NA

NA = not applicable; VDHR = Virginia Department of Historic Resources

The Stage I Analysis also considered the potential effects to archaeological resources. However, no archaeological resources were identified within the Alternative Route 4's right-of-way.

Ruther Glen Alternative Route 6

One aboveground historic resource was identified within the VDHR study tiers for Alternative Route 6 (Table I-3). Construction and operation of the new facilities along this route would have a no impact on this one resource (016-5243).

Olive Cemetery (016-5243) is a circa 1850 African American community cemetery located approximately 0.5 mile to the east-northeast of Alternative Route 6 near MP 3.6 and approximately 0.7 mile to the east-northeast of the proposed Ruther Glen Switching Station. Olive Cemetery would not have any visibility towards Alternative Route 6 or

the proposed switching station due to distance and intervening vegetation. Thus, Alternative Route 6 and the proposed switching station would have no impact on 016-5243.

TABLE I-3
Ruther Glen 230 kV Transmission Line Project
Resources in VDHR Tiers for Alternative Route 6

Buffer (miles)	Considered Resources	VDHR #	Description	Impact
1.0-1.5	National Historic Landmarks	NA	NA	NA
0.5-1.0	National Register—Listed	NA	NA	NA
	Battlefields/Historic Landscapes	NA	NA	NA
	Locally Significant	NA	NA	NA
0.0- 0.5	National Register—Eligible	NA	NA	NA
	Locally Significant	016-5243	Olive Cemetery	None
0.0 (within right-of-way)	National Historic Landmarks, National Register Properties (Listed and Eligible)	NA	NA	NA

NA = not applicable; VDHR = Virginia Department of Historic Resources

The Stage I Analysis also considered the potential effects to archaeological resources. However, no archaeological resources were identified within the right-of-way for Alternative Route 6.

Carmel Church Project

Carmel Church Proposed Route (Route 1)

Four aboveground historic resources were identified within the VDHR study tiers for the Proposed Route (Table I-4). Construction and operation of the new facilities along this route would have no impact on two resource (016-5165 and 042-0123), a minimal impact on one resource (016-5097), and a moderate impact on one resource (500-0001).

Battle of North Anna River (042-0123) is located approximately 0.3 mile to the west of the Proposed Route at MP 2.5 and approximately 920 feet to the west of the proposed switching station. Excelsior Mills (016-5165) consists of a collection of five resources associated with the manufacturing of excelsior dating to circa 1896 which lies 338 feet to the south of the Proposed Route at MP 1.8 and 0.5 mile to the east of the proposed switching station. Due to intervention vegetation and distance, the Proposed Route will have no impact on 042-0123 and 016-5165.

The Rosenwald School (016-5097) is a circa 1920 one-story wood framed school with side gable roof that lies approximately 284 feet north of the Proposed Route at MP 2.0

and 0.4 mile to the east of the proposed switching station. The construction of the Proposed Route would include tree clearing, which would be somewhat visible from the resource where there currently is dense vegetation and forest. Thus, ERM recommends that the Proposed Route would have a minimal impact on 016-5097.

The Richmond, Fredericksburg, and Potomac Railroad (500-0001) is a circa 1836 railroad which is intersected by the Proposed Route between MP 1.2 and 1.3 and 0.4 mile to the southeast of the proposed switching station. Because the route intersects the resource where there currently is only forest and vegetation, there would be a view. This would bring a modern element to the view where the route intersects the resource, along Railroad Lane. Thus, ERM recommends the Proposed Route would have a moderate impact on this resource.

TABLE I-4
Carmel Church 230 kV Transmission Line Project
Resources in VDHR Tiers for the Proposed Route (Route 1)

Buffer (miles)	Considered Resources	VDHR #	Description	Impact
1.0-1.5	National Historic Landmarks	NA	NA	NA
0.5-1.0	National Register—Listed	NA	NA	NA
	Battlefields/Historic Landscapes	NA	NA	NA
	Locally Significant	NA	NA	NA
0.0- 0.5	National Register—Eligible	016-5165	Excelsior Mills	None
	Battlefields/Historic Landscapes	042-0123	Battle of North Anna River	None
	Locally Significant	016-5097	Rosenwald School	Minimal
0.0 (within right-of-way)	National Register—Eligible	500-0001	Richmond, Fredericksburg and Potomac Railroad	Moderate

NA = not applicable; VDHR = Virginia Department of Historic Resources

The Stage I Analysis also considered the potential effects to archaeological resources. However, no archaeological resources were identified within the Proposed Route right-of-way.

Carmel Church Alternative Route 2

Five aboveground historic resources were identified within the VDHR study tiers for Alternative Route 2 (Table I-5). Construction and operation of the new facilities along this route would have no impact on three resources (016-5097, 016-5165, and 042-0123), a moderate impact on one resource (500-0001), and a minimal impact on one resource (American Indian Society Parcel).

The Rosenwald School (016-5097) is a circa 1920 one-story wood framed school with side gable roof that lies approximately 0.4 mile east of Alternative Route 2 at MP 2.7 and 0.4 mile to the east of the proposed switching station. Excelsior Mills (016-5165) consist of a collection of five resources associated with the manufacturing of excelsior dating to circa 1896 which lies 0.4 mile to the east of Alternative Route 2 at MP 2.5 and 0.5 mile to the east of the proposed switching station. The Battle of North Anna River Spring (042-0123) is located 0.3 mile west from Alternative Route 2 MP 2.7 and approximately 920 feet to the west of the proposed switching station. All three resources would not have visibility towards Route 2 due to intervening vegetation and some based on distance. Thus, the route would have no impact on 016-5097, 016-5165, and 042-0123.

The American Indian Society parcel is a locally significant resource which is located approximately 538 feet south of Alternative Route 2 at MP 0.7. Although the viewshed of the resource would be altered by the proposed route, the existing transmission line running along the east side of Ruther Glen Road has already added modern elements. This, ERM recommends Alternative Route 2 would have a minimal impact on this resource.

The Richmond, Fredericksburg, and Potomac Railroad (500-0001) is a circa 1836 railroad which is intersected by Alternative Route 2 between MP 2.2 and 2.3 and 0.4 mile to the southeast of the proposed switching station. Because the route intersects the resource where there currently is only forest and vegetation, there would be a view. This would bring a modern element to the view where the route intersects the resource, along Interstate 95. Thus, ERM recommends that Route Alternative 2 would have a moderate impact on this resource.

TABLE I-5 Carmel Church 230 kV Transmission Line Project Resources in VDHR Tiers for the Alternative Route 2				
Buffer (miles)	Considered Resources	VDHR #	Description	Impact
1.0-1.5	National Historic Landmarks	NA	NA	NA
0.5-1.0	National Register—Listed	NA	NA	NA
	Battlefields/Historic Landscapes	NA	NA	NA
	Locally Significant	NA	NA	NA
0.0- 0.5	National Register—Eligible	016-5165	Excelsior Mills	None
	Battlefields/Historic Landscapes	042-0123	Battle of North Anna River	None
	Locally Significant	016-5097 N/A	Rosenwald School American Indian Society Parcel	None Minimal
0.0 (within right-of-way)	National Register—Eligible	500-0001	Richmond, Fredericksburg and Potomac Railroad	Moderate

NA = not applicable; VDHR = Virginia Department of Historic Resources

The Stage I Analysis also considered the potential effects to archaeological resources. However, no archaeological resources were identified within the Alternative Route 2 right-of-way.

J. Chesapeake Bay Preservation Areas

Caroline County is a locality subject to the Chesapeake Bay Preservation Act, which regulates development of lands that could impact water quality in the Chesapeake Bay and its tributaries. Chesapeake Bay Preservation Areas that help maintain water quality are broken into Resource Protection Areas ("RPAs"), including tidal wetlands, tidal waterbodies, perennially flowing streams, wetlands associated with perennially flowing streams, and a 100-foot buffer around them; and Resource Management Areas ("RMAs"), land that could degrade water quality or value of RPAs. As such, RPAs are located around perennial waterbodies and associated wetland areas along the Projects' routes, including the South River, the Motto River, Lake Caroline, Polecat Creek, and Bull Run.

Caroline County includes the Chesapeake Bay Preservation Overlay District in Article XV, Section 24 of the Ordinance. The Overlay District designates RPAs along all perennial waterbodies in the study area, with RMAs forming a nominal 300-foot buffer from the outer edge of the RPAs.

Construction, installation, operation, and maintenance of electric transmission lines are conditionally exempt from the Chesapeake Bay Act as stated in the exemption for public utilities, railroads, public roads and facilities in 9 VAC 25-830-150. The Company will

meet those conditions and will use Best Management Practices to limit impacts to RPAs to the minimum extent possible while safely and effectively constructing and maintaining this infrastructure.

Ruther Glen Project

Ruther Glen Proposed Route (Route 5)

The Ruther Glen Proposed Route (Route 5) crosses approximately 0.5 mile of RPA/RMA lands, including the same RPA and RMA areas around a tributary to Mays Run and around a tributary to Boulware Pond described for Alternative Route 4.

Ruther Glen Alternative Route 4

Alternative Route 4 crosses approximately 0.7 mile of RPA/RMA lands, located around a tributary to Mays Run between MPs 0.0 to 0.2, around a tributary to Boulware Pond between MPs 1.7 to 2.2, and around a tributary of Reedy Swamp near approximate MP 2.7 and MP 3.2.

Ruther Glen Alternative Route 6

Alternative Route 6 crosses approximately 1.2 miles of RPA/RMA lands, located around a tributary to Mays Run between MPs 0.0 to 0.2, including the same RPA and RMA areas around a tributary to Mays Run and around a tributary to Boulware Pond described for Alternative Route 4, as well as an area around a tributary of Reedy Swamp between MPs 3.3 to 3.4.

Ruther Glen Switching Station

The Ruther Glen Switching Station footprint does not intersect RPA/RMA lands.

Carmel Church Project

Carmel Church Proposed Route (Route 1)

The Carmel Church Proposed Route crosses approximately 0.5 mile of RPA/RMA lands, located around a tributary to Reedy Creek between MPs 0.9 and 0.1 and Reedy Creek between MPs 1.4 and 1.5.

Carmel Church Alternative Route 2

Alternative Route 2 crosses approximately 0.3 mile of RPA/RMA lands, located around tributaries to Reedy Creek at approximate MPs 0.0 and 0.2 and a tributary to North Anna River between MPs 1.1 and 1.2.

Carmel Church Switching Station

The Carmel Church Switching Station footprint does not intersect RPA/RMA lands.

K. Wildlife Resources

Forested, open water, agricultural, and open space land use areas and wetlands within the study area may provide wildlife habitat. Forested areas within the Proposed or Alternative Routes rights-of-way would be cleared of trees and converted to maintained vegetation, which would eliminate forest habitat and cover but may provide edge habitat or open space for some species. Waterbody habitat crossed by the Proposed and Alternative Routes would be spanned by the transmission line, with impacts to aquatic species limited to any temporary construction impacts associated with vegetation clearing adjacent to the waterbody and the elimination of riparian buffer benefits (erosion control, water filtration, habitat, and temperature control through shading). Impacts to agricultural and open space would be limited to structure placement if required and vegetation maintenance; the function of the land use would otherwise remain the same.

The VGIN statewide land cover dataset (2023) was utilized to quantify land cover classifications impacted by each route alternative. Desktop-delineated wetlands and waterbodies and the methodology for delineation are discussed further in Section D, and the wetland values provided by the VGIN land cover source may differ from the values presented in Section D.

Ruther Glen Project

Ruther Glen Proposed Route (Route 5)

The majority of the Ruther Glen Proposed Route crosses forested land (43.9 acres), with smaller amounts of agricultural land (17.4 acres), and open space (14.4 acres). The Ruther Glen Proposed Route would cross 0.7 acre of wetlands and six NHD-mapped waterbodies, including one perennial waterbody.

Ruther Glen Alternative Route 4

The majority of Alternative Route 4 crosses forested land (45.7 acres), with smaller amounts of agricultural land (8.7 acres), and open space (14.9 acres). Alternative Route 4 would cross 1.0 acre of wetlands and seven NHD-mapped waterbodies, including two perennial waterbodies.

Ruther Glen Alternative Route 6

The majority of Alternative Route 6 crosses forested land (46.8 acres), with smaller amounts of agricultural land (10.5 acres), open space (14.6 acres), and open water (0.4 acre). Alternative Route 6 would cross 1.6 acres of wetlands and nine NHD-mapped waterbodies, two of which are perennial lakes/ponds.

Ruther Glen Switching Station

The Ruther Glen Switching Station footprint is on 7.5 acres of forested land and less than 0.1 acre of open space. According to the VGIN land cover data, the footprint would not impact wetlands and or waterbodies.

Carmel Church Project

Carmel Church Proposed Route (Route 1)

The majority of the Carmel Church Proposed Route crosses forested land (25.6 acres), with smaller amounts of agricultural land (0.9 acre), open space (2.1 acres), and open water (0.4 acre). The Proposed Route would cross 0.2 acre of wetlands and six NHD-mapped waterbodies, including one perennial lake/pond.

Carmel Church Alternative Route 2

The majority of Alternative Route 2 crosses forested land (28.7 acres), with smaller amounts of agricultural land (1.9 acres), and open space (1.6 acres). Alternative Route 2 would cross 0.2 acre of wetlands and four NHD-mapped waterbodies, with zero perennial waterbodies.

Carmel Church Switching Station

The entire Carmel Church Switching Station is on 10.0 acres of forested land. No wetlands or waterbodies are impacted.

L. Recreation, Agricultural, and Forest Resources

The Projects are expected to have minimal incremental impacts on recreational, agricultural, and forest resources. Opportunities for collocation with other rights-of-way, particularly existing highways and roads such as I-95 and Ladysmith Road, were considered where possible as a means of avoiding or minimizing impacts on resources. Where the route alternatives cross agricultural lands, impacts would be limited to structure placement and agricultural activities could resume post construction. Where forested areas are crossed, trees would be removed and vegetation kept to maintained heights within the right-of-way.

The Virginia Agricultural and Forestal Districts Act provides for the creation of conservation districts designed to conserve, protect, and encourage the development and improvement of a locality's agricultural and forested lands. According to the Virginia Department of Forestry ("VDOF"), there are no Agricultural and Forestal Districts crossed by the Projects.

The Virginia Scenic Rivers Act seeks to identify, designate, and protect rivers and streams that possess outstanding scenic, recreational, historic, and natural characteristics of statewide significance for future generations. No state scenic rivers will be crossed by the Projects.

Under the Virginia Open-Space Land Act, any public body can acquire title or rights to real property to provide means of preservation of open-space land. Most easements created under the Act are held by the Virginia Outdoors Foundation ("VOF"), but any state agency is authorized to create and hold an open-space easement. Such conservation easements are designed to preserve and protect open space and other resources and must be held for no less than five years in duration and can be held in perpetuity. According to the DCR's Managed Conservation Lands Database and the Protected Areas Database of the United States ("PAD-US"), there are no easements crossed by the Projects. Further, there are no easements within 0.5-mile of the Carmel Church Project. There is, however, a VOF easement less than 0.1 mile from the Ruther Glen Proposed Route between approximate MPs 2.4 and 2.7 and Ruther Glen Alternative Route 6 between approximate MPs 2.5 and 2.9. All other easements within the Ruther Glen study area are greater than 0.5-mile from the routes.

Any tree along the right-of-way that is tall enough to endanger the conductors if it were to break at the stump or uproot and fall directly toward the conductors and exhibits signs or symptoms of disease or structural defect that make it an elevated risk for falling will be designated as a "danger tree" and may be removed. The Company's arborist will contact the property owner if possible before any danger trees are cut, except in emergency situations. The Company's Forestry Coordinator will field-inspect the rights-of-way and designate any danger trees present. Qualified contractors working in accordance with the Company's Electric Transmission specifications will perform all danger tree cutting.

None of the route alternatives run parallel to or cross any Virginia Byways or Scenic Rivers. Agricultural and forest resources identified within 0.3 mile of the Proposed and Alternative Routes are discussed below. There are no recreational resources within 0.3 mile of either the Carmel Church Project or Ruther Glen Project. The East Coast Greenway Trail is the nearest recreational resource to both Projects and is approximately 0.5 mile from the Ruther Glen routes and approximately 0.6 mile from the Carmel Church routes. An assessment of impacts on these resources is provided in the Environmental Routing Studies for the Projects.

Ruther Glen Project

Ruther Glen Proposed Route (Route 5)

The Ruther Glen Proposed Route crosses approximately 43.9 acres of forested land (57% of the route) and 17.4 acres of agricultural land (23% of the route). NRCS soils data indicates approximately 30.7 acres of the Ruther Glen Proposed Route right-of-way are classified as prime farmland and 43.0 acres are classified as farmland of statewide importance.

Ruther Glen Alternative Route 4

Alternative Route 4 crosses approximately 45.7 acres of forested land (65% of the route) and 8.7 acres of agricultural land (12% of the route). NRCS soils data indicates

approximately 16.6 acres of Alternative Route 4 right-of-way are classified as prime farmland and 45.8 acres are classified as farmland of statewide importance.

Ruther Glen Alternative Route 6

Alternative Route 6 crosses approximately 46.8 acres of forested land (63% of the route) and 10.5 acres of agricultural land (14% of the route). NRCS soils data indicates approximately 20.1 acres of the Alternative Route 6 right-of-way are classified as prime farmland and 39.5 acres are classified as farmland of statewide importance.

Ruther Glen Switching Station

The Ruther Glen Switching Station footprint is almost entirely on forested land (7.5 acres). Less than 0.1 acre of the footprint is on open space. NRCS soils data indicates that approximately 0.9 acre of the Ruther Glen Switching Station footprint is classified as prime farmland, and approximately 6.6 acres are classified as farmland of statewide importance.

Carmel Church Project

Carmel Church Proposed Route (Route 1)

The Carmel Church Proposed Route crosses approximately 25.6 acres of forested land (86 percent of the route) and 0.9 acre of agricultural land (3% of the route). NRCS soils data indicates approximately 11.2 acres of the Proposed Route right-of-way are classified as prime farmland and 9.5 acres are classified as farmland of statewide importance.

Carmel Church Alternative Route 2

Alternative Route 2 crosses approximately 28.7 acres of forested land (87% of the route) and 1.9 acres of agricultural land (6% of the route). NRCS soils data indicates approximately 17.2 acres of the Alternative Route 2 right-of-way are classified as prime farmland and 5.4 acres are classified as farmland of statewide importance.

Carmel Church Switching Station

The Carmel Church Switching Station footprint is entirely on forested land (10.0 acres). NRCS soils data indicates approximately 4.6 acres of the Carmel Church Switching Station footprint are classified as prime farmland and 5.4 acres are classified as farmland of statewide importance.

M. Use of Pesticides and Herbicides

Of the techniques available, selective foliar is the preferred method of herbicide application. The Company typically maintains transmission line right-of-way by means of selective, low volume applications of EPA-approved, non-restricted use herbicides. The goal of this method is to exclude tall growing brush species from right-of-way by

establishing early successional plant communities of native grasses, forbs, and low growing woody vegetation. "Selective" application means the Company sprays only the undesirable plant species (as opposed to broadcast applications). "Low volume" application means the Company uses only the volume of herbicide necessary to remove the selected plant species. The mixture of herbicides used varies from one cycle to the next to avoid the development of resistance by the targeted plants. There are four means of dispersal available to the Company, including by-hand application, backpack, fixed nozzle-radiarc, and aerial. Very little right-of-way maintenance incorporates aerial equipment. The Company uses licensed contractors to perform this work that are either certified applicators or registered technicians in the Commonwealth of Virginia.

DEQ has previously requested that only herbicides approved for aquatic use by the EPA or the USFWS be used in or around any surface water. The Company intends to comply with this request.

Additionally, based on a discussion between Company and DCR-DNH representatives, 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 DCR 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 DCR for review and continued discussions. DCR provided an initial response to the addendum in January 2024. The Company will continue to meet with DCR to further discuss the documentation provided. Once the addendum is finalized, the Company will report on the results of its communications with DCR in future transmission certificate of public convenience and necessity filings.[5]

N. Geology and Mineral Resources

Both Project study areas are located 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

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

Department of Geology 2023). Based on review of the Geologic Map of Virginia, both Projects' routes and switching stations are located within sections of unconsolidated, undifferentiated sediments deposited within the Tertiary Period (2.6 to 66.0 million years ago). Each sediment unit encountered by the routes is mainly composed of sand and gravel.

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 areas. Based on this review, no active mineral resources were identified within 0.3 mile of the Projects' route alternatives.

The closest active mineral resource site to the Ruther Glen Project is located approximately 2.8 miles northeast of the Proposed Route and Alternative Routes 4 and 6 (MP 0.0). Additionally, there are two inactive mineral resource sites located within 0.3 mile of the Proposed Route, the closest being 0.2-mile northwest of MP 3.2. Because the closest active mineral resource site is located more than 0.3 mile from the Ruther Glen study area, it is not anticipated that construction and operation of the Project's transmission infrastructure will impact site operations (Virginia Energy 2023).

The closest active mineral resource site to the Carmel Church Project is located approximately 1.5 miles southwest of the Carmel Church Alternative Route 2 centerline (MP 1.2). Because the closest active mineral resource site is located more than 0.3 mile from the Carmel Church study area, it is not anticipated that construction and operation of the Project's transmission infrastructure will impact site operations (Virginia Energy 2023).

O. Transportation Infrastructure

Road and Railroad Crossings

The road network in the study areas include a variety of road types ranging from interstates (such as I-95) to principal arterials (Rogers Clark Boulevard/VA 207) to local roads (such as Telegraph Road, Dry Bridge Road, Boxley Road and Balty Road). I-95 runs approximately parallel through the middle of both Project study areas. The Carmel Church Proposed Route and Carmel Church Alternative Route 2 require crossing I-95. VDOT maintains the I-95 right-of-way within the study area. Two existing CSX railroads are found in the Carmel Church study area. The first railroad begins east of the Carmel Church study area's eastern boundary and runs south, crossing I-95, and continuing further south into Hanover County. The second existing railroad runs approximately parallel to Verdon Road in the southwest portion of the Carmel Church study area in Hanover County. There are no existing railroads in the Ruther Glen study area.

ERM reviewed the Caroline County Comprehensive Plan (Comprehensive Plan) and VDOT Fredericksburg District project website for upcoming projects within the study area to determine potential impacts of the Projects on future road projects. The County's Comprehensive Plan identifies several roads in the study areas as needing improvements to handle the increased growth the County is anticipating. These roads include US Route

1, Rogers Clark Boulevard/Route 207, Jericho Road/Route 658, Dry Bridge Road, and a portion of Ladysmith Road. None of the proposed or alternative routes for either Project are anticipated to impact these roads or any future improvements. There are no projects within the vicinity of any of the Projects' Proposed or Alternative Routes or Ruther Glen or Carmel Church Switching Stations that would be impacted by the construction of the Projects.

Ruther Glen Project

Ruther Glen Proposed Route (Route 5)

The Ruther Glen Proposed Route has three road crossings. The route crosses Boxley Road two times, first north of MP 2 and second west of MP 3, and crosses Balty Road near MP 1.1.

Ruther Glen Alternative Route 4

Alternative Route 4 crosses two roads, Balty Road near MP 1.1 and Boxley Road near MP 2.3; however, neither of the roads is maintained by VDOT, and Alternative Route 4 does not collocate with any existing roads.

Ruther Glen Alternative Route 6

Alternative Route 6 crosses Balty Road near MP 1.1 and Boxley Road near MP 2.4. Neither road is maintained by VDOT and the route does not collocate with any existing roads.

Ruther Glen Switching Station

The Ruther Glen Switching Station does not cross or collocate with any existing roads.

Carmel Church Project

Carmel Church Proposed Route (Route 1)

The Carmel Church Proposed Route has four road crossings: Ruther Glen Road, Railroad Lane, Taylor Drive, and I-95. The route does not collocate with any existing roads, and Ruther Glen Road is the only road crossed by the route that is maintained by VDOT.

Carmel Church Alternative Route 2

Alternative Route 2 crosses three roads: Ruther Glen Road, Oak Haven Trail, and I-95. Route 2 parallels Grannys Way for approximately 0.45 mile but does not cross the road. Additionally, Route 2 parallels I-95 for approximately 1.03 miles but does not collocate or overlap VDOT right-of-way. Route 2 does not collocate with any existing roads and Ruther Glen Road is the only road crossed that is maintained by VDOT.

Carmel Church Switching Station

The Carmel Church Switching Station does not cross or collocate with any existing roads.

Temporary closures of roads and or traffic lanes would be required during construction of the Proposed or Alternative Routes for both Projects. No long-term impacts to roads are anticipated as a result of the Projects. The Company will comply with VDOT and Caroline County requirements for access to the rights-of-way from public roads. At the appropriate time, the Company will obtain the necessary VDOT permits as required and comply with permit conditions.

The Company communicated with VDOT on May 16, 2024, regarding the proposed Project, and VDOT provided feedback via email on May 22, 2024. A copy of the VDOT email is included as Attachment 2.O.1.

P. Airports

The Federal Aviation Administration ("FAA") is responsible for overseeing air transportation in the United States. The FAA 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 Company reviewed the FAA's website[6] to identify airports within 10.0 nautical miles of the proposed Projects. Based on this review, the following FAA-restricted airports are located within 10.0 nautical miles of the Projects' routes:

Table P-1
Ruther Glen 230 kV Transmission Line Project
Airports And Heliports Located Within 10.0 Nautical Miles (nm)

Airport/Heliport Name and FAA Identifier	Use Designation	Approximate distance and direction of nearest runway from the nearest project route/ feature.
Woodford Airpark (20VA)	Private	3.8 nm north of the proposed Ruther Glen Switching Station and western terminus of all route alternatives.
Marry Walker LZ (APH)	Military/ private	6.0 nm northeast of the Proposed Route eastern cut-in.
Robbie Campbell Memorial Airfield (4VG8)	Private	7.5 nm north of the proposed Ruther Glen Switching Station and western terminus of all route alternatives.
Cool Water Airport (4VG2)	Private	9.5 nm southeast of Alternative Route 6.

[6] https://adip.faa.gov/agis/public/#/public.

Table P-2 Carmel Church 230 kV Transmission Line Project Airports And Heliports Located Within 10.0 Nautical Miles (nm)		
Airport/Heliport Name and FAA Identifier	**Use Designation**	**Approximate distance and direction of nearest runway from the nearest project route/ feature.**
Cool Water Airport (4VG2)	Private	5.3 nm southeast of Alternative Route 2. 5.5 nm southeast of the proposed Carmel Church Switching Station and western terminus of both route alternatives
Mayers Airport (VG24)	Private	8.1 nm south of Alternative Route 2.
Woodford Airpark (20VA)	Private	9.0 nm north of the Proposed Route. 9.1 nm north of the proposed Carmel Church Glen Switching Station and western terminus of both route alternatives.
Marry Walker LZ (APH)	Military/ Private	9.3 nm northeast of the Proposed Route eastern cut-in to the end of the nearest runway.

The Company conducted an airport analysis to determine if any of FAA defined Civil Airport Imaginary Surface would be penetrated by structures associated with the Projects. The Company hired ERM to conduct the review.

The regulations that govern objects that may affect navigable airspace are codified in the Code of Federal Regulations, Title 14, Part 77. In these regulations, it states that restrictions to structure heights only apply to public use airports and do not apply to privately owned airports. Of the five airports identified within 10 nautical miles of the Ruther Glen and Carmel Church study areas, four are private use airports, and one is a military-use airport (Mary Walker LZ Airport). No public use airports were identified within the study area. None of the private facilities listed in Tables P-1 and P-2 are anticipated to have a conflict with the proposed route alternative locations.

ERM reviewed the height limitations associated with FAA defined imaginary surveys for all runways associated with the Mary Walker LZ Airport to determine whether any of the towers planned to be installed for the Projects would penetrate any of the relevant runway flight surfaces.

Distances from the Ruther Glen and Carmel Church study areas to Mary Walker LZ Airport are noted in Table P-1 and P-2. Based on a review of the airport's runway and approach procedures, the facility is not in close enough proximity to any of the route alternatives to create overlap between a transmission structure and an FAA defined military Airport Imaginary Surface. In addition, none of the proposed structures associated with any of the route alternatives would exceed 200 feet above ground surface, and crane usage during construction will at no point create a temporary structure height exceeding 200 feet above ground surface. As such, no FAA notification thresholds are anticipated to be penetrated, and unless specifically requested by the FAA, no notification to the FAA is anticipated to be required. I f the FAA were to ask for additional information regarding the proposed Projects for any reason, Dominion could be required to utilize FAA Form 7460-1, Notice of Proposed Construction or Alteration, pursuant to 14 CFR Part 77 for FAA notification. Any submittal would occur after a route is selected by the SCC during the permitting phase of the Projects.

Since the FAA manages air traffic in the United States, it will evaluate any physical objects that may affect the safety of aeronautical operations through an obstruction evaluation. If required during the permitting process, Dominion Energy Virginia will

submit an FAA Form 7460-1 Notice pursuant to 14 CFR Part 77 for any tower locations that meet the review criteria.

Q. Drinking Water Wells

The Company has coordinated with the Department of Health ("VDH"), Office of Drinking Water ("ODW") on the Company's analysis of drinking water sources in proximity to the Company's construction projects. VDH-ODW has requested the Company identify known drinking water wells within the project area on the Company's Erosion and Sediment Control Plans. Water wells within 1,000 feet of the Project, however, may be outside of the transmission line corridor. The Company does not have the ability or right to field-mark wells located on private property. The Company has agreed to a method of well protection, including plotting and calling out the wells on the Project's Erosion and Sediment Control Plan, to which VDH-ODW indicated that the Company's proposed method is reasonable. A copy of that correspondence is included as Attachment 2.P.1. The Company intends to follow this same approach as a standard practice with transmission line projects and will coordinate with VDH-ODW, as needed.

R. Pollution Prevention

Generally, as to pollution prevention, as part of Dominion Energy Virginia's commitment to environmental compliance, the Company has a comprehensive Environmental Management System Manual in place that ensures it is complying with environmental laws and regulations, reducing risk, minimizing adverse environmental impacts, setting environmental goals, and achieving improvements in its environmental performance, consistent with the Company's core values. Accordingly, any recommendation by the DEQ to consider development of an effective environmental management system has already been satisfied.

ATTACHMENTS

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

DATE
12 December 2024

SUBJECT
RUTHER GLEN 230 KV LINE EXTENSION PROJECT

REFERENCE
0721582

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 new proposed Ruther Glen 230 kV (kilovolt) Line Extension (Project) in Caroline County, Virginia. This delineation was done using desktop resources and methodology. A field delineation is required to verify the accuracy and extent of aquatic resource boundaries. 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 construct and operate the following:

- Two new, double circuit, overhead 230 kV transmission lines (Ruther Glen Line #256) in new rights-of-way will cut the existing Dominion Line #256 and connect to the proposed Ruther Glen Switching Station; and
- Two new 230 kV delivery point switching stations (Ruther Glen Switching Stations, Phase 1 and Phase II) in Caroline County, which will provide interconnection to Rappahannock Electric Cooperative (REC) to serve existing and planned development in the area.

The Project is necessary to provide electrical service requested by REC) to support future data center development in Caroline County, maintain reliable service for overall load growth in the area, and comply with mandatory North American Electric Reliability Corporation (NERC) 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:

- The intersection of Cedon Road at Route 1 to the north;
- The Legacy Park sports complex and the Caroline County Agricultural Fairgrounds to the south;
- The existing Dominion line #256 transmission corridor to the east; and
- The existing Dominion line #574 transmission corridor to the west.

The study area identified for the Project contains approximately 31,270 acres (48.9 square miles) wholly within Caroline County. The Project origin is the Company's existing Ladysmith CT – St. Johns Line (line #256), terminating at the proposed Ruther Glen Switching Station located approximately 0.8 mile east of the Ladysmith Road interchange on Interstate 95 (I-95). There are no incorporated cities within the study area.

Land use and land cover within the study area consists of low amounts of developed land as well as a mix of agricultural land and forested areas along the waterbodies within the study area, including Hobby Swamp, South River, Reedy Swamp, Polecat Creek, and DeJarnette Mill Run, and associated tributaries. The largest forested/undeveloped areas are associated with riparian areas along South River waterways in the northeast portion of the study area, and riparian areas along Polecat Creek waterways in the southeastern portion of the study area. A commercial development, consisting of a recent or future data center campus, is within the study area. The study area is shown in Attachment 1.

Within the study area, ERM initially identified five potential cut in locations along the company's existing Line #256 on the eastern edge of the study area and two potential cut in locations along the Company's existing Line #574 to the west. Seven routes were proposed to connect to existing Line #256 and two routes were proposed to connect to existing Line #574. Of these, two potential cut-in locations (both on existing Line #256) and three associated routes (Routes 4, 5, and 6) were retained for analysis, while the others were eliminated. Descriptions of the routes are provided in the subsections below and shown on Attachment 1.

ROUTE ALTERNATIVES

ROUTE 4

Route 4 taps the Company's existing Line #256 approximately 0.8 mile due north of Golansville Road and extends west for approximately 1.1 miles across agricultural fields, forested land, a Columbia Gas Natural Gas easement and Balty Road. Following property lines west of Balty Road, Route 4 passes through forested parcels and crosses Dejarnette Mill Run twice before turning southwest to cross Boxley Road approximately 0.6 mile north of Golansville Road. West of Boxley Road, Route 4 turns northwest for an approximate 1.1 miles through forested land east of Reedy Swamp and west of rural residential properties before turning west to enter the proposed Ruther Glen Switching Station.

Route 4 measures approximately 3.7 miles long. The cumulative right-of-way for this alternative (70.7 acres) and the proposed Ruther Glen Switching Station site (7.5 acres) would encompass a combined 78.2 acres.

ROUTE 5

Route 5 taps the Company's existing Line #256 in the same location as Route 4 and follows the same path as Route 4 for the first approximately 2.0 miles. At this point, Route 5 turns north to cross Bath Road/Pond Road and extends north for approximately 0.80 mile through forested parcels and along the eastern edge of an agricultural parcel. Route 5 then turns west to run parallel to and south of the existing REC 115 kV easement for approximately 0.8 mile through agricultural and then forested land. Route 5 then crosses and runs parallel to the north side of the REC easement for approximately 0.4 mile through forested land before entering the Ruther Glen Switching Station.

Route 5 measures approximately 4.0 miles long. The cumulative right-of-way for this alternative (77.1 acres) and the proposed Ruther Glen Switching Station site (7.5 acres) would encompass a combined 84.6 acres.

ROUTE 6

Route 6 taps the Company's existing Line #256 in the same location as Route 4 and follows the same path as Route 4 for the first approximately 1.5 miles. At this point, Route 6 turns south for approximately 0.3 mile and then west for approximately 0.6 mile before crossing Boxley Road. This segment of Route 6 runs through forested land and crosses Dejarnette Mill Run three times, including two crossings north of Boulware Pond. After crossing BOxley Road, Route 6 turns northwest for approximately 1.2 miles through forested areas east of Reedy Swamp and west of rural residential properties along Boxley Road. Route 6 then crosses the existing REC 115kV easement and turns west to enter the proposed Ruther Glen Switching Station.

Route 6 measures approximately 3.9 miles long. The cumulative right-of-way for this alternative (74.1 acres) and the proposed Ruther Glen Switching Station site (7.5 acres) would encompass a combined 81.6 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).

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.

As stated above, field delineations were not performed and would be required to verify the accuracy and extent of aquatic resource boundaries. However, a field delineation was completed by Wetland Studies and Solutions, Inc. summer (between July and August) 2024 on the parcel containing the proposed Ruther Glen Switching Stations, which identified aquatic resources along Route 4 between MP 3.0 and the Switching Stations, Route 5 between MP 3.7 and the proposed Ruther Glen Switching Stations, and Route 5 between MP 3.2 and the Switching Stations (Wetland Studies and Solutions, Inc. 2024). The boundaries of these field delineated aquatic resources were used in the desktop wetland delineation and are included in the wetland and waterbody numbers provided in this report.

Attachment 2 depicts the interpreted wetland probability and type displayed on color base map images.

ERM

DATE
12 December 2024

REFERENCE
0721582

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 15.1-acre Ruther Glen Switching Station footprints.

TABLE 2: SUMMARY OF THE PROBABILITIES OF WETLAND AND WATERBODY OCCURRENCE ALONG THE ROUTE ALTERNATIVES [a]

Probability	Total Within Right-of-way (acres)	Wetland and Waterbody type (acres)				
		PEM (Emergent)	PFO (Forested)	PSS (Scrub Shrub)	PUB (Freshwater pond)	Riverine (Stream)
Route 4						
High	0.8	NA	0.3	NA	0.5	NA
Medium/High	0.7	0.3	0.3	NA	0.1	0.0
Medium	2.9	0.4	2.3	NA	0.0	0.2
Medium/Low	0.0	0.0	0.0	NA	0.0	0.0
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA
Route 5						
High	0.5	NA	NA	NA	0.5	
Medium/High	0.7	0.1	0.1	NA	0.5	0.0
Medium	3.7	0.6	2.8	NA	0.1	0.2
Medium/Low	0.0	NA	NA	NA	0.0	0.0
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA

Probability	Total Within Right-of-way (acres)	Wetland and Waterbody type (acres)				
		PEM (Emergent)	PFO (Forested)	PSS (Scrub Shrub)	PUB (Freshwater pond)	Riverine (Stream)
Route 6						
High	1.7	0.4	0.3	NA	0.6	0.3
Medium/High	0.6	0.1	0.3	NA	0.2	0.0
Medium	2.8	0.3	2.3	NA	0.0	0.2
Medium/Low	0.2	0.0	0.0	NA	0.1	0.0
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.

WETLAND CROSSINGS

Within the study area, most wetlands are forested and are generally concentrated around the South River in the northern half of the study area and Reedy Swamp and Lake Caroline in the southern half of the study area. Riverine (stream) features and PUB (open water) features are described in the Waterbody Crossings section below.

ROUTE 4

The length of the corridor for Ruther Glen Route 4 is approximately 3.7 miles and encompasses a total of approximately 70.7 acres of existing ROW (not including the 15.1-acre Ruther Glen Switching Station footprints). Based on the methodology discussed above, the right-of-way footprint will encompass approximately 6.2 percent (4.4 acres) of land with a medium or higher probability of containing wetlands and waterbodies. Of these 4.4 acres, 2.9 acres consist of PFO and 0.7 acre consist of PEM wetlands, and 0.5 acre consist of PUB open water and 0.2 acre consist of riverine features.

ROUTE 5

The length of the corridor for Ruther Glen Route 5 is approximately 4.0 miles and encompasses a total of approximately 77.1 acres of existing ROW (not including the 15.1-acre Ruther Glen Switching Station footprints). Based on the methodology discussed above, the right-of-way footprint will encompass approximately 6.3 percent (4.9 acres) of land with a medium or higher probability of containing wetlands and waterbodies. Of these 4.9 acres, 2.9 acres consist of PFO and 0.7 acre consist of PEM wetlands, and 1.1 acre consist of PUB open water and 0.2 acre consist of riverine features.

ROUTE 6

The length of the corridor for Ruther Glen Route 6 is approximately 3.9 miles and encompasses a total of approximately 74.1 acres of existing ROW (not including the 15.1-acre Ruther Glen Switching Station footprints). Based on the methodology discussed above, the right-of-way footprint will encompass approximately 6.9 percent (5.1 acres) of land with a medium or higher probability of containing wetlands and waterbodies. Of these 5.3 acres, 2.9 acres consist of PFO and 0.8 acre consist of PEM wetlands, and 0.8 acre consist of PUB open water and 0.5 acre consist of riverine features.

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 Ruther Glen Routes include DeJarnette Mill Run, Reedy Swamp, unnamed, intermittent tributaries to these waterbodies, and open waterbody features. No waterbodies were identified within the Ruther Glen Switching Station footprints.

TABLE 3: WATERBODIES CROSSED BY THE ROUTE ALTERNATIVES

Waterbodies Crossed	Unit	Route 4	Route 5	Route 6
NHD-Mapped Perennial Streams/Rivers	Number	2	1	0
NHD-Mapped Intermittent Streams/Rivers	Number	5	5	7
NHD-Mapped Perennial Lakes/Ponds	Number	0	0	2
Total	Number	7	6	9

Source: USGS NHD (NHD 2023)

ROUTE 4

Route 4 would have a total of seven NHD-mapped waterbody crossings, including 2 perennial waterbodies (DeJarnette Mill Run and Reedy Swamp), and 5 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 0.5 acre of PUB open water features and 0.2 acre of riverine features.

ROUTE 5

Route 5 would have a total of six NHD-mapped waterbody crossings, including 1 perennial waterbody (Reedy Swamp), and 5 unnamed, intermittent streams. As described above, based on ERM's desktop wetland and waterbody analysis, the right-of-way for Route 5 would encompass approximately 1.1 acres of PUB open water features and 0.2 acre of riverine features.

ROUTE 6

Route 6 would have a total of nine NHD-mapped waterbody crossings, including 2 perennial lakes/ponds, and 7 unnamed, intermittent streams. As described above, based on ERM's desktop wetland and waterbody analysis, the right-of-way for Route 6 would encompass approximately 0.8 acre of PUB open water features and 0.5 acre of riverine features.

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/projects-and-facilities/electric-projects/power-line-projects/carmel-church-ruther-glen.

If you have any questions regarding this wetland assessment, please contact me at 512-374-2258 or by email at gray.ford@erm.com.

Sincerely,

Gray Ford
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

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

RUTHER GLEN SWITCHING STATION

Cedon
Blantons
Davis Corner
Ryland Corner
Wrights Corner
Ladysmith Village
Ladysmith
Lake Landor
Lake Land'O
Pendleton Golf Club
Chilesburg
Lake Caroline
Balty
Athens
Poplar
Milford
313 ft
254 ft
241 ft
232 ft
Cedon Rd
Motto River
South River
Paige Rd
Gatewood Rd
Rylands Rd
Bull Church Rd
Michaels Rd
S River Rd
Countyline Church Rd
SPOTSYLVANIA COUNTY
CAROLINE COUNTY
Ladysmith Rd
Durrette Rd
Goose Hill Rd
Nelson Hill Rd
Industrial Dr
Green Rd
Boxley Rd
Golansville Rd
Lester Ln
C C C Rd
Stevens Mill Run
Reedy Swamp
De Jarnette Mill Run
Cedar Fork Rd
Polecat Creek
Partlow Rd
Penola Rd
Terrell Dr
Oates Ln
1
95
207

OH
WV
KY
Virginia
TN
Project Loaction

Proposed Switching Station
Existing Dominion Energy Electric Transmission Line
Existing REC Line
Route 4
Route 5
Route 6
Study Area

1:53,000
0 2,500 5,000
Feet

Attachment 1
Overview Map
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM
Dominion Energy

ERM

222 South 9th Street
Suite 2900
Minneapolis, Minnesota 55402

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

erm.com

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

RUTHER GLEN SWITCHING STATION

Ladysmith Rd
Bull Church Rd
Boxley Rd
American Way
Balty Rd
Pond Rd
Marks Run
Golansville Rd
Monroeville Rd
Boulware Pond
Balty

254 ft
252 ft
245 ft
241 ft
230 ft
246 ft
235 ft
232 ft
244 ft

△ Proposed Switching Station
Existing Dominion Energy Electric Transmission Line
Existing REC Line
Route 4
Route 5
Route 6
Index Page

1:15,000
0 750 1,500
Feet

Page 0

Attachment 2 Index
Wetland Probability Map Set
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline 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

Existing Dominion Energy Electric Transmission Line
Route 4 MP
Route 5 MP
Route 6 MP
Route 4
Route 5
Route 6
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

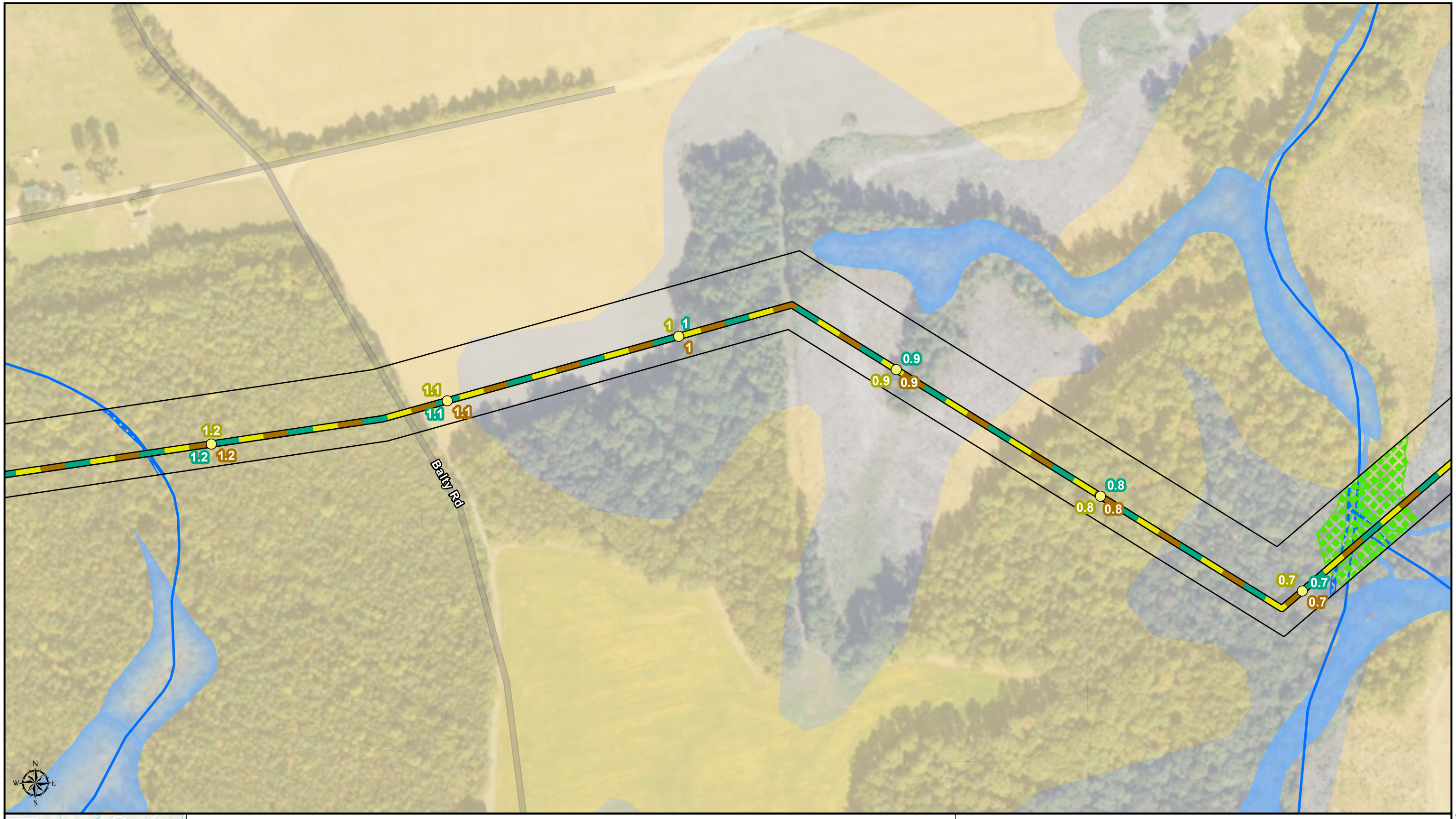
1:2,400
0 100 200
Feet

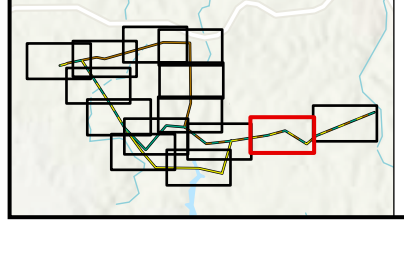
Attachment 2
Wetland Probability Map Set - Wetland Type
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

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 4 MP
Route 5 MP
Route 6 MP
Route 4
Route 5
Route 6

Wetland Cover Type
PFO
Riverine
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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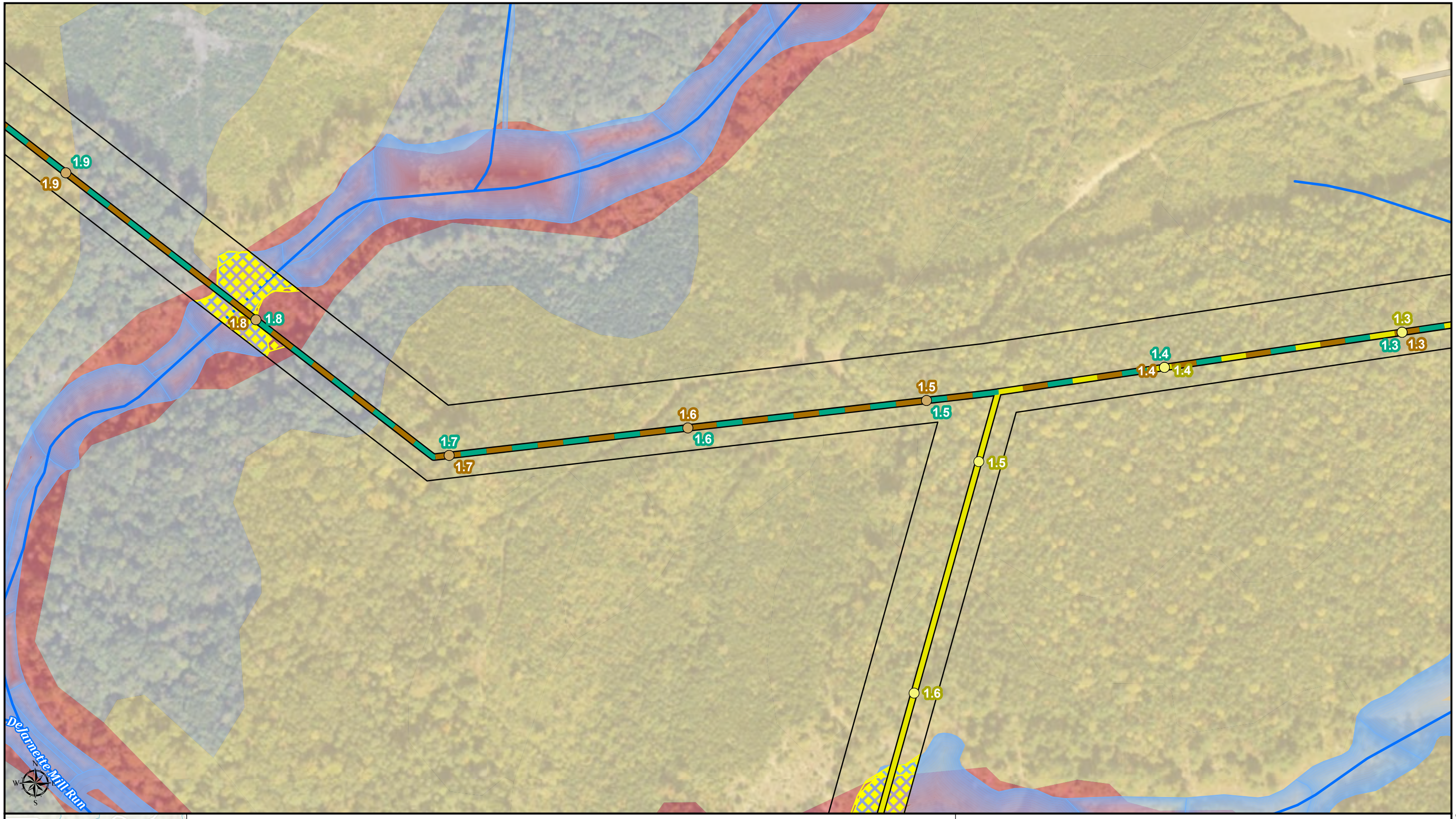

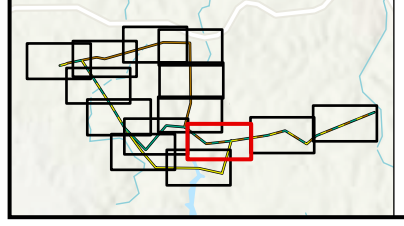

Route 4 MP
Route 5 MP
Route 6 MP
Route 4
Route 5
Route 6

Wetland Cover Type
PUB
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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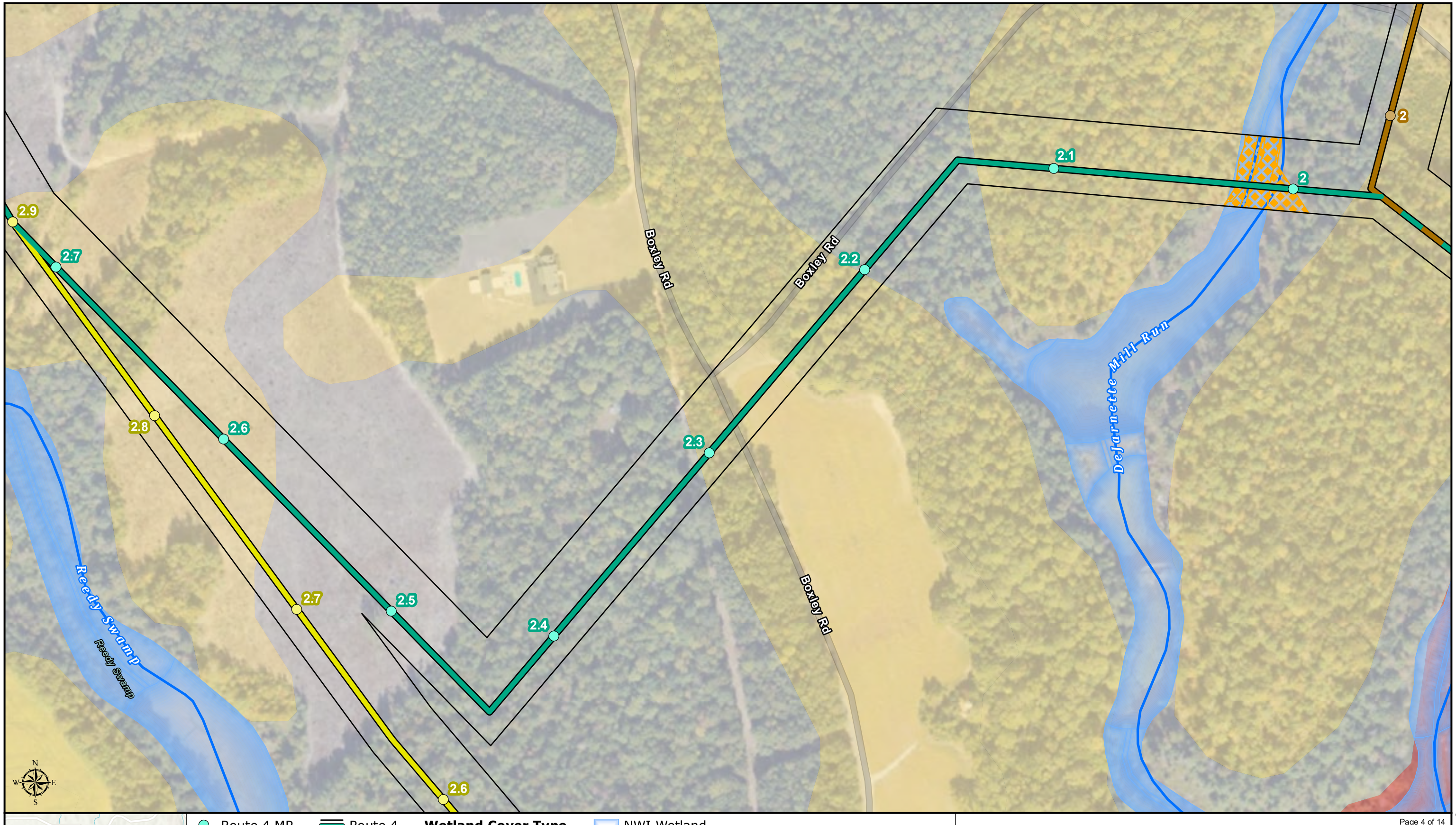

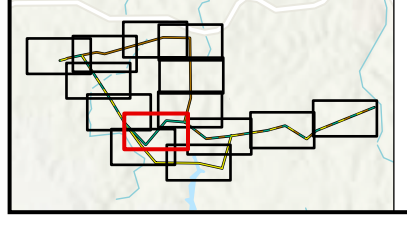

Route 4 MP
Route 5 MP
Route 6 MP
Route 4
Route 5
Route 6
NHD Stream

Wetland Cover Type
PEM
Riverine
NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM
Dominion Energy

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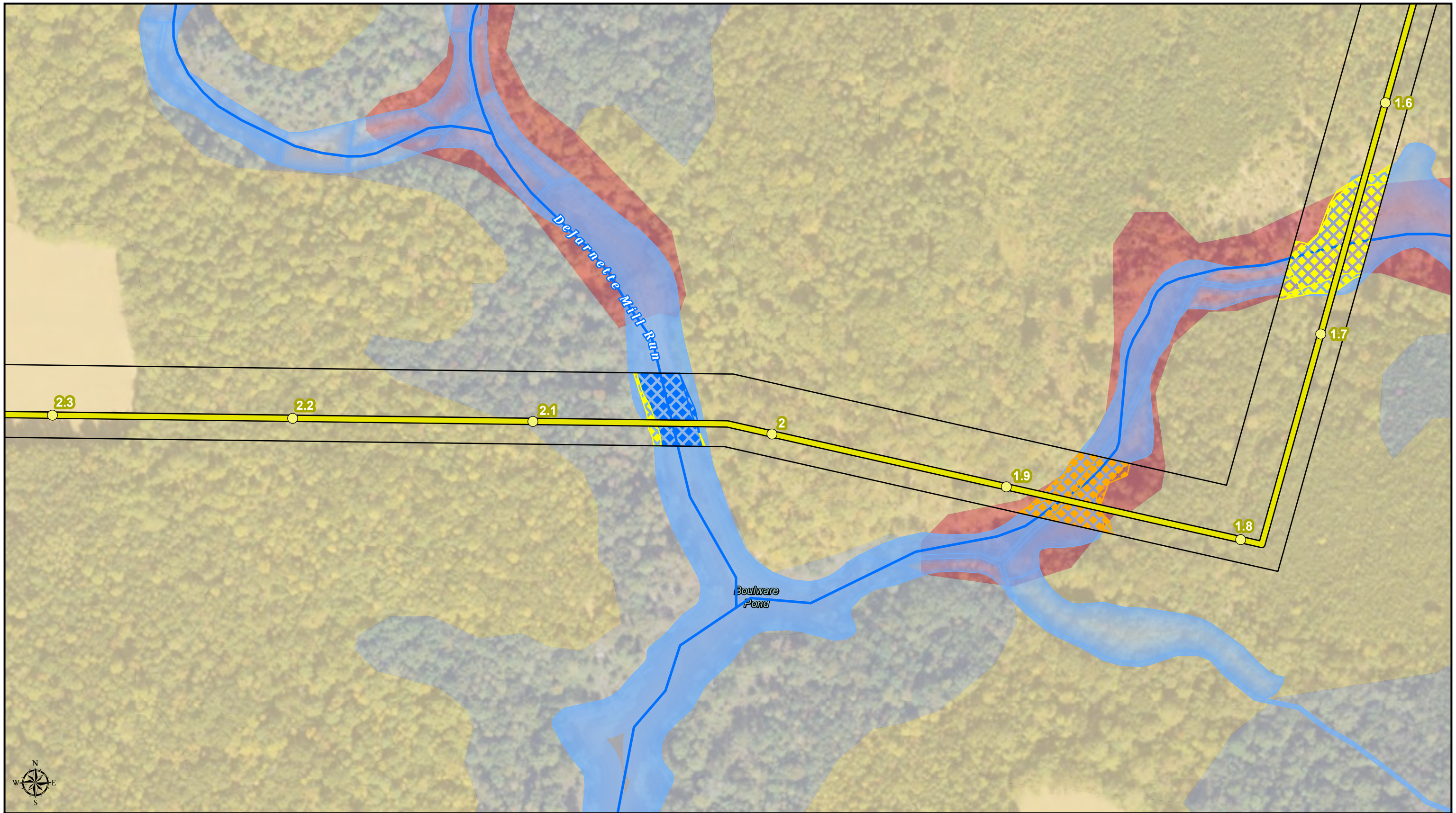

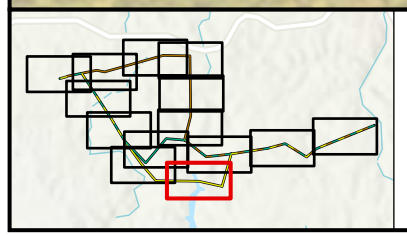

Route 6 MP
Route 6

Wetland Cover Type
PEM
PUB
Riverine
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM
Dominion Energy

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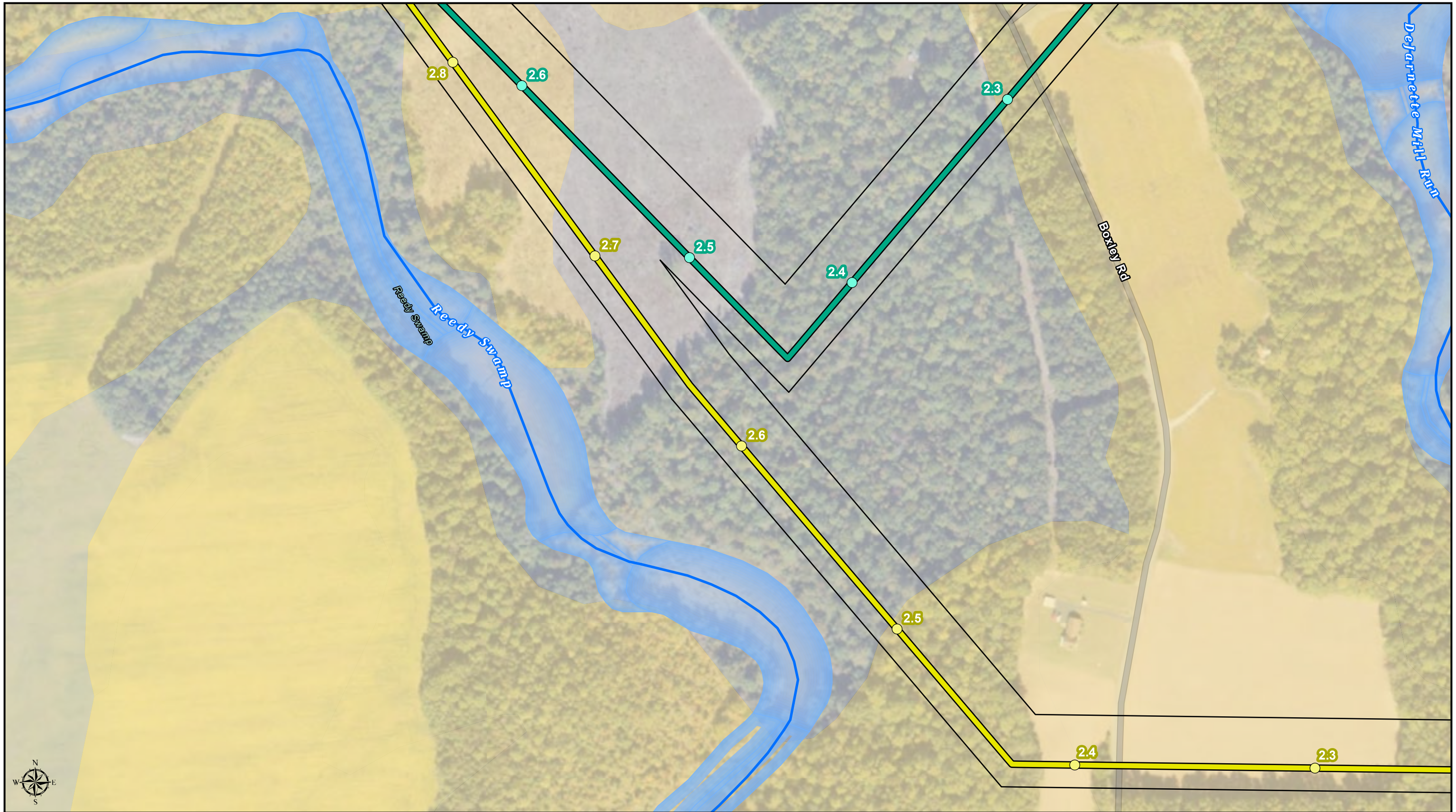
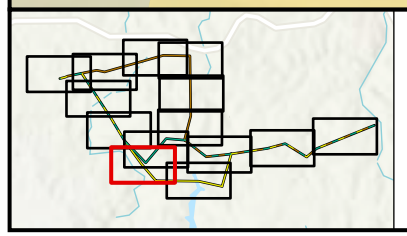




Route 4 MP
Route 6 MP
Route 4
Route 6
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric

1:2,400

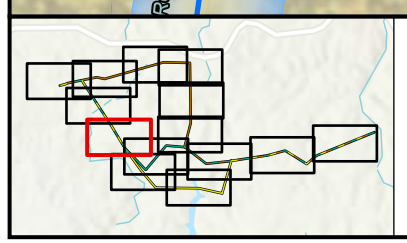
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline 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 4 MP
Route 6 MP
Route 4
Route 6
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400

0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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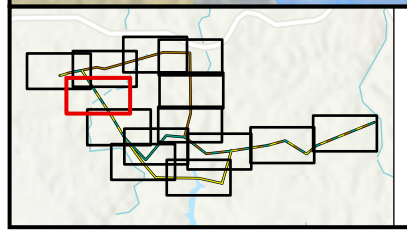

Route 4 MP
Route 6 MP
Route 4
Route 6

Wetland Cover Type
PFO
Riverine
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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Route 4 MP
Route 5 MP
Route 4
Route 5

Wetland Cover Type
PEM
PUB
Riverine
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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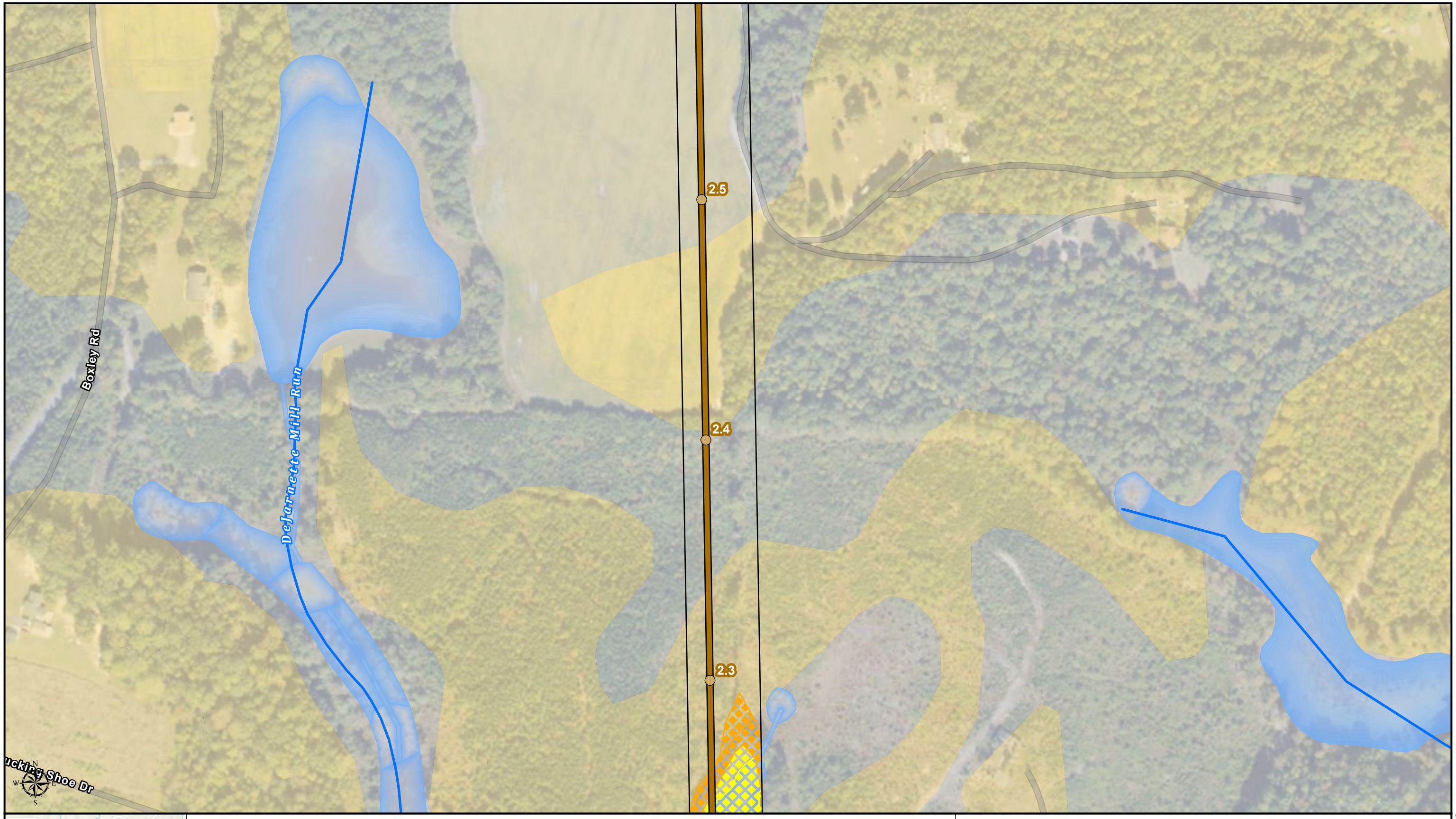
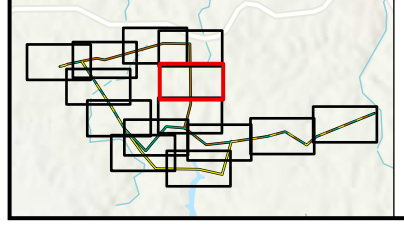




Route 5 MP
Route 5

Wetland Cover Type
PEM
PUB
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric

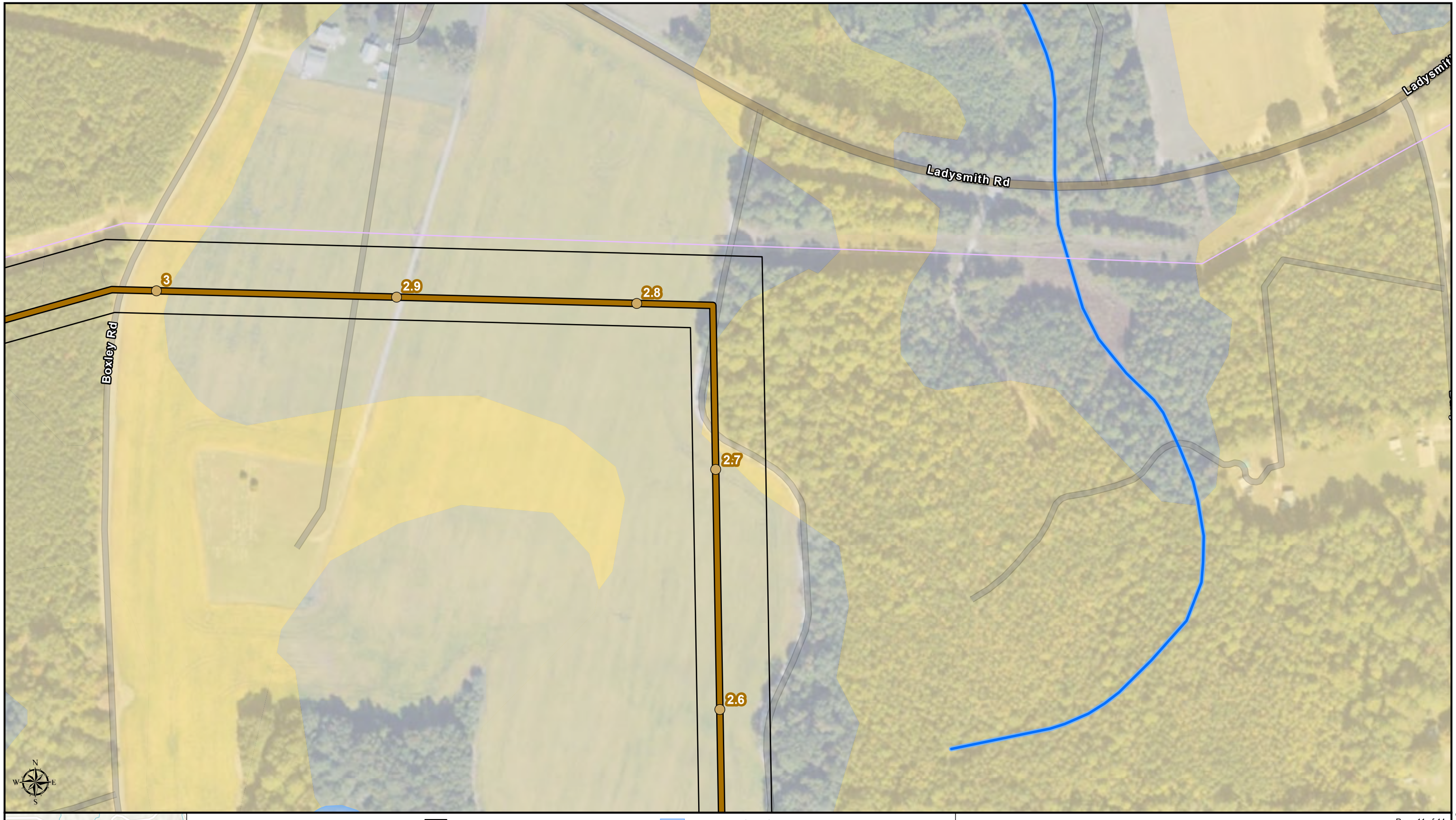
1:2,400
0 100 200
Feet

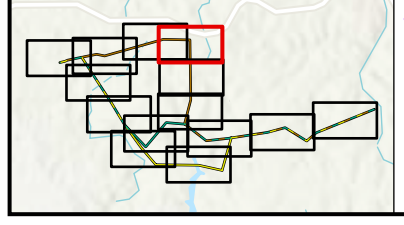
Attachment 2
Wetland Probability Map Set - Wetland Type
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

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





Existing REC Line
Route 5 MP
Route 5
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric

1:2,400
0 100 200
Feet

Attachment 2
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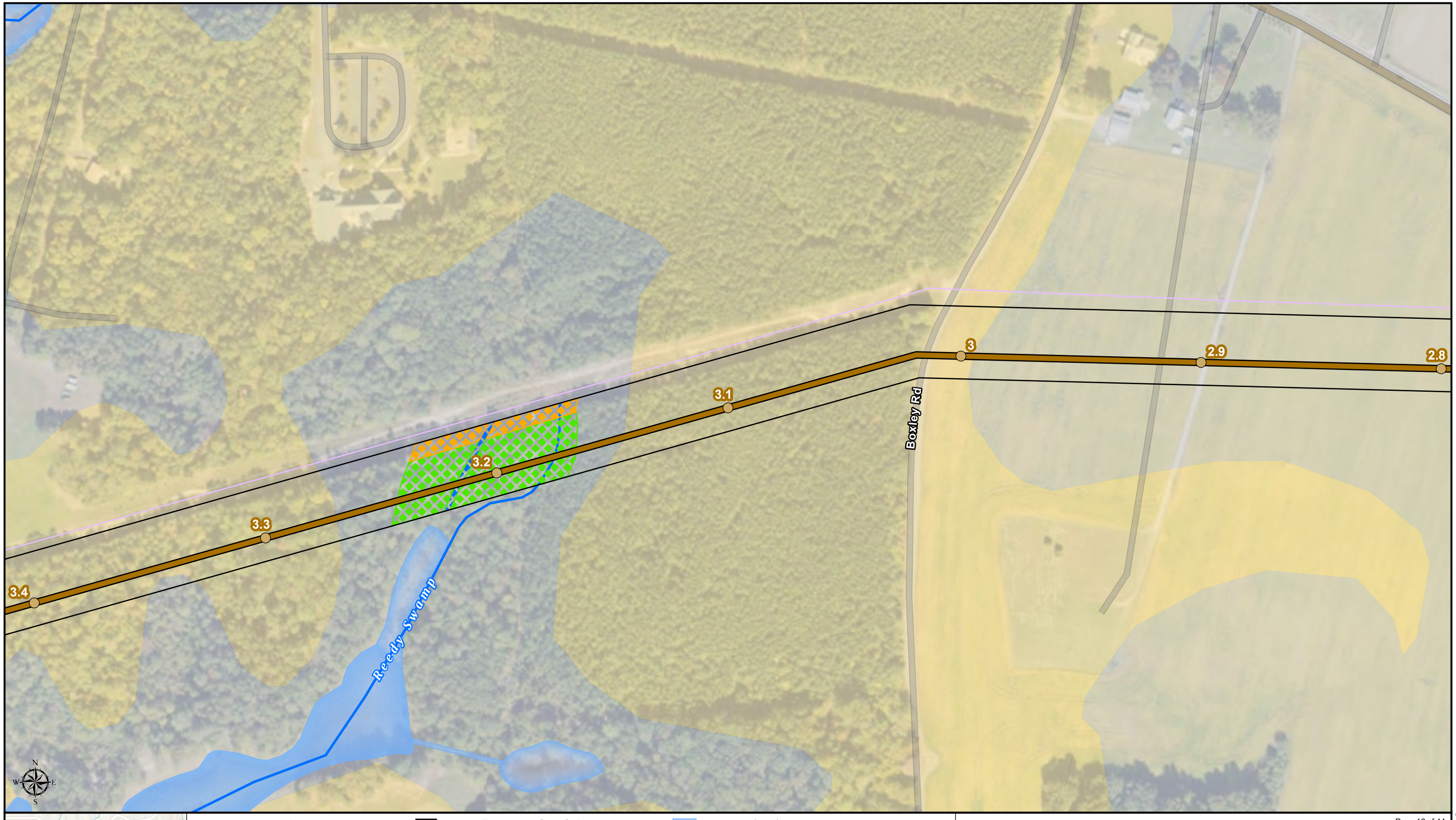

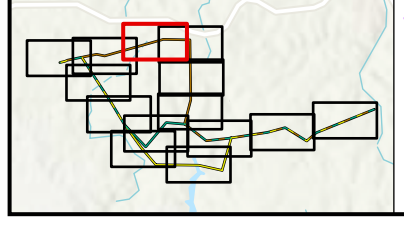

Existing REC Line
Route 5 MP
Route 5

Wetland Cover Type
PEM
PFO
Riverine
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric

1:2,400
0 100 200
Feet

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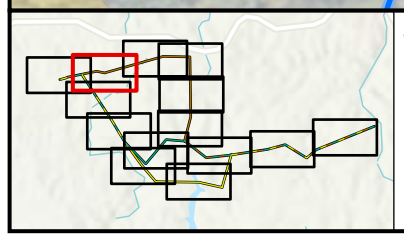

Existing REC Line
Route 4 MP
Route 5 MP
Route 6 MP

Route 4
Route 5
Route 6

Wetland Cover Type
PEM
PFO
Riverine
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

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Wetland Probability Map Set - Wetland Type
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Caroline County, Virginia

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RUTHER GLEN SWITCHING STATION

4 3.8 3.6 3.9 3.7 3.5 3.8 3.6 3.4

N W E S

Proposed Switching Station
Existing REC Line
Route 4 MP
Route 5 MP
Route 6 MP

Route 4
Route 5
Route 6

Wetland Cover Type
PEM
PFO
Riverine
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric

1:2,400
0 100 200
Feet

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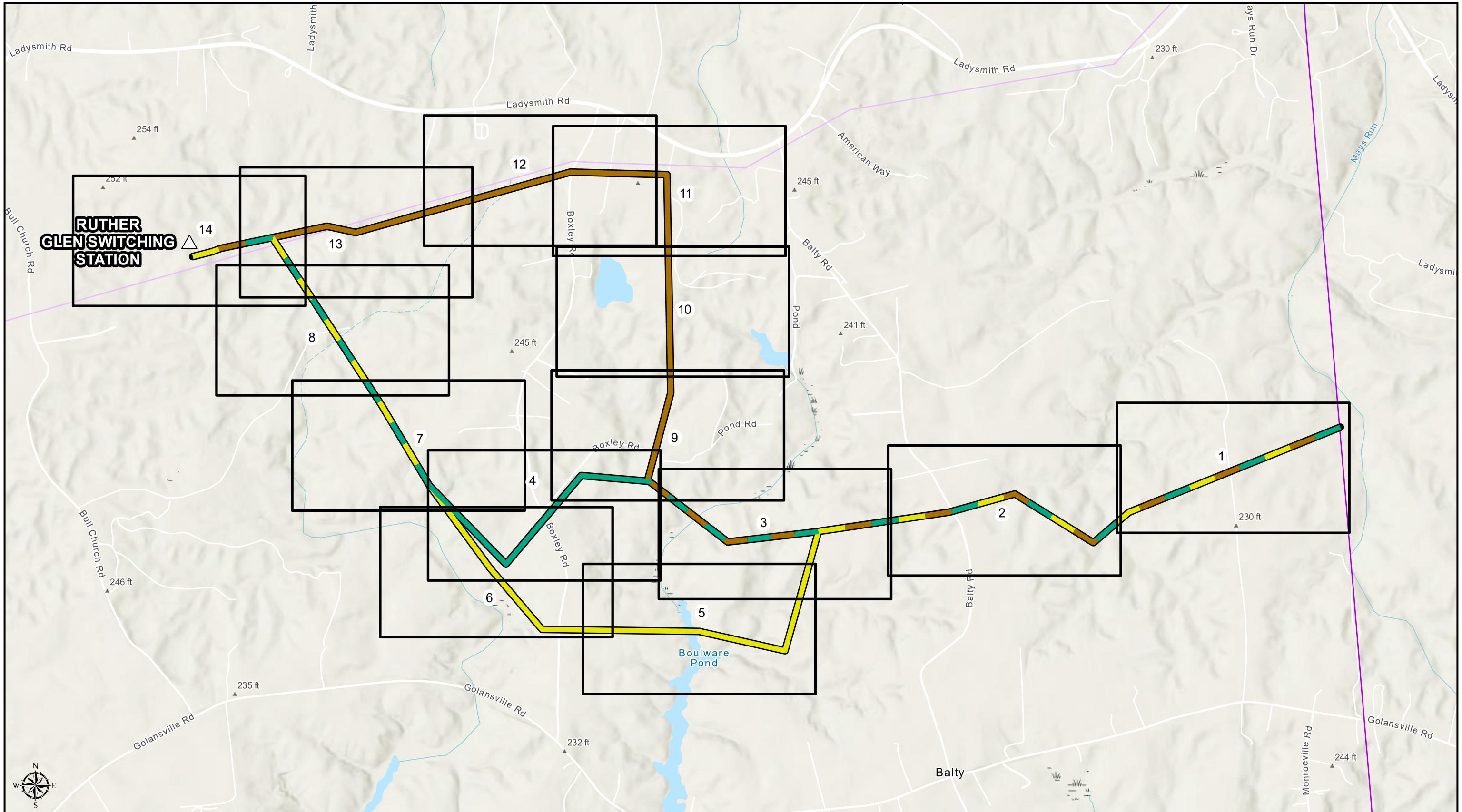

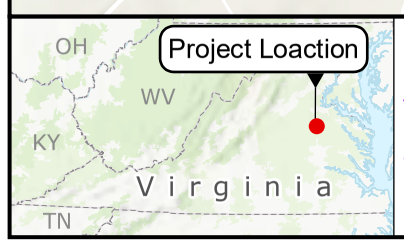

- Proposed Switching Station
- Existing Dominion Energy Electric Transmission Line
- Existing REC Line
- Route 4
- Route 5
- Route 6
- Index Page

1:15,000

0 750 1,500

Feet

Page 0

Attachment 2 Index
Wetland Probability Map Set
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

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Existing Dominion Energy Electric Transmission Line
Route 4 MP
Route 5 MP
Route 6 MP
Route 4
Route 5
Route 6
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
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Caroline County, Virginia

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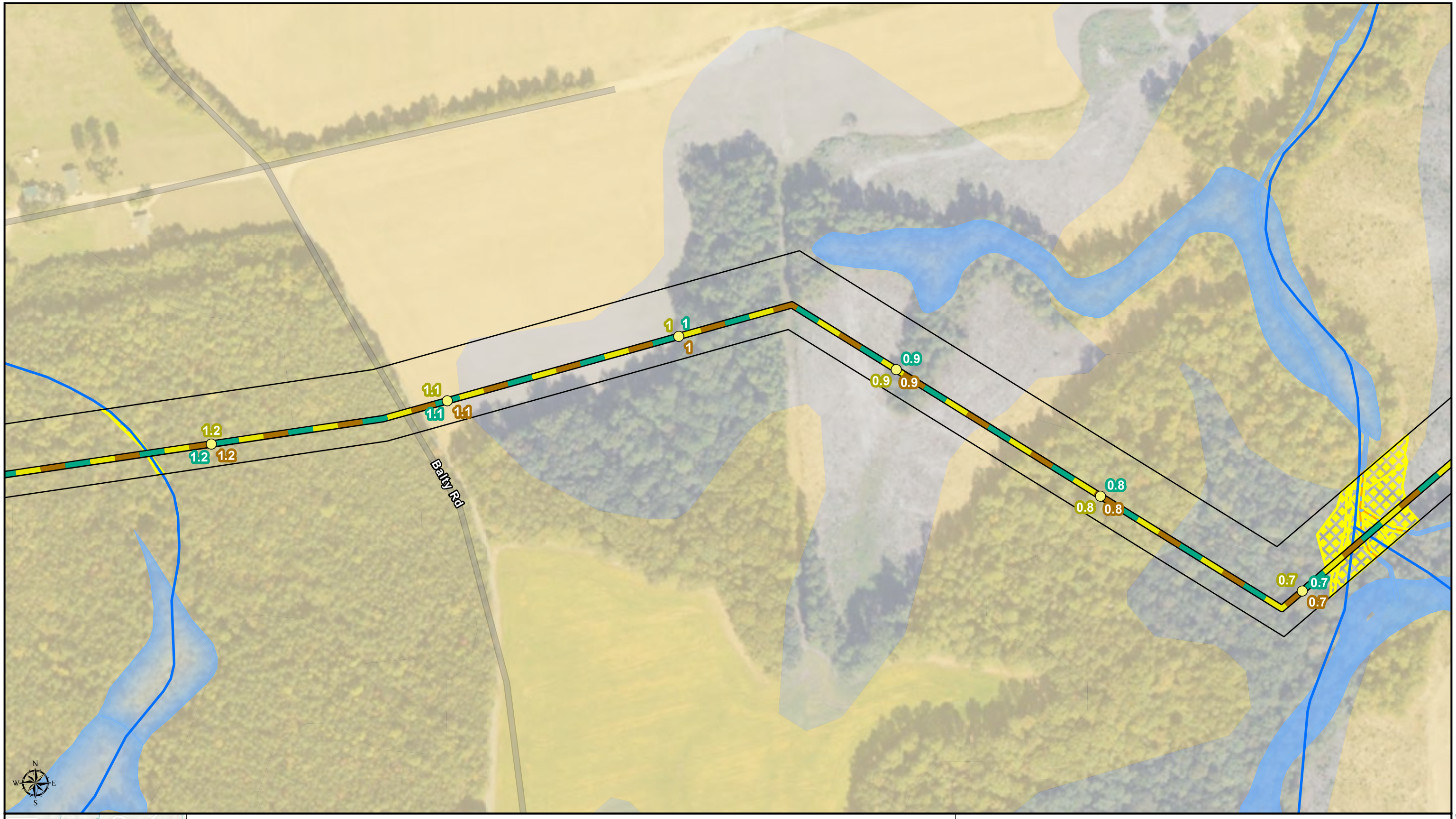

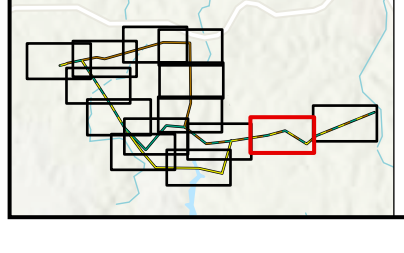

Route 4 MP
Route 5 MP
Route 6 MP
Route 4
Route 5
Route 6

Wetland Probability
Medium/High
Medium
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

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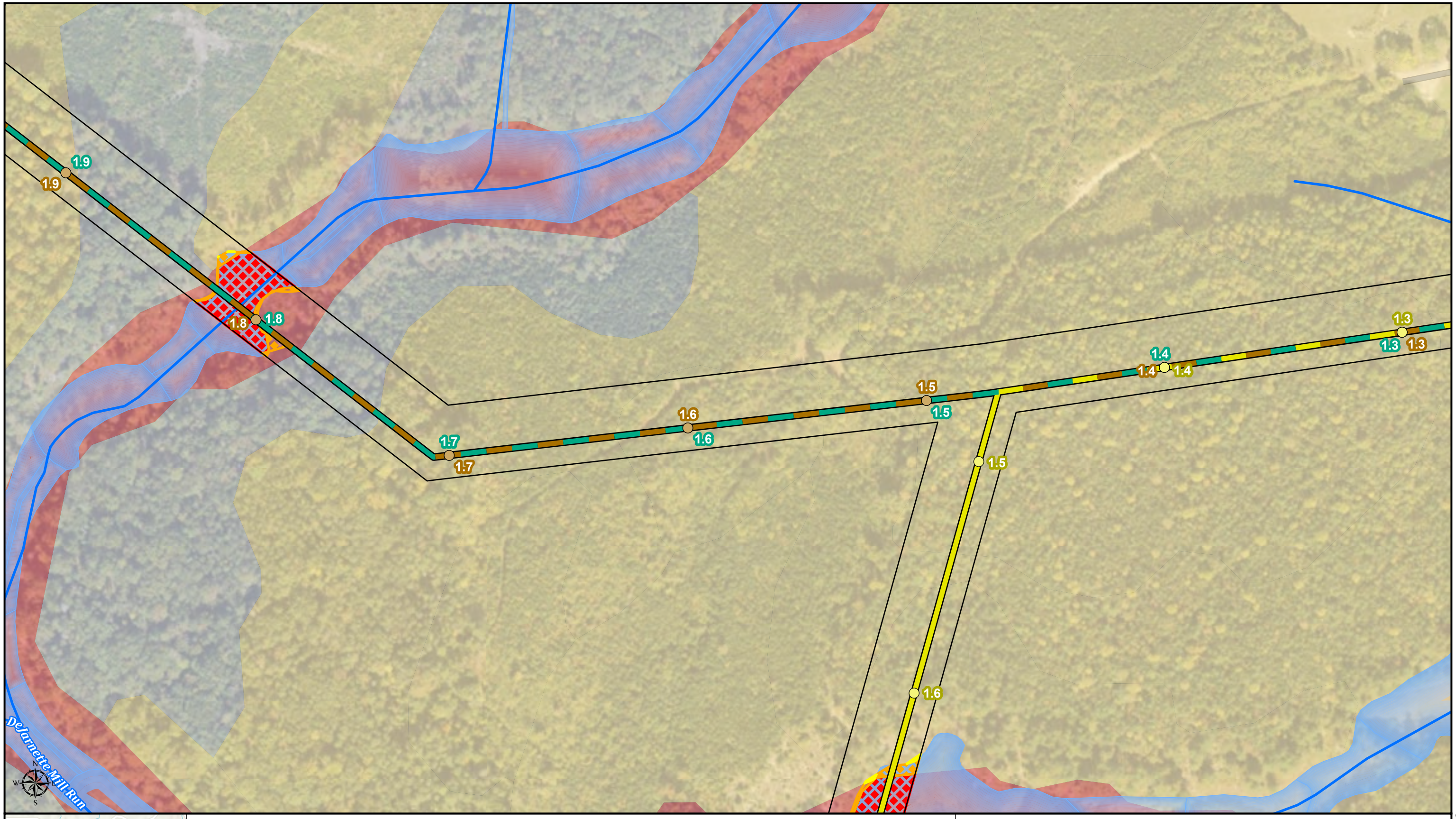

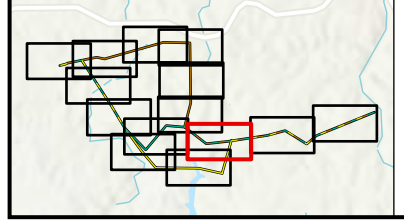

Route 4 MP
Route 5 MP
Route 6 MP
Route 4
Route 5
Route 6

Wetland Probability
High
Medium/High
Medium
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

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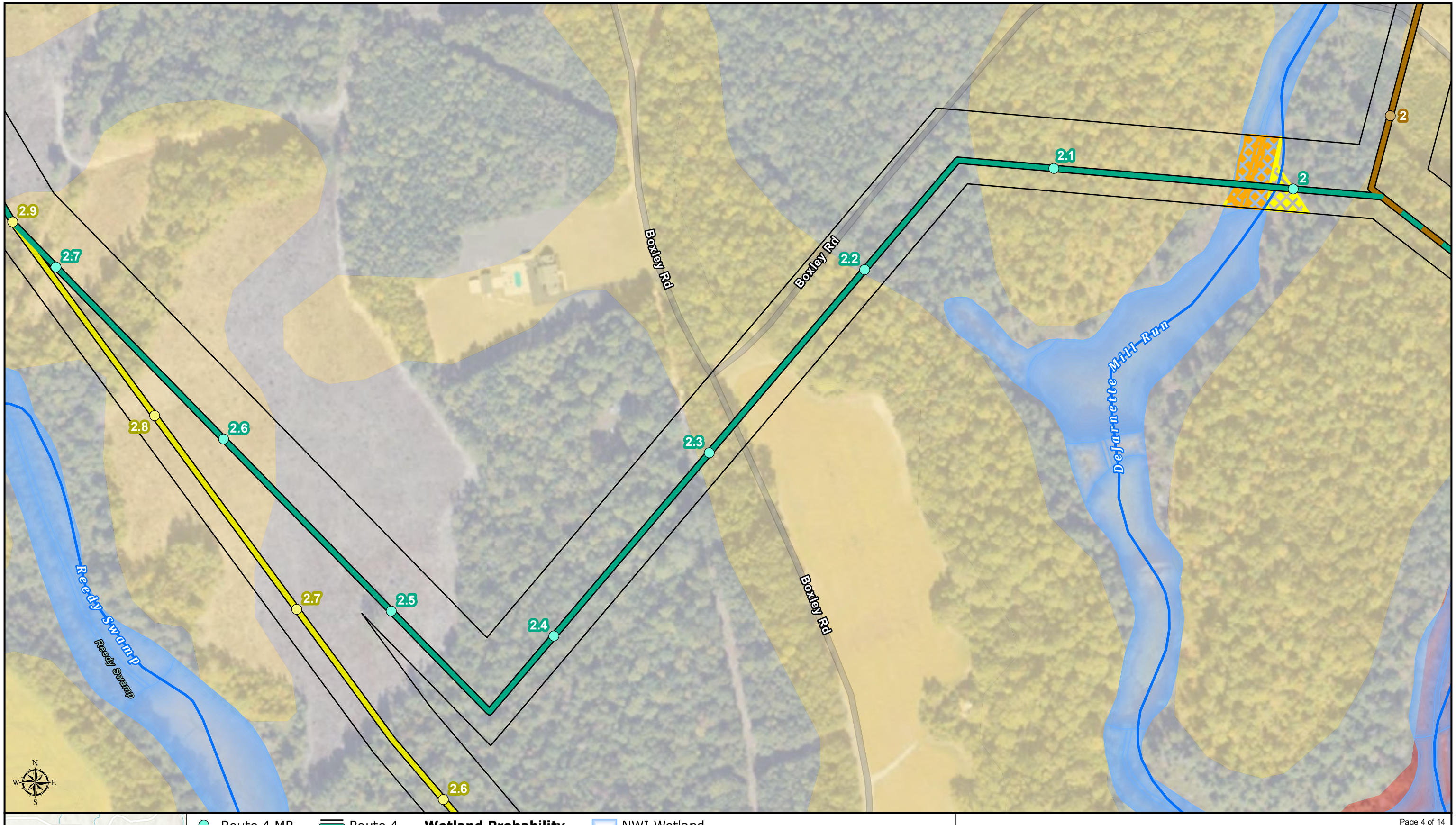

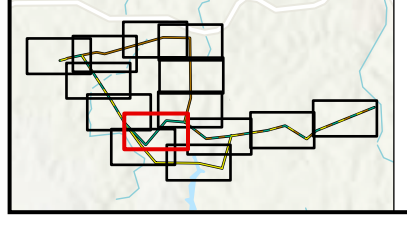

Route 4 MP
Route 5 MP
Route 6 MP
Route 4
Route 5
Route 6
NHD Stream

Wetland Probability
Medium/High
Medium

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

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Attachment 2
Wetland Probability Map Set - Probability
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

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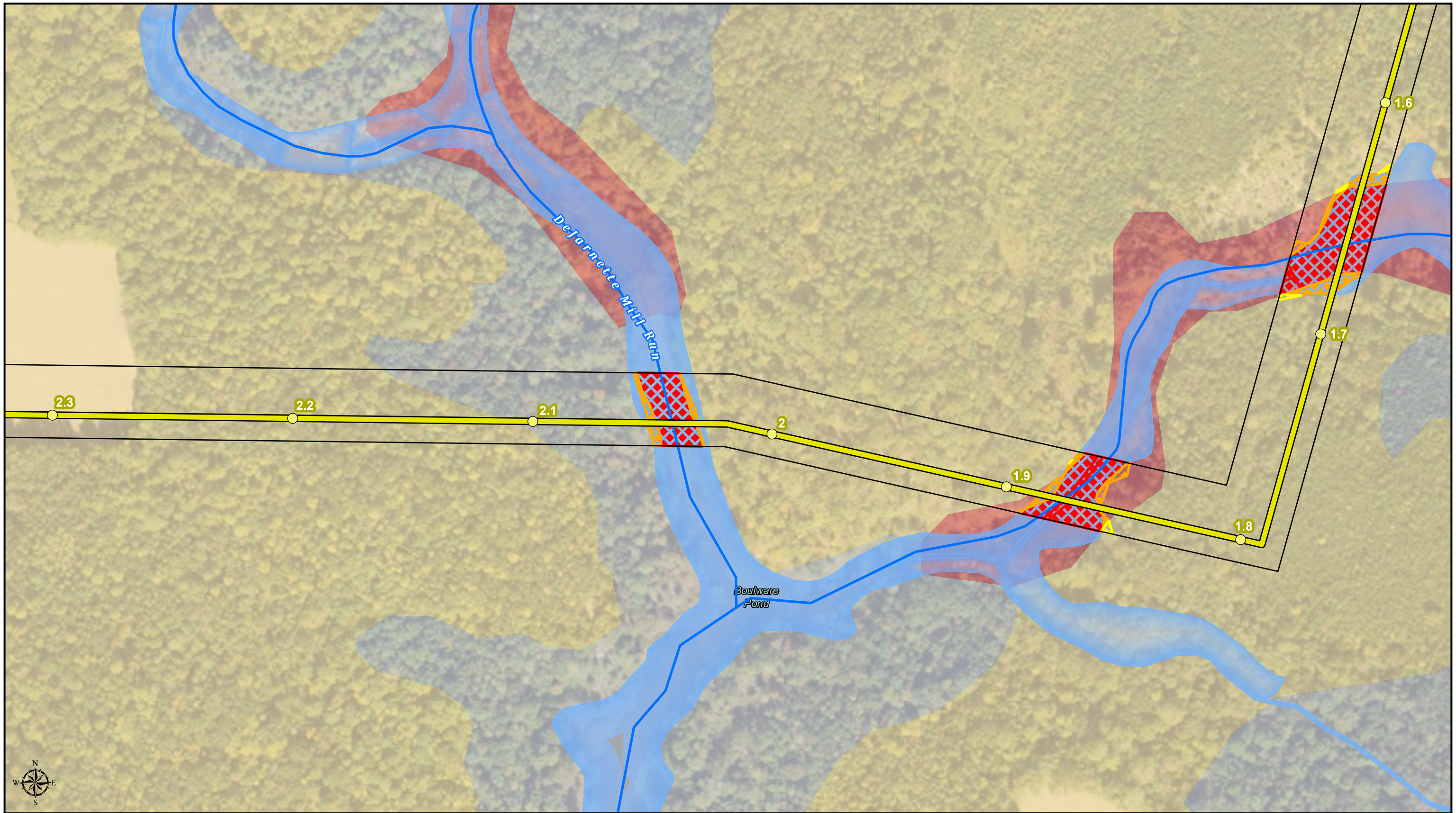

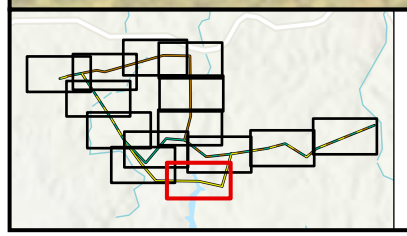

Route 6 MP

Route 6

Wetland Probability

- High
- Medium/High
- Medium
- NHD Stream

- NWI Wetland
- Nonhydric
- Predominantly nonhydric
- Predominantly hydric

1:2,400

0 100 200

Feet

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Ruther Glen 230 kV Electric Transmission Project
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Caroline County, Virginia

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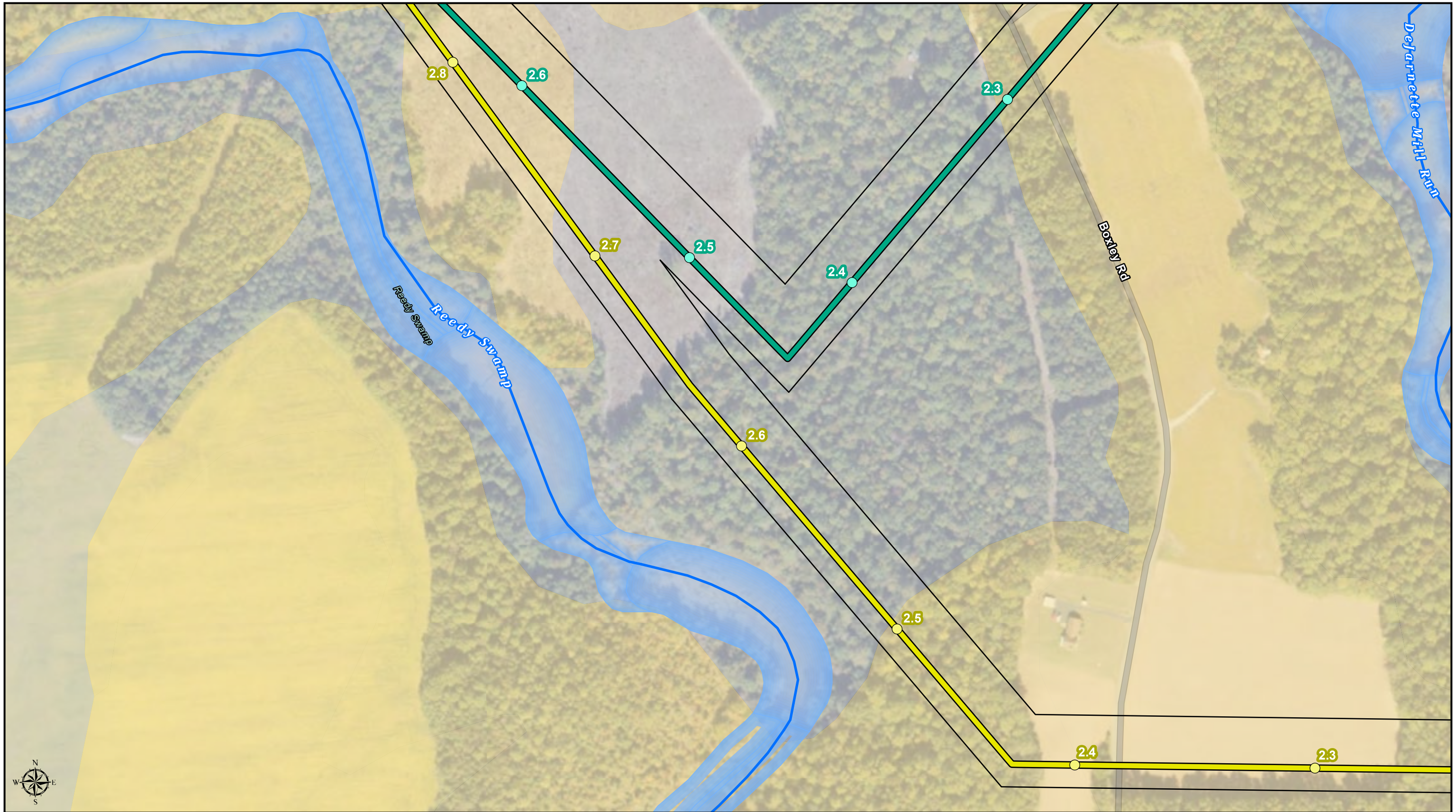

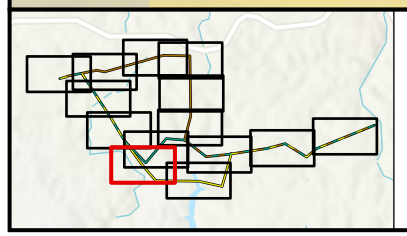

Route 4 MP
Route 6 MP
Route 4
Route 6
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric

1:2,400

0 100 200
Feet

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Caroline County, Virginia

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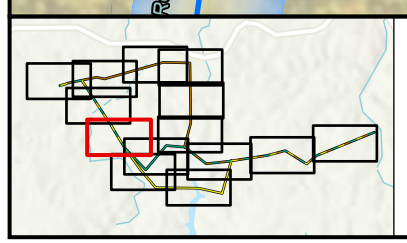

Route 4 MP
Route 6 MP
Route 4
Route 6
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

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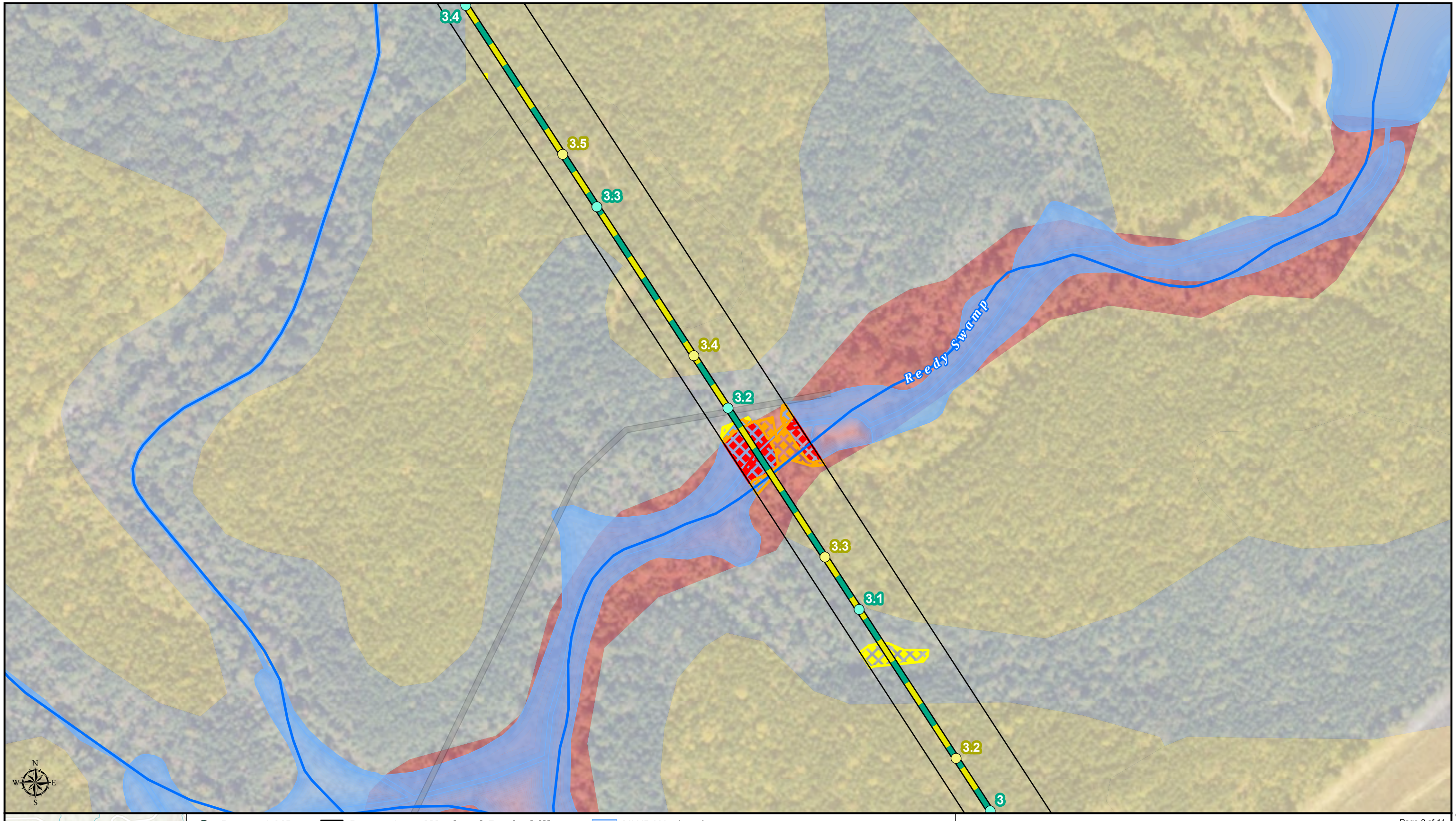

Route 4 MP
Route 6 MP
Route 4
Route 6

Wetland Probability
High
Medium/High
Medium
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

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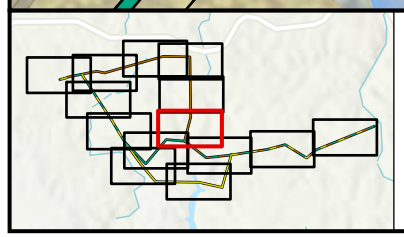

Route 4 MP
Route 5 MP
Route 4
Route 5

Wetland Probability
Medium/High
Medium
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

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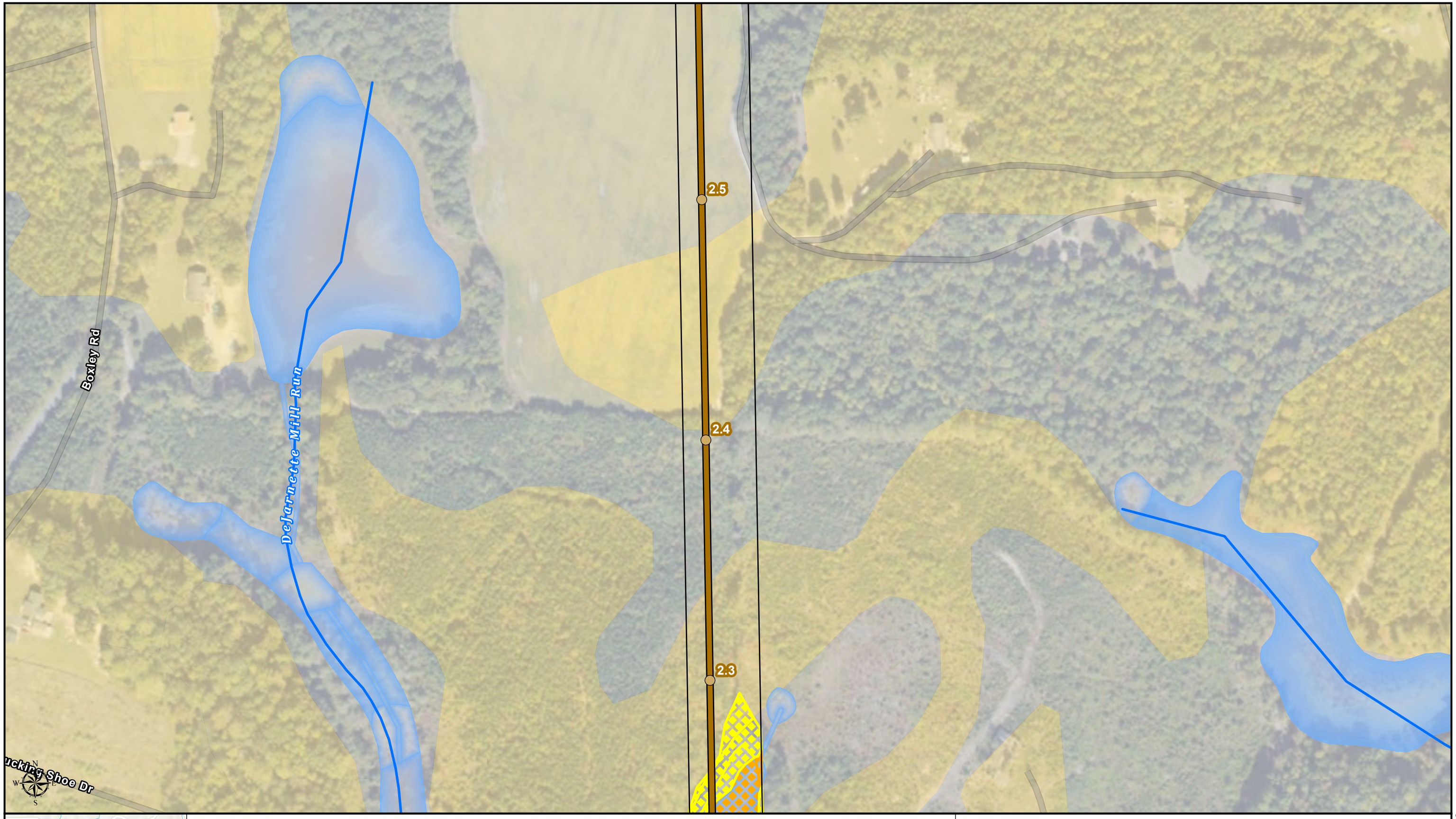

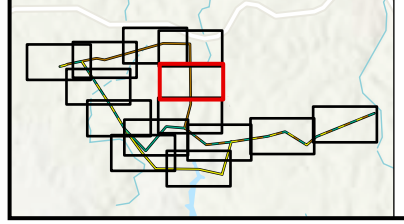

Route 5 MP
Route 5

Wetland Probability
Medium/High
Medium
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric

1:2,400
0 100 200
Feet

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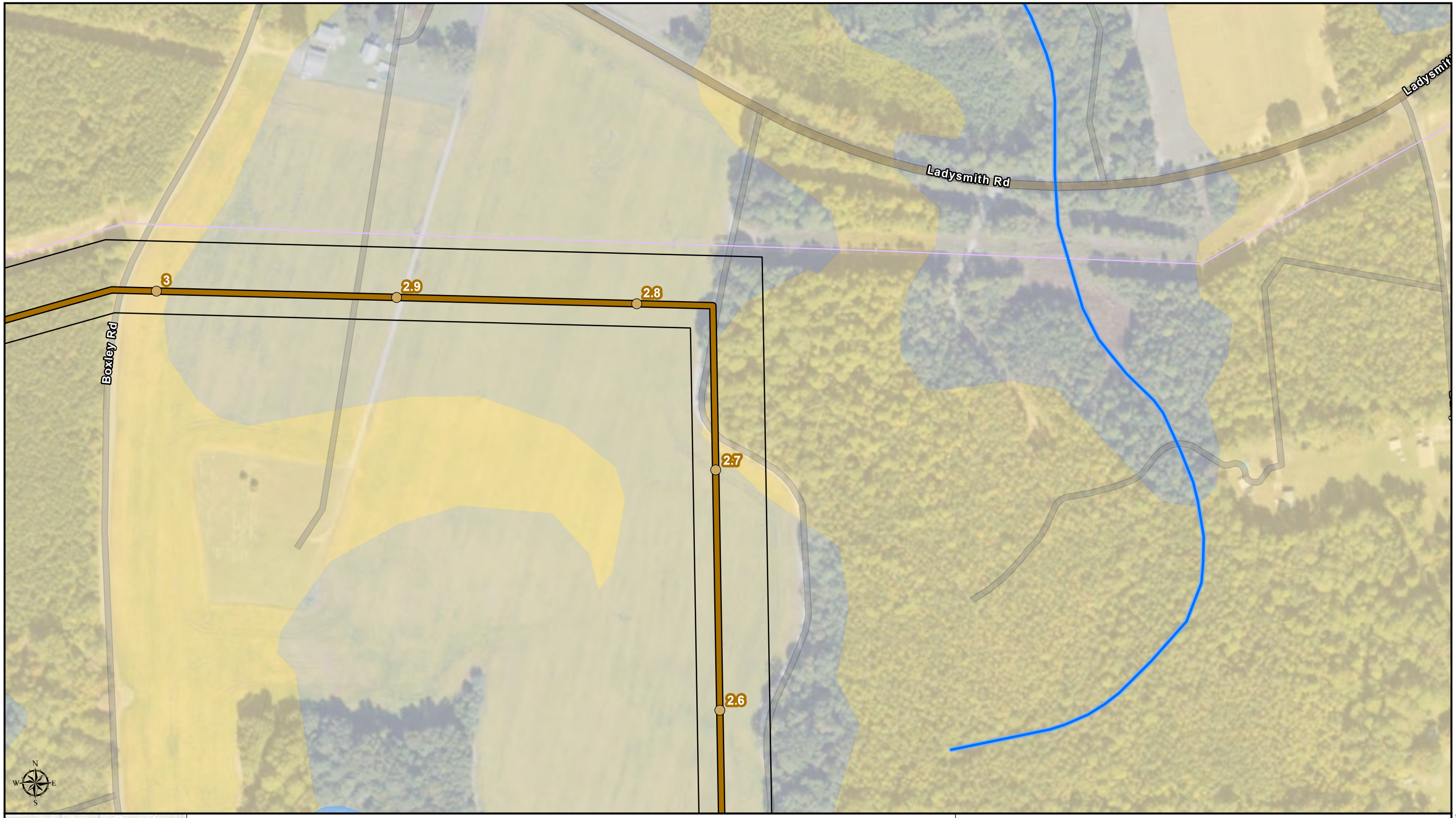

Existing REC Line
Route 5 MP
Route 5
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric

1:2,400
0 100 200
Feet

Attachment 2
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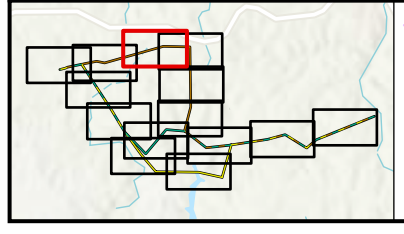

Existing REC Line
Route 5 MP
Route 5

Wetland Probability
Medium
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric

1:2,400
0 100 200
Feet

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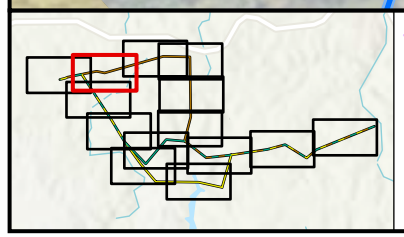

Existing REC Line
Route 4 MP
Route 5 MP
Route 6 MP

Route 4
Route 5
Route 6

Wetland Probability
Medium/High
Medium
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

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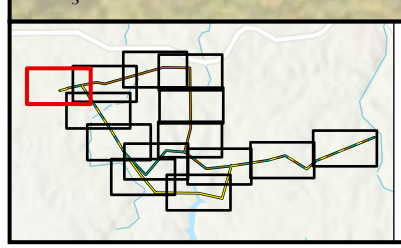
RUTHER GLEN SWITCHING STATION

4 3.8 3.6 3.9 3.7 3.5 3.8 3.6 3.4

N W E S



Proposed Switching Station
Existing REC Line
Route 4 MP
Route 5 MP
Route 6 MP

Route 4
Route 5
Route 6

Wetland Probability
Medium/High
Medium
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
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Caroline County, Virginia

ERM

Dominion Energy

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
12 December 2024

SUBJECT
CARMEL CHURCH 230 KV LINE EXTENSION PROJECT

REFERENCE
0715013

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 new proposed Carmel Church 230 kilovolt (kV) Line Extension Project (Project) in Caroline County, Virginia. This delineation was done using desktop resources and methodology. A field delineation is required to verify the accuracy and extent of aquatic resource boundaries. 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 construct and operate the following:

- A new, double circuit, overhead 230 kV transmission line (Carmel Church Loop) in new rights-of-way that will cut the existing Dominion Line #256 and connect to the proposed Carmel Church Switching Station; and
- A new 230 kV delivery point switching station (Carmel Church Switching Station) in Caroline County, which will provide interconnection to Rappahannock Electric Cooperative (REC) to serve existing and planned development in the area.

The Project is necessary to provide electrical service requested by REC to support data center development in Caroline County, maintain reliable service for overall load growth in the area, and comply with mandatory North American Electric Reliability Corporation (NERC) 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 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:

- The Lake Caroline community and the intersection of Dominion's existing Line #256 at Rogers Clark Boulevard to the north;
- Verdon Road at U.S. Route (US) 1 (also signed as Jefferson Davis Highway) and the industrial development along US 1 to the south;
- Dominion's existing Line #256 transmission corridor to the east; and
- Dominion's existing Line #574 transmission corridor to the west.

The study area identified for the Project encompasses approximately 36,200 acres (56.6 square miles) within southwestern Caroline County and in northwestern Hanover County (approximately 43.0 square miles in Caroline County and 13.6 square miles in Hanover County). The Project origin is the Company's existing Ladysmith CT – St. Johns Line (Line #256), terminating at the proposed Carmel Church Switching Station located adjacent to the west side of Interstate 95 (I-95). There are no incorporated cities within the study area. The study area is shown in Attachment 1.

Within the study area, ERM initially identified four potential cut-in locations along the Company's existing Line #256 on the eastern edge of the study area and two potential cut in locations along the Company's existing Line #574 on the western edge of the study area. ERM identified four potential route options to connect to Line #256 and two route options to connect to Line #574. Of these, two potential cut-in locations (both on existing Line #256) and their associated routes (Routes 1 and 2) were retained for further analysis, while the others were eliminated. Descriptions of the routes are provided in the subsections below and shown on Attachment 1.

ROUTE ALTERNATIVES

ROUTE 1

Route 1 extends from a tap along the Company's existing Line #256 to the proposed Carmel Church Switching Station at the northern end of the Washington DC South development. The tap is approximately 100 feet south of Line #256 crossing of Old CC Road. From there, Route 1 extends west-northwest across primarily forested land for approximately 0.7 mile, then turns west-southwest, continuing through primarily forested land. The easternmost 1.0 mile of Route 1 is within Caroline County's Planned Innovation, Research, and Technology (PIRT) District. Approximately 1.2 miles west of the tap point, Route 1 crosses portions of Reedy Creek, a Columbia Natural Gas easement, and the CSX Railroad line. Following those crossings, the route continues west-southwest for approximately 1.1 miles, passing behind existing industrial development and crossing Ruther Glen Road. The remaining 0.5 mile of the route extends west across forested property held by AVAOI Digital, across I-95, and into the proposed Carmel Church Switching Station.

Route 1 measures approximately 2.5 miles. The right-of-way for this alternative (29.8 acres) and the proposed Carmel Church Switching Station site (10.0 acres) would encompass a combined 39.8 acres.

ROUTE 2

Route 2 extends from a tap along the Company's existing Line #256 to the proposed Carmel Church Switch Station at the northern end of the Washington DC South development. The tapis approximately 0.5 mile north of the existing line's crossing of Ruther Glen Road. From there, Route 2 travels west-northwest through forested land for approximately 0.5 mile parallel to and south of Granny's Way, then approximately 0.2 mile west-southwest along the edge of an agricultural field (also to the south of Granny's Way) before crossing Ruther Glen Road. Route 2 continues west for about 0.5 mile through forested between residential parcels land before turning northwest for approximately 0.4 mile through forested property held by AVAOI Digital. Route 2 crosses I-95 and then continues north paralleling the western edge of I-95 for approximately 1.0 mile. Route 2 crosses a Columbia Natural Gas easement and the CSX Railroad line approximately 0.5 mile before connecting into the Carmel Church Switch Station.

Route 2 measures approximately 2.8 miles. The right-of-way for this alternative (33.1 acres) and the proposed Carmel Church Switching Station site (10.0 acres) would encompass a combined 43.1 acres.

ERM

DATE
12 December 2024

REFERENCE
0715013

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 2024)
- 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 2024). 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 AND WATERBODY 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).

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.

As stated above, field delineations were not performed and would be required to verify the accuracy and extent of aquatic resource boundaries. However, a field delineation was completed by WSP USA Inc. in July 2024 on the parcel containing the proposed Carmel Church Substation, which identified aquatic resources along Route 2 between MPs 2.3 and 2.6 (WSP 2024). The boundaries of these field delineated aquatic resources were used in the desktop wetland delineation and are included in the wetland and waterbody numbers provided in this report.

Attachment 2 depicts the interpreted wetland and waterbody probability and type 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 Carmel Church Substation footprint.

TABLE 2: SUMMARY OF THE PROBABILITIES OF WETLAND AND WATERBODY OCCURRENCE ALONG THE ROUTE ALTERNATIVES [a]

Probability	Total Within Right-of-way (acres)[b]	Wetland and Waterbody type (acres)				
		PEM (Emergent)	PFO (Forested)	PSS (Scrub Shrub)	PUB (Freshwater pond)	Riverine (Stream)
Route 1						
High	0.8	NA	NA	NA	0.8	NA

Probability	Total Within Right-of-way (acres)[b]	Wetland and Waterbody type (acres)				
		PEM (Emergent)	PFO (Forested)	PSS (Scrub Shrub)	PUB (Freshwater pond)	Riverine (Stream)
Medium/High	0.6	0.0	0.0	NA	0.5	0.0
Medium	1.4	0.4	0.9	NA	0.1	0.0
Medium/Low	0.1	0.0	0.1	NA	0.0	0.0
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA
Route 2						
High	0.2	NA	0.2	NA	NA	0.0
Medium/High	0.8	NA	0.7	NA	NA	0.1
Medium	0.7	NA	0.7	NA	NA	0.0
Medium/Low	0.0	NA	0.0	NA	NA	0.0
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 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 Reedy Creek and its tributaries in the northeastern part of the study area and North Anna

River and its tributaries in the southwestern part of the study area. Riverine (stream) and PUB (open water features) are described in the Waterbody Crossings section below.

ROUTE 1

The length of the corridor for Carmel Church Route 1 is approximately 2.5 miles and encompasses a total of approximately 29.8 acres (not including the 10.0-acre Carmel Church Switching Station footprint). Based on the methodology discussed above, the right-of-way footprint will encompass approximately 9.3 percent (2.8 acres) of land with a medium or higher probability of containing wetlands and waterbodies. Of the 2.8 acres of wetlands and waterbodies, 0.9 acres consist of PFO wetlands, 0.4 acre consists of PEM wetlands, 1.3 acres consist of PUB open water features, and 0.1 acre consists of riverine features.

ROUTE 2

The length of the corridor for Carmel Church Route 2 is approximately 2.8 miles and encompasses a total of approximately 33.1 acres (not including the 10.0-acre Carmel Church Switching Station footprint). Based on the methodology discussed above, the right-of-way footprint will encompass approximately 5.0 percent (1.7 acres) of land with a medium or higher probability of containing wetlands and waterbodies. Of the 1.7 acres of wetlands and waterbodies, 1.6 acres consist of PFO wetlands and 0.1 acre of riverine features.

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 Carmel Church Routes include Reedy Creek and unnamed, intermittent tributaries to Reedy Creek and the North Anna River as well as open water features. No waterbodies were identified within the Carmel Church Substation footprint.

TABLE 3: WATERBODIES CROSSED BY THE ROUTE ALTERNATIVES

Waterbodies Crossed	Unit	Route 1	Route 2
Perennial Streams/Rivers	Number	0	0
Intermittent Streams/Rivers	Number	5	4
Perennial Lakes/Ponds	Number	1	0
Total	Number	6	4

Source: USGS NHD (NHD 2023)

ROUTE 1

Route 1 would have a total of six NHD-mapped waterbody crossings, including a perennial lake/pond associated with Reedy Creek and five unnamed, intermittent streams. As described above, based on ERM's desktop wetland and waterbody analysis, the right-of-way for Route 1 would encompass approximately 1.2 acres of PUB open water features and 0.1 acre of riverine features.

ROUTE 2

Route 2 would have a total of four NHD-mapped waterbody crossings, all 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 0.1 acre of riverine features.

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/projects-and-facilities/electric-projects/power-line-projects/carmel-church-ruther-glen.

If you have any questions regarding this wetland assessment, please contact me at 512-374-2258 or by email at gray.ford@erm.com.

Sincerely,

Gray Ford
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

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

CARMEL CHURCH SWITCHING STATION

Cedar Fork
Coffey Corner
Houstons Corner
Holliday
Hewlett
Noel
North Anna
Coatesville
Verdon
McDuff
Moncure Corner
Colemans Mill Crossing
Swans Corner
Patersons Corner
Ruther Glen
Chandler Crossing
Caroline Pines
Bagdad
Signboard
Burruss Corner
McBryant Corner
Kemp Corner
Peatross
Penola
Mattaponi Springs Golf Club
Phillips Pond
Doggetts Fork
Lorne
Jericho Rd
Verdon Rd
Oxford Rd
Long Creek
North Anna River
Polecat Creek
Saddle Swamp
Reedy Creek
Burruss Ln
Dry Bridge Rd
McBryant Rd
Signboard Rd
Gregory Rd
N Telegraph Rd
Jefferson Davis Hwy
Old C C Rd
Zion Rd
Cedar Fork Rd
Terrell Dr
Penola Rd
Oates Ln
Landora Bridge Rd
Carters Gate Rd
Hartley Rd
Hewlett Rd
Katy Ln
Annfield Rd
Coatesville Rd
White Pine Rd
Little Rvr
Mount Hope Church Rd
Phillfield Rd
CAROLINE COUNTY
HANOVER COUNTY
95
207
301
256 ft
241 ft
310 ft
290 ft
233 ft

Project Loaction
OH
WV
KY
Virginia
TN

△ Proposed Switching Station
Existing Dominion Energy Electric Transmission Line
Route 1
Route 2
Study Area

1:58,000
0 2,500 5,000
Feet

Attachment 1
Overview Map
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM
Dominion Energy

222 South 9th Street
Suite 2900
Minneapolis, Minnesota 55402

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F +0 804 253 1091

erm.com

ATTACHMENT 2

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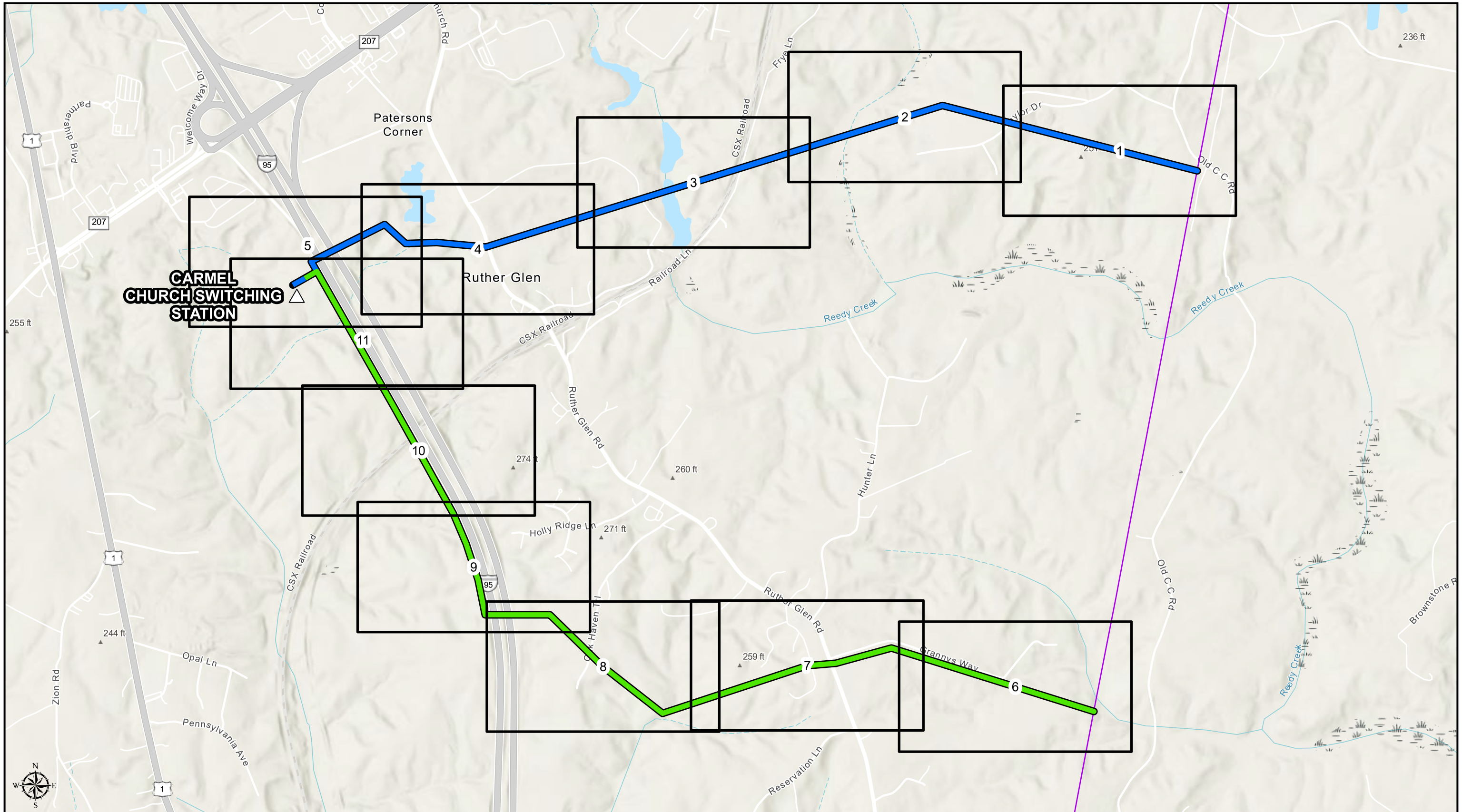
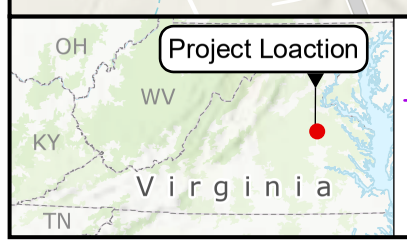




△ Proposed Switching Station

Existing Dominion Energy Electric Transmission Line

Route 1

Route 2

Index Page

1:15,000

0 750 1,500

Feet

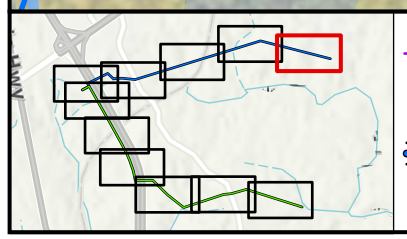
Page 0

Attachment 2 Index
Wetland Probability Map Set
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline 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



Existing Dominion Energy Electric Transmission Line
Route 1 MP
Route 1

Wetland Probability
Medium/High
Medium
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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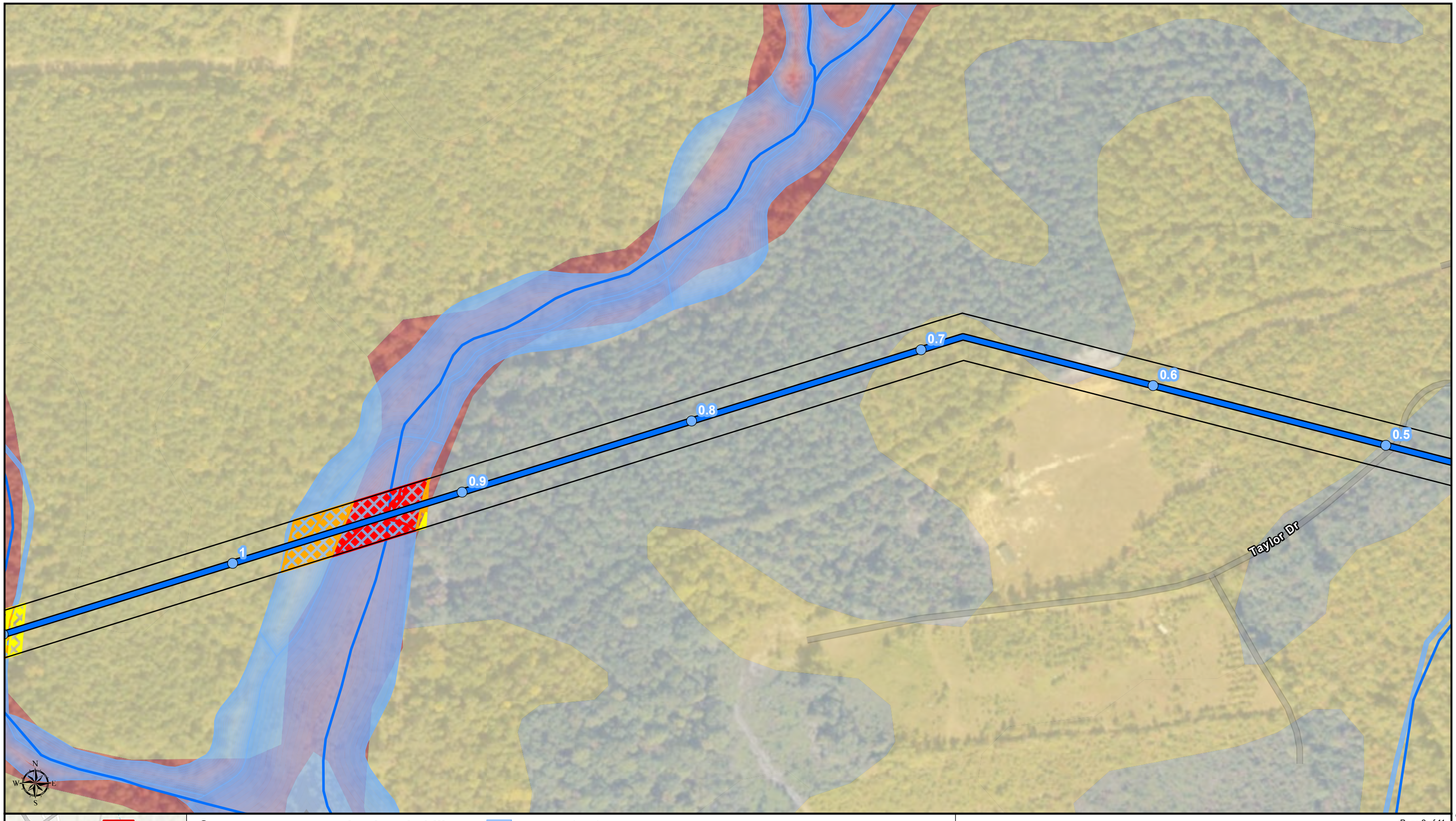

Route 1 MP
Route 1

Wetland Probability
High
Medium/High
Medium
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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Route 1 MP
Route 1

Wetland Probability
High
Medium/High
Medium
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

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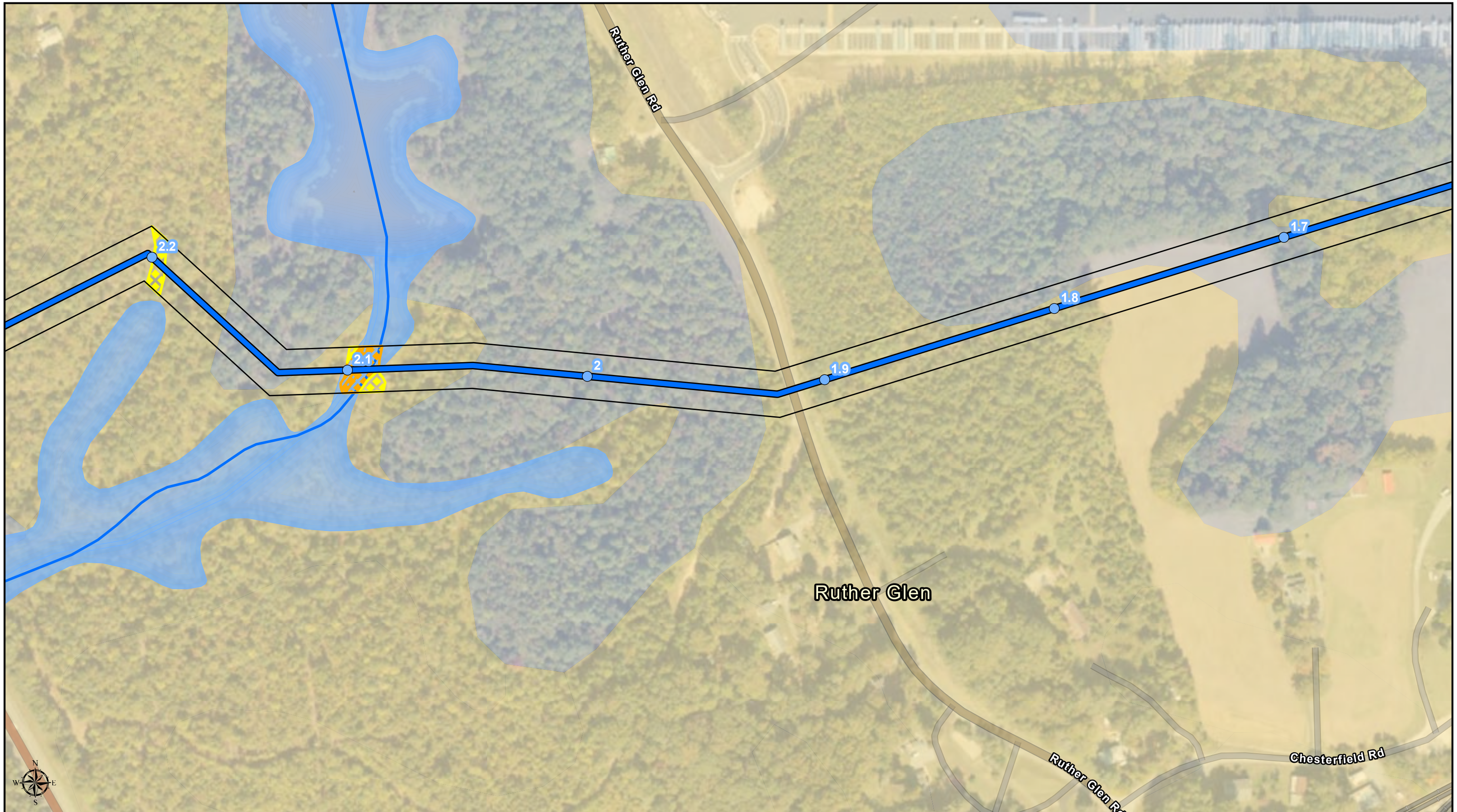

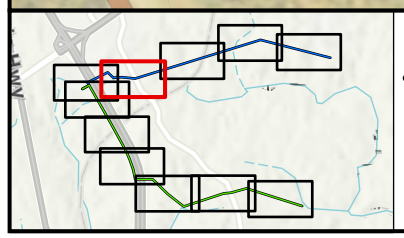

Route 1 MP
Route 1

Wetland Probability
Medium/High
Medium
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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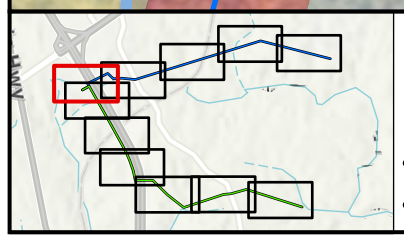

- Proposed Switching Station
- Route 1 MP
- Route 2 MP
- Route 1
- Route 2

Wetland Probability

- Medium/High
- Medium
- NHD Stream
- NWI Wetland
- Nonhydric
- Predominantly nonhydric
- Predominantly hydric

1:2,400

0 100 200

Feet

Attachment 2
Wetland Probability Map Set - Probability
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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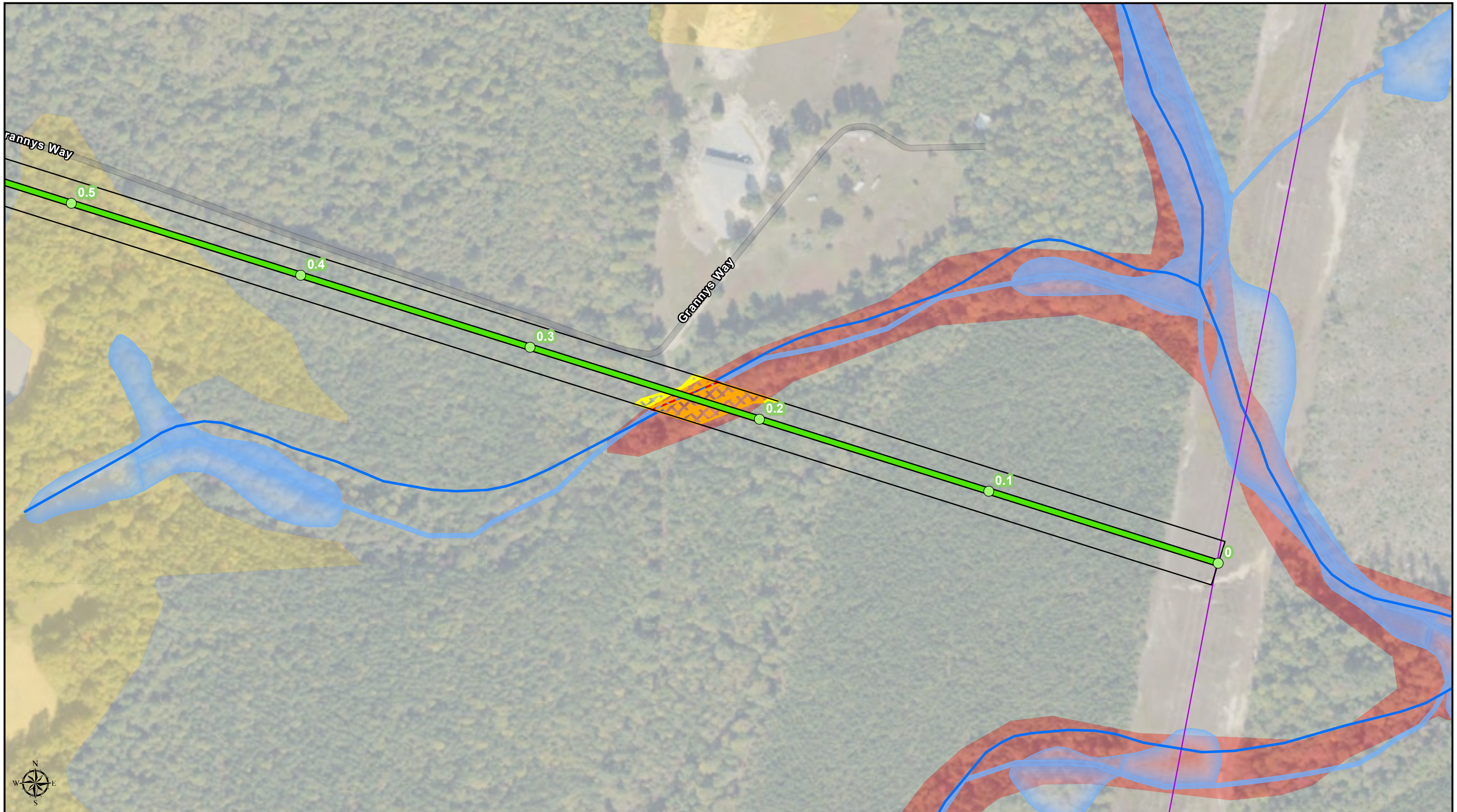

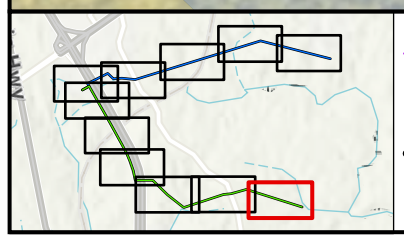

Existing Dominion Energy Electric Transmission Line
Route 2 MP
Route 2

Wetland Probability
High
Medium/High
Medium
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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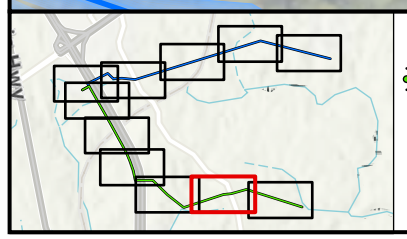

Route 2 MP
Route 2
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric

1:2,400

0 100 200

Feet

Attachment 2
Wetland Probability Map Set - Probability
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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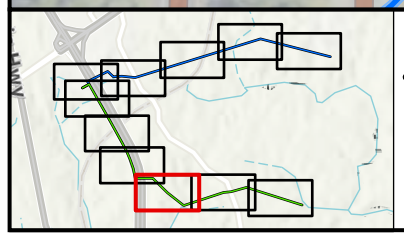

Route 2 MP
Route 2

Wetland Probability
High
Medium/High
Medium
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

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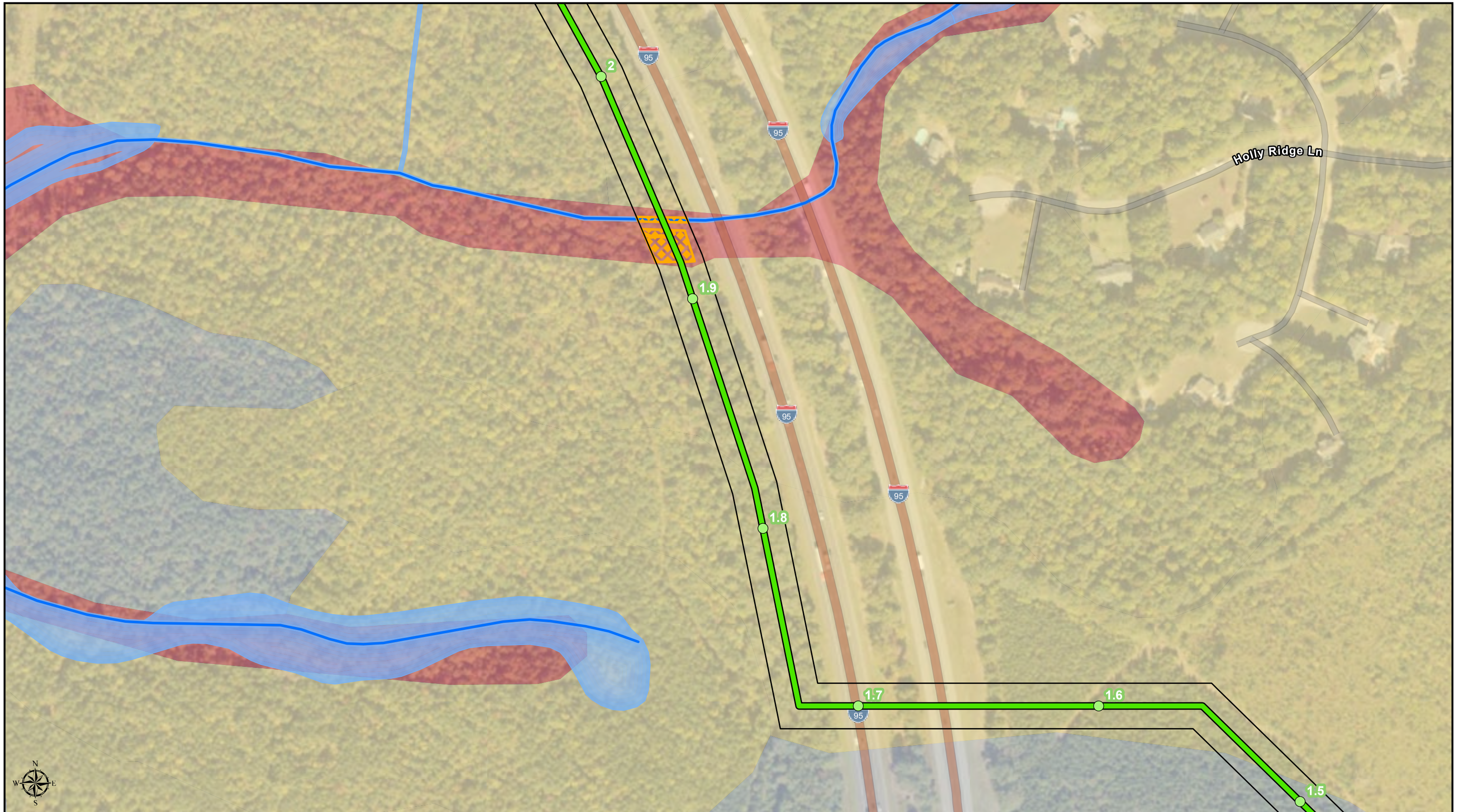

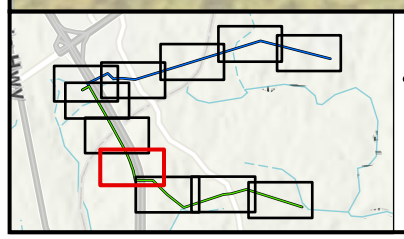

Route 2 MP
Route 2

Wetland Probability
Medium/High
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

ERM

Attachment 2
Wetland Probability Map Set - Probability
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

Dominion Energy

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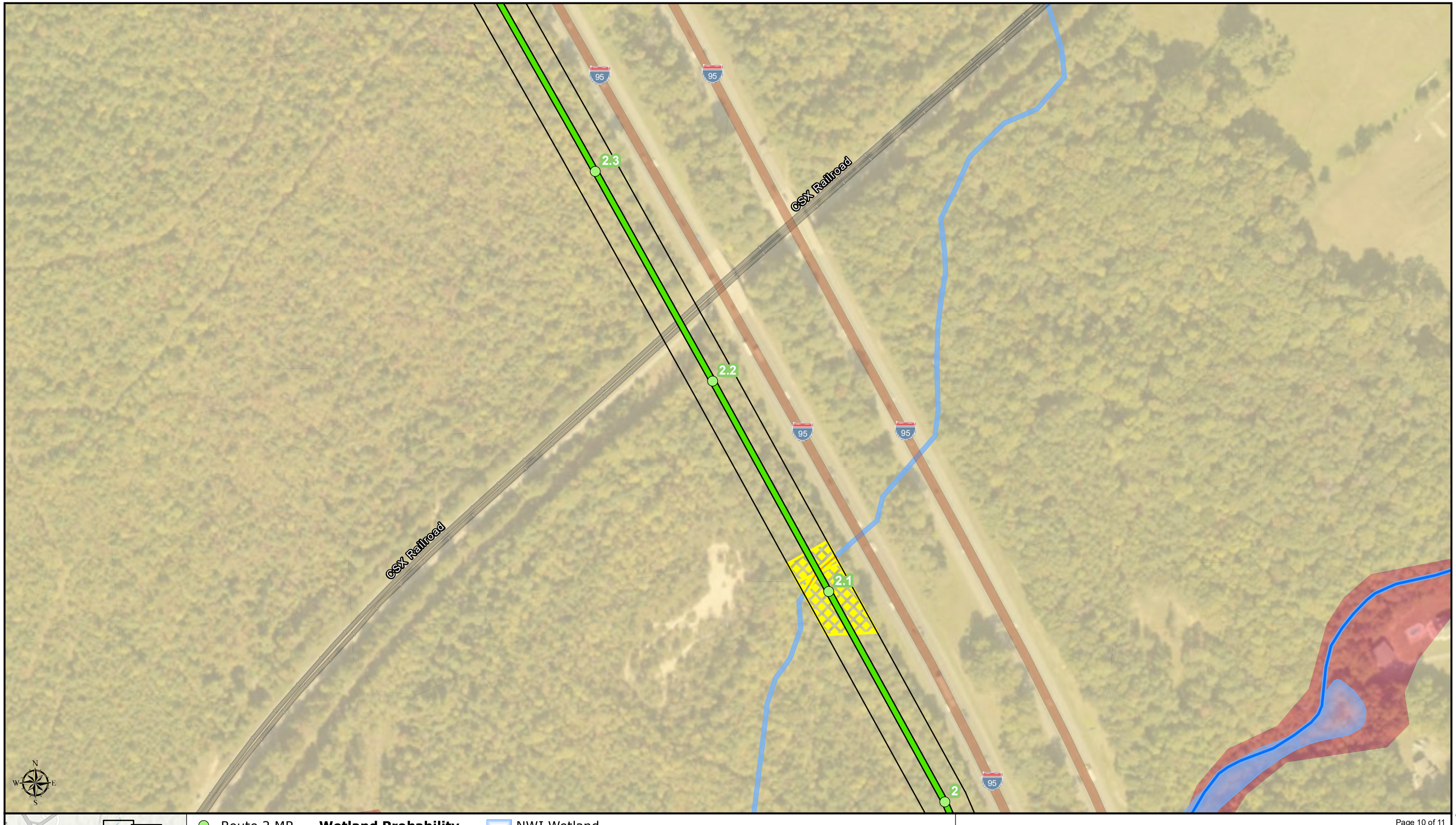

Route 2 MP
Route 2

Wetland Probability
Medium/High
Medium
NHD Stream

NWI Wetland
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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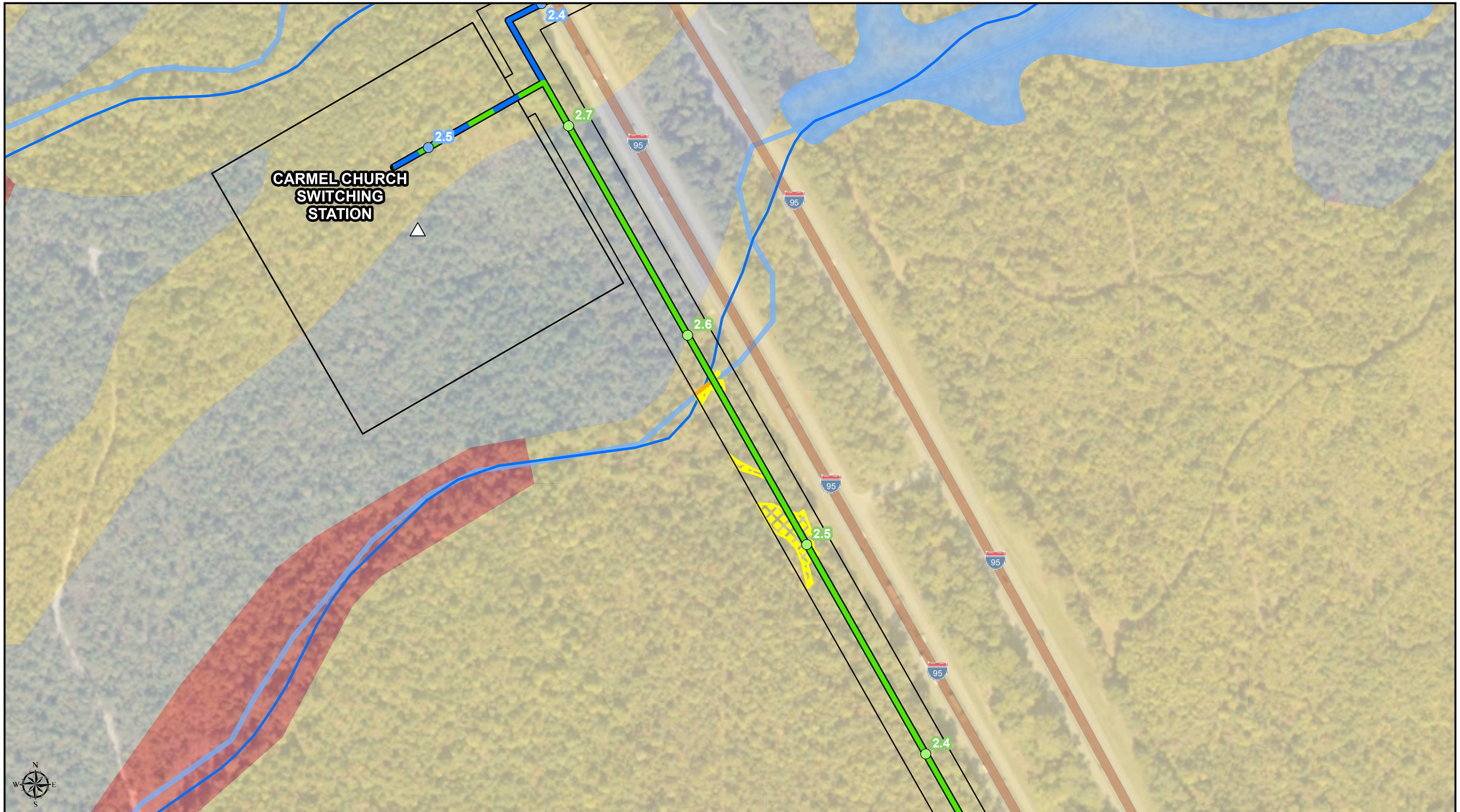

Proposed Switching Station
Route 1 MP
Route 2 MP
Route 1
Route 2

Wetland Probability
Medium/High
Medium
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Probability
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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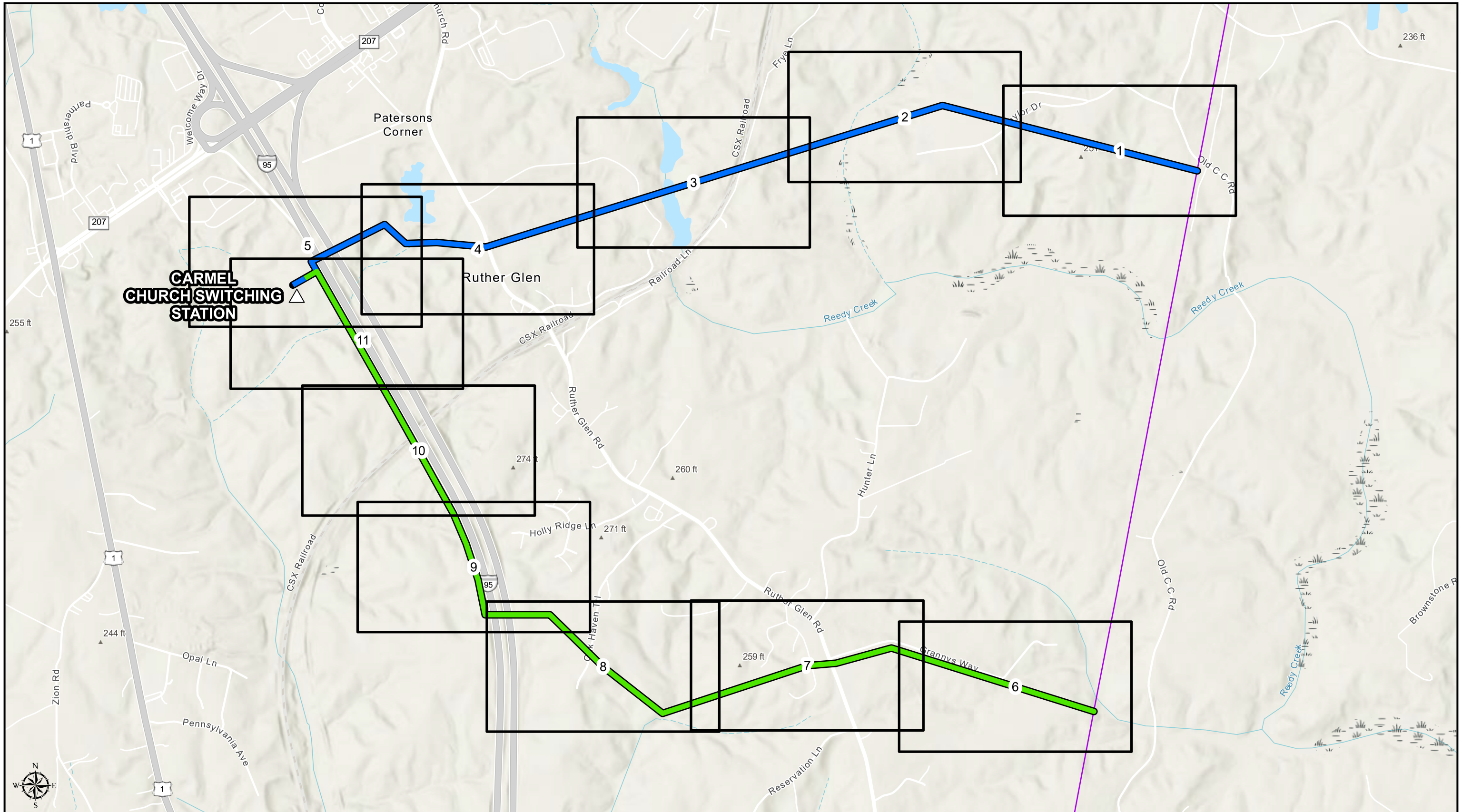

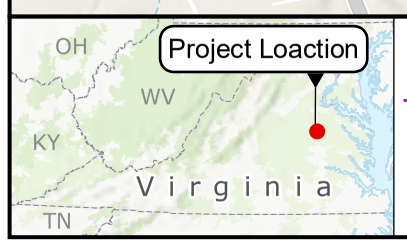

△ Proposed Switching Station

Existing Dominion Energy Electric Transmission Line

Route 1

Route 2

Index Page

1:15,000

0 750 1,500

Feet

Attachment 2 Index
Wetland Probability Map Set
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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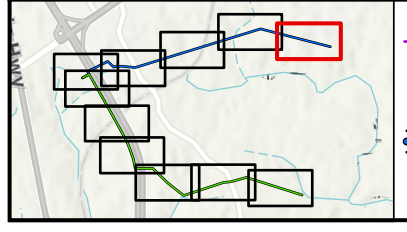

Existing Dominion Energy Electric Transmission Line
Route 1 MP
Route 1

Wetland Cover Type
PFO
Riverine
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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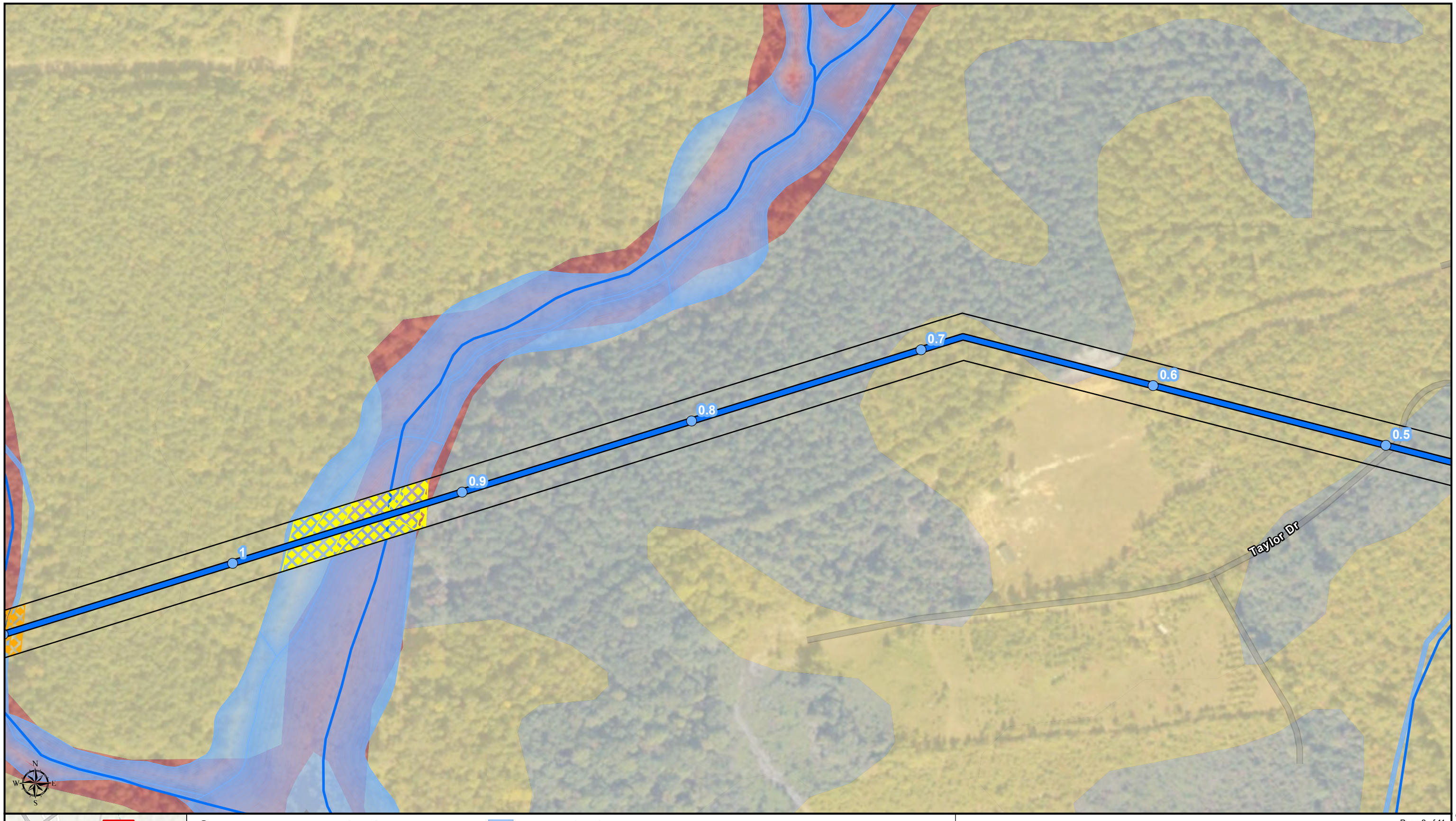

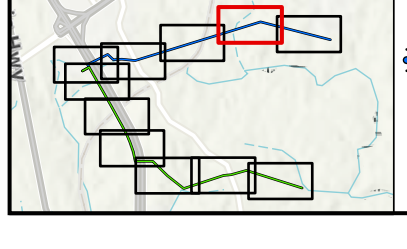

Route 1 MP
Route 1

Wetland Cover Type
PEM
PUB
Riverine
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline 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 1 MP
Route 1

Wetland Cover Type
PEM
PFO
PUB
Riverine
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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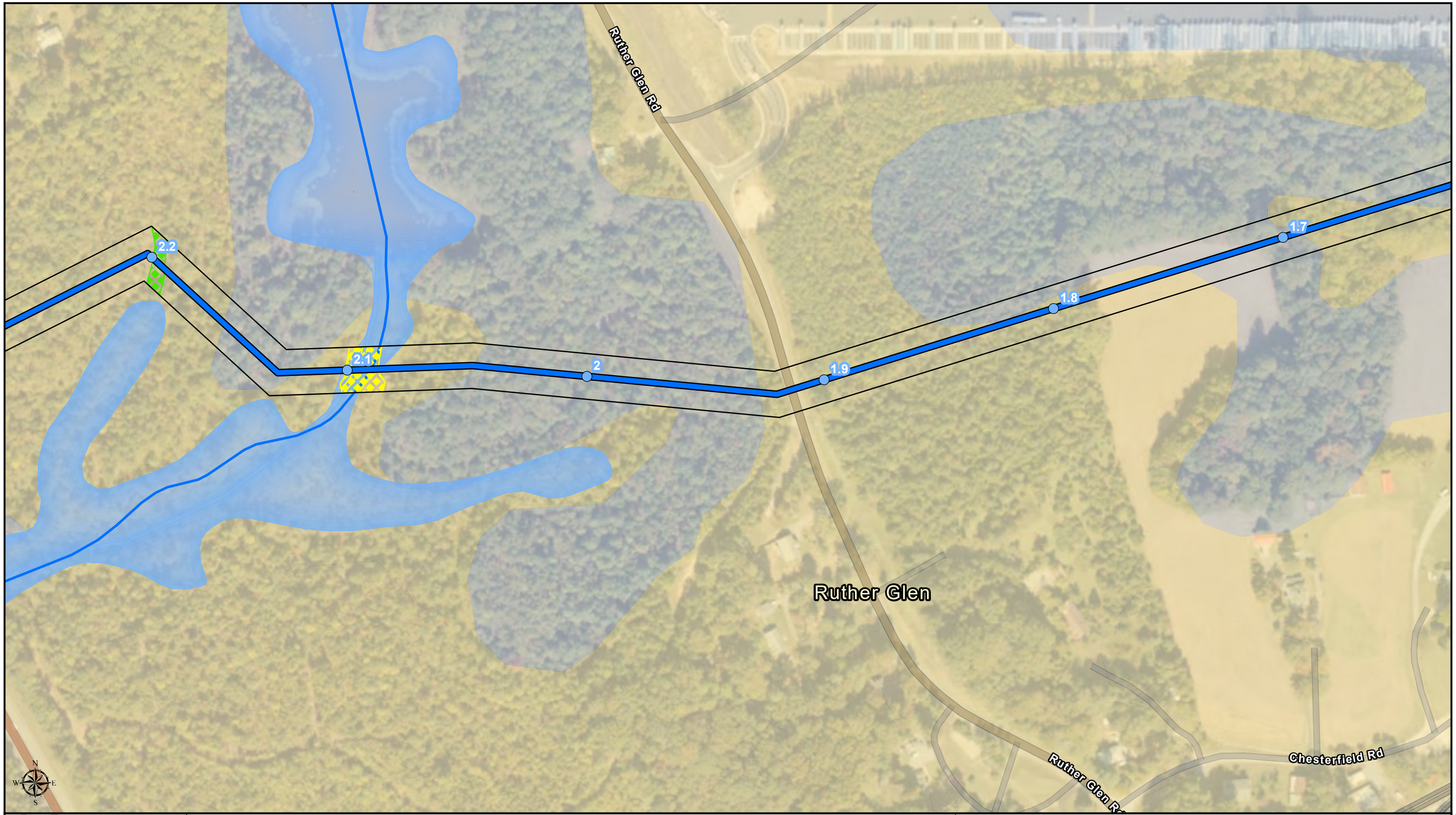

Route 1 MP
Route 1

Wetland Cover Type
PFO
PUB
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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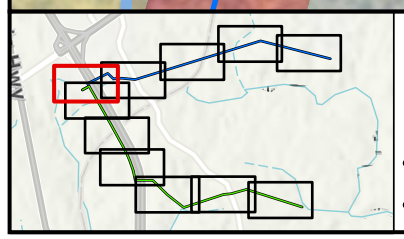

Proposed Switching Station
Route 1 MP
Route 2 MP
Route 1
Route 2

Wetland Cover Type

PFO
PUB
Riverine
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400

0 100 200

Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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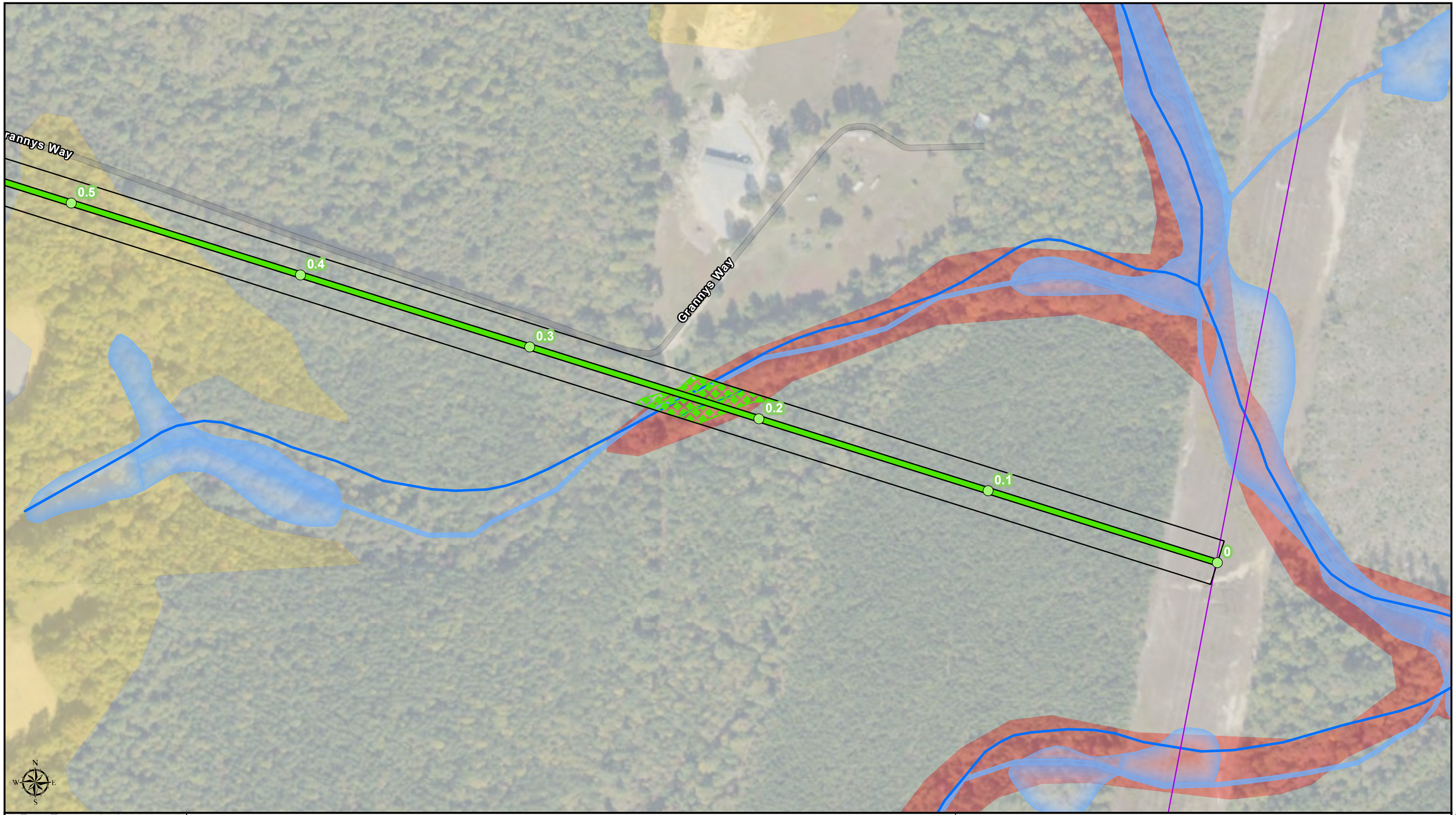

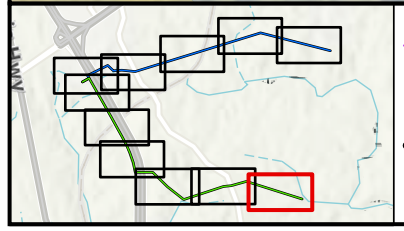

Existing Dominion Energy Electric Transmission Line
Route 2 MP
Route 2

Wetland Cover Type
PFO
Riverine
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM
Dominion Energy

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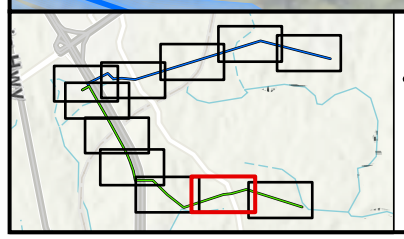

Route 2 MP
Route 2
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric

1:2,400

0 100 200

Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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Route 2 MP
Route 2

Wetland Cover Type
PFO
Riverine
NHD Stream

NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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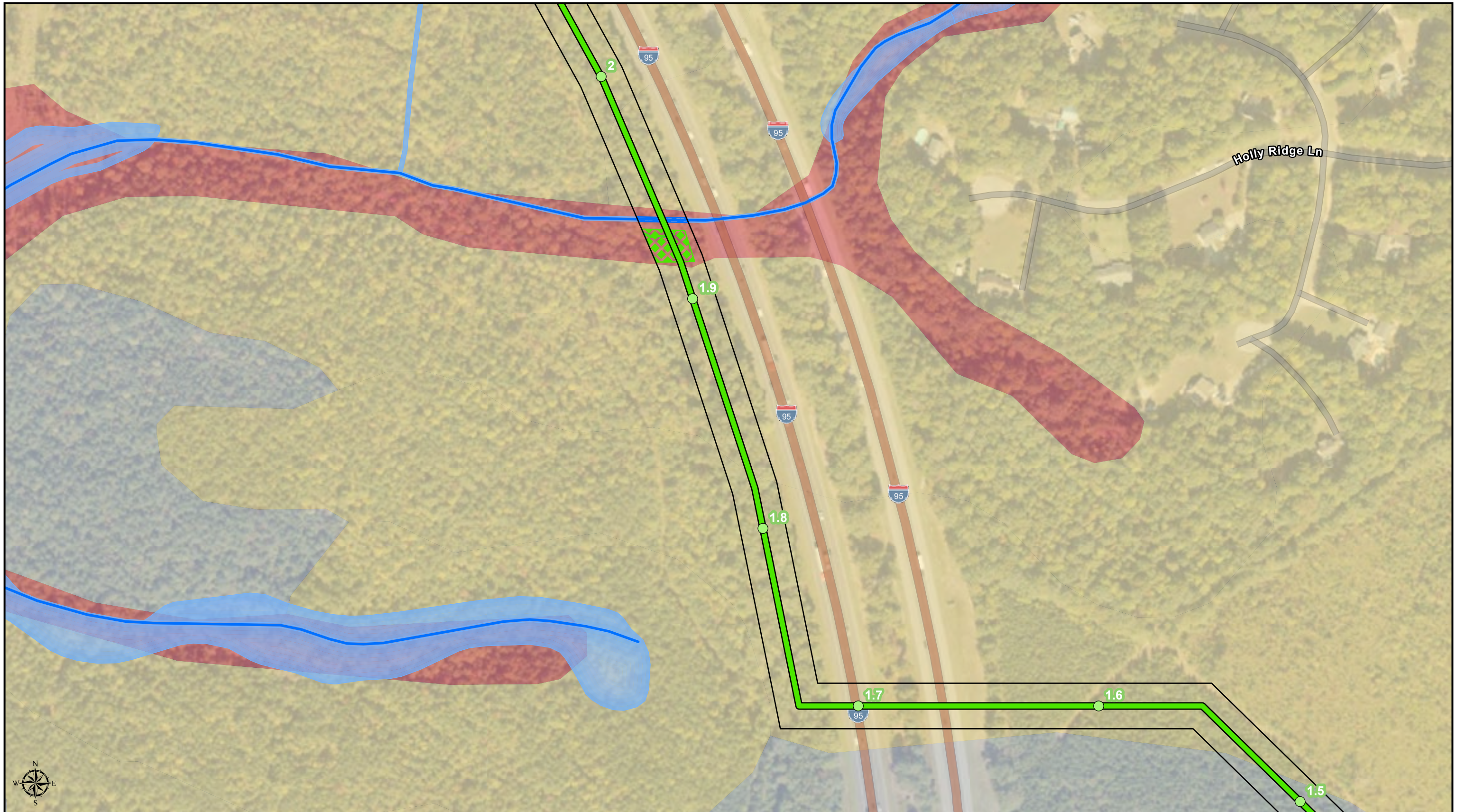

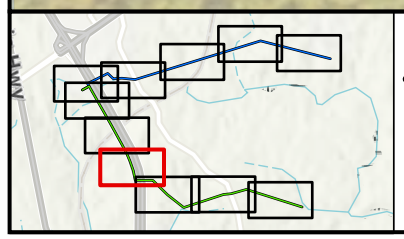

Route 2 MP
Route 2

Wetland Cover Type
PFO
Riverine
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM
Dominion Energy

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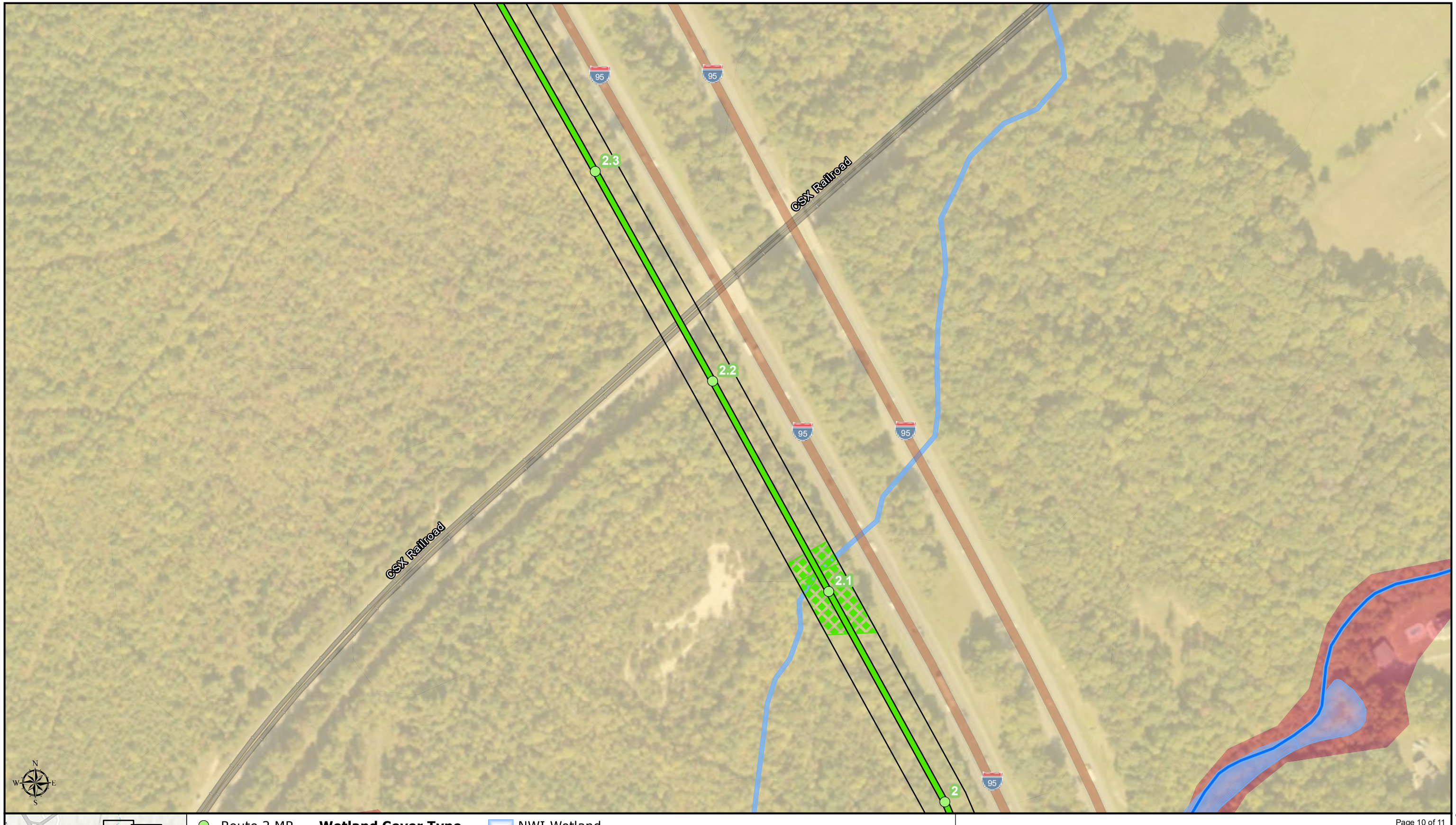

Route 2 MP
Route 2

Wetland Cover Type
PFO
NHD Stream
NWI Wetland
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy

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Proposed Switching Station
Route 1 MP
Route 2 MP
Route 1
Route 2

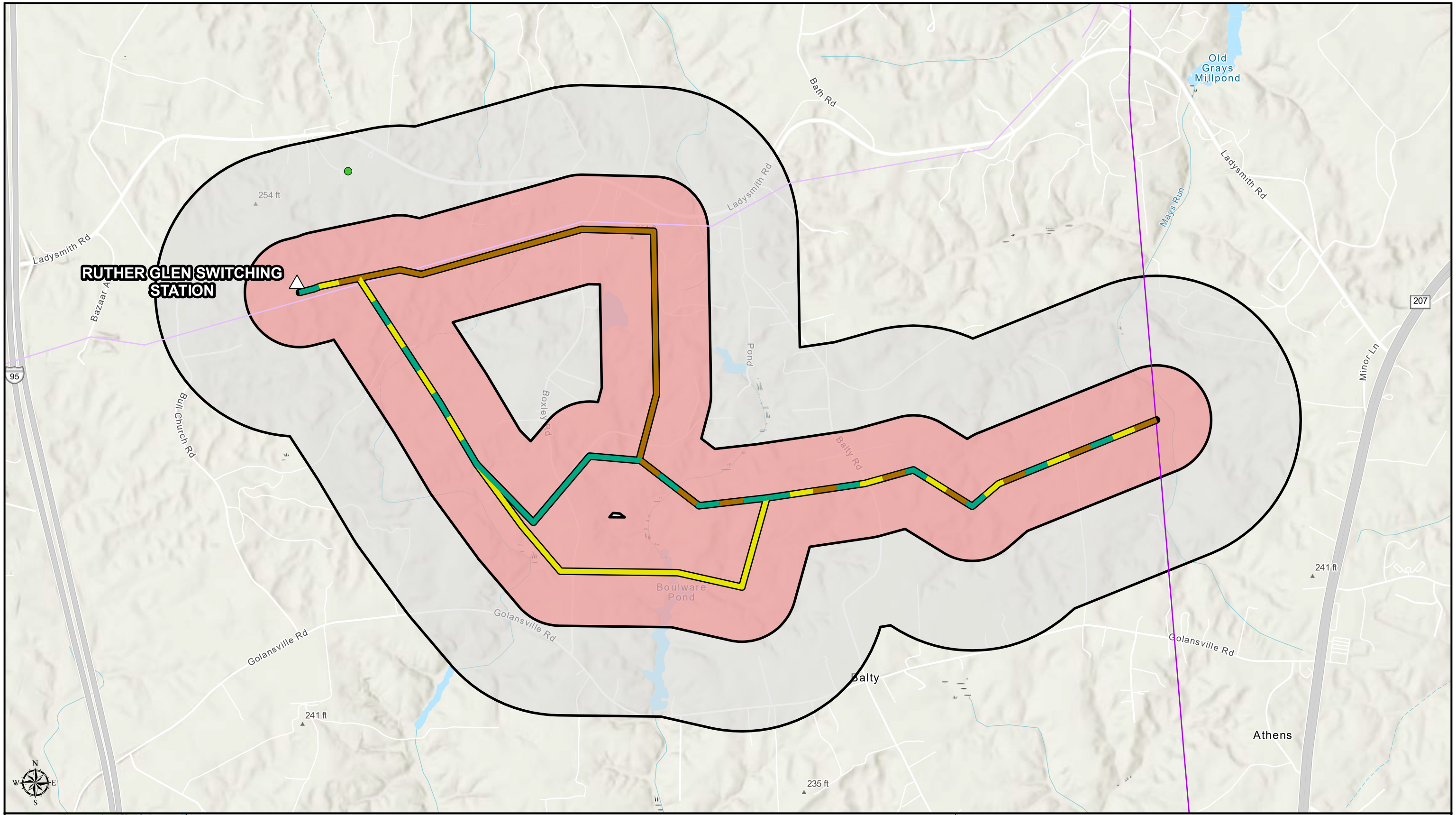
Wetland Cover Type
PFO
Riverine
NHD Stream
NWI Wetland
Nonhydric
Predominantly nonhydric
Predominantly hydric

1:2,400
0 100 200
Feet

Attachment 2
Wetland Probability Map Set - Wetland Type
Carmel Church 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

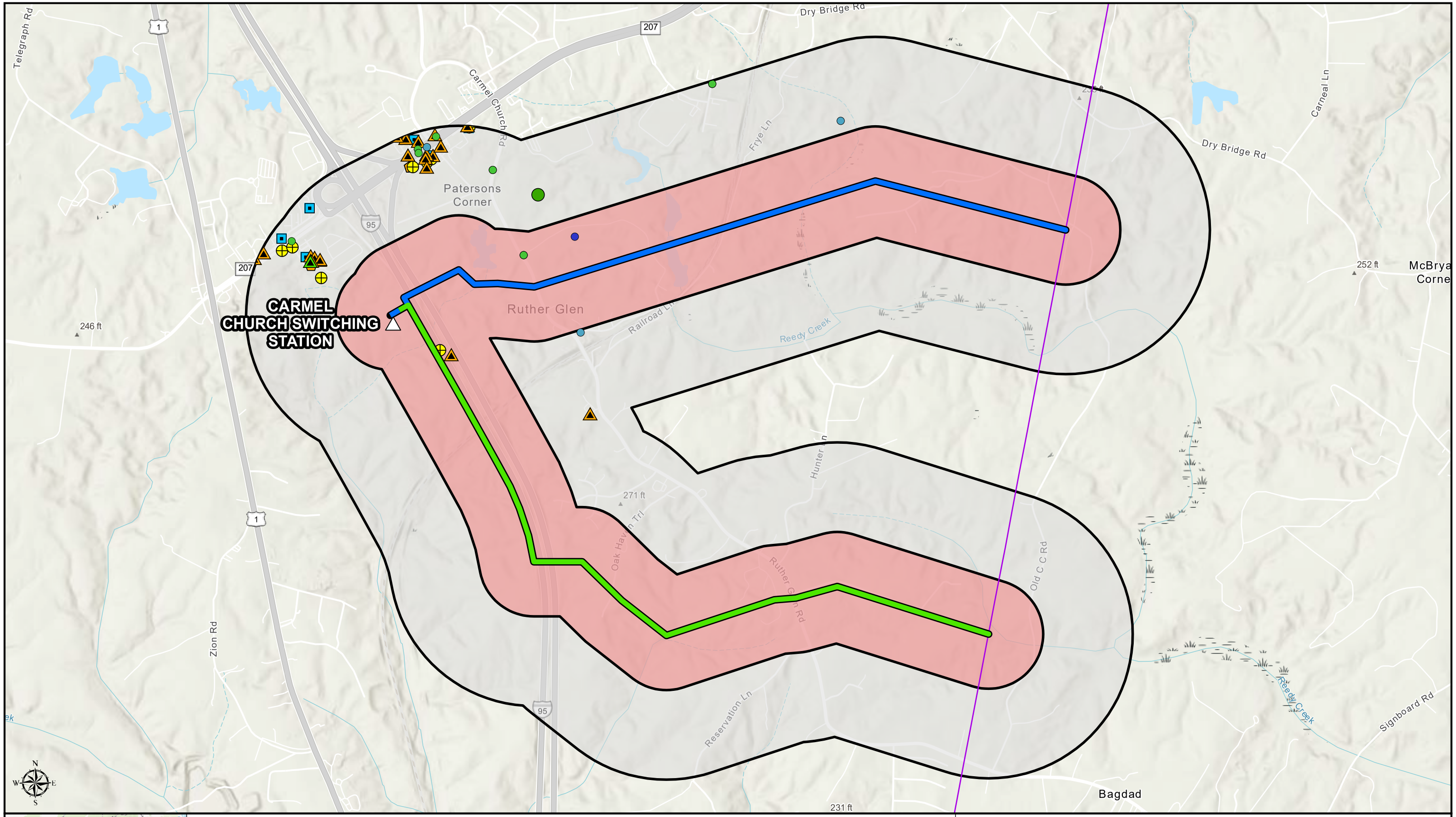
Dominion Energy

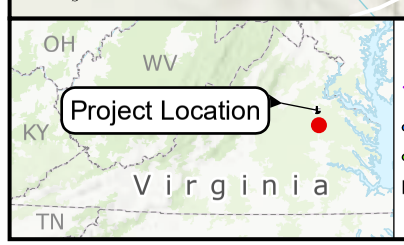


Attachment 2.F.1
Solid and Hazardous Waste Sites Within 1,000 Feet and Half Mile of Centerline
Ruther Glen 230 kV Electric Transmission Line Project
Dominion Energy Virginia
Caroline County, Virginia

ERM

Dominion Energy





- Proposed Switching Station
- Existing Dominion Energy Electric Transmission Line
- Proposed Route
- Alternative Route 2

EPA Facility Registry Service
- Waste
- Water
- Air

VDEQ
- Active Air Sites Daily
- Petroleum Releases Daily - Closed
- Petroleum Releases Daily - Open
- PReP Reports Daily
- Registered Petroleum Tank Facilities Daily
- VPDES Outfalls Daily
- Buffer - 1,000 Feet
- Buffer - 0.5 Mile

0 1,000 2,000
Feet

1:20,000

Attachment 2.F.2
Solid and Hazardous Waste Sites Within 1,000 Feet and Half Mile of Centerline
Carmel Church 230 kV Electric Transmission Line Project

ERM

Dominion Energy Virginia
Caroline County, Virginia

Dominion Energy

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

September 20, 2024

Briana Cooney
Environmental Resources Management, Inc.
222 South 9th Street, South 2900
Minneapolis, MN 55402

Re: 0721582, Ruther Glen Rereview

Dear Ms. Cooney:

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

According to the information in our files, the Ladysmith North Conservation Site, the Wrights Corner Conservation Site, and the Wrights Corner South Conservation Site are located within the project area, including a 100 foot buffer. Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation sites are given a biodiversity significance ranking (B-rank) based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant.

The Ladysmith North Conservation Site has been assigned a B-rank of B3, which represents a site of high significance. The natural heritage resource associated with this site is:

Isotria medeoloides	Small Whorled Pogonia	G2G3/S2/LT/LE

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 listed as threatened by the United States Fish and Wildlife Service (USFWS) and endangered by the Virginia Department of Agriculture and Consumer Services (VDACS).

The Wrights Corner Conservation Site and the Wrights Corner South Conservation Site have been assigned a B-rank of B3, which represents a site of high significance. The natural heritage resource associated with these sites is:

Juncus caesariensis	New Jersey rush	G2G3/S2/SOC/LT

New Jersey rush a sedge-like herb with a rough surface and narrow leaves, inhabits acidic hardwood swamps, seeps, swales or pond margins. These sites usually contain a persistent seepage of groundwater or perennially reliable flow (Ware, 1991). It has also been documented in seepages within such disturbed areas as powerline rights-of-way. New Jersey rush is restricted to isolated occurrences in the coastal plain of Virginia (TNC et. al., 1999). Threats to this plant include disruptions in its hydrological regime, such as draining or filling wetlands and flooding by beavers, invasions by competitors resulting from clear-cutting of the overstory (Ware, 1991) and succession of its habitat to woody vegetation (Nature Serve 2011). Surveys for New Jersey rush should be conducted during the fruiting period of this plant from August – October. Please note that this species is listed as threatened by the Virginia Department of Agriculture and Consumer Services (VDACS). It is also classified as a species of concern by the United States Fish and Wildlife Service (USFWS); however, this designation has no official legal status.

In addition, Sheep laurel (*Kalmia angustifolia*, G5/S2/NL/NL) has been documented within the project area and Purple pitcher plant (*Sarracenia purpurea*, G5/S2/NL/NL) has been historically documented within the project area.

Sheep laurel is a state rare plant found primarily in acidic soils. Its range stretches from Newfoundland and Labrador to Virginia, and as far west as Michigan and Ontario. This plant blooms from May to July. While common across the eastern seaboard, sheep-laurel is very rare and imperiled in Virginia (Gleason and Cronquist, 1991), with 13 remaining extant local occurrences as of 2024. Purple pitcher plant is a state rare perennial that inhabits bogs, pinelands and such disturbed areas as powerline rights-of-way (TNC, 1996). This species blooms from April to July (Weakley, in prep.). In Virginia, purple pitcher-plants are currently known from 25 extant occurrences in the coastal plain region as of 2024.

To minimize adverse impacts to the documented natural heritage resources listed above, DCR recommends avoidance of the conservation sites and the occurrences of Sheep laurel and Purple pitcher plant that occur outside of the conservation sites.

Furthermore, according to a DCR biologist, there is a potential for additional populations of Small whorled pogonia, New Jersey rush, Sheep laurel and Purple pitcher plant to occur in the project area if suitable habitat exists on site, as well as potential for Brown Bog Sedge (*Carex buxbaumii*, G5/S2/NL/NL), Blood panic grass (*Dichanthelium consanguineum*, G5/S1S2/NL/NL), Epling's Hedge-nettle (*Stachys eplingii*, G1G2/S1/SOC/NL) and Larkspur coreopsis (*Coreopsis delphiniifolia*, G3?/S1/NL/NL) to occur.

Due to the potential for this site to support additional populations of natural heritage resources, DCR recommends an inventory for the resources listed above 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.

Due to the legal status of Small whorled pogonia, DCR also recommends coordination with USFWS to ensure compliance with protected species legislation.

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

In addition, the proposed project may impact Ecological Cores **(C2, 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.

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 Virginia Department of Wildlife Resources (VDWR) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed https://services.dwr.virginia.gov/fwis/ or contact Amy Martin at 804-367-2211 or amy.martin@dwr.virginia.gov.

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
Natural Heritage Locality Liaison

Literature Cited

Gleason, H., and Cronquist, A. 1991. Manual of Vascular Plants of Northeastern United States and Adjacent Canada, Second Edition. The New York Botanical Garden, Bronx, New York. p.205

NatureServe. 2011. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: July 25, 2011).

The Nature Conservancy. 1996. Biological and Conservation Data System. Arlington, Virginia, USA.

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.

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

Weakley, A.S. In prep. Flora of the Carolina's and Virginia. The Nature Conservancy, Southeastern Regional Office. p. 14-8.

Site Location

37,58,02.3 -77,25,08.5
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

Display at center | **Search Point** is not at map center

Base Map Choices
Color Aerial Photography

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

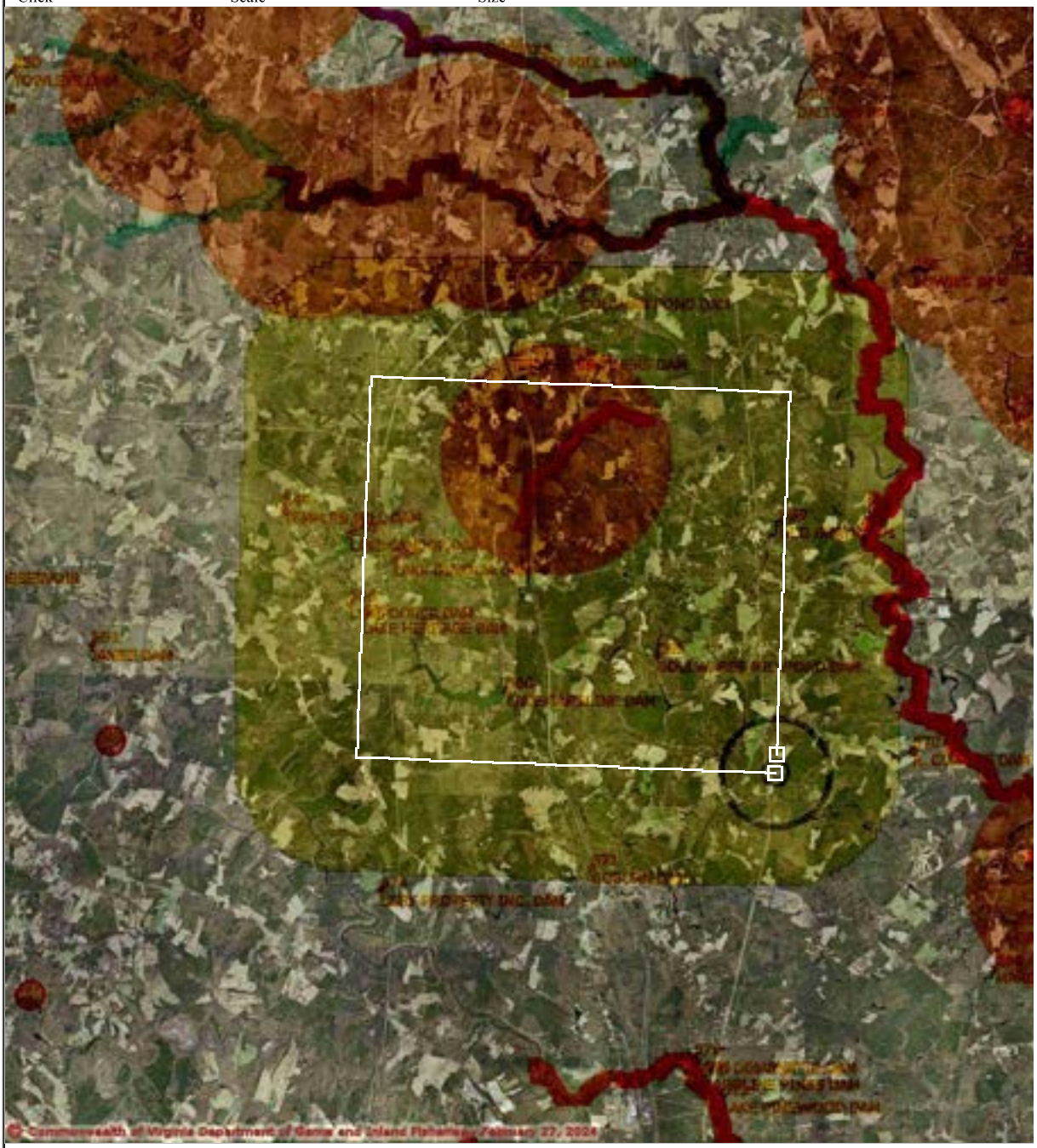
Impediment

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

2 mile radius Search Area

Bald Eagle Concentration Areas and Roosts

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



Point of Search 37,58,02.3 -77,25,08.5
Map Location 38,00,58.7 -77,29,08.2

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: Color Aerial Photography 2002 - Virginia Base Mapping Program, Virginia Geographic Information Network

Map projection is UTM Zone 18 NAD 1983 with left 265802 and top 4226541. Pixel size is 30. . Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 1000 columns by 1000 rows for a total of 1000000 pixles. The map display represents 32000 meters east to west by 32000 meters north to south for a total of 1024.0 square kilometers. The map display represents 105004 feet east to west by 105004 feet north to south for a total of 395.5 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.
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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 2024-02-27 15:33:06 (qa/qc March 21, 2016 12:20 - tn=1817824.0 dist=3218 I)
$poi=37.9673200 -77.4190499

VaFWIS Search Report Compiled on 2/27/2024, 3:31:42 PM

Help

Known or likely to occur within a **2 mile buffer around polygon; center 37.9673200 -77.4190499** in **033 Caroline County, 085 Hanover County, 177 Spotsylvania County, VA**

View Map of Site Location

538 Known or Likely Species ordered by Status Concern for Conservation (displaying first 27) (27 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
060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon		BOVA,HU6
010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes	BOVA,TEWaters
060029	FTST	IIa	Lance, yellow	Elliptio lanceolata	Yes	BOVA,TEWaters,SppObs,HU6
050020	SE	Ia	Bat, little brown	Myotis lucifugus		BOVA
050034	SE	Ia	Bat, Rafinesque's eastern big-eared	Corynorhinus rafinesquii macrotis		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
060081	FPST	IIa	Floater, green	Lasmigona subviridis		BOVA
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		BOVA,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 538 species** View 538

*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 (1 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**	
C182	Mattaponi river	Confirmed	6		IV	Yes

Impediments to Fish Passage (11 records)

View Map of All Fish Impediments

ID	Name	River	View Map
569	BOULWARES MILLPOND DAM	DE JARNETTE MILL RUN	Yes
571	COBURN DAM	TR-POLECAT CREEK	Yes
561	COLEMAN POND DAM	WHITE RUN	Yes

560	LAKE CAROLINE DAM	STEVENS MILL RUN	Yes
564	LAKE DEVOLIA DAM	TR-SOUTH RIVER	Yes
566	LAKE DOVER DAM	TR-STEVENS MILL CREEK	Yes
565	LAKE HERITAGE DAM	TR-STEVENS MILL CREEK	Yes
548	LAKE LANDOR DAM	TR-SOUTH RIVER	Yes
559	OLD GRAYS DAM	MAYS RUN	Yes
549	TEMPLES MILL DAM	SOUTH RIVER	Yes
563	TERRELL BROTHERS DAM	TR-MATTA RIVER	Yes

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters (40 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						
Mattaponi River (0109732)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus		Yes
Mattaponi River (0111648)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus		Yes
Mattaponi River (0120358)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus		Yes
Mattaponi River (0120489)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus		Yes
Mattaponi River (0121011)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus		Yes
Mattaponi River (0121717)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus		Yes
Mattaponi River (0123323)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus		Yes
Mattaponi River (0123642)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus		Yes
Mattaponi River (0124192)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus		Yes
Mattaponi River (0125418)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus		Yes
Mattaponi River (0127062)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus		Yes

Mattaponi River (0127240)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Mattaponi River (0127968)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Mattaponi River (0128004)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Mattaponi River (0128136)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Mattaponi River (0130253)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Mattaponi River (0131002)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Mattaponi River (0131377)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Mattaponi River (0131572)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Mattaponi River (0132510)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Mattaponi River (0132797)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Mattaponi River (0133713)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Mattaponi River (0135887)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes

To view **All 40 Threatened and Endangered Waters records** View 40

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Species Observations (294 records - displaying first 20 , 1 Observation with Threatened or Endangered species)

View Map of All Query Results
Species Observations

obsID	class	Date Observed	Observer	N Species			View Map
				Different Species	Highest TE*	Highest Tier**	
7626	SppObs	Oct 22 1994	PHILIP H. STEVENSON	2	FTST	II	Yes
617391	SppObs	Jun 24 2012	Kory; Steele| Emily ; Steele	6		III	Yes
617388	SppObs	Jun 24 2012	Susan; Watson| Paul; Sattler| Kelly ; Geer	5		III	Yes
617371	SppObs	Jun 23 2012	Paul ; Sattler| John ; Orr| John; White| Kelly ; Geer	4		III	Yes
617376	SppObs	Jun 23 2012	Paul ; Sattler| John ; Orr| John; White| Kelly ; Geer	4		III	Yes
617385	SppObs	Jun 23 2012	Susan; Watson| Caroline ; Seitz	5		III	Yes
617377	SppObs	Jun 23 2012	Paul ; Sattler| John ; Orr| John; White| Kelly ; Geer	4		III	Yes
617381	SppObs	Jun 23 2012	Susan; Watson| Caroline ; Seitz	10		III	Yes
617372	SppObs	Jun 23 2012	Paul ; Sattler| John ; Orr| John; White| Kelly ; Geer	6		III	Yes
617375	SppObs	Jun 23 2012	Kory ; Steele| Emily ; Steele| David ; Perry	6		III	Yes
617370	SppObs	Jun 22 2012	Susan; Watson| Paul; Sattler	1		III	Yes
303268	SppObs	Apr 22 2003	Alex Barron	3		III	Yes
426488	SppObs	Dec 18 2001	VCU - INSTAR	12		III	Yes
426381	SppObs	Oct 24 2001	VCU - INSTAR	12		III	Yes
426432	SppObs	Oct 24 2001	VCU - INSTAR	5		III	Yes
426486	SppObs	Oct 16 2001	VCU - INSTAR	6		III	Yes
426483	SppObs	Oct 16 2001	VCU - INSTAR	9		III	Yes
426322	SppObs	Jul 12 2001	VCU - INSTAR	13		III	Yes
426431	SppObs	Jul 11 2001	VCU - INSTAR	12		III	Yes

426380	SppObs	Jul 11 2001	VCU - INSTAR	9		III	Yes

Displayed 20 Species Observations

Selected 294 Observations View all 294 Species Observations

Habitat Predicted for Aquatic WAP Tier I & II Species

N/A

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**	
50136	Ladysmith, SE	60		III	Yes
50135	Ladysmith, SW	8		III	Yes
51134	Woodford, CE	43		III	Yes
51136	Woodford, SE	48		III	Yes

Public Holdings:

N/A

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

FIPS Code	City and County Name	Different Species	Highest TE	Highest Tier
033	Caroline	374	FESE	I
085	Hanover	384	FESE	I
177	Spotsylvania	379	FESE	I

USGS 7.5' Quadrangles:
Hewlett
Ladysmith
Ruther Glen
Woodford

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
YO23	North Anna River-Hawkins Creek	59	SE	I
YO26	North Anna River-Long Creek	58	SE	I
YO45	Matta River	58	FESE	I
YO46	South River	56	FTST	I
YO47	Mattaponi River-Campbell Creek	64	FTSE	I
YO48	Polecat Creek	53	FTST	II
YO49	Reedy Creek	51	SS	II

Compiled on 2/27/2024, 3:31:42 PM I1817824.0 report=all searchType= P dist= 3218 poi= 37.9673200 -77.4190499 siteDD= 37.9673276 -77.4190513;37.9673901 -77.4257763;37.9674523 -77.4325014;37.9675140 -77.4392264;37.9675753 -77.4459515;37.9676362 -77.4526766;37.9676968 -77.4594017;37.9677569 -77.4661269;37.9678167 -77.4728520;37.9678761 -77.4795771;37.9679351 -77.4863023;37.9679937 -77.4930275;37.9680519 -77.4997526;37.9681097 -77.5064778;37.9681671 -77.5132030;37.9682241 -77.5199282;37.9682808 -77.5266534;37.9683370 -77.5333787;37.9683929 -77.5401039;37.9684484 -77.5468292;37.9685035 -77.5535544;37.9733415 -77.5534914;37.9781796 -77.5534284;37.9830177 -77.5533654;37.9878558 -77.5533023;37.9926938 -77.5532393;37.9975319 -77.5531762;38.0023700 -77.5531132;38.0072081 -77.5530501;38.0120462 -77.5529870;38.0168842 -77.5529239;38.0217223 -77.5528608;38.0265604 -77.5527977;38.0313985 -77.5527346;38.0362366 -77.5526715;38.0410746 -77.5526084;38.0459127 -77.5525452;38.0507508 -77.5524821;38.0555889 -77.5524189;38.0604270 -77.5523558;38.0652650 -77.5522926;38.0652099 -77.5455584;38.0651543 -77.5388241;38.0650984 -77.5320899;38.0650421 -77.5253558;38.0649853 -77.5186216;38.0649282 -77.5118874;38.0648707 -77.5051532;38.0648128 -77.4984191;38.0647545 -77.4916849;38.0646959 -77.4849508;38.0646368 -77.4782167;38.0645774 -77.4714826;38.0645175 -77.4647485;38.0644573 -77.4580144;38.0643966 -77.4512803;38.0643356 -77.4445463;38.0642742 -77.4378122;38.0642124 -77.4310782;38.0641502 -77.4243441;38.0640877 -77.4176101;38.0592497 -77.4176823;38.0544117 -77.4177544;38.0495737 -77.4178265;38.0447356 -77.4178987;38.0398976 -77.4179708;38.0350596 -77.4180429;38.0302216 -77.4181150;38.0253836 -77.4181870;38.0205456 -77.4182591;38.0157076 -77.4183312;38.0108696 -77.4184032;38.0060316 -77.4184753;38.0011936 -77.4185473;37.9963556 -77.4186193;37.9915176 -77.4186913;37.9866796 -77.4187633;37.9818416 -77.4188353;37.9770036 -77.4189073;37.9721656 -77.4189793

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Threatened and Endangered Waters where Sturgeon, Atlantic (010032) observed

37,58,02.3 -77,25,08.5 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

Display at center | **Search Point** is not at map center

Base Map Choices
BW Aerial Photography

Map Overlay Choices
Current List: Position, Search, TEWaters

Map Overlay Legend

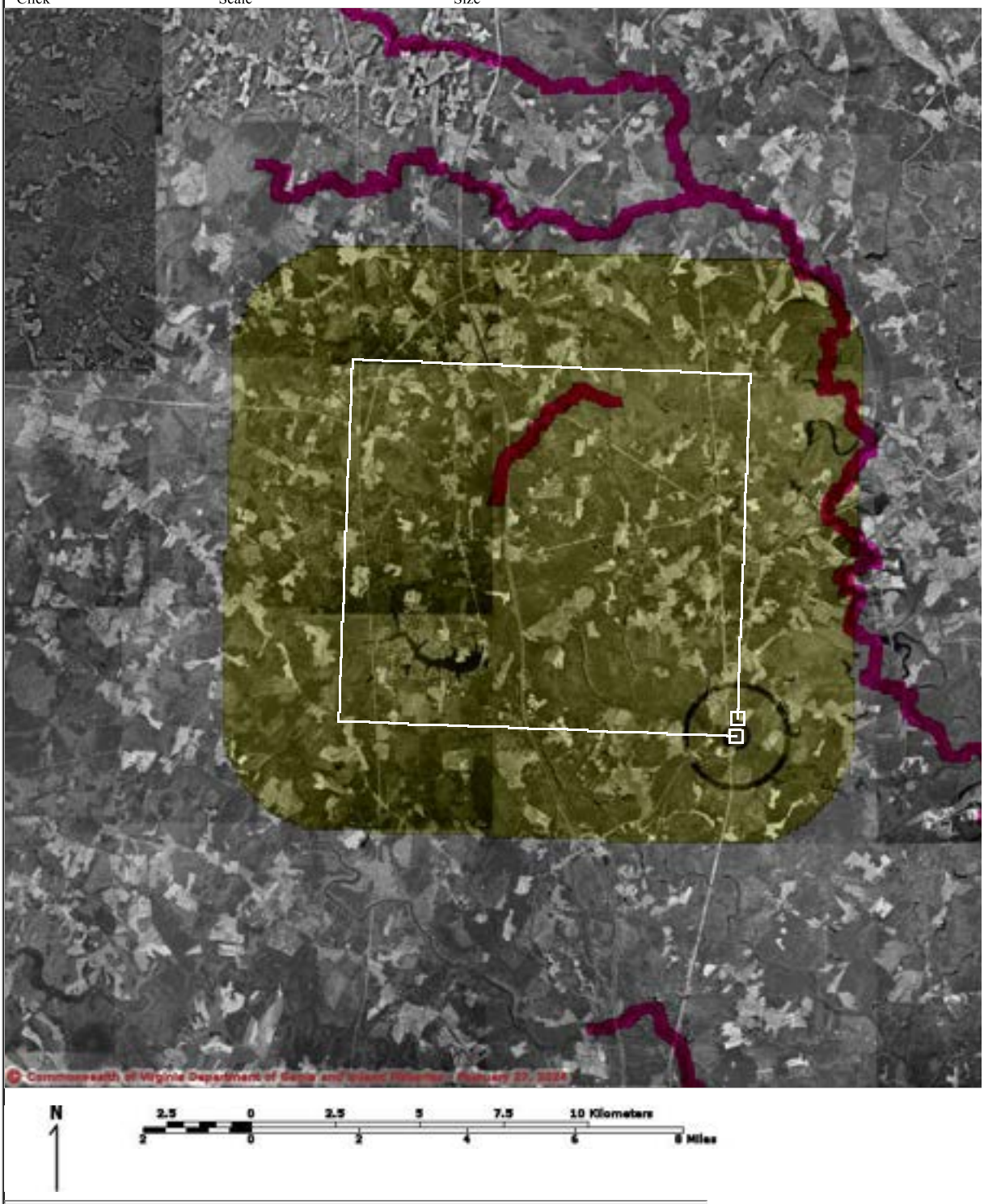
T & E Waters
Federal
State

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

2 mile radius Search Area

back | Refresh Browser Page | Help

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



Point of Search 37,58,02.3 -77,25,08.5
Map Location 38,00,58.7 -77,29,08.2

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: Black & White USGS Aerial Photography (see Microsoft terraserver-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 265802 and top 4226541. Pixel size is 30. .
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map assembled 2024-02-27 15:47:43 (qa/qc March 21, 2016 12:20 - tn=1817824.1 dist=3218 I)
$poi=37.9673200 -77.4190499

Threatened and Endangered Waters where Lance, yellow (060029) observed

37,58,02.3 -77,25,08.5
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

Display at center	**Search Point** is not at map center

Base Map Choices
BW Aerial Photography

Map Overlay Choices
Current List: Position, Search, TEWaters

Map Overlay Legend

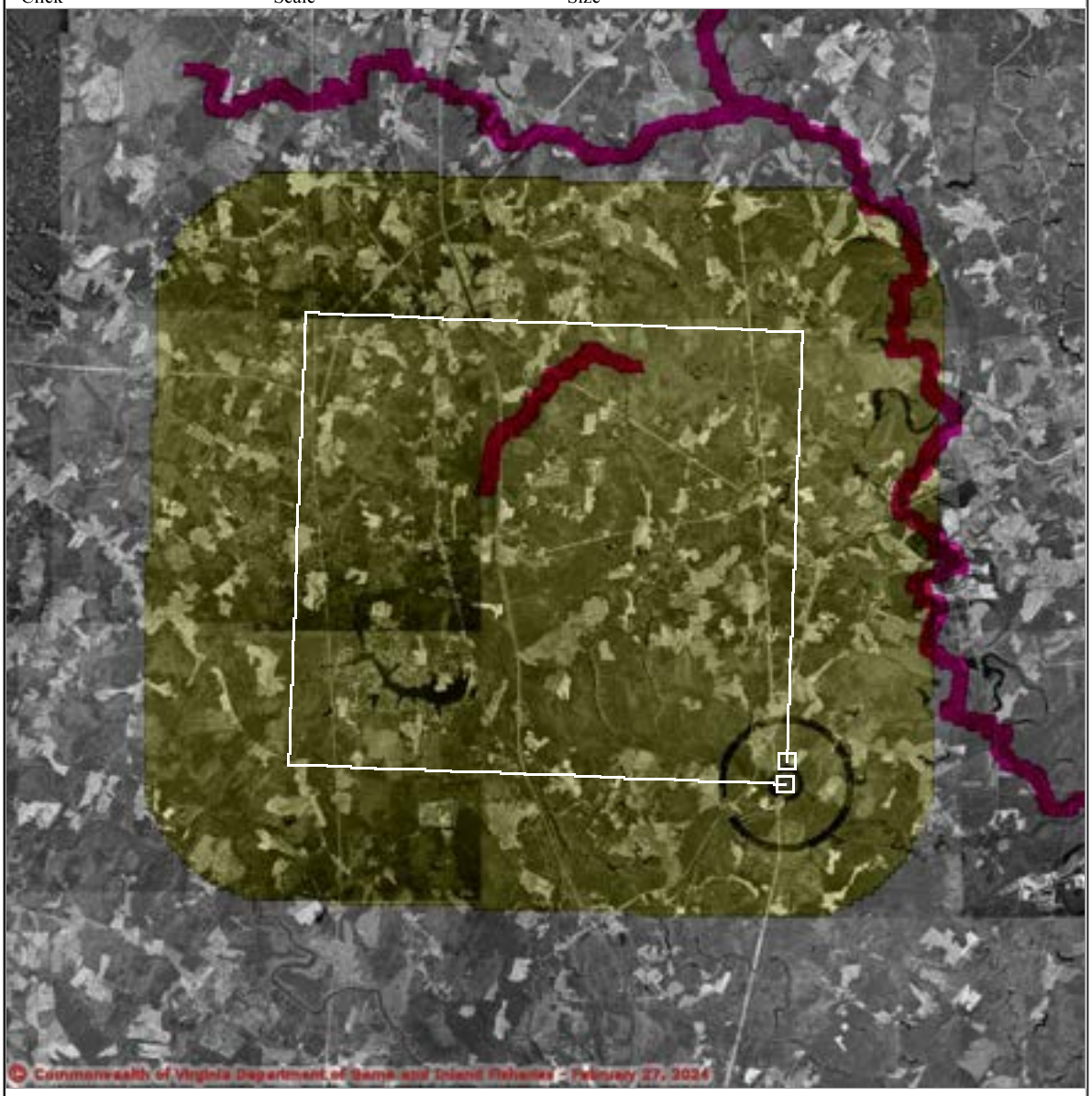
T & E Waters
Federal
State

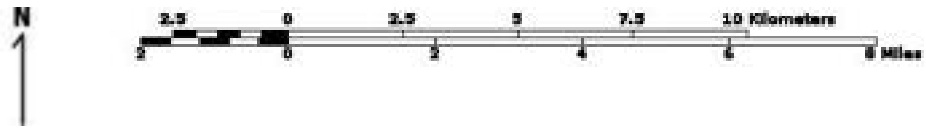
Position Rings
1 mile and 1/4 mile at the Search Point

2 mile radius Search Area

back 38,07,48.3 -77,21,56.5 Refresh Browser Page Help

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





Point of Search 37,58,02.3 -77,25,08.5
Map Location 38,00,58.7 -77,29,08.2

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: Black & White USGS Aerial Photography (see Microsoft terraserver-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 269002 and top 4223341. Pixel size is 30. .
Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 800 columns by 800 rows for a total of 640000 pixles. The map display represents 25600 meters

east to west by 25600 meters north to south for a total of 655.3 square kilometers. The map display represents 84003 feet east to west by 84003 feet north to south for a total of 253.1 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 2024-02-27 15:48:53 (qa/qc March 21, 2016 12:20 - tn=1817824.1 dist=3218 I)
$poi=37.9673200 -77.4190499

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:
Project Code: 2024-0056171
Project Name: Ruther Glen

09/23/2024 20:25:51 UTC

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

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

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

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

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

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 https://www.fws.gov/program/migratory-bird-permit/what-we-do.

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 Project 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
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds

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: 2024-0056171
Project Name: Ruther Glen
Project Type: Transmission Line - New Constr - Above Ground
Project Description: This request is a part of a pre-permitting effort to determine feasibility of overhead powerline routes.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@38.0155805,-77.48563429069615,14z

Counties: Caroline County, 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.

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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
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
Swamp Pink *Helonias bullata* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4333	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.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

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

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper

Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

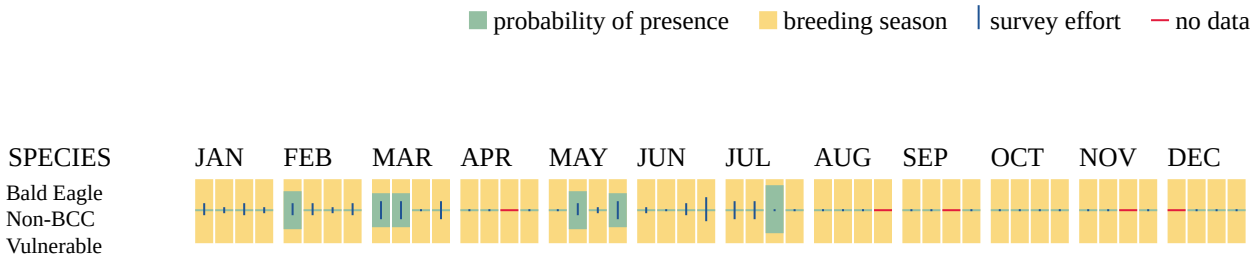
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Aug 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Chuck-will's-widow *Antrostomus carolinensis* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9604	Breeds May 10 to Jul 10
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10678	Breeds May 1 to Aug 20
Grasshopper Sparrow *Ammodramus savannarum perpallidus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8329	Breeds Jun 1 to Aug 20
Prairie Warbler *Setophaga discolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9513	Breeds May 1 to Jul 31

NAME	BREEDING SEASON
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9439	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9478	Breeds elsewhere
Scarlet Tanager *Piranga olivacea* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11967	Breeds May 10 to Aug 10
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9431	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

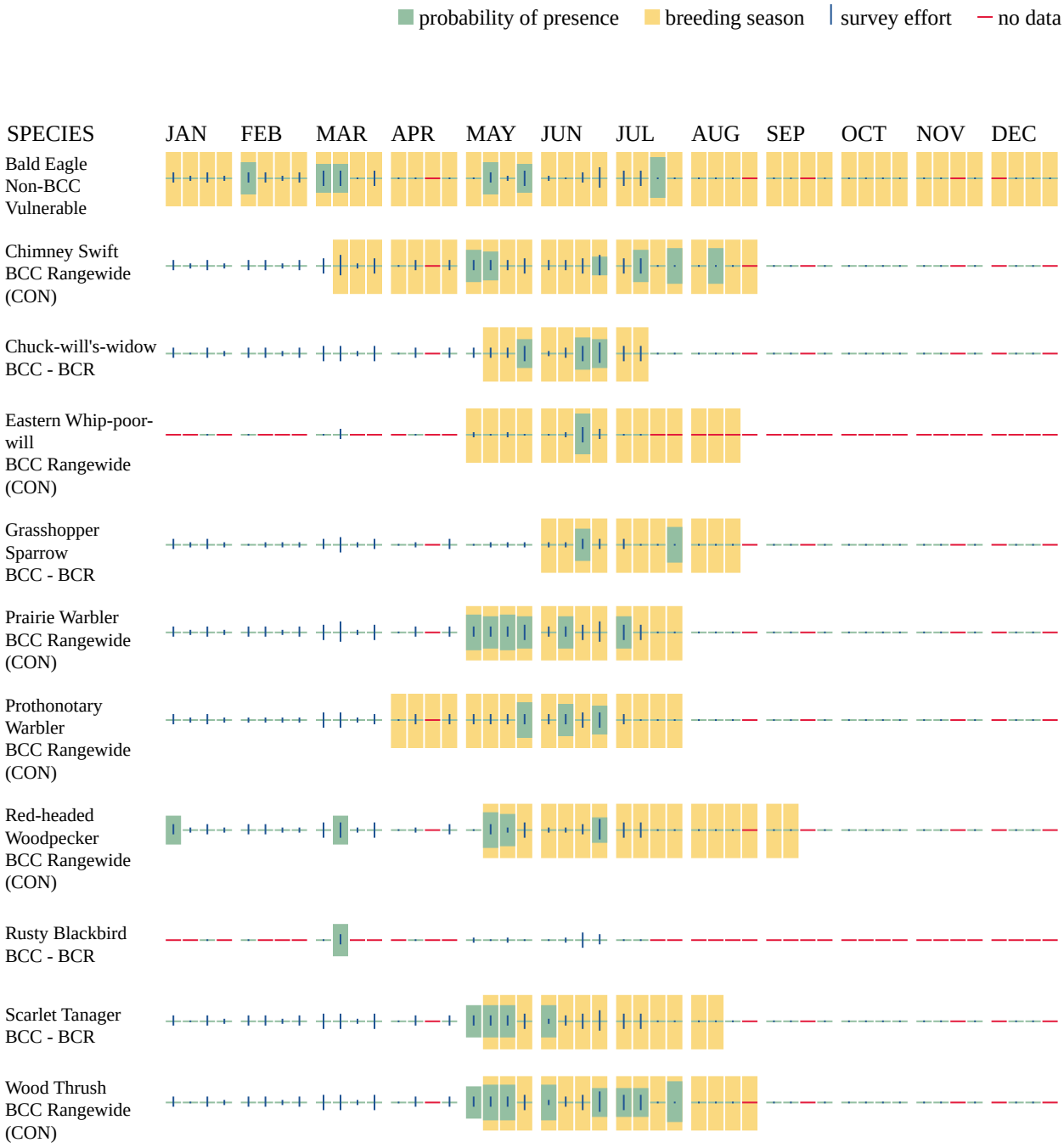
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

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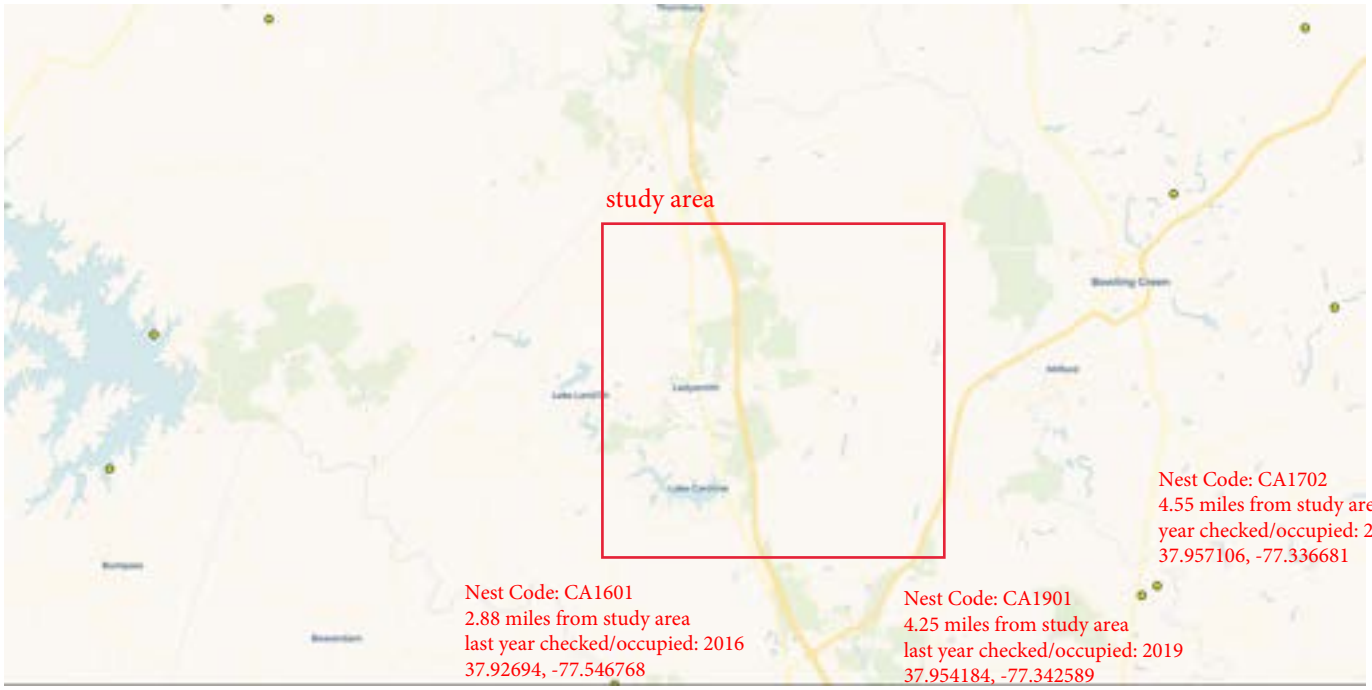
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

IPAC USER CONTACT INFORMATION

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

CCB Mapping Portal



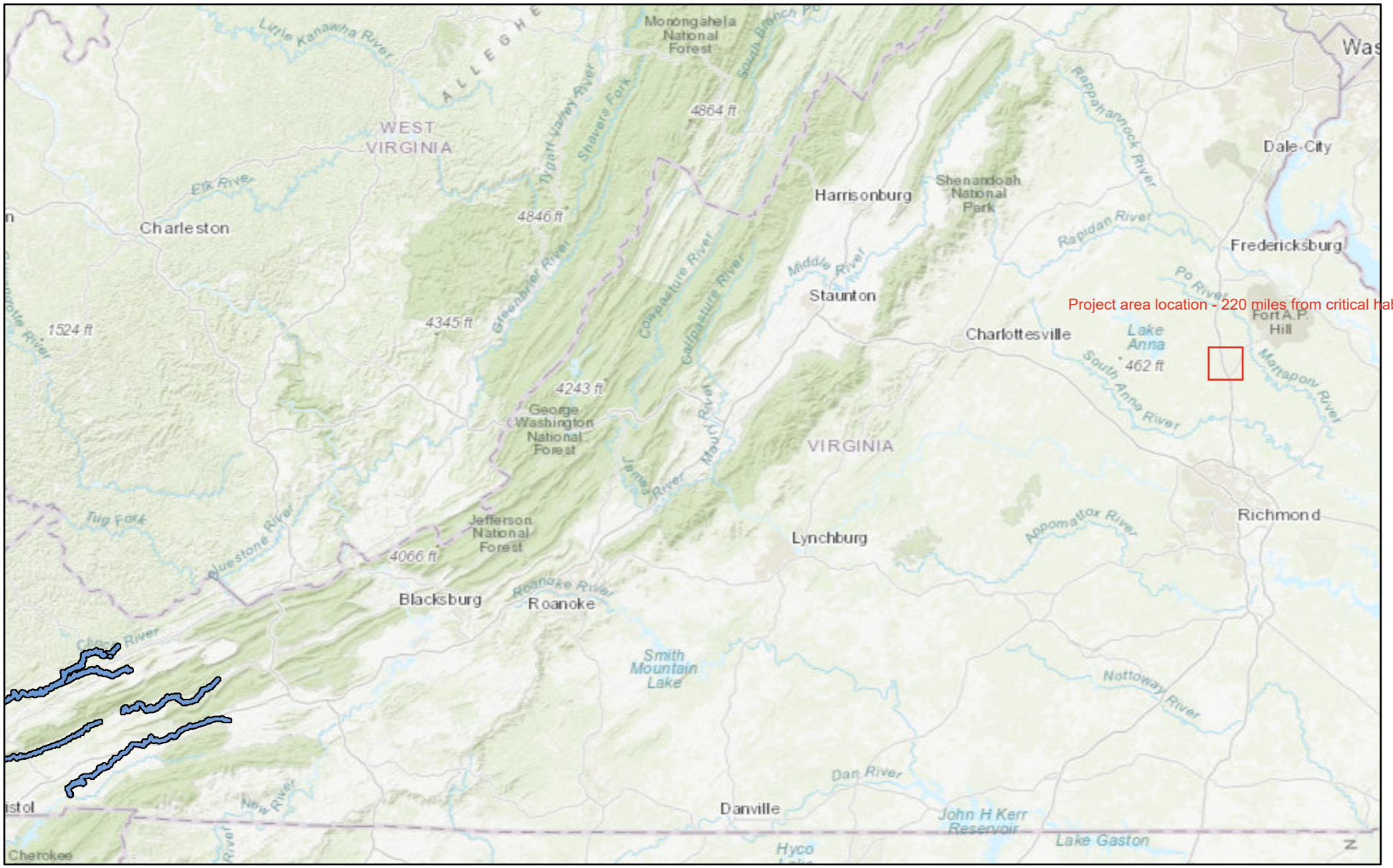
Layers: VA Eagle Nest Locator

Map Center [longitude, latitude]: [-77.51850128173828, 38.023078078670366]

Map Link:
https://ccbbirds.org/maps/#layer=VA+Eagle+Nest+Locator&zoom=12&lat=38.023078078670366&lng=-77.51850128173828&legend=legend_tab_7c321b7e-e523-11e4-aaa0-0e0c41326911&base=Street+Map+%28OSM%2FCarto%29

Report Generated On: 02/29/2024

Critical Habitat - Ruther Glen



February 29, 2024

Virginia Critical Habitat (published)

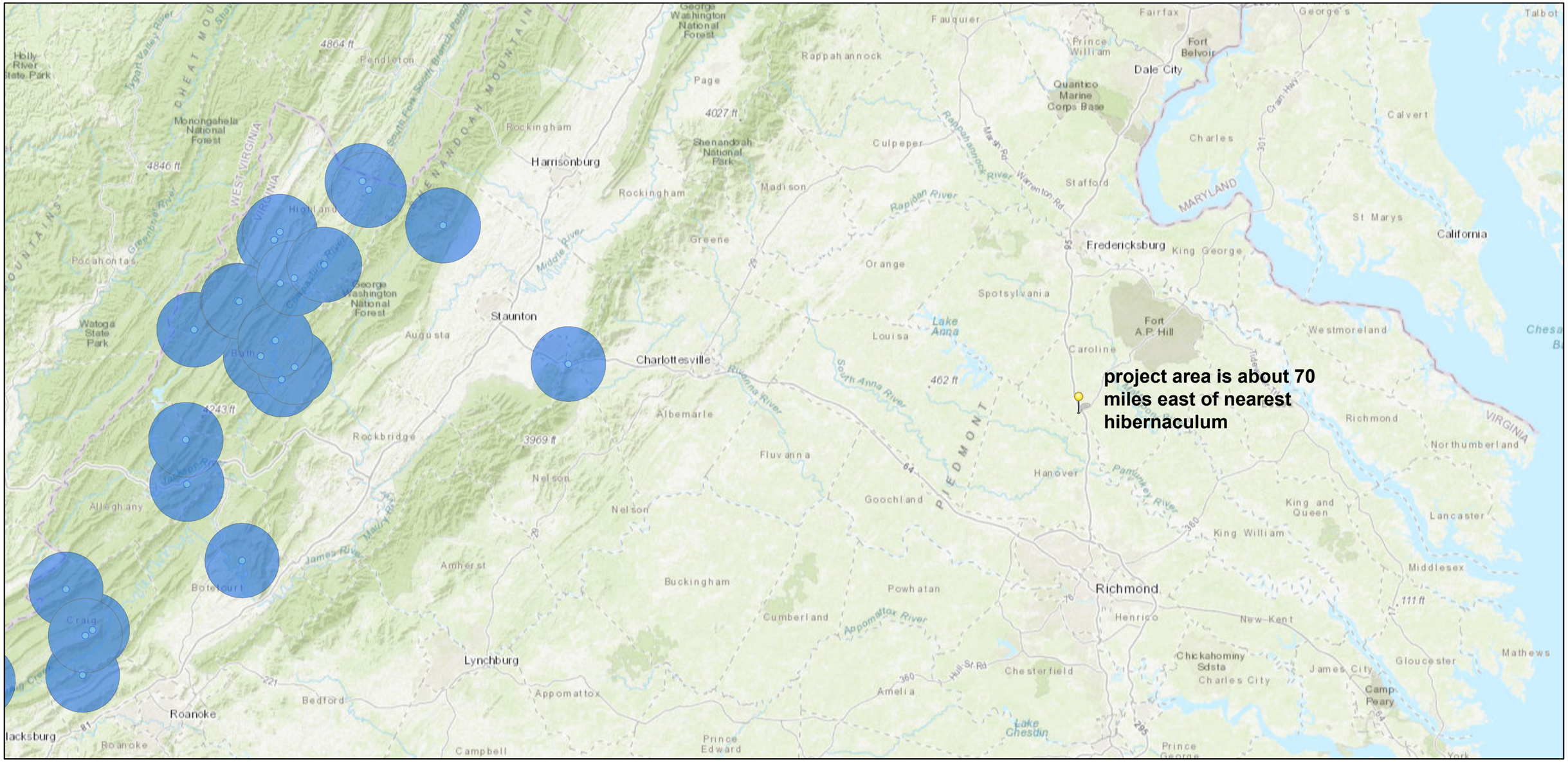
1:2,311,162

0 15 30 60 mi

0 25 50 100 km

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

MYLU-PESU Locations and Roost Trees - Ruther Glen



2/29/2024

Tri-colored and Little Brown Hibernaculum Half Mile Buffer

Tri-colored and Little Brown Hibernaculum 5.5 Mile Buffer

1:1,155,581

0 10 20 40 mi

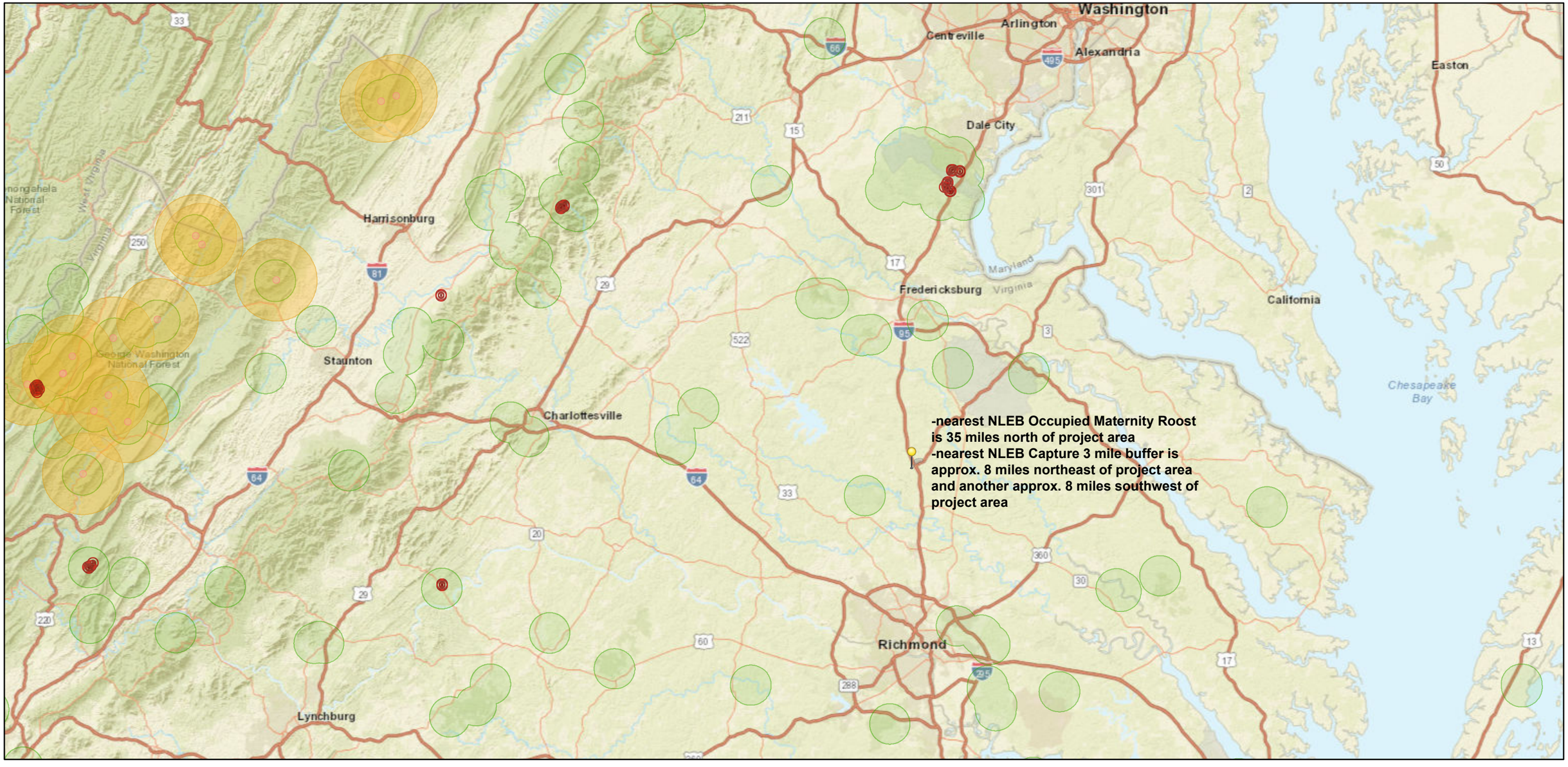
0 15 30 60 km

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

Dept. Game and Inland Fisheries

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

NLEB Locations and Roost Trees - Ruther Glen



2/29/2024

- 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

1:1,155,581

0 10 20 40 mi

0 15 30 60 km

Esri, HERE, Garmin, NGA, USGS, NPS

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, NGA, USGS, NPS |

From: nhreview (DCR)
To: Briana Cooney
Cc: Hypes, Rene (DCR); Weber, Joseph (DCR)
Subject: Re: 0642267, Golden-Mars
Date: Thursday, May 23, 2024 9:58:13 AM
Attachments: image002.png
image003.png
image.png
image.png

EXTERNAL MESSAGE

Briana,

Thanks for your patience with this. I've reiterated your questions in blue, with answers below.

I was reviewing the SCS shapefile you all sent, and I noticed that there are pieces of the SCS that are now developed. Have there been any studies of this area recently? Are you able to tell me when this SCS area was created or last modified?

- Our **Chief of Biodiversity Information and Conservation Tools** said that there does seem to be areas of the SCS that were developed since it was created. Much of the SCS is still intact, however, and perhaps even more important for maintaining water quality for NHR.
- It looks like the SCS was last modified 7/6/2023. Stream Conservation Sites do not represent protected areas, but waterways and terrestrial areas that contribute to the habitat quality of the documented resource. These areas will affect the water quality of the Yellow lampmussel habitat regardless of their current land use.

I also noticed that the natural heritage resource associated with this SCS is the Yellow lampmussel; however, in my database searches, I haven't seen a documented occurrence of this species within the SCS or study area. Do you have additional information on the presence of this species?

- Generally we do not share the location of our documented resources, only the associated SCS or Conservation Site. Looking at my data, the Yellow lampmussel **is documented within the SCS**. The documented locations are in Broad Run, the main branch of the SCS in the northern portion. The other stream areas included in the SCS are upstream of documented occurrences and changes to the water quality within the SCS will impact the documented resource.
- I can't really comment on the lack of the Yellow lampmussel in the databases without knowing which ones you used. It would not be found in DWR or USFWS databases as it is not a listed species. NHDE (*Natural Heritage Database Explorer*) only shows documented occurrences to Tier 3 users, which is only available to our conservation partners.

I've also noticed in this project and previous projects that some ecological cores identified are less than 100 acres, and the VDCR letter states: "Ecological Cores are areas of at least 100 acres of continuous interior…" Should we continue to study cores that are under 100 acres?

- The cores are found in Virginia Natural Landscape Assessment Ecological Cores and Habitat Fragments data layer. It looks like the feature in question is a habitat fragment, the link above can give you some more information about Cores and Habitat Fragments.
- From our Chief of Biodiversity Information and Conservation Tools: "**Smaller areas of continuous interior cover (i.e., 10 to 99 acres) called Habitat Fragments support Ecological**

Cores and provide similar functions and values. Both feature types are discussed on the website.

- Ecological Cores and Habitat Fragments are ranked by Ecological Integrity based on variables including rare species habitats, habitat diversity, resilience, and water quality, to reflect the wide range of important benefits and ecosystem services they provide. Brief descriptions of Ecological Integrity rankings are:
- C1 – Outstanding: These cores tend to be large in area, of deepest interior, of greatest water quality protections, highest in habitat diversity and rich in rare species, including species listed as threatened or endangered. Of all Ecological Cores in the Commonwealth 1% are ranked as C1.
- C2 – Very High: These cores have all or many of the same characteristics and values as C1 cores, though to a lesser extent. About 2.5% of all cores in the Commonwealth are ranked C2.
- C3 – High, C4 – Moderate, and C5 – General: These cores, as well as **habitat fragments**, have some of the same quantifiable values and characteristics as higher-ranked cores, though much reduced due to their having substantially less interior area and smaller area overall.
-
- There are no Habitat Fragments ranked above C3. "

- Due to Habitat Fragments ability to provide important ecological functions and values, we do still recommend avoiding impacts and when impacts can not be avoided to keep them to the edge of the fragment/core. We only recommend a formal impact analysis for C1 and C2 Cores, which never include fragments.

Hopefully this information is helpful. I have Cc'd Joe Weber our Chief of Biodiversity Information and Conservation Tools and Rene' Hypes our Project Review Coordinator. Let me know if you have anymore questions or if any of the information here needs clarification.

Thank you,

Nicki Gustafson *(she/her)*
Project Review Assistant
Division of Natural Heritage
Virginia Department of Conservation and Recreation
600 E. Main Street, 24th Floor
Richmond, VA 23219
804-625-3979 | nicki.gustafson@dcr.virginia.gov

From: nhreview (DCR) <nhreview@dcr.virginia.gov>
Sent: Tuesday, May 21, 2024 11:48 AM
To: Briana Cooney <Briana.Cooney@erm.com>
Subject: Re: 0642267, Golden-Mars

Briana,

Thanks for you for reaching out again. We passed your question on to our Data Management Division when we received your email. They do the modeling for the Ecological Cores and the Stream Conservation Sites and we wanted to be sure we were giving you accurate information. I will circle back with them and see if they have more information for you. Thank you for your patience with this.

Best,

Nicki Gustafson *(she/her)*
Project Review Assistant
Division of Natural Heritage
Virginia Department of Conservation and Recreation
600 E. Main Street, 24th Floor
Richmond, VA 23219
804-625-3979 | nicki.gustafson@dcr.virginia.gov

From: Briana Cooney <Briana.Cooney@erm.com>
Sent: Tuesday, May 21, 2024 11:37 AM
To: nhreview (DCR) <nhreview@dcr.virginia.gov>
Subject: RE: 0642267, Golden-Mars

Hello!

I just wanted to follow up on my email below. Is someone able to address my questions? Thanks!

ERM
Sustainability is our business

Briana Cooney
Senior Consultant, Scientist
She/Her/Hers

Minneapolis
612-347-7114

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401-309-7028

From: Briana Cooney <briana.cooney@erm.com>
Sent: Wednesday, May 8, 2024 1:47 PM
To: nhreview (DCR) <nhreview@dcr.virginia.gov>
Subject: RE: 0642267, Golden-Mars

Hello!

I'm hoping to get a little more clarity on a couple things so I can study these areas effectively.

I was reviewing the SCS shapefile you all sent, and I noticed that there are pieces of the SCS that are now developed. Have there been any studies of this area recently? Are you able to tell me when this SCS area was created or last modified? I also noticed that the natural heritage resource associated with this SCS is the Yellow lampmussel; however, in my database searches, I haven't seen a documented occurrence of this species within the SCS or study area. Do you have additional information on the presence of this species?

I've also noticed in this project and previous projects that some ecological cores identified are less than 100 acres, and the VDCR letter states: "Ecological Cores are areas of at least 100 acres of continuous interior…" Should we continue to study cores that are under 100 acres?

Thanks for your insight!

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From: nhreview (DCR) <nhreview@dcr.virginia.gov>
Sent: Friday, March 15, 2024 5:39 PM
To: Briana Cooney <briana.cooney@erm.com>
Subject: 0642267, Golden-Mars

EXTERNAL MESSAGE

Ms. Cooney,

Please find attached the DCR-DNH comments, shapefile, data agreement and invoice for the above referenced project. The comments are in pdf format and can be printed for your records. Also species rank information is available at http://www.dcr.virginia.gov/natural-heritage/help for your reference.

Along with our comments there is an invoice for our services. Please submit a copy of the invoice with payment to the Treasurer of Virginia, Department of Conservation and Recreation, Finance, 600 East Main Street, 24th Floor Richmond, VA 23219. Payment is due within 30 days of the invoice date. Late payment may result in the suspension of project review service for future projects. **To pay the invoice by credit card, please click here for the DCR credit card payment portal weblink or copy http://www.dcr.virginia.gov/payment-verification into your browser. It will take approximately 24 hours for the invoice to be available for payment in the online system.**

Please send a confirmation e-mail upon receipt of our comments. Thank you for the opportunity to provide this information.

Rene' Hypes
Environmental Review Coordinator
Virginia Department of Conservation and Recreation
Division of Natural Heritage
600 E. Main Street, Richmond, VA 23219
804-371-2708
rene.hypes@dcr.virginia.gov

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

September 20, 2024

Briana Cooney
Environmental Resources Management, Inc.
222 South 9th Street, South 2900
Minneapolis, MN 55402

Re: 0715013, Carmel Church Rereview

Dear Ms. Cooney:

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

According to the information in our files, the Reedy Creek Seeps Conservation Site and the North Anna Bluffs Conservation Site are located within the project area, including a 100 foot buffer. Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation sites are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant.

The Reedy Creek Seeps Conservation Site has been assigned a biodiversity rank of B3, which represents a site of high significance. The natural heritage resources associated with this site are:

Juncus caesariensis	New Jersey rush	G2G3/S2/SOC/LT
Mimosa microphylla	Little-leaf sensitive-brier	G5T5/S1/NL/NL
Rhynchospora alba	Northern white beaksedge	G5/S2/NL/NL
Siren intermedia	Lesser Siren	G5/S2S3/NL/NL
Xyris curtissii	Curtiss' yellow-eyed grass	G5T5/S1/NL/NL
Carex vestita	Velvet sedge	G5/S2/NL/NL
Kalmia angustifolia	Sheep laurel	G5/S2/NL/NL
Sarracenia purpurea	Purple pitcher plant	G5/S2/NL/NL
Platanthera blephariglottis	Small white fringed orchid	G5/S2/NL/NL

An additional occurrence of New Jersey rush has been documented outside of the conservation site within the existing transmission line right-of-way on the eastern side of the submitted project shape.

The North Anna Bluffs Conservation Site has been assigned a biodiversity rank of B2, which represents a site of very high significance. The natural heritage resources associated with this site are:

Coastal Plain / Outer Piedmont Basic Mesic Forest	G4?/S3/NL/NL
Coastal Plain / Piedmont Floodplain Swamp (Green Ash - Red Maple Type)	G3G4/S3S4/NL/NL
Piedmont / Coastal Plain Hemlock - Hardwood Forest	G2G3/S1/NL/NL
Water-Willow Rocky Bar and Shore	G4G5/S4/NL/NL

In addition, the Little River At Rt. 688 Stream Conservation Site (SCS) is located within the project area. SCSs encompass stream/river reaches, waterbodies, and terrestrial contributing areas containing or associated with aquatic or semi-aquatic resources, including upstream and downstream reaches and tributaries up to 3-km stream distance from the aquatic resources. The size and dimensions of a SCS are based on the hydrology of the waterway and surrounding landscape, taking into consideration dam locations and whether the waterway is tidal. SCS's are also given a biodiversity significance ranking (B-rank) based on the rarity, quality, and number of element occurrences they contain. The Little River At Rt. 688 SCS has been given a B-rank of B3, which represents a site of high significance. The natural heritage resource associated with this SCS is:

Aquatic Natural Community (NP-Pamunkey Fourth Order Stream)	G2/S2/NL/NL

The documented Aquatic Natural Community is based on Virginia Commonwealth University's **INSTAR** (*Interactive Stream Assessment Resource*) database which includes over 2,000 aquatic (stream and river) collections statewide for fish and macroinvertebrate. These data represent fish and macroinvertebrate assemblages, instream habitat, and stream health assessments. The associated Aquatic Natural Community is significant on multiple levels. First, this stream is a grade B, per the VCU-Center for Environmental Sciences (CES), indicating its relative regional significance, considering its aquatic community composition and the present-day conditions of other streams in the region. This stream reach also holds a Healthy stream designation per the INSTAR Virtual Stream Assessment (VSS) score. This score assesses the similarity of this stream to ideal stream conditions of biology and habitat for this region. Lastly, this stream contributes to high Biological Integrity at the watershed level (6th order) based on number of native/non-native, pollution-tolerant/intolerant and rare, threatened or endangered fish and macroinvertebrate species present. Threats to the significant Aquatic Natural Community and the surrounding watershed include water quality degradation related to point and non-point pollution, water withdrawal and introduction of non-native species.

To minimize adverse impacts to the documented natural heritage resources within the project area, DCR recommends avoidance of the Reedy Creek Seeps Conservation Site and the North Anna Bluffs Conservation Site. To minimize adverse impacts to the Little River At Rt. 688 Stream Conservation Site, DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations, establishment/enhancement of riparian buffers with native plant species and maintaining natural stream flow. DCR also recommends avoidance of construction in wetlands and ephemeral ponds that may occur within the project area. DCR recommends resubmitting this project for further review as the project area becomes more defined.

In addition, the proposed project may impact Ecological Cores **(C1, C2, 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.

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.

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 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 North Anna River, which has been designated by the VDWR as a "Threatened and Endangered Species Water" for the Atlantic sturgeon is within the submitted project boundary including a 100-foot buffer. Therefore, DCR recommends coordination with the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) and Virginia's regulatory authority for the management and protection of this 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 Resources Division
Hannah Schul, VDWR

VAFWIS - Department of Wildlife Resources

37.92194 -77.48056
is the Search Point
Submit Cancel

Search Point
- **Change** to "clicked" map point
- **Fixed** at 37.92194 -77.48056

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

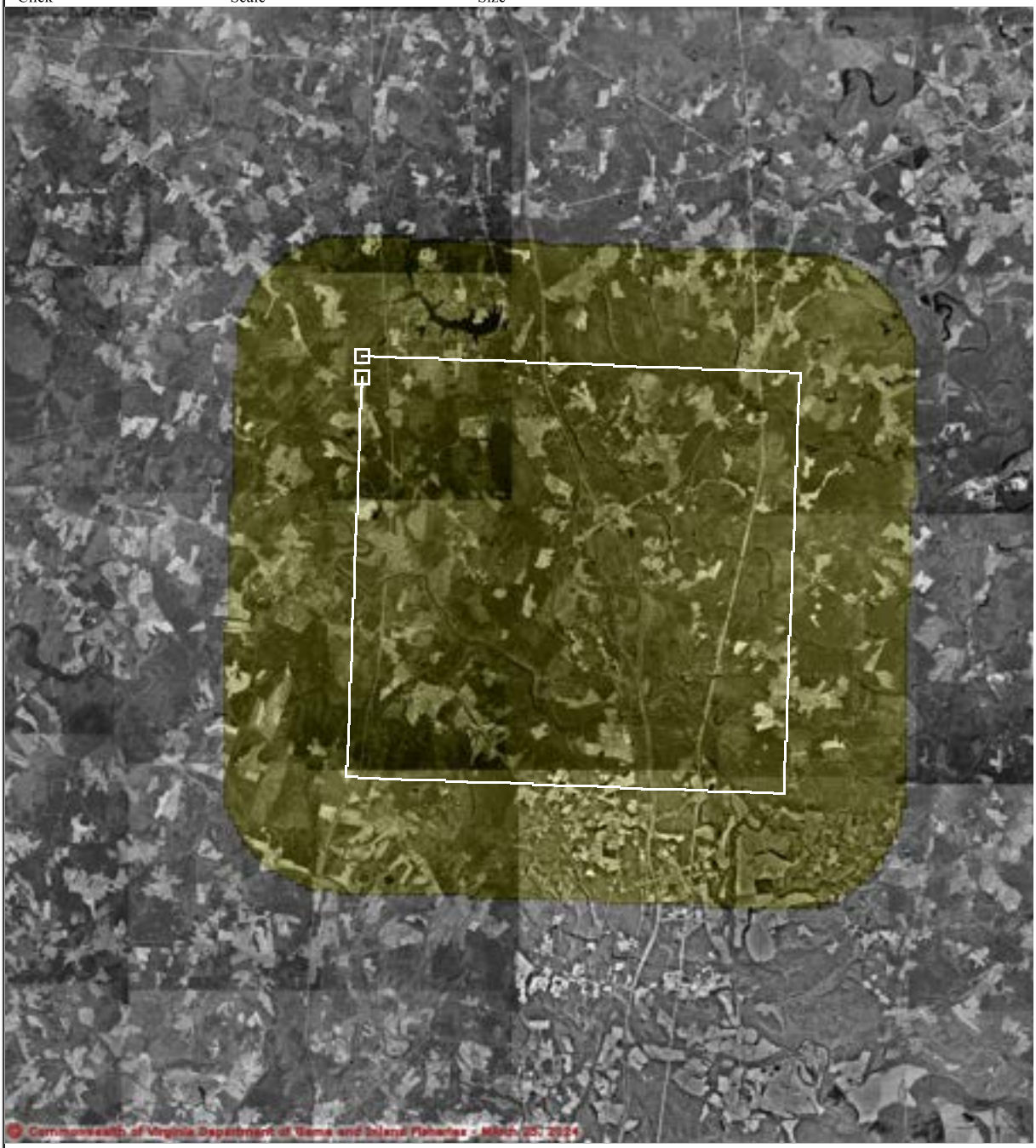
Search Point is at map center

Base Map Choices
BW Aerial Photography

Map Overlay Choices
Current List: Search

Map Overlay Legend
2 mile radius Search Area

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



Point of Search 37.92194 -77.48056
Map Location 37.92194 -77.48056

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: Black & White USGS Aerial Photography (see Microsoft terraserver-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 265968 and top 4216056. Pixel size is 31. .
Coordinates displayed are decimal Degrees North and West. Map is currently displayed as 1000 columns by 1000 rows for a total of 1000000 pixles. The map display represents 32000 meters east to west by 32000 meters north to south for a total of 1024.0 square kilometers. The map display represents 105004 feet east to west by 105004 feet north to south for a total of 395.5 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 2024-03-25 18:52:38 (qa/qc March 21, 2016 12:20 - tn=1974781 dist=3218 I
)
$poi=37.9760800 -77.5499700

VaFWIS Search Report Compiled on 3/25/2024, 6:54:54 PM

Help

Known or likely to occur within a **2 mile buffer around polygon; center 37.9760800 -77.5499699** in **033 Caroline County, 085 Hanover County, VA**

View Map of Site Location

496 Known or Likely Species ordered by Status Concern for Conservation (displaying first 26) (26 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
060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon		BOVA
010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes	BOVA,TEWaters
060029	FTST	IIa	Lance, yellow	Elliptio lanceolata		BOVA,HU6
050020	SE	Ia	Bat, little brown	Myotis lucifugus		BOVA
050034	SE	Ia	Bat, Rafinesque's eastern big-eared	Corynorhinus rafinesquii macrotis		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
060081	FPST	IIa	Floater, green	Lasmigona subviridis		BOVA
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
100079	FC	IIIa	Butterfly, monarch	Danaus plexippus		BOVA
030063	CC	IIIa	Turtle, spotted	Clemmys guttata	Yes	BOVA,SppObs,HU6
010077		Ia	Shiner, bridle	Notropis bifrenatus		BOVA,HU6
100248		Ia	Fritillary, regal	Speyeria idalia idalia		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		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

To view **All 496 species** View 496

*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**	
C182	Mattaponi river	Confirmed	6		IV	Yes
C39	Little river	Confirmed	1			Yes
C54	North Anna river	Confirmed	5		IV	Yes

Impediments to Fish Passage (9 records)

View Map of All Fish Impediments

ID	Name	River	View Map
569	BOULWARES MILLPOND DAM	DE JARNETTE MILL RUN	Yes
533	CAMPBELL DAM	BEAVER CREEK	Yes
684	CAROLINE PINES DAM	TR-NORTH ANNA RIVER	Yes
571	COBURN DAM	TR-POLECAT CREEK	Yes
560	LAKE CAROLINE DAM	STEVENS MILL RUN	Yes
572	LAKE DEJARNETTE DAM	TR-NORTH ANNA	Yes
573	LAKE PINEWOOD DAM	TR-NORTH ANNA RIVER	Yes
570	R. COLLINS DAM	TR-MATTAPONI RIVER	Yes
674	USRY PROPERTY INC. DAM	TR-N ANNA RIVER	Yes

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters (19 Reaches)

View Map of All Threatened and Endangered Waters

Stream Name	T&E Waters Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
Mattaponi River (0125424)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Mattaponi River (0139702)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0103317)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0103421)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0103770)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0106914)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0111375)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0112643)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0112772)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0113850)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0116556)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0117847)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0118048)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0119036)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0119204)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0119424)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0119494)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes

North Anna River (0120219)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0123129)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests (1 records)

View Map of All Query Results
Bald Eagle Nests

Nest	N Obs	Latest Date	DGIF Nest Status	View Map
CA9901	15	Mar 1 2008	HISTORIC	Yes

Displayed 1 Bald Eagle Nests

Species Observations (441 records - displaying first 20 , 1 Observation with Threatened or Endangered species)

View Map of All Query Results
Species Observations

obsID	class	Date Observed	Observer	N Species			View Map
				Different Species	Highest TE*	Highest Tier**	
364388	SppObs	Jan 1 1900		1	CC	III	Yes
647921	SppObs	Sep 26 2022	Cameron Bryant	9		III	Yes
647922	SppObs	Sep 26 2022	Cameron Bryant	14		III	Yes
647900	SppObs	Jul 12 2022	Cameron Bryant	15		III	Yes
647899	SppObs	Jul 12 2022	Cameron Bryant	13		III	Yes
647880	SppObs	May 5 2022	Cameron Bryant	13		III	Yes
647881	SppObs	May 5 2022	Cameron Bryant	14		III	Yes
647823	SppObs	Sep 7 2021	Cameron Bryant	16		III	Yes
647824	SppObs	Sep 7 2021	Cameron Bryant	12		III	Yes

647805	SppObs	Jul 20 2021	Cameron Bryant	15		III	Yes
647806	SppObs	Jul 20 2021	Cameron Bryant	16		III	Yes
647793	SppObs	May 17 2021	Cameron Bryant	13		III	Yes
647792	SppObs	May 17 2021	Cameron Bryant	7		III	Yes
647530	SppObs	Sep 14 2020	Cameron Bryant	13		III	Yes
647531	SppObs	Sep 14 2020	Cameron Bryant	14		III	Yes
647503	SppObs	Jul 6 2020	Cameron Bryant	16		III	Yes
647504	SppObs	Jul 6 2020	Cameron Bryant	13		III	Yes
647483	SppObs	May 26 2020	Cameron Bryant	12		III	Yes
647482	SppObs	May 26 2020	Cameron Bryant	13		III	Yes
647426	SppObs	Sep 23 2019	Paul Vidonic	14		III	Yes

Displayed 20 Species Observations

Selected 441 Observations View all 441 Species Observations

Habitat Predicted for Aquatic WAP Tier I & II Species

N/A

Habitat Predicted for Terrestrial WAP Tier I & II Species

N/A

Virginia Breeding Bird Atlas Blocks (5 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**	
50126	Hewlett, SE	55		III	Yes
50136	Ladysmith, SE	60		III	Yes
50135	Ladysmith, SW	8		III	Yes
51126	Ruther Glen, SE	64		III	Yes
51136	Woodford, SE	48		III	Yes

Public Holdings:

N/A

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

FIPS Code	City and County Name	Different Species	Highest TE	Highest Tier
033	Caroline	374	FESE	I
085	Hanover	384	FESE	I

USGS 7.5' Quadrangles:
Hanover Academy
Hewlett
Ladysmith
Ashland
Ruther Glen
Woodford
Hanover
Penola

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
YO10	Newfound River	58	SE	I
YO23	North Anna River-Hawkins Creek	59	SE	I
YO25	Lower Little River	59	SE	I
YO26	North Anna River-Long Creek	58	SE	I
YO46	South River	56	FTST	I
YO47	Mattaponi River-Campbell Creek	64	FTSE	I
YO48	Polecat Creek	53	FTST	II
YO49	Reedy Creek	51	SS	II

Compiled on 3/25/2024, 6:54:54 PM I1974781.0 report=all searchType= P dist= 3218 poi= 37.9760800 -77.5499699 siteDD= 37.9760836 -77.5499761;37.9760259 -77.5429603;37.9759678 -77.5359445;37.9759093 -77.5289287;37.9758503 -77.5219130;37.9757910 -77.5148972;37.9757312 -77.5078815;37.9756709 -77.5008658;37.9756103 -77.4938501;37.9755492 -77.4868344;37.9754877 -77.4798187;37.9754258 -77.4728030;37.9753634 -77.4657874;37.9753006 -77.4587717;37.9752374 -77.4517561;37.9751738 -77.4447405;37.9751098 -77.4377248;37.9750453 -77.4307092;37.9749804 -77.4236937;37.9749151 -77.4166781;37.9748493 -77.4096625;37.9694956 -77.4097428;37.9641418 -77.4098232;37.9587881 -77.4099035;37.9534344 -77.4099837;37.9480806 -77.4100640;37.9427269 -77.4101443;37.9373732 -77.4102245;37.9320194 -77.4103048;37.9266657 -77.4103850;37.9213120 -77.4104652;37.9159582 -77.4105454;37.9106045 -77.4106256;37.9052508 -77.4107058;37.8998971 -77.4107860;37.8945433 -77.4108662;37.8891896 -77.4109463;37.8838359 -77.4110264;37.8784822 -77.4111066;37.8731285 -77.4111867;37.8677747 -77.4112668;37.8678404 -77.4182720;37.8679056 -77.4252773;37.8679704 -77.4322825;37.8680348 -77.4392878;37.8680988 -77.4462931;37.8681623 -77.4532984;37.8682254 -77.4603037;37.8682881 -77.4673091;37.8683503 -77.4743144;37.8684122 -77.4813198;37.8684736 -77.4883251;37.8685346 -77.4953305;37.8685951 -77.5023359;37.8686553 -77.5093413;37.8687150 -77.5163467;37.8687743 -77.5233521;37.8688332 -77.5303576;37.8688916 -77.5373630;37.8689496 -77.5443685;37.8690072 -77.5513739;37.8743611 -77.5513041;37.8797149 -77.5512343;37.8850687 -77.5511645;37.8904225 -77.5510947;37.8957763 -77.5510249;37.9011301 -77.5509550;37.9064839 -77.5508851;37.9118377 -77.5508153;37.9171916 -77.5507454;37.9225454 -77.5506755;37.9278992 -77.5506056;37.9332530 -77.5505357;37.9386069 -77.5504658;37.9439607 -77.5503959;37.9493145 -77.5503259;37.9546683 -77.5502560;37.9600222 -77.5501860;37.9653760 -77.5501160;37.9707298 -77.5500461

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Threatened and Endangered Waters where Sturgeon, Atlantic (010032) observed

37,58,33.8 -77,32,59.8 is **the Search Point**

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

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

Display at center | **Search Point** is not at map center

Base Map Choices
BW Aerial Photography

Map Overlay Choices
Current List: Position, Search, TEWaters

Map Overlay Legend

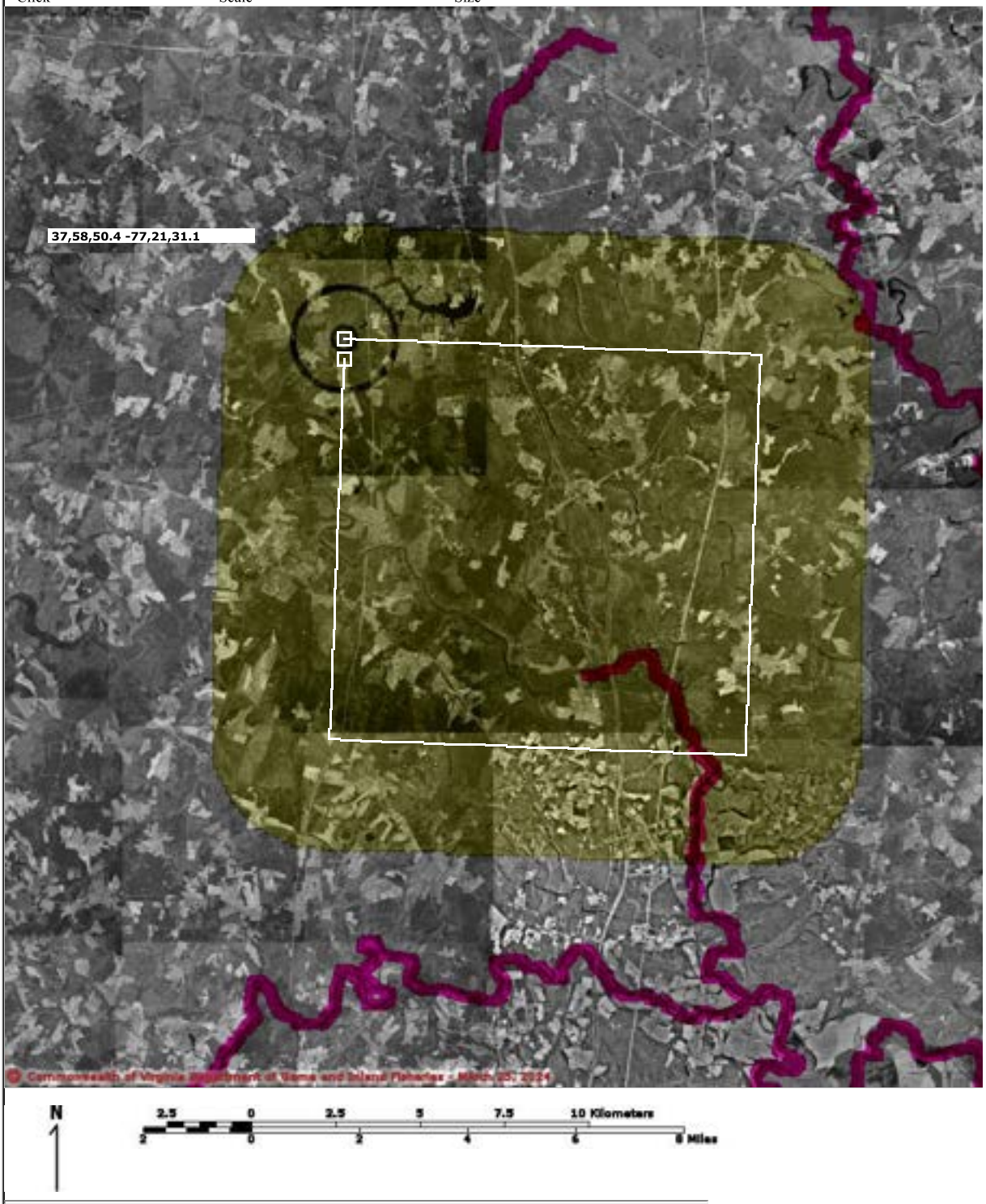
T & E Waters
Federal
State

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

2 mile radius Search Area

back | Refresh Browser Page

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



Point of Search 37,58,33.8 -77,32,59.8
Map Location 37,55,19.0 -77,28,50.0

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: Black & White USGS Aerial Photography (see Microsoft terraserver-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 265968 and top 4216056. Pixel size is 31. . Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 1000 columns by 1000 rows for a total of 1000000 pixles. The map display represents 32000 meters east to west by 32000 meters north to south for a total of 1024.0 square kilometers. The map display represents 105004 feet east to west by 105004 feet north to south for a total of 395.5 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 2024-03-25 18:55:34 (qa/qc March 21, 2016 12:20 - tn=1974781.1 dist=3218 I)
$poi=37.9760800 -77.5499699

Virginia Department of Wildlife Resources

3/25/2024 6:56:32 PM

Fish and Wildlife Information Service

VaFWIS Search Report Compiled on 3/25/2024, 6:56:32 PM

Help

Known or likely to occur within a **2 mile buffer around polygon; center 37.9760800 -77.5499699**
in **033 Caroline County, 085 Hanover County, VA**
where (010032) **Sturgeon, Atlantic** observed.

View Map of Site Location

Threatened and Endangered Waters where Sturgeon, Atlantic (010032) observed

(19 Reaches)

View Map of All Threatened and Endangered Waters

Stream Name	T&E Waters Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
Mattaponi River (0125424)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Mattaponi River (0139702)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0103317)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0103421)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0103770)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0106914)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0111375)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0112643)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0112772)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0113850)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes

North Anna River (0116556)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0117847)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0118048)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0119036)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0119204)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0119424)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0119494)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0120219)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
North Anna River (0123129)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes

*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.

Compiled on 3/25/2024, 6:56:32 PM I1974781.1 report=BOVA searchType= P dist= 3218 poi= 37.9760800 -77.5499699

audit no. 1974781 3/25/2024 6:56:32 PM Virginia Fish and Wildlife Information Service

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:
Project Code: 2024-0025642
Project Name: Carmel Church

09/23/2024 20:24:49 UTC

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

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

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

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

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

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 https://www.fws.gov/program/migratory-bird-permit/what-we-do.

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 Project 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
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds

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: 2024-0025642
Project Name: Carmel Church
Project Type: Transmission Line - New Constr - Above Ground
Project Description: This request is a part of a pre-permitting effort to determine feasibility of overhead powerline routes

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.92192925,-77.48062155,14z

Counties: Caroline and Hanover counties, Virginia

ENDANGERED SPECIES ACT SPECIES

There is a total of 8 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.

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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
Green Floater *Lasmigona subviridis* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7541	Proposed Threatened
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
Swamp Pink *Helonias bullata* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4333	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.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

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

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

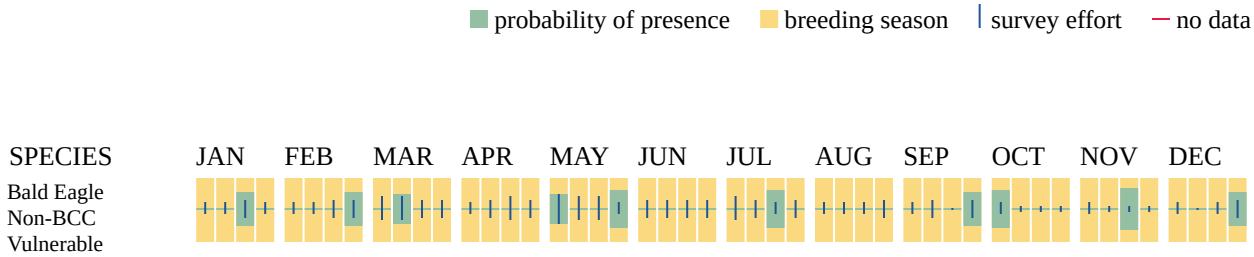
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Aug 31
Blue-winged Warbler *Vermivora cyanoptera* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9509	Breeds May 1 to Jun 30
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Chuck-will's-widow *Antrostomus carolinensis* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9604	Breeds May 10 to Jul 10
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10678	Breeds May 1 to Aug 20

NAME	BREEDING SEASON
Grasshopper Sparrow *Ammodramus savannarum perpallidus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8329	Breeds Jun 1 to Aug 20
Kentucky Warbler *Geothlypis formosa* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9443	Breeds Apr 20 to Aug 20
Prairie Warbler *Setophaga discolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9513	Breeds May 1 to Jul 31
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9439	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9478	Breeds elsewhere
Scarlet Tanager *Piranga olivacea* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11967	Breeds May 10 to Aug 10
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9431	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

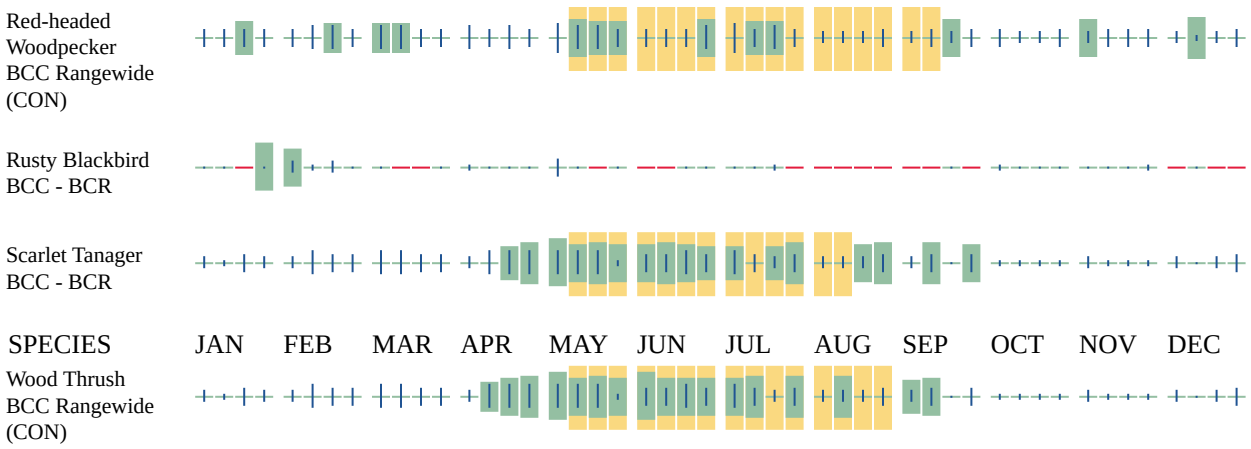
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

IPAC USER CONTACT INFORMATION

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

CCB Mapping Portal

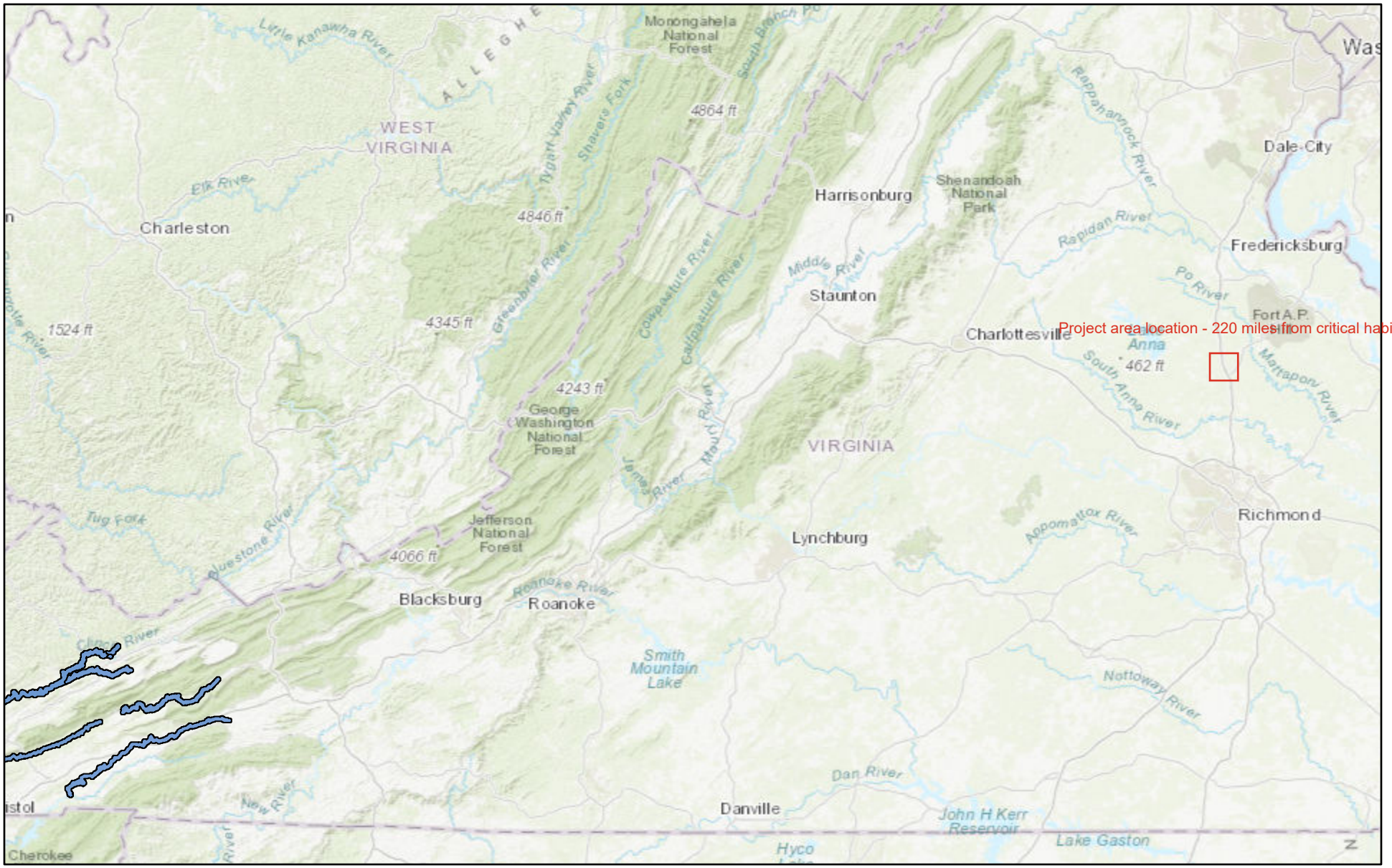
Layers: VA Eagle Nest Locator

Map Center [longitude, latitude]: [-77.45670318603516, 37.92348237861797]

Map Link:
https://ccbbirds.org/maps/#layer=VA+Eagle+Nest+Locator&zoom=12&lat=37.92348237861797&lng=-77.45670318603516&legend=legend_tab_7c321b7e-e523-11e4-aaa0-0e0c41326911&base=World+Imagery+%28ESRI%29

Report Generated On: 12/12/2023

Critical Habitat - Carmel Church



December 12, 2023

Virginia Critical Habitat (published)

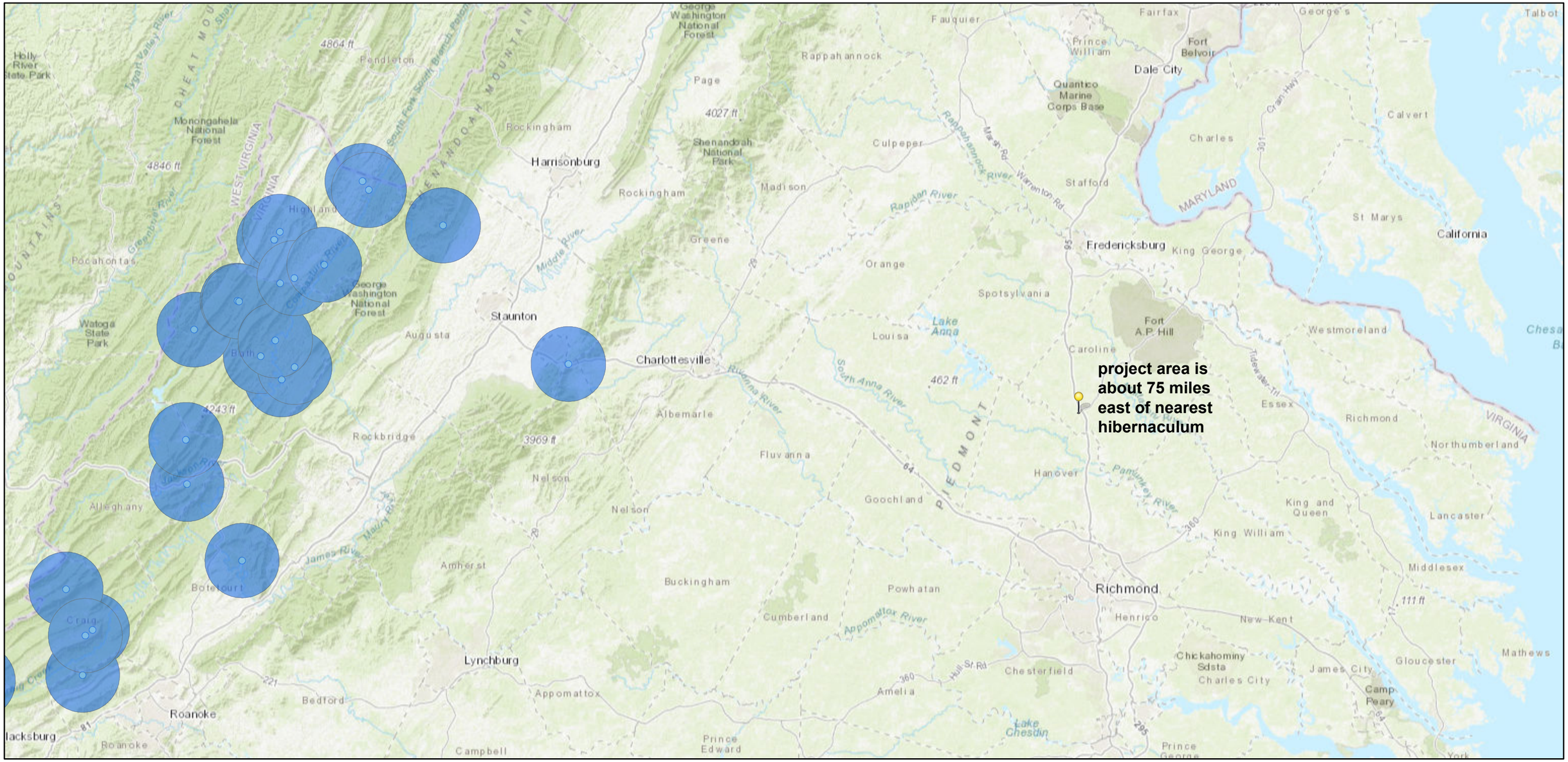
1:2,311,162

0 15 30 60 mi

0 25 50 100 km

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

MYLU-PESU Locations and Roost Trees - Carmel Church



12/12/2023, 2:33:59 PM

Tri-colored and Little Brown Hibernaculum Half Mile Buffer

Tri-colored and Little Brown Hibernaculum 5.5 Mile Buffer

1:1,155,581

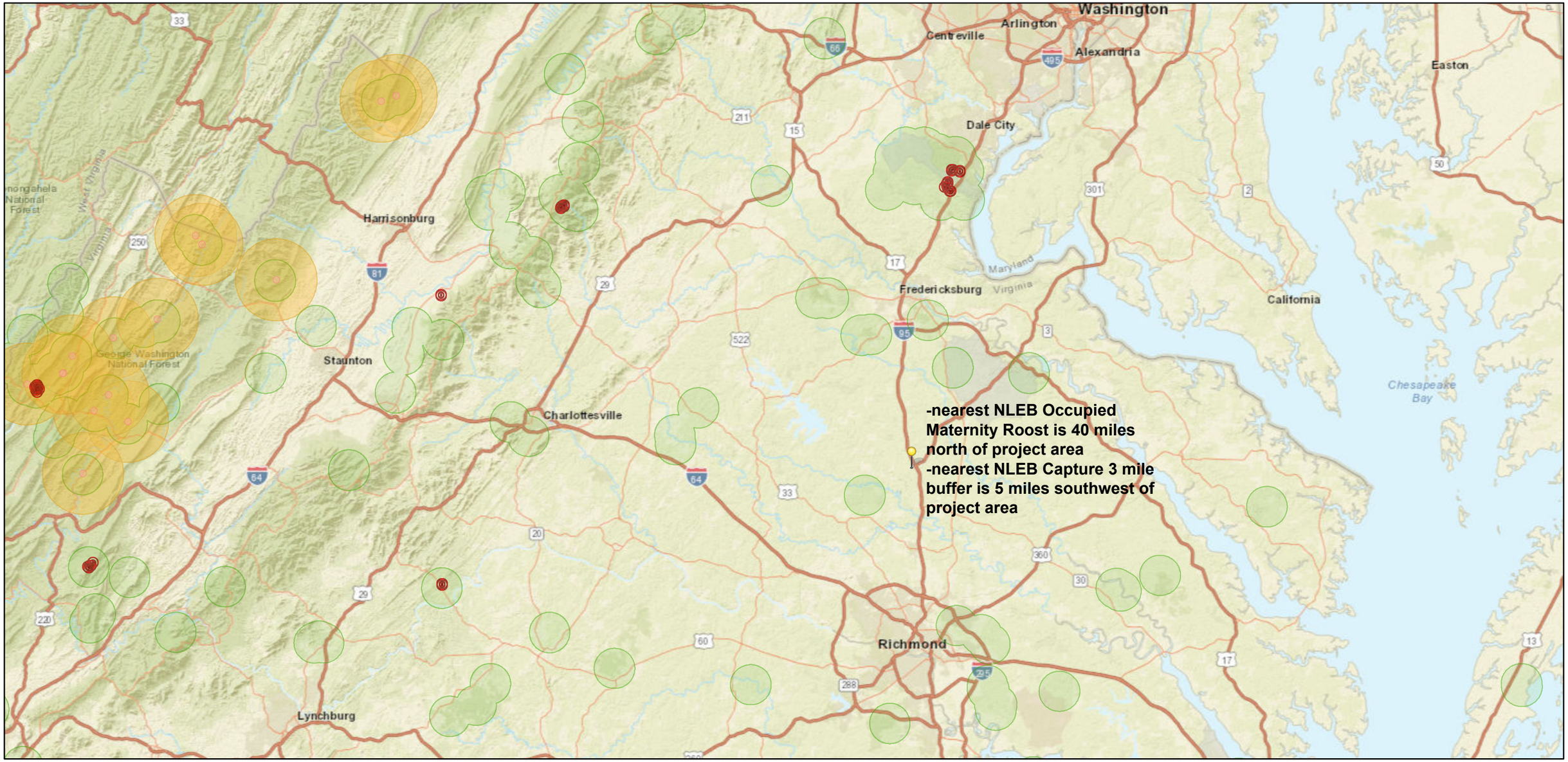
0 10 20 40 mi

0 15 30 60 km

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

Dept. Game and Inland Fisheries
Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS |

NLEB Locations and Roost Trees - Carmel Church



12/12/2023, 2:44:05 PM

- 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

1:1,155,581

0 10 20 40 mi

0 15 30 60 km

Esri, HERE, Garmin, NGA, USGS, NPS

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, NGA, USGS, NPS |

From: nhreview (DCR)
To: Briana Cooney
Cc: Hypes, Rene (DCR); Weber, Joseph (DCR)
Subject: Re: 0642267, Golden-Mars
Date: Thursday, May 23, 2024 9:58:13 AM
Attachments: image002.png
image003.png
image.png
image.png

EXTERNAL MESSAGE

Briana,

Thanks for your patience with this. I've reiterated your questions in blue, with answers below.

I was reviewing the SCS shapefile you all sent, and I noticed that there are pieces of the SCS that are now developed. Have there been any studies of this area recently? Are you able to tell me when this SCS area was created or last modified?

- Our **Chief of Biodiversity Information and Conservation Tools** said that there does seem to be areas of the SCS that were developed since it was created. Much of the SCS is still intact, however, and perhaps even more important for maintaining water quality for NHR.
- It looks like the SCS was last modified 7/6/2023. Stream Conservation Sites do not represent protected areas, but waterways and terrestrial areas that contribute to the habitat quality of the documented resource. These areas will affect the water quality of the Yellow lampmussel habitat regardless of their current land use.

I also noticed that the natural heritage resource associated with this SCS is the Yellow lampmussel; however, in my database searches, I haven't seen a documented occurrence of this species within the SCS or study area. Do you have additional information on the presence of this species?

- Generally we do not share the location of our documented resources, only the associated SCS or Conservation Site. Looking at my data, the Yellow lampmussel **is documented within the SCS**. The documented locations are in Broad Run, the main branch of the SCS in the northern portion. The other stream areas included in the SCS are upstream of documented occurrences and changes to the water quality within the SCS will impact the documented resource.
- I can't really comment on the lack of the Yellow lampmussel in the databases without knowing which ones you used. It would not be found in DWR or USFWS databases as it is not a listed species. NHDE (*Natural Heritage Database Explorer*) only shows documented occurrences to Tier 3 users, which is only available to our conservation partners.

I've also noticed in this project and previous projects that some ecological cores identified are less than 100 acres, and the VDCR letter states: "Ecological Cores are areas of at least 100 acres of continuous interior…" Should we continue to study cores that are under 100 acres?

- The cores are found in Virginia Natural Landscape Assessment Ecological Cores and Habitat Fragments data layer. It looks like the feature in question is a habitat fragment, the link above can give you some more information about Cores and Habitat Fragments.
- From our Chief of Biodiversity Information and Conservation Tools: "**Smaller areas of continuous interior cover (i.e., 10 to 99 acres) called Habitat Fragments support Ecological**

Cores and provide similar functions and values. Both feature types are discussed on the website.

- Ecological Cores and Habitat Fragments are ranked by Ecological Integrity based on variables including rare species habitats, habitat diversity, resilience, and water quality, to reflect the wide range of important benefits and ecosystem services they provide. Brief descriptions of Ecological Integrity rankings are:
- C1 – Outstanding: These cores tend to be large in area, of deepest interior, of greatest water quality protections, highest in habitat diversity and rich in rare species, including species listed as threatened or endangered. Of all Ecological Cores in the Commonwealth 1% are ranked as C1.
- C2 – Very High: These cores have all or many of the same characteristics and values as C1 cores, though to a lesser extent. About 2.5% of all cores in the Commonwealth are ranked C2.
- C3 – High, C4 – Moderate, and C5 – General: These cores, as well as **habitat fragments**, have some of the same quantifiable values and characteristics as higher-ranked cores, though much reduced due to their having substantially less interior area and smaller area overall.
-
- There are no Habitat Fragments ranked above C3. "

- Due to Habitat Fragments ability to provide important ecological functions and values, we do still recommend avoiding impacts and when impacts can not be avoided to keep them to the edge of the fragment/core. We only recommend a formal impact analysis for C1 and C2 Cores, which never include fragments.

Hopefully this information is helpful. I have Cc'd Joe Weber our Chief of Biodiversity Information and Conservation Tools and Rene' Hypes our Project Review Coordinator. Let me know if you have anymore questions or if any of the information here needs clarification.

Thank you,

Nicki Gustafson *(she/her)*
Project Review Assistant
Division of Natural Heritage
Virginia Department of Conservation and Recreation
600 E. Main Street, 24th Floor
Richmond, VA 23219
804-625-3979 | nicki.gustafson@dcr.virginia.gov

From: nhreview (DCR) <nhreview@dcr.virginia.gov>
Sent: Tuesday, May 21, 2024 11:48 AM
To: Briana Cooney <Briana.Cooney@erm.com>
Subject: Re: 0642267, Golden-Mars

Briana,

Thanks for you for reaching out again. We passed your question on to our Data Management Division when we received your email. They do the modeling for the Ecological Cores and the Stream Conservation Sites and we wanted to be sure we were giving you accurate information. I will circle back with them and see if they have more information for you. Thank you for your patience with this.

Best,

Nicki Gustafson *(she/her)*
Project Review Assistant
Division of Natural Heritage
Virginia Department of Conservation and Recreation
600 E. Main Street, 24th Floor
Richmond, VA 23219
804-625-3979 | nicki.gustafson@dcr.virginia.gov

From: Briana Cooney <Briana.Cooney@erm.com>
Sent: Tuesday, May 21, 2024 11:37 AM
To: nhreview (DCR) <nhreview@dcr.virginia.gov>
Subject: RE: 0642267, Golden-Mars

Hello!

I just wanted to follow up on my email below. Is someone able to address my questions? Thanks!

ERM
Sustainability is our business

Briana Cooney
Senior Consultant, Scientist
She/Her/Hers

Minneapolis
612-347-7114

erm.com

401-309-7028

From: Briana Cooney <briana.cooney@erm.com>
Sent: Wednesday, May 8, 2024 1:47 PM
To: nhreview (DCR) <nhreview@dcr.virginia.gov>
Subject: RE: 0642267, Golden-Mars

Hello!

I'm hoping to get a little more clarity on a couple things so I can study these areas effectively.

I was reviewing the SCS shapefile you all sent, and I noticed that there are pieces of the SCS that are now developed. Have there been any studies of this area recently? Are you able to tell me when this SCS area was created or last modified? I also noticed that the natural heritage resource associated with this SCS is the Yellow lampmussel; however, in my database searches, I haven't seen a documented occurrence of this species within the SCS or study area. Do you have additional information on the presence of this species?

I've also noticed in this project and previous projects that some ecological cores identified are less than 100 acres, and the VDCR letter states: "Ecological Cores are areas of at least 100 acres of continuous interior…" Should we continue to study cores that are under 100 acres?

Thanks for your insight!

ERM
Sustainability is our business

Briana Cooney
Senior Consultant, Scientist
She/Her/Hers

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612-347-7114
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From: nhreview (DCR) <nhreview@dcr.virginia.gov>
Sent: Friday, March 15, 2024 5:39 PM
To: Briana Cooney <briana.cooney@erm.com>
Subject: 0642267, Golden-Mars

EXTERNAL MESSAGE

Ms. Cooney,

Please find attached the DCR-DNH comments, shapefile, data agreement and invoice for the above referenced project. The comments are in pdf format and can be printed for your records. Also species rank information is available at http://www.dcr.virginia.gov/natural-heritage/help for your reference.

Along with our comments there is an invoice for our services. Please submit a copy of the invoice with payment to the Treasurer of Virginia, Department of Conservation and Recreation, Finance, 600 East Main Street, 24th Floor Richmond, VA 23219. Payment is due within 30 days of the invoice date. Late payment may result in the suspension of project review service for future projects. **To pay the invoice by credit card, please click here for the DCR credit card payment portal weblink or copy http://www.dcr.virginia.gov/payment-verification into your browser. It will take approximately 24 hours for the invoice to be available for payment in the online system.**

Please send a confirmation e-mail upon receipt of our comments. Thank you for the opportunity to provide this information.

Rene' Hypes
Environmental Review Coordinator
Virginia Department of Conservation and Recreation
Division of Natural Heritage
600 E. Main Street, Richmond, VA 23219
804-371-2708
rene.hypes@dcr.virginia.gov

Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Travis A. Voyles
Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus
Director
(804) 698-4020

February 27, 2024

Dominion Energy
120 Tredegar Street
Richmond, VA 23219
Attn: Elizabeth L. Hester

Transmitted Via Email: (Elizabeth.l.hester@dominionenergy.com)

Re: Dominion Energy (Electric Transmission) - AS&S - Program Renewal – 2024/2025

Dear Ms. Hester:

The Virginia Department of Environmental Quality (DEQ) hereby approves the Annual Standards and Specifications for Erosion & Sediment Control and Stormwater Management for Construction and Maintenance of Linear Electric Transmission Facilities for Dominion Energy's document dated "February 2024". This coverage is effective from February 27, 2024, to February 26, 2025.

To ensure compliance with approved specifications, the Virginia Erosion and Sediment Control Law and the Virginia Stormwater Management Act, DEQ staff will conduct random site inspections, respond to complaints, and provide on-site technical assistance with specific erosion and sediment control and stormwater management measures and plan implementation.

Please note that your approved Annual Standards and Specifications include the following requirements:

1. Variance, exception, and deviation requests must be submitted to DEQ separately from this Annual Standards and Specifications' submission. DEQ may require project-specific plans associated with such requests to be submitted for review and approval.

2. The following information must be submitted to DEQ for each project at least two weeks in advance of the commencement of regulated land-disturbing activities. Notifications shall be sent by email to: StandardsandSpecs@deq.virginia.gov
    a. Project name or project number;
    b. Project location (including nearest intersection, latitude and longitude, access point);
    c. On-site project manager name and contact info;

d. Responsible Land Disturber (RLD) name and contact info;
e. Project description;
f. Acreage of disturbance for project;
g. Project start and finish date; and
h. Any variances/exceptions/deviations associated with this project.

3. Project tracking of all regulated land disturbing activities (LDA) must be submitted to DEQ once per 6-month period. Project tracking records shall contain the same information as required in the two week e-notifications for each regulated LDA.

4. Erosion & Sediment Control and Stormwater Management plans must be reviewed by DEQ-certified Plan Reviewers. Dominion Energy, as the AS&S holder, retains the authority to approve plans and must do so in writing. Should an AS&S holder contract out to a third-party to fulfill the plan review function, the third-party Plan Reviewer may recommend approval of the plan, but final approval must come from the AS&S holder.

To ensure an efficient information exchange and response to inquiries, DEQ Central Office is your primary point of contact. Central Office staff will coordinate with our Regional Office staff as appropriate

Please contact Abigail Snider at 804-486-0365 or Abigail.Snider@deq.virginia.gov if you have any questions about this letter.

Respectfully,

Kyle Kennedy, Manager
Office of Stormwater Management

Cc: Larry Gavan, DEQ-CO
Antony Angueira, DEQ-CO

Ruther Glen 230 kV Electric Transmission Line Project

Pre-Application Analysis

PREPARED FOR

Dominion Energy Virginia

DATE
11 December 2024

REFERENCE
0721582

SIGNATURE PAGE

Ruther Glen 230 kV Electric Transmission Line Project

Pre-Application Analysis

0721582

Megan Wiginton
Senior Architectural Historian

MacKenzie Carroll
Architectural Historian

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Data Analytics and Visualization Specialist

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ACRONYMS AND ABBREVIATIONS

3D	three dimensional
CMOS	Complementary Metal Oxide Semiconductor
ERM	Environmental Resources Management
ESRI	Environmental Systems Research Institute
GNSS	Global Navigation Satellite System
GPR	Ground Penetrating Radar
ISO	International Organization for Standardization
JPEG	Joint Photographic Experts Group format
KOP	Key Observation Points
kV	kilovolt
MP	Milepost
NHL	National Historic Landmarks
NPS	National Park Service
NRHP	National Register of Historic Places
PBR	Physically Based Rendering
PDF	Portable Document Format
RAW	an unprocessed image
REC	Rappahannock Electric Cooperative
ROW	Right-of-Way
SCC	State Corporation Commission
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator
VCRIS	Virginia Cultural Resources Information System
VDHR	Virginia Department of Historic Resources
VDOT	Virginia Department of Transportation

EXECUTIVE SUMMARY

This report presents the findings of a pre-application analysis conducted for Dominion Energy Virginia's Ruther Glen 230 kilovolt (kV) Electric Transmission Line Project in Caroline County, Virginia. For this Project, the Company is proposing to construct and operate:

- One new, double-circuit, overhead 230 kV transmission line (Ruther Glen Line #256) in 160 feet of new rights-of-way will cut the existing Dominion Line #256 and connect to the proposed Ruther Glen Switching Station.
- One new 230 kV delivery point switching station (Ruther Glen Switching Station) in Caroline County, which will provide interconnection to REC to serve existing and planned development in the area.

Three potential routes were evaluated for the Ruther Glen Line, each of which cuts into the Ruther Glen Switching Station. This pre-application analysis assesses and compares potential impacts on previously recorded historic and archaeological resources in relation to each route. Impacts associated with construction and operation of the proposed Ruther Glen Switching Station were also considered and combined with the findings for each route. 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 State Corporation Commission (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 proposed alternative routes.

One previously recorded historic resource meeting criteria specified in the Guidelines falls within the study tiers defined by the VDHR. The likely impacts each route would have on this resource are presented in Table 1. All three routes pass near the same resource, the Olive Cemetery. ERM recommends that Routes 4 and 6 would have No Impact on the resource, and Route 5 would have a Minimal Impact on that resource.

TABLE 1 EXECUTIVE SUMMARY OF PROJECT IMPACTS TO CONSIDERED HISTORIC RESOURCES IN THE STUDY AREA OF THE ROUTE ALTERNATIVES

Considered Resource	Route Alternatives		
	Route 4	**Route 5**	**Route 6**
016-5243	No Impact	Minimal	No Impact

Source: VCRIS (2024)

The proposed Ruther Glen Line would be constructed entirely in new right-of-way measuring 160 feet wide. Dominion Energy Virginia would use multiple structure configurations for the Project. The new structures would be double circuit weathering steel monopoles, with heights ranging from

90 to 155 feet and an average height dependent on the selected route, excluding foundation reveal, and subject to change based on final engineering. Two circuits would be supported on the same structure type at approximately 500–700-foot intervals along the right-of-way for the Project.

Routes 4 and 6 would present No Impact on cultural resources while Route 5 would present a Minimal Impact on one resource. Either Route 4 or Route 6 would have the least impact on known historic and archaeological resources.

RUTHER GLEN 230 KV ELECTRIC TRANSMISSION LINE PROJECT
INTRODUCTION

1. INTRODUCTION

This report presents the findings of a pre-application analysis conducted for Dominion Energy Virginia's Ruther Glen 230 kilovolt (kV) Electric Transmission Line Project in Caroline County, Virginia. For this Project, the Company is proposing to construct and operate:

- One new, double-circuit, overhead 230 kV transmission line (Ruther Glen Line #256) in 160 feet of new rights-of-way will cut the existing Dominion Line #256 and connect to the proposed Ruther Glen Switching Station.
- One new 230 kV delivery point switching station (Ruther Glen Switching Station) in Caroline County, which will provide interconnection to REC to serve existing and planned development in the area.

Three potential routes were evaluated for the proposed Ruther Glen Line, each of which cuts into the proposed Ruther Glen Switching Station (Figure 1). The pre-application analysis assesses potential impacts on previously recorded historic and archaeological resources relative to each route alternative. ERM conducted the pre-application analysis on behalf of Dominion Energy Virginia to assist in the development of a feasible Project design that minimizes impacts on historic resources. The study was completed in accordance with 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).

1.1 ROUTE ALTERNATIVES

1.1.1 ROUTE 4

Route 4 taps the Company's existing Line #256 approximately 0.8 mile due north of Golansville Road and extends west for approximately 1.1 miles across agricultural fields, forested land, a Columbia Gas Natural Gas easement and Balty Road. Following property lines west of Balty Road, Route 4 passes through forested parcels and crosses Dejarnette Mill Run twice before turning southwest to cross Boxley Road approximately 0.6 mile north of Golansville Road. West of Boxley Road, Route 4 turns northwest for approximately 1.1 miles through forested land east of Reedy Swamp and west of rural residential properties before turning west to enter the proposed Ruther Glen Switching Station.

Route 4 measures approximately 3.7 miles and would require a 160-foot of right-of-way. The cumulative right-of-way for this alternative (70.7 acres) and the proposed Ruther Glen Switching Station (7.5 acres) would encompass a combined 78.2 acres.

1.1.2 ROUTE 5

Route 5 taps the Company's existing Line #256 in the same location as Route 4 and follows the same path as Route 4 for the first approximately 2.0 miles. At this point, Route 5 turns north to cross Bath Road/Pond Road and extends north for approximately 0.80 mile through forested parcels and along the eastern edge of an agricultural parcel. Route 5 then turns west to run parallel to and south of the existing REC 115 kV easement for approximately 0.8 mile through

RUTHER GLEN 230 KV ELECTRIC TRANSMISSION LINE PROJECT INTRODUCTION

agricultural and then forested land. Route 5 then crosses and runs parallel to the north side of the REC easement for approximately 0.4 mile through forested land before entering the Ruther Glen Switching Station.

Route 5 measures approximately 4.0 miles and would require a 160-foot of right-of-way. The cumulative right-of-way for this alternative (77.1 acres) and the proposed Ruther Glen Switching Station site (7.5 acres) would encompass a combined 84.6 acres.

1.1.3 ROUTE 6

Route 6 taps the Company's existing Line #256 in the same location as Route 4 and follows the same path as Route 4 for the first approximately 1.5 miles. At this point, Route 6 turns south for approximately 0.3 mile and then west for approximately 0.6 mile before crossing Boxley Road. This segment of Route 6 runs through forested land and crosses Dejarnette Mill Run three times, including two crossings north of Boulware Pond. After crossing BOxley Road, Route 6 turns northwest for approximately 1.2 miles through forested areas east of Reedy Swamp and west of rural residential properties along Boxley Road. Route 6 then crosses the existing REC 115 kV easement and turns west to enter the proposed Ruther Glen Switching Station.

Route 6 measures approximately 3.9 miles and would require a 160-foot of right-of-way. The cumulative right-of-way for this alternative (74.1 acres) and the proposed Ruther Glen Switching Station site (7.5 acres) would encompass a combined 81.6 acres.

1.2 MANAGEMENT RECOMMENDATIONS

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

One previously recorded historic resource meeting the criteria specified in the Guidelines falls within study tiers defined by the VDHR for transmission line routes (see Table 1). All three routes, Routes 4, 5, and 6, each pass near one considered architectural resources, the Olive Cemetery. Routes 4 and 6 would have No Impact on the resource, and Route 5 would have a Minimal Impact on that resource.

Routes 4 and 6 would present the least impact on cultural resources (archaeological and historic), with each assessed to have No Impact on the one resource in the study tiers. Route 5 would pose the greatest impact on cultural resources, creating a Minimal Impact on one resource. More information about the considered resource and the nature of potential impacts associated with the various route alternatives are found in the sections that follow.

RUTHER GLEN 230 KV ELECTRIC TRANSMISSION LINE PROJECT
INTRODUCTION

FIGURE 1 OVERVIEW OF TRANSMISSION LINE ROUTES UNDER CONSIDERATION FOR THE PROJECT

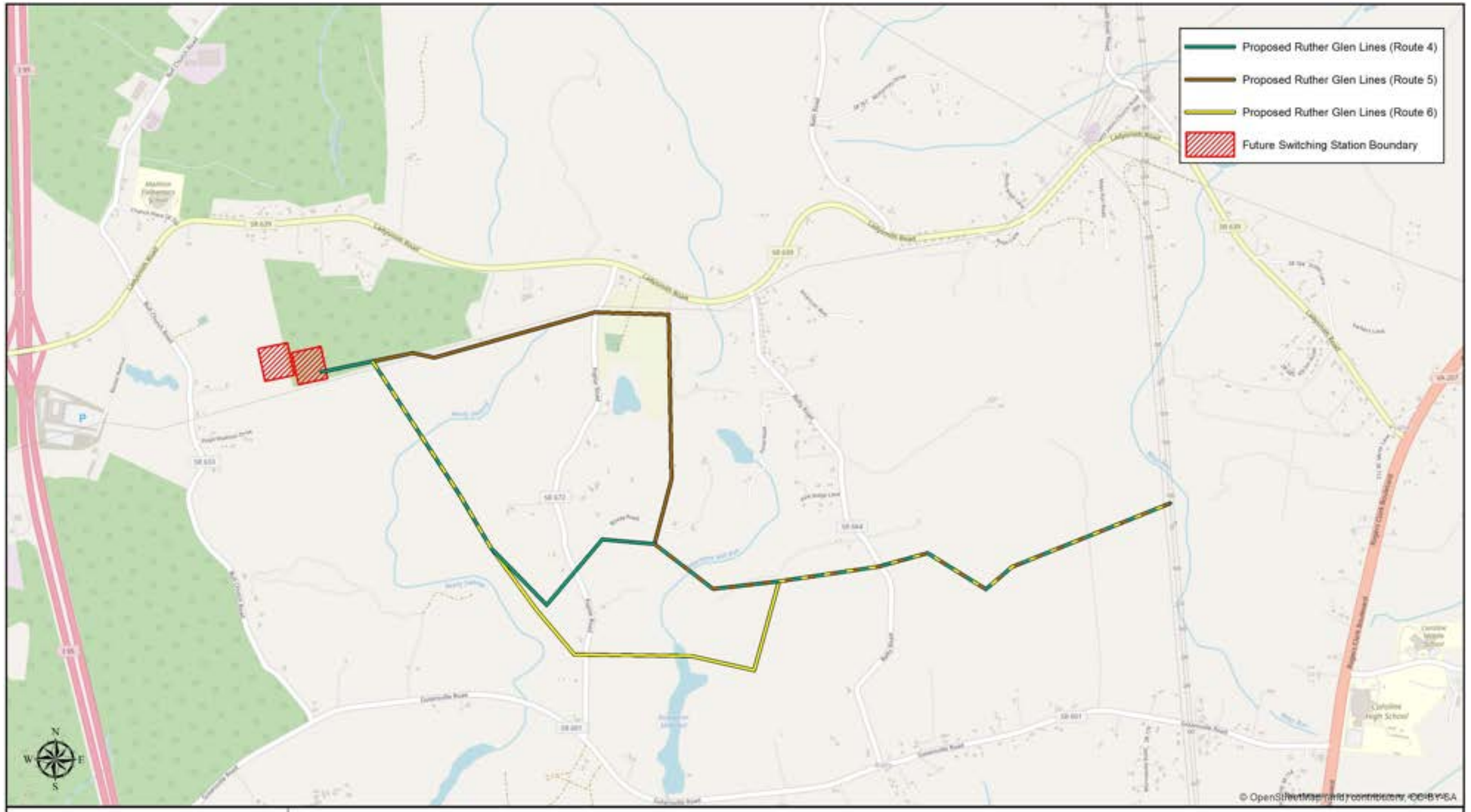

Figure 1
Overview of Transmission Line Segments under Consideration for the Project
Ruther Glen Project
Dominion Energy Virginia
Caroline County, VA

FILE: C:\Users\Vincent.macek\OneDrive - ERM\Dominion Carmel Church Ruther Glen\UPDATES b-24\Ruther Glen Figure 1.mxd | REVISED: 10/21/2024 | SCALE: 1:20,000 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 route alternatives under consideration in accordance with the VDHR Guidelines. For each route, this analysis identified and considered the following previously recorded resources.

- National Historic Landmarks (NHLs) within a 1.5-mile radius of each centerline;
- National Register of Historic Places (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 route alternative.

Data on previously recorded cultural resources within each study tier was sought from the Virginia Cultural Resources Information System (VCRIS). However, no previously recorded resources aligned with the criteria specified in the Guidelines were identified in the study tiers in the VCRIS database. ERM also sought information on locally significant resources by contacting several possibly interested parties: Caroline Historical Society, Hanover County Historical Society, Hanover County Black Heritage Society, Virginia Department of Transportation (VDOT), VDHR, Northern Virgnia Conservation Trust, Preservation Virginia, Virginia Genealogical Society, Virginia Museum of History and Culture, Woodfork Genealogy, and American Battlefield Trust. Information was collected on locally significant resources within a 1.0-mile radius of each proposed route centerline.

Along with the records review, ERM conducted field assessments of the considered historic resources along each route alternative in accordance with the Guidelines. Digital photographs of each resource and views to the proposed transmission lines were taken. Photo simulations and vegetated visual analysis were prepared to assess the potential for visual impacts deriving from construction of the new transmission line.

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 historic resources in the vicinity of each route alternative based on the VDHR's tiered study model defined in the Guidelines. The location of the one considered historic resource relative to the various route alternatives is shown on Figure 2. Individual maps for each route alternative are provided in Attachment 1.

FIGURE 2 LOCATION OF CONSIDERED HISTORIC RESOURCE IN RELATION TO ALTERNATIVE ROUTES

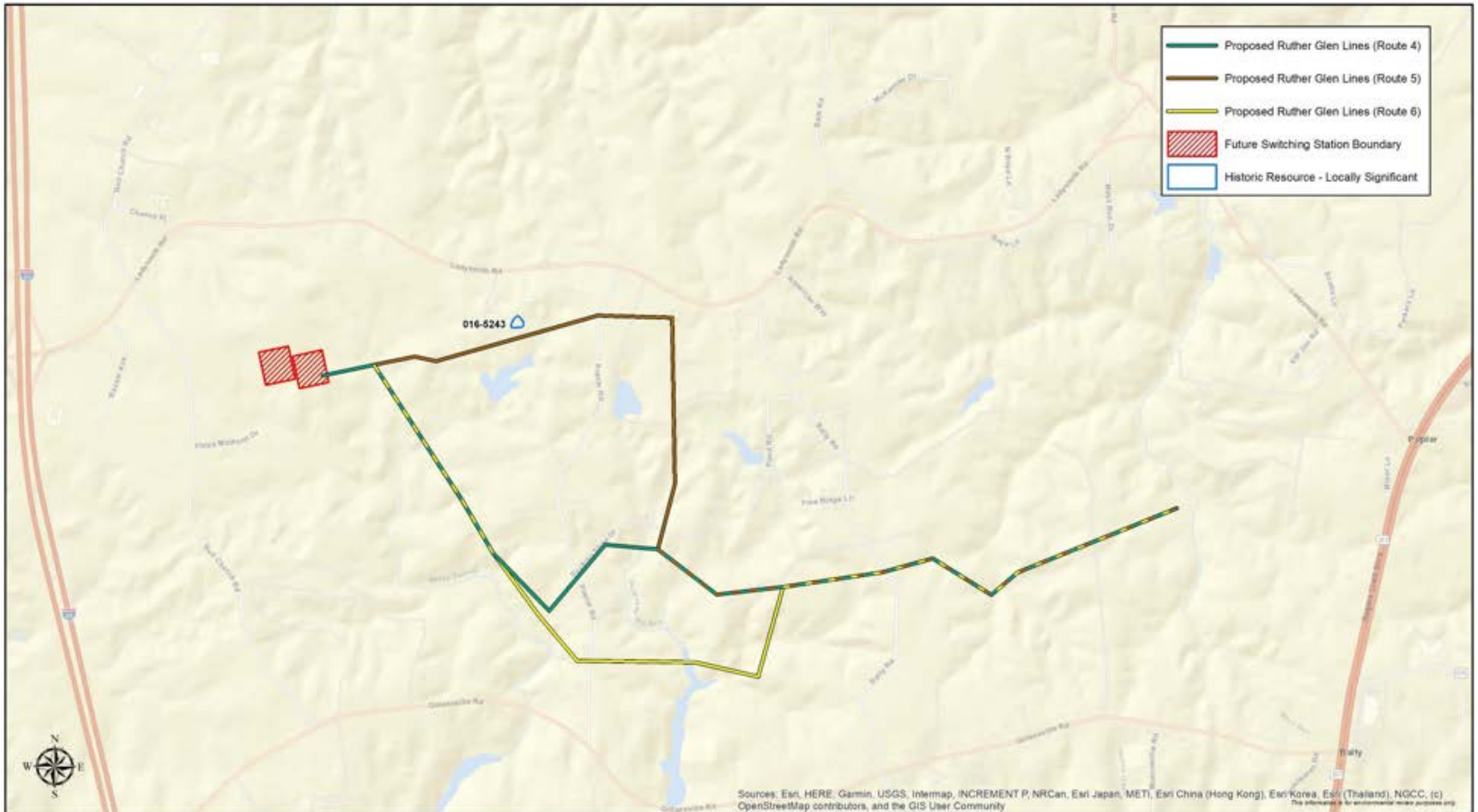

Figure 2
Location of Considered Historic Resource Along and Near Route Alternatives
Ruther Glen Project
Dominion Energy Virginia
Caroline County, VA

FILE: C:\Users\Vincent.mace\OneDrive - ERM\Dominion Carmel Church Ruther Glen\UPDATES 9-24\Ruther Glen Figure 2.mxd | REVISED: 10/21/2024 | SCALE: 1:20,000 when printed at 11x17 DRAWN BY: GIS

RUTHER GLEN 230 KV ELECTRIC TRANSMISSION LINE PROJECT RECORDS REVIEW

Resources located within what would be 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 changes to the viewshed introduced by the new transmission line structures and conductors. Resources in the 0.5-mile tier would not be directly impacted, but would likely be visually impacted, unless topography, vegetation, or the built environment obscures the view to the transmission line. At a distance of over 0.5 mile, it becomes less likely that a resource would be within line-of-sight of the proposed transmission line. Beyond 1.0 mile, it becomes even less likely that a given resource would be within line-of-sight of a transmission line.

Areas of overlap between routes mean that the impacts on some resources would likely be identical in those cases, depending on required structure placement. The nature of the impacts, 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 by the SCC, that route would be subject to a full historic architectural survey in which additional (as of yet, unrecorded) historic properties could be identified and Project impacts assessed. The survey area would be defined based on the design height of the transmission line structures, topography, tree cover, and other factors impacting line-of-sight from historic resources to the selected route.

2.3.1 ROUTE 4

The considered resource within the VDHR tiers for Route 4 is presented in Table 2 and depicted in Attachment 1, Sheet 1. This resource was subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

TABLE 2 HISTORIC RESOURCES IN THE VDHR TIERS FOR ROUTE 4

Buffer (Miles)	Resource Category	Resource Number	Description
0.0 to 0.5	Locally Significant	016-5243	Olive Cemetery

2.3.2 ROUTE 5

The considered resource within the VDHR tiers for Route 5 is presented in Table 3 and depicted in Attachment 1, Sheet 2. This resource was subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

TABLE 3 HISTORIC RESOURCES IN THE VDHR TIERS FOR ROUTE 5

Buffer (Miles)	Resource Category	Resource Number	Description
0.0 to 0.5	Locally Significant	016-5243	Olive Cemetery

RUTHER GLEN 230 KV ELECTRIC TRANSMISSION LINE PROJECT
RECORDS REVIEW

2.3.3 ROUTE 6

The considered resource within the VDHR tiers for Route 6 is presented in Table 4 and depicted in Attachment 1, Sheet 3. This resource was subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

TABLE 4 HISTORIC RESOURCES IN THE VDHR TIERS FOR ROUTE 6

Buffer (Miles)	Resource Category	Resource Number	Description
0.0 to 0.5	Locally Significant	016-5243	Olive Cemetery

RUTHER GLEN 230 KV ELECTRIC TRANSMISSION LINE PROJECT
PREVIOUS SURVEYS

3. PREVIOUS SURVEYS

There have been no previous cultural resource surveys covering portions of the alternative routes for Ruther Glen Line. Three prior surveys have been conducted within 1.5 mile of the Project routes and switching station sites, the nearest of which is approximately a mile away. Information on these previous surveys—including VDHR survey number, report title, report authors, and report date—is provided in Table 5. The extent of the previous survey coverage is depicted in Attachment 2.

TABLE 5 CULTURAL RESOURCE SURVEYS COVERING PORTIONS OF THE ALTERNATIVE ROUTES

VDHR Survey #	Title	Authors	Date
CE-009	Phase I Archaeological Reconnaissance Survey, Caroline County Park	Lyle E. Browning	1986
CE-172	A Cultural Resources Survey Associated with Route 639 Ladysmith Road Widening, Caroline County, Virginia	Nicholas Arnhold, Laura Purvis	2017
CE-198	A Phase I Cultural Resources Survey of Approximately 2.5 Acres Associated with the Proposed Development of Sheetz #37, in Ruther Glen, Virginia	Donald Sadler, Ellen Brady	2020

RUTHER GLEN 230 KV ELECTRIC TRANSMISSION LINE PROJECT
STAGE 1 PRE-APPLICATION ANALYSIS FINDINGS

4. STAGE 1 PRE-APPLICATION ANALYSIS FINDINGS

4.1 METHODS FOR ANALYSIS

Fieldwork for the pre-application analysis was conducted by Secretary of the Interior Qualified architectural historian MacKenzie Carroll between April 24–26, 2024. The fieldwork involved photographing resources requiring visual assessment according to the Guidelines and examining potential line-of-sight views from each resource toward the route alternativesPhotographs were taken from the public right-of-way nearest to the resource facing toward the applicable route(s).

Panoramic photographs were taken from the one considered 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 (KOP). 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 was 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 f1.4D prime
- Tripod: Manfrotto 055MF4 with Manfrotto 438 ball leveler
- Panoramic head: Manfrotto 303SPH

The following camera settings were used for all photography:

RUTHER GLEN 230 KV ELECTRIC TRANSMISSION LINE PROJECT STAGE 1 PRE-APPLICATION ANALYSIS FINDINGS

- Camera mode: Manual Priority
- ISO: 100
- Aperture: f13
- Image format: RAW

After the photos were complete, they were uploaded to a server to begin the simulation/ visualization process. The single-frame photographs were opened in Adobe Photoshop CC 2022 where they were checked, and any camera sensor dust spots were removed before being saved as high-resolution JPEG images. If required, discrete color and tonal adjustments were made to each frame before they were saved. The single-frame photographs were stitched together in PTGui Pro version 12.11 professional photographic stitching software using cylindrical projection settings. The camera locations were plotted in Global Mapper version 23.1. Digital models of the transmission line structures were provided by Dominion, then cleaned up and textured in Autodesk 3DS Max 2021. The transmission structures along each route were rendered in Vray version 5.2 from each SP camera location. 3D imagery was produced at the field of view using camera matching. Renderings for each route and each tower combination were then exported for use as an overlay.

Detailed, correctly dimensioned 3D computer models of the transmission structures 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 (see Attachment 3). These were textured using Vray PBR materials to simulate the weathering steel texture. The detailed, textured models were rendered to a digital image using a simulated physical camera and a sun and sky simulation lighting model in the computer software consistent with conditions within the original viewpoint photography.

Photomontages were produced by overlaying the rendered image on the photograph, using known control points and the wireline imagery showing the tower columns at the correct height and distance. Final adjustments were then made to the brightness and contrast of the rendered images to match them to the photograph. Final photomontages were prepared from each viewpoint for 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. Finally, the final images were cropped to the proportions required for the visual simulation figures, and the visualization figures were prepared in Adobe InDesign CC2022 and exported in a PDF format.

Additional viewshed renderings were conducted to assess the visibility of the three proposed route alternatives from Olive Cemetery (016-5243). 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 90 feet to 155 feet 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.

RUTHER GLEN 230 KV ELECTRIC TRANSMISSION LINE PROJECT STAGE 1 PRE-APPLICATION ANALYSIS FINDINGS

4.2 ASSESSMENT OF POTENTIAL IMPACTS

The assessment of potential Project impacts on individual resources made use of the visual assessment findings and categorized the level of impacts by severity according to the following scale devised by VDHR:

- **None**–Project is not visible from the resource.
- **Minima**l–Viewsheds have existing transmission lines, there would be only a minor change in height, and/or other views are partially obscured by topography or vegetation.
- **Moderate**–Viewsheds have more expansive views of the transmission line, more dramatic changes in height are proposed, and/or the overall visibility of the Project would be greater.
- **Severe**–Existing viewshed contains no transmission line, the view to the Project would be relatively unobstructed, the new transmission line would introduce a significant change to the setting of historic properties, and/or a dramatic change in the height of an existing transmission line would take place in close proximity to historic properties.

4.3 HISTORIC RESOURCE DESCRIPTIONS

4.3.1 016-5243, OLIVE CEMETERY

Olive Cemetery, a circa 1850 African American community cemetery, is located approximately 0.16 miles to the south of Ladysmith Road nestled deep in a wooded area just south of the St. Mary of the Annunciation Catholic Church (Attachment 4, Figure 1). According to previous surveyors the cemetery is partially delineated by barbed wire.

First surveyed in August of 2022 by Joanna Wilson-Green, the cemetery was noted as not being associated with the neighboring church located several hundred feet away. In November 2022, Wilson-Green resurveyed the resource, which was accompanied by the caretakers from the neighboring church. The resource was then surveyed again in December of 2023 by Sarah Lowry of New South Associates, who conducted ground penetrating radar (GPR). The GPR survey identified 225 potential cemetery features. Among those, it was noted that there were 81 probable and 135 possible graves totaling 216. Of the 216 possible graves, 36 had associated markers and mounds, 93 were identified by mounding only, while the remaining 87 were neither marked nor mounded. Of the remaining 9 cemetery features, all had GPR anomalies with no definitive information to it representing an interment. The earliest marked grave is from 1902, and the most recent marked grave dates to 1982. In March of 2024, Wilson-Green recorded the name change by the caretakers to Olive Cemetery as to not confuse it with a neighboring cemetery with a similar name.

016-5243 has not been formally evaluated for NRHP eligibility by VDHR, but ERM has categorized it as locally significant for the purposes of the Ruther Glen Project due to its ties to the local African American community. 016-5243 lies within the half-mile study tier for all three routes.

4.4 HISTORIC RESOURCE FINDINGS FOR ROUTE 4

The impacts to resource in Route 4 study tiers are discussed below. Photo simulations are provided in Attachment 5.

RUTHER GLEN 230 KV ELECTRIC TRANSMISSION LINE PROJECT STAGE 1 PRE-APPLICATION ANALYSIS FINDINGS

4.4.1 016-5234, OLIVE CEMETERY

Olive Cemetery is approximately 0.47 mile to the east-northeast of Route 4 and approximately 0.65 mile to the east-northeast of the proposed switching station (Attachment 5, Figure 1). The area between the resource and the route is densely wooded, except for an area of cleared land around a dwelling and along the existing transmission line running roughly east to west to the south of the cemetery. Due to the secluded location, one simulation was prepared for this resource from a vantage point located 0.11 miles to the north-northeast of the resource's boundary in the parking lot of a nearby church (KOP 007; Attachment 5, Figure 2). As shown by the simulation, there will be no view to the route or proposed switching station due to the existing vegetation and distance. Therefore, ERM recommends there would be **No Impact** on this resource from Route 4.

4.5 HISTORIC RESOURCE FINDINGS FOR ROUTE 5

The impacts to the historic resource in the Route 5 study tiers are discussed below. Photo simulations are provided in Attachment 5.

4.5.1 016-5243, OLIVE CEMETERY

Olive Cemetery is located approximately 183 feet to the north of Route 5, which follows along an existing transmission line right-of-way near this resource (Attachment 5, Figure 3). The area between the resource and the route consists of a thin strip of trees followed by a clearing for the existing transmission line running northeast to southwest.

Due to the secluded location, one simulation was prepared for this resource from a vantage point located 0.11 miles to the north-northeast of the resource's boundary in the parking lot of a nearby church (KOP 007; Attachment 5, Figure 4). From this location, the proposed Route 5 would not be visible due to the dense vegetation, although the bulk of the screening vegetation in the simulation is north of the resource, not between the resource and Route 5.

Because ERM was unable to take a simulation from the resource boundary that would capture actual sight lines to the route, ERM conducted additional modeling using the vegetated viewshed analysis, which analyzes vantage points across the resource and in the surrounding area looking towards Route 5. The model depicts where there is potential for transmission structures to be visible and quantifies the number of structures likely to be visible. According to the analysis, there will be no view of structures from the resource (Attachment 6, Figure 1). However, this analysis used available aerial imagery, which may differ from current conditions.

While the vicinity of the Olive Cemetery has been impacted by recent construction that might increase the visibility of Route 5 from vantage points within the resource, the viewshed has also been altered previously by the existing transmission line, which parallels the north side of Route 5's alignment and which has already introduced comparable modern infrastructure into the resource's viewshed. Even so, Route 5 would introduce additional modern elements that would be more prominent within the resource's viewshed, albeit partially obscured by dense vegetation during most of the year. Therefore, ERM recommends that Route 5 would have a **Minimal Impact** on 016-5243.

RUTHER GLEN 230 KV ELECTRIC TRANSMISSION LINE PROJECT STAGE 1 PRE-APPLICATION ANALYSIS FINDINGS

4.6 HISTORIC RESOURCE FINDINGS FOR ROUTE 6

The impacts to the resource in Route 6 study tiers are discussed below. Photo simulations are provided in Attachment 5.

4.6.1 016-5234, OLIVE CEMETERY

Olive Cemetery is approximately 0.47 mile to the east-northeast of Route 6 (Attachment 5, Figure 5). The area between the resource and the route is densely wooded, except for an area of cleared land around a dwelling and along the existing transmission line running roughly east to west to the south of the cemetery. Due to the secluded location, one simulation was prepared for this resource from a vantage point located 0.11 miles to the north-northeast of the resource's boundary in the parking lot of a nearby church (KOP 007; Attachment 5, Figure 6). As shown by the simulation, there will be no view to the route due to the existing vegetation and distance. Therefore, ERM recommends there would be **No Impact** on this resource from Route 6.

4.7 ARCHAEOLOGICAL RESOURCES WITHIN THE RIGHT-OF-WAY FOR THE ROUTE ALTERNATIVES

There are no known archaeological sites within the right-of-way for any of the alternative transmission line routes or switching station sites.

RUTHER GLEN 230 KV ELECTRIC TRANSMISSION LINE PROJECT CONCLUSIONS AND RECOMMENDATIONS

5. CONCLUSIONS AND RECOMMENDATIONS

As part of the effort to evaluate potential impacts from route alternatives associated with the Project, the pre-application analysis gathered information on archaeological and historic resources that qualify for consideration according to the VDHR Guidelines for transmission line projects.

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

One historic resource falls within the VDHR study tiers for the route alternatives under consideration. A comparison of the resource impacts from each route is presented in Table 6. Specifics on the impacts posed by each alternative are covered in the subsections that follow.

TABLE 6 COMPARISON OF PROJECT IMPACTS ON HISTORIC RESOURCES IN THE STUDY AREAS OF THE ROUTE ALTERNATIVES

Route Alternative	Number of Considered Resources in Each Impact Category				
	None	Minimal	Moderate	Severe	Total
Route 4	1	-	-	-	1
Route 5	-	1	-	-	1
Route 6	1	-	-	-	1

Final assessments of Project impacts will be dependent on the completion of identification-phase archaeological and historic architectural surveys along the route selected by the SCC, followed by 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 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 mitigations could be identified through consultation with VDHR and other consulting parties.

5.1 ROUTE 4

One previously recorded historic resource meeting the criteria specified in the Guidelines is within the VDHR study tiers for Route 4 (Table 7). The route would have No Impact on this historic resource.

RUTHER GLEN 230 KV ELECTRIC TRANSMISSION LINE PROJECT CONCLUSIONS AND RECOMMENDATIONS

TABLE 7 IMPACTS ON 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)	-	-	-
	National Register – eligible (Battlefields/Historic Landscape)	-	-	-
	Locally Significant	-	-	-
0.0 to 0.5	National Register Properties (Listed)	-	-	-
	National Register – Eligible	-	-	-
	Locally Significant	016-5243	Olive Cemetery	None
0.0 (within ROW)	National Register Properties (Listed)	-	-	-
	National Register – Eligible	-	-	-

ROW = right-of-way

5.2 ROUTE 5

One previously recorded historic resource meeting the criteria specified in the Guidelines is within the VDHR study tiers for Route 5 (Table 8). The route would have a Minimal Impact on this historic resource.

TABLE 8 IMPACTS ON HISTORIC RESOURCES IN THE VDHR STUDY TIERS FOR ROUTE 5

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)	-	-	-
	National Register – eligible (Battlefields/Historic Landscape)	-	-	-
	Locally Significant	-	-	-
0.0 to 0.5	National Register Properties (Listed)	-	-	-
	National Register – Eligible	-	-	-
	Locally Significant	016-5243	Olive Cemetery	Minimal
0.0 (within ROW)	National Register Properties (Listed)	-	-	-
	National Register – Eligible	-	-	-

ROW = right-of-way

RUTHER GLEN 230 KV ELECTRIC TRANSMISSION LINE PROJECT CONCLUSIONS AND RECOMMENDATIONS

5.3 ROUTE 6

One previously recorded historic resource meeting the criteria specified in the Guidelines is within the VDHR study tiers for Route 6 (Table 9). The route would have No Impact on this historic resource.

TABLE 9 IMPACTS ON HISTORIC RESOURCES IN THE VDHR STUDY TIERS FOR ROUTE 6

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)	-	-	-
	National Register – eligible (Battlefields/Historic Landscape)	-	-	-
	Locally Significant	-	-	-
0.0 to 0.5	National Register Properties (Listed)	-	-	-
	National Register – Eligible	-	-	-
	Locally Significant	016-5243	Olive Cemetery	None
0.0 (within ROW)	National Register Properties (Listed)	-	-	-
	National Register – Eligible	-	-	-

ROW = right-of-way

5.4 FUTURE INVESTIGATIONS

The next stage of assessing impacts on historic resources will be to conduct an identification-phase field survey to identify and assess resources along the specific route selected by the SCC that could be impacted by the Project. Survey 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 archaeological and historic architectural resources and documenting additional as-of-yet unrecorded 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

RUTHER GLEN 230 KV ELECTRIC TRANSMISSION LINE PROJECT CONCLUSIONS AND RECOMMENDATIONS

artifact collection/analysis. Site forms will be prepared for VCRIS 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 architectural resource regarding eligibility for listing on the NRHP and to assess Project impacts.

RUTHER GLEN 230 KV ELECTRIC TRANSMISSION LINE PROJECT REFERENCES

6. REFERENCES

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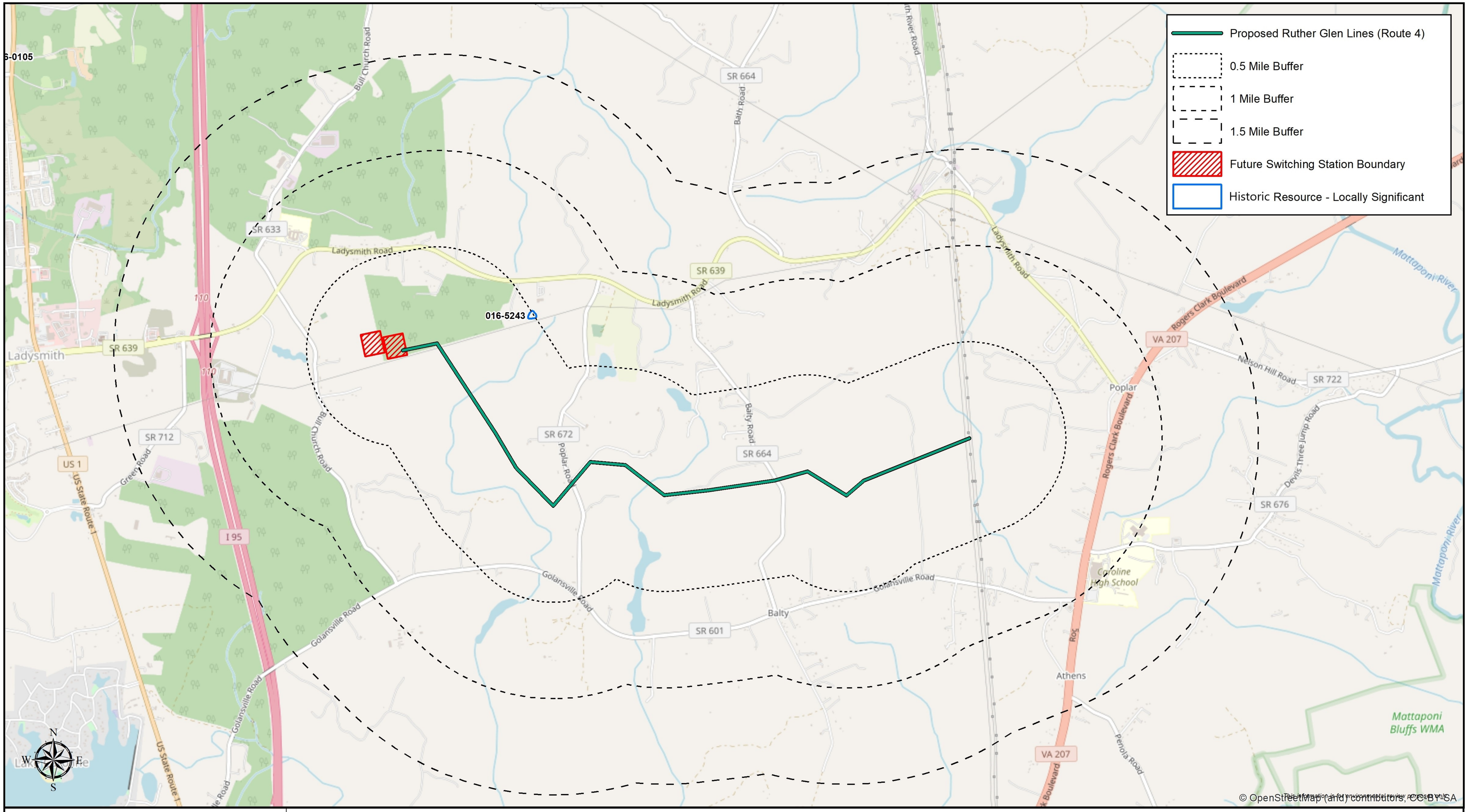
ATTACHMENT 1 LOCATIONS OF CONSIDERED HISTORIC RESOURCES ASSOCIATED WITH PROPOSED PROJECT



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Attachment 1, Sheet 1
Locations of Considered Resources Associated with Proposed Project Alternatives - Proposed Ruther Glen Lines (Route 4)
Ruther Glen Project
Dominion Energy Virginia
Caroline County, VA

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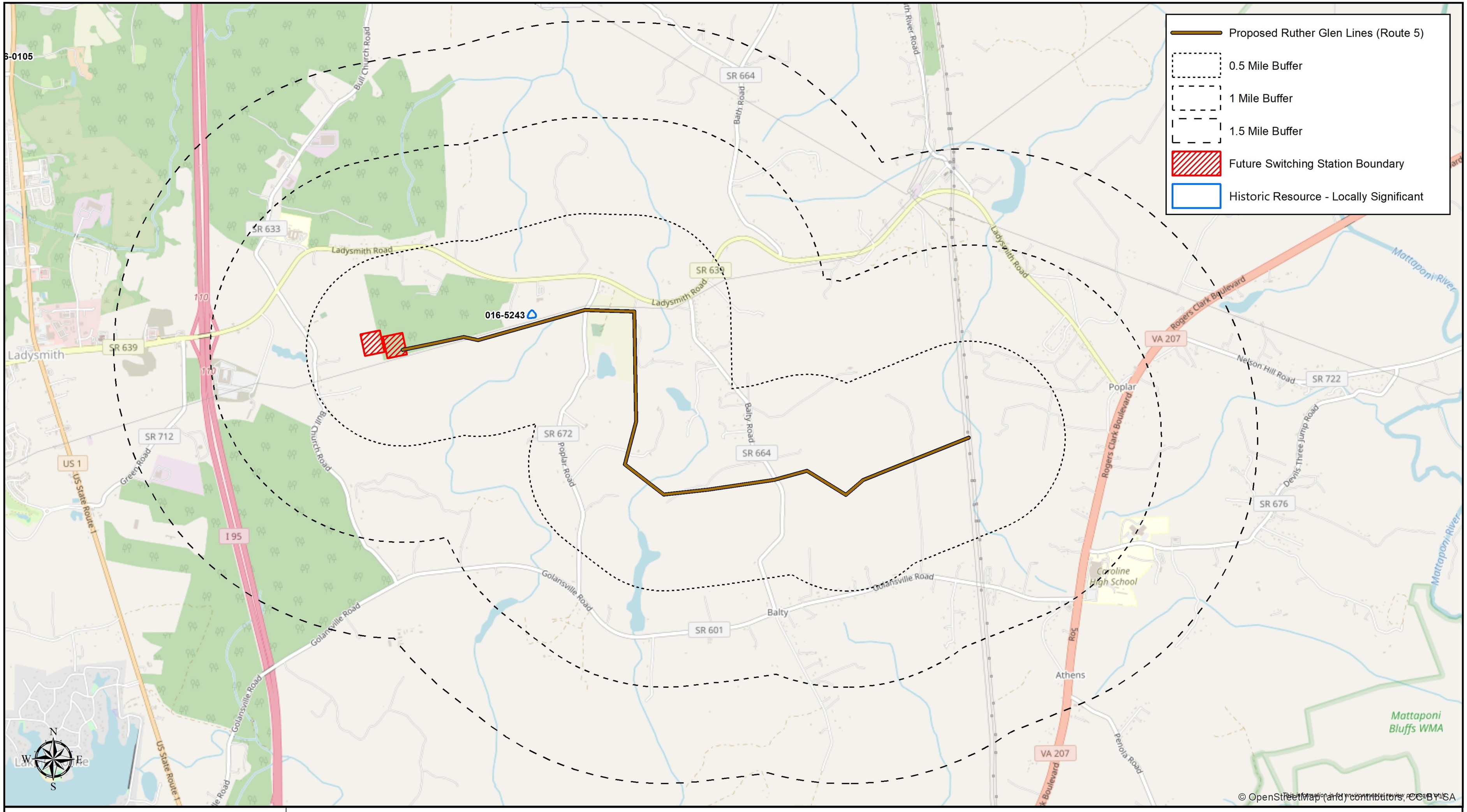

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Attachment 1, Sheet 2

Locations of Considered Resources Associated with Proposed Project Alternatives - Proposed Ruther Glen Lines (Route 5)

Ruther Glen Project

Dominion Energy Virginia

Caroline County, VA

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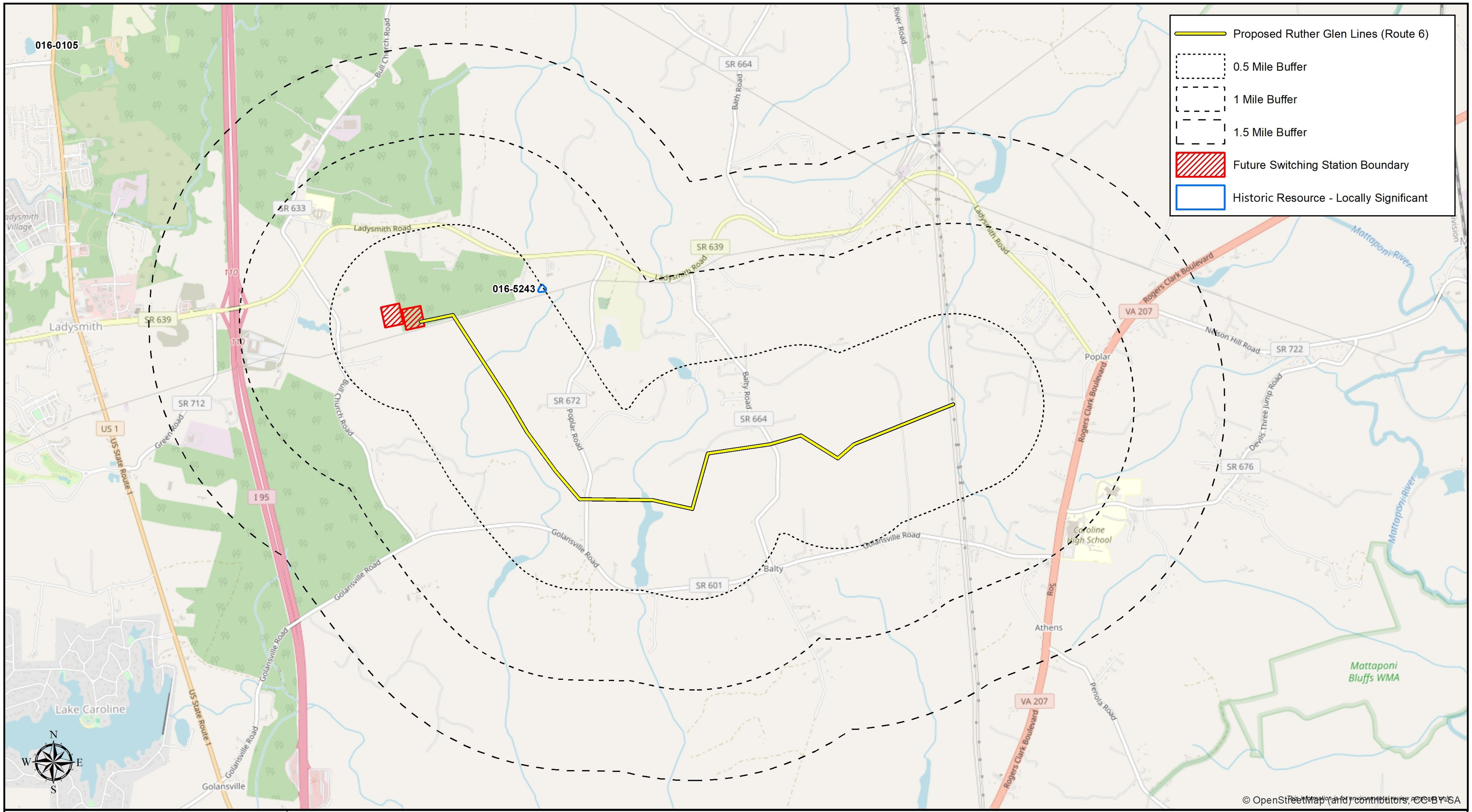

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Attachment 1, Sheet 3

Locations of Considered Resources Associated with Proposed Project Alternatives - Proposed Ruther Glen Lines (Route 6)

Ruther Glen Project

Dominion Energy Virginia

Caroline County, VA

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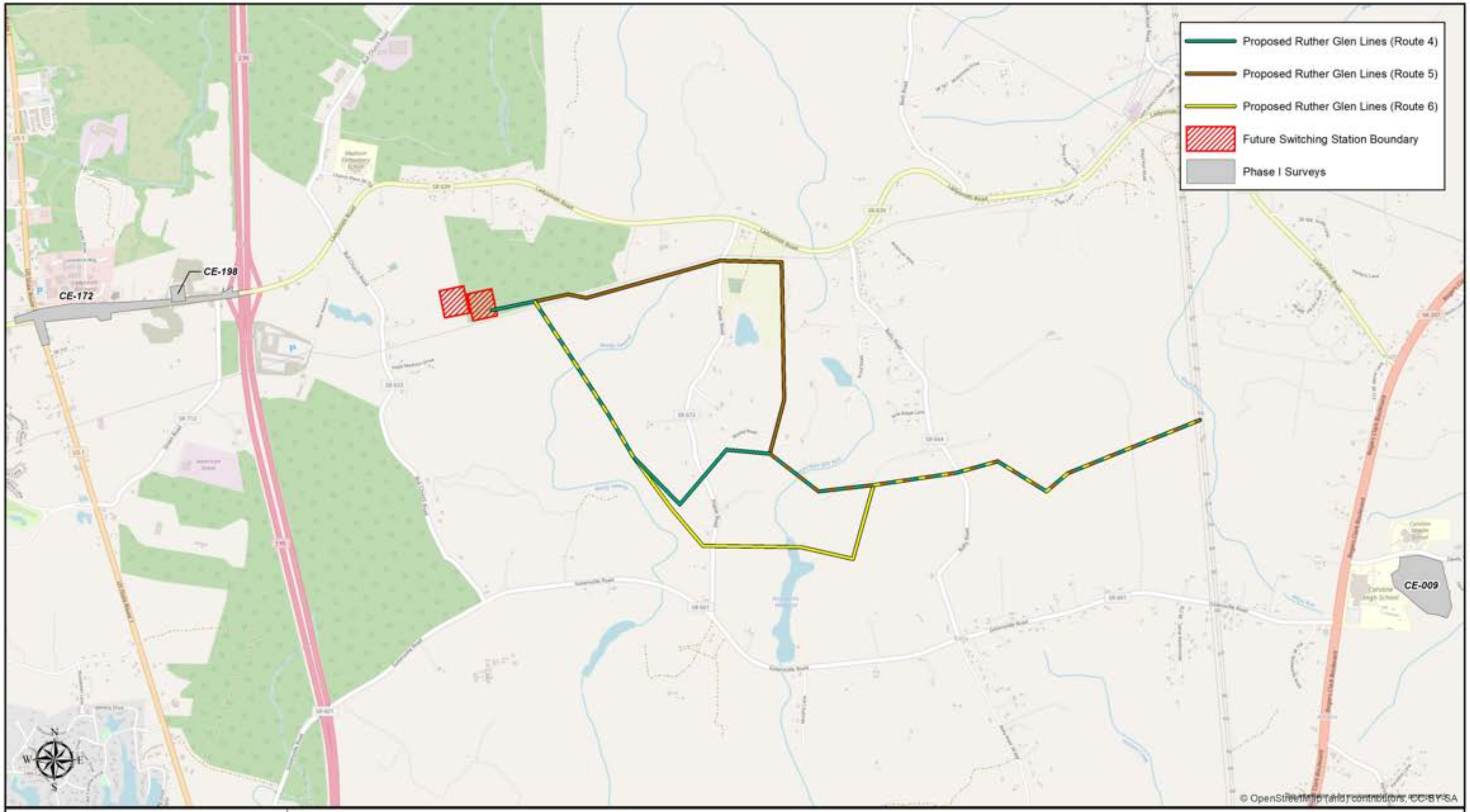
ATTACHMENT 2 CULTURAL RESOURCES SURVEYS COVERING PORTIONS OF ROUTES



0 0.25 0.5 0.75 1 Miles

1:24,000

Attachment 2
Location of Phase I Surveys Associated with Proposed Project Alternatives
Ruther Glen Project
Dominion Energy Virginia
Caroline County, VA

Dominion Energy

ERM

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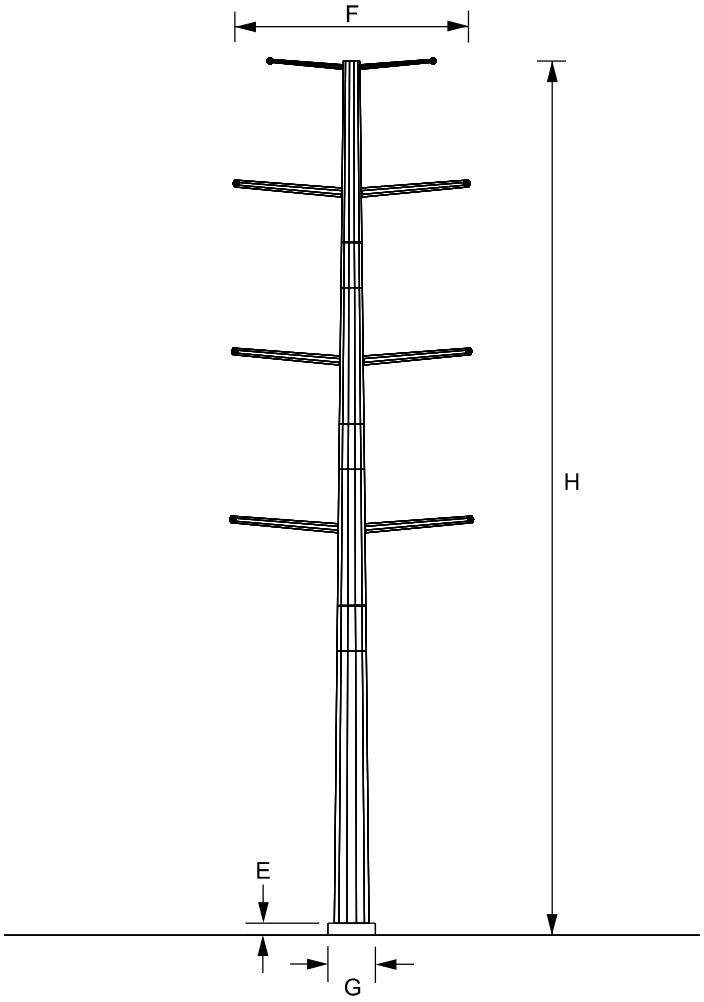
ATTACHMENT 3 TYPICAL DESIGN AND LAYOUT



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):	4.0 MILES (13 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' 155' 120'
I. AVERAGE SPAN LENGTH (RANGE):	571' - SEE NOTE 4
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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LINES 256, 2410 (ROUTE 5)

TYPICAL DC ENGINEERED MONOPOLE DOUBLE DEADEND STRUCTURE

ATTACHMENT NO.

II.B.3.a

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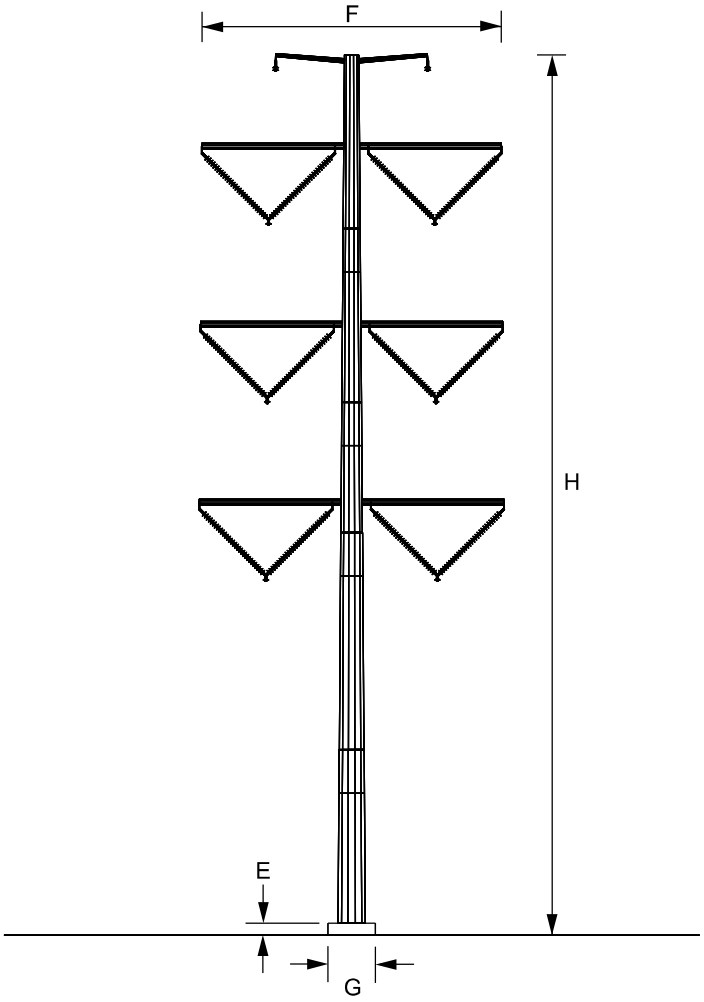

TYPICAL DC ENGINEERED MONOPOLE SUSPENSION STRUCTURE (V-STRING)

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):	4.0 MILES (20 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):	105' 135' 115'
I. AVERAGE SPAN LENGTH (RANGE):	571' - SEE NOTE 4
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

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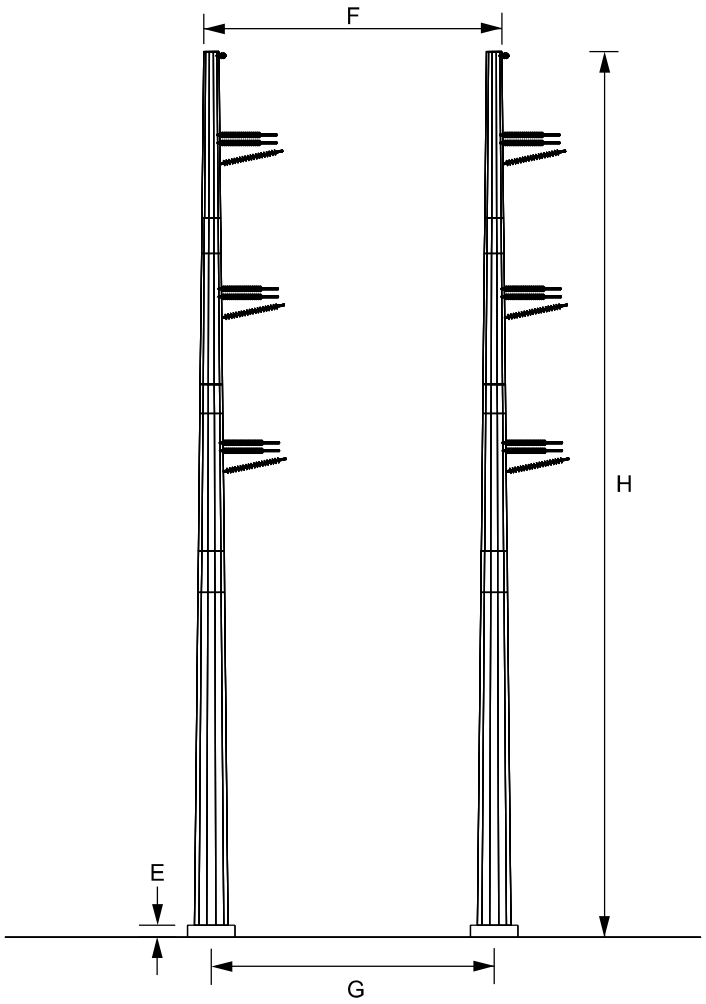
LINES 256, 2410 (ROUTE 5)

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):	4.0 MILES (2 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:	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):	100' 105' 103'
I. AVERAGE SPAN LENGTH (RANGE):	571' - SEE NOTE 4
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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LINES 256, 2410 (ROUTE 5)

TYPICAL DC ENGINEERED 2-POLE DOUBLE DEADEND STRUCTURE

ATTACHMENT NO.

II.B.3.c

DRAWN BY: SDH

ATTACHMENT 4 HISTORIC RESOURCE PHOTOS

Figure 1. 016-5243, Olive Cemetery, No View from the Public ROW, View to the South.

ATTACHMENT 5 PHOTO SIMULATIONS

Figure 1. Aerial photograph depicting land use and photo view for 016-5243.

EXISTING CONDITIONS

PROPOSED CONDITIONS

RUTHER GLEN

230 kV Electric Transmission Project

Dominion Energy Virginia

Caroline County, Virginia

Dominion Energy℠

KOP 007

Ladysmith Rd

Figure 2

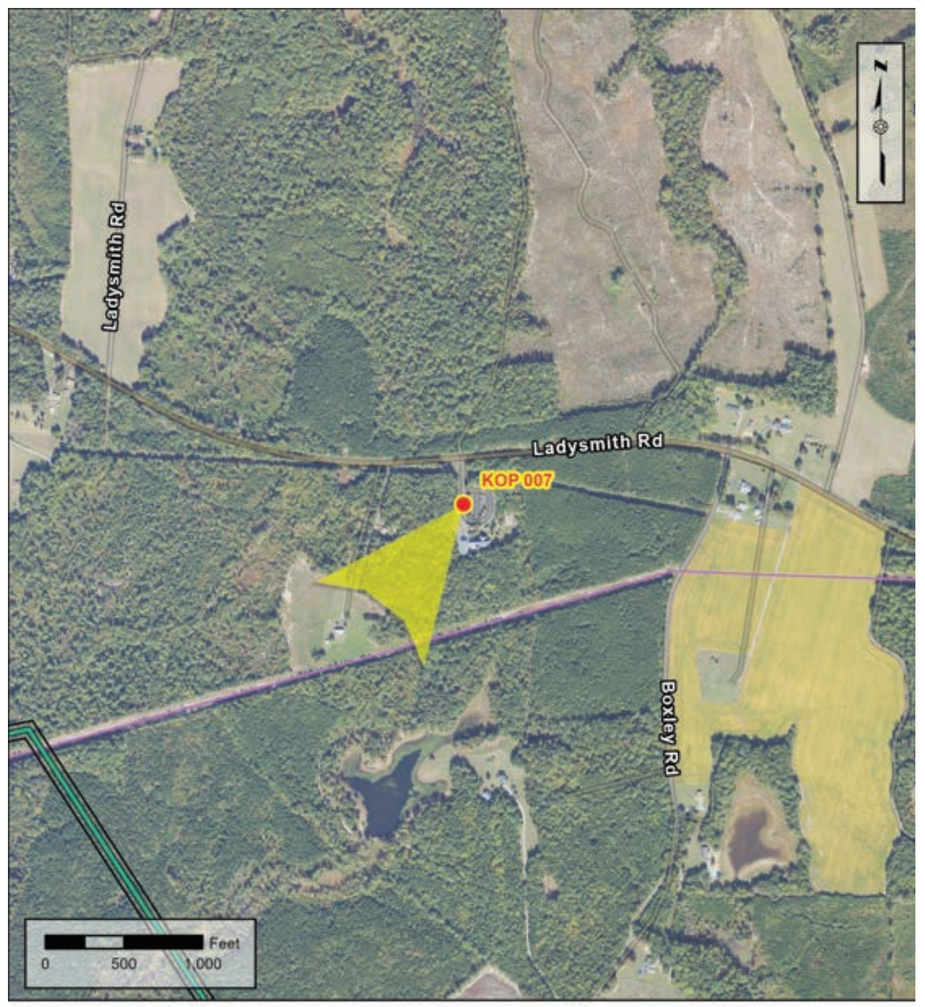
Route: 4

Date:07/25/2024

Time: 03:53 pm

Viewing Direction: Southwest

Distance to closest feature: 0.6 miles



Legend

- KOP View Direction
- Existing REC Line
- 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.

Figure 3. Aerial photograph depicting land use and photo view for 016-5243.

RUTHER GLEN
230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

Dominion Energy℠

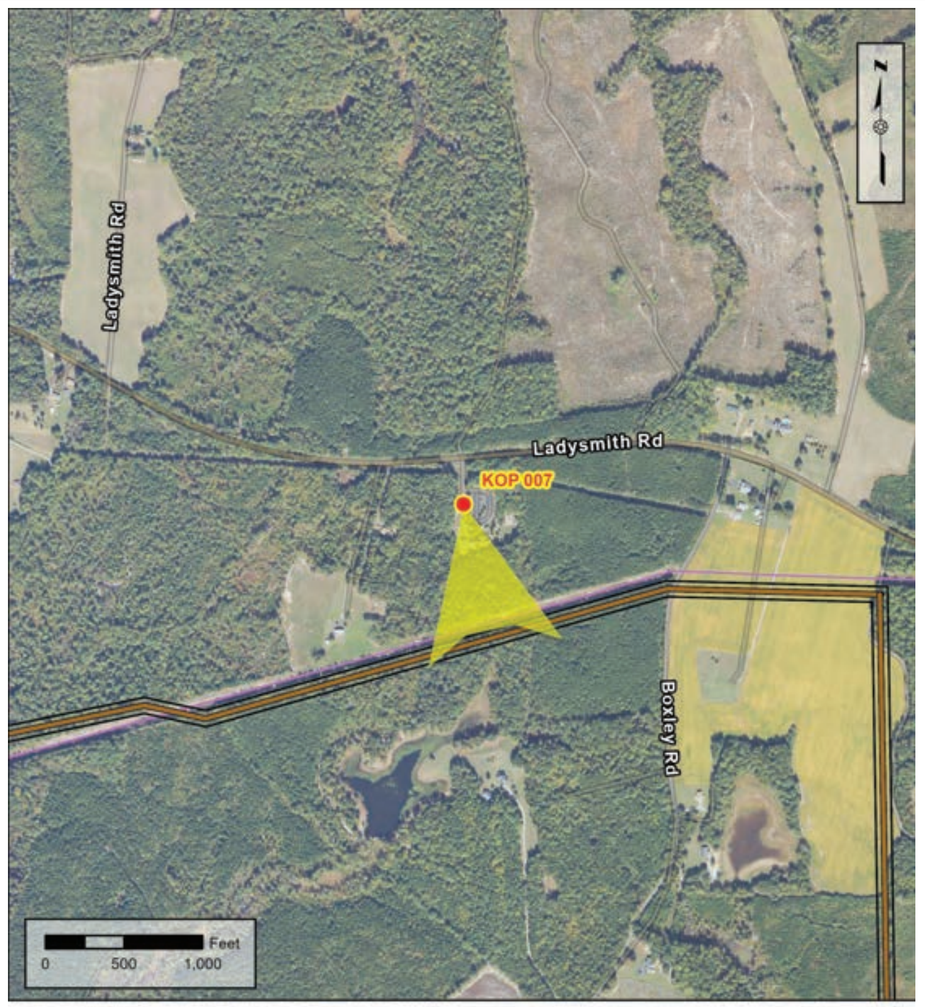
KOP 007

Ladysmith Rd

Figure 4
Route: 5
Date:07/25/2024
Time: 03:53 pm
Viewing Direction: South
Distance to closest feature: 0.2 miles

EXISTING CONDITIONS

PROPOSED CONDITIONS



Legend

- KOP View Direction
- Existing REC Line
- Route 5
- 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.

Figure 5. Aerial photograph depicting land use and photo view for 016-5243.

RUTHER GLEN
230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

Dominion Energy℠

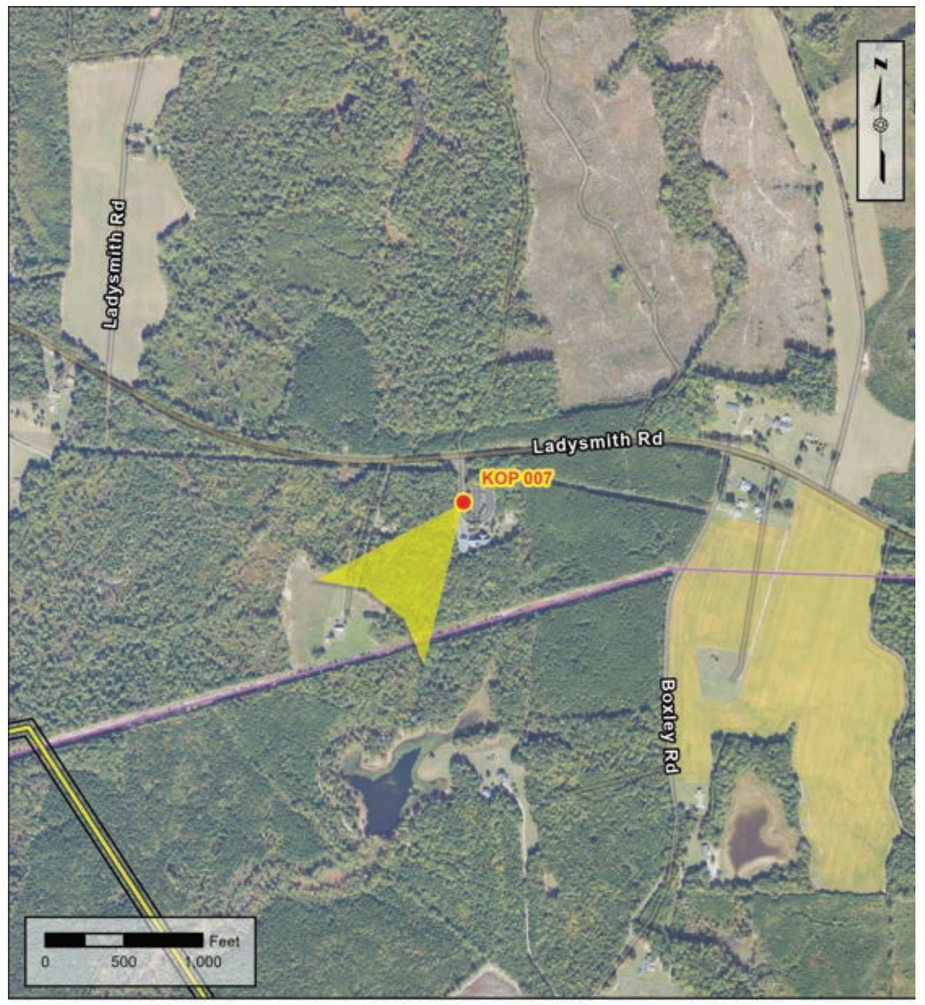
KOP 007

Ladysmith Rd

Figure 6
Route: 6
Date:07/25/2024
Time: 03:53 pm
Viewing Direction: Southwest
Distance to closest feature: 0.6 miles

EXISTING CONDITIONS

PROPOSED CONDITIONS

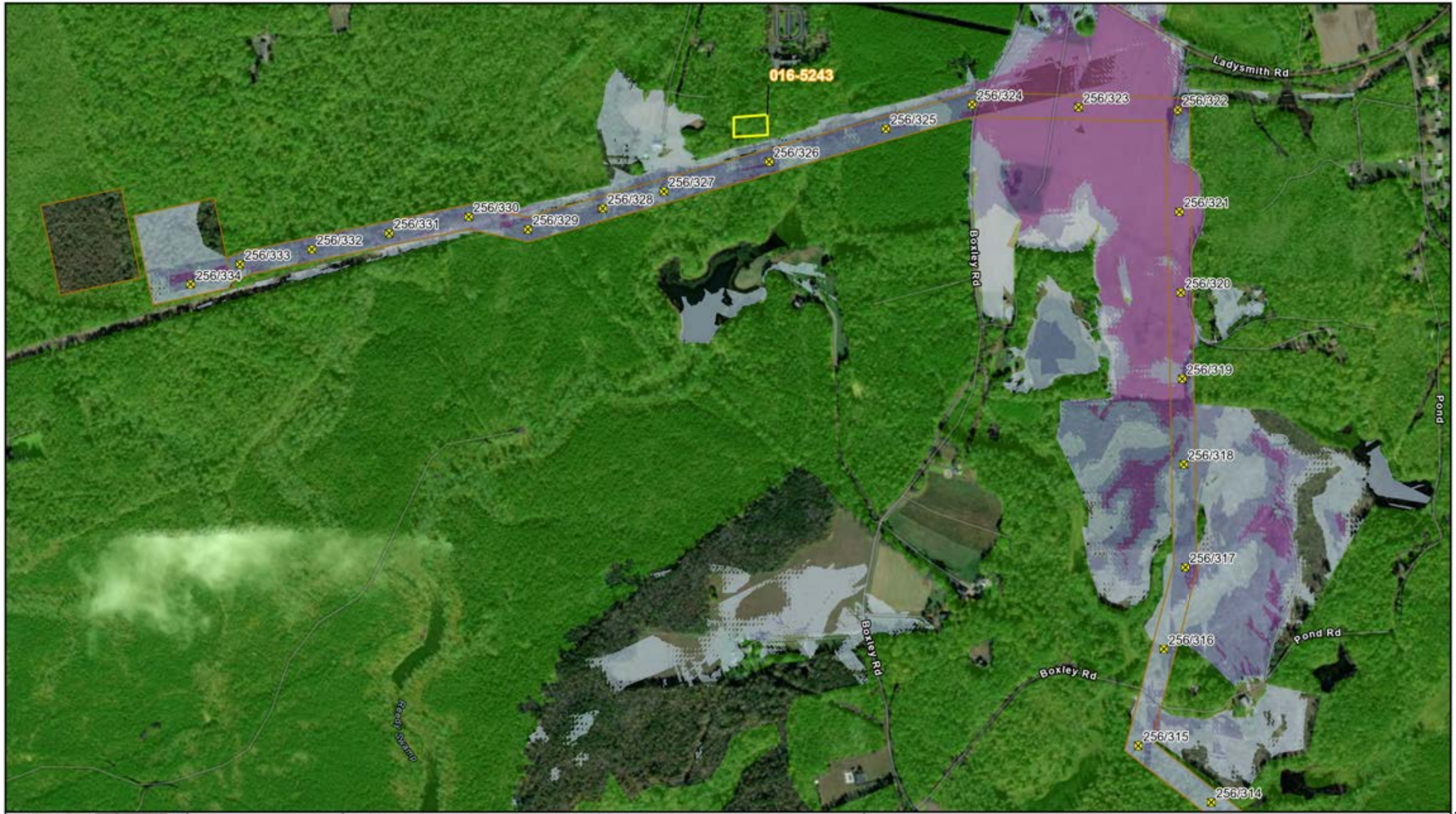


Legend

- KOP View Direction
- Existing REC Line
- Route 6
- 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.

ATTACHMENT 6 VEGETATED VIEWSHED ANALYSIS


016-5243
256/324
256/323
256/322
256/325
256/326
256/327
256/328
256/329
256/330
256/331
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256/333
256/334
256/321
256/320
256/319
256/318
256/317
256/316
256/315
256/314
Ladysmith Rd
Boxley Rd
Boxley Rd
Boxley Rd
Pond Rd
Pond
Reedy Swamp
Project Location
OH
WV
KY
Virginia
TN
0
300
600
Feet
1:7,200
Locally Significant Architecture Resource
Structure Locations
160' Right-of-Way
Modeled Vegetation
18 - 22 Structures Visible
9 - 18 Structures Visible
5 - 9 Structures Visible
1 - 5 Structures Visible
Route 5 Vegetated Viewshed Analysis - DSM
Ruther Glen 230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia
ERM
Dominion Energy
MPLS M:\US\Projects\D-F\Dominion\Carmel_Church_ArcGIS\2024\09\Cultural_VSA\Cultural_VSA.aprx\DOM_CRCH_RG_VSA_Rte5 | REVISED: 10/15/2024 | SCALE: 1:7,200 when printed at 11x17
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Carmel Church 230 kV Electric Transmission Line Project

Pre-Application Analysis

PREPARED FOR

Dominion Energy

DATE
11 December 2024

REFERENCE
0715013

SIGNATURE PAGE

Carmel Church 230 kV Electric Transmission Line Project

Pre-Application Analysis

0715013

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ACRONYMS AND ABBREVIATIONS

3D	three dimensional
ABPP	American Battlefield Protection Program
CMOS	Complementary Metal–Oxide–Semiconductor
CWSAC	Civil War Sites Advisory Commission
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
KOP	Key Observation Point
kV	kilovolt
MP	milepost
NHL	National Historic Landmark
NPS	National Park Service
NRHP	National Register of Historic Places
PBR	Physically Based Rendering
PDF	Portable Document Format
PotNR	Potential National Register Area
RAW	an unprocessed image
REC	Rappahannock Electric Cooperative
ROW	Right-of-Way
SCC	State Corporation Commission
SLR	Single-Lens Reflex
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
V-CRIS	Virginia Cultural Resource Information System
VDHR	Virginia Department of Historic Resources
VDOT	Virginia Department of Transportation
VLR	Virginia Landmarks Register

EXECUTIVE SUMMARY

This report presents the findings of a pre-application analysis conducted for Dominion Energy Virginia's Carmel Church 230 kilovolt (kV) Electric Transmission Line Project (Project) in Caroline County, Virginia. For this Project, the Company is proposing to construct and operate:

- A new, double circuit, overhead 230 kV transmission line (Carmel Church Loop) in new right-of-way that will cut the Dominion's existing Ladysmith CT – Four Rivers Line #256 (Line #256) and connect to the proposed Carmel Church Switching Station.
- A new 230 kV delivery point switching station in Caroline County, Virginia, which will provide interconnection to REC to serve existing and planned development in the area.

Two potential routes were evaluated for the Carmel Church transmission line. This pre-application analysis assesses and compares potential impacts on previously recorded historic and archaeological resources in relation to each route. Environmental Resources Management (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 State Corporation Commission (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 were identified within the right-of-way of the routes. Five previously recorded historic resources meeting criteria specified in the Guidelines fall within study tiers defined by the VDHR for identifying architectural resources along and near transmission line routes (Table 1). The likely impacts on individual historic resources associated with each route are presented in the table below.

Route 1 passes near three historic resources and intersects one historic resource meeting the criteria specified in the Guidelines. Route 2 passes near four historic resources and intersects one historic resource. ERM recommends that Route 1 would have No Impact on two of the identified resources, a Minimal Impact on one resource, and a Moderate Impact on the fourth resource. Route 2 would have No Impact on three historic resources, a Minimal Impact on one, and a Moderate Impact on one historic resource. Because both Routes 1 and 2 would create a Minimal Impact on one resource and a Moderate Impact on another resource, the routes would have an equal level of impact on known historic resources.

Dominion would construct the proposed Carmel Church line entirely within new right-of-way, measuring approximately 100 feet wide. Dominion would use weathered steel monopoles with heights ranging from 85 to 135 feet and and an average height of 109 or 111 dependent on the selected route, excluding foundation based on preliminary conceptual design, and subject to change based on final engineering. Each line structure would support two circuits. Structures would be installed at approximately 500- to 700-foot intervals along the Project's right-of-way.

TABLE 1 EXECUTIVE SUMMARY OF PROJECT IMPACTS TO CONSIDERED HISTORIC RESOURCES IN THE STUDY AREA OF THE ROUTE ALTERNATIVES

	Route Alternatives	
Considered Resource	**Route 1**	**Route 2**
016-5097	Minimal	No Impact
016-5165	No Impact	No Impact
042-0123	No Impact	No Impact
500-0001	Moderate	Moderate
American Indian Society Parcel	-	Minimal

Source: VCRIS (2024)

1. INTRODUCTION

This report presents the findings of a pre-application analysis conducted for Dominion Energy Virginia's 230 kilovolt (kV) Carmel Church Electric Transmission Line Project (Project) in Caroline County, Virginia. For this Project, the Company is proposing to construct and operate:

- A new, double circuit, overhead 230 kV transmission line (Carmel Church Loop) in new right-of-way that will cut the Dominion's existing Ladysmith CT – Four Rivers #256 (Line #256) and connect to the proposed Carmel Church Switching Station.
- A new 230 kV delivery point switching station in Caroline County, Virginia, which will provide interconnection to Rappahannock Electric Cooperative (REC) to serve the Washington DC South development, which includes data centers.

Two potential routes were evaluated for the proposed Carmel Church Lines, each of which cut into the proposed Carmel Church switching station (Figure 1). The pre-application analysis assesses potential impacts on previously recorded historic and archaeological resources relative to each route. ERM conducted the pre-application analysis on behalf of Dominion Energy Virginia to assist in the development of a feasible Project design that minimizes impacts on historic resources. The study was completed in accordance with 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).

1.1 ROUTE ALTERNATIVES

Two routes are under consideration for the Carmel Church line, Route 1 and Route 2, are depicted as Figure 1.

1.1.1 ROUTE 1

Route 1 taps Dominion's existing Line #256 and connects to the proposed Carmel Church Switching Station that is located at the northern end of the Washington DC South development. The tap location is situated approximately 120 feet south of the crossing of Line #256 and Old CC Road. Route 1 extends west from the tap location, primarily within forested land, to span Taylor Drive and navigate north of the City of Richmond Police Department's Outdoor Range Facility property. This part of Route 1 is also in the Planned Innovation, Research, and Technology (PIRT) District for Caroline County. Approximately 1.2 miles west of the tap point, Route 1 crosses portions of Reedy Creek, a Columbia Natural Gas easement, and a CSX Railroad line. Continuing west for about 1.12 miles, Route 1 passes behind existing industrial development and enters forested property held by Washington DC South. The route enters the proposed Carmel Church Switching Station directly beyond the crossing of Interstate 95 (I-95).

Route 1 measures approximately 2.38 miles. The right-of-way for this alternative (28.57 acres) and the proposed Carmel Church Switching Station site (10 acres) would encompass a combined 38.57 acres.

1.1.2 ROUTE 2

Route 2 taps Dominion's existing Line #256 and connects to the proposed Carmel Church Switching Station that is located at the northern end of the Washington DC South development. Tapping Line #256 approximately 0.45 mile north of the existing transmission corridor's crossing of Ruther Glen Road, Route 2 travels northwest through forested land for about 0.7 mile to parallel Granny's Way to the south and span Ruther Glen Road. Route 2 continues west for about 0.5 mile between residential parcels and through forested land before veering northwest onto property held by Washington DC South. After crossing onto the developer's property, Route 2 spans I-95 and then continues north paralleling the western edge of I-95 for approximately 1 mile. Route 2 crosses a Columbia Natural Gas easement and a CSX Railroad line before connecting into the Carmel Church Switch Station.

Route 2 measures approximately 2.69 miles. The right-of-way for this alternative (32.28 acres) and the proposed Carmel Church Switching Station site (10 acres) would encompass a combined 42.28 acres.

1.2 MANAGEMENT RECOMMENDATIONS

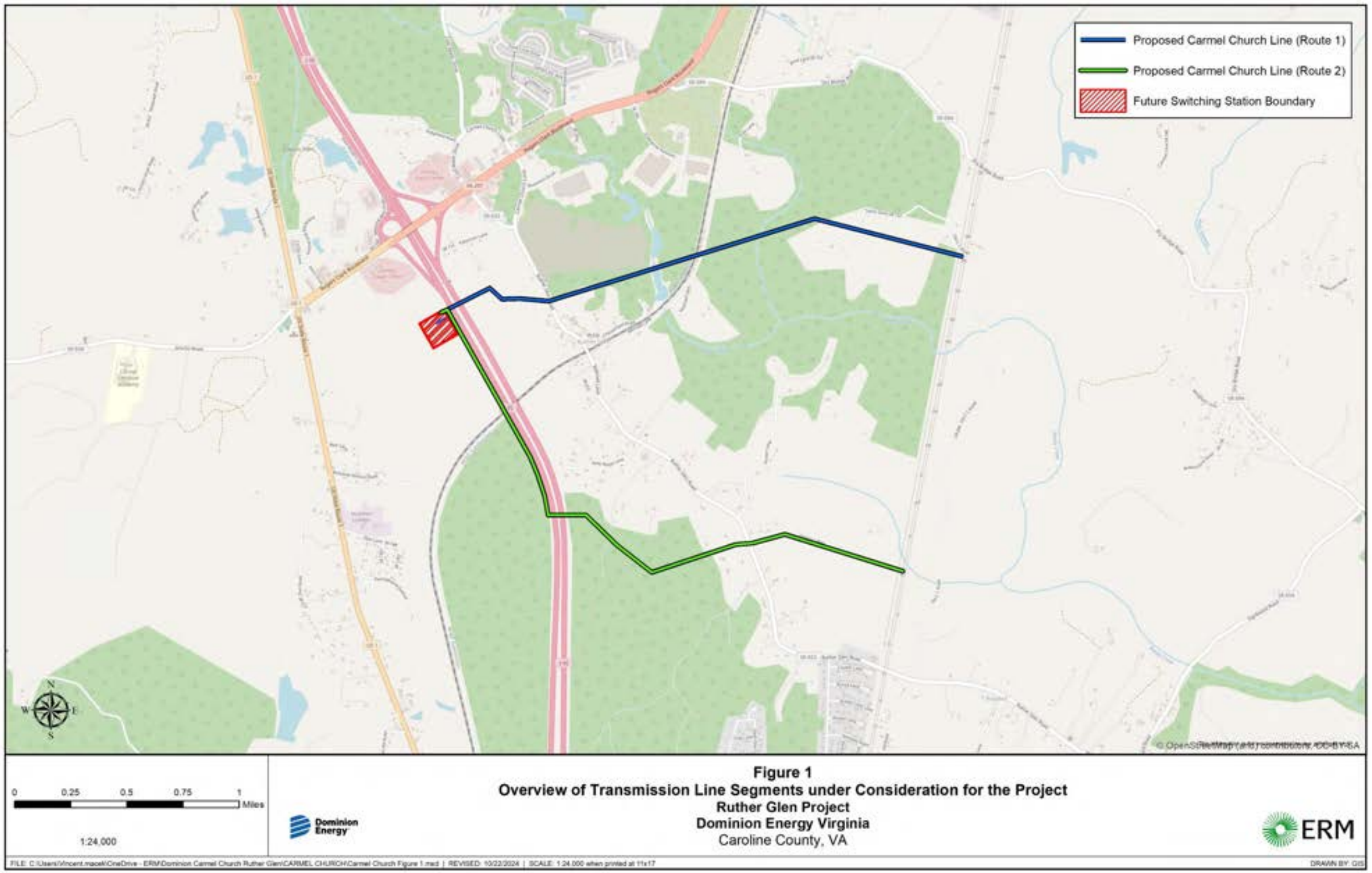
No previously recorded archaeological sites were identified within what would be the right-of-way for either route.

Five previously recorded historic architectural resources meeting criteria specified in the Guidelines fall within the study tiers defined by the VDHR for identifying architectural resources along and near transmission line routes (see Table 1). In addition to four previously recorded historic architectural resources documented in the Virginia Cultural Resource Information System (V-CRIS), one locally significant resource was identified within the study tiers defined by the VDHR. This resource is a parcel of land owned by the American Indian Society of Washington DC as a location to perform ceremonies. Route 1 passes near three historic resources and intersects one historic resource. Route 2 passes near four and intersects one historic resource.

For the Carmel Church line, ERM recommends both Routes 1 and 2 would have a Moderate Impact on the Richmond, Fredericksburg and Potomac Railroad Historic District (500-0001). ERM is recommending Route 1 would have No Impact on two and a Minimal Impact on one historic resource. Route 2 would have No Impact on three and a Minimal Impact on one historic resource.

Based on the above discussion, the two routes would have an equal level of impact on historic resources. Neither route alternative intersects archaeological sites. Routes 1 and 2 would pose the same Moderate Impact to the Richmond, Fredericksburg and Potomac Railroad Historic District and No Impact to certain other resources. Route 1 would create a Minimal Impact to one resource, the Ruther Glen Rosenwald School. Route 2 would create a Minimal Impact to the American Indian Society Parcel. More information about each resource and the nature of potential impacts associated with the two route alternatives are found in the sections that follow.

FIGURE 1 OVERVIEW OF TRANSMISSION LINE ROUTES UNDER CONSIDERATION FOR THE PROJECT



2. RECORDS REVIEW

2.1 DATA COLLECTION APPROACH

ERM conducted an analysis of potential cultural resource impacts for the alternative routes under consideration in accordance with the VDHR Guidelines. For each route, this analysis identified and considered the following previously recorded resources.

- National Historic Landmarks (NHLs) within a 1.5 mile-radius of 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.

Data on previously recorded cultural resources within each study tier was obtained from the V-CRIS. ERM additionally collected information by contacting several possibly interested parties (Caroline County Historical Society, Hanover County Historic Society, Hanover County Black Heritage Society, Virginia Department of Transportation [VDOT], VDHR, Northern Virginia Conservation Trust, Preservation Virginia, Virginia Genealogical Society, Virginia Museum of History and Culture, Woodfork Genealogy, and American Battlefield Trust) to find locally significant resources within a 1.0-mile radius of each proposed route centerline.

Along with the records review, ERM conducted field assessments of the considered aboveground resources along each alternative route in accordance with the Guidelines. Digital photographs of each historic resource and views to the proposed transmission line were taken. Photo simulations were then prepared to assess the potential for visual impacts from the new transmission infrastructure on the resources.

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 either alternative transmission line route.

2.3 HISTORIC RESOURCES

The following discussion summarizes the known historic resources in the vicinity of each alternative route based on the VDHR's tiered study model defined in the Guidelines. The locations of the considered historic resources and the alternative routes are shown on Figure 2. Individual maps for each proposed alternative are provided in Attachment 1.

Resources located within what would be 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 changes to

the viewshed introduced by the new transmission line structures and conductors. Resources in the 0.5-mile tier would not be directly impacted, but would likely be visually impacted, unless topography, vegetation, or the built environment obscures the view to the transmission line. At a distance of over 0.5 mile, it becomes less likely that a resource would be within line-of-sight of the proposed transmission line. Beyond 1.0 mile, it becomes even less likely that a given resource would be within line-of-sight of a transmission line.

The nature of the impacts, 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 certified by the SCC, that route would be subject to a full historic architectural survey in which additional (as of yet, unrecorded) historic properties could be identified and Project impacts assessed. The survey area would be defined based on the design height of the transmission line structures, topography, tree cover, and other factors impacting line-of-sight from architectural resources to the selected route.

2.3.1 ROUTE 1

The considered resources that lie within the VDHR tiers for Route 1 are presented in Table 2 and depicted in Attachment 1, Sheet 1. These four considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

TABLE 2 HISTORIC RESOURCES IN THE VDHR TIERS FOR ROUTE 1

Buffer (Miles)	Resource Category	Resource Number	Description
0.0 to 0.5	Locally Significant	016-5097	Ruther Glen Rosenwald School
	National Register - Eligible	016-5165	Excelsior Industry of Caroline County Historic District
	National Register - Potentially Eligible	042-0123	North Anna Battlefield
0.0 (within ROW)	National Register- Eligible	500-0001	Richmond, Fredericksburg and Potomac Railroad Historic District

2.3.2 ROUTE 2

The considered resources that lie within the VDHR tiers for Route 2 are presented in Table 3 and depicted in Attachment 1, Sheet 1. These five considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

TABLE 3 HISTORIC RESOURCES IN THE VDHR TIERS FOR ROUTE 2

Buffer (Miles)	Resource Category	Resource Number	Description
0.0 to 0.5	Locally Significant	N/A	American Indian Society of Washington DC
		016-5097	Ruther Glen Rosenwald School
	National Register - Eligible	016-5165	Excelsior Industry of Caroline County Historic District
	National Register - Potentially Eligible	042-0123	North Anna Battlefield
0.0 (within ROW)	National Register- Eligible	500-0001	Richmond, Fredericksburg and Potomac Railroad Historic District

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

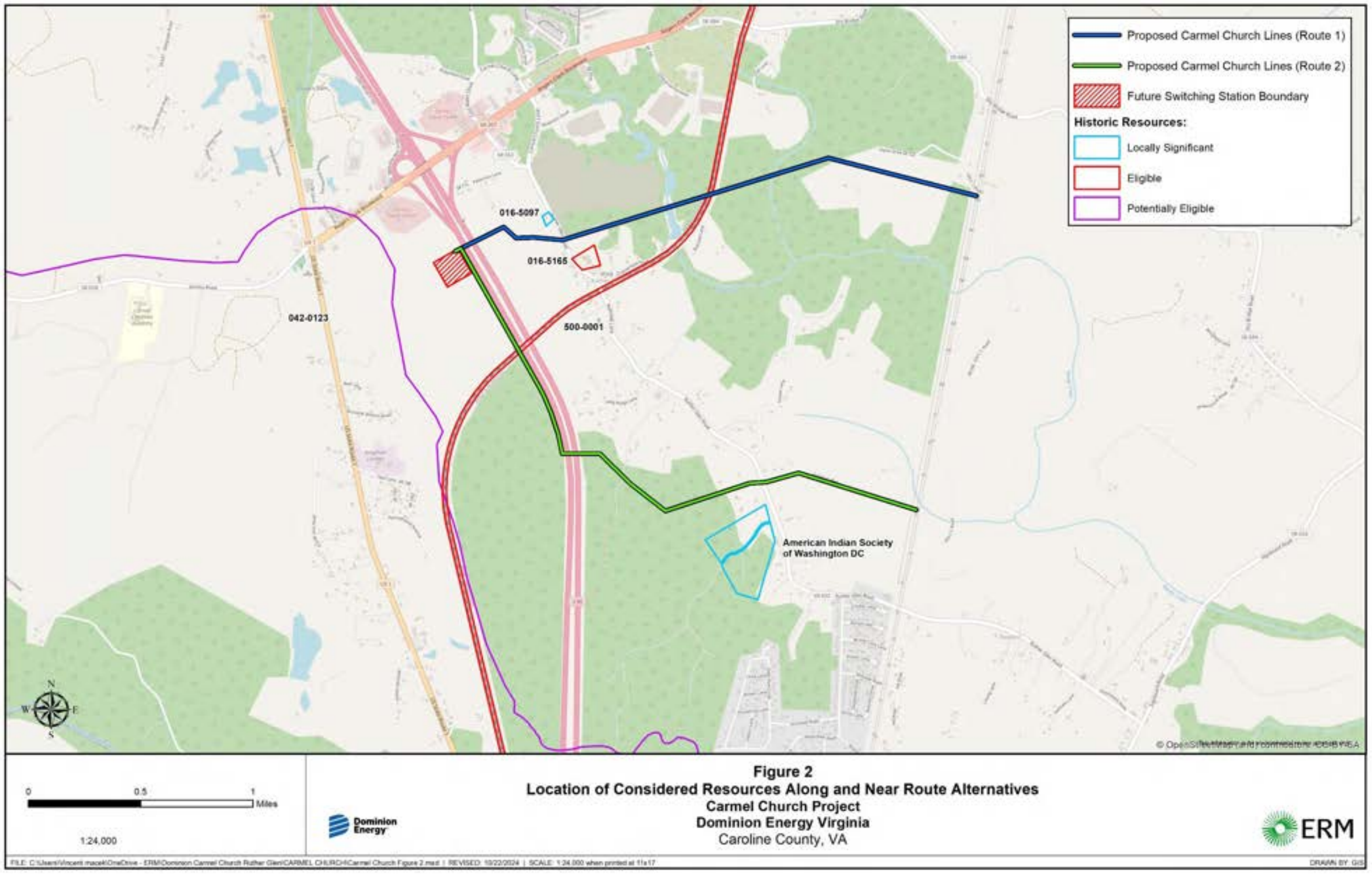


Figure 2
Location of Considered Resources Along and Near Route Alternatives
Carmel Church Project
Dominion Energy Virginia
Caroline County, VA

FILE: C:\Users\Vincent.macek\OneDrive - ERM\Dominion Carmel Church Rother Glen\CARMEL CHURCH\Carmel Church Figure 2.mxd | REVISED: 10/22/2024 | SCALE: 1:24,000 when printed at 11x17 DRAWN BY: GIS

3. PREVIOUS SURVEYS

There has been one previous cultural resource survey (CE-206) covering a portion of Route 1. Six prior surveys have been conducted within 1.0 mile; however, those do not intersect either Route 1 or Route 2 (Table 4). 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 4 CULTURAL RESOURCE SURVEYS COVERING PORTIONS OF THE ALTERNATIVE ROUTES

VDHR Survey #	Title	Authors	Date
CE-027	Phase I Archaeological Investigations of Spratt Recycling, Inc. Property, (Schwab Tract), Swans Corner, Caroline County, Virginia	Alain C. Outlaw, Martha W. McCartney, Carol D. Tyrer	1992
CE-042	Archaeological Survey, Interstate 95/Route 207 Interchange, Caroline County, Virginia	Lee Tippett, Megan Rupnik	2005
CE-163	Phase I Cultural Resource Identification Survey of the Footprint of Development for the Proposed Coolwater Drive Warehouse, Caroline County, Virginia	Darby O'Donnell	2015
CE-181	M.C. Dean – Caroline County Center for Innovation and Industry, Caroline County, Virginia: Phase I Cultural Resources Investigation	David Carroll, Jeremy Smith	2018
CE-206	Phase I Cultural Resource Identification Survey of the 70-acre Flint Tract, Caroline County, Virginia	Darby O'Donnell, Charles Strang Selden	2021
CE-210	Phase I Cultural Resource Survey of the M.C. Dean Southern Water Line Route, Caroline County, Virginia	Patrick L. Johnson, Jonathan Valalik	2022
CF-202	Phase II Archaeological Evaluation of the DeSear Farmstead Site (44CF594), Chesterfield County, Virginia	Donald G. Jones, Matthew R. Laird, Kimberly S. Zawacki, David M. Givens	2000

4. STAGE I PRE-APPLICATION ANALYSIS FINDINGS

4.1 METHODS FOR ANALYSIS

Fieldwork for the pre-application analysis was conducted by Secretary of the Interior Qualified architectural historian MacKenzie Carroll between September 2–5, 2024. 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 proposed transmission line(s) from the property at the most prominent view of the landscape. When such permission was not available, photographs were taken from the public right-of-way (typically a road) nearest to the resource facing toward the 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. The precise location of the photograph was captured with a mobile tablet device connected to a sub-meter accurate Global Navigation Satellite System (GNSS) receiver, the Trimble R1. The locations where photographs were taken were noted as Simulation Points (SP). Site visits to the SPs were prioritized based on their location relative to the resource, so that viewpoints east of the resource were visited in the morning and viewpoints west of the resource were visited in the afternoon. This helped ensure, where possible, that the sun was behind the photographer at the time the viewpoint photography was captured. Additionally, minor adjustments to position were made to obtain as clear a view to the site center as possible, avoiding trees, landscaping, or built obstructions. Tablets recorded the center bearing, angle of view, altitude, and camera lens height. Upon receipt of the viewpoint location information, the viewpoints were plotted onto open source mapping from the Environmental Systems Research Institute (ESRI) using the Universal Transverse Mercator (UTM) 18N coordinate system.

The process of taking panoramas included setting up the tripod and camera. The camera was placed on the panoramic head in a landscape orientation where its lens height was confirmed and set at 1.5 meters (note: a portrait camera orientation was sometimes used in situations where the viewpoint is very close to a development so that the top of the development is not cut off by the image boundaries). The tripod head and camera combination were then leveled. With the camera's viewfinder centered on the perceived site center, exposure and focus settings were taken. These were then fixed manually on the camera so that they could not be inadvertently altered. The head was rotated 90 degrees to the left where the first frame of the 360-degree sequence was then taken. Each subsequent frame was taken using a 50 percent overlap of the previous frame until the full 360-degree sequence was captured. The camera was then removed from the tripod and a viewpoint location photograph was captured showing the tripod in its position.

The following camera and tripod configuration was used:

- Camera body: Nikon D800 professional specification digital SLR (full frame CMOS sensor)
- Camera lens: Nikkor AF 50mm f1.8 prime

- Tripod: Manfrotto 055MF4 with Manfrotto 438 ball 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, then cleaned up and textured in Autodesk 3DS Max 2021. The transmission structures along each route were rendered in Vray version 5.2 from each SP camera location. 3D imagery was produced at the field of view using camera matching. Renderings for each route and each tower combination were then exported for use as an overlay.

Detailed, correctly dimensioned 3D computer models of the transmission structures 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 (see Attachment 3). These were textured using Vray PBR materials to simulate the weathering steel texture. The detailed, textured models were rendered to a digital image using a simulated physical camera and a sun and sky simulation lighting model in the computer software consistent with conditions within the original viewpoint photography.

Photomontages were produced by overlaying the rendered image on the photograph, using known control points and the wireline imagery showing the tower columns at the correct height and distance. Final adjustments were then made to the brightness and contrast of the rendered images to match them to the photograph. Final photomontages were prepared from each viewpoint for 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. Finally, the final images were cropped to the proportions required for the visual simulation figures, and the visualization figures were prepared in Adobe InDesign CC2022 and exported in a PDF format.

4.2 ASSESSMENT OF POTENTIAL IMPACTS

The assessment of potential Project impacts on individual resources made use of the visual assessment findings and categorized the level of impacts by severity according to the following scale devised by VDHR:

- **None**–Project is not visible from the resource.
- **Minima**l–Viewsheds have existing transmission lines, there would be only a minor change in height, and/or other views are partially obscured by topography or vegetation.
- **Moderate**–Viewsheds have more expansive views of the transmission line, more dramatic changes in height are proposed, and/or the overall visibility of the Project would be greater.
- **Severe**–Existing viewshed contains no transmission line, the view to the Project would be relatively unobstructed, the new transmission line would introduce a significant change to the setting of historic properties, and/or a dramatic change in the height of an existing transmission line would take place in close proximity to historic properties.

4.3 HISTORIC RESOURCE DESCRIPTIONS

4.3.1 016-5097, RUTHER GLEN ROSENWALD SCHOOL

The Ruther Glen Rosenwald School (016-5097) is located in a rural area of Caroline County, east of Interstate 95. The school is located on the west side of Ruther Glen Road/Route 652, approximately a half mile north of Chesterfield Road/Route 620. The building sits on a 1.1-acre parcel.

016-5097 is one of nine schools in Caroline County that were partially funded by the Rosenwald Fund, which provided communities with matching grants to construct schools for African American children in the segregated South. The resource consists of a one-story frame building, which was later converted into the dwelling by the time it was reviewed by the VDHR staff in 2014 (Appendix 4, Figure 1; VDHR 2014). They described the school as a circa 1920 single-story, square building with a side-gabled roof and an inset one-bay corner porch that sheltered the primary entrance. To the right of the porch are two large replacement windows. A one-story addition was added off the rear.

The school was constructed at a cost of $1,556, of which $500 was provided by the Rosenwald Fund and the remainder was contributed by the local African American community. It uses Plan No. 1 from the newly developed plans of director Samuel L. Smith, following the move of the school-building program from the Tuskegee Institute to Fisk University in 1920. Plan No. 1 was designed as a one-teacher school, one of the most common sizes for rural African American schools. The building was to be constructed facing east or west only to allow the bands of windows on the front and rear to take advantage of natural light. The plan consisted of a recessed corner porch, a large 22-foot by 30-foot classroom, a smaller 10-foot by 14-foot industrial room, and two cloak rooms. The plan did not include restrooms, which would have been located outside (History South 2024; McClure 2020; VDHR 2014).

The Ruther Glen Rosenwald School was reported to VDHR in 2003, but has not been formally surveyed. In 2014, a staff record was established based on a Google street view that confirmed the location and continued existence of the resource. 016-5097 has not been given a formal NRHP determination, however the VDHR staff has recommended additional research be completed. ERM has categorized it as locally significant for the purposes of the Carmel Church Project due to ties to the local African American community. 016-5097 lies within the half-mile study tier for both route alternatives.

4.3.2 016-5165, EXCELSIOR INDUSTRY OF CAROLINE COUNTY HISTORIC DISTRICT

016-5165, the Excelsior Industry of Caroline County Historic District, consists of four noncontiguous properties along the tracks of the Richmond, Fredericksburg & Potomac (RF&P) Railroad associated with the early twentieth century manufacture of excelsior in Caroline County. These four resources are scatted throughout the county, with two located within the community of Ruther Glen (016-5105 and 016-5106), only one (016-5150) of which is located within the study tiers for this Project. The remaining two are located in Milford and Penola. Excelsior, also known as wood wool, is a product composed of wood shavings or coils that was used for a variety of purposes, including furniture and mattress padding and packing material (Attachment 4, Figure 2). Originally a brand name, the term came to be applied to the product generally. George P. Lyon established the first excelsior mill in Caroline County in the village of Woodford on the RF&P Railroad in 1896. The vast pine forests of the county provided an ample supply of raw material for excelsior production. His success led to the opening of additional mills, sometimes in association with existing lumber mills, and by 1924, Caroline County had the largest number of mills in the state. The industry became Caroline County's largest in the 1920s and contributed significantly to the local economy (Barile et al. 2018a).

The high fire risk from the highly combustible wood wastes made excelsior mills virtually uninsurable, and many were lost to fires. The Lyon Mill in Woodford burned in three consecutive years at the beginning of the twentieth century, but was rebuilt each time, indicating the market for its product. However, after World War II, the availability of other products with the capabilities of excelsior, including synthetic fibers, resulted in a sharp decline in production. When the Woodford Excelsior Mill was again destroyed by fire in 1950, it did not reopen. Nevertheless, as late as the 1970s, two of the top five manufacturers in the country had mills in Caroline County, including Taylor Fiber, Inc. of Ruther Glen. Although the remnants of excelsior mills and their associated structures in Caroline County represent only a small fraction of the once ubiquitous features of the industry, the remaining buildings are an important reminder of the importance of the now defunct enterprises that dotted the county's landscape (Barile et al. 2018a).

Excelsior Mill #1 (016-5105), near the intersection of Ruther Glen Road (Route 652) and Chesterfield Road (Route 620), was constructed about 1919 as the Caroline Excelsior Company by Thomas H. Chewning and Herman L. Taylor. Chewning's brother Clarence purchased a one-third share soon after. In 1956, the Chewning brothers sold their shares to Taylor, who passed the operation to his son, H. Ashton Taylor, in 1960. The younger Taylor, who had been working in his father's business for many years, renamed the company Taylor Fiber, Inc. The company produced excelsior and "kindred products," and by 1977 was one of only 12 facilities in the country still in operation. The company employed 30 people in 1982. The mill finally closed in 1988 (Barile et al. 2018a).

016-5105 consists of six buildings of varying materials and function, as well as a ca. 1950 conical waste burner. The burner is a sheet metal clad frame on a concrete foundation. The top is open and vents and an access door are located near the base. A funnel-shaped attachment was used to blow sawdust and other mill waste into the burner, which gravitated toward the center due to a cyclone effect. Two large frame warehouses are located on the property, along with a frame tool shed and machine shop and a concrete-block warehouse. The buildings all appear to date to

between 1950 and 1970. The buildings are all vacant and in a deteriorating condition. A house that was once located to the west of the mill complex has been demolished.

The site of Excelsior Mill #2 (016-1506) is located at the eastern terminus of Chesterfield Road in Ruther Glen. The T. Hunter sawmill and lumber yard was established on the property in 1901 and was purchased after Hunter's death in 1911 by Cora Blanton, whose husband, Thomas, operated the adjacent Ruth Glen Excelsior Company. The company expanded onto the new property and operated until 1956, when it was shut down through a lawsuit filed by the owners of Excelsior Mill #1 (Taylor Fibers, Inc.), which claimed to operate under the name of Ruther Glen Excelsior Company (Barile et al. 2018a).

016-5106 consists of three buildings and a conical waste burner. The burner is similar to the one at Excelsior Mill #1 described above and appears to date to about 1950. The three buildings are warehouses, the largest of which is constructed of concrete block with a flat roof. A frame warehouse clad in corrugated metal is located to the west of the larger building. The third warehouse could not be accessed at the time of the survey. The buildings are all vacant and in a deteriorating condition.

Excelsior Industry of Caroline County MPD was determined eligible for the NRHP in 2018 (VDHR 2018). 016-5165 lies within the half-mile study tier for both route alternatives.

4.3.3 043-0123, NORTH ANNA BATTLEFIELD

043-0123, North Anna Battlefield, is located in northern Hanover and southern Caroline counties (Attachment 4, Figures 3 through 6). The resource represents the site of a pivotal engagement between Robert E. Lee's Army of Northern Virginia and George Meade's Army of the Potomac. The battle was part of Grant's Overland Campaign to take Richmond in the Spring of 1864. After heavy losses at the battles of Wilderness and Spotsylvania Courthouse, Grant's once superior numbers had dwindled, but he had managed to push Lee back to the south side of the North Anna River, where the Confederate commander entrenched. Lee's right, under General Longstreet, guarded the Richmond, Fredericksburg and Potomac Railroad crossing and the Chesterfield bridge over the North Anna River on the Telegraph Road. On the Confederate left was A. P. Hill's 3rd Corps near Jericho Mill (American Battlefield Trust 2024b; National Park Service [NPS] 2024).

On May 23rd, 1864, Hancock's Union Corps advanced on the Chesterfield bridge where Henagan's brigade was stationed in a small redoubt on the north side of the river. Greatly outnumbered, Henagan retreated across the river. Meanwhile, at Jerico Mill, Warren's V Corps crossed the river unopposed, only to be met with an attack by Hill's corps, which nearly overwhelmed the Union forces. Warren managed to hold his position, however, and remained on the south side of the river. During the night, Lee withdrew his flanks to create an "inverted V" with its point at Ox Ford on the North Anna River. The heavily fortified line would require Grant to divide his forces on either side of the river, which Lee hoped would allow him to throw the majority of his force against one side of line and crush one of Grant's corps (American Battlefield Trust 2024a; NPS 2024).

On the 24th, Grant took the bait, assuming the fallback on the Confederate right was a retreat, and sent Hancock's corps across the river, where they engaged in a fierce firefight with Confederate skirmishers. However, an ailing Lee failed to order an all-out attack in time, and

before a blow could be dealt, Meade realized his vulnerable position and ordered Hancock to halt and entrench. After two days in front of the Confederate defenses, Grant determined he could not gain sufficient advantage for an attack, and again opted for a flanking maneuver, withdrawing across the river on the night of the 26th and shifting southeast to Totopotomoy Creek. Lee followed, leaving his carefully constructed defenses at the North Anna River (American Battlefield Trust 2024a; NPS 2024).

Resource 042-0123 has been determined potentially eligible for the NRHP for its association with the events of the North Anna Battlefield ([VDHR 2007). The boundaries of the resource are represented by the Civil War Sites Advisory Commission (CWSAC) Study Area boundary defined for its 1993 report and subsequent revisions (American Battlefield Protection Program [ABPP] 2009; CWSAC 1999). The Study Area includes all of the areas traversed by the armies prior to, during, and following the battle. Within the Study Area, the CWSAC also delineated the Potential National Register Area (PotNR) that retains sufficient integrity to be considered for preservation, and the Core Area, where the principal fighting took place. The Core Area is about a mile to the south of Route 2 of the Project. U.S. Route 1 runs to the west of the route alternative and follows roughly the route of the historic Telegraph Road. Hancock's corps took this road south toward the crossing of the North Anna River at the Chesterfield Bridge, where they encountered Henagan's brigade in the redoubt beginning the battle. U.S. 1 is not within the PotNR area, and the Project area is tangential to the main area of the battle.

The North Anna Battlefield was determined potentially eligible for the NRHP in 2007 (VDHR 2023). 042-0123 lies within the half-mile study tier for both route alternatives.

4.3.4 500-0001, RICHMOND, FREDERICKSBURG, AND POTOMAC RAILROAD HISTORIC DISTRICT

500-0001, the Richmond, Fredericksburg and Potomac (RF&P) Railroad Historic District, consists of the former RF&P Railroad (now part of CSX) and associated secondary resources such as bridges, culverts, and stations (Attachment 4, Figure 7). The railroad was completed between Richmond and Fredericksburg in 1837 and was extended in 1842 to Aquia Creek, where it connected with steamboat service on the Potomac River. Plans were made to extend the line to Alexandria in the 1850s, but the project was interrupted by the Civil War. The resource played an important role in the war, as both armies sought to control the line for use in transporting troops and supplies, while preventing the enemy from doing the same. At the end of the war, the line was in ruins but was quickly rebuilt. The line between Fredericksburg and Alexandria was completed in 1872 by the Alexandria and Fredericksburg Railroad Company. The two lines prospered in the late nineteenth century and were combined under a single management structure through a holding company called the Richmond-Washington Company in 1901 (Barile et al. 2018b).

In 1903, the entire line between Richmond and Washington, D.C. was double-tracked, and its switching yards near Richmond and Washington, D.C. were expanded. The company weathered the Depression through its real estate holdings, which came to represent the most significant portion of its operations into the second half of the twentieth century. After World War II, the RF&P made additional improvements to its line, including grade reductions, curve straightening,

and structural improvements to accommodate additional weight on its tracks. However, as a small regional railroad, the company relied on passenger service over freight, and rail travel continued to decline as automobiles became the dominant form of transportation. The construction of I-95 along a parallel route to the line in the late 1950s further eroded passenger traffic on the line. In the 1970s, Amtrak took over the RF&P's passenger service and the company reorganized as primarily a real estate management entity. In 1991, CSX Transportation acquired the railroad, which continues to operate. The Virginia Railway Express (VRE) provides weekday passenger service between Richmond and Washington, D.C. (Barile et al. 2018b).

The RF&P Railroad Historic District was determined eligible for the NRHP under Criterion A for its significance in the economic and transportation history of the region through which it passes and the development of the cities along its route. 500-0001 is intersected by both route alternatives and would be intersected by their right-of-way.

4.3.5 AMERICAN INDIAN SOCIETY PARCEL

The American Indian Society of Washington DC is located at 25401 Reservation Lane in Ruther Glen on a 45-acre parcel to the west of Ruther Glen Road (Attachment 4, Figure 8). The parcel consists of forested land. To the east of the resource are residential dwellings and an agricultural field.

The society is a membership-based group based in Washington D.C., created to fill the need for a central organization representing different Tribal Nations. The society was formally organized in August 1966 with the goal to promote, protect, and share Indigenous cultures as well as provide community education (AISDC 2024). The American Indian Society actively uses the property for ceremonial purposes.

The American Indian Society of Washington DC is not a recorded resource in V-CRIS. ERM is considering the parcel a locally significant resource due to its use as a ceremonial location. The parcel is located approximately 550 feet south of Route 2.

4.4 HISTORIC RESOURCES FINDINGS FOR ROUTE 1

The impacts to each resource in the Route 1 study tiers are discussed below. Photo simulations are provided in Attachment 5.

4.4.1 016-5097, RUTHER GLEN ROSENWALD SCHOOL

The Ruther Glen Rosenwald School is located approximately 500 feet to the north of Route 1, which uses greenfield alignment (Attachment 5, Figure 1). The area between the resource and the route consists primarily of dense woodland, but is cleared along Ruther Glen Road, which would be crossed by Route 1 near MP 1.9.

One simulation (KOP 006) was prepared for this resource from a vantage point on the east side of Ruther Glen Road, across the street from the resource, looking south towards Route 1 (Attachment 5, Figure 2). The density of the woodlands to the south would likely obstruct line of sight from the resource to Route 1 except when looking south from the resource's easternmost boundary along Ruther Glen Road. As seen in the simulation, the tree clearing that would take

place along the new right-of-way would be somewhat visible where the proposed line crosses Ruther Glen Road, and conductors would be seen spanning the road. No structures would be visible from the KOP. The resource is surrounded by dense woods to the south, west, and east, obscuring sight lines to Route 1 except along the road. Existing electric distribution lines have already added a similar modern element to the landscape along the resource's east side.

Due to the viewshed change to the resource from limited vantage points looking south, ERM recommends that Route 1 would have a **Minimal Impact** on the Rosenwald School.

4.4.2 016-5165, EXCELSIOR INDUSTRY OF CAROLINE COUNTY HISTORIC DISTRICT

One (016-5106) of the four associated resources that comprise the Excelsior Industry of Caroline County Historic District is located within the study tier for Route 1. It is situated approximately 350 feet south of MP 1.9 for Route 1 (Attachment 5, Figure 3). The area between the resource and the route contains residential dwellings situated within dense woodland. One simulation (KOP 008H) was prepared from the northwest corner of this resource on the west side of Ruther Glen Road (Attachment 5, Figure 4). As shown by the simulation, there would be no view to the route due to the existing vegetation. Therefore, ERM recommends there would be **No Impact** on this resource from Route 1.

4.4.3 042-0123, NORTH ANNA BATTLEFIELD

The North Anna Battlefield easternmost boundary is located approximately 0.31 miles to the west of where Route 1 cuts into the proposed switching station (Attachment 5, Figures 5 and 7). The area between the resource and route contains high traffic roadways—Rogers Clark Boulevard and Jefferson Davis Highway—and heavily forested land. Two simulations were prepared for this resource, one located at the northeast intersection of Rogers Clark Boulevard (KOP 001H; Attachment 5, Figures 6) and the other from Jefferson Davis Highway (KOP 002H; Attachment 5, Figure 8). In both locations, the simulations show that the resource would not have a view of the route due to the distance and density of vegetation. Therefore, ERM recommends there would be **No Impact** on the North Anna Battlefield from Route 1.

4.4.4 500-0001, RICHMOND, FREDERICKSBURG, AND POTOMAC RAILROAD HISTORIC DISTRICT

The Richmond, Fredericksburg, and Potomac Railroad Historic District is intersected by Route 1 at Frye Lane between MP 1.2 and 1.3 (Attachment 5, Figure 9). The area surrounding this intersection point consists of dense woodland.

Only one simulation (KOP 005H) was prepared for this resource due to the limited points of intersection from public rights-of-way. The KOP was taken approximately 955 feet southwest from where the route crosses the railroad looking north towards Route 1 (Attachment 5, Figure 10). From this location, the new transmission line structures and conductors would be visible through tree breaks and during leaf-off seasons. The route would add modern transmission infrastructure (structures and conductors) to a viewshed where it does not currently exist. However, in regard to the resource as a whole, the route would only intersect approximately 125 feet of the resource, which spans miles on either side of this intersection, and the landscape along the length of the

resource has already been altered by other modern development, such as highways and commercial buildings. As you leave the point of intersection and move farther along the resource's southern or northern alignment, the likelihood of the route's visibility is greatly diminished due to the dense vegetation and distance.

Although Route 1 would add a highly visible modern element to a small portion of the resource and physically cross a section of the right-of-way with overhead lines, the larger viewshed of the resource would not be significantly altered. However, since it does intersect the resource, ERM recommends there would be a **Moderate Impact** on the Richmond, Fredericksburg, and Potomac Railroad Historic District from Route 1.

4.5 HISTORIC RESOURCES FINDINGS FOR ROUTE 2

The impacts to each resource in the Route 2 study tiers are discussed below. Photo simulations are provided in Attachment 5.

4.5.1 016-5097, RUTHER GLEN ROSENWALD SCHOOL

The Ruther Glen Rosenwald School is located approximately 0.37 miles northeast of Route 2 (Attachment 5, Figure 11). The area between the resource and the route contains dense woodlands and an interstate highway. One simulation (KOP 006) was prepared for this resource, taken on the east side of Ruther Glen Road, across the street from the resource, looking southwest towards Route 2 (Attachment 5, Figure 12). There would be no view to the route due to vegetation and distance. Therefore, ERM recommends there would be **No Impact** on this resource from Route 2.

4.5.2 016-5165, EXCELSIOR INDUSTRY OF CAROLINE COUNTY HISTORIC DISTRICT

One (016-5105) of the four associated resources that comprise the Excelsior Industry of Caroline County Historic District is located within the study tiers for Route 2. It is situated approximately 0.39 miles east of MP 2.5 for Route 2 (Attachment 5, Figure 13). The area between the resource and the route contains a few residential dwellings along Ruther Glen Road, backed by woodlands to the west. One simulation (KOP 008H) was prepared for this resource, taken from the northwest corner of the resource's boundary on Ruther Glen Road (Attachment 5, Figure 14). There would be no view to the route due to vegetation and distance. Therefore, ERM recommends there would be **No Impact** on this resource from Route 2.

4.5.3 042-0123, NORTH ANNA BATTLEFIELD

The North Anna Battlefield easternmost boundary is located approximately 0.31 miles to the west of where Route 2 cuts into the proposed switching station (Attachment 5, Figures 15 and 17). The area between the resource and route contains high traffic roadways—Rogers Clark Boulevard and Jefferson Davis Highway—and heavily wooded land. Two simulations were prepared for this resource, one located at the northeast intersection of Rogers Clark Boulevard (KOP 001H; Attachment 5, Figures 16) and the other from Jefferson Davis Highway (KOP 002H; Attachment 5, Figure 18). In both locations, the simulations show that the resource would not have a view of the route due to the distance and density of vegetation. Therefore, ERM recommends there would be **No Impact** on the North Anna Battlefield from Route 2.

4.5.4 500-0001, RICHMOND, FREDERICKSBURG, AND POTOMAC RAILROAD HISTORIC DISTRICT

The Richmond, Fredericksburg, and Potomac Railroad Historic District is intersected by Route 2 between MP 2.2 and 2.3 (Attachment 5, Figure 19). The area surrounding this intersection point consists of dense woodland on the east and western sides. Interstate 95 crosses the resources by bridge closest to MP 2.2. The proposed route parallels the interstate from the switching station to around MP 1.7 before turning east then southeast.

Only one simulation (KOP 009) was prepared for this resource due to the limited points of intersection and safety concerns from public rights-of-way. The KOP was taken approximately 0.5 mile northeast of Route 2 and approximately 200 feet to the north of the resource along Chesterfield Road (Attachment 5, Figure 20). From this location, the new transmission line structures and lines would not be visible due to the dense vegetation and distance. Although this simulation shows no line of sight to the route, the resource would be intersected by Route 2. Although the interstate highway has already altered the viewshed in the immediate vicinity, the route would add modern transmission infrastructure (structures and conductors) to a viewshed where it does not currently exist. However, in regard to the resource as a whole, the route would only intersect approximately 107 feet of the resource, which spans for miles on either side of this point. The landscape encompassing the resource has already been altered by other modern developments, such as highways and commercial buildings. As you leave the point of intersection and move farther along the resource's alignment, the likelihood of the route's visibility is greatly diminished due to the dense vegetation, distance, and positioning of the route perpendicular to the resource.

Although Route 2 would add a highly visible modern element to a small portion of the resource and physically cross a section of the right-of-way with overhead lines, the larger viewshed of the resource would not be significantly altered by the route. However, since it does intersect the resource, ERM recommends there would be a **Moderate Impact** on the Richmond, Fredericksburg, and Potomac Railroad Historic District from Route 2.

4.5.5 AMERICAN INDIAN SOCIETY PARCEL

The American Indian Society Parcel is located approximately 560 feet south from Route 2 (Attachment 5, Figure 21). The area between the resource and the route is a combination of scattered residential development, agricultural land, and small stands of trees.

One simulation (KOP 112) was prepared for this resource, and was taken 151 feet southeast of the parcel's northeast corner along Ruther Glen Road (Attachment 5, Figure 22). As shown by the simulation, the route alternative is visible crossing Ruther Glen Road and traversing the agricultural field located to the northeast from the resource's entrance point. The parcel's north and east boundary consists predominantly of dense woods. The approximate 100-foot buffer of woods to the east of the parcel's boundary along Ruther Glen Road, and the dense expanse of woods to the north would likely screen the route from view at most vantage points inside the parcel. However, since the proposed route would cross an open field to the northeast of the resource, it would be visible from the entry point of the parcel as depicted in KOP 112.

Although the viewshed of the resource would be altered by the proposed route, there is an existing transmission line running along the east side of Ruther Glen Road adding a modern element to the parcel's viewshed. Due to the change in its current viewshed, ERM recommends that Route 2 would have a **Minimal Impact** on the American Indian Society Parcel

4.6 ARCHAEOLOGICAL RESOURCES WITHIN THE RIGHT-OF-WAY FOR THE ROUTE ALTERNATIVES

No previously recorded archaeological sites were identified within the right-of-way of the routes.

5. CONCLUSION AND RECOMMENDATIONS

As part of the effort to evaluate potential impacts from alternative routes associated with the Project, the pre-application analysis gathered information on archaeological and historic resources that qualify for consideration according to the VDHR Guidelines for transmission line projects.

No known archaeological sites are located in 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 resources impacted and the degree of impact from each route is presented in Table 5. The specific resources affected by each alternative are covered in the subsections that follow.

TABLE 5 COMPARISON OF PROJECT IMPACTS ON HISTORIC RESOURCES IN THE STUDY AREAS OF THE ALTERNATIVE ROUTES

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

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, followed by 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 mitigations could be identified through consultation with VDHR and other consulting parties.

5.1 ROUTE 1

Four previously recorded historic resources meet the criteria specified in the Guidelines within the VDHR study tiers for Route 1 (Table 6). The route would have No Impact on two historic resources, a Minimal Impact on one, and a Moderate Impact on one.

TABLE 6 IMPACTS ON HISTORIC RESOURCES IN THE VDHR STUDY TIERS FOR CARMEL CHURCH ROUTE 1

Buffer (miles)	Resource Category	Resource Number	Description	Impact
0.0 to 0.5	Locally Significant	016-5097	Rosenwald School	Minimal
	National Register - Eligible	016-5165	Excelsior Industry of Caroline County Historic District	None
	National Register – Potentially Eligible	042-0123	North Anna Battlefield	None
0.0 (within ROW)	National Register - Eligible	500-0001	Richmond, Fredericksburg and Potomac Railroad Historic District	Moderate

5.2 ROUTE 2

Five previously recorded historic resources meet the criteria specified in the Guidelines within the VDHR study tiers for Route 2 (Table 7). The route would have No Impact on three historic resources, a Minimal Impact on one, and a Moderate Impact on one.

TABLE 7 IMPACTS ON HISTORIC RESOURCES IN THE VDHR STUDY TIERS FOR CARMEL CHURCH ROUTE 2

Buffer (miles)	Resource Category	Resource Number	Description	Impact
0.0 to 0.5	Locally Significant	N/A	American Indian Society of Washington DC	Minimal
		016-5097	Rosenwald School	None
	National Register - Eligible	016-5165	Excelsior Industry of Caroline County Historic District	None
	National Register – Potentially Eligible	042-0123	North Anna Battlefield	Moderate
0.0 (within ROW)	National Register – Eligible	500-0001	Richmond, Fredericksburg and Potomac Railroad Historic District	None

5.3 FUTURE INVESTIGATIONS

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 specific route selected by the SCC that could be impacted by the Project. Survey 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 resources and documenting additional as-of-yet unrecorded 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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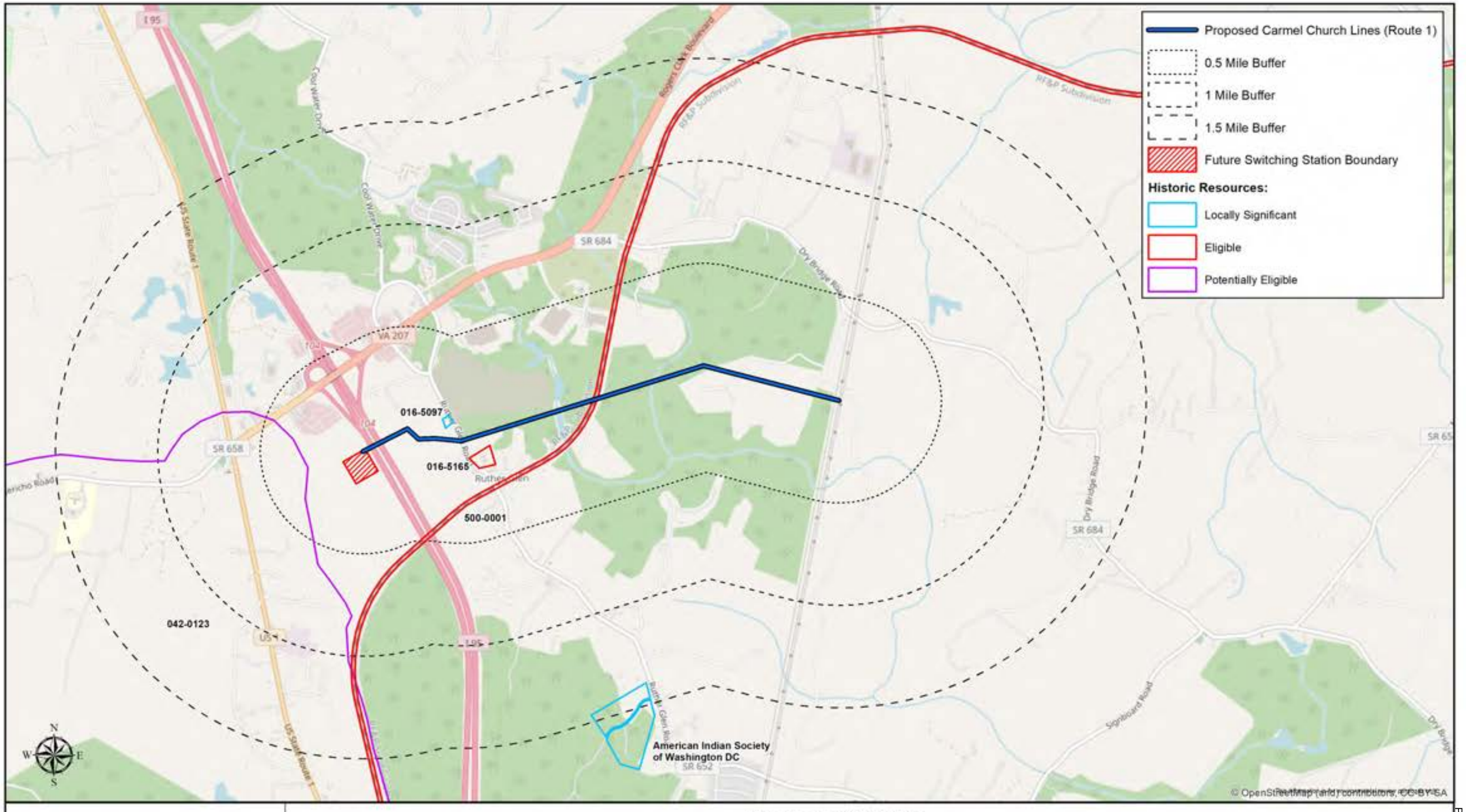
ATTACHMENT 1 LOCATIONS OF CONSIDERED HISTORIC RESOURCES ASSOCIATED WITH PROPOSED PROJECT



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Attachment 1, Sheet 1
Location of Considered Resources Associated with Proposed Project Alternatives - Proposed Carmel Church Lines (Route 1)
Carmel Church Project
Dominion Energy Virginia
Caroline County, VA

Dominion Energy

ERM

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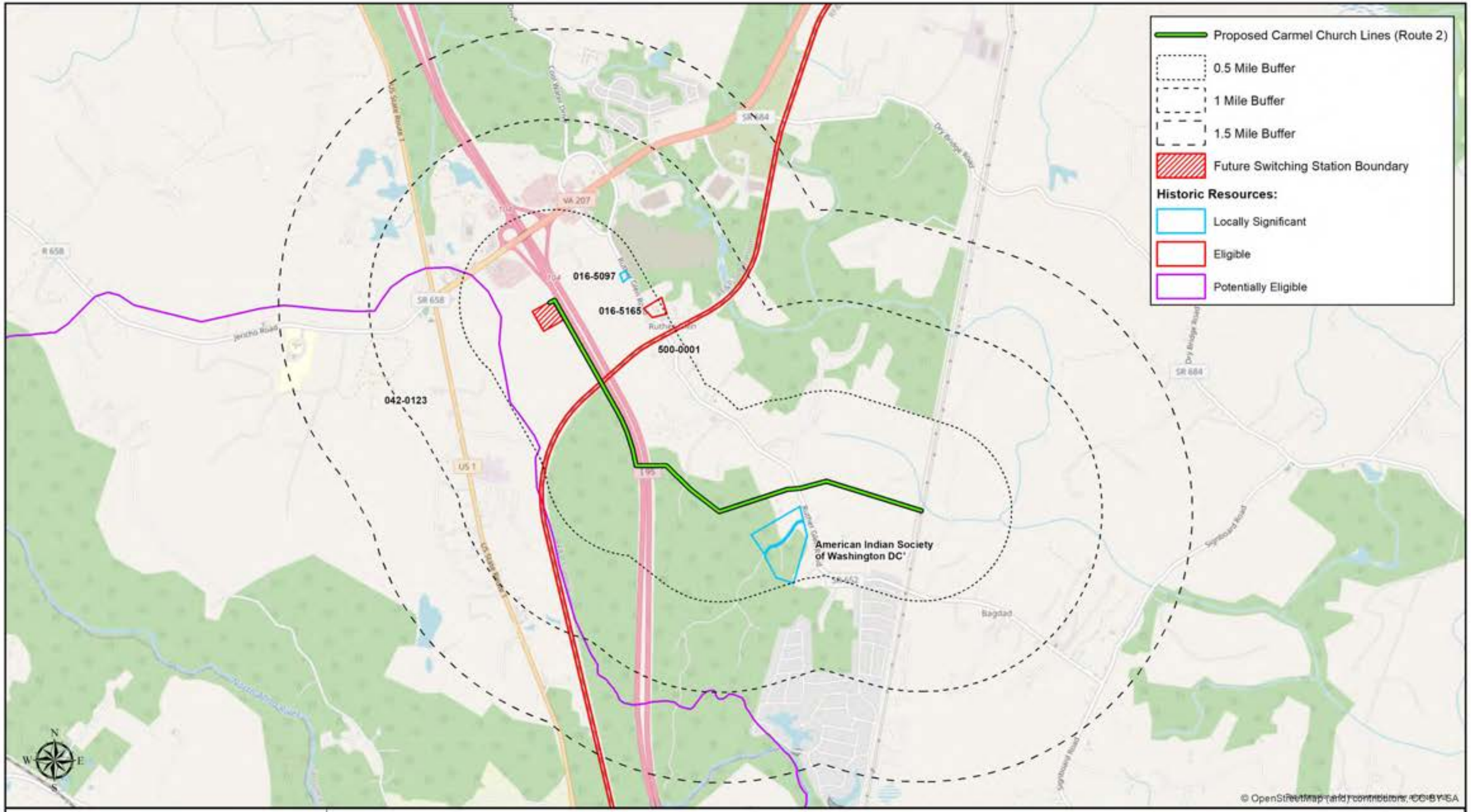

0 0.5 1 1.5 Miles

1:32,000

Attachment 1, Sheet 2

Location of Considered Resources Associated with Proposed Project Alternatives - Proposed Carmel Church Lines (Route 2)

Carmel Church Project

Dominion Energy Virginia

Caroline County, VA

Dominion Energy

ERM

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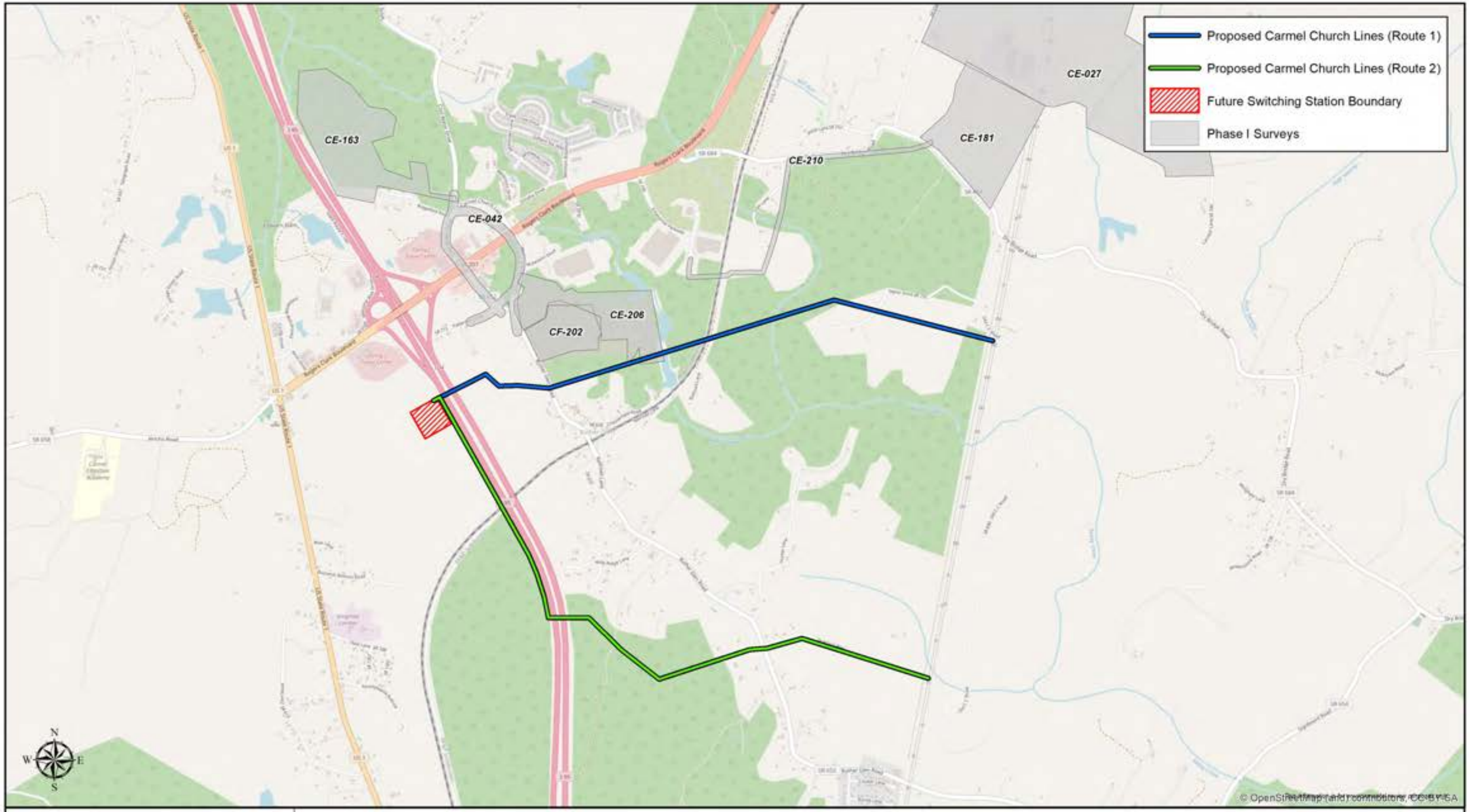
ATTACHMENT 2 CULTURAL RESOURCES SURVEYS COVERING PORTIONS OF ROUTES



Attachment 2
Locations of Phase I Surveys Associated with Proposed Project Alternatives
Carmel Church Project
Dominion Energy Virginia
Caroline County, VA

Dominion Energy

ERM

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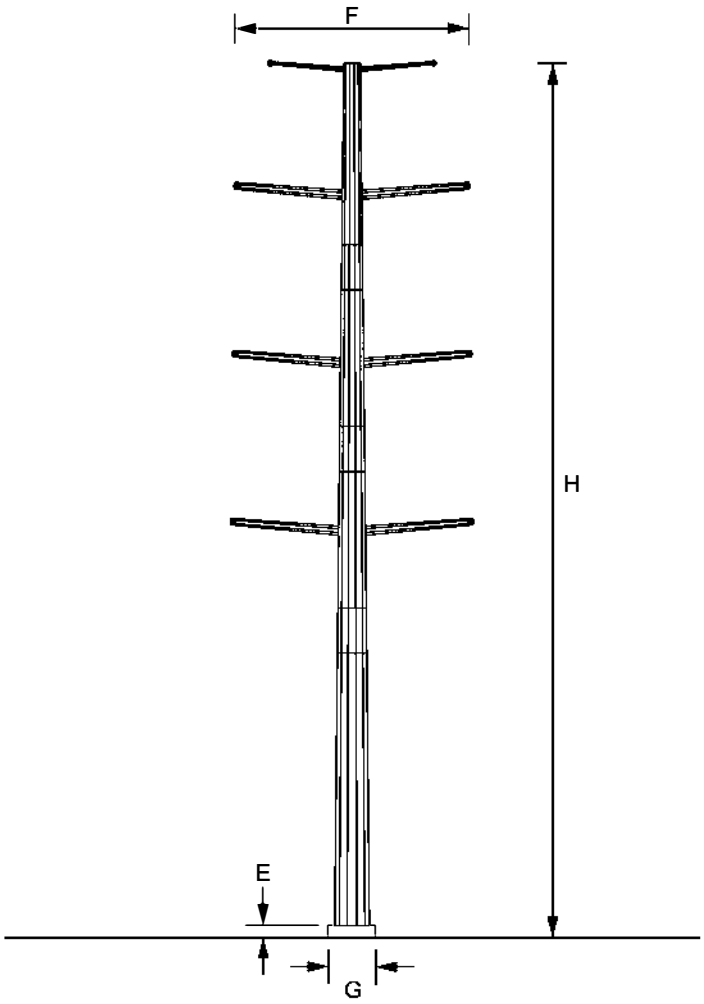
ATTACHMENT 3 TYPICAL DESIGN AND LAYOUT



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):	2.40 MILES (6 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):	90' 115' 108'
I. AVERAGE SPAN LENGTH (RANGE):	507' - SEE NOTE 4
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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TYPICAL DC ENGINEERED MONOPOLE DOUBLE DEADEND STRUCTURE

ATTACHMENT NO.

II.B.3.d

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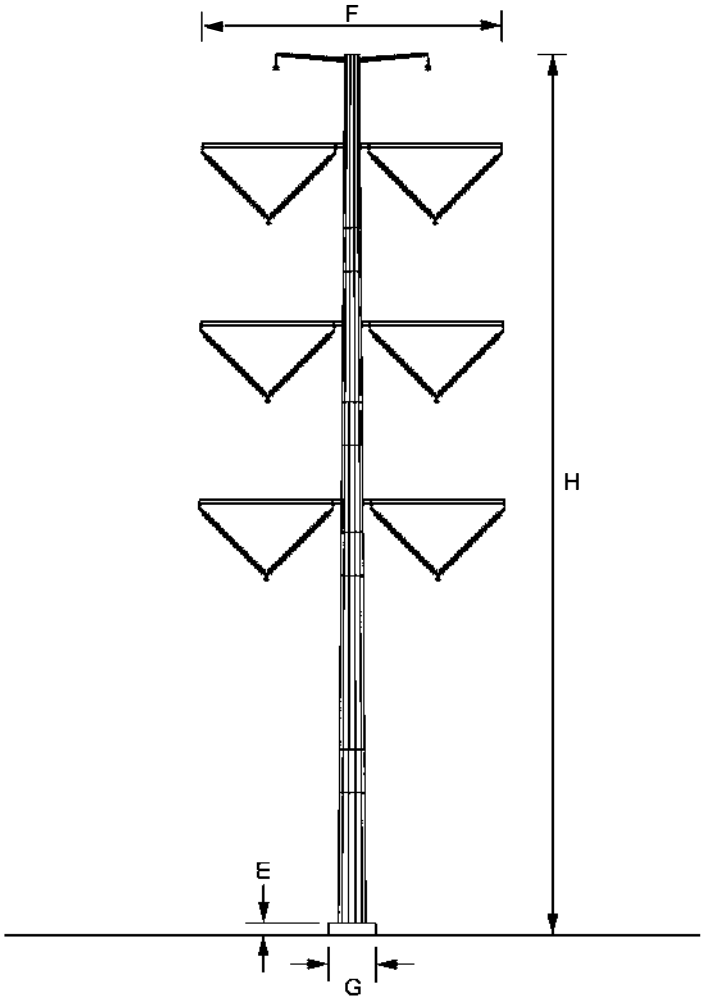

TYPICAL DC ENGINEERED MONOPOLE SUSPENSION STRUCTURE (V-STRING)

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):	2.40 MILES (14 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):	100' 135' 111'
I. AVERAGE SPAN LENGTH (RANGE):	507' - SEE NOTE 4
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

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TYPICAL DC ENGINEERED MONOPOLE SUSPENSION STRUCTURE (V-STRING)

ATTACHMENT NO.

II.B.3.e

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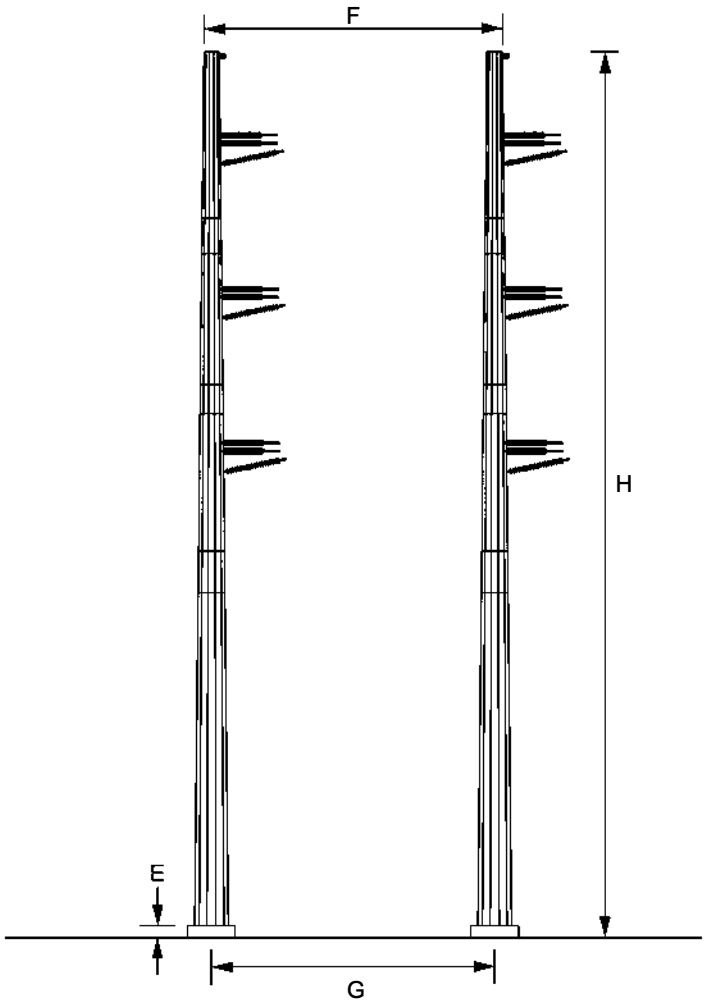

TYPICAL DC ENGINEERED 2-POLE DOUBLE DEADEND STRUCTURE

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):	2.40 MILES (3 STRUCTURES) - SEE NOTE 1
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	MATCH CURRENT STANDARDS 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):	100' 100' 100'
I. AVERAGE SPAN LENGTH (RANGE):	507' - SEE NOTE 4
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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TYPICAL DC ENGINEERED 2-POLE DOUBLE DEADEND STRUCTURE

ATTACHMENT NO.

II.B.3.f

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ATTACHMENT 4 HISTORIC RESOURCE PHOTOS

Figure 1. 016-5097, Rosenwald School, View to the Southwest.

Figure 2. 016-5165, Excelsior Industry of Caroline County Historic District, View to the North.

Figure 3. 042-0123, North Anna Battlefield, on Roger Clark Boulevard, View to the Southeast.

Figure 4. 042-0123, North Anna Battlefield, on Roger Clark Boulevard, View to the South.

Figure 5. 042-0123, North Anna Battlefield, on Roger Clark Boulevard, View to the Southwest.

Figure 6. 042-0123, North Anna Battlefield, on Roger Clark Boulevard, View to the Southwest.

Figure 7. 500-0001, Richmond, Fredericksburg, and Potomac Railroad, View to the Northeast.

Figure 8. American Indian Society for Washington DC, View to the East.

ATTACHMENT 5 PHOTO SIMULATIONS

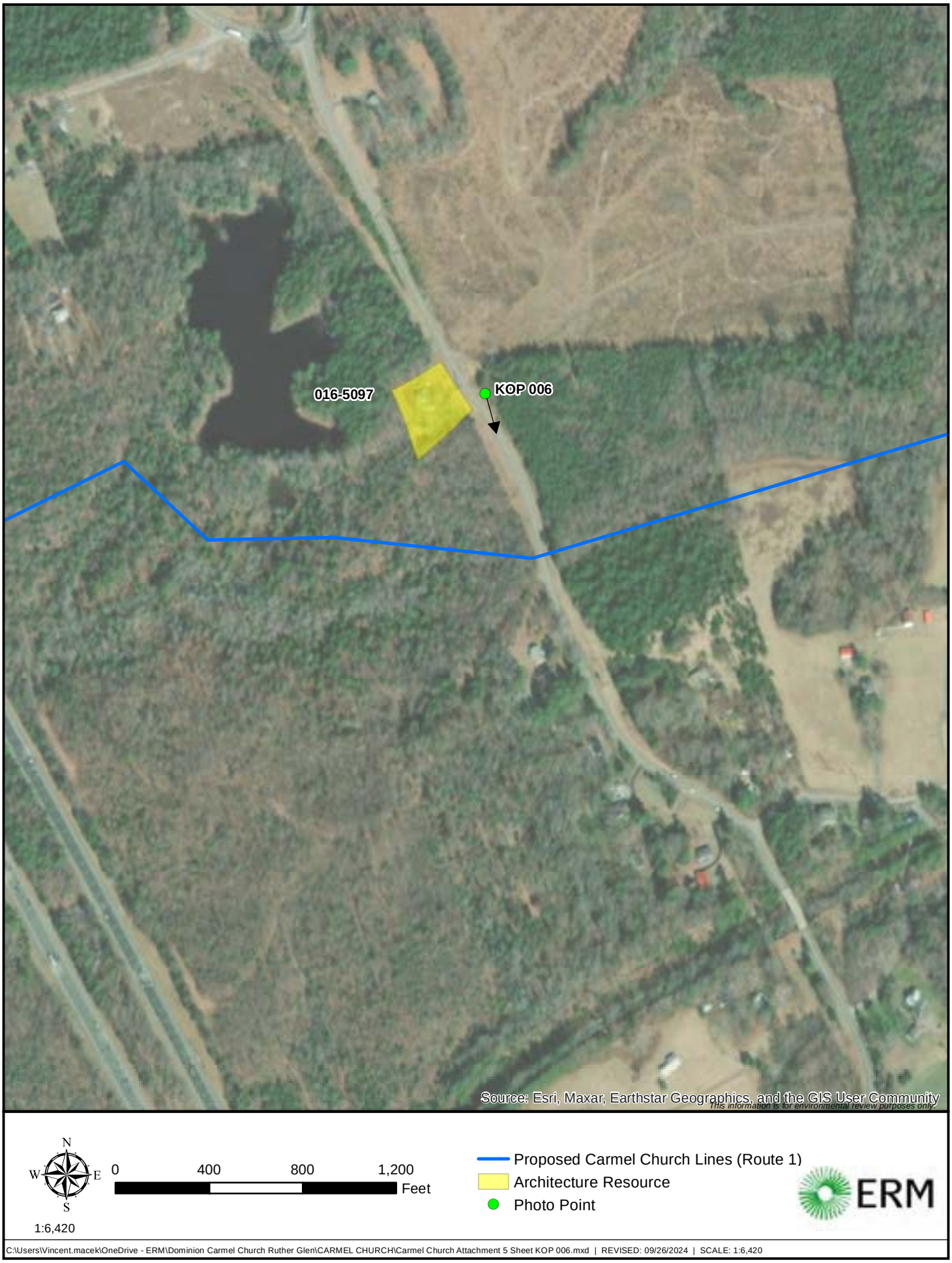


Figure 1. Aerial photograph depicting land use and photo view for 016-5097.

EXISTING CONDITIONS

PROPOSED CONDITIONS

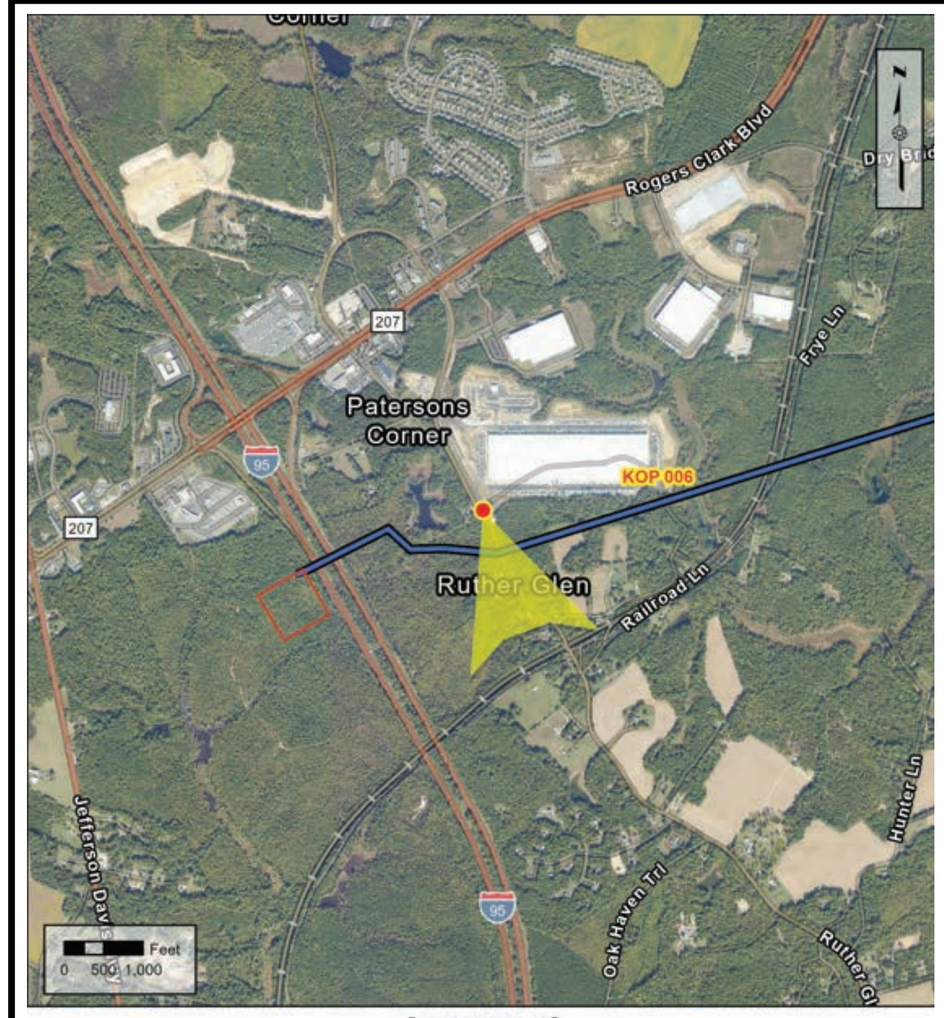
CARMEL CHURCH
230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

Dominion Energy℠

KOP 006

Ladysmith Rd

Figure 2
Route: 1
Date:07/24/2024
Time: 10:10 am
Viewing Direction: Southeast
Distance to closest feature: 0.1 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.

Figure 3. Aerial photograph depicting land use and photo view for 016-5165.

CARMEL CHURCH
230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

Dominion Energy℠

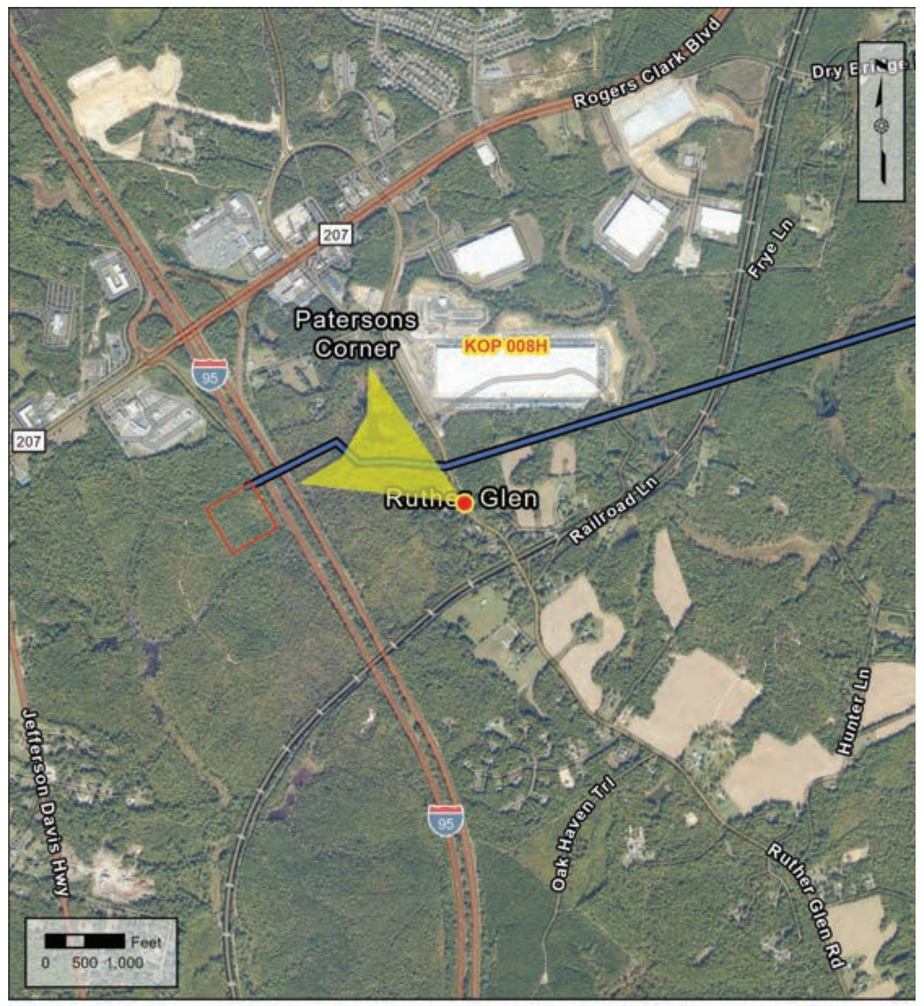
KOP 008

Old C C Rd

Figure 4
Route: 1
Date:09/03/2024
Time: 1:15 pm
Viewing Direction: Northwest
Distance to closest feature: 0.1 miles

EXISTING CONDITIONS

PROPOSED CONDITIONS



Legend

- KOP View Direction
- Route 1
- Right-of-Way
- Substation Boundary

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.

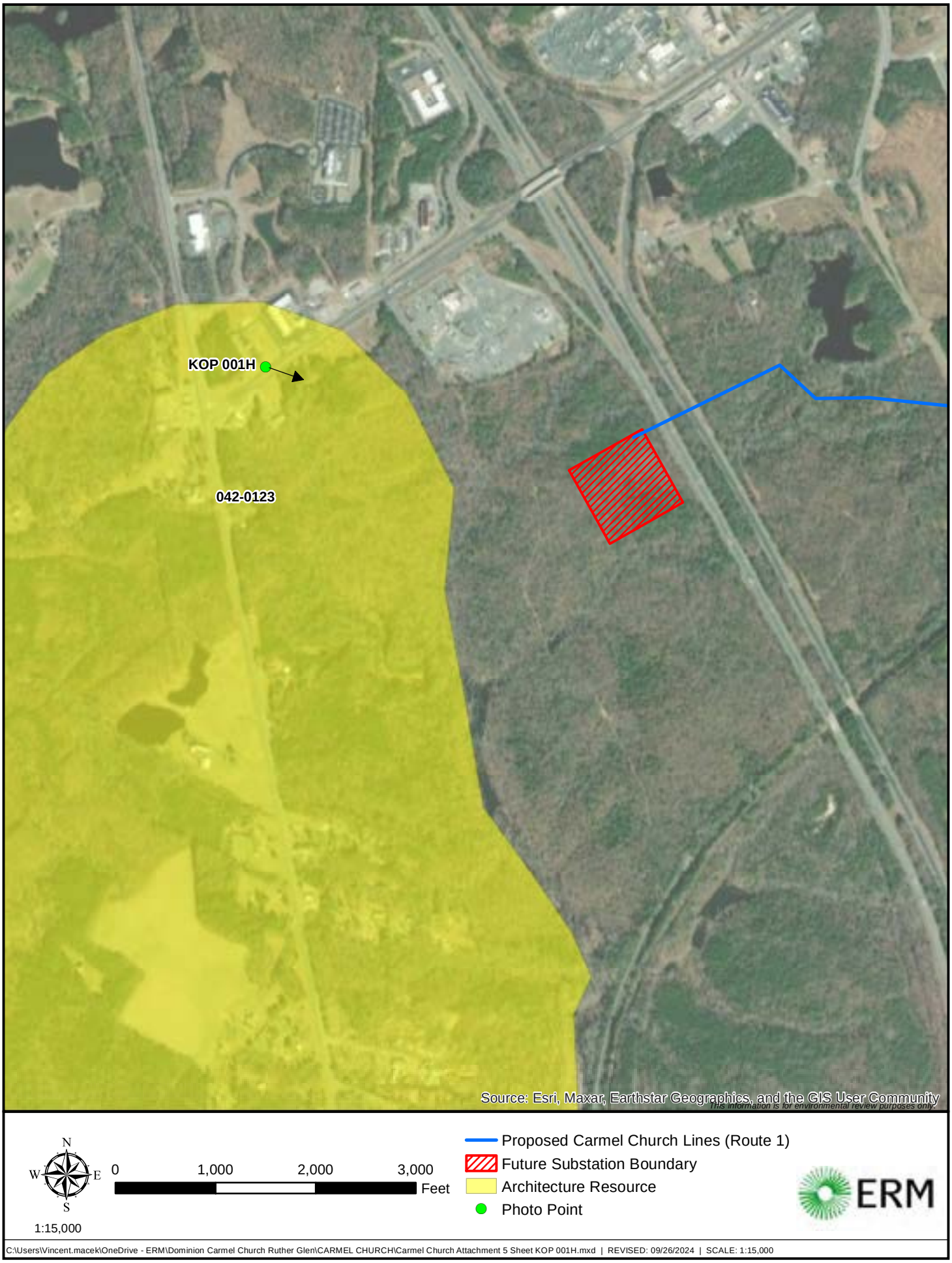


Figure 5. Aerial photograph depicting land use and photo view for 042-0123

CARMEL CHURCH
230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

Dominion Energy℠

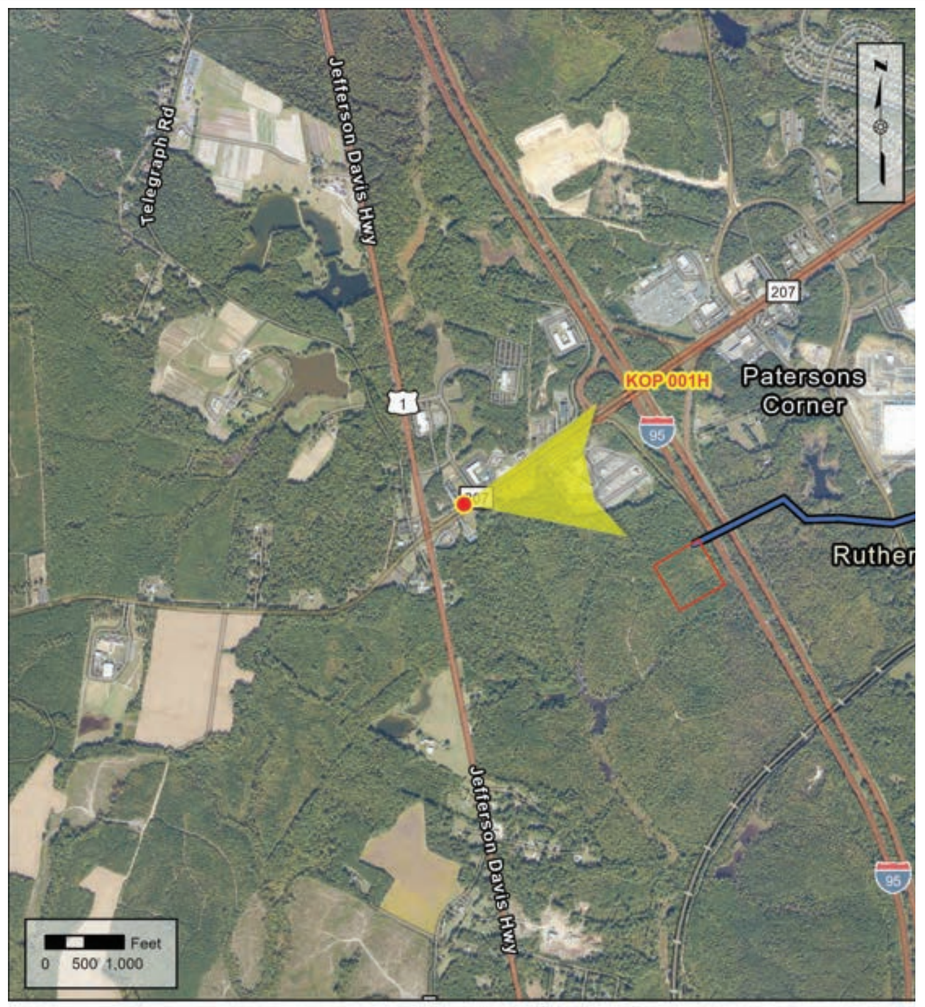
KOP 001H

Rogers Clark Blvd

Figure 6
Route: 1
Date:09/03/2024
Time: 11:39 am
Viewing Direction: Southeast
Distance to closest feature: 0.6 miles

EXISTING CONDITIONS

PROPOSED CONDITIONS



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.

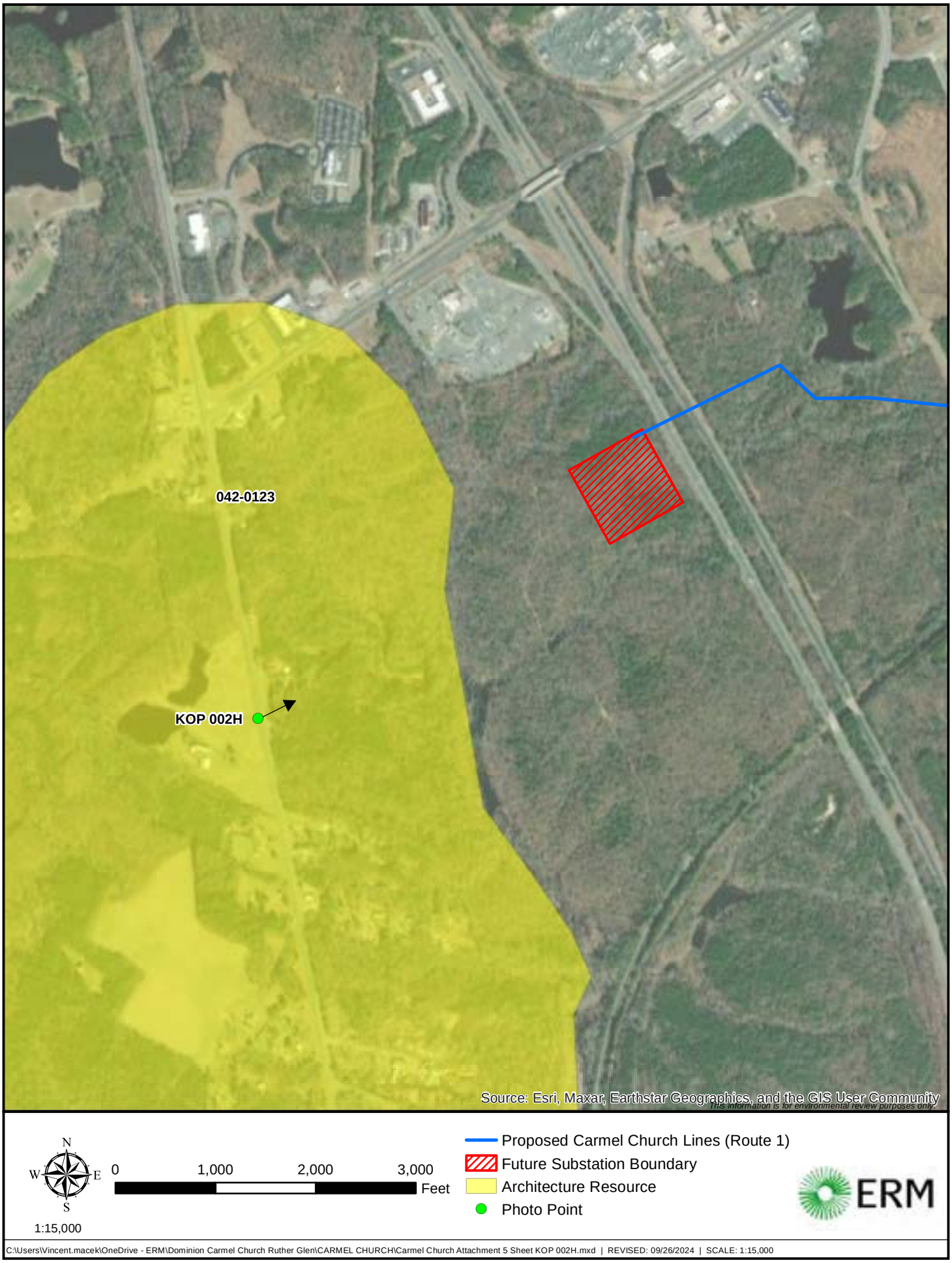


Figure 7. Aerial photograph depicting land use and photo view for 042-0123

EXISTING CONDITIONS

PROPOSED CONDITIONS

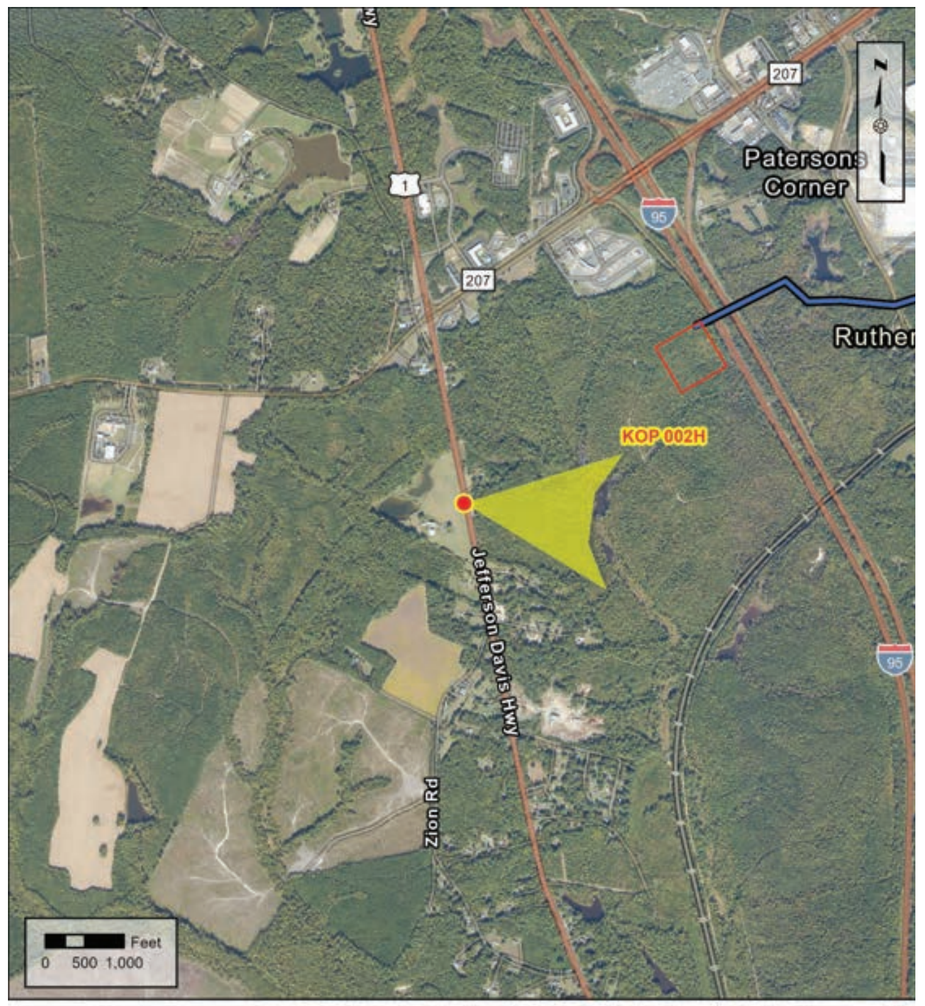
CARMEL CHURCH
230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

Dominion Energy℠

KOP 002H

Jefferson Davis Hwy

Figure 8
Route: 1
Date:09/03/2024
Time: 11:58 am
Viewing Direction: Southeast
Distance to closest feature: 0.7 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.

Figure 9. Aerial photograph depicting land use and photo view for 500-0001.

EXISTING CONDITIONS

PROPOSED CONDITIONS

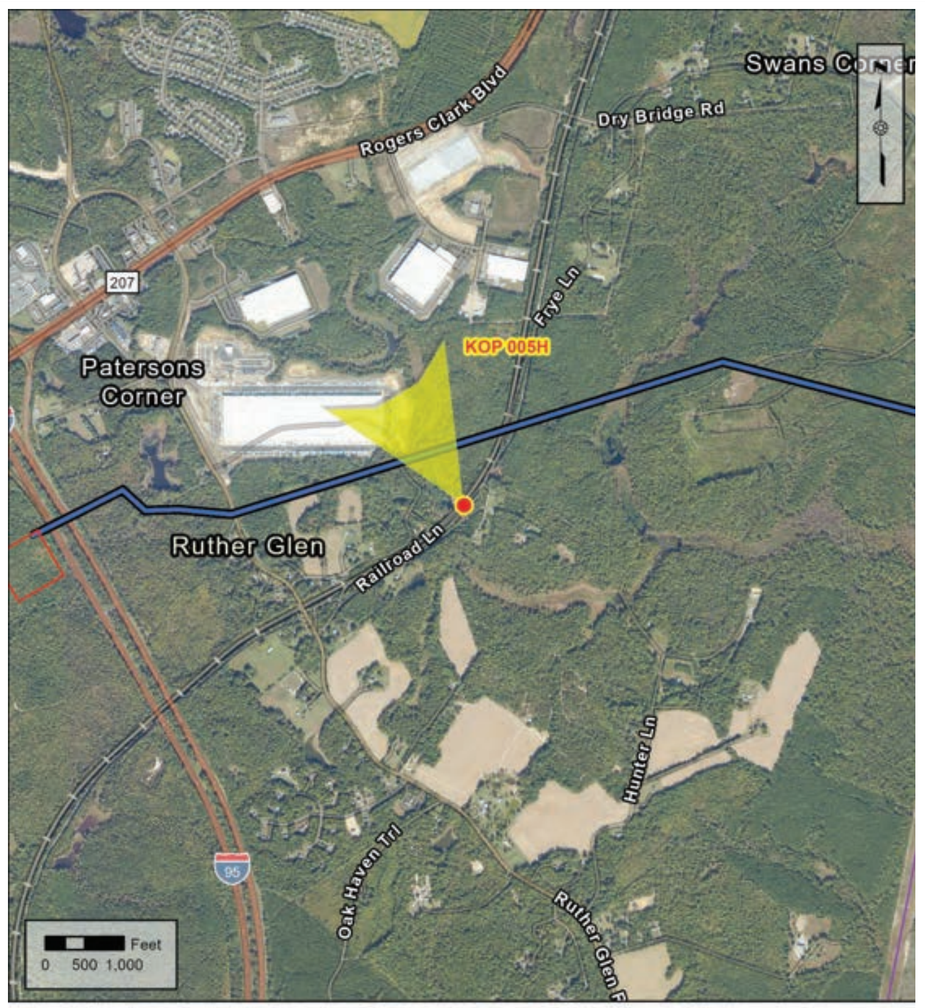
CARMEL CHURCH
230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

Dominion Energy℠

KOP 005H

Railroad Ln

Figure 10
Route: 1
Date:09/03/2024
Time: 01:37 pm
Viewing Direction: Northwest
Distance to closest feature: 0.1 miles



Legend

- KOP View Direction
- Existing Dominion Transmission Line
- Route 1
- Right-of-Way
- Substation Boundary

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.

Figure 11. Aerial photograph depicting land use and photo view for 016-5097.

CARMEL CHURCH
230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

Dominion Energy℠

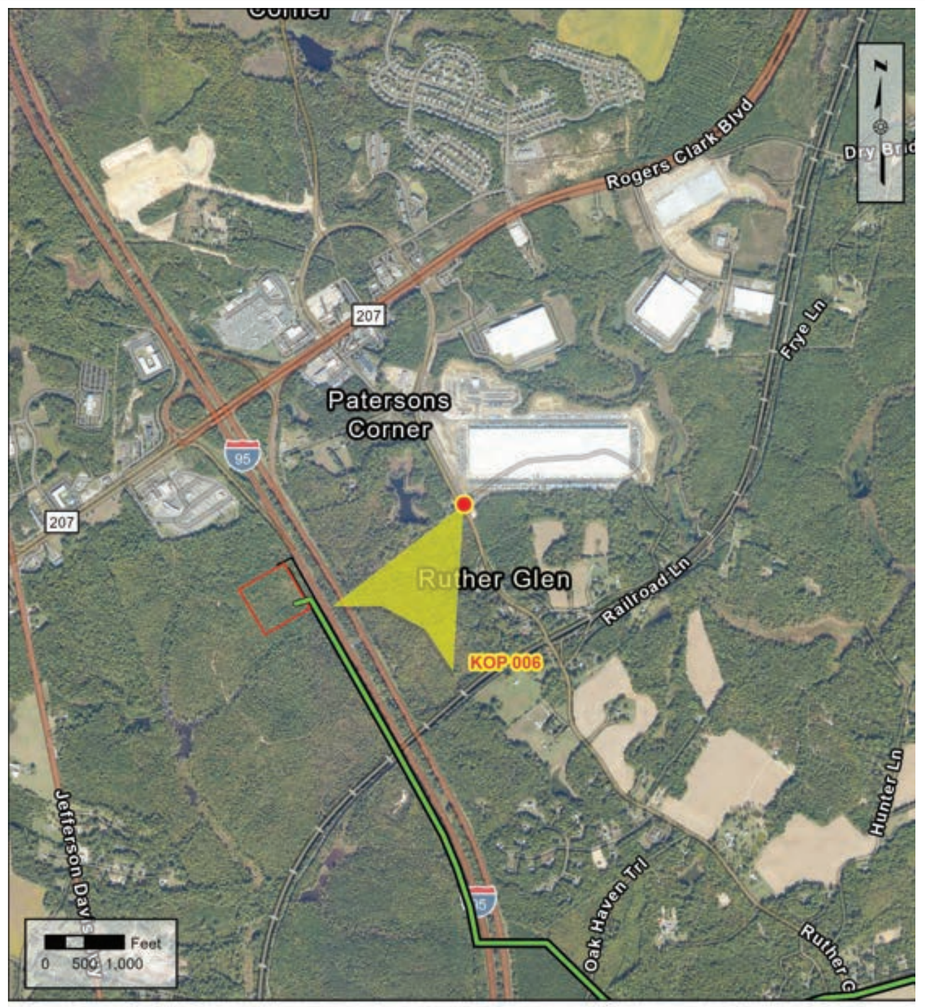
KOP 006

Railroad Ln

Figure 12
Route: 2
Date:07/24/2024
Time: 10:10 am
Viewing Direction: Southwest
Distance to closest feature: 0.4 miles

EXISTING CONDITIONS

PROPOSED CONDITIONS



Legend

- KOP View Direction
- Route 2
- Right-of-Way
- Substation Boundary

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.

Figure 13. Aerial photograph depicting land use and photo view for 016-5165.

CARMEL CHURCH
230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

Dominion Energy℠

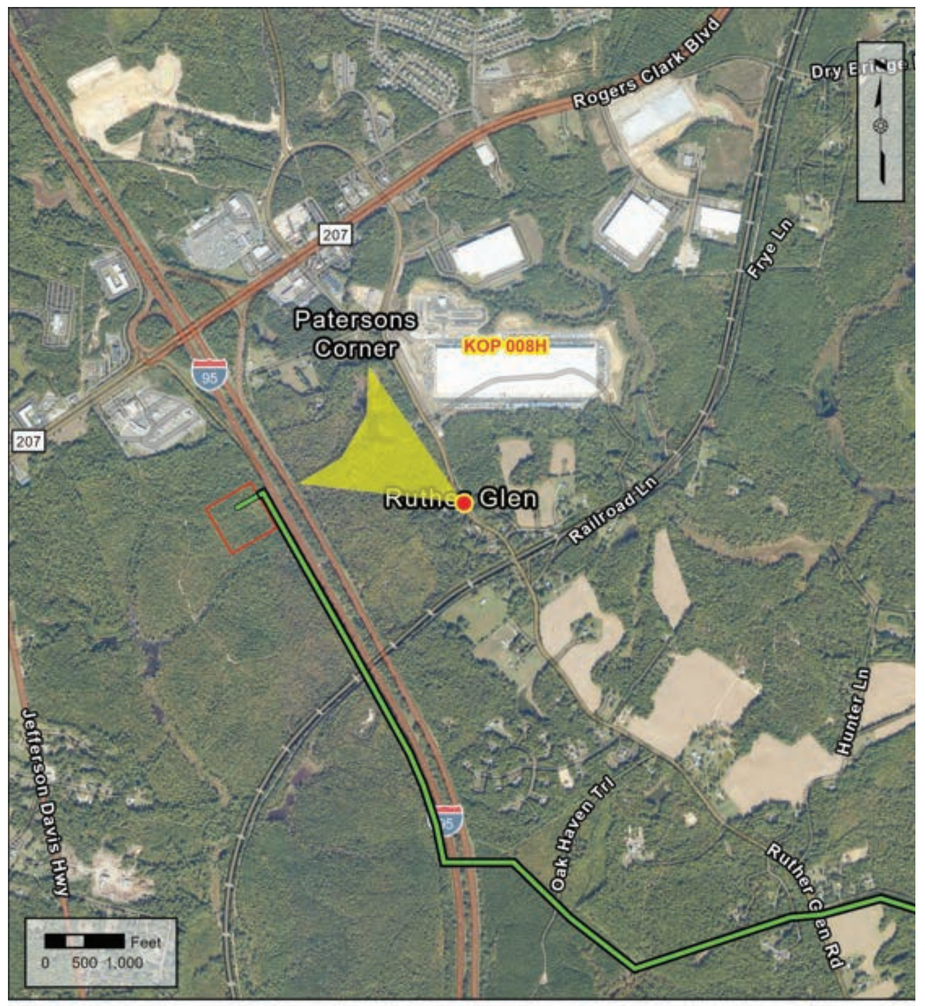
KOP 008H

Ruther Glen Rd

Figure 14
Route: 2
Date:09/03/2024
Time: 1:15 pm
Viewing Direction: Northwest
Distance to closest feature: 0.4 miles

EXISTING CONDITIONS

PROPOSED CONDITIONS



Legend

- KOP View Direction
- Route 2
- Route 2,Substation Boundary
- Route 2,100ft ROW

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.

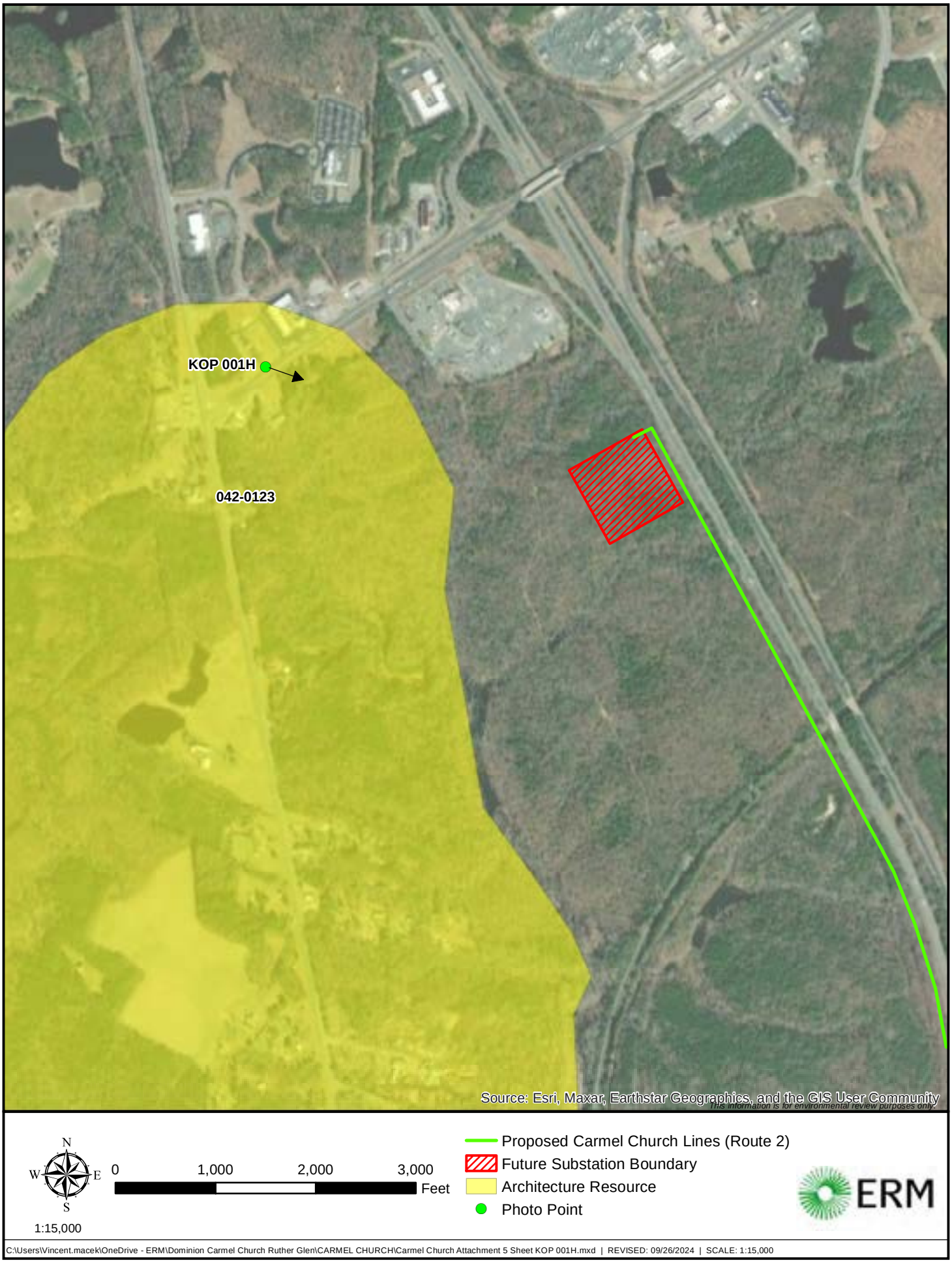


Figure 15. Aerial photograph depicting land use and photo view for 042-0123

CARMEL CHURCH
230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

Dominion Energy℠

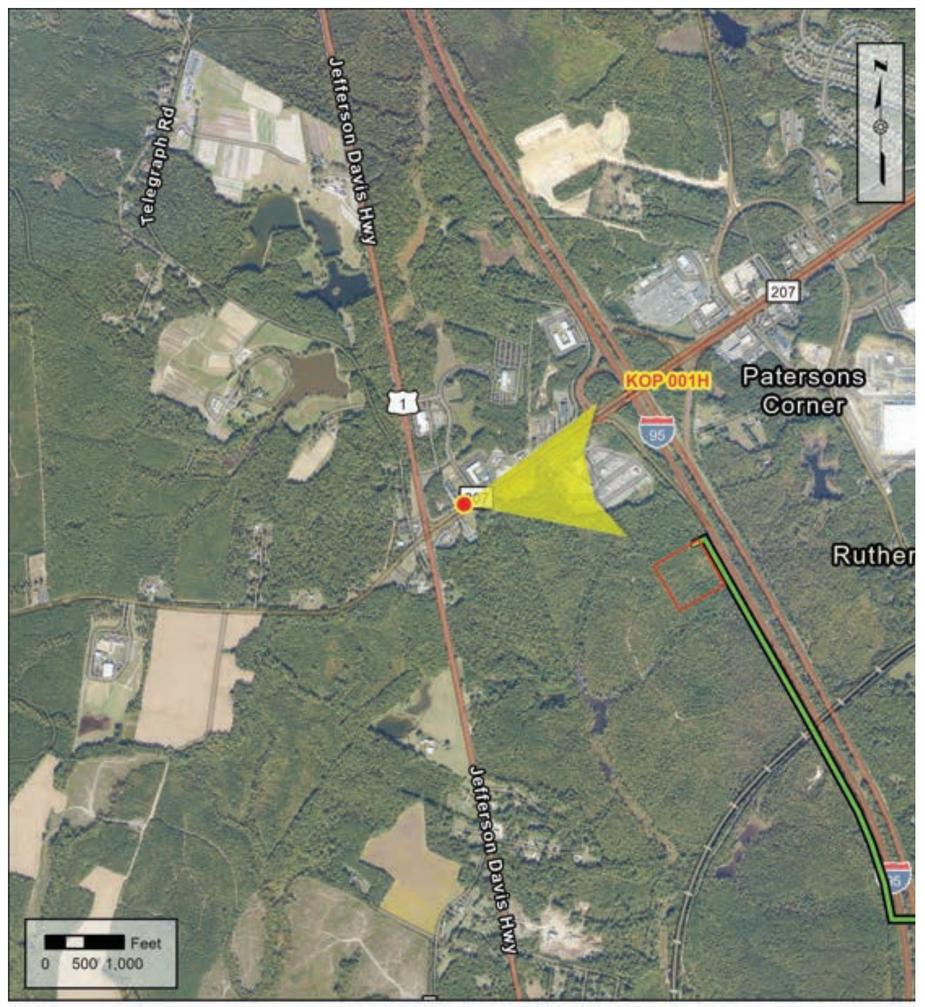
KOP 001H

Rogers Clark Blvd

Figure 16
Route: 2
Date:09/03/2024
Time: 11:39 am
Viewing Direction: East
Distance to closest feature: 0.6 miles

EXISTING CONDITIONS

PROPOSED CONDITIONS



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.

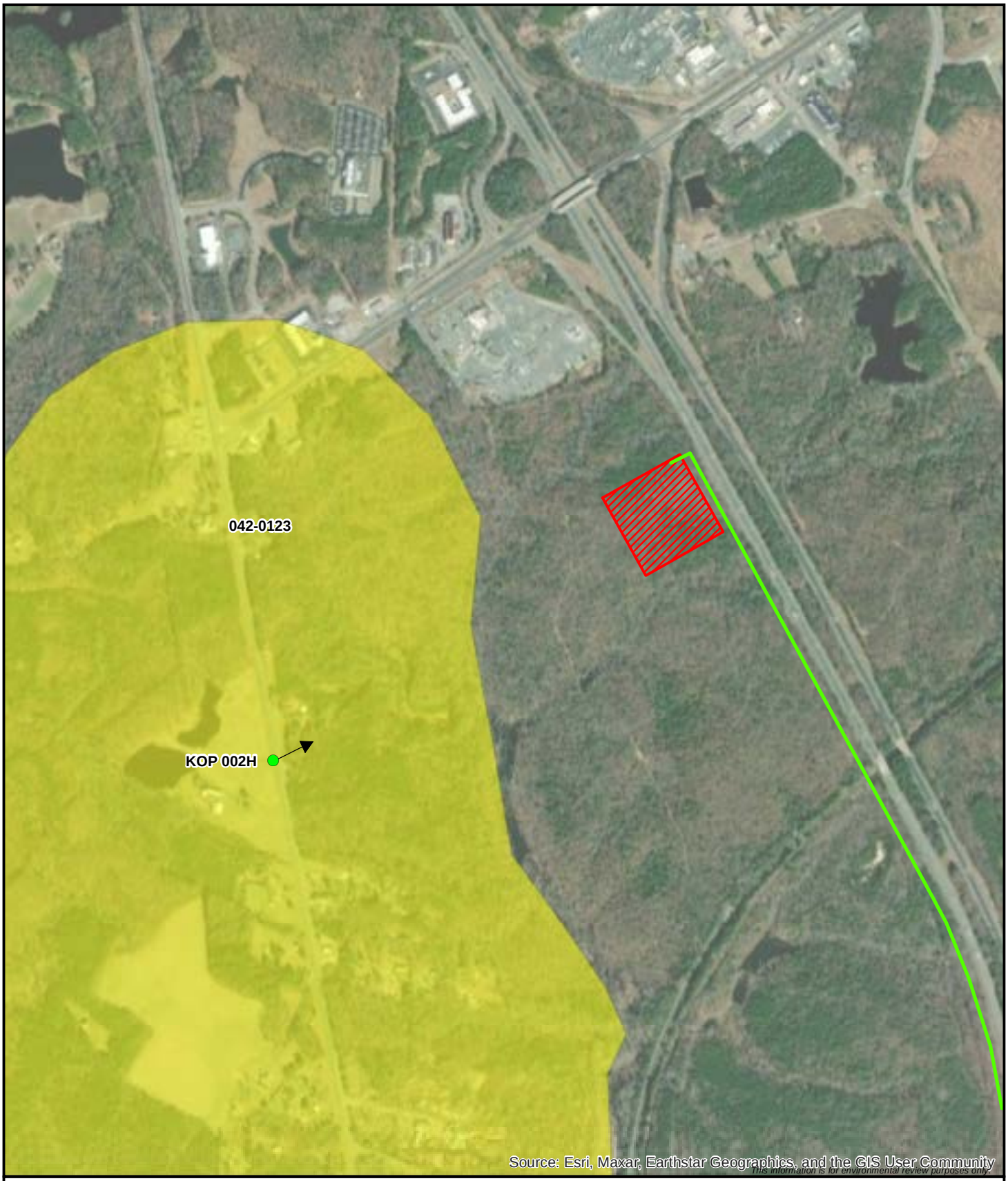


Figure 17. Aerial photograph depicting land use and photo view for 042-0123

CARMEL CHURCH
230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

Dominion Energy℠

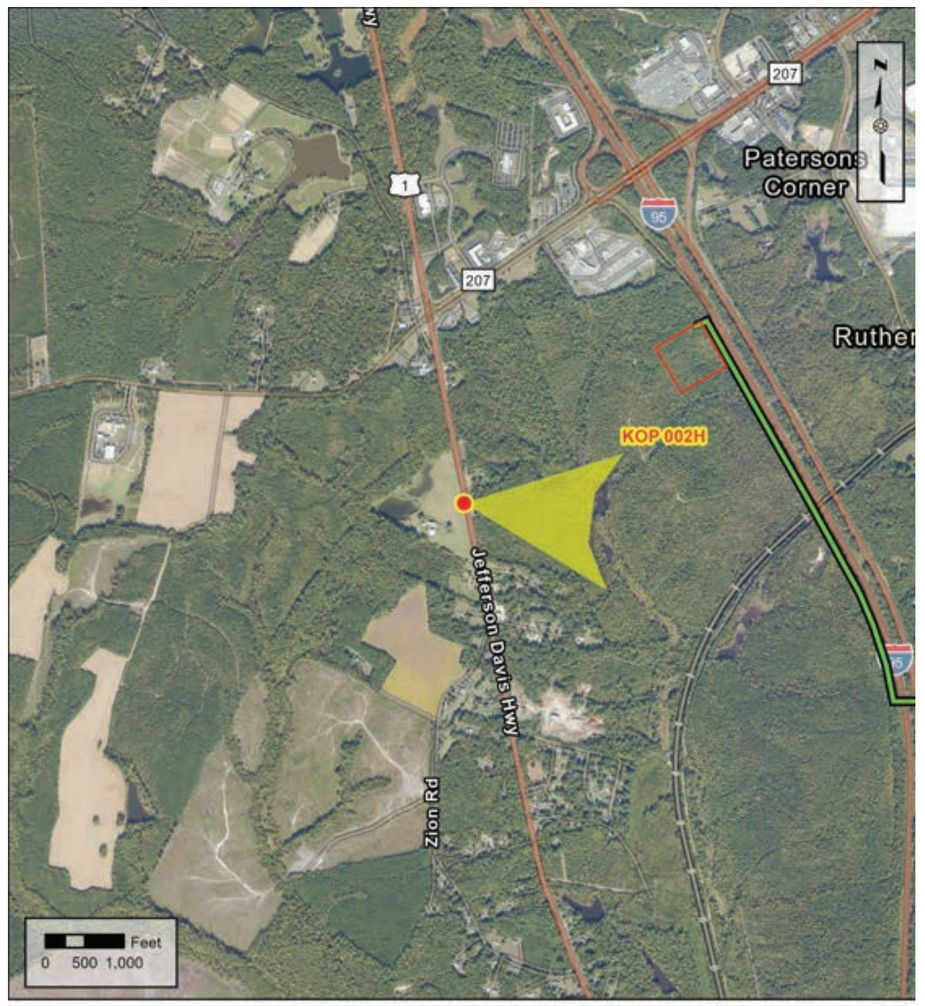
KOP 002H

Jefferson Davis Hwy

Figure 18
Route: 2
Date:09/03/2024
Time: 11:58 am
Viewing Direction: East
Distance to closest feature: 0.7 miles

EXISTING CONDITIONS

PROPOSED CONDITIONS



Legend

- KOP View Direction
- Route 2
- Right-of-Way
- Substation Boundary

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.

Figure 19. Aerial photograph depicting land use and photo view for 500-0001.

EXISTING CONDITIONS

PROPOSED CONDITIONS

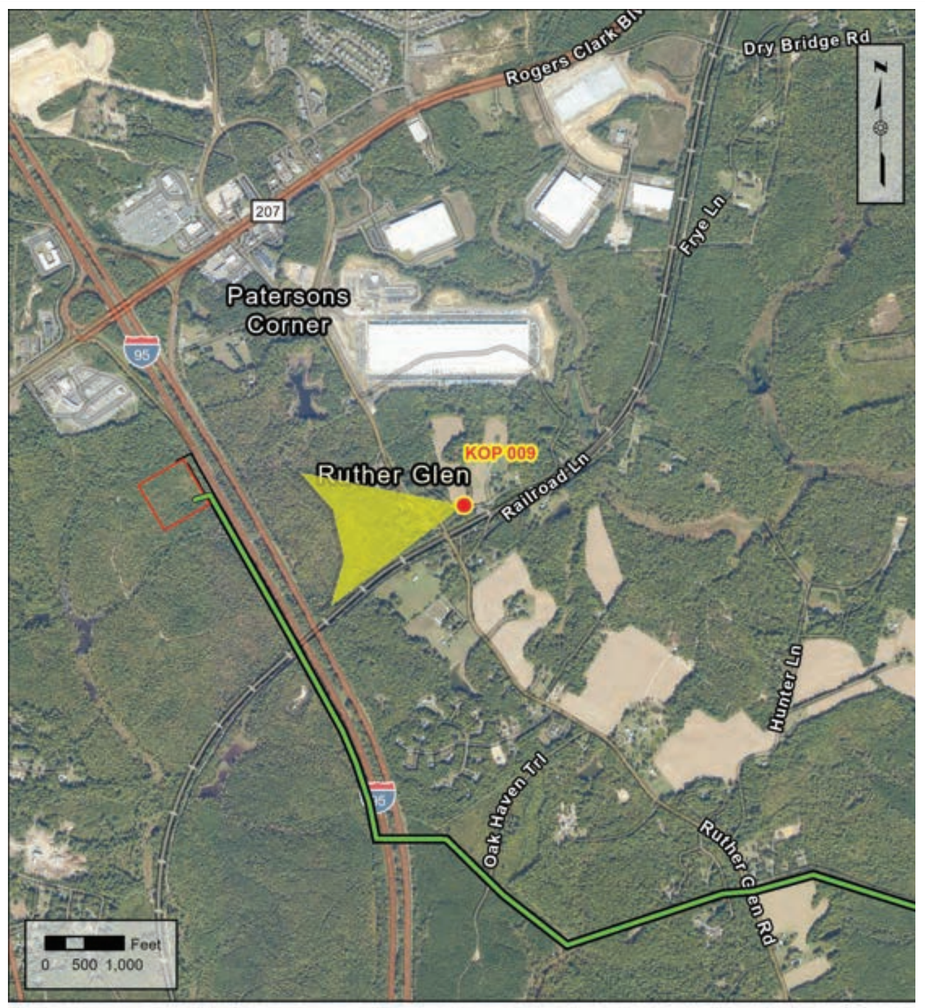
CARMEL CHURCH
230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

Dominion Energy℠

KOP 009

Chesterfield Rd

Figure 20
Route: 2
Date:07/24/2024
Time: 10:30 am
Viewing Direction: West
Distance to closest feature: 0.5 miles



Legend

- KOP View Direction
- Route 2
- Right-of-Way
- Substation Boundary

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.

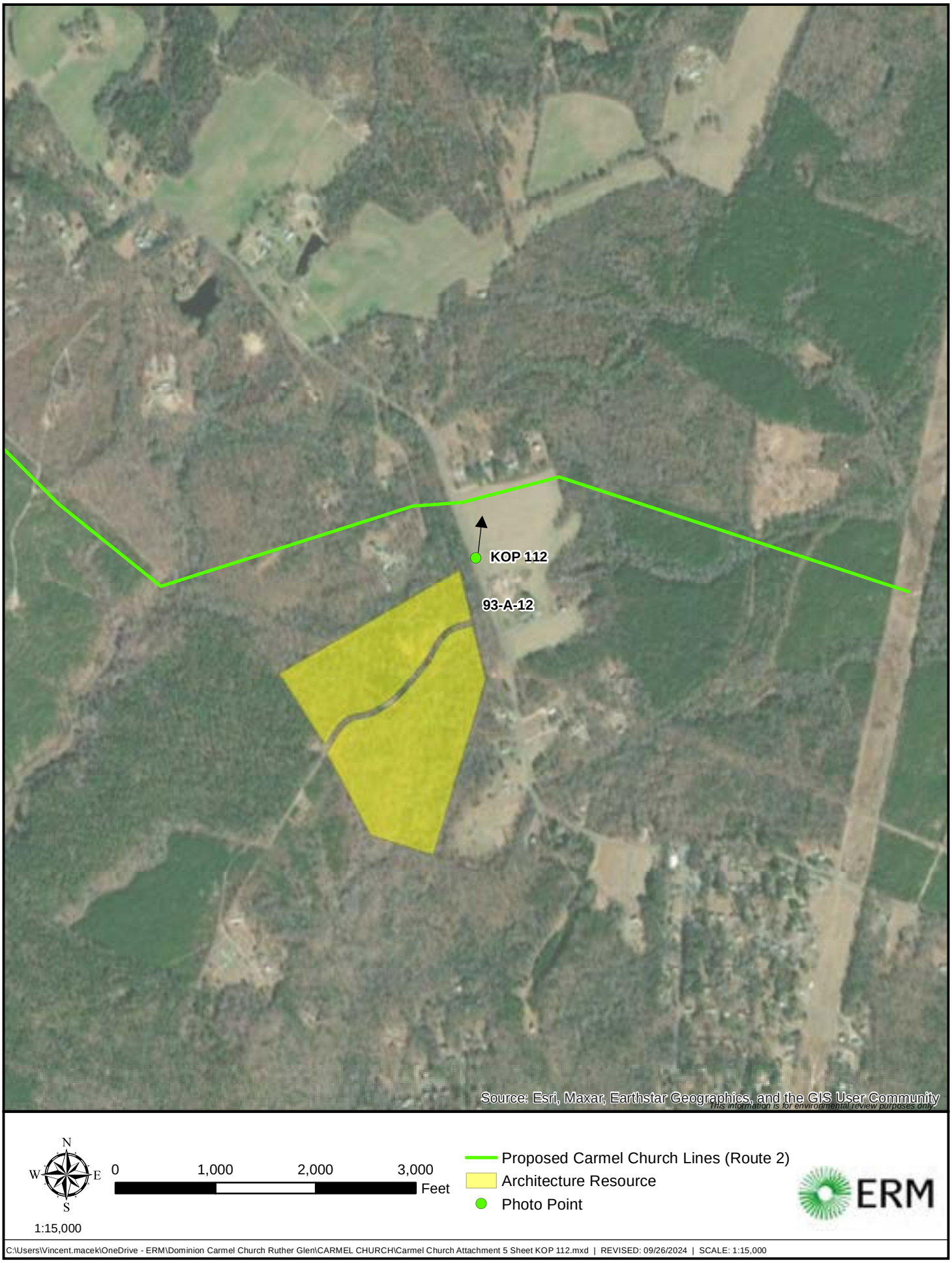


Figure 21. Aerial photograph depicting land use and photo view for 93-A-12.

CARMEL CHURCH
230 kV Electric Transmission Project
Dominion Energy Virginia
Caroline County, Virginia

Dominion Energy℠

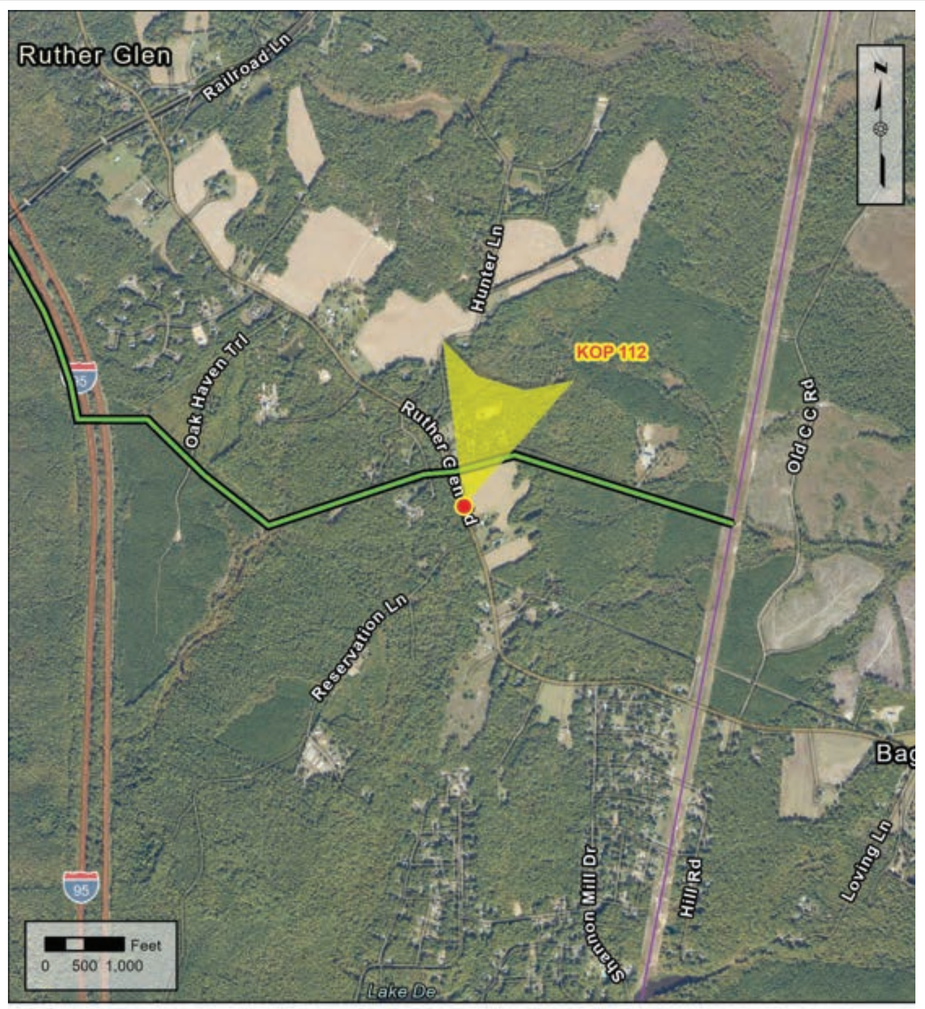
KOP 112

Ruther Glen Rd

Figure 22
Route: 2
Date:09/03/2024
Time: 02:33 pm
Viewing Direction: Northeast
Distance to closest feature: 0.1 miles

EXISTING CONDITIONS

PROPOSED CONDITIONS



Note: Project components illustrated are based on proposed preliminary designs
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From: Rice, James (VDOT)
To: Tracey S McDonald (Services - 6)
Cc: Oster, Carolyn (VDOT); Flippen, Roswell (VDOT); Lupo, Shane (VDOT); rachel.tippett@erm.com; Ann Gordon Mickel (DEV Trans Distribution - 1); Pat Robblee
Subject: [EXTERNAL] VDOT Follow-Up-Carmel Church/Ruther Glen Transmission Projects
Date: Wednesday, May 22, 2024 8:42:18 AM
Attachments: Outlook-5hyelo2n.png

Hi Tracey,
Please see the additional VDOT comments below. This is a follow-up to our Teams call on May 16th.

1. At this time, VDOT has no major proposed improvements on the routes presented.

2. For any proposed crossings of roadways, please do not cross at any current bridge or culvert crossing maintained by VDOT. The alignment should be 100'+/- up or downstream from the crossing. This is for future maintenance and replacement of our structures.

If you have any questions or need additional assistance, please let me know.

Many Thanks,
Jim

Jim Rice, PE
Land Development Engineer
Fredericksburg Residency
Virginia Department of Transportation
540-907-2068
James.Rice@VDOT.Virginia.gov

From: Warren, Arlene <arlene.warren@vdh.virginia.gov>
Sent: Tuesday, June 22, 2021 7:53 AM
To: Rachel.M.Studebaker@dominionenergy.com
Subject: [EXTERNAL] Re: FW: SCC Case No. PUR-2021-00010/DEQ21-013S

This is an EXTERNAL email that was NOT sent from Dominion Energy. Are you expecting this message? Are you expecting a link or attachment? DO NOT click links or open attachments until you verify them

The proposal from Dominion is reasonable and we consider it acceptable.

Best Regards,

Arlene Fields Warren

GIS Program Support Technician

Office of Drinking Water

Virginia Department of Health

109 Governor Street

Richmond, VA 23219

(804) 864-7781

On Thu, Jun 17, 2021 at 4:33 PM Rachel.M.Studebaker@dominionenergy.com <Rachel.M.Studebaker@dominionenergy.com> wrote:

Hello Ms. Warren,

I am reaching out in regard to the DEQ Report for SCC Case No. PUR-2021-00010/DEQ21-013S (230 kV lines #2113 and #2154 Transmission Line Rebuilds and Related Projects). As part of the VDH ODW review, it was recommended that all wells within a 1,000-foot radius of the project site be field marked and protected from accidental damage. It is our custom construction process to not conduct any work outside of the existing right-of-way (ROW), with the exception of entry using existing access roads, and use DEQ approved erosion and sediment controls. These well are located outside of the project area ROW on private land and Dominion Energy does not have permission to enter private property to field mark the wells.

Therefore, we are proposing to plot and call out the wells on the Erosion and Sediment control plans as a way of flagging them for the construction team for protection from accidental damage. Is this a sufficient approach to comply with the ODW recommendation?

Thank you,

Rachel Studebaker

Environmental Specialist II

Dominion Energy Services

120 Tredegar Street, Richmond, VA 23219

Office: (804) 273-4086

Cell: (804) 217-1847

#