



**Dominion
Energy[®]**

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

**Before the State Corporation
Commission of Virginia**

**230 kV Elmont-White Oak Line
#2075, 230 kV Chickahoniny-
White Oak Line #2294, and
White Oak Substation
Expansion**

Application No. 326

Case No. PUR-2023-00110

Filed: June 23, 2023

Volume 2 of 3

COMMONWEALTH OF VIRGINIA
BEFORE THE
STATE CORPORATION COMMISSION

APPLICATION OF
VIRGINIA ELECTRIC AND POWER COMPANY
FOR APPROVAL AND CERTIFICATION
OF ELECTRIC TRANSMISSION FACILITIES

230 kV Elmont-White Oak Line #2075,
230 kV Chickahominy-White Oak Line #2294 and
White Oak Substation Expansion

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DEQ Supplement

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Based on consultations with the 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 Project by DEQ and other relevant agencies.

1. Project Description

In order to relieve identified violations of mandatory North American Electric Reliability Corporation (“NERC”) Reliability Standards beginning in the winter of 2023-2024 timeframe brought on by significant increases in electrical demand over the past five years as well as expected demand growth projected for the future, and to maintain the structural integrity and reliability of its transmission system, Dominion Energy Virginia proposes in Henrico County, Virginia, to:

- (1) Construct two new approximately 4.69-mile overhead 230 kV transmission lines on primarily double circuit monopole structures in a new predominantly 100-foot-wide right-of-way¹ by cutting the Company’s existing 230 kV Chickahominy-Elmont Line #2075 at a location between Structures #2075/150 and #2075/151, resulting in (i) 230 kV Elmont-White Oak Line #2075, and (ii) 230 kV Chickahominy-White Oak Line #2294 (the “White Oak Lines”). At the cut-in location within the existing right-of-way, the Company will remove one single circuit lattice tower and install one single circuit H-frame structure on 500 kV Chickahominy-Elmont Line #557 to facilitate construction of the White Oak Lines. From the cut-in location within the existing right-of-way, the White Oak Lines will extend a total of approximately 4.69 miles generally in a southwesterly direction before terminating at the expanded White Oak Substation. While the proposed cut-in location is in the existing right-of-way, the proposed White Oak Lines will be constructed on new right-of-way

¹ Within the existing 230 kV Chickahominy-Elmont Line #2075 right-of-way, the Company will install two new single circuit three-pole structures to support the proposed 230 kV Elmont-White Oak Line #2075 and the proposed 230 kV Chickahominy-White Oak Line #2294. In order for the conductors to meet clearance requirements when passing beneath the existing 500 kV Chickahominy-Elmont Line #557 that is collocated with Line #2075 in the existing transmission corridor, the width of the White Oak Lines corridor will gradually taper from 180 feet to a 100-foot-wide right-of-way for a total approximately 0.06 mile. The first 0.025 mile will begin at the structure cut-in location in the existing right-of-way and continue to the edge of the existing right-of-way. From the edge of the existing right-of-way, the proposed White Oak Lines will continue to gradually decrease to a 100-foot-wide right-of-way for approximately 0.035 mile. At the cut-in location on Line #2075 between Structures #2075/150 and #2075/151, existing Structure #2075/150 (a double circuit 230 kV weathering steel H-frame structure that is currently supporting only one circuit) will be removed and replaced with two new 230 kV single circuit weathering steel three-pole structures (proposed Structures #2075/150 and #2294/150). The proposed structures will be located within the existing transmission corridor and are estimated to be within 20% of the existing structure heights. The conductors for the White Oak Lines will begin in a horizontal configuration at the cut-in location (using the two new single circuit three-pole structures installed side-by-side) then pass under the existing Line #557. Within that 0.06-mile segment, the White Oak Lines will transition from horizontal arrangement (using two single circuit H-frame structures installed side-by-side) to vertical arrangement (using one double circuit monopole). As the White Oak Lines rotate to a vertical arrangement, the corridor will gradually taper from 180-foot-wide beginning within the existing transmission corridor to a 100-foot-wide right-of-way. A 100-foot-wide right-of-way would then be needed for the remainder of the route (approximately 4.63 miles) to maintain adequate clearances for blowout and forestry maintenance for the double circuit monopole structures. See page 7 of 11 of [Attachment II.A.6](#) of the Appendix for a map depicting the tapering of the 0.06-mile segment of the Proposed Route of the White Oak Lines from 180 feet to 100 feet.

supported primarily by double circuit weathering steel monopoles and will utilize three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA;

- (2) Expand the Company's existing White Oak Substation in Henrico County, Virginia in order to accommodate the termination of the new White Oak Lines (the "White Oak Substation Expansion"). The White Oak Substation Expansion will require an additional approximately 0.7 acre, which the Company will obtain through easement; and
- (3) Upgrade the line protection at the Company's existing Chickahominy and Elmont Substations.

The White Oak Lines, White Oak Substation Expansion, and related substation work are collectively referred to as the "White Oak Electric Transmission Project" or "Project."

The Project is necessary to relieve identified violations of NERC Reliability Standards in order to maintain and improve reliable electric service to customers in the load area surrounding the Company's existing White Oak Substation ("White Oak Load Area" or "WOLA") in Henrico County, Virginia. These reliability violations, if not relieved, will severely impact the transmission system's ability to provide reliable service to Dominion Energy Virginia's customers in the White Oak Load Area.

For the White Oak Substation Expansion, the existing White Oak Substation will be expanded in order to accommodate the termination of the new White Oak Lines. The White Oak Substation Expansion will include installation of three 230 kV 4000 ampere ("amp" or "A") breakers to create an 8-breaker hybrid breaker-and-a-half arrangement and will require an additional approximately 0.7 acre of land.

For this Project, the Company retained the services of Environmental Resources Management ("ERM") to help collect information within the study area, identify potential routes, perform a routing analysis comparing the route alternatives, and document the routing efforts in an Environmental Routing Study.

The Company identified an approximately 4.69-mile overhead proposed route for the Project ("Proposed Route" or "Route 3"), as well as two overhead alternative routes ("Alternative Route 1" and "Alternative Route 2"). The Company is proposing these three routes for notice. Discussion of the Proposed Route and Alternative Routes, as well as other overhead and hybrid overhead/underground routes that the Company studied but ultimately rejected, is provided in Section II of the Appendix and discussed in more detail in the Environmental Routing Study included with the Application. A description of the Project Proposed and Alternative Routes is as follows.

Proposed Route (Route 3)

The Proposed Route of the White Oak Lines is approximately 4.69 miles in length.

Beginning at the cut-in location between Structures #2075/150 and #2075/151, the route travels southwest toward the intersection of the Norfolk Southern railroad and Meadow Road. The route then continues west, paralleling the south side of the railroad before turning south and crossing I-64. The route continues south crossing Old Williamsburg Road then East Williamsburg Road before turning southeast and paralleling Technology Boulevard past the intersection with Techpark Place. The route then turns south, crossing Technology Boulevard, then southeast ending on the west side of the expanded White Oak Substation.

The Proposed Route of the White Oak Lines primarily will be supported by double circuit monopole structures. For the Proposed Route, the minimum structure height is 55 feet, the maximum structure height is 130 feet, and the average structure height is 111 feet (excluding significantly shorter structures at the cut-in location so as not to create a downward bias as to the overall average structure height), based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

Alternative Route 1

Alternative Route 1 of the White Oak Lines is approximately 4.19 miles in length. Beginning at the cut-in location between Structures #2075/159 and #2075/160, the route travels southwest toward White Oak Road. The route turns west, crosses White Oak Road, then turns to the southwest. The route crosses Elko Road then turns northwest to parallel Elko Road before turning west and crossing Engineered Wood Way and Canal Swamp. The route turns northwest to parallel Technology Boulevard, crosses Technology Creek drive, then turns west to cross Technology Boulevard. The route turns to the southwest along the west side of an existing data center then southeast ending on the west side of the expanded White Oak Substation.

Alternative Route 1 of the White Oak Lines will be supported by primarily double circuit monopole structures. For Alternative Route 1, the minimum structure height is 50 feet, the maximum structure height is 125 feet, and the average structure height is 105 feet (excluding significantly shorter structures at the cut-in location so as not to create a downward bias as to the overall average structure height), based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

Alternative Route 2

Alternative Route 2 of the White Oak Lines is approximately 3.24 miles in length. Beginning at the cut-in location between Structures #2075/157 and #2075/158, the route travels southwest crossing Old Williamsburg Road and continues southwest through wooded, residential areas north of Monaco Drive. The route passes the south side of Elko Middle School before crossing Elko Road and continues southwest across undeveloped parcels in the White Oak Technology Park. The route turns south, crosses Technology Boulevard, and then southwest continuing along the west side of an existing data center. The route then turns to the southeast ending on the west side of the expanded White Oak

Substation.

Alternative Route 2 of the White Oak Lines will be supported by primarily double circuit monopole structures. For Alternative Route 2, the minimum structure height is 55 feet, the maximum structure height is 125 feet, and the average structure height is 109 feet (excluding significantly shorter structures at the cut-in location so as not to create a downward bias as to the overall average structure height), based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

2. Environmental Analysis

The Company solicited comments from certain relevant state and local agencies about the proposed Project on November 15, 2022. Copies of the November 15, 2022 letters are included as Attachment 2. The DEQ responded to the Company's November 15, 2022 request for the proposed Project in an email dated November 23, 2022 (see Attachment 2.1), attaching the agency's Scoping Response Letter dated November 16, 2023 (see Attachment 2.2). After changes in the Project scope, the Company solicited comments from all relevant state and local agencies about the proposed Project on May 18, 2023. Copies of the May 18, 2023 letters are included as Attachment 2.3.²

A. Air Quality

For the Project, 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.

Tree clearing will be required as part of this Project. Tree clearing would be on existing and new right-of-way. The Company does not expect to burn cleared material, but, if necessary, the Company will coordinate with the responsible locality to obtain these permits and will comply with any conditions set forth by the locality, or take actions as otherwise set forth in the Company's right-of-way easements. The Company's tree clearing methods are described in Section 2.L.

² Dominion Energy Virginia followed up with the DEQ to confirm it had received the Company's May 18, 2023 agency letter, at which time the DEQ indicated it did not intend to submit another scoping response letter.

B. Water Source

(No water source is required for transmission lines so this discussion will focus on water bodies that will be crossed by the proposed transmission lines.)

On behalf of the Company, ERM identified and mapped waterbodies in the study area using publicly available geographic information system (“GIS”) databases such as the U.S. Geological Survey (“USGS”) National Hydrography Dataset (“NHD”) and National Wetland Inventory, U.S. Geological Survey topographic maps (1:24,000), and recent (2023) digital aerial photography. The Proposed and Alternative Routes for the White Oak Lines cross perennial and intermittent waterbodies, including perennial and intermittent sections of Canal Swamp (Alternative Route 1), an intermittent section of Boar Swamp (Proposed Route), and open waterbodies. Waterbodies in the Project area are shown on Figure 2 of Appendix D in the Environmental Routing Study.

The distance between transmission line structures proposed by Dominion Energy Virginia will be adequate to span the waterbodies identified along the Proposed and Alternative Routes. Tree clearing would likely be required within forested riparian areas at these crossing locations. All routes would likely have an effect on surface waters along these routes due to the removal of forested riparian areas adjacent to streams. Impacts to riparian areas will be limited by utilizing the minimal right-of-way crossing feasible for each crossing, thereby minimizing impacts to surface waters and the adjacent riparian habitat.

According to the 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 Project.

Proposed Route (Route 3)

Based on ERM’s review of remote sensing data sources including USGS NHD and desktop review of topography and aerial photography, the Proposed Route would have a total of eight waterbody crossings, including seven intermittent streams, and one swamp/marsh within the right-of-way. Waterbodies crossed by the right-of-way include an intermittent segment of Boar Swamp, unnamed intermittent tributaries to Boar Swamp and Eberhard Pond, and two open waterbody features.

Alternative Route 1

Based on ERM’s review of remote sensing data sources including USGS NHD and desktop review of topography and aerial photography, Alternative Route 1 would have a total of six waterbody crossings, including two perennial and three intermittent streams and one swamp/marsh within the right-of-way. Waterbodies crossed by the right-of-way identified in the desktop review include two crossings of Canal Swamp, unnamed intermittent tributaries to Canal Swamp and the Chickahominy River, and three open waterbody features.

Alternative Route 2

Based on ERM's review of remote sensing data sources including USGS NHD and desktop review of topography and aerial photography, Alternative Route 2 would have a total of seven waterbody crossings, including five intermittent streams, one lake/pond, and one swamp/marsh within the right-of-way. Waterbodies crossed by the right-of-way identified in the desktop review include three intermittent tributaries to the Chickahominy River and three open waterbody features.

White Oak Substation

Based on ERM's review of remote sensing data sources including USGS NHD and the wetland desktop delineation methodology described above, there are no mapped waterbody crossings within the White Oak Substation Expansion footprint.

During construction, waterbodies will be maintained for proper drainage using culverts 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 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.

Section 28.2-1203 of the Code of Virginia recently was amended by the Virginia General Assembly through the passage of House Bill 2181 ("HB 2181"), which was signed into law by Governor Glenn Youngkin, effective July 1, 2023.³ With the passage of HB 2181, the Virginia Marine Resources Commission ("VMRC") will no longer have jurisdiction over non-tidal waters with a drainage area greater than 5.0 square miles. This permitting authority will be transitioned to the DEQ. The Company is actively monitoring this transition of jurisdiction. To date, no guidance on the DEQ process or on the existing VMRC permits has been released. The Company will actively monitor this regulatory change and pursue the required permits as needed for this Project at the time of permitting.

The Company solicited comments from the Corps and the VMRC regarding the proposed Project on November 15, 2022. VMRC responded by letter dated December 9, 2022, noting that the Project is within jurisdictional areas of the VMRC and may require a permit. A copy of this response is included as Attachment 2.B.1. The Company solicited comments from the Corps and VMRC again on May 18, 2023. If necessary, a Joint Permit

³ See Chapter 258 of the 2023 Session of the Virginia Acts of Assembly (effective July 1, 2023) available at <https://lis.virginia.gov/cgi-bin/legp604.exe?231+ful+CHAP0258>.

Application (“JPA”) will be submitted for review by the 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 Project.

D. Tidal and Non-tidal Wetlands

No tidal wetlands were identified within the Project area. Non-tidal wetlands are summarized below.

On behalf of the Company, ERM has identified wetlands along the Project routes using remote sensing data sources to conduct an offsite desktop wetlands delineation. A copy of ERM’s Wetland and Waterbody Desktop Summary for Project is included in Attachment 2.D.1. Sources for this desktop summary include the USGS 7.5-minute series topographic quadrangle maps, the National Wetland Inventory Online Maps from the U.S. Fish and Wildlife Service (“USFWS”), soils data from the Natural Resources Conservation Service Web Soil Survey, ESRI World Topographic Maps (2023), aerial photography from 2023, and National Agricultural Imagery Program (“NAIP”) and Virginia Base Mapping Program (“VBMP”) Digital Ortho-Rectified Infrared Images dating from 2021. ERM did not field delineate wetlands within the Project area.

All wetlands will require protective matting to be installed to support construction vehicles and equipment and materials during construction. Most wetlands are anticipated to be spanned and impacts avoided, however, forested and scrub-shrub type wetlands will be cleared, resulting in conversion to scrub-shrub or emergent type wetlands. Vegetation will be allowed to return to maintained right-of-way heights after construction is completed.

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	
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 each Project route, 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.⁴

Proposed Route (Route 3)

Based on ERM’s Desktop Wetland Analysis data, the Proposed Route will require the clearing and/or disturbance of up to approximately 15.63 acres of wetlands. Of these, approximately 11.98 acres consist of palustrine forested (“PFO”) wetland areas, 0.57 acre consists of palustrine scrub-shrub (“PSS”) wetlands, 0.70 acre consists of palustrine emergent (“PEM”) wetlands, 2.18 acres consist of palustrine unconsolidated bottom (“PUB”) wetlands, and 0.18 acre consists of riverine/stream wetland areas.

Alternative Route 1

Based on ERM’s Desktop Wetland Analysis data, Alternative Route 1 will require the clearing and/or disturbance of up to approximately 15.99 acres of wetlands. Of these, approximately 12.44 acres consist of PFO wetland areas, 0.57 acre consists of PSS wetlands, 0.30 acre consists of PEM wetlands, 2.43 acres consist of PUB wetlands, and 0.25 acre consists of riverine/stream wetland areas.

⁴ The sum of the addends presented for the Proposed and Alternative Routes wetland types may not equal the totals due to rounding.

Alternative Route 2

Based on ERM's Desktop Wetland Analysis data, Alternative Route 2 will require the clearing and/or disturbance of up to approximately 11.71 acres of wetlands. Of these, approximately 7.09 acres consist of PFO wetland areas, 0.72 acre consists of PEM wetlands, 0.57 acre consists of PSS wetlands, 3.18 acres consist of PUB wetlands, and 0.15 acre consists of riverine/stream wetland areas.

White Oak Substation Expansion

No wetlands were identified within the White Oak Substation Expansion footprint.

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). The Company will obtain any necessary permits to impact jurisdictional resources. While most wetlands will be spanned, forested wetlands will be converted to PSS wetlands and PSS wetlands will be temporary cleared for construction access. Vegetation clearing of forested and PSS wetlands will not remove the stumps and root stock. Wetland systems will be re-established to an open meadow or PSS habitat post construction. All wetlands will require protective matting to be installed to support construction vehicles and equipment and materials during construction.

The Company solicited comments from the Corps and the DEQ Office of Wetlands and Stream Protection ("OWSP") on November 15, 2022. The Company again solicited comments from the Corps and the DEQ-OWSP on May 18, 2023 (see [Attachment 2.3](#)) and engaged in additional correspondence with DEQ-OWSP. 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 state regulations and laws. The Project is 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.

E. Floodplains

As depicted on the Federal Emergency Management Agency's online Flood Insurance Rate Maps #51087C0170C, #51087C0190C, #51087C0235C, and #51087C0255C (effective dates all 12/18/2007), the Project study area contains Zone A, areas of a 1% annual chance flood hazard, and Zone X, areas of minimal flood hazard. The Company will coordinate with the local floodplain coordinators as required.

F. Solid and Hazardous Waste

Environmentally regulated sites in the study area have been identified using publicly available geographic information system 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.

A summary of the information from the EPA and DEQ databases within a 1.0-mile buffer of the centerlines of the Proposed and Alternative Routes is provided in Table F-1 below. The locations of the sites are depicted in Attachment 2.F.1.

TABLE F-1 White Oak Electric Transmission Project ^a Environmental Regulated Facilities and Hazardous Waste/Petroleum Release Sites within 1.0 Mile			
Database	Proposed Route (Route 3)	Alternative Route 1	Alternative Route 2
Waste	6	9	7
Toxics	1	2	2
Land	1	1	1
Air	5	9	6
Water	2	4	3
Solid Waste Facilities	0	0	0
Petroleum Facilities	5	4	4
Petroleum Releases	18	20	20
Total ^b	38	49	43
^a	The White Oak Substation Expansion 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 (Facilities that handle or generate hazardous wastes) Toxics (Facilities that release toxic substances to the environment) Land (Site cleanup under RCRA, Superfund, or Brownfield programs, and/or DEQ VRP program) Air (Facilities with a release of pollutants to the air) Water (Facilities that discharge storm or process water to surface water) Solid Waste Facilities (Former and existing landfills) Petroleum Facilities (Regulated petroleum storage) Petroleum Releases (Typically associated with storage tank releases)		

No Brownfield or Superfund sites identified in the reviewed databases were located within 1.0 mile of the Proposed and Alternative Routes. The Virginia Department of Transportation – Elko Materials Laboratory RCRA Corrective Action site is located

approximately 450 feet east of the Proposed Route at milepost (“MP”)⁵ 4.1, and 180 feet north of Alternative Route 1 at MP 3.5 and Alternative Route 2 at MP 2.6. Based on a review of available EPA files, the site operates as a lab and conducts tests on materials used for construction and maintaining roadways. Contaminants at the site include volatile organic compounds and chlorinated solvents such as 1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, 1,4-dioxane, and trichloroethene. Approximately 180 feet east-southeast of the Proposed Route, and north of the Alternative Route 1 and Alternative Route 2 rights-of-way, on the north side of Technology Boulevard, a former wastewater surface impoundment at the site contained hazardous waste and is classified as a Solid Waste Management Unit (“SWMU”). A groundwater restriction area is in-place within and surrounding the SWMU. In January 2021, the DEQ issued a final remedy decision that included excavating and removing contaminated soil, monitoring the groundwater plume for natural attenuation of contaminants, and implementing institutional and engineering controls. According to EPA files, contaminated groundwater migration at the site and potential human exposures are listed as “under control.” Based on review of DEQ files and topographic contours, groundwater predominantly flows to the west-southwest and was encountered at a depth of 10 to 12 feet. To the extent the depths of the foundations are greater than 10-12 feet and petroleum contaminated soils are encountered during construction, the Company has a standard of practice (Best Management Practices) in place to safely handle and dispose of any potentially contaminated soil and/or groundwater encountered during construction activities. The contaminated groundwater plume was found to have migrated off-site to the west-southwest for a distance of at least 330 feet towards a stormwater detention pond south of Technology Boulevard. As such, the groundwater from the site is not anticipated to cross the rights-of-way of either the Proposed Route or Alternative Routes. Due to the hydraulic gradient, proximity to the Project, and available information from the EPA and DEQ, the RCRA Corrective Action site may have impacted groundwater near the rights-of-way for the Proposed Route or Alternative Routes.

The EPA Sandston PCE Superfund and associated Response site is mapped near MP 2.6 of the Proposed Route; however, based on documented site history and a review of EPA files, the site is located west of the Project area and is outside of the 1.0-mile buffer of the centerlines of the Proposed and Alternative Routes.

If contaminated soils and/or groundwater are encountered during construction, the Company has a standard of practice (Best Management Practices) in place to safely handle and dispose of any potentially contaminated media. Whether the material is determined to be a hazardous waste or non-hazardous waste, all discharged soil or groundwater will be managed at a permitted facility that the Company has approved for use.

⁵ The MPs for the Proposed Route and Alternative Routes are shown on map sets attached to the Environmental Routing Study, including Figures 3.1-1 and 3.1-2.

To evaluate the potential impact to the routes, ERM further assessed the sites within 1,000 feet of the Project's Proposed and Alternative Routes (Table F-2).

TABLE F-2 White Oak Electric Transmission Project ^a Environmental Regulated Facilities and Hazardous Waste/Petroleum Release Sites within 1,000 Feet			
Database	Proposed Route (Route 3)	Alternative Route 1	Alternative Route 2
Waste	2	4	3
Toxics	0	2	0
Land	1	1	1
Air	0	3	2
Water	1	2	1
Solid Waste Facilities	0	0	0
Petroleum Facilities	1	1	0
Petroleum Releases	1	1	7
Total ^b	6	14	14
^a The White Oak Substation Expansion 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 (Facilities that handle or generate hazardous wastes) Toxics (Facilities that release toxic substances to the environment) Land (Site cleanup under RCRA, Superfund, or Brownfield programs, and/or DEQ VRP program) Air (Facilities with a release of pollutants to the air) Water (Facilities that discharge storm or process water to surface water) Solid Waste Facilities (Former and existing landfills) Petroleum Facilities (Regulated petroleum storage) Petroleum Releases (Typically associated with storage tank releases)			

Based on a review of sites listed in the EPA and DEQ databases within 1,000 feet of the centerlines of the Proposed and Alternative Routes and the estimated depth to groundwater and flow direction, ERM did not identify any petroleum releases that may have impacted soil and/or groundwater at the White Oak Substation, or within the Proposed or Alternative Routes rights-of-way. One petroleum release is located approximately 100 feet northwest of the White Oak Substation Expansion and is associated with the Quality Technology Services ("QTS") data center facility. Review of available DEQ files indicate that after a pollution complaint regarding an aboveground storage tank was submitted in December 2004, an investigation concluded that contamination levels did not warrant further remediation, and corrective action was not required. The DEQ closed the release case in February 2005. In addition, a January 2023 report obtained from the DEQ indicates that shallow soil sampling at the aboveground tank site did not detect contaminants above laboratory reporting limits. Based on the distance from the Project area and review of regulatory files indicating soil contamination was not identified at the release site, it is unlikely that the petroleum release affected the Project area.

A second petroleum release is located approximately 400 feet south of MP 0.4 of Alternative Route 2 and is hydraulically separated from the Project area by a surficial waterbody. Due to the distance from the right-of-way and hydraulic separation, it is unlikely that the petroleum release affected the Project area.

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 Project, including the Virginia Department of Conservation and Recreation ("DCR") Natural Heritage Data Explorer ("NHDE"). The NHDE includes three components: Conservation Sites, Stream Conservation Units, and General Location Areas for Natural Heritage Resources. 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 federally- 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.

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 queries of the above referenced sources, 16 federal and/or state-listed threatened and endangered species have the potential to occur within the study area (Table G-1). For additional information, see Section 3.3.5 of the Environmental Routing Study.

<p>TABLE G-1 White Oak Electric Transmission Project</p> <p>Potential Federal-and State-Listed Species in the Project Area</p>				
Species	Status	Database	Habitat	Results
Northern long-eared bat (<i>Myotis septentrionalis</i>)	FE, ST	USFWS IPaC, DWR-NLEB Winter Habitat and Roost Tree Map, DWR VaFWIS	Generally associated with old-growth or late successional interior forests. Partially dead or decaying trees are used for breeding, summer day roosting, and foraging. Hibernation occurs primarily in caves, mines, and tunnels.	Species not confirmed as present, and no known hibernacula or maternity roost trees are documented within the Project area. Project would require clearing of forested areas; however, given lack of confirmed species presence, impacts are not anticipated.

<p align="center">TABLE G-1 White Oak Electric Transmission Project</p> <p align="center">Potential Federal-and State-Listed Species in the Project Area</p>				
Species	Status	Database	Habitat	Results
Eastern black rail (<i>Laterallus jamaicensis</i>)	FT, SE	VaFWIS	Associated with marshes and swamps with dense vegetative cover.	Species not confirmed as present. Project would require clearing of forested areas; however, given lack of confirmed species presence, impacts are not anticipated.
James spinymussel (<i>Parvaspina collina</i>)	FE, SE	VaFWIS	Associated with freshwater rivers.	Species not confirmed as present, and no instream work would be performed. No impacts are anticipated.
Dwarf wedgemussel (<i>Alasmodonta heterodon</i>)	FE, SE	VaFWIS	Deep quick running water on cobble, fine gravel, or on firm silt or sandy bottoms.	Species not confirmed as present, and no instream work would be performed. No impacts are anticipated.
Atlantic pigtoe (<i>Fusconaia masoni</i>)	FT, ST	VaFWIS	Medium to large rivers, found among sand and gravel substrate.	Species not confirmed as present, and no instream work would be performed. No impacts are anticipated
Yellow lance (<i>Elliptio lanceolata</i>)	FT, ST	DWR VaFWIS	Main channels of drainages and streams as small as one meter across with clean, coarse, medium-sized sand or gravel substrate.	Species not confirmed as present, and no instream work would be performed. No impacts are anticipated.
Atlantic sturgeon (<i>Acipenser oxyrinchus</i>)	FE, SE	DWR VaFWIS	Inhabit rivers, lakes, ponds, and other freshwater ecosystems. However, most species live primarily in saltwater or brackish water, and migrate to freshwater to spawn.	Species not confirmed as present, and no instream work would be performed. No impacts are anticipated.
Swamp pink (<i>Helonias bullata</i>)	FT, SE	USFWS IPaC, DCR	Acidic, sandy seeps and seepage swamps; often rooted in Sphagnum hummocks.	Species not confirmed as present. No impacts are anticipated.
Little brown bat (<i>Myotis lucifugus</i>)	SE	DWR VaFWIS and DWR Little Brown Bat and Tri-colored Bat Winter Habitat and Roosts Application	Roosts in caves, buildings, rocks, trees, under bridges, and in mines and tunnels. Found in all forested regions of the state.	Species not confirmed as present, and no hibernaculum identified within 0.5-mile-radius of the Project. No impacts are anticipated.
Rafinesque's eastern big-eared bat (<i>Corynorhinus rafinesquii macrotis</i>)	SE	VaFWIS	Roosts in caves, buildings, rocks, trees, under bridges, and in mines and tunnels. Found in all forested regions of the state.	Species not confirmed as present, and no hibernaculum identified within 0.5-mile-radius of the Project. No impacts are anticipated.
Tri-colored bat (<i>Perimyotis subflavus</i>)	FP, SE	DWR VaFWIS and DWR Little Brown Bat and Tri-colored Bat Winter Habitat and Roosts Application	Typically roost in trees near forest edges during summer. Hibernates deep in caves or mines in areas with warm, stable temperatures during winter.	Species not confirmed as present, and no hibernaculum identified within 0.5-mile-radius of the Project. No impacts are anticipated.

<p align="center">TABLE G-1 White Oak Electric Transmission Project</p>				
<p align="center">Potential Federal-and State-Listed Species in the Project Area</p>				
Species	Status	Database	Habitat	Results
Green floater (<i>Lasmigona subviridis</i>)	ST	DWR VaFWIS	Small to medium streams in quiet pools and eddies with gravel and sand substrates.	VaFWIS Search Report listed as not confirmed and no instream work would be performed. No impacts are anticipated.
Henslow's sparrow (<i>Ammodramus henslowii</i>)	ST	DWR VaFWIS	Open grasslands with few or no woody plants and tall dense grasses and litter layer.	VaFWIS Search Report listed as not confirmed. No impacts are anticipated.
Loggerhead shrike and Migrant loggerhead shrike (<i>Lanius ludovicianus</i> and <i>Lanius ludovicianus migrans</i>)	ST	DWR VaFWIS	Open country with scattered shrubs and trees or other tall structures for perching.	VaFWIS Search Report listed as not confirmed. No impacts are anticipated.
Peregrine falcon (<i>Falco peregrinus</i>)	ST	DWR VaFWIS	Tall structures, such as powerline poles, buildings, and rock ledges, in generally open landscapes.	VaFWIS Search Report listed as not confirmed. No impacts are anticipated.
New Jersey rush (<i>Juncus caesariensis</i>)	ST	DCR	Bogs, sphagnum seeps in powerline rights-of-way, and peaty edges of beaver ponds.	Species not confirmed as present. No impacts are anticipated.
Federal/State Status: FE Federally listed as endangered. FT Federally listed as threatened. FP Federally proposed as endangered SE State listed as endangered. ST State listed as threatened.				

The USFWS IPaC database query identified two federally-listed species, Northern long-eared bat (“NLEB”) (*Myotis septentrionalis*) and Swamp pink (*Helonias bullata*), that may potentially occur within the study area. The VAFWIS database query identified 15 federally and/or state-listed species that have the potential to occur within 5.0 miles of the geographic center of the study area, including the NLEB, Eastern black rail (*Laterallus jamaicensis*), Atlantic sturgeon (*Acipenser oxyrinchus*), James spinymussel (*Parvaspina collina*), Dwarf wedgemussel (*Alasmidonta heterodon*), Atlantic pigtoe (*Fusconaia masoni*), Yellow lance (*Elliptio lanceolata*), Little brown bat (*Myotis lucifugus*), Eastern big-eared bat (*Corynorhinus rafinesquii macrotis*), Tri-colored bat (*Perimyotis subflavus*), Henslow's sparrow (*Centronyx henslowii*), Peregrine falcon (*Falco peregrinus*), Loggerhead shrike (*Lanius ludovicianus*), Migrant loggerhead shrike (*Lanius ludovicianus migrans*), and Green floater (*Lasmigona subviridis*). Further, the DCR Natural Heritage Program (“NHP”) identified that the state-listed New Jersey rush (*Juncus caesariensis*) and Swamp pink may also potentially occur within the study area.

While the USFWS, DWR, and VaFWIS database queries identified 16 federally and/or state listed species that have the potential to occur within 5.0 miles the study area, DWR has not confirmed any occurrences the species within the study area. According to its review, DCR-DNH concluded that two federally and/or state listed species listed above (New Jersey rush and Swamp pink) have been documented by DCR or DWR as having potential habitat in areas immediately adjacent to or crossed by the Project routes. DCR also found that the Proposed and Alternative Routes intersects multiple Ecological Cores ranging in rank from C1 (outstanding integrity) to C5 (general ecological integrity). DCR did not identify any State Natural Area Preserves along the routes.

The DCR review identified eight ecological cores (Core IDs 58053, 58209, 58483, 58589, 58590, 58660, 58820, and 58958) crossed by the Proposed Route. The right-of-way of the Proposed Route crosses 3.39 acres of Core ID 58053, which is ranked as C1 ‘Outstanding;’ however, almost all forest in this area of the core that the route crosses was cleared in 2023, which has almost certainly reduced the rank of the core unit already. The right-of-way crosses 0.03 acres of Core ID 58209 (ranked as C3 ‘High’), but no fragmentation would occur due to this minor crossing. Approximately 22.49 acres of ecological cores ranked as C4 ‘Moderate’ (Core IDs 58660, 58820, and 58958) are impacted, and 9.27 acres of ecological cores ranked as C5 ‘General’ (Core IDs 58483, 58589, and 58590) are impacted.

Alternative Route 1 crosses five ecological cores (Core IDs 58695, 58836, 58908, 58958, and 58959). The right-of-way of Alternative Route 1 impacts 18.74 combined acres of ecological cores 58695 and 58908 (ranked as C3 ‘High’), 0.84 acres of ecological core 58958 (ranked as C4 ‘Moderate’), and 8.39 combined acres of ecological cores 58836 and 58959 (ranked as C5 ‘General’).

Alternative Route 2 crosses three ecological cores (Core IDs 58764, 58908, and 58958). The right-of-way of Alternative Route 2 impacts 8.17 acres of ecological core 58908 (ranked as C3 ‘High’), 0.84 acres of ecological core 58958 (ranked as C4 ‘Moderate’), and 8.49 acres of ecological core 58764 (ranked as C5 ‘General’).

To minimize impacts to ecological cores, location of the routes are proposed in areas where the least impacts to the ecological quality of the core(s) will occur. To the maximum extent practicable, routes have been proposed on the edges of cores to reduce fragmentation, in areas of lower habitat quality, or in areas of existing or currently planned development by others.

The Proposed Route and Alternative Routes do not intersect any secondary buffers of currently documented bald eagle nests as identified in The Bald Eagle Protection Guidelines for Virginia (2012). The nearest bald eagle nest (CCB ID: HE 9501) is located approximately 2.0 miles southeast of the Proposed Route and was documented to be occupied in 2021. Neither the Proposed Route nor the Alternative Routes 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.

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

Proposed Route (Route 3)

Of the 16 species identified above, none have historically been documented by state agencies in areas crossed by the Proposed Route. The Proposed Route would require approximately 43.20 acres of tree clearing, which is more than what would be required for Alternative Route 1 (35.85 acres) or Alternative Route 2 (32.32 acres). The Proposed Route would have seven intermittent waterbody crossings and one swamp/marsh crossing; however, as the crossings would be spanned by the transmission line, impacts to aquatic species are not anticipated. According to the CCB, this route does not cross a primary or secondary buffer zone of a documented bald eagle nest.

Alternative Route 1

Impacts of Alternative Route 1 to threatened and endangered species would be similar to those described above for the Proposed Route. The only difference between the routes, with regards to potential impacts on wildlife, is that Alternative Route 1 would require slightly more forested land clearing than Alternative Route 2 (35.85 acres versus 32.32 acres).

Alternative Route 2

Impacts of Alternative Route 2 to threatened and endangered species would be similar to those described above for the Proposed Route. The only difference between the routes, with regards to potential impacts on wildlife, is that Alternative Route 2 would require the least amount of forested land clearing (32.32 acres).

White Oak Substation Expansion

Impacts of the White Oak Substation Expansion to threatened and endangered species are anticipated to be minimal but are included in the description above for the Proposed Route. The difference with regards to potential impacts on wildlife is that the White Oak Substation Expansion does not require forested land clearing. The White Oak Substation Expansion would only impact 0.7 acre of developed land. No waterbodies are impacted by the proposed expansion footprint, so no impacts to aquatic species are anticipated.

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 Project changes and/or six months have passed before this information is utilized.⁶

On November 15, 2022, the Company requested comments from USFWS, DWR, and DCR about the Project. The Company again requested comments from USFWS, DWR, and DCR on May 18, 2023. DCR responded by letter dated June 12, 2023, and a copy of that letter is included as Attachment 2.G.2.

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 August 13, 2019, is provided as Attachment 2.H.1. According to the approval letter, coverage was effective through August 12, 2020. The Company submitted the renewal application on August 3, 2020 and is awaiting approval.

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 Project Proposed Routes and Alternative Routes in accordance with the Virginia Department of Historic Resources' ("VDHR") *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (VDHR 2008). This analysis was completed in February 2023 and submitted to VDHR on June 16, 2023. The report is included as Attachment 2.I.1. For each route alternative, the analysis 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.

⁶ The Company updated this commitment consistent with discussions held between Company and DCR representatives on August 23, 2022.

- ERM also collected information from Henrico County Historical Society (2023) and the Charles City County Richard M Bowman Center for Local History (2023) to find locally significant resources within a 1.0-mile radius of each centerline. No additional resources were identified through this source. ERM additionally collected information on battlefields surveyed and assessed by the National Park Service's American Battlefield Protection Program ("ABPP") (NPS 2023). No additional ABPP study areas, core areas, or potential NRHP boundaries for battlefields were identified within the relevant study tiers for the various route options through this source.

Along with a records review completed for the four tiers as defined by VDHR, ERM also conducted field assessments of the aboveground considered resources for the Proposed Route and Alternative Routes in accordance with the VDHR Guidelines. Digital photographs of each resource were taken. Photo simulations of the proposed transmission line were prepared to assess visual impacts from construction of the proposed transmission line for each considered resource along the Proposed and Alternative Routes. 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 proposed transmission line structures.

A summary of the resources considered and identified in the vicinity of each route 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 Project.

The resources crossed by the right-of-way of the transmission line routes may be subject to both direct impacts from placement of the transmission line across the property as well as visual impacts from changes to the viewshed introduced by the new transmission infrastructure. Resources in the 0-0.5-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 Project. However, a full architectural survey (to be completed following the selection of a route) is necessary to determine which resources would be visually impacted and to survey for additional unrecorded resources.

Because portions of some routes use common alignments, many of the same cultural resources would be impacted regardless of the routes selected for the Project. The nature of those 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 line structures is confirmed. As part of the forthcoming full 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.

Proposed Route (Route 3)

Seven historic resources were identified within the VDHR study tiers for the Proposed Route (Table I-1). Construction and operation of the facilities associated with this route would have no impact on four resources (042-5017, 043-0288, 043-5077, and 043-5080), a minimal impact on one resource (043-5081), and a moderate impact on two resources (043-0078 and 043-0308). While mitigation of adverse effects could be required for 043-0078 and 043-0308, the Proposed Route in the vicinity of these sites is directly adjacent to or crosses future planned industrial developments. As a result, the impact of the Project on these resources would be cumulative to those of the future planned developments as described in more detail below.

The Second Cold Harbor Battlefield (042-5017) is approximately 0.45 mile southeast of the Proposed Route at about MP 0.5; the Savage Station Farm and Cemetery (043-0288) is approximately 0.15 mile west of the Proposed Route at about MP 1.7; Glendale Battlefield (043-5077) is approximately 0.33 mile east of the Proposed Route at about MP 2.8; and the Second Deep Bottom Battlefield (043-5080) is approximately 0.91 mile southwest of the Proposed Route at about MP 4.6. There would be no view of infrastructure installed along the Proposed Route (Route 3) visible from these resources due to intervening distance and dense vegetation. Thus, the route would result in no impact on these resources.

The Proposed Route crosses Seven Pines Battlefield (043-5081) between approximate MPs 2.0 and 2.2, just south of the crossing of Interstate 64 and north of the crossing of Old Williamsburg Road, along a greenfield segment. If the Proposed Route is selected for the Project, transmission line structures would be visible at the crossing of Old Williamsburg Road, but they would not be visible from nearby areas because of the dense surrounding forest cover. Views to the north and south are completely blocked by dense tree cover and pockets of residential dwellings. While the view of the Proposed Route to the east and west along Old Williamsburg Road would represent a change to the setting, the vantage points for this change would be limited in relation to the resource overall. Further, there are already existing transmission lines that run through the battlefield to the east, which have diminished the historic viewshed of the battlefield in that area. For these reasons, the Proposed Route would have a minimal impact on 043-5081.

Cedar Knoll (043-0078) is approximately 0.07 mile east of the Proposed Route at approximate MP 2.1 in an area where the route uses a greenfield alignment. The resource, which is located on Old Williamsburg Road, is surrounded by dense tree growth to the north, east, and west. Transmission infrastructure installed along the Proposed Route would be visible from the southeastern corner of the resource boundary and some vantage points within the resource during off-leaf seasons when looking up

through the trees to the east. It is unlikely that the Proposed Route would be visible from the resource's northern boundary, as the route angles to the northeast away from the resource. Although there is an existing overhead electrical distribution line in the southeastern viewshed, the construction of the Project along the Proposed Route would add larger, more obtrusive infrastructure, and would change the current viewshed to the southeast and east. Thus, there would be a moderate impact to this resource from the Proposed Route.

However, Cedar Knoll (043-0078) would also be indirectly impacted by Vienna Finance, Inc.'s, Atlantic Crossing, LLC's, and Hourigan Development, LLC's ("VAH") planned data center development, referred to as the "future VAH data center campus, which is planned to be built in the area approximately between East Williamsburg Road to the north, Boar Swamp to the east, Technology Boulevard to the south, and I-295 to the west. This planned development is on the opposite (south) side of Old Williamsburg Road from the resource. Because of the future VAH data center campus, impacts on the setting of the resource are expected regardless of the route selected for the Project. The predicted impact on 043-0078 from the Proposed Route ("moderate impact") would be cumulative to the impacts from the future VAH campus center campus but limited to the area planned for future industrial development. Additional details about these impacts can be found in Section 4.5 of the Environmental Routing Study.

The Proposed Route crosses a contiguous portion of the Savage Station Battlefield (043-0308) ABPP Potential National Register Area for approximately 3.69 miles and is collocated with the associated historic Richmond and York River Railroad (the current Norfolk Southern Railroad) for 0.66 mile from about MPs 0.8 to 4.6. The proposed White Oak Substation Expansion is also located in the resource.⁷ If the Proposed Route is selected for the Project, it would create a new corridor through the resource within which vegetation would be removed for the installation of new transmission structures and conductors. The Proposed Route crosses a large section of the battlefield's Potential National Register Area, of which 3.03 miles occurs along greenfield alignment. The route would be visible as it crosses over Technology Boulevard; however, it would mainly be the conductors visible rather than the structures, which would be located within the dense forested areas adjacent to the road.

The Richmond and York River Railroad was significant to the Seven Days Battles and the Savage Station Battle, used to transport artillery, equipment, and troops during the Peninsula Campaign of 1862 as the Union Army's main supply line. The Proposed Route crosses over this railroad between approximate MPs 0.9 and 1.0 and collocates with it for approximately 0.66 mile. The impact to the portion of the battlefield

⁷ The proposed expansion of the existing White Oak Substation is located within 043-0308's boundary but is situated among existing data centers and transmission lines that have already compromised the landscape. Thus, the expansion would constitute a minimal impact to the resource.

containing the railroad is partially mitigated by the fact that the route would not be visible from other parts of the battlefield nor from vantage points along public rights-of-way. In addition, the Company's existing Lines #557 and #2075 cross over this railroad about 1.05 miles to the east within the bounds of the battlefield, such that the setting has already been altered in a similar fashion. For these reasons, use of the Proposed Route would not have a significant impact on the portion of Savage Station Battlefield associated with the Norfolk Southern Railroad.

Within the battlefield, the Proposed Route would be visible from the public right-of-way at the Meadow Road crossing and the tops of transmission line structures would potentially be visible where the route is parallel to Crib Lane, depending on the height and fullness of the tree coverage in different areas. Some sections of the route cross undeveloped areas and others cross heavily developed areas. Where the Proposed Route traverses wooded areas, it would mostly be obscured from vantage points in other parts of the battlefield. Much of the battlefield area traversed by the Proposed Route is undeveloped and thickly forested. The areas within the battlefield with potential sight lines to the Proposed Route include places where the route crosses open corridors, including Meadow Road, I-64, East Williamsburg Road, and Technology Boulevard. Although these areas would be visible to other parts of the battlefield, I-64, East Williamsburg Road, and Technology Boulevard are all developed areas containing adjacent residential or commercial properties, which have compromised the battlefield's historic setting. The developed areas near the existing White Oak Substation have also impacted the viewscape of the battlefield due to existing infrastructure, including the Company's existing White Oak and Portugee Substations and Lines #286 and #2198.

In addition to following a greenfield alignment for a majority of its length across the resource, infrastructure installed along the Proposed Route would be visible within the battlefield and from public rights-of-way in several areas, including four road crossings and the crossing of the Norfolk Southern Railroad, which was significant to Savage Station Battlefield. For these reasons, the Proposed Route would have a moderate impact on Savage Station Battlefield.

However, the Savage Station Battlefield (043-0308) would additionally be affected by six planned industrial developments, as described in Section 3.1.1 and 4.1.1 of the Environmental Routing Study. These developments include the future VAH data center campus (crossed by the Proposed Route), WOTP Site 2 (crossed by Alternative Route 2), WOTP Site 5 (crossed by Alternative Route 1), WOTP Sites 5 and 10 (located south of Alternative Route 1), and QTS Track 9 (crossed by all routes). As a result, the impact from the Proposed Route on this resource would be cumulative to those of the planned developments regardless of the route selected. One advantage to the Proposed Route is that a substantial portion of the crossing on the battlefield is within the vicinity of the future VAH data center campus, which aligns the Project with lands planned for industrial development.

TABLE I-1 White Oak Electric Transmission Project Resources in VDHR Tiers for the Proposed Route (Route 3)				
Buffer (miles)	Considered Resources	VDHR #	Description	Impact
1.0-1.5	National Historic Landmarks	NA	NA	NA
	National Register—Listed	NA	NA	NA
0.5-1.0	Battlefields—Potentially Eligible	043-5080*	Second Deep Bottom Battlefield	None
	National Register—Eligible	043-0078	Cedar Knoll	Moderate
0.0- 0.5	Battlefields—Potentially Eligible	043-0288	Savage Station Farm and Cemetery	None
		042-5017	Second Cold Harbor Battlefield	None
		043-5077*	Glendale Battlefield	None
0.0 (within right-of-way)	National Register —Eligible	043-0308*	Savage Station Battlefield	Moderate
		043-5081	Seven Pines Battlefield	Minimal

*NA = not applicable; VDHR = Virginia Department of Historic Resources; * Located within the VDHR study tiers for the White Oak Substation Expansion*

The Stage I Analysis also considered the potential effects to archaeological resources. One archaeological site would be crossed by the right-of-way for the Proposed Route: 44HE0898.

Site 44HE0898, which has not been evaluated for listing in the NRHP, is located off Technology Boulevard in Sandston, Virginia. Based on previous investigations, the site is a historic house dating to the twentieth century. The overall integrity of the archaeological deposits at the site is unknown. Aerial photography spanning the period from 1952 to 2018 shows the structure still extant in 1968 but gone by 1984. Subsequent aerial photographs show no change to the site conditions through 2018.

Alternative Route 1

Five aboveground historic resources were identified within the VDHR study tiers for Alternative Route 1 (Table I-2). Construction and operation of the new facilities associated with Alternative Route 1 would have no impact on two resources (043-5080 and 043-5081) and a minimal impact on three resources (042-5017, 043-0308, and 043-5077).

Site 043-5080, the Second Deep Bottom Battlefield, is located approximately 0.91 mile to the southwest of Alternative Route 1 at about MP 4.1, while 043-5081, the Seven Pines Battlefield (043-5081), is located approximately 0.25 mile to the northwest of Alternative Route 1 at MP 0.0. Both battlefields would have no view of the new infrastructure that would be installed along the route due to distance and intervening vegetation. Thus, the route would result in no impact on these resources.

The right-of-way for Alternative Route 1 crosses 042-5017, the Second Cold Harbor Battlefield, from MP 0.0 to about MP 0.1 along a greenfield alignment requiring new right-of-way. Most potential views of the transmission line from the resource would be obscured by dense vegetation. Moreover, because there are existing transmission lines in the viewshed of the battlefield, the addition of a new line along Alternative Route 1 would have little additional impact on 042-5017 because a very small portion of the overall battlefield would be impacted. Tree removal likely would not be fully visible from the nearest public right-of-way, while the structures and conductors of Alternative Route 1 could be visible only from a limited vantage point along White Oak Road. For these reasons, ERM concluded that Alternative Route 1 would result in a minimal impact on the Second Cold Harbor Battlefield.

The right-of-way for Alternative Route 1 crosses the Savage Station Battlefield (043-0308) multiple times, from approximate MPs 0.8 to 1.1, MPs 1.7 to 2.2, and MPs 3.4 to 4.1, along a greenfield alignment requiring new right-of-way. Construction of the Project along Alternative Route 1 would add additional modern elements, including the proposed expansion of the existing White Oak Substation, in an already compromised setting, which includes data centers. Vegetated portions of the route would not be visible from other parts of the battlefield due to existing canopy. The only portions of the route that would be visible are at the intersection of public roads and the route. Furthermore, developed lands near the existing White Oak Substation have impacted the setting of the battlefield with existing infrastructure, including the Company's existing White Oak and Portugee Substations and Lines #286 and #2198. The areas where the route might be visible are small within the overall viewscape of the battlefield. Thus, Alternative Route 1 would result in a minimal impact on Savage Station Battlefield.⁸

The right-of-way for Alternative Route 1 crosses Glendale Battlefield (043-5077) between approximate MPs 1.6 and 2.2 along a greenfield alignment. Where Alternative Route 1 intersects the battlefield, there are open fields and woodlands where vegetation would be removed for the installation of the new transmission lines. Alternative Route 1 would be visible to drivers and pedestrians along Elko Road when looking to the northeast in the open field where the route crosses Elko Road. Alternative Route 1 could potentially be visible from Elko Road looking to the southwest particularly during off-leaf season. This would introduce modern elements to the area where no modern infrastructure currently exists. To the north and west of Alternative Route 1, in and adjacent to the resource, however, there is considerable modern development including data centers and the Company's existing White Oak and Portugee Substations and Lines #286 and #2091. The majority of the battlefield would be unaffected, with sight lines to the new transmission infrastructure largely limited to views along Elko

⁸ The proposed expansion of the existing White Oak Substation is located within 043-0308's boundary but is situated among existing data centers and transmission lines that have already compromised the landscape. Thus, the expansion would constitute a minimal impact to the resource.

Road. For these reasons, Alternative Route 1 would result in a minimal impact on Glendale Battlefield.⁹

<p style="text-align: center;">TABLE I-2 White Oak Electric Transmission Project Resources in VDHR Tiers for Alternative Route 1</p>				
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—Potentially Eligible	043-5080*	Second Deep Bottom Battlefield	None
0.0-0.5	National Register—Eligible	043-5081	Seven Pines Battlefield	None
0.0 (within right-of-way)	National Register—Eligible	043-0308*	Savage Station Battlefield	Minimal
	Battlefields—Potentially Eligible	042-5017	Second Cold Harbor Battlefield	Minimal
		043-5077*	Glendale Battlefield	Minimal

*NA = not applicable; VDHR = Virginia Department of Historic Resources; * Located within the VDHR study tiers for the White Oak Substation Expansion*

The Stage I Analysis also considered the potential effects to archaeological resources. Two archaeological sites lie within the new right-of-way associated with Alternative Route 1: 44HE0683 and 44HE0708.

Site 44HE0683 is recorded as a 1,489.61-acre airport dating from 1925 to 1949 that was used as a decoy airport during World War II. Alternative Route 1 crosses the northern periphery of the site in two places. The majority of the site is south of Alternative Route 1, in an area characterized by extensive commercial, industrial, and residential development. Included in this development are the Company's existing Portugee and Elko Substations, as well as commercial retail outlets, manufacturing facilities, and data centers. While the mapped boundary of 44HE0683 spans both sides of Portugee Road, historic aerial images and topographic maps show that the remnants of the airstrips to the north of the road have been destroyed by commercial and industrial development. The site has been determined not eligible for listing in the NRHP, and thus, requires no further consideration.

Site 44HE0708 is located off Elko Road in Sandston, Virginia. It is identified as a historic, domestic farmstead dating to the New Dominion and World War I to II periods, from approximately 1925 to 1949. Based on previous investigations, the site consists of four poured concrete foundations, a 10-foot diameter circular concrete pit,

⁹ The proposed expansion of the White Oak Substation (approximately 0.40 mile to the north) would not be visible from 043-5077 and would have no effect on the resource due to intervening vegetation and distance.

a pair of 6-foot-tall concrete gate posts, and two old roadways. Architectural and domestic remains were collected in plow zone contexts, though no artifacts were recovered through subsurface testing. Based on these findings, this site was determined ineligible for listing in the NRHP. Aerial photography spanning from 1963 to 2018 examined for the Project shows no change in the condition of the site area.

Alternative Route 2

Five aboveground historic resources were identified within the VDHR study tiers for Alternative Route 2 (Table I-3). Construction and operation of the new facilities associated with Alternative Route 2 would have no impact on one resource (043-5080) and a minimal impact on four resources (042-5017, 043-0308, 043-5077, and 043-5081).

Alternative Route 2 follows the same alignment as Alternative Route 1 where it passes near the Second Deep Bottom Battlefield (043-5080).¹⁰ There would be no view of transmission infrastructure installed along this route due to distance and intervening vegetation. Thus, the route would result in no impact on the battlefield.

Alternative Route 2 crosses the Second Cold Harbor Battlefield (042-5017) from about MPs 0.0 to 0.5 along a greenfield alignment requiring new right-of-way. In addition to the crossing, transmission infrastructure would be visible from limited places within the battlefield, though sight lines to the battlefield from the nearest public right-of-way would be obstructed by trees and other vegetation. Use of Alternative Route 2 for the White Oak Lines would have little additional impact on 042-5017 because the route traverses a small portion of the overall battlefield in the southern corner, while structures and conductors would only be visible from limited vantage points along White Oak Road. Therefore, Alternative Route 2 would result in a minimal impact on 042-5017.

Alternative Route 2 crosses the Savage Station Battlefield (043-0308) ABPP Potential National Register Area in three places (from approximate MPs 0.1 to 0.4, MPs 1.5 to 1.9, and MPs 2.3 to 3.2¹¹) along a greenfield alignment. Outside the crossing, Alternative Route 2 would only be visible from the nearest public right-of-way during off-leaf seasons; otherwise, despite its proximity, foliage would largely obscure views of the transmission line. The route would be visible from areas inside the resource boundary where the route crosses it, though these areas are highly developed and include the Company's existing White Oak and Portugee Substations and Lines #286

¹⁰ The nearest MP along Alternative Route 2 to 043-5080 is MP 3.2.

¹¹ The proposed expansion to the existing White Oak Substation is located within 043-0308's boundary but is situated among existing data centers and transmission lines that have already compromised the landscape. Thus, the expansion would constitute a minimal impact to the resource.

and #2198, which introduced modern elements to the battlefield's viewscape. There would be few vantage points within and adjacent to the battlefield from which Alternative Route 2 would be visible. For these reasons, Alternative Route 2 would have a minimal impact on Savage Station Battlefield.

Alternative Route 2 crosses Glendale Battlefield (043-5077) between approximate MPs 1.5 and 1.8. The visual impact on the battlefield from tree clearing within the right-of-way would be small in relation to the overall size of the battlefield and would only affect a peripheral portion of the resource. The section of the battlefield that would be directly impacted by Alternative Route 2 is approximately 1.43 miles south of the ABPP Potential National Register boundary and approximately 2.25 miles south of the ABPP Core Area boundary, both of which are well outside the range of potential impacts from Route 2. For these reasons, Alternative Route 2 would have a minimal impact on Glendale Battlefield.¹²

Alternative Route 2 crosses the Seven Pines Battlefield (043-5081) approximately between MPs 0.1 and 0.3 along a greenfield alignment. Other than at the intersection of the route and battlefield, views would remain unchanged. The majority of the battlefield would be unaffected by the new transmission line, with sight lines to the new transmission infrastructure largely limited to views from inside the Alternative Route 2 right-of-way. Furthermore, as two existing transmission lines are present in the vicinity of Alternative Route 2, modern infrastructure has already been introduced to the eastern section of the battlefield. For these reasons, Alternative Route 2 would have a minimal impact on 043-5081.

<p style="text-align: center;">TABLE I-3 White Oak Electric Transmission Project Resources in VDHR Tiers for Alternative Route 2</p>				
Buffer (miles)	Considered Resources	VDHR #	Description	Impact
1.0-1.5	National Historic Landmarks	NA	NA	NA
0.5-1.0	National Register—Listed Battlefields—Potentially Eligible	NA	NA	NA
0.0- 0.5	National Register—Eligible	043-5080*	Second Deep Bottom Battlefield	None
0.0 (within right-of-way)	National Register — Eligible	NA	NA	NA
	National Register — Eligible	043-0308*	Savage Station Battlefield	Minimal
		043-5081	Seven Pines Battlefield	Minimal
		042-5017	Second Cold Harbor Battlefield	Minimal

¹² The proposed expansion of the existing White Oak Substation is located approximately 0.40 mile to the north of 043-5077. However, the expansion would not be visible from the resource due to intervening vegetation and distance, and thus, would have no impact on 043-5077.

Battlefields— Potentially Eligible	043-5077*	Glendale Battlefield	Minimal
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NA = not applicable; VDHR = Virginia Department of Historic Resources; * Located within the VDHR study tiers for the White Oak Substation Expansion

The Stage I Analysis also considered the potential effects to archaeological resources. No archaeological sites lie within the new right-of-way associated with Alternative Route 2.

The Company solicited comments from VDHR on November 15, 2022, and again on May 18, 2023. VDHR provided letter responses on December 14, 2022 and June 13, 2023, to the November 2022 and May 2023 requests for comments. In the letter responses, VDHR recommends that Dominion Energy Virginia follow the *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia*. See Attachment 2.I.2 for the December 14, 2022 response, and Attachment 2.I.3 for the June 13, 2023 response.

J. Chesapeake Bay Preservation Areas

Henrico 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. Henrico County developed the Chesapeake Bay Preservation Program to meet the legislative requirements, designating Chesapeake Bay Preservation Areas that help maintain water quality. These areas 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, land that could degrade water quality or value of RPAs. As such, RPAs are located around perennial waterbodies and associated wetland areas along the Proposed and Alternative Routes, including wetlands adjacent to the Chickahominy River near the cut in locations of the Proposed and Alternative Routes, Canal Swamp (Alternative Route 1), and other unnamed perennial tributaries.

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. In addition, the Company will use Best Management Practices to limit impacts to RPAs to the minimum extent possible while safely and effectively constructing and maintaining this infrastructure.

K. Wildlife Resources

Relevant agency databases were reviewed and requests for comments from the USFWS, DWR, and DCR were submitted to determine if the proposed Project has the potential to affect any threatened or endangered species. As discussed in Section 2.G and identified in Attachment 2.G.1, certain federal and state listed species were identified as potentially occurring in the Project area. The Company will coordinate with the USFWS, DWR, and

DCR as appropriate to determine whether additional surveys are necessary and to minimize impacts on wildlife resources. In general, the Project area includes a combination of undeveloped forested land (deciduous species with scattered pine), open space, and developed land consisting of public roads, industrial, and commercial use. Native grasses can be used during revegetation to maintain a healthy plant species diversity.

Based on recommendations by the Virginia Department of Wildlife Resources (“DWR”), the Company will endeavor to adhere to the time of year restrictions (“TOYRs”) for cutting trees and vegetations favorable to winged animals from March 15 – November 15, to the extent practicable. This includes further minimizing potential effects by avoiding trees favorable for bat maternity roosting locations nesting bird habitat, to the extent practicable.

In addition, the Company is actively monitoring the regulatory changes and requirements associated with the NLEB and how it could potentially impact construction timing associated with the TOYRs. The existing interim guidance from the USFWS for the NLEB expires on March 31, 2024. The Company is also monitoring potential regulatory changes associated with the potential up-listing of the Tri-colored bat. On September 14, 2022, the Tri-colored bat was proposed to be up-listed to Endangered, with an estimated announcement of a final decision within 12 months. Regulatory guidance on the Tri-colored bat will be available upon up-listing. The Company’s construction window described above may require adjustment based upon the regulatory guidance and potential TOYRs associated with these two bat species.

Proposed Route (Route 3)

The majority of the Proposed Route crosses undeveloped forested lands (43.20 acres), with smaller areas of agricultural lands (1.85 acres), developed lands (3.68 acres), open water (3.10 acres), and open space (5.86 acres) interspersed within the proposed alignment. Based on review of recent (2023) aerial photography, a total of approximately 43.20 acres of forested habitat would need to be cleared within the right-of-way for the construction of this route.

Alternative Route 1

The majority of Alternative Route 1 crosses undeveloped forested lands (35.85 acres) and agricultural lands (7.89 acres), with smaller areas of open water (3.02 acres), developed lands (3.09 acres), and open space (1.87 acres) within the route alignment. Based on review of recent (2023) aerial photography, a total of approximately 35.85 acres of forested habitat would need to be cleared within the right-of-way for the construction of this route.

Alternative Route 2

The majority of Alternative Route 2 crosses undeveloped forested lands (32.32 acres), with smaller areas of open water (3.55 acres), developed lands (2.84 acres) and open space (1.31 acres) within the route alignment. Based on review of recent (2023) aerial photography, a

total of approximately 32.32 acres of forested habitat would need to be cleared within the right-of-way for the construction of this route.

White Oak Substation Expansion

The only land impacted by the proposed expansion of the White Oak Substation consists of 0.7 acre of developed land. This value is incorporated in the above route sections.

L. Recreation, Agricultural, and Forest Resources

The Project is expected to have minimal incremental impacts on recreational, agricultural, and forest resources. The Project routes collocation and impacts on forest land are described in the sections below.

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 Project.

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"), the Project affects no Agricultural and Forestal Districts ("AFDs"). The Proposed Route crosses a total of 28.59 acres of prime farmlands soils and 10.94 acres of soils classified as farmlands of state importance.

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. Such conservation easements must be held for no less than five years in duration and can be held in perpetuity. According to the DCR's NHDE, the Project does not affect any Virginia Outdoors Foundation ("VOF") easements, other conservation, or any conservation lands identified by the DCR.

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 right-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.

Proposed Route (Route 3)

The Proposed Route would be collocated for a total of 1.76¹³ miles, including 0.50 mile along Technology Boulevard, 0.66 mile along the Norfolk Southern Railroad, and 0.59 mile along planned sewer lines. Construction of this route would impact 43.20 acres of forested land.

A review of NRCS soils data indicates that approximately 28.59 acres of the Proposed Route's footprint are classified as prime farmland, and 10.94 acres are classified as farmland of statewide importance. According to a review of recent 2023 aerial photography, the Proposed Route crosses agricultural land for 1.85 miles (3 percent of the route) in a parcel between MPs 2.1 and 2.3. The Proposed Route crosses no AFDs or agricultural lands nor does the route run parallel to or cross any Virginia Byways, Scenic Rivers, Resource Protection Areas, or Virginia Birding and Wildlife Trails.

Alternative Route 1

Alternative Route 1 would be collocated for a total of 1.31 miles¹⁴ along the following existing features: Elko Road (0.26 mile), Technology Boulevard (0.71 mile), and sewer line (0.38 mile). Construction of this route would impact 35.85 acres of forested land.

A review of NRCS soils data indicates that approximately 25.12 acres of Alternative Route 1's footprint are classified as prime farmland, and 8.65 acres are classified as farmland of statewide importance. According to a review of recent 2023 aerial photography, Alternative Route 1 crosses agricultural land for 7.89 miles (15 percent of the route) in areas east and west of White Oak Road and northeast of Elko Road. Agricultural land is found between approximate MPs 0.6 and 1.1 and MP 1.5 and 1.8. Alternative Route 1 crosses no AFDs or agricultural lands nor does the route run parallel to or cross any Virginia Byways, Scenic Rivers, Resource Protection Areas, or Virginia Birding and Wildlife Trails.

Alternative Route 2

Alternative Route 2 would be collocated for a total of 0.29 mile along Elko Tract Road (0.15 mile) and Technology Boulevard (0.13 mile). Construction of the Proposed Route would impact 32.32 acres of forested land.

A review of NRCS soils data indicates that approximately 19.45 acres of Alternative Route 2 footprint are classified as prime farmland, and 6.96 acres are classified as farmland of statewide importance. According to a review of recent 2023 aerial photography, there is no land being used for agricultural purposes within or near the

¹³ The sum of the addends may not equal the totals due to rounding.

¹⁴ The sum of the addends may not equal the totals due to rounding.

right-of-way of Alternative Route 2. The route crosses no AFDs or agricultural lands nor does the route run parallel to or cross any Virginia Byways, Scenic Rivers, Resource Protection Areas, or Virginia Birding and Wildlife Trails.

White Oak Substation Expansion

The White Oak Substation Expansion footprint would not impact forested lands. The land affected by the proposed expansion is developed (0.70 acre).

A review of NRCS soils data indicates that approximately 0.63 acre of the White Oak Substation Expansion footprint is classified as prime farmland, and less than 0.01 acre is classified as farmland of statewide importance. According to a review of recent 2023 aerial photography, there is no land being used for agricultural purposes within or near the proposed expansion footprint. The White Oak Substation Expansion crosses no Agricultural and Forestal Districts (“AFDs”) or agricultural lands nor does the proposed expansion parallel or cross any Virginia Byways, Scenic Rivers, Resource Protection Areas, or Virginia Birding and Wildlife Trails.

On November 15, 2022, the Company solicited VDOF for comments on the proposed Project. The Company again solicited comments from VDOF on May 18, 2023, as well as comments from VOF on that date.

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 in August 2022, and again in February 2023, the Company is continuing to review 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 work to provide DCR an addendum to the IVMP, which further explains how the Company's operations and maintenance Forestry program addresses invasive species. The Company is actively compiling an addendum draft to provide to DCR for review and continued discussions. Once all discussions are complete and the addendum is final, the Company will report on the results of its communications with DCR in future transmission certificate of public convenience and necessity filings. At this time, the Company anticipates providing a draft of the addendum to DCR during the third quarter of 2023.¹⁵

N. Geology and Mineral Resources

The Project is located within the Coastal Plain geologic province, which is characterized by a wedge of sediments that increases in thickness from the edge of the Piedmont province in the west towards the coast, and by terraces marking ancient shorelines that stair-step downward towards the coast and major rivers. Underlying sediments consist of Jurassic and Cretaceous-age sands, silts, and clays shed during the uplift of the Appalachians. Surficial sediments consist of Tertiary and Quaternary-age sands, silts, and clays deposited as sea levels fluctuated during these glacial periods.

Based on review of the Geologic Map of Virginia, the majority of the Project area is underlain by Tertiary-age sand, silt and gravel formations that were deposited between 2 and 65 million years ago. The portions of the Proposed Route, Alternative Route 1, and Alternative Route 2 located closest to the Chickahominy River cross younger, Quaternary-age alluvial clay and mud deposited by waterbodies (Virginia Department of Energy, 2023a; William and Mary Department of Geology, 2023).

ERM reviewed publicly available Virginia Department of Energy datasets (2023b), USGS topographic quadrangles, and recent (2023) digital aerial photographs to identify mineral resources in the study area. Based on the review, no active mineral operations were identified within 0.25 mile of the alternative routes. The closest permit location listed as "active", the Bottom Bridge sand mine, is approximately 1.0 mile southeast of MP 0.0 of Alternative Route 1. Based on Virginia Department of Energy records, the mine was permitted in 2006 to disturb approximately 81.9 acres, and as of 2020, the mine had disturbed the total permitted acreage threshold.

¹⁵ 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*).

One inactive sand and gravel pit location with a released permit is adjacent to MP 0.9 of the Proposed Route. No inactive mineral operations were identified within 0.25 mile of Alternative Route 1 and Alternative Route 2.

A plugged oil and gas well is located approximately 0.5 mile north-northwest of MP 1.3 of Alternative Route 2, south of East Williamsburg Road. No active oil or gas wells were identified within 0.25 mile of the alternative routes. As such, Project activities are not anticipated to impact, or be impacted by, fuel and non-fuel mineral operations.

O. Transportation Infrastructure

Road and Railroad Crossings

Major public roads within the study area include I-64 and US Route 60 (East Williamsburg Road). Other through roads within the study area include Memorial Drive, Technology Boulevard, Elko Road (State Route 156), and White Oak Road. VDOT maintains Elko Road (State Route 156), I-64, and US Route 60. The other above-mentioned roads are maintained by Henrico County.

VDOT has no planned future projects or projects currently under construction in the study area.¹⁶ Several planned road extensions included in the Henrico County Vision 2026 Comprehensive Plan are in the western portion of the study area between I-295 and Memorial Drive.¹⁷ The road extensions are shown only conceptually in the plan, with no detailed siting. Henrico County has begun construction to extend Engineered Wood Way, a county road within the White Oak Technology Park, by 0.36 mile from its current terminus to provide access to planned development parcels.¹⁸

Proposed Route (Route 3)

The Proposed Route would cross I-64, East Williamsburg Road (State Route 60), Technology Boulevard, Old Williamsburg Road, and Meadow Road. The road crossings would be spanned. The Proposed Route would also be collocated with Technology Boulevard for 0.50 mile. Although Henrico County's Comprehensive Plan shows possible future roads in the area west of I-295, due to the lack of detailed siting or planning for these roads, it is not possible to know whether the Proposed Route would have an impact on future roads.

¹⁶ Virginia Department of Transportation (VDOT). 2022b. Richmond District Projects. Available at: <https://www.virginiadot.org/projects/richmond/default.asp>.

¹⁷ Henrico County Planning Department. 2009. 2026 Comprehensive Plan. Available at: <https://henrico.us/planning/2026-comprehensive-plan/>.

¹⁸ Henrico County Public Works Department. 2022. Projects: Engineered Wood Way. Available at: <https://henrico.us/works/projects/>.

The Proposed Route would cross the Norfolk Southern railroad once and be collocated with the railroad for approximately 0.66 mile. The crossing will comply with applicable clearance requirements over the railroad.

Alternative Route 1

Alternative Route 1 would cross White Oak Road, Elko Road, Technology Boulevard and Technology Creek Drive. The road crossings would be spanned. Alternative Route 1 would be collocated with Elko Road for 0.26 mile and with Technology Boulevard for 0.71 mile.

Alternative Route 2

Alternative Route 2 would cross Elko Road, Technology Boulevard, and Old Williamsburg Road. All road crossings would be spanned. Alternative Route 2 would be collocated with Elko Tract Road for 0.16 mile and Technology Boulevard for 0.13 mile.

White Oak Substation Expansion

The White Oak Substation is not located adjacent to a public road and the proposed expansion would have no impact on roads.

Temporary closures of roads and or traffic lanes would be required during construction of the Proposed Route or Alternative Routes. No long-term impacts to roads are anticipated and the collocated sections of Project rights-of-way would be located entirely outside of road and railroad rights-of-way. The Company will comply with VDOT and Henrico 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. If the Proposed Route is selected, the Company will also work with Norfolk Southern railroad in obtaining permits for crossing the railroad right-of-way.

On May 18, 2023, the Company solicited comments from VDOT on the proposed Project. VDOT responded by emails dated May 31, 2023 and June 27, 2023, indicating that VDOT does not see any fatal flaws to any of the routes but that it would prefer either Alternative Routes 1 or 2 to the Proposed Route crosses I-64. These responses are included as Attachment 2.O.1.

Airports

The design of the proposed Project must prevent interference with pilots' safe ingress and egress at airports in the vicinity of the Project. Such hazard or impediments include interference with navigation and communication equipment and glare from materials and external lights.

The Company reviewed the FAA’s website to identify airports within ten miles of the proposed Project. Based on this review, the following FAA-restricted airports are located within ten miles of the Project:

- Richmond International Airport, approximately 2.6 miles west of the Project
- New Kent County Airport, approximately 2.9 miles east of the Project

The Company reviewed height limitations associated with FAA-defined civil airport imaginary surfaces for all runways associated with the Richmond International Airport and all other public or private registered airfields to determine whether any of the structure heights associated with each specific structure location would penetrate the imaginary surfaces for any of the runways. The Company hired ERM to conduct the review. ERM reviewed the height limitations associated with FAA-defined imaginary surfaces for all runways associated with the Richmond International Airport. Standard GIS tools, including ESRI’s ArcMap 3D and Spatial Extension software were used to create and georeference the imaginary surfaces in space, and in relation to the locations and proposed heights of the transmission structures. Ground surface data for the study area was derived by using a USGS 10 Meter Digital Elevation Model.

Of the two airports listed above, it was determined only the Richmond International Airport was in close enough proximity to potentially impact navigable airspace. At its most critical point, the Proposed Route proposes to be located within 2.6 miles (14,200 feet) of Runway 16/34 of the Richmond International Airport. The airport surveyed ground elevation is 167.5 feet above mean sea level (“AMSL”). The ground elevation in the study area ranges from approximately 150 AMSL on the northern end of the study area to 100 AMSL in the southern end of the study area. The routes are located outside the approach surface of the Richmond International Airport. Based on the ground elevation at the Project area and the distance from the end of the nearest runway, there would be no potential for impacts on any of the imaginary surfaces or terminal instrument procedures imaginary surfaces associated with the Richmond International Airport. Structures for the Project would range from approximately 55 to 130 feet in height. The Company does not propose to place structures below any of these surfaces, thus no impacts to the Richmond International Airport are anticipated. Based on current plans, it is likely that the Project will be required to submit FAA Form 7460-1, Notice of Proposed Construction or Alteration, to the FAA. Submittal of these notices would take place during the permitting process of the Project.

On May 18, 2023, the Company solicited comments from Virginia Department of Aviation (“DOAv”) on the proposed Project. The Company received a response from DOAv dated May 22, 2023, and a copy of the response is included as Attachment 2.O.2.

P. Drinking Water Wells

As a general matter, water wells within 1,000 feet of the route of the Partial Rebuild Project may be outside of the transmission line corridor and located on private property. The Company does not have the ability or right to field mark the wells on private property. In August 2021, the Company contacted the Virginia Department of Health (“VDH”), Office of Drinking Water (“ODW”) to propose a method of well protection, including plotting and calling out the wells on the Partial Rebuild 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 in this proceeding, as it has in other cases, and will coordinate with VDH-ODW, as needed.

In response to the Company’s November 15, 2022 request for comments, Dominion Energy Virginia received an email from VDH-ODW dated December 9, 2022, regarding potential Project impacts to public water distribution systems or sanitary sewage collection systems. A copy of this email is included as Attachment 2.P.2. The Company also solicited comments from VDH-ODW on May 18, 2023. VDH-ODW responded by email dated May 19, 2023, and a copy of this email is included as Attachment 2.P.3.

Q. 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

Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, VA 23219
DominionEnergy.com



November 15, 2022

BY EMAIL

Ms. Michelle Henicheck
Office of Wetlands and Streams
Department of Environmental Quality
1111 East Main Street, Suite 1400
Richmond, Virginia 23219

RE: Dominion Energy Virginia's Proposed 230 kV Elmont-White Oak Line #2075, 230 kV Chickahominy-White Oak Line #2294 and White Oak Substation Expansion in Henrico County, Virginia

Dear Ms. Henicheck,

Dominion Energy Virginia (the "Company") is proposing to construct two new overhead 230 kV transmission lines on double circuit structures in a new, primarily 100-foot-wide right-of-way (the "White Oak Lines") and to expand its existing White Oak Substation in order to accommodate the White Oak Lines (the "White Oak Substation Expansion") in Henrico County, Virginia. Collectively, the White Oak Lines, the White Oak Substation Expansion, and related substation work are referred to as the "White Oak Electric Transmission Project" or "Project." The Company has identified proposed and alternative routes in new right-of-way for the White Oak Lines, as shown on the attached map.

The Project is needed in response to significant increases in electrical demand over recent years as well as expected demand growth projected for the future, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is in the process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). Pursuant to the July 2003 Memorandum Wetlands Impact Consultation between the Company and the Department of Environmental Quality (the "DEQ"), Dominion Energy Virginia is sending this letter to initiate consultation with the DEQ prior to filing an application for a CPCN from the Commission.

A wetland delineation has not been conducted at this time. However, Environmental Resources Management conducted a wetland desktop study to identify probable wetlands based on a review of multiple data sources. The table below provides a summary of the medium to high probability wetlands expected to be affected within the proposed Project right-of-way.

Dominion Energy Virginia
White Oak Electric Transmission Project
Henrico County, Virginia
Page 2 of 3

Table 1: Summary of the Probabilities of Wetland and Waterbody Occurrence along Project Route Alternatives ^a

Probability	Total right-of-way Acres ^b	Wetland and Waterbody type (acres)				
		PEM Emergent	PFO Forested	PSS Scrub-shrub	PUB Freshwater pond	Riverine Stream
Route 2 (Proposed Route)						
High	0.23	NA	0.23	NA	NA	NA
Medium/High	7.02	0.00	3.52	0.56	2.93	NA
Medium	4.82	0.02	4.38	0.01	0.25	0.15
Alternative Route 1						
High	1.77	NA	1.77	NA	NA	NA
Medium/High	9.99	0.05	6.89	0.56	2.39	0.11
Medium	4.10	0.25	3.65	0.01	0.04	0.15
Alternative Route 3						
High	NA	NA	NA	NA	NA	NA
Medium/High	7.11	NA	4.31	0.56	2.10	0.14
Medium	7.74	NA	7.46	0.01	0.04	0.22

NA Not applicable due to absence of wetland or waterbody type within the alternative route

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

^b Total acres may not total the sum of wetland and waterbody types. This is 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.

The full Wetland Desktop Study will be submitted once finalized. Subsequently, a wetland delineation will be conducted and the limits of wetlands of other waters of the United States will be submitted to the U.S. Army Corps of Engineers for confirmation.

At this time, in advance of filing an application with the Commission, the Company respectfully requests that you submit any comments or additional information you feel would have bearing on the Project within 30 days of the date of this letter.

Enclosed is a Project Overview Map depicting the proposed and alternative routes of the White Oak Lines, as well as the general Project location. Please note that the Project Overview Map and route descriptions depicted therein are preliminary in nature and subject to final engineering. Please refer to the CPCN application for any updates to the Project description and/or routes. If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact Heather E.B. Kennedy at (804) 317-9930 or heather.e.kennedy@dominionenergy.com.

Dominion Energy Virginia
White Oak Electric Transmission Project
Henrico County, Virginia
Page 3 of 3

The Company appreciates your assistance with this project review and looks forward to any additional information you may have to offer.

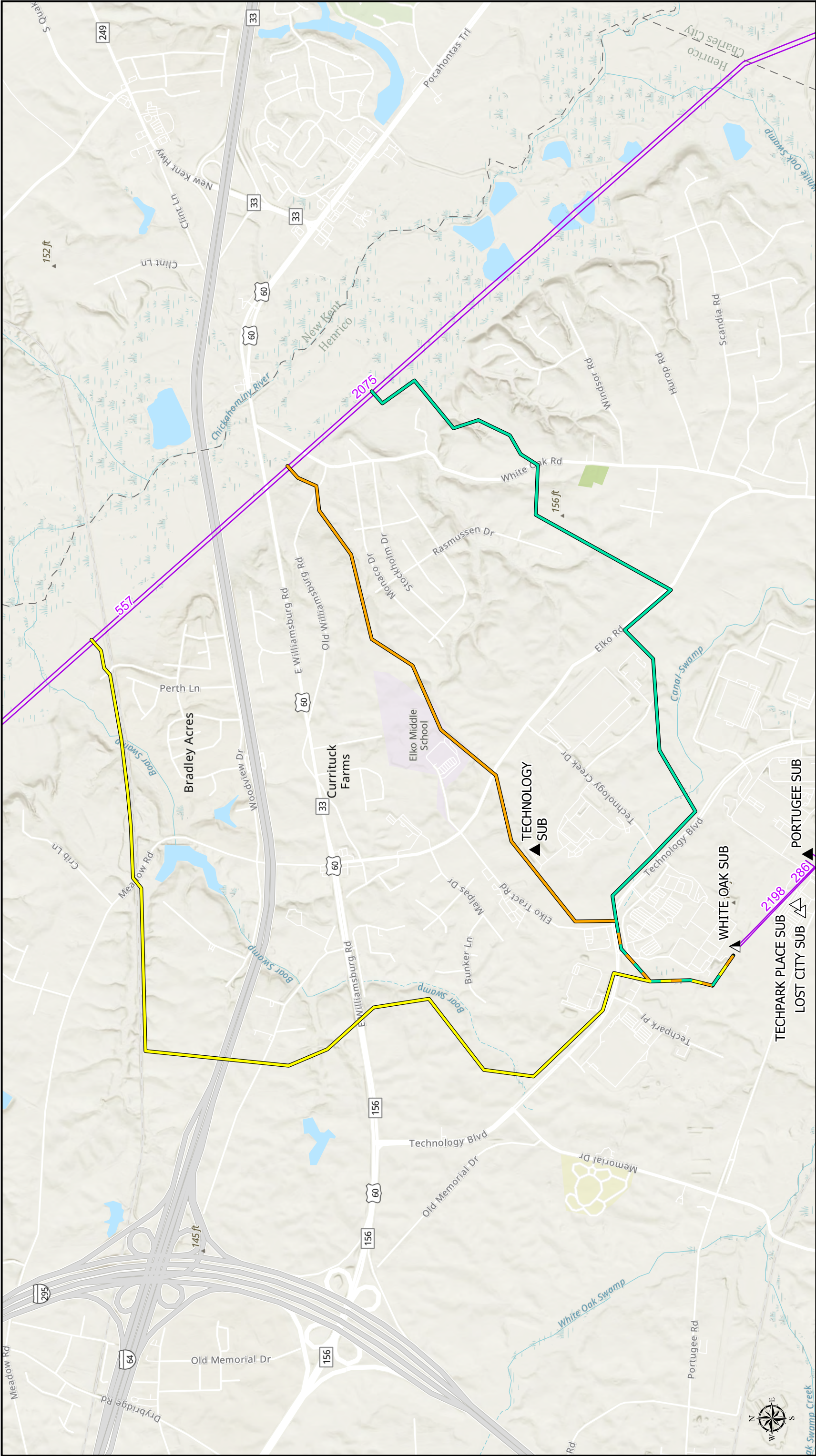
Sincerely,




Dominion Energy Virginia

A handwritten signature in black ink, appearing to read "Elizabeth L. Hester".

Elizabeth L. Hester
Authorized Representative
Manager, Environmental Services

Attachment: Project Overview Map



 0 1,000 2,000 Feet 1:24,000	White Oak Alternative Routes Route 1 Route 2 (Proposed Route) Route 3 Existing Substation Future Substation Proposed Substation Expansion Existing Dominion Transmission Line	 Project Overview White Oak Electric Transmission Project Dominion Energy Virginia Henrico County, Virginia	 DRAWN BY: NAD
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Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, VA 23219
DominionEnergy.com



November 15, 2022

BY EMAIL

RE: Dominion Energy Virginia's Proposed 230 kV Elmont-White Oak Line #2075, 230 kV Chickahominy-White Oak Line #2294 and White Oak Substation Expansion in Henrico County, Virginia

To Whom It May Concern,

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The Project is needed in response to significant increases in electrical demand over recent years as well as expected demand growth projected for the future, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is in the process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). At this time, in advance of filing an application for a CPCN from the Commission, the Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Project within 30 days of the date of this letter.

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Dominion Energy Virginia
White Oak Electric Transmission Project
Henrico County, Virginia
Page 2 of 2

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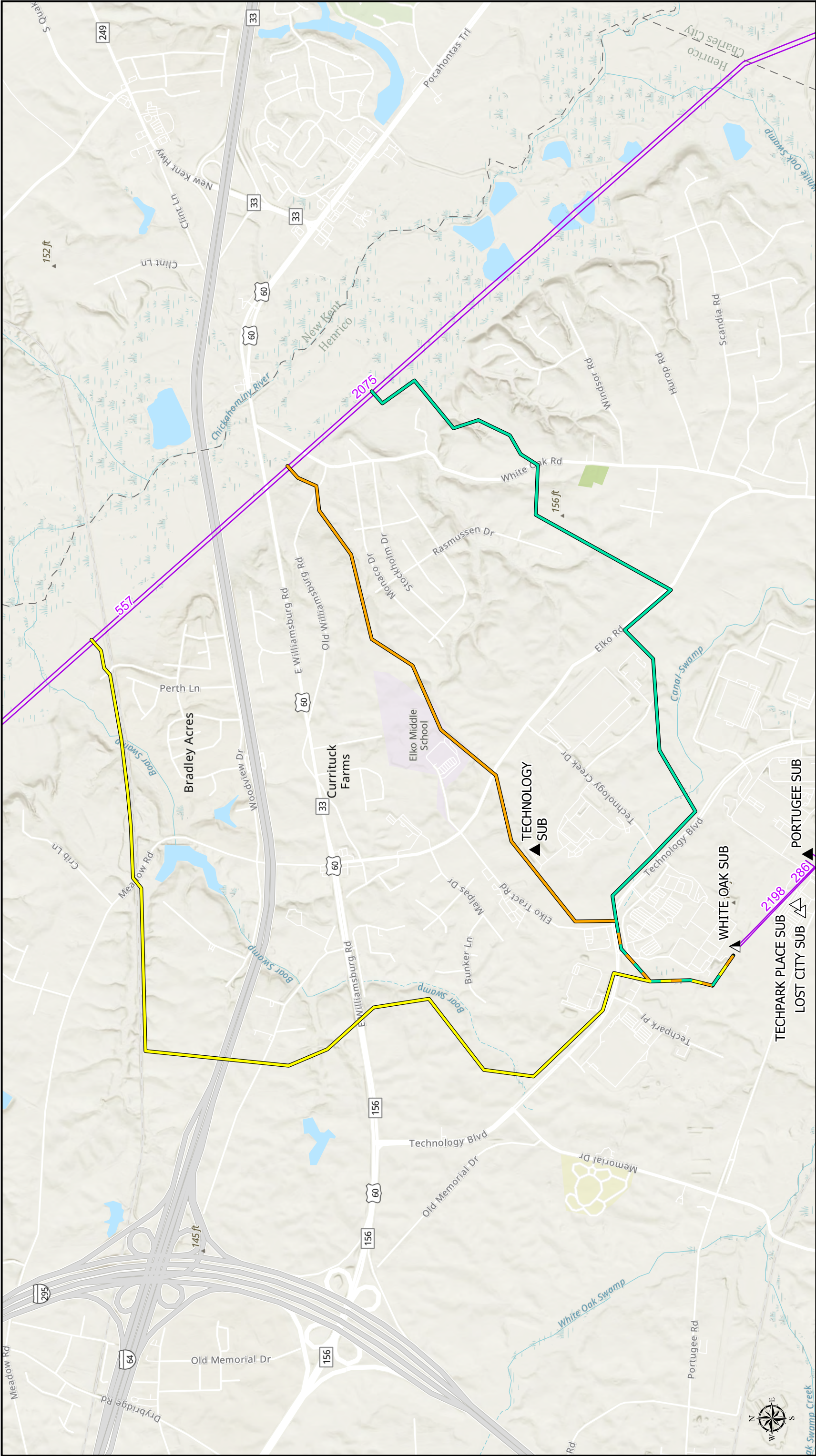
Sincerely,

Dominion Energy Virginia

A handwritten signature in black ink, appearing to read "E. Hester".

Elizabeth L. Hester
Authorized Representative
Manager, Environmental Services

Attachment: Project Overview Map



▲

Existing Substation

△

Future Substation

▲

Proposed Substation Expansion

—

Existing Dominion Transmission Line

0

1,000

2,000

Feet

1:24,000

White Oak Alternative Routes

—

Route 1

—

Route 2 (Proposed Route)

—

Route 3

▲

TECHPARK PLACE SUB

△

LOST CITY SUB

▲

WHITE OAK SUB

▲

PORTUGEE SUB

ERM

Project Overview

White Oak Electric Transmission Project

Dominion Energy Virginia

Henrico County, Virginia

Dominion Energy

DRAWN BY: NAD

Haynes, Anne Hampton

From: Fulcher, Valerie <valerie.fulcher@deq.virginia.gov>
Sent: Wednesday, November 23, 2022 11:55 AM
To: rr dgif-ESS Projects; rr DCR-PRR Environmental Review; odwreview (VDH); Carlos Martinez; Tom Ballou; Lawrence Gavan; Daniel Moore; West, Kelley; Roger Kirchen; Terrance Lasher; Karl Didier; Michelle Henicheck; Scott Kudlas; vit@henrico.us; sstewart@planrva.org; ImpactReview; rr Environmental Impact Review; David Spears
Cc: Heather.E.Kennedy@dominionenergy.com
Subject: [EXTERNAL] NEW SCOPING Elmont-White Oake Line #2075 and Line 2294
Attachments: White Oak SCC Agency Notification Letters (To Whom) - signed.pdf; Elmont to White Oak Scoping Response.pdf; Attachment Project_Overview_11.14.22.pdf

CAUTION! This message was NOT SENT from DOMINION ENERGY

Are you expecting this message to your DE email? Suspicious? Use PhishAlarm to report the message. Open a browser and type in the name of the trusted website instead of clicking on links. DO NOT click links or open attachments until you verify with the sender using a known-good phone number. Never provide your DE password.

Good morning—attached is a **request for scoping comments** on the following:

Proposed 230 kV Elmont-White Oak Line #2075, 230 kV Chickahominy-White Oak Line #2294 and White Oak Substation Expansion in Henrico County, Virginia

If you choose to make comments, please send them directly to the project sponsor (Heather.E.Kennedy@dominionenergy.com) and copy the DEQ Office of Environmental Impact Review: eir@deq.virginia.gov. We will coordinate a review when the environmental document is completed.

DEQ-OEIR's scoping response is also attached.

If you have any questions regarding this request, please email our office at eir@deq.virginia.gov.

Valerie

--

Valerie A. Fulcher, CAP, OM, Admin/Data Coordinator Senior

Department of Environmental Quality

Environmental Enhancement - Office of Environmental Impact Review

1111 East Main Street

Richmond, VA 23219

NEW PHONE NUMBER: 804-659-1550

Email: Valerie.Fulcher@deq.virginia.gov

<https://www.deq.virginia.gov/permits-regulations/environmental-impact-review>

OUR ENFORCEABLE POLICIES HAVE BEEN UPDATED FOR 2021: <https://www.deq.virginia.gov/permits-regulations/environmental-impact-review/federal-consistency>

For program updates and public notices please subscribe to Constant
Contact: <https://lp.constantcontact.com/su/MVcCump/EIR>



Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

1111 E. Main Street, Suite 1400, Richmond, Virginia 23219

P.O. Box 1105, Richmond, Virginia 23218

(800) 592-5482 FAX (804) 698-4178

www.deq.virginia.gov

Travis A. Voyles
Acting Secretary of Natural and Historic Resources

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

November 16, 2022

Elizabeth Hester
Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, VA 23219

RE: Dominion Energy Virginia's Proposed Cannon 230 kV Elmont-White Oak Line #2075, 230 kV Chickahominy-White Oak Line #2294 and White Oak Substation Expansion in Henrico County, Virginia

Dear Ms. Hester:

This letter is in response to the scoping request for the above-referenced project.

As you may know, the Department of Environmental Quality, through its Office of Environmental Impact Review (DEQ-OEIR), is responsible for coordinating Virginia's review of environmental impacts for electric power generating projects and power line projects in conjunction with the licensing process of the State Corporation Commission.

DOCUMENT SUBMISSIONS

In order to ensure an effective coordinated review of the environmental impact analysis may be sent directly to OEIR. We request that you submit one electronic to eir@deq.virginia.gov (25 MB maximum) or make the documents available for download at a website, file transfer protocol (ftp) site or the VITA LFT file share system (Requires an "invitation" for access. An invitation request should be sent to eir@deq.virginia.gov). The required "Wetlands Impact Consultation" can be sent directly to Michelle Henicheck at michelle.henicheck@deq.virginia.gov or at the address above.

ENVIRONMENTAL REVIEW UNDER VIRGINIA CODE 56-46.1

While this Office does not participate in scoping efforts beyond the advice given herein, other agencies are free to provide scoping comments concerning the preparation of the environmental impact analysis document. Accordingly, we have coordinated your request with the following state agencies and those localities and Planning District Commissions, including but not limited to:

Department of Environmental Quality:

- DEQ Regional Office
 - Air Division
 - Office of Wetlands and Stream Protection
 - Office of Local Government Programs
 - Division of Land Protection and Revitalization
 - Office of Stormwater Management
- Department of Conservation and Recreation
Department of Health
Department of Agriculture and Consumer Services
Department of Wildlife Resources
Virginia Marine Resources Commission
Department of Historic Resources
Department of Mines, Minerals, and Energy
Department of Forestry
Department of Transportation

DATA BASE ASSISTANCE

Below is a list of databases that may assist you in the preparation of a NEPA document:

- DEQ Online Database: Virginia Environmental Geographic Information Systems

Information on Permitted Solid Waste Management Facilities, Impaired Waters, Petroleum Releases, Registered Petroleum Facilities, Permitted Discharge (Virginia Pollution Discharge Elimination System Permits) Facilities, Resource Conservation and Recovery Act (RCRA) Sites, Water Monitoring Stations, National Wetlands Inventory:

- www.deq.virginia.gov/ConnectWithDEQ/VEGIS.aspx

- DEQ Virginia Coastal Geospatial and Educational Mapping System (GEMS)

Virginia's coastal resource data and maps; coastal laws and policies; facts on coastal resource values; and direct links to collaborating agencies responsible for current data:

- <http://128.172.160.131/gems2/>

- MARCO Mid-Atlantic Ocean Data Portal

The Mid-Atlantic Ocean Data Portal is a publicly available online toolkit and resource center that consolidates available data and enables users to visualize and analyze ocean resources and human use information such as fishing grounds, recreational areas, shipping lanes, habitat areas, and energy sites, among others.

<http://portal.midatlanticocean.org/visualize/#x=-73.24&y=38.93&z=7&logo=true&controls=true&basemap=Ocean&tab=data&legends=false&layers=true>

- DHR Data Sharing System.

Survey records in the DHR inventory:

- www.dhr.virginia.gov/archives/data_sharing_sys.htm
- DCR Natural Heritage Search

Produces lists of resources that occur in specific counties, watersheds or physiographic regions:
 - www.dcr.virginia.gov/natural_heritage/dbsearchtool.shtml
- DWR Fish and Wildlife Information Service

Information about Virginia's Wildlife resources:
 - <http://vafwis.org/fwis/>
- Total Maximum Daily Loads Approved Reports
 - <https://www.deq.virginia.gov/programs/water/waterqualityinformationtmdls/tmdl/tmdldevelopment/approvedtmdlreports.aspx>
- Virginia Outdoors Foundation: Identify VOF-protected land
 - <http://vof.maps.arcgis.com/home/index.html>
- Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Database: Superfund Information Systems

Information on hazardous waste sites, potentially hazardous waste sites and remedial activities across the nation, including sites that are on the National Priorities List (NPL) or being considered for the NPL:
 - www.epa.gov/superfund/sites/cursites/index.htm
- EPA RCRAInfo Search

Information on hazardous waste facilities:
 - www.epa.gov/enviro/facts/rcrainfo/search.html
- Total Maximum Daily Loads Approved Reports
 - <https://www.deq.virginia.gov/programs/water/waterqualityinformationtmdls/tmdl/tmdldevelopment/approvedtmdlreports.aspx>
- EPA Envirofacts Database

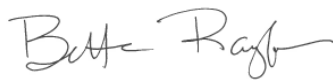
EPA Environmental Information, including EPA-Regulated Facilities and Toxics Release Inventory Reports:
 - www.epa.gov/enviro/index.html
- EPA NEPAassist Database

Facilitates the environmental review process and project planning:
<http://nepaassisttool.epa.gov/nepaassist/entry.aspx>

If you have questions about the environmental review process, please feel free to contact me (telephone (804) 659-1915 or e-mail bettina.rayfield@deq.virginia.gov).

I hope this information is helpful to you.

Sincerely,

A handwritten signature in black ink, appearing to read "Bettina Rayfield". The signature is fluid and cursive, with a long horizontal stroke extending from the end.

Bettina Rayfield, Program Manager
Environmental Impact Review and
Long-Range Priorities

Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, VA 23219
DominionEnergy.com



Ms. Michelle Henicheck
Office of Wetlands and Streams
Department of Environmental Quality
1111 East Main Street, Suite 1400
Richmond, Virginia 23219

May 18, 2023

SCC ELECTRIC TRANSMISSION PROJECT NOTIFICATION

RE: Dominion Energy Virginia's Proposed 230 kV Elmont-White Oak Line #2075, 230 kV Chickahominy-White Oak Line #2294 and White Oak Substation Expansion in Henrico County, Virginia

Dear Ms. Henicheck,

Dominion Energy Virginia (the "Company") is proposing to construct two new overhead 230 kV transmission lines on double circuit structures in a new, primarily 100-foot-wide right-of-way (the "White Oak Lines") and to expand its existing White Oak Substation in order to accommodate the White Oak Lines (the "White Oak Substation Expansion") in Henrico County, Virginia. Collectively, the White Oak Lines, the White Oak Substation Expansion, and related substation work are referred to as the "White Oak Electric Transmission Project" or "Project." The Company has identified proposed and alternative routes in new right-of-way for the White Oak Lines, as shown on the Project Overview Map.

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A wetland delineation has not been conducted at this time. However, Environmental Resources Management conducted a wetland desktop study to identify probable wetlands based on a review of multiple data sources. The table below provides a summary of the medium to high probability wetlands expected to be present within the proposed Project right-of-way.

Ms. Henicheck
May 18, 2023
Page 2 of 3

Table 1: Summary of the Probabilities of Wetland and Waterbody Occurrence along Project Route Alternatives ^a

Probability	Total within right-of-way (acres) ^b	Wetland and Waterbody type (acres)				
		PEM Emergent	PFO Forested	PSS Scrub-	PUB Freshwater	Riverine Stream
Route 3 (Proposed Route)						
High	NA	NA	NA	NA	NA	NA
Medium/High	9.17	0.70	5.67	0.56	2.14	0.09
Medium	6.46	NA	6.31	0.01	0.04	0.09
Alternative Route 1						
High	1.81	NA	1.81	NA	NA	NA
Medium/High	10.00	0.05	6.90	0.56	2.39	0.11
Medium	4.18	0.25	3.73	0.01	0.04	0.15
Alternative Route 2						
High	0.75	0.71	0.05	0.00	0.00	0.00
Medium/High	7.10	0.01	3.55	0.56	2.93	0.05
Medium	3.86	NA	3.50	0.01	0.25	0.10

NA Not applicable due to absence of wetland or waterbody type within the alternative route

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

b Total acres may not total the sum of wetland and waterbody types. This is 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.

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The Company respectfully requests that you submit any comments or additional information you feel would have bearing on the Project within 30 days of the date of this letter.

Enclosed is a Project Overview Map depicting the proposed and alternative routes of the White Oak Lines, as well as the general Project location.¹ Please note that the Project Overview Map and route descriptions depicted therein are preliminary in nature and subject to final engineering. Please refer to the CPCN application for any updates to the Project description and/or routes.

We have included a GIS shapefile of the transmission line routes to assist in your review. If there are any questions, please do not hesitate to contact Heather E.B. Kennedy at (804) 317-9930 or heather.e.kennedy@dominionenergy.com.

¹ To the extent you received notice of this Project from the Company on November 15, 2022, note that the attached Project Overview Map has been updated. Please feel free to submit additional comments or information, as appropriate.

Ms. Henicheck
May 18, 2023
Page 3 of 3

The Company appreciates your assistance with this project review and looks forward to any additional information you may have to offer.

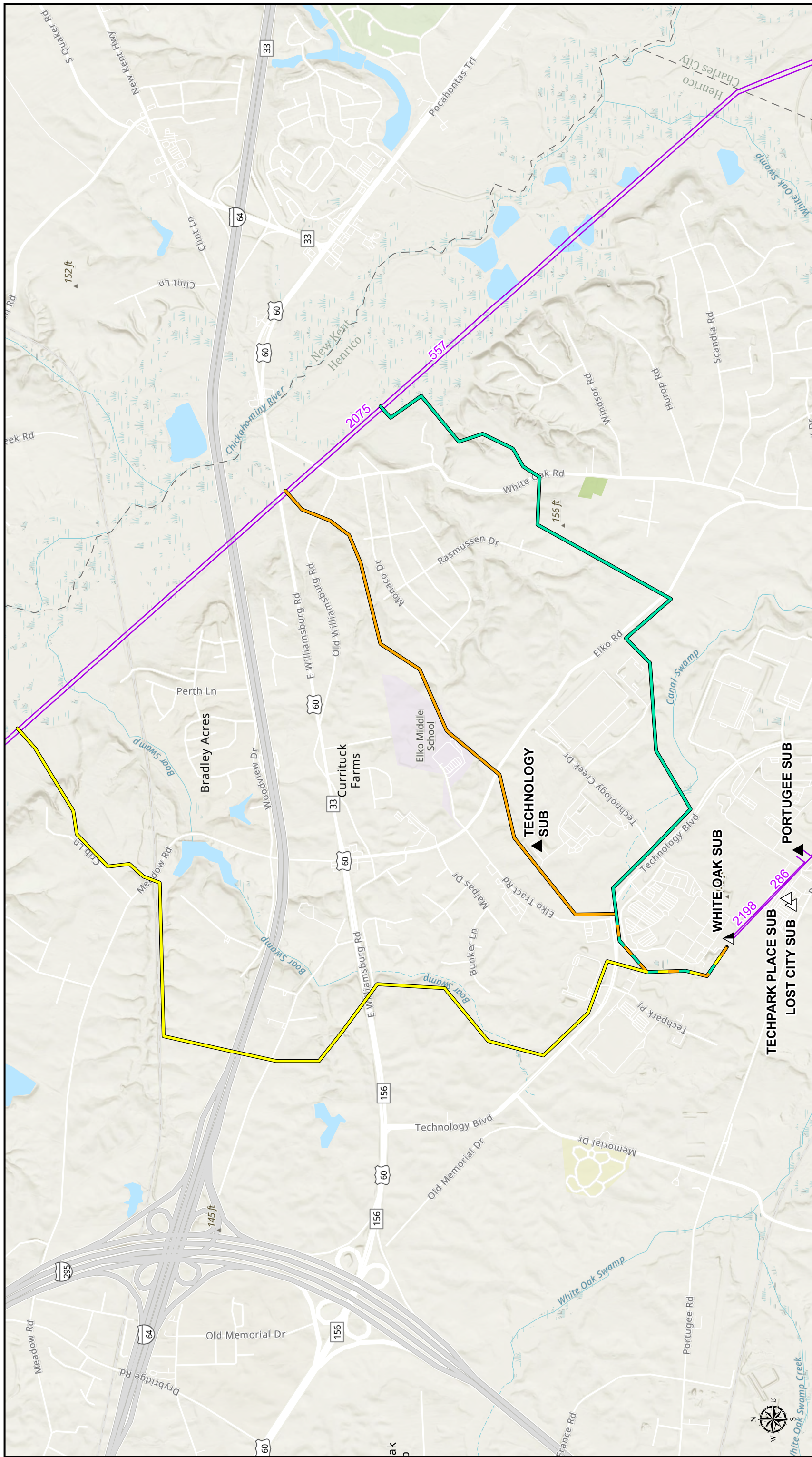
Sincerely,

Dominion Energy Virginia

A handwritten signature in black ink, appearing to read "Elizabeth Hester".

Elizabeth Hester
Authorized Representative
Manager, Environmental Services

Attachment: Project Overview Map
 Wetland and Waterbody Map Set



Project Overview
White Oak Electric Transmission Project
Dominion Energy Virginia
Henrico and Charles City County, Virginia



MPI S:\M\Clients\D-F\DOM\White Oak\ ArcGIS\SCC Appendix\ DOM WTOK SCC Appendix Update aprx\Project Overview | REVISED: 04/26/2023 | SCALE: 1:25,000 when printed at 11x17

DRAWN BY: NAME

Dominion Energy Services, Inc.
120 Tredegar Street, Richmond, VA 23219
DominionEnergy.com



May 18, 2023

SCC ELECTRIC TRANSMISSION PROJECT NOTIFICATION

RE: Dominion Energy Virginia's Proposed 230 kV Elmont-White Oak Line #2075, 230 kV
Chickahominy-White Oak Line #2294 and White Oak Substation Expansion in Henrico
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May18, 2023
Page 2 of 2

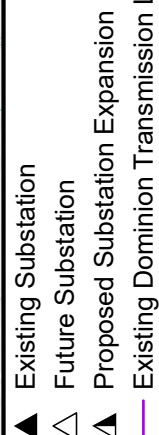
The Company appreciates your assistance with this project review and looks forward to any additional information you may have to offer.

Thank you,

A handwritten signature in black ink, appearing to read "E. Hester".

Elizabeth "Tibby" L. Hester
Authorized Representative
Manager, Environmental Services

Enclosure: Project Overview Map



Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, VA 23219
DominionEnergy.com



May 18, 2023

BY EMAIL

Kevin Gregg
Chief of Maintenance and Operations for Central Office
Virginia Department of Transportation
1401 E. Broad Street
Richmond, Virginia 23219

RE: Dominion Energy Virginia's Proposed 230 kV Elmont-White Oak Line #2075, 230 kV Chickahominy-White Oak Line #2294 and White Oak Substation Expansion in Henrico County, Virginia

Dear Mr. Gregg,

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Dominion Energy Virginia
White Oak Electric Transmission Project
Henrico County, Virginia
Page 2 of 2

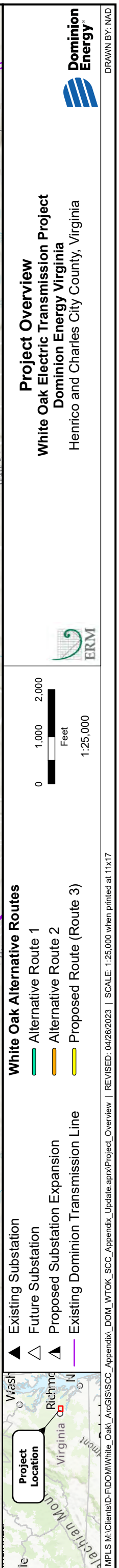
We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

A handwritten signature in blue ink, appearing to read 'SJR Brooks', is positioned above the printed name.

Stefan R. Brooks
Dominion Energy Contractor - Siting and Permitting team

Attachment: Project Overview Map



Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, VA 23219
DominionEnergy.com



May 18, 2023

BY EMAIL

Dale Totten
Acting District Engineer
Virginia Department of Transportation, Richmond District
2430 Pine Forest Drive
South Chesterfield, Virginia 23834

RE: Dominion Energy Virginia's Proposed 230 kV Elmont-White Oak Line #2075, 230 kV Chickahominy-White Oak Line #2294 and White Oak Substation Expansion in Henrico County, Virginia

Dear Mr. Totten,

Dominion Energy Virginia (the "Company") is proposing to construct two new overhead 230 kV transmission lines on double circuit structures in a new, primarily 100-foot-wide right-of-way (the "White Oak Lines") and to expand its existing White Oak Substation in order to accommodate the White Oak Lines (the "White Oak Substation Expansion") in Henrico County, Virginia. Collectively, the White Oak Lines, the White Oak Substation Expansion, and related substation work are referred to as the "White Oak Electric Transmission Project" or "Project." The Company has identified proposed and alternative routes in new right-of-way for the White Oak Lines, as shown on the attached Project Overview Map.

The Project is needed in response to significant increases in electrical demand over recent years as well as expected demand growth projected for the future, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is in the process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). The Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Project within 30 days of the date of this letter.

The enclosed Project Overview Map depicts the proposed and alternative routes of the White Oak Lines, as well as the general Project location. Please note that the Project Overview Map and route descriptions depicted therein are preliminary in nature and subject to final engineering. Please refer to the CPCN application for any updates to the Project description and/or routes.

If you would like to receive a GIS shapefile of the transmission line routes to assist in your review or if there are any questions, please do not hesitate to contact Stefan Brooks at (804) 514-3129 or stefan.r.brooks@dominionenergy.com.

Dominion Energy Virginia
White Oak Electric Transmission Project
Henrico County, Virginia
Page 2 of 2

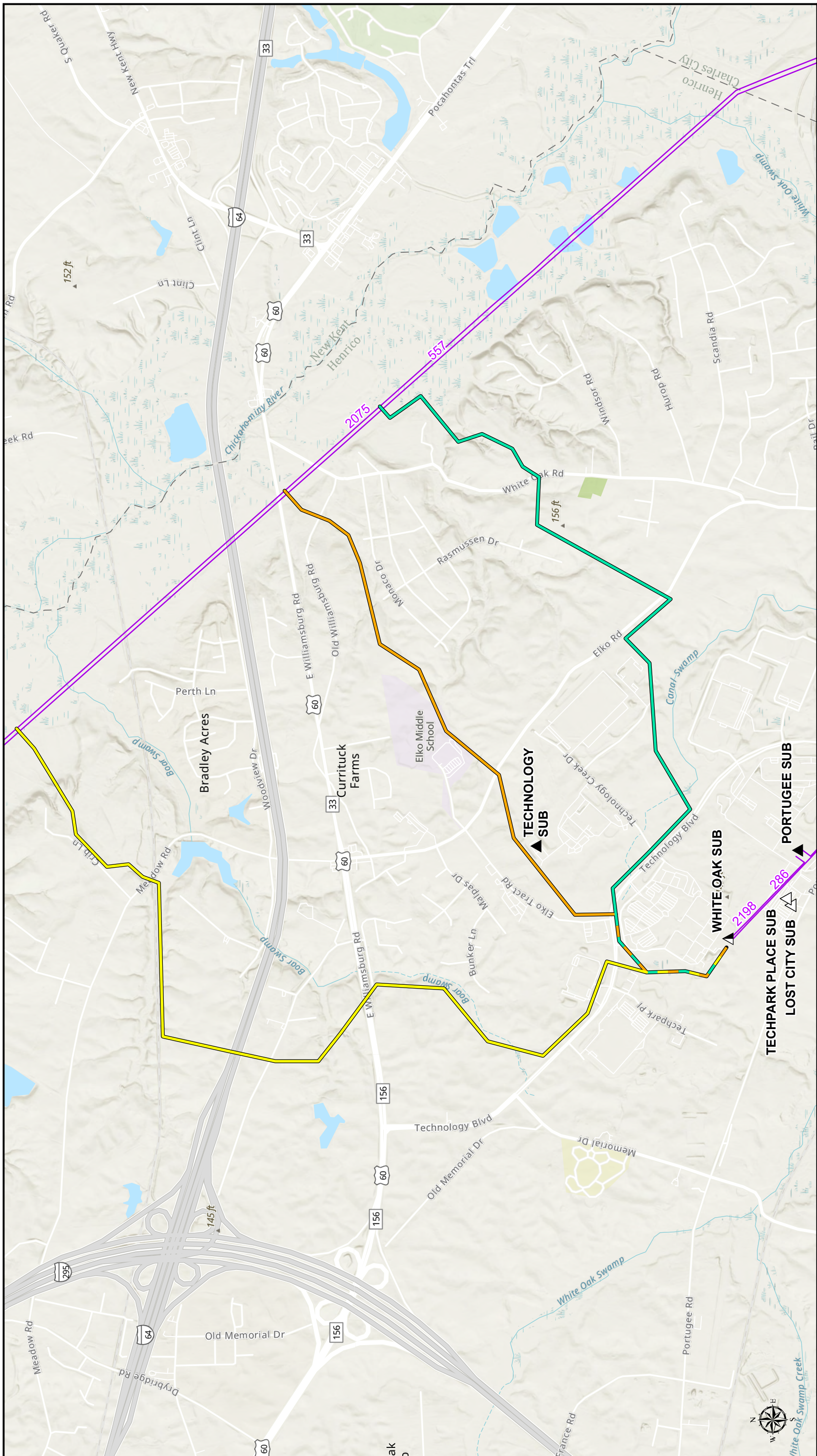
We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

A handwritten signature in blue ink, appearing to read 'SJR BL', is positioned above the printed name.

Stefan R. Brooks
Dominion Energy Contractor - Siting and Permitting team

Attachment: Project Overview Map



Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, VA 23219
DominionEnergy.com



May 18, 2023

BY EMAIL

Scott Denny
Airport Services Division
Virginia Department of Aviation
5702 Gulfstream Road
Richmond, Virginia 23250

RE: Dominion Energy Virginia's Proposed 230 kV Elmont-White Oak Line #2075, 230 kV Chickahominy-White Oak Line #2294 and White Oak Substation Expansion in Henrico County, Virginia

Dear Mr. Denny,

Dominion Energy Virginia (the "Company") is proposing to construct two new overhead 230 kV transmission lines on double circuit structures in a new, primarily 100-foot-wide right-of-way (the "White Oak Lines") and to expand its existing White Oak Substation in order to accommodate the White Oak Lines (the "White Oak Substation Expansion") in Henrico County, Virginia. Collectively, the White Oak Lines, the White Oak Substation Expansion, and related substation work are referred to as the "White Oak Electric Transmission Project" or "Project." The Company has identified proposed and alternative routes in new right-of-way for the White Oak Lines, as shown on the attached Project Overview Map.

The Project is needed in response to significant increases in electrical demand over recent years as well as expected demand growth projected for the future, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is in the process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). The Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Project within 30 days of the date of this letter.

The enclosed Project Overview Map depicts the proposed and alternative routes of the White Oak Lines, as well as the general Project location. Please note that the Project Overview Map and route descriptions depicted therein are preliminary in nature and subject to final engineering. Please refer to the CPCN application for any updates to the Project description and/or routes.

If you would like to receive a GIS shapefile of the transmission line routes to assist in your review or if there are any questions, please do not hesitate to contact Stefan Brooks at (804) 514-3129 or stefan.r.brooks@dominionenergy.com.

Dominion Energy Virginia
White Oak Electric Transmission Project
Henrico County, Virginia
Page 2 of 2

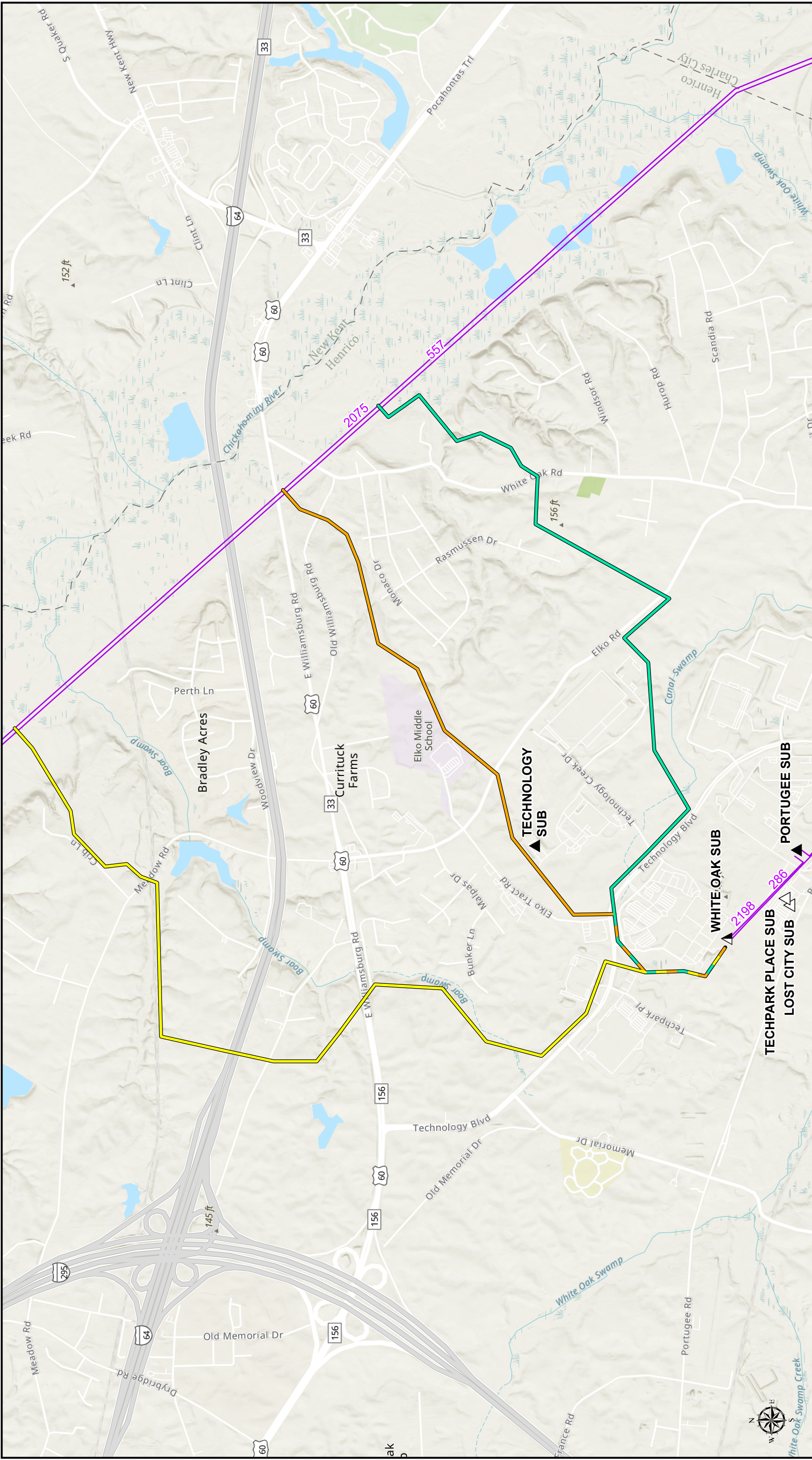
We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

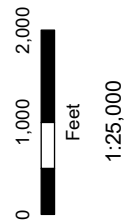
A handwritten signature in blue ink, appearing to read 'SJR Brooks', is positioned above the printed name.

Stefan R. Brooks
Dominion Energy Contractor - Siting and Permitting team

Attachment: Project Overview Map



Project Overview
White Oak Electric Transmission Project
Dominion Energy Virginia
Henrico and Charles City County, Virginia



White Oak Alternative Routes

- Alternative Route 1
- Alternative Route 2
- Proposed Route (Route 3)

- | Existing Substation | Future Substation | Proposed Substation Expansion | Existing Dominion Transmission Line |
|---------------------|-------------------|-------------------------------|-------------------------------------|
| | | | |



Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, VA 23219
DominionEnergy.com



May 18, 2023

BY EMAIL

Ms. Martha Little
Virginia Outdoors Foundation
600 East Main Street, Suite 402
Richmond, Virginia 23219

RE: Dominion Energy Virginia's Proposed 230 kV Elmont-White Oak Line #2075, 230 kV Chickahominy-White Oak Line #2294 and White Oak Substation Expansion in Henrico County, Virginia

Dear Ms. Little,

Dominion Energy Virginia (the "Company") is proposing to construct two new overhead 230 kV transmission lines on double circuit structures in a new, primarily 100-foot-wide right-of-way (the "White Oak Lines") and to expand its existing White Oak Substation in order to accommodate the White Oak Lines (the "White Oak Substation Expansion") in Henrico County, Virginia. Collectively, the White Oak Lines, the White Oak Substation Expansion, and related substation work are referred to as the "White Oak Electric Transmission Project" or "Project." The Company has identified proposed and alternative routes in new right-of-way for the White Oak Lines, as shown on the attached Project Overview Map.

The Project is needed in response to significant increases in electrical demand over recent years as well as expected demand growth projected for the future, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is in the process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). The Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Project within 30 days of the date of this letter.

The enclosed Project Overview Map depicts the proposed and alternative routes of the White Oak Lines, as well as the general Project location. Please note that the Project Overview Map and route descriptions depicted therein are preliminary in nature and subject to final engineering. Please refer to the CPCN application for any updates to the Project description and/or routes.

If you would like to receive a GIS shapefile of the transmission line routes to assist in your review or if there are any questions, please do not hesitate to contact Stefan Brooks at (804) 514-3129 or stefan.r.brooks@dominionenergy.com.

Dominion Energy Virginia
White Oak Electric Transmission Project
Henrico County, Virginia
Page 2 of 2

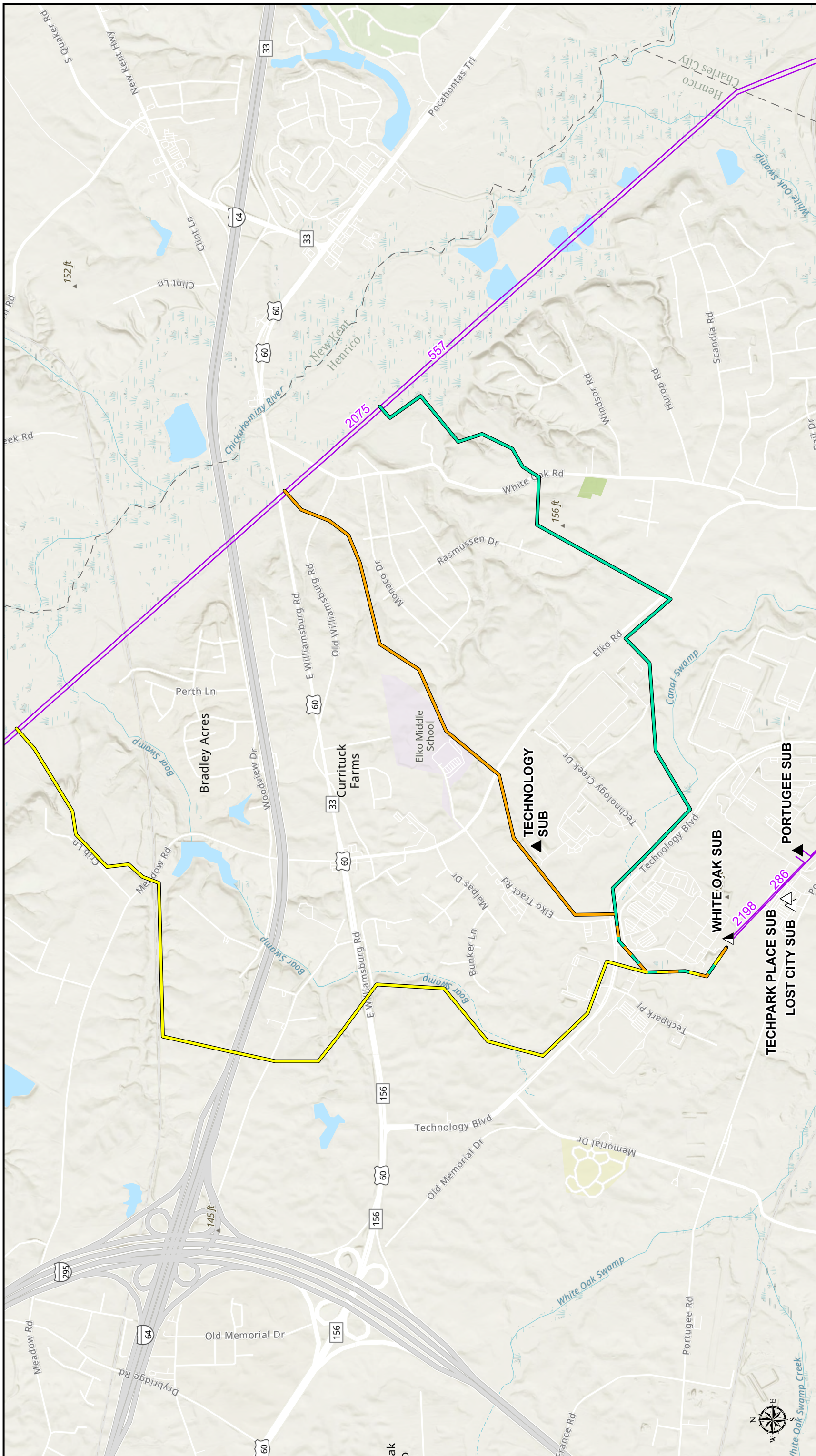
We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

A handwritten signature in blue ink, appearing to read 'SJR Brooks', is positioned above the printed name.

Stefan R. Brooks
Dominion Energy Contractor - Siting and Permitting team

Attachment: Project Overview Map



Dominion Energy Virginia
P.O. Box 26666 Richmond, VA 23261-6666



May 18th, 2023

Mr. John Vithoulikas
County Manager
Henrico County
P.O. Box 90775
Henrico, Virginia 23273-0775

**RE: Dominion Energy Virginia's Proposed 230 kV Elmont-White Oak Line #2075, 230 kV Chickahominy-White Oak Line #2294 and White Oak Substation Expansion in Henrico County, Virginia
Notice Pursuant to Va. Code § 15.2-2202 E**

Dear Mr. Vithoulikas,

Dominion Energy Virginia (the "Company") is proposing to construct two new overhead 230 kV transmission lines on double circuit structures in a new, primarily 100-foot-wide right-of-way (the "White Oak Lines") and to expand its existing White Oak Substation in order to accommodate the White Oak Lines (the "White Oak Substation Expansion") in Henrico County, Virginia. Collectively, the White Oak Lines, the White Oak Substation Expansion, and related substation work are referred to as the "White Oak Electric Transmission Project" or "Project." The Company has identified proposed and alternative routes in new right-of-way for the White Oak Lines, as shown on the attached Project Overview Map.

The Project is needed in response to significant increases in electrical demand over recent years as well as expected demand growth projected for the future, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

Dominion Energy Virginia is in the process of preparing an application for a Certificate of Public Convenience and Necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). Pursuant to Va. Code § 15.2-2202, the Company is writing to notify you of the proposed Project in advance of this Commission filing.

The Company respectfully requests that you submit any comments or additional information you feel would have any bearing on the Project within 30 days of the date of this letter. The enclosed Project Overview Map depicts the proposed and alternative routes of the White Oak Lines, as well as the general Project location. Please note that the Project Overview Map and route descriptions depicted therein are preliminary in nature and subject to final engineering. Please refer to the CPCN application for any updates to the Project description and/or routes.

If you would like to receive a GIS shapefile of the routes to assist in your review or if you have any questions, please do not hesitate to contact me at (804) 514-3129 or stefan.r.brooks@dominionenergy.com. You can also reach out to James Beazley, Regional Policy Director – Dominion Energy.

Dominion Energy Virginia

P.O. Box 26666 Richmond, VA 23261-6666



Dominion Energy Virginia appreciates your assistance with this review and looks forward to any additional information you may have to offer.

Regards,

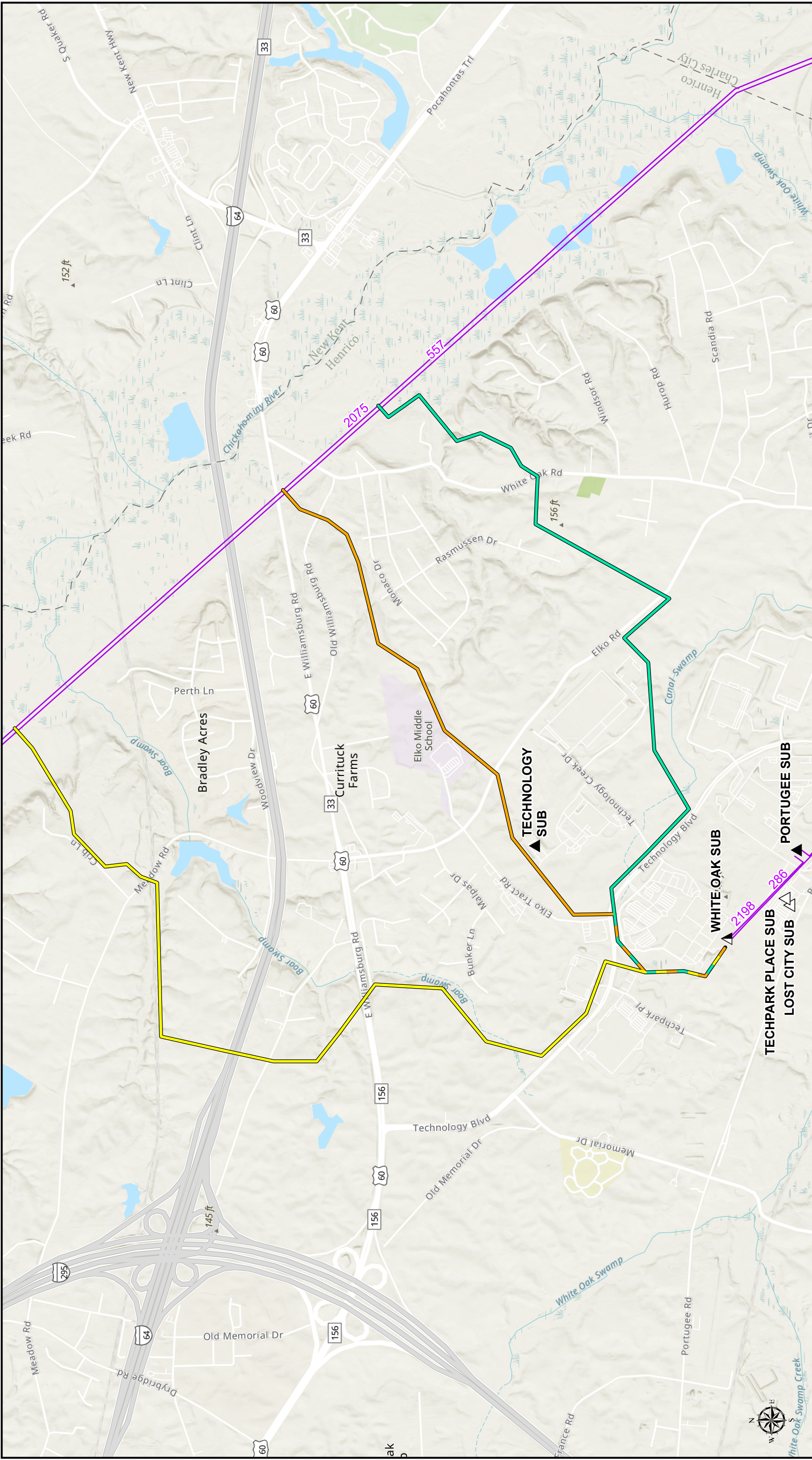
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Stefan R. Brooks

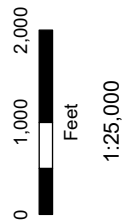
Dominion Energy Contractor - Siting and Permitting team

Attachment: Project Overview Map

cc: James Beazley, Dominion Energy



Project Overview
White Oak Electric Transmission Project
Dominion Energy Virginia
Henrico and Charles City County, Virginia



White Oak Alternative Routes

- Alternative Route 1
- Alternative Route 2
- Proposed Route (Route 3)

- ▲ Existing Substation
△ Future Substation
▲ Proposed Substation Expansion
— Existing Dominion Transmission Line





COMMONWEALTH of VIRGINIA

Marine Resources Commission
380 Fenwick Road
Bldg 96
Fort Monroe, VA 23651-1064

Travis A. Voyles
Acting Secretary of Natural and
Historic Resources

Jamie L. Green
Commissioner

December 9, 2022

Dominion Energy Services, Inc.
Attn: Heather Kennedy
120 Tredegar Street
Richmond, VA 23219

Re: Dominion Energy 230 kV Elmont-White Oak Line #2075,
230 kV Chickahominy-White Oak Line #2294 and White
Oak Substation Expansion

Dear Ms. Kennedy,

This will respond to the request for comments regarding Dominion Energy Virginia's Proposed 230 kV Elmont-White Oak Line #2075, 230 kV Chickahominy-White Oak Line #2294 and White Oak Substation Expansion, prepared by Dominion Energy. Specifically, Dominion Energy has proposed to construct two new overhead 230 kV transmission lines on double circuit structures in a new right-of-way and to expand the existing White Oak Substation in Henrico County, Virginia.

We reviewed the provided project documents and found the proposed project is within the jurisdictional areas of the Virginia Marine Resources Commission (VMRC) and may require a permit from this agency. Please be advised that the VMRC, pursuant to §28.2-1200 et seq of the Code of Virginia, has jurisdiction over encroachments in, on, or over the beds of the bays, ocean, rivers, streams, or creeks which are the property of the Commonwealth. Accordingly, if any portion of the subject project involves any encroachments channelward of ordinary high water along non-tidal, natural rivers and streams with a drainage area greater than 5-square miles, a permit may be required from our agency. Any jurisdictional impacts will be reviewed by the VMRC during the JPA process.

Please contact me at (757) 247-2285 or by email at claire.gorman@mrc.virginia.gov if you have questions. Thank you for the opportunity to comment.

Sincerely,

A handwritten signature in blue ink, appearing to read "Claire Gorman".

Claire Gorman
Environmental Engineer, Habitat Management

CG
HM



222 South 9th Street
Suite 2900
Minneapolis, Minnesota
55402

Telephone: (804) 253-1090
Fax: (804) 253-1091

www.erm.com

June 23, 2023

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



Subject: Wetland and Waterbody Desktop Summary
230 kV Elmont-White Oak Line #2075, 230 kV Chickahominy-White Oak Line #2294 and
White Oak Substation Expansion
New SCC Filing

Dear Ms. Rayfield:

Environmental Resources Management (ERM), on behalf of Virginia Electric and Power Company (Dominion Energy Virginia, Dominion, or the Company), conducted a desktop wetland and waterbody review of publicly available information for the proposed 230 kV Elmont-White Oak Line #2075, 230 kV Chickahominy-White Oak Line #2294 and White Oak Substation Expansion project (Project) located within Henrico County, Virginia. A field delineation was not performed as part of this analysis and would be required to verify the accuracy and extent of aquatic resource boundaries. Attachment 1 depicts the general location of the Project route alternatives. Attachment 2 illustrates the wetland boundaries that were identified as part of the desktop review.

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

- Construct two new approximately 4.69-mile overhead 230 kV transmission lines on primarily double circuit monopole structures in a new predominately 100-foot-wide right-of-way by cutting the Company's existing 230 kV Chickahominy-Elmont Line #2075 at a location between Structures #2075/150 and #2075/151, resulting in (i) 230 kV Elmont-White Oak Line #2075, and (ii) 230 kV Chickahominy-White Oak Line #2294 (the "White Oak Lines"). At the cut-in location within the existing right-of-way, the Company will remove one single circuit lattice tower and install one single circuit H-frame structure on 500 kV Chickahominy-Elmont Line #557 to facilitate construction of the White Oak Lines. From the cut-in location within the existing right-of-way, the White Oak Lines will extend a total of approximately 4.69 miles generally in a southwesterly direction before terminating at the expanded White Oak Substation. While the proposed cut-in location is in the existing right-of-way, the proposed White Oak Lines will be constructed on new right-of-way supported primarily by double circuit weathering steel monopoles and will utilize three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA;
- Expand the Company's existing White Oak Substation in Henrico County, Virginia in order to accommodate the termination of the new White Oak Lines (the "White Oak Substation Expansion"). The White Oak Substation Expansion will require an additional approximately 0.7 acre, which the Company will obtain through easement; and
- Perform line-protection resets at the Company's existing Chickahominy and Elmont Substations.

The Company proposes to construct and operate the White Oak Lines and expand its existing White Oak Substation to relieve identified violations of North American Electric Reliability Corporation (NERC) reliability standards beginning in the Winter 2023/2024 timeframe and meet expected demand growth and maintain the structural integrity and reliability of the Company's transmission system. The Project is necessary to maintain and improve reliable electric service to customers in the load area surrounding White Oak Substation ("White Oak Load Area" or WOLA) in Henrico County, Virginia.¹ The Company considered the facilities required to construct and operate the Project, the length of new rights-of-way that will be required, the amount of existing development in each area, the potential for environmental impacts on communities, and the relative cost of the Project.

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

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

Project Study Area and Potential Routes

A study area was developed encompassing an area containing the Project origin and termination points for the planned facilities (i.e., White Oak Substation and potential cut-in locations along the Company's existing 230 kV Chickahominy-Elmont Line #2075), as well as an area broad enough to allow for the identification of reasonable route alternatives meeting the Project's objectives. Additionally, and to the extent practicable, the limits of the study area were defined by reference to easily distinguished landmarks, such as roads or other features.

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

- The Company's existing Chickahominy-Elmont Lines #2075 and #557 and the Henrico County and Charles City County border to the north and east
- The Company's existing Darbytown-White Oak Line #286, Chesterfield-Chickahominy Line #287, Chickahominy-Portugee Line #2091, and Allied-Chickahominy Line #2050 to the south
- Interstate 295 (I-295) to the northwest and west

The study area encompasses approximately 28.5 square miles almost entirely within the unincorporated southwestern portion of Henrico County, but overlaps small sections of neighboring Charles City, New

¹ The WOLA is defined generally as the area in eastern Henrico County around and including the White Oak Technology Park (WOTP), east of Interstate 295 between the Chickahominy River to the north and White Oak Swamp Creek to the south. It also includes the area in western New Kent County, west of the New Kent County Airport approximately between Black Creek to the north and Route 60 (Pocahontas Trail) to the south.

Kent, and Hanover Counties². The study area includes the unincorporated named communities of Elko, Currituck Farms, Bradley Acres, and Glendale; although there are no incorporated cities or U.S. Census Bureau census-designated places. The limits of the study area are shown in Attachment 1.

Dominion identified four overhead routes that would involve expansion of Dominion's existing White Oak Substation and construction of two new 230 kV transmission lines, which would cut-in to the Company's existing 230 kV Chickahominy-Elmont Line #2075 to the east, described below:

Proposed Route Alternatives

White Oak Lines

Route 1

Route 1 originates at a cut-in location along Line #2075 between Structures #2075/159 and #2075/160 in the area east of White Oak Road and south of East Williamsburg Road. From there, the route heads southeast for about 0.23 mile, then southwest for 0.26 mile, passing east and south of a horse farm along White Oak Road. It then continues to the south/southwest for about 0.43 mile along a private road towards a crossing of White Oak Road. On the west side of White Oak Road, Route 1 turns and continues west for about 0.21 mile, then heads southwest towards Elko Road for about 0.66 mile. After crossing the road, the route enters Henrico County EDA-owned land in the WOTP before turning sharply northwest to parallel the west side of Elko Road for about 0.26 mile. From there, it heads west/southwest for about 0.82 mile, crossing Engineered Wood Way, paralleling a short segment of existing sewer line easement, and crossing Canal Swamp. At Technology Boulevard, Route 1 turns northeast to parallel the east side of the boulevard for about 0.48 mile, crossing Technology Creek Drive. It then heads west for about 0.23 mile, exiting the Henrico County EDA-owned land in the WOTP and crossing and paralleling a short segment of Technology Boulevard near an intersection with Elko Tract Road. From there, the route heads southwest for about 0.19 mile, then south for about 0.23 mile, spanning a pond in two locations. It then turns and continues southeast for about 0.19 mile, terminating on the west side of the expanded White Oak Substation. In total, Route 1 measures approximately 4.19 miles in length.

Route 2

Route 2 originates at a cut-in location along Line #2075 between Structures #2075/157 and #2075/158 near the intersection of White Oak Boulevard and East Williamsburg Road. From there, the route heads to the south/southwest for about 0.34 mile, crossing Old Williamsburg Road. It then continues to the west/southwest for about 0.50 mile in the area approximately between Old Williamsburg Road to the north and Monaco Drive to the south. Route 2 then continues to the southwest for about 0.79 mile, crossing land owned by the Henrico County School Board east of Elko Road. The route parallels the southeasternmost edge of the School Board property line, passing about 170 feet southeast of Elko Middle School. After crossing Elko Road, the route continues southwest for about 0.88 mile, crossing land owned by the Henrico County EDA within the WOTP as well as a developed parcel containing the Company's existing Technology Substation. This segment of the route additionally passes near a potential future memorial site for the Garthright-Fisher families. After crossing Technology Boulevard, Route 2 follows the same alignment as Route 1 for 0.73 mile to its terminus at the expanded White Oak Substation. In total, Route 2 measures approximately 3.24 miles in length.

Route 3

Route 3 originates at a cut-in location along Line #2075 between Structures #2075/150 and #2075/151 in the area east of Crib Lane and north of the Norfolk Southern Railroad. From there, Route 3 heads southwest for about 0.98 mile to a point just west of the intersection of the railroad and Meadow Road. The route then turns and heads west for about 0.66 mile, paralleling the south side of the railroad tracks. It next turns and heads south (away from the railroad) for about 0.68 mile, crossing I-64 and Old Williamsburg Road. The route then heads southeast for about 0.42 mile, crossing East Williamsburg Road, then southwest for about 0.83 mile, generally parallel to Boar Swamp. This segment of the route (i.e., the area approximately between Old Williamsburg Road and Technology Boulevard) crosses a planned data center development. The route then heads southeast for about 0.51 mile, paralleling the east side of Technology Boulevard. At a point just east of Techpark Place, the route crosses Technology Boulevard as it heads south following Route 1 for 0.43 mile and spans a pond in two locations. It then turns and continues southeast for about 0.18 mile, terminating on the west side of the expanded White Oak Substation. In total, Route 3 measures about 4.69 miles in length.

Route 4

Route 4 originates at a cut-in location along Line #2075 between the Structure #2075/169 and #2075/170 locations in Charles City County near White Oak Swamp. From there, the route heads west for about 0.07 mile, entering Henrico County approximately 300 feet west of the cut-in location. The route then turns and heads southwest for about 0.32 mile to a crossing of the CSX Railroad right-of-way. Route 4 next turns and continues west for about 1.28 miles mostly parallel and adjacent to the south side of the railroad right-of-way, crossing White Oak Swamp. At a point just east of Elko Road, the route turns and heads southwest away from the railroad for about 0.41 mile to avoid residences along the road as well as the Elko Game Preserve. At the intersection of Elko Road and Hughes Road, Route 4 turns and continues for 0.50 mile to the west before heading about 0.69 mile to the northwest to an intersection with the CSX Railroad right-of-way. The route then parallels the south side of the railroad tracks for 1.39 miles across White Oak Swamp, crossing the Company's existing right-of-way for Lines #2091 and #286 about 0.60 mile south of Portugee Road. After crossing to the north side of the tracks, Route 4 continues to the north/northwest for about 1.07 miles, crossing Portugee Road. The route then turns sharply southeast and continues for 0.07 mile, then follows the same alignment as Route 1 for about 0.14 mile east to a terminus on the west side of the expanded White Oak Substation. In total, Route 4 measures approximately 5.94 miles in length.

White Oak Substation Expansion

The White Oak Substation Expansion will include installation of three 230 kV 4000A breakers to create an 8-breaker hybrid breaker-and-a-half arrangement and will require an additional approximately 0.70 acre of land adjacent to the existing substation.

Desktop Evaluation Methodology

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

- USA National Agricultural Imagery Program (NAIP) Natural Color Images, Virginia, 1-meter pixel resolution, photo date 2023 (NAIP 2023)

- USA NAIP Imagery: Color Infrared NAIP Infrared Images, Virginia, 1-meter pixel resolution (NAIP 2021)
- Current aerial imagery taken in February 2023 (Planet Imagery 2023)
- ESRI World Topographic Map, multiple scales (ESRI, et al., 2023)
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) mapping (2022) (USFWS 2022)
- U.S. Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) Soil Survey Geographic (SSURGO) database (NRCS 2019)
- USGS National Hydrography Dataset (NHD); (USGS 2020)

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 (NAIP 2021).

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 (ESRI et al., 2023).

USFWS National Wetland Inventory Mapping

NWI maps provide the boundaries and classifications of potential wetland areas as mapped by the USFWS (USFWS 2022). However, 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, when aerial photography is used as the major data source. The classifications of the majority of the NWI polygons in the study area appear to be accurate based on a review of the cover types observed in the aerial photography. However, in areas where there was an obvious discrepancy between the NWI classification and the aerial photography, ERM modified the classification to more accurately reflect current conditions. In order to acknowledge ERM's adjustment of NWI classifications where appropriate, all of the wetland types referenced in this assessment are referred to as "assigned wetland cover types" regardless of whether the cover type was actually modified from the NWI classification.

USDA-NRCS Soils Data

Soils in the study area were identified and assessed using the SSURGO database, which is a digital version of the original county soil surveys (NRCS 2019). 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 contain features such as lakes, ponds, streams, rivers, and canals (USGS 2020). 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:

1. Infrared and natural color aerial photography was used in conjunction with topographic maps and soils maps to identify potential wetland areas. Boundaries were assigned to the areas that appeared to exhibit wetland signatures based on this review and a cover type was determined based on aerial photo interpretation. For the purpose of the study, these areas are referred to as Interpreted Wetlands.
2. To further determine the probability of a wetland occurring within a given location, the Interpreted Wetland polygon shape files were digitally layered with the NWI mapping and soils information from the SSURGO database.
3. The probability of a wetland occurring was assigned based on the number of overlapping data layers (i.e., indicators of potential wetland presence) that occurred in a particular area.

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

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

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

Wetland and Waterbody Crossings

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

Results

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

Table 2: Summary of the Probabilities of Wetland and Waterbody Occurrence along Project Route Alternatives ^{a,b}

Probability	Total within right-of-way (acres) ^c	Wetland and Waterbody type (acres)				
		PEM Emergent	PFO Forested	PSS Scrub-shrub	PUB Freshwater pond	Riverine Stream
Alternative Route 1						
High	1.81	NA	1.81	NA	NA	NA
Medium/High	10.00	0.05	6.90	0.56	2.39	0.11
Medium	4.18	0.25	3.73	0.01	0.04	0.15
Medium/Low	0.74	NA	0.56	0.14	0.03	NA
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA
Alternative Route 2						
High	0.75	0.71	0.05	0.00	0.00	0.00
Medium/High	7.10	0.01	3.55	0.56	2.93	0.05
Medium	3.86	NA	3.50	0.01	0.25	0.10
Medium/Low	0.45	NA	0.21	0.14	0.00	0.09
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA
Alternative Route 3						
High	NA	NA	NA	NA	NA	NA
Medium/High	9.17	0.70	5.67	0.56	2.14	0.09
Medium	6.46	NA	6.31	0.01	0.04	0.09
Medium/Low	0.79	NA	0.52	0.26	0.00	0.01

ERM

Wetland and Waterbody Desktop
Summary

Page 8 of 12

Probability	Total within right-of-way (acres) ^c	Wetland and Waterbody type (acres)				
		PEM Emergent	PFO Forested	PSS Scrub-shrub	PUB Freshwater pond	Riverine Stream
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA
Alternative Route 4						
High	5.31	NA	5.11	NA	NA	0.20
Medium/High	38.71	0.08	35.71	1.56	NA	1.35
Medium	2.01	0.01	1.80	0.09	NA	0.12
Medium/Low	3.35	0.00	3.24	0.10	NA	0.01
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA

Note: Totals may not equal the sum of addends due to rounding.

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 White Oak Substation wetlands and waterbodies are included within each route rather than individually.

c Total acres may not total the sum of wetland and waterbody types because some of the lower probability rankings do not overlap with NWI or interpreted wetlands, and therefore do not have a wetland/waterbody type associated with them.

Wetland Crossings

Route 1

The length of the corridor for Route 1 is approximately 4.19 miles and encompasses a total of approximately 51.72 acres. Based on the methodology discussed above, the right-of-way footprint will encompass approximately 30.92 percent (15.99 acres) of land with a medium or higher probability of containing wetlands and waterbodies.

Route 2

The length of the corridor for Route 2 is approximately 3.24 miles and encompasses a total of approximately 40.02 acres. Based on the methodology discussed above, the right-of-way footprint will encompass approximately 29.26 percent (11.71 acres) of land with a medium or higher probability of containing wetlands and waterbodies.

Route 3

The length of the corridor for Route 3 is approximately 4.69 miles and encompasses a total of approximately 57.69 acres. Based on the methodology discussed above, the right-of-way footprint will encompass approximately 27.10 percent (15.63 acres) of land with a medium or higher probability of containing wetlands and waterbodies.

Route 4

The length of the corridor for Route 4 is approximately 5.94 miles and encompasses a total of approximately 75.53 acres. Based on the methodology discussed above, the right-of-way footprint will

encompass approximately 60.94 percent (46.03 acres) of land with a medium or higher probability of containing wetlands and waterbodies.

White Oak Substation Expansion

The footprint of the White Oak Substation Expansion is approximately 0.08 miles and encompasses a total of approximately 0.70 acres. Based on the methodology discussed above, the right-of-way will does not contain land with a medium or higher probability of containing wetlands and waterbodies.

Waterbody Crossings

ERM identified and mapped waterbodies in the study area using similar publicly available GIS databases as those used to identify and map wetlands. All of the routes cross perennial and intermittent streams, including perennial and intermittent sections of Canal Swamp (Route 1), an intermittent section of Boar Swamp (Route 3), and perennial White Oak Swamp (Route 4). Routes 1, 2, and 3 all cross an open waterbody feature associated with a perennial tributary to White Oak Swamp near White Oak Substation and what appears to be a manmade detention basin (based on historic aerial photography), and Routes 1 and 2 cross additional open waterbody features.

Route 1

Based on the NHD and the wetland desktop delineation methodology described above, there are a total of 6 waterbody crossings, including 2 perennial and 3 intermittent streams and 1 swamp/marsh crossing within the Route 1 right-of-way. Waterbodies crossed by the right-of-way identified in the desktop review include 2 crossings of Canal Swamp, intermittent tributaries to Canal Swamp and the Chickahominy River, and three open waterbody features.

Route 2

Based on the NHD and the wetland desktop delineation methodology described above, there are a total of 7 waterbody crossings, including 5 intermittent streams, 1 lake/pond, and 1 swamp/marsh within the Route 2 right-of-way. Waterbodies crossed by the right-of-way identified in the desktop review include three intermittent tributaries to the Chickahominy River and three open waterbody features.

Route 3

Based on the NHD and the wetland desktop delineation methodology described above, there are a total of 8 waterbody crossings, including 7 intermittent streams and 1 swamp/marsh, within the Route 3 right-of-way. Waterbodies crossed by the right-of-way include an intermittent segment of Boar Swamp, unnamed intermittent tributaries to Boar Swamp and Eberhard Pond and two open waterbody features.

Route 4

Based on the NHD and the wetland desktop delineation methodology described above, there are a total of 9 perennial stream waterbody crossings within the Route 4 right-of-way. Waterbodies crossed by the right-of-way include multiple crossings of White Oak Swamp and multiple unnamed perennial tributaries to the White Oak Swamp waterbody.

White Oak Substation Expansion

Based on the NHD and the wetland desktop delineation methodology described above, there are no mapped waterbody crossings within the White Oak Substation expansion footprint.

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 and streams, the transmission lines have been designed to span or avoid wetlands where possible. Most of the wetlands in the area are associated with streams and rivers, and it is anticipated that these features can be spanned, keeping structure locations outside of wetlands to the extent practicable.

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

Mats would be used for construction equipment to travel over wetlands, as appropriate. Due to the absence of an existing right-of-way in some areas along the routes, new temporary access roads may be necessary. Additionally, if a route section cannot be accessed from existing roads, Dominion may need to install a culvert, ford, or temporary bridge along the ROW to cross small streams, where present. In such cases, temporary fill material in wetlands adjacent to the crossings may be required. This fill would be placed on erosion control fabric and removed when work is completed, returning ground elevations to original contours. Potential direct impacts on wetlands associated with construction would be temporary in nature.

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

Summary

This Wetland and Waterbody Summary report was prepared in accordance with the Memorandum of Agreement between the DEQ and the SCC for purposes 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/white-oak>.

ERMWetland and Waterbody Desktop
Summary

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

Sincerely,

Mariah Weitzenkamp
Environmental Resources Management

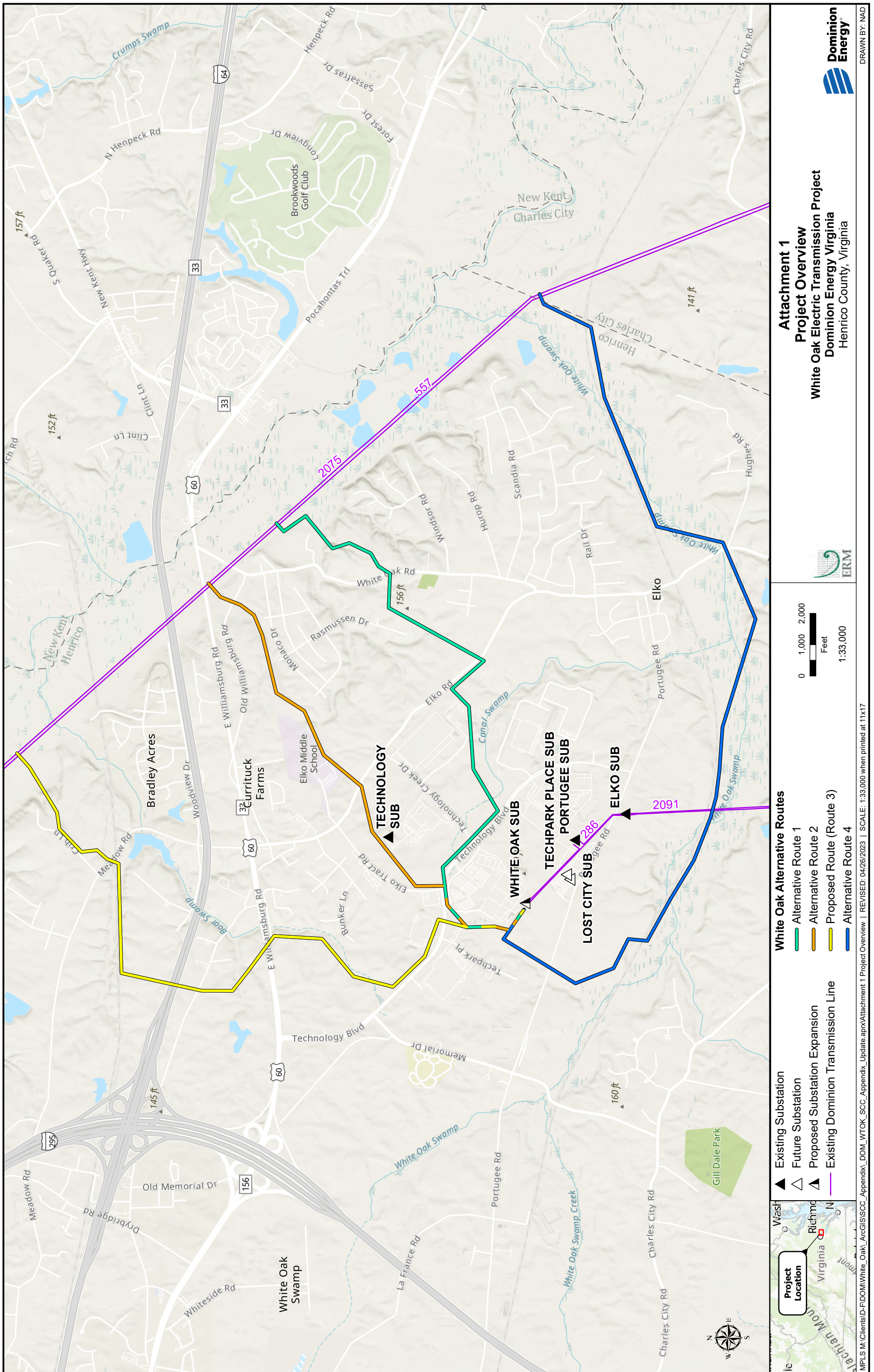
cc: Stefan Brooks, Dominion Energy Virginia
Heather Kennedy, Dominion Energy Virginia

Enclosures: Attachments 1 and 2

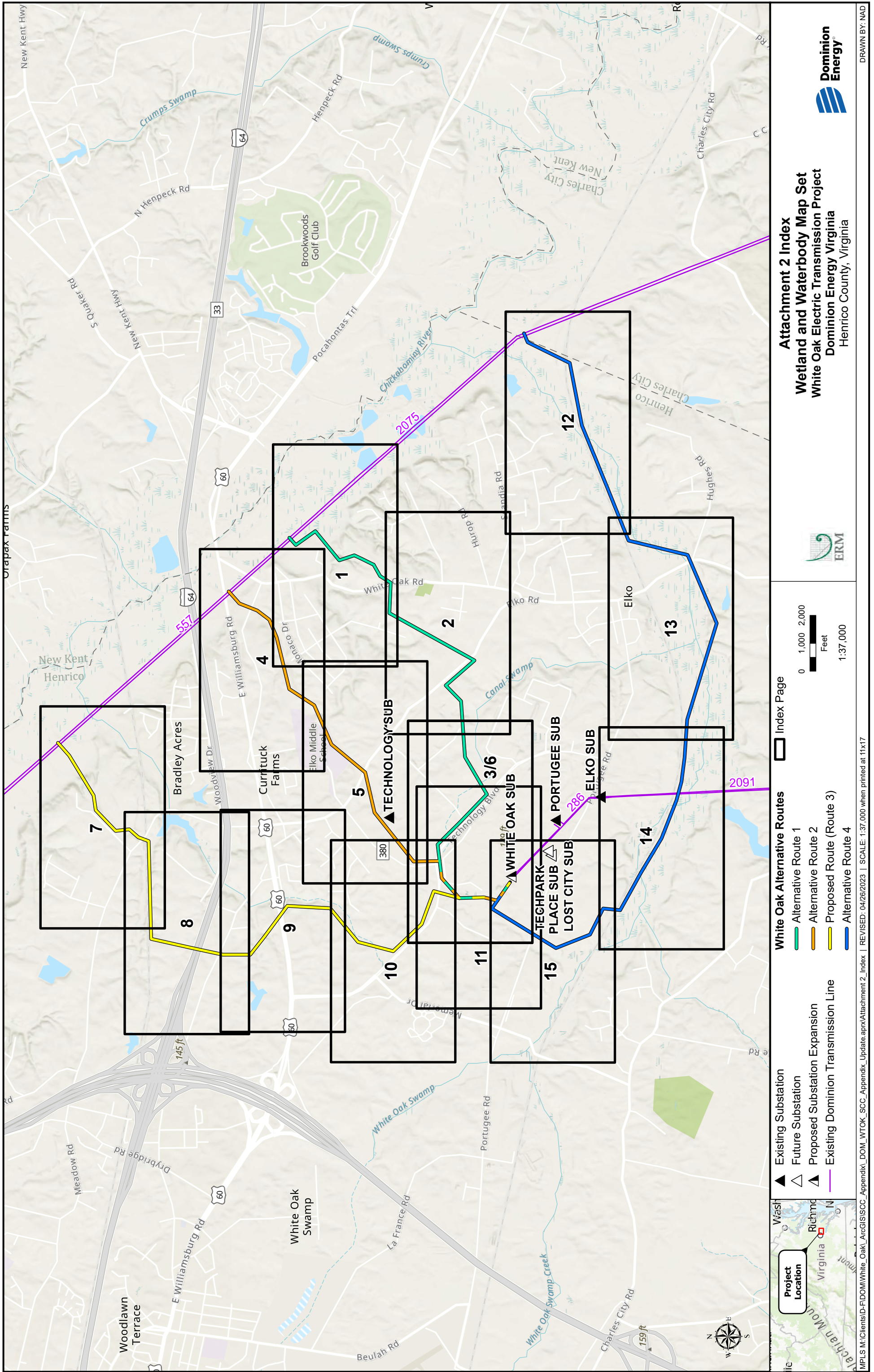
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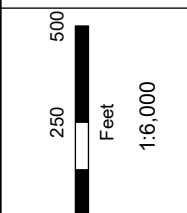
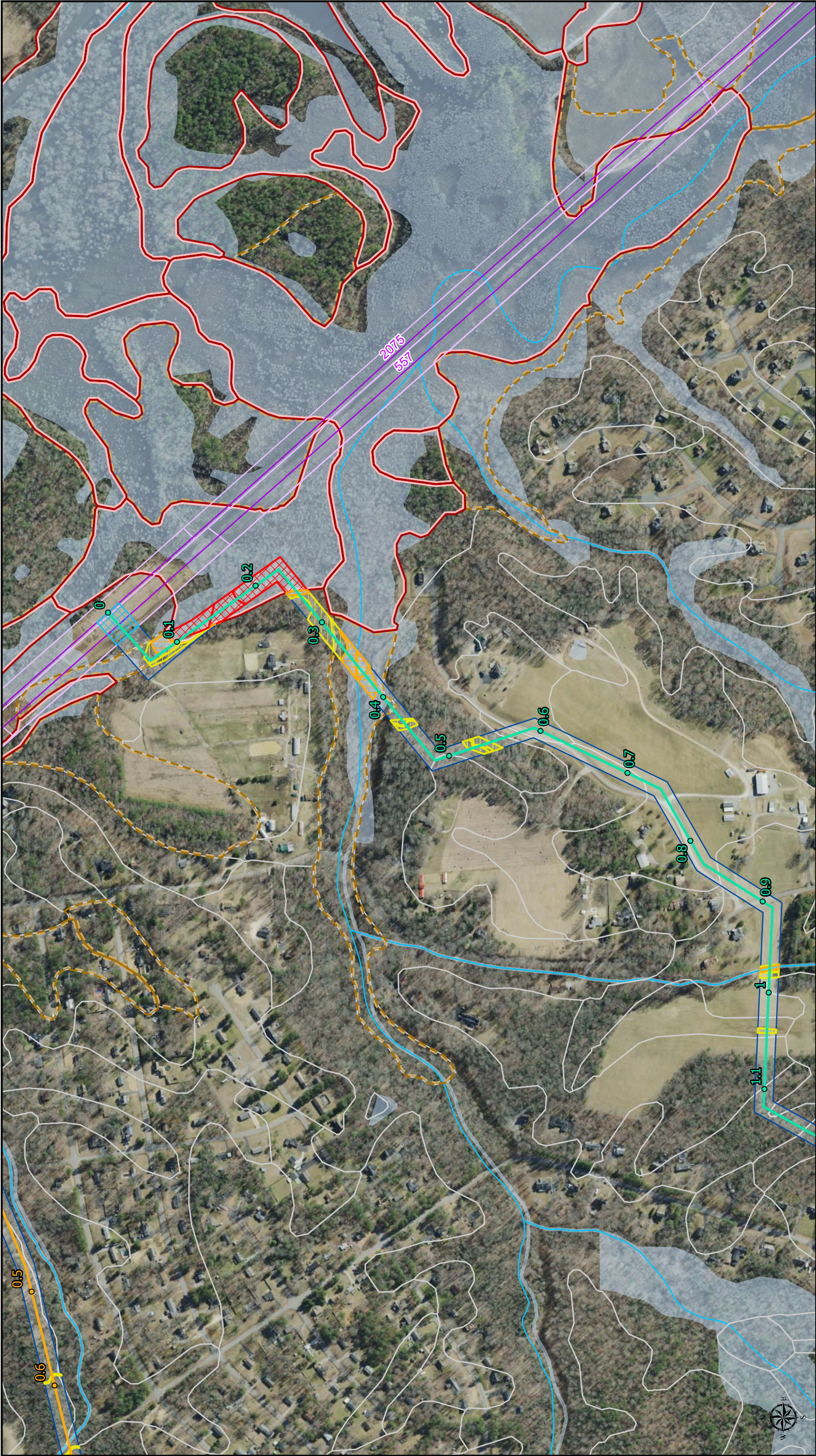
- Environmental Laboratory. 1987. Technical Report Y-87-1: Corps of Engineers Wetlands Delineation Manual US Army Corps of Engineers, Waterways Experiment Station. January 1987.
- Environmental Laboratory. 2012. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region. Prepared for U.S. Army Corps of Engineers Wetlands Regulatory Assistance Program. ERDC/EL TR-12-9. Accessed February 2023.
- Natural Resource Conservation Service (NRCS). 2019. Soil Survey Geographic Data (SSURGO). Available online at <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>. Accessed February 2023.
- Planet Imagery. 2023. Aerial images taken February 2023. Ordered by ERM.
- USA National Agricultural Imagery Program (NAIP). 2023. USA NAIP Imagery: Natural Color. Available online at: <https://naip-usdaonline.hub.arcgis.com/>. Accessed February 2023.
- USA National Agricultural Imagery Program (NAIP). 2021. USA NAIP Imagery: Color Infrared. Available online at: <https://naip-usdaonline.hub.arcgis.com/>. Accessed February 2023.
- U.S. Fish and Wildlife (USFWS). 2022. National Wetlands Inventory. Available online at <http://www.fws.gov/wetlands/>. Accessed February 2023.
- ESRI, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community. (ESRI et al). 2023. World Topographic Map. https://basemaps.arcgis.com/arcgis/rest/services/World_Basemap_v2/VectorTileServer. Accessed February 2023.
- USGS (U.S. Geological Survey). 2020. The National Hydrography Dataset. Accessed: February 2023. Retrieved from: <https://www.usgs.gov/core-science-systems/ngp/national-hydrography>

ATTACHMENT 1



ATTACHMENT 2



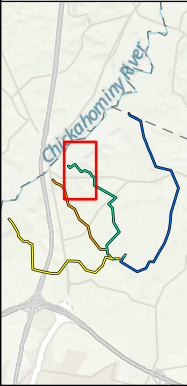


Partially Hydric Soil
Wetland Probability
Medium
Medium/High
High

Proposed Right-of-Way
NHD Flowline
NWI Wetland
Nonhydric Soil
Hydric Soil

White Oak Alternative Routes
Alternative Route 1
Alternative Route 2
Right-of-Way Type
Existing Right-of-Way


Existing Dominion Transmission Line
Existing Dominion Right-of-Way
Milepost
Route 1
Route 2





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**Attachment 2**
Wetland and Waterbody Map Set
White Oak Electric Transmission Project
Dominion Energy Virginia
Henrico County, Virginia




**Milepost**
Route 1
White Oak Alternative Routes
Alternative Route 1

Right-of-Way Type
Proposed Right-of-Way
NHD Flowline
NWI Wetland
Nonhydraulic Soil

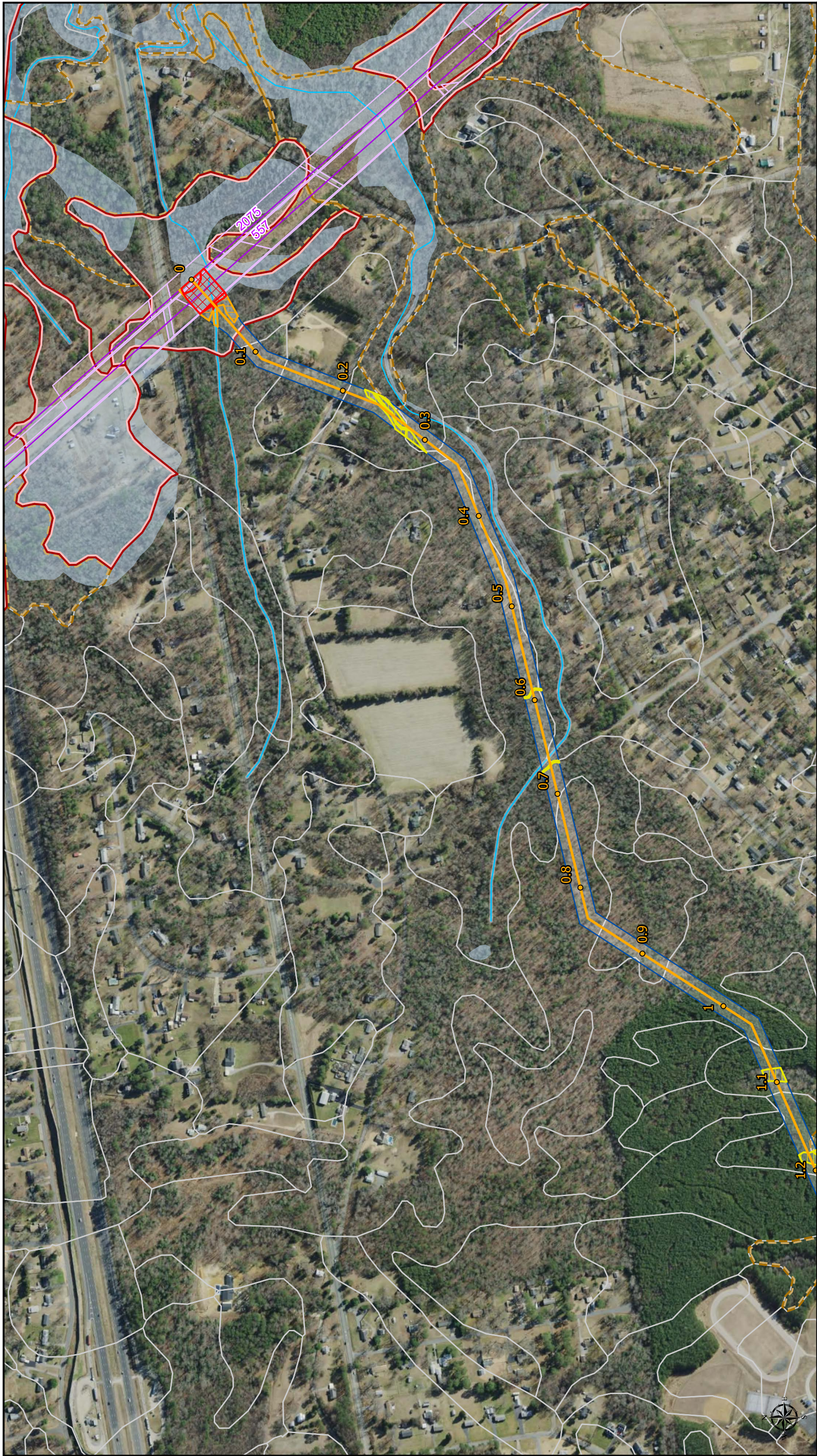
Wetland Probability
Medium
Medium/High

 Partially Hydric Soil


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Feet
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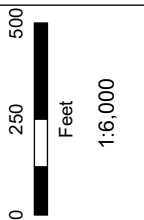


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Attachment 2
Wetland and Waterbody Map Set
White Oak Electric Transmission Project
Dominion Energy Virginia
Henrico County, Virginia



Wetland Probability



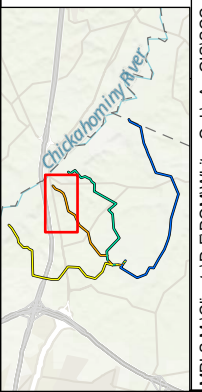
White Oak Alternative Routes

- NHD Flowline
- NWI Wetland
- Nonhydric Soil
- Hydric Soil
- Partially Hydric Soil

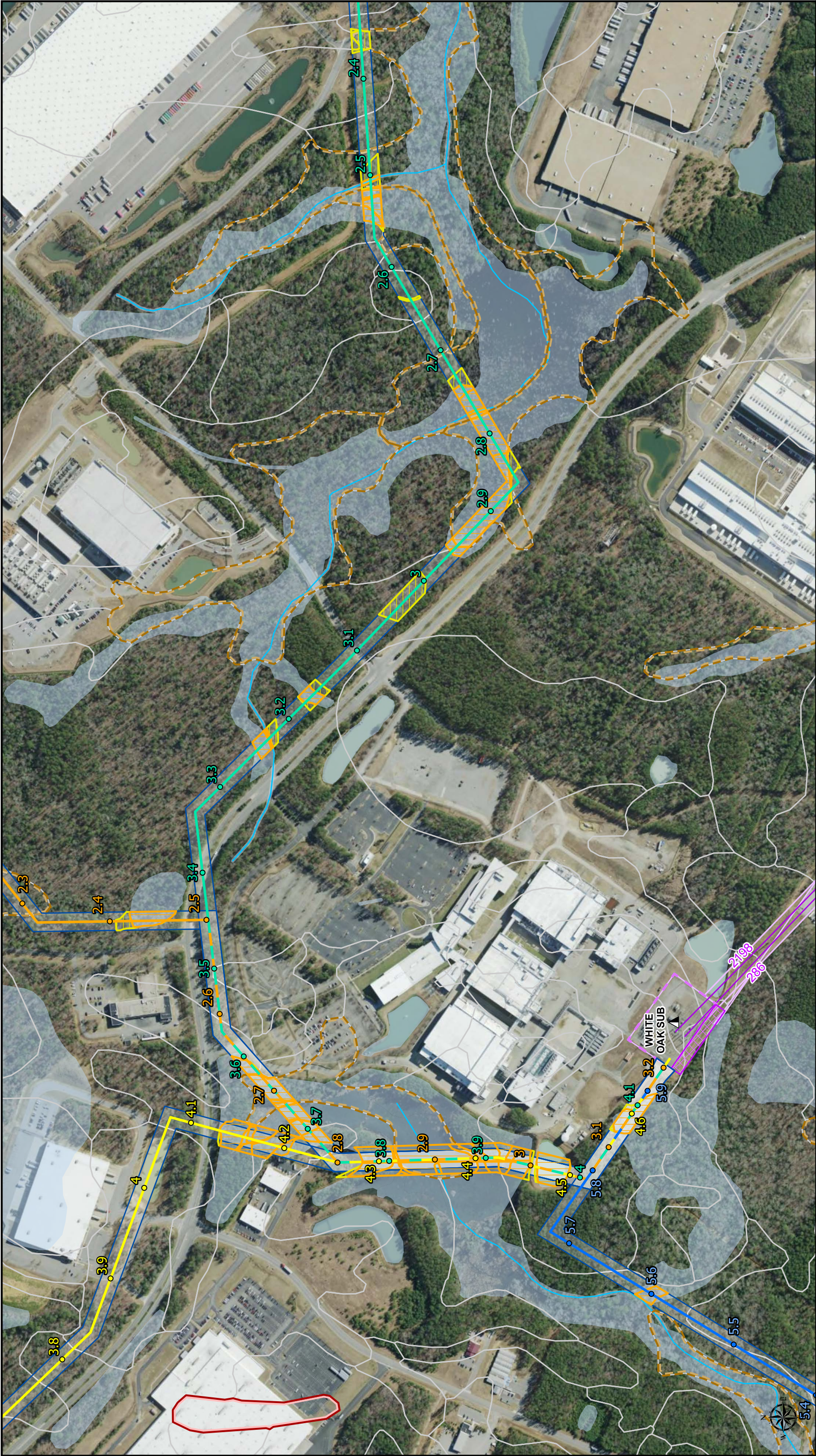
Right-of-Way Type

- Existing Right-of-Way
- Proposed Right-of-Way

 Existing Dominion Transmission Line
 Existing Dominion Right-of-Way
Milepost
 Route 2







Proposed Substation Expansion

Existing Dominion Transmission Line

Existing Dominion Right-of-Way

White Oak Substation

Existing White Oak Substation

Proposed White Oak Substation Expansion

Alternative Route 2

Proposed Route (Route 3)

Alternative Route 4

Right-of-Way Type

Proposed Right-of-Way

NHD Flowline

NWI Wetland

Milepost

Route 1

Route 2

Route 3

Route 4

White Oak Alternative Routes

Alternative Route 1

Nonhydryc Soil

Hydryc Soil

Partially Hydryc Soil

Wetland Probability

Medium

Medium/High

0

250

500

Feet

1:6,000

ERM

Dominion Energy

Attachment 2

Wetland and Waterbody Map Set

White Oak Electric Transmission Project

Dominion Energy Virginia

Henrico County, Virginia

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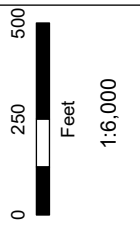
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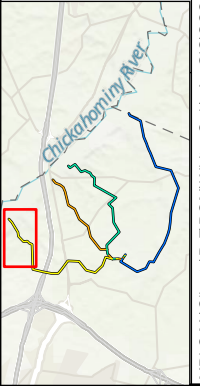


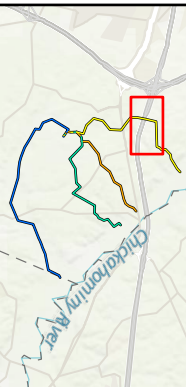
Page 7 of 15

Attachment 2
Wetland and Waterbody Map Set
White Oak Electric Transmission Project
Dominion Energy Virginia
Henrico County, Virginia



-
- Right-of-Way Type**
- Existing Dominion Transmission Line
 - Existing Dominion Right-of-Way
 - Proposed Right-of-Way
 - NHD Flowline
 - NWI Wetland
 - Nonhydraulic Soil
- Wetland Probability**
- Hydric Soil
 - Partially Hydric Soil
 - Medium
 - Medium/High
- Milepost**
- Route 3
- White Oak Alternative Routes**
- Proposed Route (Route 3)





●

Route 3

White Oak Alternative Routes

Proposed Route (Route 3)

Right-of-Way Type

Proposed Right-of-Way

NHD Flowline

NWI Wetland

Nonhydric Soil

Partially Hydric Soil

Wetland Probability

Medium

Medium/High

0

250

500

Feet

1:6,000

Attachment 2

Wetland and Waterbody Map Set

White Oak Electric Transmission Project

Dominion Energy Virginia

Henrico County, Virginia

ERM

Dominion Energy

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Attachment 2

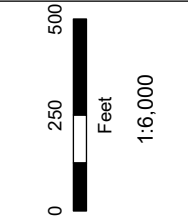
Wetland and Waterbody Map Set

White Oak Electric Transmission Project

Dominion Energy Virginia

Henrico County, Virginia





Partially Hydric Soil

Wetland Probability

Medium

Medium/High

Right-of-Way Type

Proposed Right-of-Way

NHD Flowline

NWI Wetland

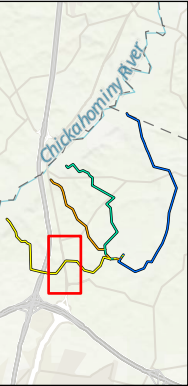
Nonhydric Soil

Milepost

Route 3

White Oak Alternative Routes

Proposed Route (Route 3)





ERM

Attachment 2
Wetland and Waterbody Map Set
White Oak Electric Transmission Project
Dominion Energy Virginia
Henrico County, Virginia

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0

250

500

Feet

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Hydric Soil

Partially Hydric Soil

Wetland Probability

Medium

Medium/High

Right-of-Way Type

Proposed Right-of-Way

NHD Flowline

NWI Wetland

Nonhydric Soil

White Oak Alternative Routes

Alternative Route 1

Alternative Route 2

Proposed Route (Route 3)

Milepost

Route 1

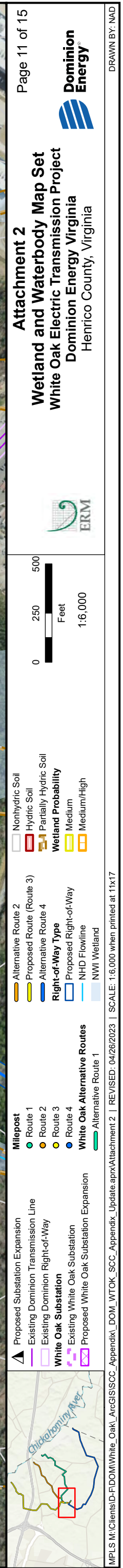
Route 2

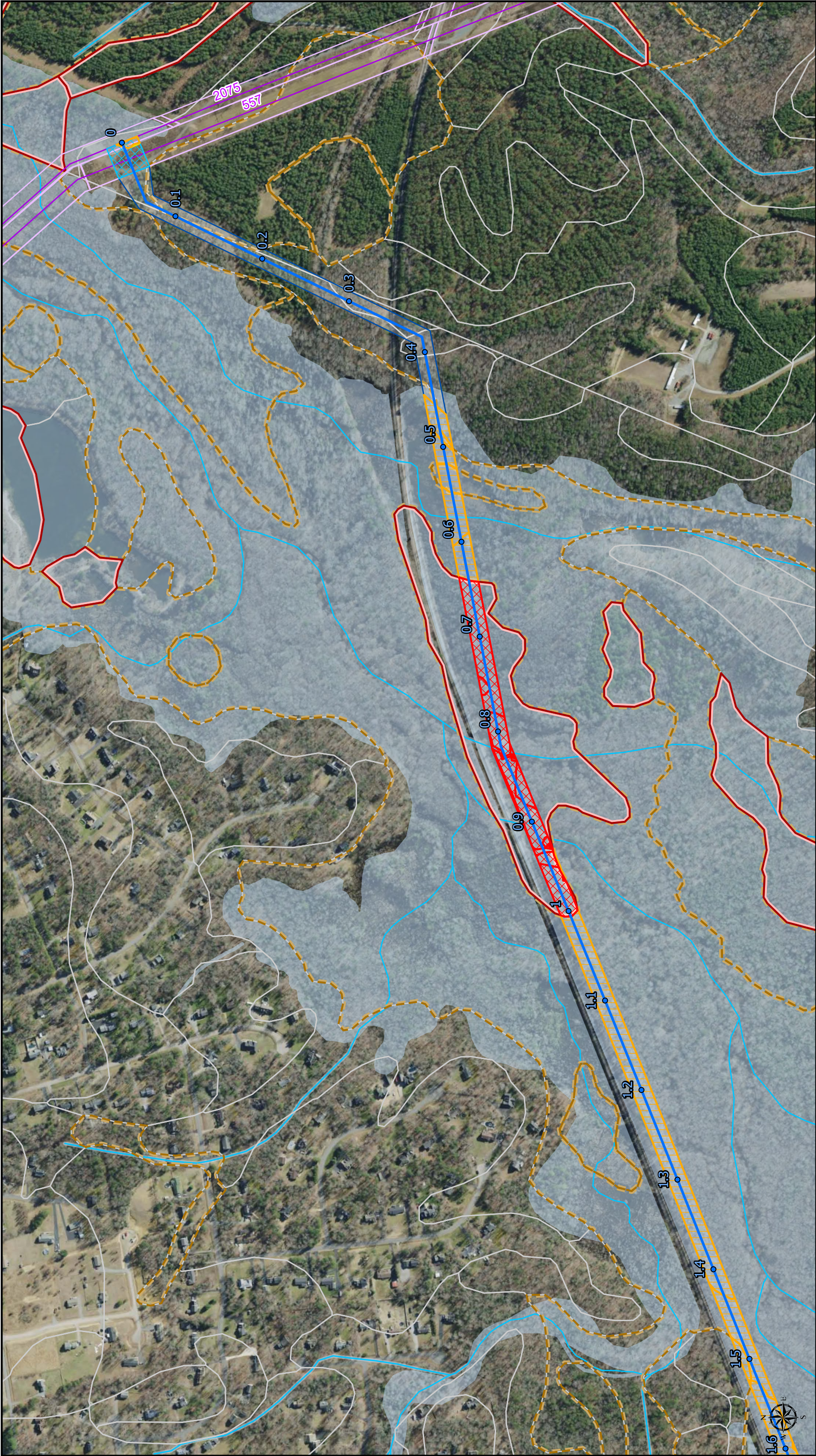
Route 3

Chickaponiny River

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Attachment 2
Wetland and Waterbody Map Set
White Oak Electric Transmission Project
Dominion Energy Virginia
Henrico County, Virginia

ERM

Dominion Energy

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Wetland Probability

- Medium
- Medium/High
- High

White Oak Alternative Routes

- Alternative Route 4

Right-of-Way Type

- Existing Right-of-Way
- Proposed Right-of-Way

Wetland Probability Legend

- NHD Flowline
- NWI Wetland
- Nonhydryc Soil
- Hydryc Soil
- Partially Hydryc Soil

Scale

0 250 500 Feet

1:6,000

Existing Dominion Transmission Line

- Existing Dominion Right-of-Way

Milepost

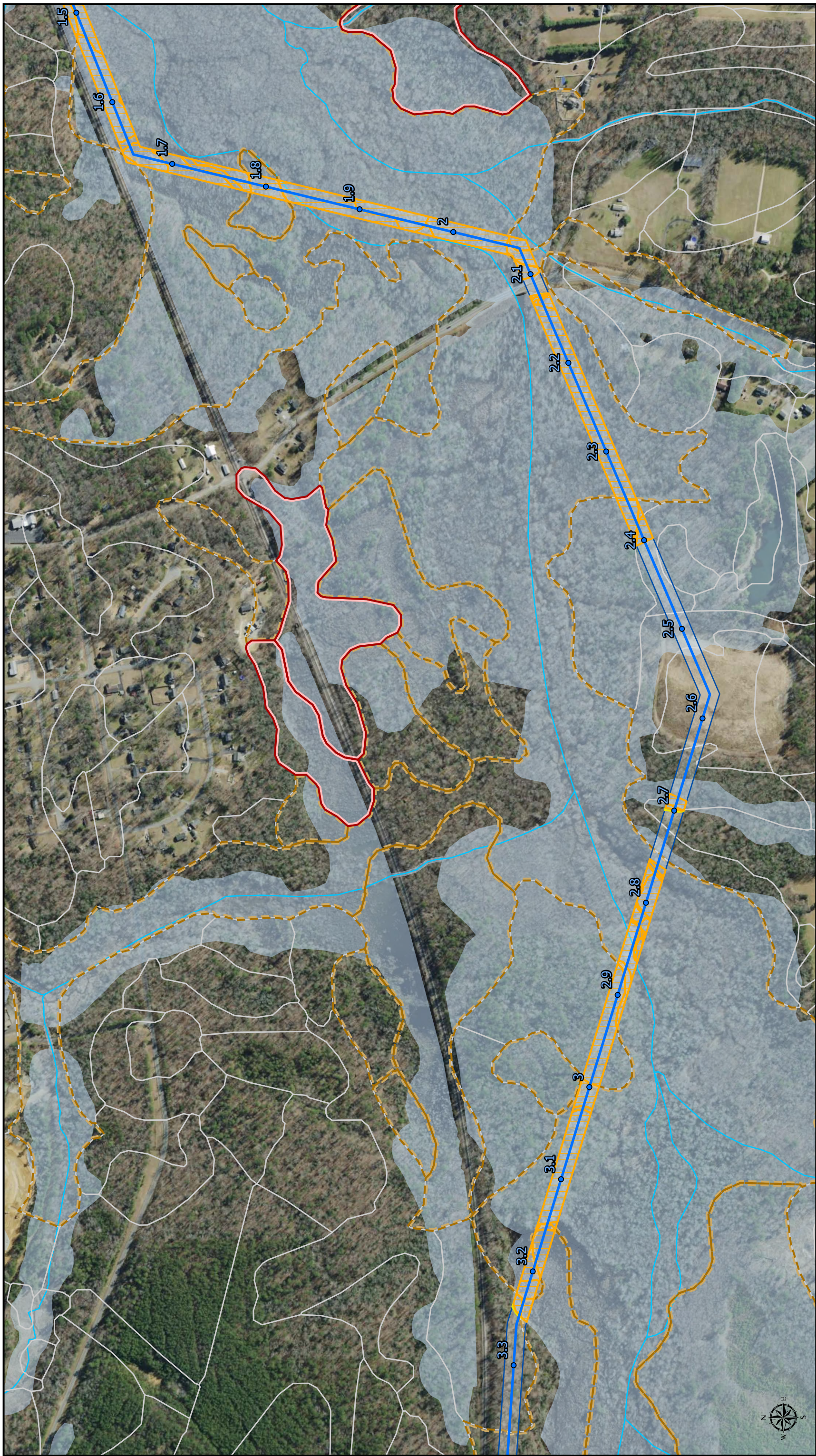
- Route 4

Map

Chickahominy River

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Milepost

● Route 4

White Oak Alternative Routes

— Alternative Route 4

Right-of-Way Type

 Proposed Right-of-Way
 NHD Flowline
 NWI Wetland

☐ Nonhydric Soil

Hydric Soil
Partially Hydric Soil

Wetland Probability

Medium
Medium/High



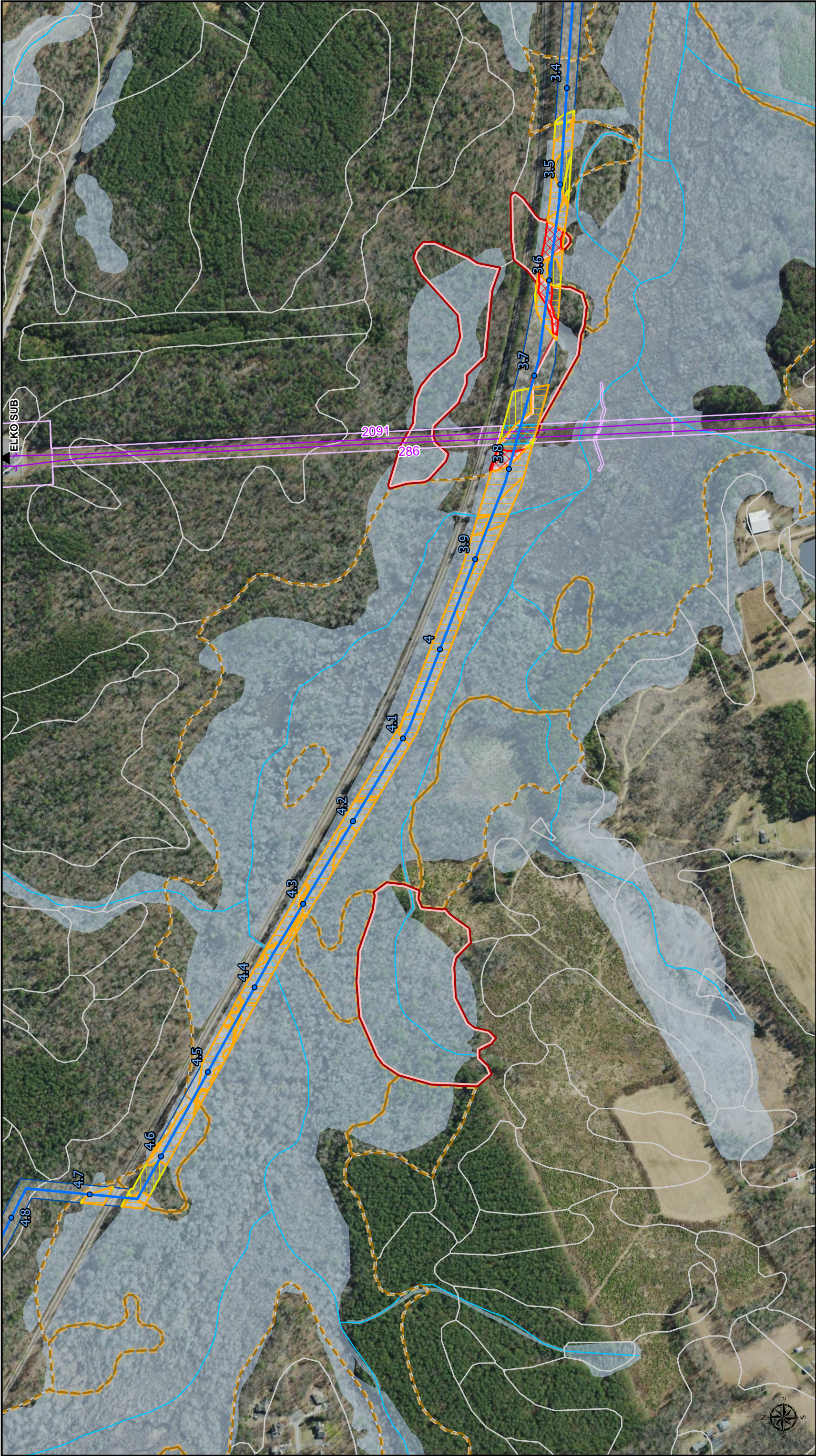
Attachment 2
Wetland and Waterbody Map Set
White Oak Electric Transmission Project
Dominion Energy Virginia
Henrico County, Virginia

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Existing Substation

- ▲ Existing Substation
- Existing Dominion Transmission Line
- Existing Dominion Right-of-Way

Milepost

- Route 4

White Oak Alternative Routes

- Alternative Route 4

Right-of-Way Type

- Existing Right-of-Way
- Proposed Right-of-Way

Wetland Probability

- NHD Flowline
- NWI Wetland
- Nonhydryc Soil
- Hydryc Soil
- Partially Hydryc Soil

0 250 500 Feet

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Wetland Probability

- Medium
- Medium/High
- High

Attachment 2

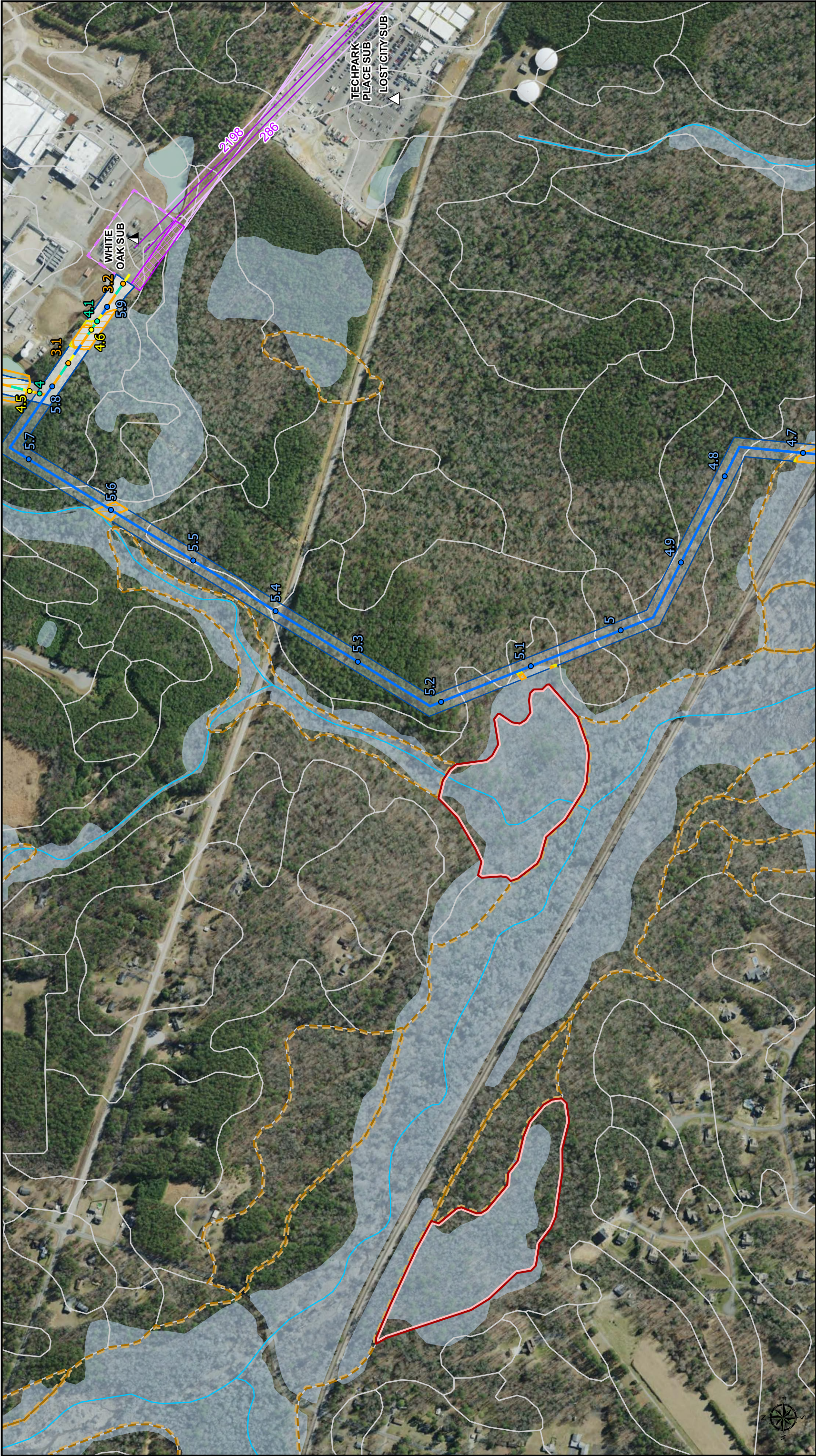
Wetland and Waterbody Map Set

White Oak Electric Transmission Project

Dominion Energy Virginia

Henrico County, Virginia

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Future Substation

Proposed Substation Expansion

Existing Dominion Transmission Line

Existing Dominion Right-of-Way

White Oak Substation

Existing White Oak Substation

Proposed White Oak Substation Expansion

Milepost

Route 1

Route 2

Route 3

Route 4

White Oak Alternative Routes

Alternative Route 1

Alternative Route 2

Proposed Route 3

Alternative Route 4

Right-of-Way Type

Proposed Right-of-Way

NHD Flowline

NWI Wetland

Nonhydryc Soil

Hydryc Soil

Partially Hydryc Soil

Wetland Probability

Medium

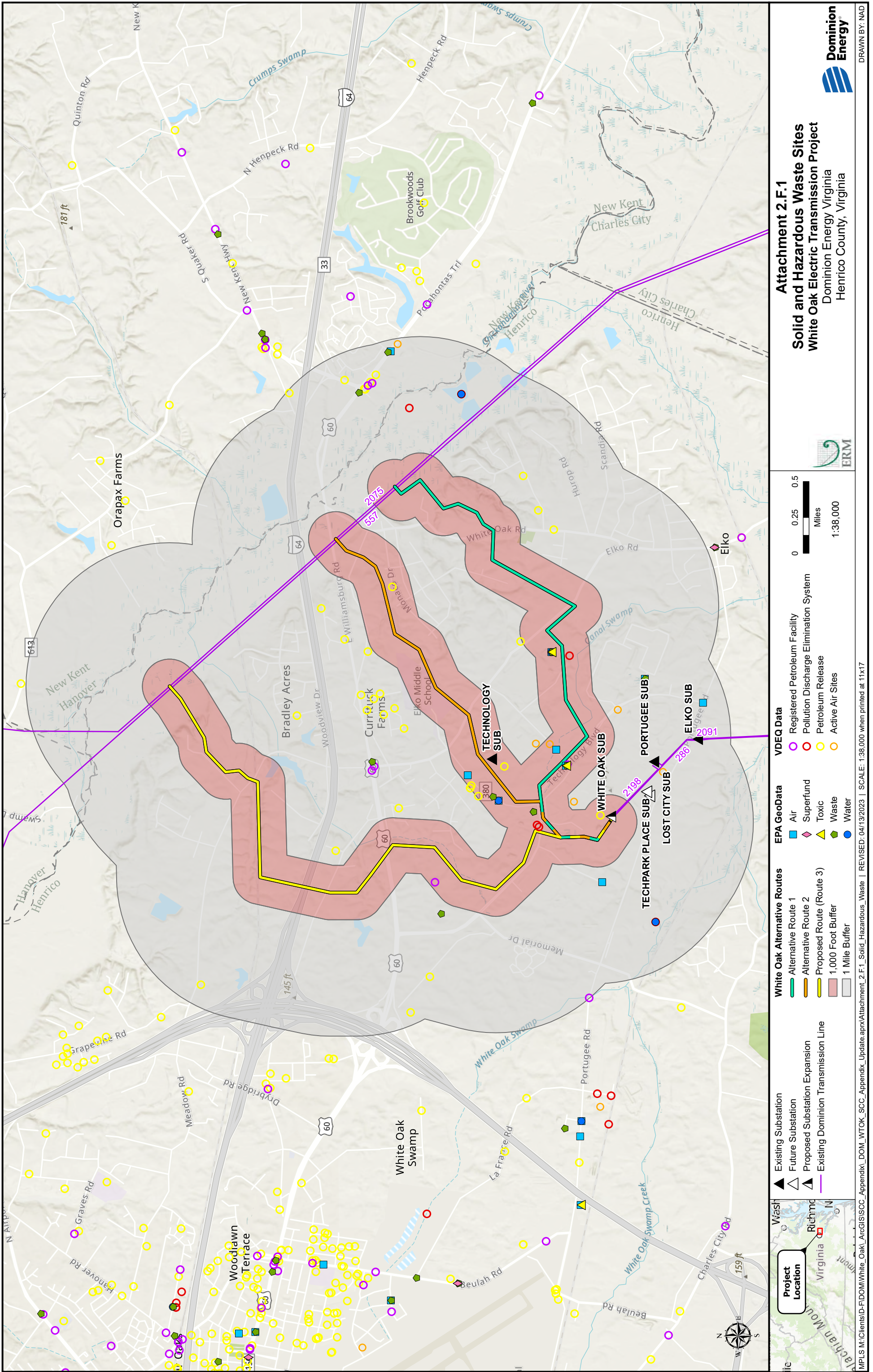
Medium/High

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N

Chickahominy River



Travis A. Voyles
Acting Secretary of Natural and Historic Resources

Matthew S. Wells
Director

Andrew W. Smith
Chief Deputy Director



COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Frank N. Stovall
Deputy Director
for Operations

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

Laura Ellis
Deputy Director for
Administration and Finance

February 2, 2023

Kathlynn Lewis
Kimley-Horn and Associates
919 East Main Street
Richmond, VA 23219

Re: White Oak Routing Study-Full Study Area

Dear Ms. Lewis:

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

According to the information currently in our files, the Elko West Conservation Site and the Chickahominy Flats Conservation Site are located within the project site. 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.

Elko West Conservation Site has been given a biodiversity significance ranking of B3, which represents a site of high significance. The natural heritage resources of concern at this site are:

<i>Asclepias rubra</i>	Red Milkweed	G4G5/S2/NL/NL
<i>Helonias bullata</i>	Swamp-pink	G3/S2S3/LT/LE
<i>Chelone cuthbertii</i>	Cuthbert's Turtlehead	G3/S2/NL/NL
Coastal Plain / Outer Piedmont	Acidic Seepage Swamp	G3?/S3/NL/NL

In addition, Elliott's goldenrod (*Solidago latissimifolia*, G5/S2/NL/NL) has been documented within the conservation site and New Jersey rush (*Juncus caesariensis*, G2G3/S2/NL/LT) has been historically documented within the conservation site.

Chickahominy Flats Conservation Site has been given a biodiversity significance ranking of B3, which represents a site of high significance. The natural heritage resource of concern at this site is:

600 East Main Street, 24th Floor | Richmond, Virginia 23219 | 804-786-6124

State Parks • Soil and Water Conservation • Outdoor Recreation Planning
Natural Heritage • Dam Safety and Floodplain Management • Land Conservation

Non-Riverine Wet Hardwood Forest (Northern Coastal Plain Type) G2?/S2/NL/NL

This association occurs in the central and northern Virginia Coastal Plain on large, flat, imperfectly drained terraces and very wide, ancient floodplains that are no longer subject to alluvial processes. Its hydrology is seasonally to nearly permanently saturated, with occasional ponding or groundwater sheet flows, and is maintained by a high water table rather than riverine or estuarine flooding (NatureServe, 2011). Habitats are essentially flat, with seasonally perched water tables. Shallow, braided channels and depressions which pond water intermittently are frequent habitat features. Surface soils are silt, sand, and clay loams, usually overlying dense clay subsoils (hardpans) that impede drainage. Mature stands of this association are dominated by variable mixtures of hydrophytic oaks (*Quercus* spp.), including swamp chestnut oak (*Quercus michauxii*), cherrybark oak (*Quercus pagoda*), willow oak (*Quercus phellos*), pin oak (*Quercus palustris*), and white oak (*Quercus alba*). Cutting and other disturbances result in higher proportions of sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), and other intolerant trees. Small trees and shrubs include American hornbeam (*Carpinus caroliniana* ssp. *caroliniana*), American holly (*Ilex opaca* var. *opaca*), sweet pepper-bush (*Clethra alnifolia*), sweetbay (*Magnolia virginiana*), fetterbush (*Leucothoe racemosa*), and highbush blueberries (*Vaccinium* spp.). Herb layers usually contain netted chain fern (*Woodwardia areolata*) and a variety of sedges, (e.g., *Carex abscondita*, *Carex debilis* var. *debilis*, *Carex intumescens*). Late-successional non-riverine saturated forests have been greatly reduced in extent or modified by extensive agricultural clearing, logging, conversion to pine silvicultures, and hydrologic alterations such as ditching and draining. (Fleming, et al., 2011).

To minimize adverse impacts to the documented natural heritage resources, DCR recommends avoidance of the conservation sites. Furthermore, according to a DCR biologist and predicted suitable habitat modeling, there is potential for additional populations of the natural heritage resources listed above to occur in the project area if suitable habitat exists on site.

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

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.

In addition, the proposed project is within Ecological Cores (C1, C2, C3, C4, C5) as identified in the Virginia Natural Landscape Assessment (<https://www.dcr.virginia.gov/natural-heritage/vaconvisvnl>). 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.

Please note this project is within a section of the Chickahominy River that has been designated as a scenic river in the state of Virginia.

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 \$1000.00 has been assessed for the service of providing this information. Please find attached an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, DCR Finance, 600 East Main Street, 24th Floor, Richmond, VA 23219. Payment is due within thirty days of the invoice date. Please note late payment may result in the suspension of project review service for future projects.

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

The Virginia Department of Wildlife Resources (VDWR) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from <http://vafwis.org/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,

A handwritten signature in cursive script that reads "Tyler Meader".

Tyler Meader
Natural Heritage Locality Liaison

Literature Cited

Fleming, G.P., K.D. Patterson, K. Taverna, and P.P. Coulling. 2012. The natural communities of Virginia: classification of ecological community groups. Second approximation. Version 2.5. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, VA.

NatureServe. 2011. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: August 22, 2011).

Travis A. Voyles
Acting Secretary of Natural and Historic Resources

Matthew S. Wells
Director

Andrew W. Smith
Chief Deputy Director



COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Frank N. Stovall
Deputy Director
for Operations

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

Laura Ellis
Deputy Director for
Administration and Finance

November 29, 2022

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

Re: 0636302, White Oak Extended Study Area

Dear Ms. Lewis:

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

According to the information currently in our files, the Elko West Conservation Site is located within the project site. 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. Elko West Conservation Site has been given a biodiversity significance ranking of B3, which represents a site of high significance. The natural heritage resources of concern at this site are:

<i>Asclepias rubra</i>	Red Milkweed	G4G5/S2/NL/NL
<i>Helonias bullata</i>	Swamp-pink	G3/S2S3/LT/LE
<i>Chelone cuthbertii</i>	Cuthbert's Turtlehead	G3/S2/NL/NL
Coastal Plain / Outer Piedmont Acidic Seepage Swamp		G3?/S3/NL/NL

To minimize adverse impacts to the natural heritage resources as a result of the proposed activities, DCR recommends avoidance of the conservation site.

Furthermore, according to a DCR biologist and predicted suitable habitat modeling, there is potential for Swamp pink and New Jersey rush (*Juncus caesariensis*, G2G3/S2/SOC/LT) to occur in the project area if suitable habitat exists on site. Swamp-pink, a perennial herb, inhabits groundwater-influenced, perennially saturated, nutrient-poor headwater wetlands and is sensitive to hydrologic alterations to its habitat. The major direct threat to this species is habitat loss. Indirect threats result from activities that affect the hydrologic regime including such upslope activities as timber harvesting, land clearing and development, and agriculture. Downstream threats to the

hydrology of a swamp-pink habitat arise from flooding caused by road crossings with culverts that become blocked and beaver activity (Van Alstine, 1994). In Virginia, swamp-pink is mostly found in the western Coastal Plain, but disjunct populations occur in Augusta County near the edge between the Ridge and Valley and Northern Blue Ridge regions.

The optimal survey time period for swamp-pink is late April 15-May 31 when the inflorescences may be present, the emerging, bright green, young basal rosettes are highly evident before the competing herbaceous vegetation has fully expanded, and light levels are high before canopy leaf-out. The basal leaves of swamp pink are present all year, making it possible to find swamp-pink rosettes in June 1-September 30, but surveys during this time frame are much more difficult due to the density of competing herbaceous vegetation, such as skunk cabbage, in the swamp forest and the deep shade after canopy leaf-out. Surveys in October-March are unreliable as older leaves expand, lie on the ground, turn brownish-red, and possibly become covered after leaf-fall (U.S. Fish and Wildlife Service, 1991). Please note that this species is currently classified as threatened by the United States Fish and Wildlife Service (USFWS) and as endangered by the Virginia Department of Agriculture and Consumer Services (VDACS).

New Jersey rush (*Juncus caesariensis*, G2G3/S2/SOC/LT), 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.

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

DCR-Division of Natural Heritage biologists are qualified to conduct inventories for rare, threatened, and endangered species. Please contact Anne Chazal, Natural Heritage Chief Biologist, at anne.chazal@dcr.virginia.gov or 804-786-9014 to discuss availability and rates for field work. For a list of USFWS-approved surveyors in Virginia visit <https://www.fws.gov/media/collection-approved-surveyor-lists-project-review-process-virginia>.

In addition, the proposed project will impact Ecological Cores (**C3, C4, C5**) as identified in the Virginia Natural Landscape Assessment (<https://www.dcr.virginia.gov/natural-heritage/vaconvisvnl>). 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.

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 \$1000.00 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.

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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 from <http://vafwis.org/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,

A handwritten signature in cursive script that reads "Tyler Meader". The signature is written in dark ink and is positioned above the printed name.

Tyler Meader
Natural Heritage Locality Liaison

Literature Cited

- 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).
- U.S. Fish and Wildlife Service. 1991. Swamp Pink (*Helonias bullata*) Recovery Plan. U.S. Fish and Wildlife Service, Region 5, Newton Corner, MA. 40 pp. plus appendices.
- Van Alstine, N.E. 1994. Information on Swamp Pink (*Helonias bullata*). Compiled for Endangered Species Workshop.
- 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.

Travis A. Voyles
Acting Secretary of Natural and Historic Resources

Matthew S. Wells
Director

Andrew W. Smith
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COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

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Deputy Director
for Operations

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

Laura Ellis
Deputy Director for
Administration and Finance

October 14, 2022

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

Re: White Oak Routing Study-Full Study Area

Dear Ms. Lewis:

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

According to the information currently in our files, the Elko West Conservation Site and the Chickahominy Flats Conservation Site are located within the project site. 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.

Elko West Conservation Site has been given a biodiversity significance ranking of B3, which represents a site of high significance. The natural heritage resources of concern at this site are:

<i>Asclepias rubra</i>	Red Milkweed	G4G5/S2/NL/NL
<i>Helonias bullata</i>	Swamp-pink	G3/S2S3/LT/LE
<i>Chelone cuthbertii</i>	Cuthbert's Turtlehead	G3/S2/NL/NL
Coastal Plain / Outer Piedmont	Acidic Seepage Swamp	G3?/S3/NL/NL

In addition, Elliott's goldenrod (*Solidago latissimifolia*, G5/S2/NL/NL) has been documented within the conservation site and New Jersey rush (*Juncus caesariensis*, G2G3/S2/NL/LT) has been historically documented within the conservation site.

Chickahominy Flats Conservation Site has been given a biodiversity significance ranking of B3, which represents a site of high significance. The natural heritage resource of concern at this site is:

600 East Main Street, 24th Floor | Richmond, Virginia 23219 | 804-786-6124

State Parks • Soil and Water Conservation • Outdoor Recreation Planning
Natural Heritage • Dam Safety and Floodplain Management • Land Conservation

Non-Riverine Wet Hardwood Forest (Northern Coastal Plain Type) G2?/S2/NL/NL

This association occurs in the central and northern Virginia Coastal Plain on large, flat, imperfectly drained terraces and very wide, ancient floodplains that are no longer subject to alluvial processes. Its hydrology is seasonally to nearly permanently saturated, with occasional ponding or groundwater sheet flows, and is maintained by a high water table rather than riverine or estuarine flooding (NatureServe, 2011). Habitats are essentially flat, with seasonally perched water tables. Shallow, braided channels and depressions which pond water intermittently are frequent habitat features. Surface soils are silt, sand, and clay loams, usually overlying dense clay subsoils (hardpans) that impede drainage. Mature stands of this association are dominated by variable mixtures of hydrophytic oaks (*Quercus* spp.), including swamp chestnut oak (*Quercus michauxii*), cherrybark oak (*Quercus pagoda*), willow oak (*Quercus phellos*), pin oak (*Quercus palustris*), and white oak (*Quercus alba*). Cutting and other disturbances result in higher proportions of sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), and other intolerant trees. Small trees and shrubs include American hornbeam (*Carpinus caroliniana* ssp. *caroliniana*), American holly (*Ilex opaca* var. *opaca*), sweet pepper-bush (*Clethra alnifolia*), sweetbay (*Magnolia virginiana*), fetterbush (*Leucothoe racemosa*), and highbush blueberries (*Vaccinium* spp.). Herb layers usually contain netted chain fern (*Woodwardia areolata*) and a variety of sedges, (e.g., *Carex abscondita*, *Carex debilis* var. *debilis*, *Carex intumescens*). Late-successional non-riverine saturated forests have been greatly reduced in extent or modified by extensive agricultural clearing, logging, conversion to pine silvicultures, and hydrologic alterations such as ditching and draining. (Fleming, et al., 2011).

To minimize adverse impacts to the documented natural heritage resources, DCR recommends avoidance of the conservation sites. Furthermore, according to a DCR biologist and predicted suitable habitat modeling, there is potential for additional populations of the natural heritage resources listed above to occur in the project area if suitable habitat exists on site.

Due to the potential for this site to support additional populations of natural heritage resources, DCR recommends an inventory for the resources 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. A list of other individuals who are qualified to conduct inventories for federally listed species may be obtained from the USFWS.

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.

In addition, the proposed project is within Ecological Cores (C1, C2, C3, C4, C5) as identified in the Virginia Natural Landscape Assessment (<https://www.dcr.virginia.gov/natural-heritage/vaconvisvnl>). Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: <http://vanhde.org/content/map>.

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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.

Please note this project is within a section of the Chickahominy River that has been designated as a scenic river in the state of Virginia.

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.

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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,

A handwritten signature in cursive script, reading "Tyler Meader".

Tyler Meader
Natural Heritage Locality Liaison

CC: Troy Andersen, USFWS

Literature Cited

Fleming, G.P., K.D. Patterson, K. Taverna, and P.P. Coulling. 2012. The natural communities of Virginia: classification of ecological community groups. Second approximation. Version 2.5. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, VA.

NatureServe. 2011. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: August 22, 2011).



United States Department of the Interior

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



In Reply Refer To:
Project Code: 2022-0075534
Project Name: White Oak Routing Study

February 07, 2023

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 ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

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

02/07/2023

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

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

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

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/birds/policies-and-regulations.php>.

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/birds/bird-enthusiasts/threats-to-birds.php>.

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/birds/policies-and-regulations/executive-orders/e0-13186.php>.

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
- 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

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Project Summary

Project Code: 2022-0075534
Project Name: White Oak Routing Study
Project Type: Transmission Line - New Constr - Above Ground
Project Description: This request is part of a pre-permitting investigation for routing options on an overhead transmission proejct.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@37.5091501,-77.2328525084705,14z>



Counties: Hanover , Henrico , and New Kent counties, Virginia

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Endangered Species Act Species

There is a total of 3 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 Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

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

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

Mammals

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

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> 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 <i>Helonias bullata</i> 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.

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.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

-
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)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\)](#) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

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

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> 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.	Breeds Oct 15 to Aug 31
Blue-winged Warbler <i>Vermivora pinus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 1 to Jun 30
Bobolink <i>Dolichonyx oryzivorus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31

NAME	BREEDING SEASON
Canada Warbler <i>Cardellina canadensis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Chimney Swift <i>Chaetura pelagica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Eastern Whip-poor-will <i>Antrostomus vociferus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Kentucky Warbler <i>Oporornis formosus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
King Rail <i>Rallus elegans</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5
Lesser Yellowlegs <i>Tringa flavipes</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Prairie Warbler <i>Dendroica discolor</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Prothonotary Warbler <i>Protonotaria citrea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird <i>Euphagus carolinus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Wood Thrush <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	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 and understand the

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

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (—)

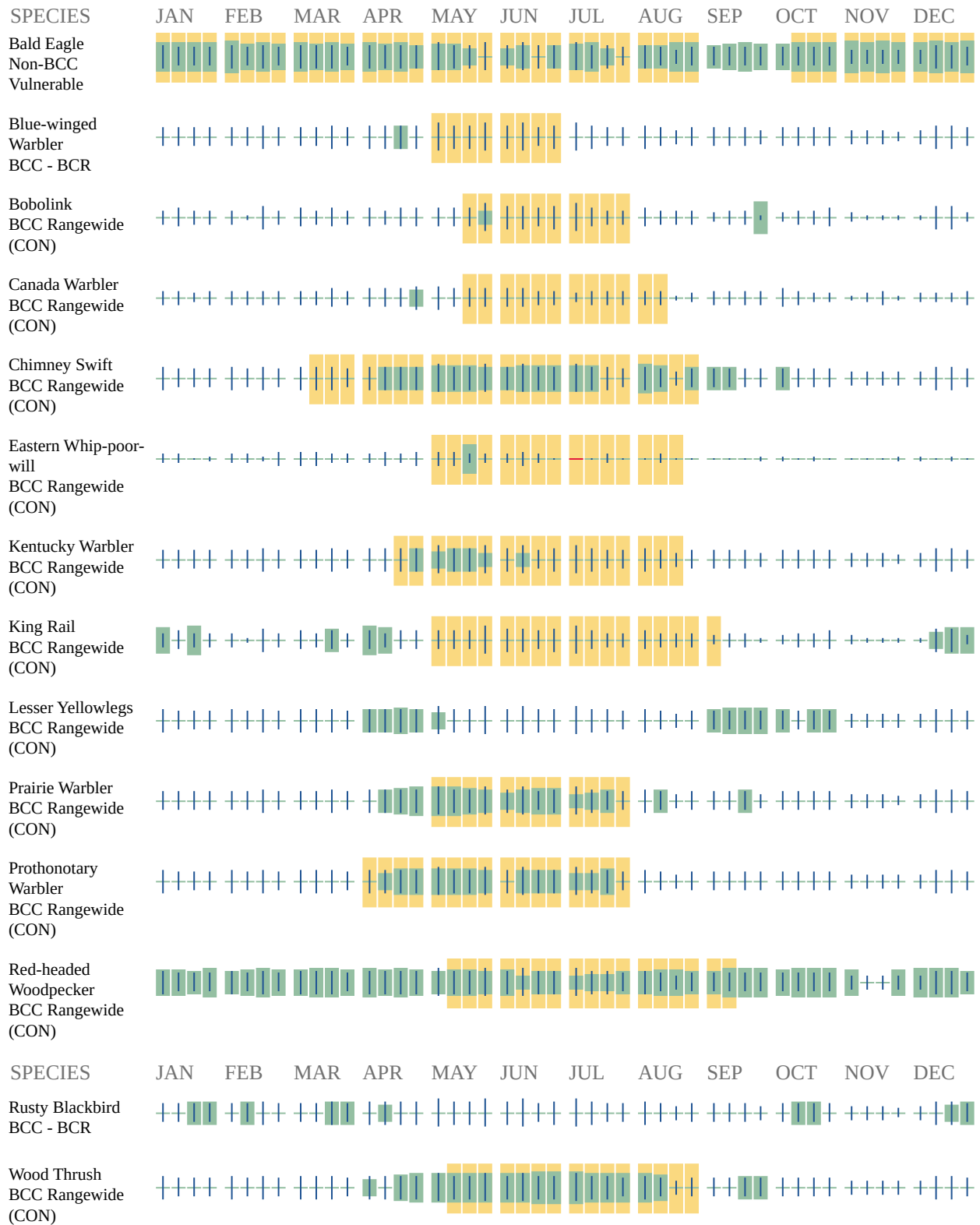
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort — no data

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Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- 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>

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and

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how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

IPaC User Contact Information

Agency: ERM Group
Name: Kathlynn Lewis
Address: 919 E. Main St.
Address Line 2: Suite 1701
City: Richmond
State: VA
Zip: 23219
Email: kathlynn.lewis@erm.com
Phone: 8047837556

VaFWIS Search Report Compiled on 2/14/2023, 8:47:57 AM[Help](#)

Known or likely to occur within a **5 mile radius around point 37.5163468 -77.2270368**
 in **036 Charles City County, 085 Hanover County, 087 Henrico County, 127 New Kent County, VA**

[View Map of
Site Location](#)

601 Known or Likely Species ordered by Status Concern for Conservation
 (displaying first 34) (34 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
060017	FESE	Ia	Spinymussel, James	Parvaspina collina		BOVA
060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon		BOVA
010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus		BOVA
040110	FTSE	Ia	Rail, eastern black	Laterallus jamaicensis jamaicensis		BOVA
050022	FTST	Ia	Bat, northern long-eared	Myotis septentrionalis		BOVA
060173	FTST	Ia	Pigtoe, Atlantic	Fusconaia masoni		BOVA
060029	FTST	IIa	Lance, yellow	Elliptio lanceolata		BOVA
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
040096	ST	Ia	Falcon, peregrine	Falco peregrinus		BOVA
040293	ST	Ia	Shrike, loggerhead	Lanius ludovicianus		BOVA
040379	ST	Ia	Sparrow, Henslow's	Centronyx henslowii		BOVA
060081	ST	IIa	Floater, green	Lasmigona subviridis		BOVA
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
100079	FC	IIIa	Butterfly, monarch	Danaus plexippus		BOVA
030067	CC	IIa	Terrapin, northern diamond-backed	Malaclemys terrapin terrapin		BOVA,HU6
030063	CC	IIIa	Turtle, spotted	Clemmys guttata		BOVA,HU6
030031	CC	IIIc	Kingsnake, scarlet	Lampropeltis elapsoides		BOVA
010077		Ia	Shiner, bridge	Notropis bifrenatus		BOVA

040092		Ia	Eagle, golden	Aquila chrysaetos		BOVA
060084		Ib	Pigtoe, Virginia	Lexingtonia subplana		BOVA
040213		Ic	Owl, northern saw-whet	Aegolius acadicus		BOVA
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	Yes	BOVA,BBA,SppObs,HU6
060071		IIa	Lampmussel, yellow	Lampsilis cariosa		BOVA
040203		IIb	Cuckoo, black-billed	Coccyzus erythrophthalmus		BOVA,HU6
040105		IIb	Rail, king	Rallus elegans		BOVA,HU6
080336		IIc	Beetle, Gammon's stenelmis riffle	Stenelmis gammoni		BOVA
100003		IIc	Skipper, rare	Problema bulenta		BOVA

To view **All 601 species** [View 601](#)

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

**I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need;

III=VA Wildlife Action Plan - Tier III - High Conservation Need;

IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Virginia Wildlife Action Plan Conservation Opportunity Ranking:

a - On the ground management strategies/actions exist and can be feasibly implemented.;

b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.;

c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

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

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams

N/A

Impediments to Fish Passage (4 records)

[View Map of All Fish Impediments](#)

ID	Name	River	View Map
376	BARKERS MILLPOND DAM	ELDER SWAMP	Yes
385	EBERHARD DAM	BOAR SWAMP	Yes
432	TOM BROOKS DAM	TR-CHICKAHOMINY RIVER	Yes
386	UKROP DAM	HASS CREEK	Yes

Colonial Water Bird Survey (9 records)

[View Map of All Query Results Colonial Water Bird Survey](#)

Colony_Name	N Obs	Latest Date	N Species			View Map
			Different Species	Highest TE*	Highest Tier**	
Western Shore, Quinton, Henrico	1	May 5 2013	2			Yes
Orapax Farm	1	Jun 2 2003	1			Yes
WHITE OAK SWAMP	10	Jun 2 2003	2			Yes
White Oak Swamp 2	1	Jun 2 2003	1			Yes
Chickahominy River at Whi	1	Jun 1 1993	2			Yes
Chickahominy River South	1	Jun 1 1993	1			Yes
Hanover/Henrico/New Kent	1	Jun 1 1993	1			Yes
QUINTON	3	Jun 1 1991	1			Yes
SEVEN PINES	4	Jun 1 1991	2			Yes

Displayed 9 Colonial Water Bird Survey

Threatened and Endangered Waters

N/A

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
HE9501	16	Apr 23 2008	Unknown	Yes

Displayed 1 Bald Eagle Nests

Species Observations (279 records - displaying first 20)[View Map of All Query Results](#)
[Species Observations](#)

obsID	class	Date Observed	Observer	N Species			View Map
				Different Species	Highest TE [*]	Highest Tier ^{**}	
604610	SppObs	Jun 24 2009	Donald; Mackler Arun; Bose	8		II	Yes
605961	SppObs	Feb 27 2009	Donald; Mackler	1		II	Yes
615844	SppObs	Oct 18 2012	Wayne; Starnes	2		III	Yes
601089	SppObs	Dec 4 2009	Donald; Mackler	11		III	Yes
600592	SppObs	Oct 27 2009	Donald; Mackler	3		III	Yes
604628	SppObs	Oct 20 2009	Donald; Mackler	3		III	Yes
607845	SppObs	Jun 26 2009	Donald; Mackler Arun; Bose	12		III	Yes
603477	SppObs	Jun 25 2009	Donald; Mackler Arun; Bose	11		III	Yes
607148	SppObs	Jun 16 2009	Donald; Mackler	21		III	Yes
607521	SppObs	Jun 16 2009	Donald; Mackler Arun; Bose	13		III	Yes
601066	SppObs	Jun 16 2009	Donald; Mackler Arun; Bose	12		III	Yes
603395	SppObs	Jun 16 2009	Donald; Mackler	2		III	Yes
601255	SppObs	Jun 16 2009	Donald; Mackler Arun; Bose	12		III	Yes
601878	SppObs	Jun 15 2009	Donald; Mackler Arun; Bose	16		III	Yes
601009	SppObs	Jun 15 2009	Donald; Mackler	2		III	Yes
601030	SppObs	Jun 5 2009	Donald; Mackler	1		III	Yes
604485	SppObs	Jun 3 2009	Donald; Mackler	18		III	Yes
607230	SppObs	Jun 2 2009	Donald; Mackler	2		III	Yes
605814	SppObs	Mar 24 2009	Donald; Mackler	2		III	Yes
606789	SppObs	Feb 26 2009	Donald; Mackler	1		III	Yes

Displayed 20 Species Observations

Selected 279 Observations [View all 279 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 (7 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 ^{**}	
52084	Dutch Gap, CE	1			Yes
53096	Quinton, SE	66		III	Yes
53095	Quinton, SW	1			Yes
53082	Roxbury, NE	4			Yes
53081	Roxbury, NW	36		III	Yes
52094	Seven Pines, CE	2			Yes
52096	Seven Pines, SE	66		II	Yes

Public Holdings: (1 names)

Name	Agency	Level
National Guard Site	National Guard	Federal

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

FIPS Code	City and County Name	Different Species	Highest TE	Highest Tier
036	Charles City	394	FTSE	I
085	Hanover	384	FTSE	I
087	Henrico	389	FESE	I
127	New Kent	413	FESE	I

USGS 7.5' Quadrangles:

Dutch Gap
 Seven Pines
 Roxbury
 Quinton

USGS NRCS Watersheds in Virginia:

N/A

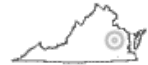
USGS National 6th Order Watersheds Summary of Wildlife Action Plan Tier I, II, III, and IV Species:

HU6 Code	USGS 6th Order Hydrologic Unit	Different Species	Highest TE	Highest Tier
JL01	James River-Almond Creek	64	SS	II
JL04	Fourmile Creek	58	SS	II
JL05	Turkey Island Creek	66	SE	I
JL19	Chickahominy River-Powwhite Creek	71	SE	I
JL20	Chickahominy River-Higgins Swamp	71	SE	I
JL21	White Oak Swamp	66	SE	I
JL22	Chickahominy River-Toe Ink Swamp	72	SE	I
YO33	Black Creek	63	SE	I
YO34	Pamunkey River-Montague Creek	68	SE	I

Compiled on 2/14/2023, 8:47:57 AM I1460162.0 report=all searchType= R dist= 8045 poi= 37.5163468 -77.2270368

PixelSize=64; Anadromous=0.029852; BBA=0.061346; BECAR=0.023056; Bats=0.023172; Buffer=0.386036; County=0.079461; HU6=0.105969; Impediments=0.025946; Init=0.419862; PublicLands=0.041245; Quad=0.058186; SppObs=0.546975; TEWaters=0.031132; TierReaches=0.033496; TierTerrestrial=0.111188; Total=1.902879; Tracking_BOVA=0.220315; Trout=0.031445; huva=0.055448

VaFWIS - Department of Game and Inland Fisheries



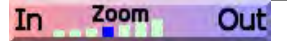
37.51634 -77.22703
is the Search Point

[Refresh Browser Page](#)

Map Click



Map Scale



Screen Size



[Help](#)

Search Point

- ☒ Change to "clicked" map point
☐ Fixed at 37.51634 -77.22703

Show Position Rings

- ☒ Yes ☐ No

1 mile and 1/4 mile at the Search Point

Show Search Area

- ☒ Yes ☐ No

5 Search distance miles radius

Search Point is at map center

Base Map [Choices](#)

Topography ▼

Map Overlay [Choices](#)

Current List: Position, Search

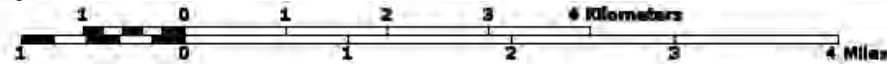
Map Overlay Legend



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



5 mile radius Search Area



Point of Search 37.51634 -77.22703

Map Location 37.51634 -77.22703

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

Base Map source: USGS 1:100,000 topographic maps (see [Microsoft terraserver-usa.com](http://Microsoft.terraserver-usa.com) for details)

Map projection is UTM Zone 18 NAD 1983 with left 298384 and top 4159285. Pixel size is 16 meters. Coordinates displayed are decimal Degrees North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixels. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5 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 Game and Inland Fisheries.

map assembled 2023-02-14 08:45:01 (qa/qc March 21, 2016 12:20 - tn=1460162 dist=8045 I

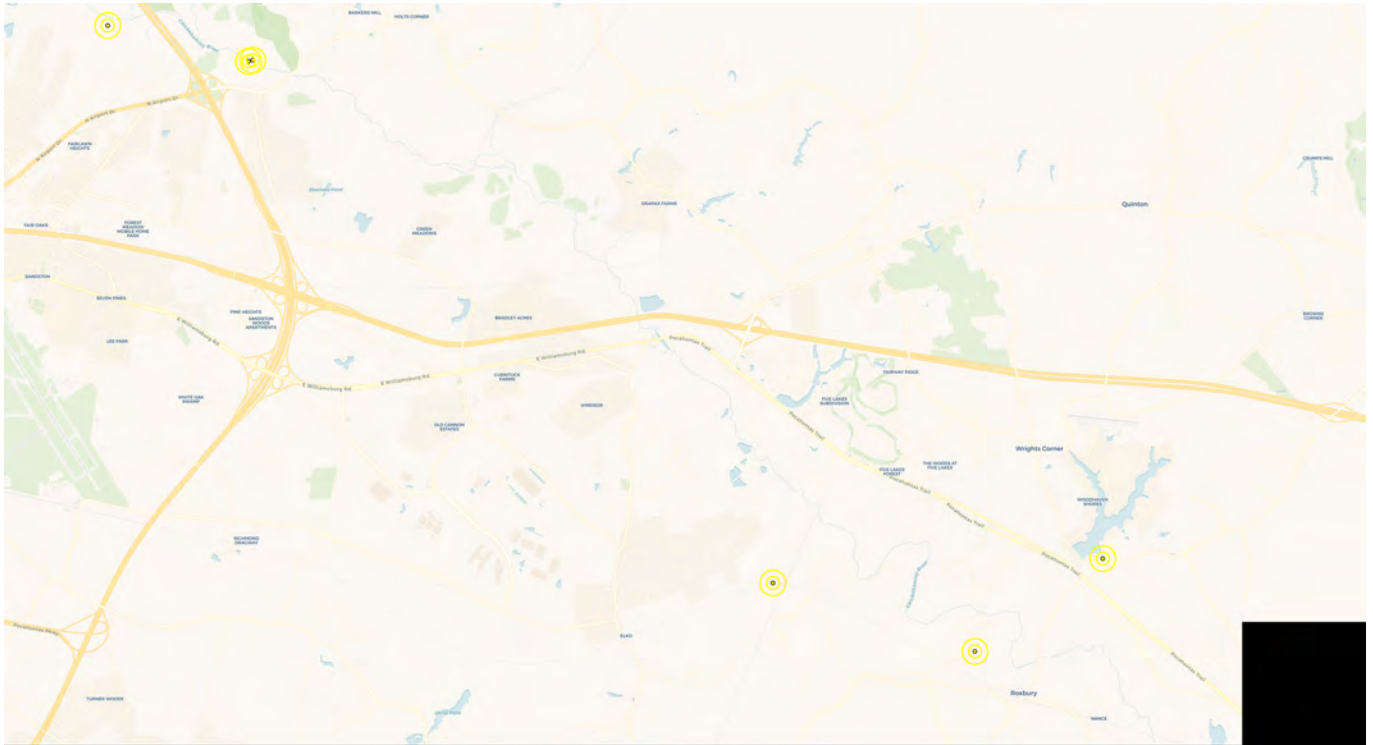
)

\$poi=37.5163468 -77.2270369



The CENTER for
CONSERVATION
BIOLOGY

CCB Mapping Portal



Layers: VA Eagle Nest Locator, VA Eagle Nest Buffers

Map Center [longitude, latitude]: [-77.20826625823973, 37.51650001221655]

Map Link:

https://ccbbirds.org/maps/#layer=VA+Eagle+Nest+Locator&layer=VA+Eagle+Nest+Buffers&zoom=14&lat=37.51650001221655&lng=-77.20826625823973&legend=legend_tab_7c321b7e-e523-11e4-aaa0-0e0c41326911&base=Street+Map+%28OSM%2FCarto%29

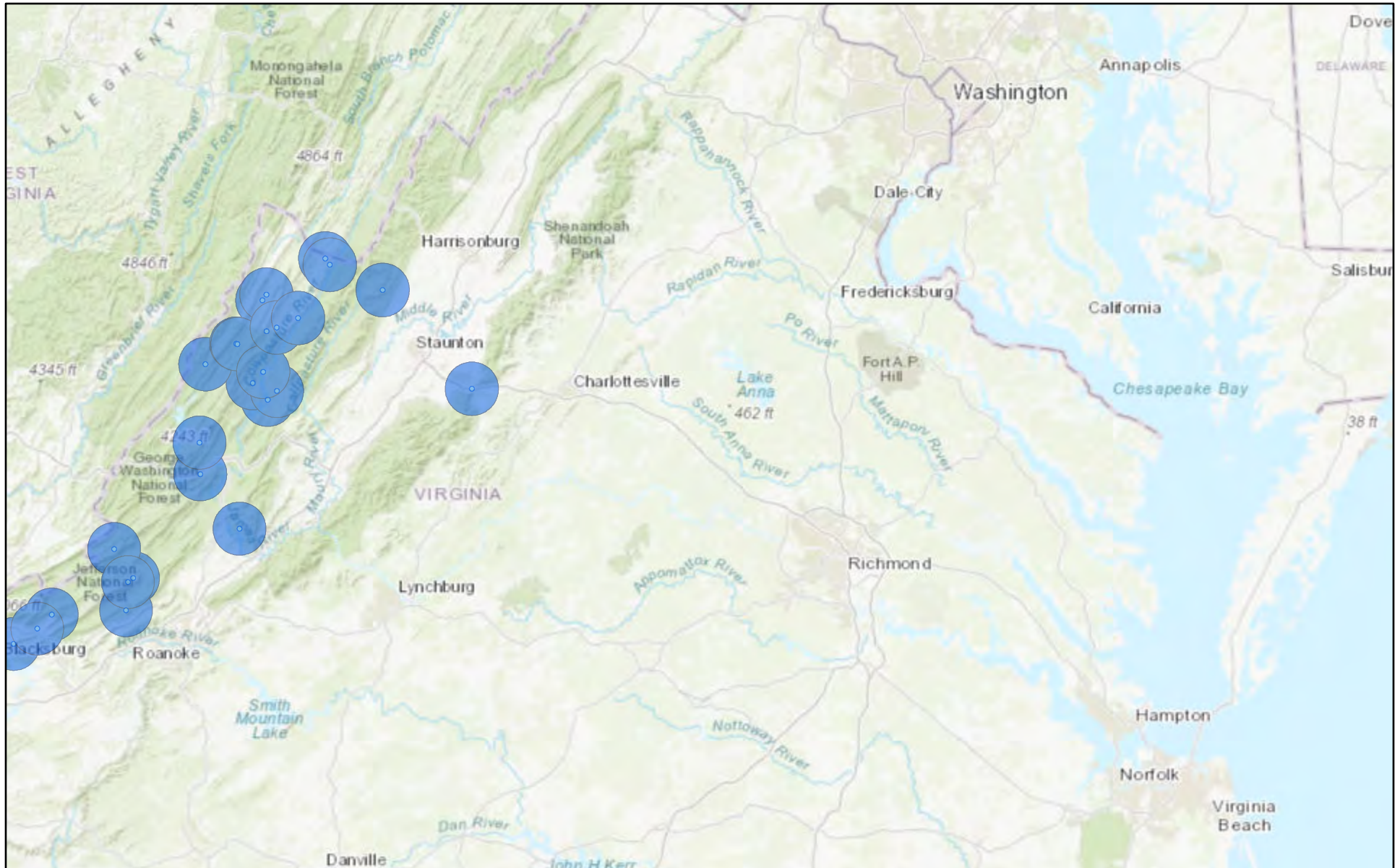
Report Generated On: 02/10/2023

The Center for Conservation Biology (CCB) provides certain data online as a free service to the public and the regulatory sector. CCB encourages the use of its data sets in wildlife conservation and management applications. These data are protected by intellectual property laws. All users are reminded to view the [Data Use Agreement](#) to ensure compliance with our data use policies. For additional data access questions, view our [Data Distribution Policy](#), or contact our Data Manager, Marie Pitts, at mlpitts@wm.edu or 757-221-7503.



Report generated by [The Center for Conservation Biology Mapping Portal](#).

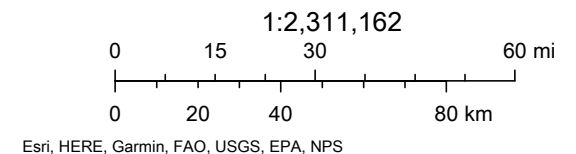
To learn more about CCB visit ccbbirds.org or contact us at info@ccbbirds.org

MYLU-PESU Locations and Roost Trees

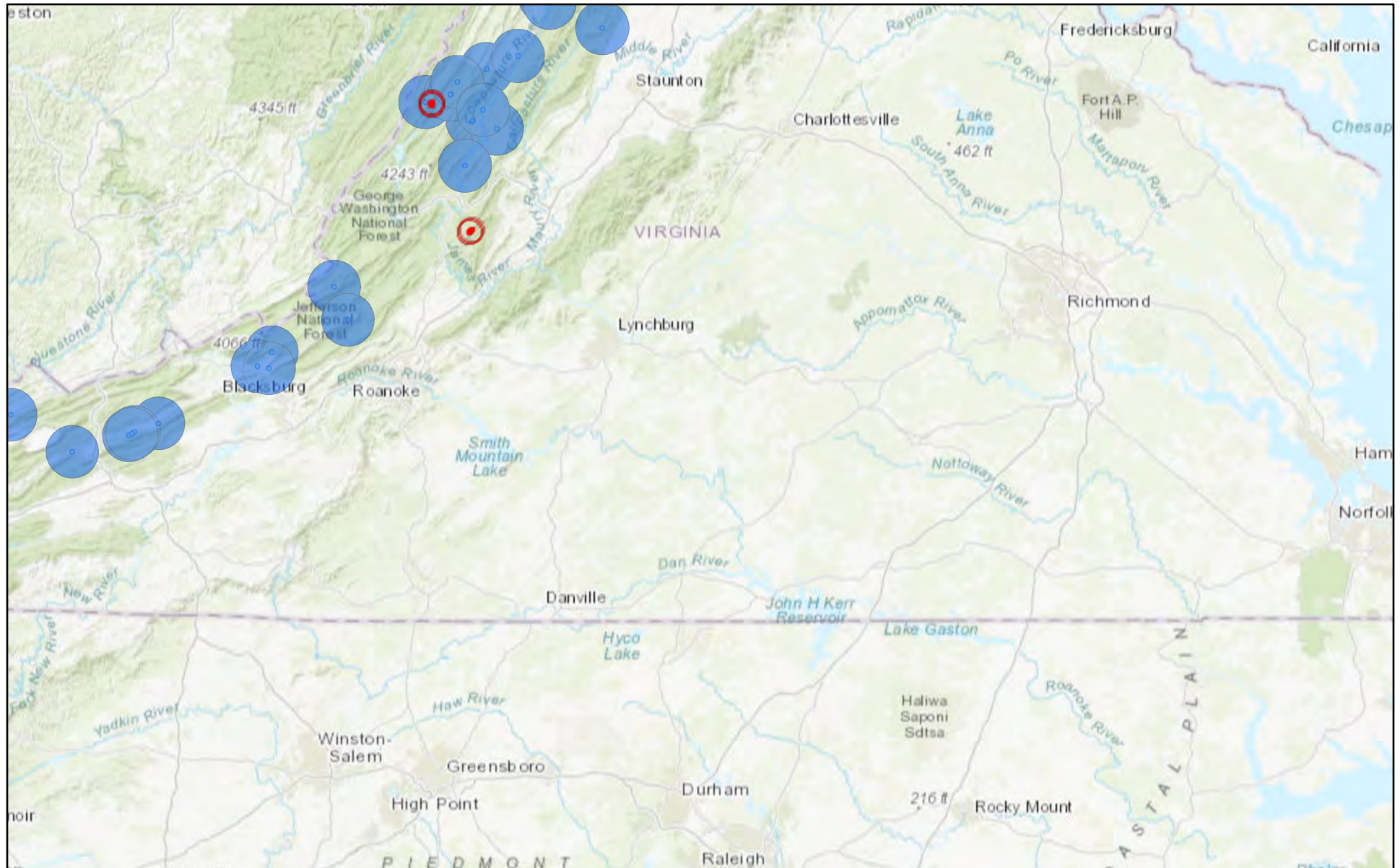


8/16/2022, 9:31:42 PM

-  Tri-colored and Little Brown Hibernaculum Half Mile Buffer
-  Tri-colored and Little Brown Hibernaculum 5.5 Mile Buffer

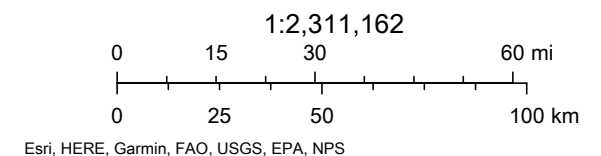


NLEB Locations and Roost Trees



8/16/2022, 9:36:25 PM

- NLEB Known Occupied Maternity Roost (Summer Habitat)
- NLEB Hibernaculum 5.5 Mile Buffer
- NLEB Hibernaculum Half Mile Buffer





COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

MEMORANDUM

DATE: June 12, 2023

TO: Heather Kennedy

FROM: Allison Tillett, Environmental Impact Review Coordinator

SUBJECT: Dominion Energy Virginia Proposed 230 kV White Oak Lines and White Oak Substation Expansion

Office of Real Property

If any portion of the Project crosses DCR-owned land Dominion Energy Virginia will be required to request an easement to accommodate their facilities.

Division of Planning and Recreation Resources

The Department of Conservation and Recreation (DCR), Division of Planning and Recreational Resources (PRR), develops the *Virginia Outdoors Plan* and coordinates a broad range of recreational and environmental programs throughout Virginia. These include the Virginia Scenic Rivers program; Trails, Greenways, and Blueways; Virginia State Park Master Planning and State Park Design and Construction. PRR also administers the Land & Water Conservation Fund (LWCF) program in Virginia.

Division of Natural Heritage

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

According to a DCR biologist and predicted suitable habitat modeling, there is a potential for Swamp-pink (*Helonias bullata*, G3/S2S3/LT/LE) to occur in all of the proposed routes if suitable habitat exists on site. Swamp-pink is a perennial herb that inhabits groundwater-influenced, perennially saturated, nutrient-poor headwater wetlands and is sensitive to hydrologic alterations to its habitat. The major direct threat to this species is habitat loss. Indirect threats result from activities that affect the hydrologic regime including such upslope activities as timber harvesting, land clearing and development, and agriculture. Downstream threats to the hydrology of a swamp-pink habitat arise from flooding caused by road crossings with culverts that become blocked and beaver activity (Van Alstine, 1994). In Virginia, swamp-pink is mostly found in the western Coastal

Plain, but disjunct populations occur in Augusta County near the edge between the Ridge and Valley and Northern Blue Ridge regions.

The optimal survey time period for swamp-pink is late April 15-May 31 when the inflorescences may be present, the emerging, bright green, young basal rosettes are highly evident before the competing herbaceous vegetation has fully expanded, and light levels are high before canopy leaf-out. The basal leaves of swamp pink are present all year, making it possible to find swamp-pink rosettes in June 1-September 30, but surveys during this time frame are much more difficult due to the density of competing herbaceous vegetation, such as skunk cabbage, in the swamp forest and the deep shade after canopy leaf-out. Surveys in October-March are unreliable as older leaves expand, lie on the ground, turn brownish-red, and possibly become covered after leaf-fall (U.S. Fish and Wildlife Service, 1991).

Please note that this species is currently classified as threatened by the United States Fish and Wildlife Service (USFWS) and as endangered by the Virginia Department of Agriculture and Consumer Services (VDACS).

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

DCR-Division of Natural Heritage biologists are qualified to conduct inventories for rare, threatened, and endangered species. Please contact Anne Chazal, Natural Heritage Chief Biologist, at anne.chazal@dcr.virginia.gov or 804-786-9014 to discuss availability and rates for field work. For a list of USFWS-approved surveyors in Virginia visit <https://www.fws.gov/media/collection-approved-surveyor-lists-project-review-process-virginia>.

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.

In addition, there is potential for isolated, forested wetlands (Coastal Plain Depression Wetlands or Non-Riverine Wet Hardwood Forest) within portions of the project area. DCR recommends avoiding canopy removal and/or any soil disturbance in and around isolated, forested wetlands.

Furthermore, dependent on the selected preferred alternative for the proposed project, it will impact Ecological Cores (**C1, C3, C4, C5**) as identified in the Virginia Natural Landscape Assessment (<https://www.dcr.virginia.gov/natural-heritage/vaconvisvnl>). 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 alternative (Route 3) will impact one or more cores with very high (C2) to outstanding (C1) ecological integrity. Further investigation of these impacts is recommended and DCR-DNH can conduct a formal impact analysis upon request. This analysis would estimate impacts to cores and habitat fragments, providing an estimate of the total acreage of direct and indirect impacts of the project. For more information about the analysis and service charges, please contact Joe Weber, DCR Chief of Biodiversity Information and Conservation Tools at Joseph.Weber@dcr.virginia.gov.

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

Please note, Biotics documents the presence of Chickahominy Flats Conservation Site within the proposed alternative Route 3. However, based on a review by a DCR biologist we do not anticipate that the proposed project will adversely impact the associated natural heritage resource.

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 project information and 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.

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

The 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 from <http://vafwis.org/fwis/> or contact Amy Martin at 804-367-2211 or amy.martin@dwr.virginia.gov.

Division of State Parks

DCR's Division of State Parks is responsible for acquiring and managing, state parks. Park development and master planning are managed by the Division of Planning and Recreation Resources. Master plans are required prior to a parks opening and are updated every ten years (Virginia Code § 10.1-200 *et seq.*).

Division of Dam Safety and Floodplain Management

Dam Safety Program:

The Dam Safety program was established to provide proper and safe design, construction, operation and maintenance of dams to protect public safety. Authority is bestowed upon the program according to *The Virginia Dam Safety Act*, Article 2, Chapter 6, Title 10.1 (10.1-604 *et seq.*) of the Code of Virginia and Dam Safety Impounding Structure Regulations (Dam Safety Regulations), established and published by the Virginia Soil and Water Conservation Board (VSWCB).

Floodplain Management Program:

The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA), and communities who elect to participate in this voluntary program manage and enforce the program on the local level through that community's local floodplain ordinance. Each local floodplain ordinance must comply with the minimum standards of the NFIP, outlined in 44 CFR 60.3; however, local communities may adopt more restrictive requirements in their local floodplain ordinance, such as regulating the 0.2% annual chance flood zone (Shaded X Zone).

All development within a Special Flood Hazard Area (SFHA), as shown on the locality's Flood Insurance Rate Map (FIRM), must be permitted and comply with the requirements of the local floodplain ordinance.

State Agency Projects Only

[Executive Order 45](#), signed by Governor Northam and effective on November 15, 2019, establishes mandatory standards for development of state-owned properties in Flood-Prone Areas, which include Special Flood Hazard Areas, Shaded X Zones, and the Sea Level Rise Inundation Area. These standards shall apply to all state agencies.

1. Development in Special Flood Hazard Areas and Shaded X Zones
 - A. All development, including buildings, on state-owned property shall comply with the locally-adopted floodplain management ordinance of the community in which the state-owned property is located and any flood-related standards identified in the Virginia Uniform Statewide Building Code.
 - B. If any state-owned property is located in a community that does not participate in the NFIP, all development, including buildings, on such state-owned property shall comply with the NFIP requirements as defined in 44 CFR §§ 60.3, 60.4, and 60.5 and any flood-related standards identified in the Virginia Uniform Statewide Building Code.
 - (1) These projects shall be submitted to the Department of General Services (DGS), for review and approval.
 - (2) DGS shall not approve any project until the State NFIP Coordinator has reviewed and approved the application for NFIP compliance.
 - (3) DGS shall provide a written determination on project requests to the applicant and the State NFIP Coordinator. The State NFIP Coordinator shall maintain all documentation associated with the project in perpetuity.

- C. No new state-owned buildings, or buildings constructed on state-owned property, shall be constructed, reconstructed, purchased, or acquired by the Commonwealth within a Special Flood Hazard Area or Shaded X Zone in any community unless a variance is granted by the Director of DGS, as outlined in this Order.

The following definitions are from Executive Order 45:

Development for NFIP purposes is defined in 44 CFR § 59.1 as “Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.”

The Special Flood Hazard Area may also be referred to as the 1% annual chance floodplain or the 100-year floodplain, as identified on the effective Flood Insurance Rate Map and Flood Insurance Study. This includes the following flood zones: A, AO, AH, AE, A99, AR, AR/AE, AR/AO, AR/AH, AR/A, VO, VE, or V.

The Shaded X Zone may also be referred to as the 0.2% annual chance floodplain or the 500- year floodplain, as identified on the effective Flood Insurance Rate Map and Flood Insurance Study.

The Sea Level Rise Inundation Area referenced in this Order shall be mapped based on the National Oceanic and Atmospheric Administration Intermediate-High scenario curve for 2100, last updated in 2017, and is intended to denote the maximum inland boundary of anticipated sea level rise.

“State agency” shall mean all entities in the executive branch, including agencies, offices, authorities, commissions, departments, and all institutions of higher education.

“Reconstructed” means a building that has been substantially damaged or substantially improved, as defined by the NFIP and the Virginia Uniform Statewide Building Code.

Federal Agency Projects Only

Projects conducted by federal agencies within the SFHA must comply with federal Executive Order 11988: Floodplain Management.

DCR’s Floodplain Management Program does not have regulatory authority for projects in the SFHA. The applicant/developer must reach out to the local floodplain administrator for an official floodplain determination and comply with the community’s local floodplain ordinance, including receiving a local permit. Failure to comply with the local floodplain ordinance could result in enforcement action from the locality. For state projects, DCR recommends that compliance documentation be provided prior to the project being funded. For federal projects, the applicant/developer is encouraged reach out to the local floodplain administrator and comply with the community’s local floodplain ordinance.

To find flood zone information, use the Virginia Flood Risk Information System (VFRIS):

www.dcr.virginia.gov/vfris

To find community NFIP participation and local floodplain administrator contact information, use DCR’s Local Floodplain Management Directory: www.dcr.virginia.gov/dam-safety-and-floodplains/floodplain-directory

The remaining DCR divisions have no comments regarding the scope of this project. Thank you for the opportunity to comment.

Cc: Brian Fuller, DCR Real Property Manager
Charles Marsten, DCR Real Property Specialist



Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

1111 E. Main Street, Suite 1400, Richmond, Virginia 23219

P.O. Box 1105, Richmond, Virginia 23218

(800) 592-5482

www.deq.virginia.gov

Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director
(804) 698-4000

August 13, 2019

Mr. Jason E. Williams
Director Environmental Services
Dominion Energy
5000 Dominion Boulevard
Glen Allen, VA 23060

Transmitted electronically: jason.e.william@dominionenergy.com

Subject: Dominion Energy (Electric Transmission) – Annual Standards and Specifications for Erosion & Sediment Control and Stormwater Management (AS&S for ESC and SWM)

Dear Mr. Williams:

The Virginia Department of Environmental Quality ("DEQ") hereby approves the Annual Standards and Specifications for Erosion & Sediment Control and Stormwater Management for Dominion Energy (Electric Transmission) dated "May 29, 2019". This coverage is effective from August 13, 2019 to August 12, 2020.

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 separately from this Annual Standards and Specifications submission to DEQ. DEQ may require project-specific plans associated with variance 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
 - i: Project name or project number;
 - ii: Project location (including nearest intersection, latitude and longitude, access point);
 - iii: On-site project manager name and contact info;
 - iv: Responsible Land Disturber (RLD) name and contact info;
 - v: Project description;

Dominion Energy (Electric Transmission) – AS&S for ESC and SWM

August 12, 2019

Page 2 of 2

- vi: Acreage of disturbance for project;
 - vii: Project start and finish date; and
 - viii: Any variances/exceptions/waivers associated with this project.
3. Project tracking of all regulated land disturbing activities (LDA) must be submitted to the DEQ on a bi-annual basis. 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 plan review and approval must be conducted by DEQ-Certified plan reviewers and documented in writing.

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

Thank you very much for your submission and continued efforts to conserve and protect Virginia's precious natural resources.

Sincerely,



Jaime B. Robb, Manager
Office of Stormwater Management

Cc: Amelia Boschen, Amelia.h.boschen@dominionenergy.com
Elizabeth Hester, Elizabeth.l.hester@dominionenergy.com
Stacey Ellis, Stacey.t.ellis@dominionenergy.com

Case Decision Information:

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have thirty days from the date of service (the date you actually received this decision or the date it was mailed to you, whichever occurred first) within which to appeal this decision by filing a notice of appeal in accordance with the Rules of the Supreme Court of Virginia with the Director, Department of Environmental Quality. In the event that this decision is served on you by mail, three days are added to that period.



White Oak Electric Transmission Project

Pre-Application Analysis,
Henrico and Charles City Counties, Virginia
(Redacted)

13 June 2023

Project No.: 0636302

Signature page

13 June 2023

White Oak Electric Transmission Project

Pre-Application Analysis, Henrico and Charles City Counties, Virginia
(Redacted)



Michael B. Langmyer
Architectural Historian



Jeffrey L. Holland
Senior Historian



Jeremy Mastroianni
Data Analytics and Visualization Specialist



Mary Beth F. Derrick
Senior Architectural Historian

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EXECUTIVE SUMMARY

This report presents the findings of the pre-application analysis for Virginia Electric and Power Company's (Dominion Energy Virginia or the Company) proposed White Oak 230 kV Transmission Line Project (Project) in Henrico and Charles City Counties, Virginia. For this Project, the Company proposes to construct and operate the following new facilities:

- Two new overhead 230 kV transmission lines (the Elmont-White Oak Line #2075 and Chickahominy-White Oak Line #2294; collectively, the White Oak Lines) to be installed on double circuit structures in a new 100-foot-wide right-of-way cutting into the Company's existing 230 kV Chickahominy-Elmont Line (#2075); and
- A 0.70-acre expansion of the Company's existing White Oak Substation to accommodate the termination of the White Oak Lines (herein referred to as the White Oak Substation Expansion).

For the White Oak Lines, the Company identified four overhead route alternatives (Routes 1, 2, 3, and 4), as discussed in the Environmental Routing Study that will be attached to the Virginia State Corporation Commission (SCC) application for the Project.

This pre-application analysis assesses and compares potential impacts on previously recorded historic and archaeological resources in relation to each Route Alternative. Impacts from the White Oak Substation Expansion are also considered, although they would be the same for all of the route alternatives. Environmental Resources Management, Inc. (ERM) conducted the analysis on behalf of Dominion Energy Virginia to assist in the development of a feasible Project design that minimizes impacts to historic resources. The pre-application analysis is a required study for transmission line projects regulated by the SCC. The study was completed in accordance with the Virginia Department of Historic Resources' (VDHR's) *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (VDHR 2008) (Guidelines).

Six known archaeological sites are located in the right-of-way of the route alternatives discussed in this study. Two sites are within the right-of-way for Route 1, one site is within the right-of-way for Route 3, and three sites are within the right-of-way for Route 4. There are no archaeological sites within the right-of-way for Route 2. The archaeological sites associated with each route and their current National Register of Historic Places (NRHP) status are summarized in the table below. While no transmission structures are planned to be placed within the boundaries of these sites regardless of the route selected, the sites could be impacted by construction traffic or clearing within the right-of-way. A confident determination regarding the nature of archaeological deposits at each site and impacts on the sites from prior land use activities would require a field survey.

Nine previously recorded historic resources meeting criteria specified in the Guidelines fall within study tiers defined by the VDHR for consideration in the pre-application analysis. Since portions of some route alternatives use common alignments, impacts on several resources would be identical regardless of the route option selected for the Project. The likely impacts on individual historic resources associated with each route are presented in the table below.

Routes 1, 2, and 4 pass near the fewest number of considered historic resources (five each). While Route 3 passes near the largest number of considered resources (seven), the severity of impacts on resources would be the highest for Route 4. ERM recommends that Route 1 would have no impact on two resources and a minimal impact on three; that Route 2 would have no impact on one resource and a minimal impact on four resources; that Route 3 would have no impact on four resources, a minimal impact on one, and a moderate impact on two; and that Route 4 would have no impact on two resources, a minimal impact on two, and a moderate impact on one.

WHITE OAK ELECTRIC TRANSMISSION PROJECT

Pre-Application Analysis, Henrico and Charles City Counties, Virginia (Redacted)

Considering both archaeological and historic resources, Route 2 appears to present the least impact on cultural resources, with no archaeological sites in the right-of-way and only minimal impacts on four historic resources. Route 4 appears to present the greatest impact on cultural resources, with three archaeological sites in the right-of-way, including one that has not been evaluated for NRHP eligibility, and minimal impacts on one and moderate impacts on two historic resources.

Executive Summary of National Register Status of Considered Archaeological Resources in the Study Area of the Route Alternatives

Considered Resource	Route Alternatives			
	White Oak Lines			
	Route 1	Route 2	Route 3	Route 4
44HE0683	Not Eligible	-	-	-
44HE0898	-	-	Not Evaluated	-
44HE0702	-	-	-	Not Evaluated
44HE0704	-	-	-	Not Eligible
44HE0708	Not Eligible	-	-	-
44HE0923	-	-	-	Not Eligible

Executive Summary of Project Impacts to Considered Aboveground Historic Resources in the Study Area of the Route Alternatives

Considered Resource	Route Alternatives			
	White Oak Lines			
	Route 1	Route 2	Route 3	Route 4
042-5017	Minimal	Minimal	None	-
043-0078	-	-	Moderate	-
043-0288	-	-	None	-
043-0308	Minimal	Minimal	Moderate	Minimal
043-5074	-	-	-	None
043-5077	Minimal	Minimal	None	Moderate
043-5080	None	None	None	None
043-5081	None	Minimal	Minimal	-
121-5134	-	-	-	Minimal

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Acronyms and Abbreviations

Name	Description
3D	three dimensional
ABPP	American Battlefield Protection Program
CMOS	complementary metal–oxide–semiconductor
CWSAC	Civil War Sites Advisory Commission
EDA	Economic Development Authority
ERM	Environmental Resources Management Inc.
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	mile post
MVA	megavolt-amperes
NHL	National Historic Landmark
NPS	National Park Service
NERC	North American Electric Reliability Corporation
NRHP	National Register of Historic Places
PBR	physically based rendering
PDF	portable document format
Project	White Oak Electric Transmission Project
RAW	an unprocessed image
SCC	State Corporation Commission
SLR	single-lens reflex
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VAH	Vienna Finance, Inc., Atlantic Crossing, LLC, and Hourigan Development, LLC
VCRIS	Virginia Cultural Resource Information System
VDHR	Virginia Department of Historic Resources
VLR	Virginia Landmarks Register
WOTP	White Oak Technology Park
WPA	Works Progress Administration

INTRODUCTION

This report presents the findings of the pre-application analysis prepared by Environmental Resources Management, Inc. (ERM) on behalf of Virginia Electric and Power Company (Dominion Energy Virginia or the Company) for the proposed White Oak Electric Transmission Project (Project) in Henrico and Charles City Counties, Virginia. This project consists of the following proposed facilities, which are designed to a) relieve identified violations of North American Electric Reliability Corporation (NERC) reliability standards beginning in the Winter 2023/2024 timeframe, b) maintain the structural integrity and reliability of the Company's transmission system for the overall growth in the Project area:

- Two new overhead 230 kV transmission lines (the Elmont-White Oak Line #2075 and Chickahominy-White Oak Line #2294; collectively, the White Oak Lines) to be installed on double-circuit structures in a new 100-foot-wide right-of-way; and
- A 0.70-acre expansion of the Company's existing White Oak Substation to accommodate the termination of the White Oak Lines (the installation of three 230 kV 4000A breakers; herein referred to as the White Oak Substation Expansion).

The White Oak Lines would extend generally west from a cut-in along the Company's existing 230 kV Chickahominy-Elmont Line to connect to the White Oak Substation Expansion, which is needed to accommodate future load growth in the White Oak Load Area. As discussed in more detail below, several route alternatives for the White Oak Lines are currently under consideration.

In developing potential route alternatives for the White Oak Lines, the Company considered the following: (1) the facilities required to construct and operate the new infrastructure; (2) the length and width of new right-of-way that would be required for the Project; (3) the potential for impacts on environmental and cultural resources, visual resources, and communities; and (4) cost.

The pre-application analysis assesses potential impacts on previously recorded historic and archaeological resources relative to each Route Alternative. Impacts from the White Oak Substation Expansion are also considered, although they would be the same for all of the route alternatives. 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).

Overview

Four route alternatives (Routes 1, 2, 3, and 4) were under consideration for the new overhead transmission lines. A map depicting each Route Alternative and the existing White Oak Substation is provided as Figure 1.1-1.

Route 1

Route 1 originates at a cut-in location along Line #2075 between Structures #2075/159 and #2075/160 in the area east of White Oak Road and south of East Williamsburg Road. From there, the route heads southeast for about 0.23 mile, then southwest for 0.26 mile, passing east and south of a horse farm along White Oak Road. It then continues to the south/southwest for about 0.43 mile along a private road towards a crossing of White Oak Road. On the west side of White Oak Road, Route 1 turns and continues west for about 0.21 mile, then heads southwest towards Elko Road for about 0.66 mile. After crossing the road, the route enters Henrico County Economic Development Authority (EDA)-owned land in the White Oak Technology Park (WOTP), before turning sharply northwest to parallel the west side of

Elko Road for about 0.26 mile. From there, it heads west/southwest for about 0.82 mile, crossing Engineered Wood Way, paralleling a short segment of existing sewer line easement, and crossing Canal Swamp. At Technology Boulevard, Route 1 turns northeast to parallel the east side of the boulevard for about 0.48 mile, crossing Technology Creek Drive. It then heads west for about 0.23 mile, exiting the Henrico County EDA-owned land in the WOTP and crossing and paralleling a short segment of Technology Boulevard near an intersection with Elko Tract Road. From there, the route heads southwest then south for about 0.44 mile, spanning a pond in two locations. It then turns and continues south for about 0.15 mile terminating on the west side of the expanded White Oak Substation. In total, Route 1 measures approximately 4.19 miles in length.

Route 2

Route 2 originates at a cut-in location along Line #2075 between Structures #2075/157 and #2075/158 near the intersection of White Oak Boulevard and East Williamsburg Road. From there, the route heads to the south/southwest for about 0.34 mile, crossing Old Williamsburg Road. It then continues to the west/southwest for about 0.50 mile in the area approximately between Old Williamsburg Road to the north and Monaco Drive to the south. Route 2 then continues to the southwest for about 0.79 mile, crossing land owned by the Henrico County School Board east of Elko Road. The route parallels the southeasternmost edge of the School Board property line, passing about 170 feet southeast of Elko Middle School. After crossing Elko Road, the route continues southwest for about 0.88 mile, crossing land owned by the Henrico County EDA within the WOTP as well as a developed parcel containing the Company's existing Technology Substation. This segment of the route additionally passes near a future memorial site and cemetery for the Garthright-Fisher families. After crossing Technology Boulevard, Route 2 follows the same alignment as Route 1 for 0.71 mile to its terminus at the expanded White Oak Substation. In total, Route 2 measures approximately 3.24 miles in length.

Route 3

Route 3 originates at a cut-in location along Line #2075 between Structures #2075/150 and #2075/151 in the area east of Crib Lane and north of the Norfolk Southern Railroad. From there, Route 3 heads southwest for about 0.98 mile to a point just west of the intersection of the railroad and Meadow Road. The route then turns and heads west for about 0.66 mile, paralleling the south side of the railroad tracks. It next turns and heads south (away from the railroad) for about 0.68 mile, crossing I-64 and Old Williamsburg Road. The route then heads southeast for about 0.42 mile, crossing East Williamsburg Road, then southwest for about 0.83 mile, generally parallel to Boar Swamp. This segment of the route (i.e., the area approximately between Old Williamsburg Road and Technology Boulevard) crosses the future Vienna Finance, Inc., Atlantic Crossing, LLC, and Hourigan Development, LLC (VAH) data center campus development. The route then heads southeast for about 0.51 mile, paralleling the east side of Technology Boulevard. At a point just east of Techpark Place, the route turns and heads south for 0.18 mile, crossing Technology Boulevard. The route then follows the same alignment as Route 1 for 0.41 mile to its terminus at the expanded White Oak Substation. In total, Route 3 measures approximately 4.69 miles in length.

Route 4

Route 4 originates at a cut-in location along Line #2075 between Structures #2075/150 and #2075/151 in Charles City County near White Oak Swamp. From there, the route heads west for about 0.07 mile, entering Henrico County approximately 300 feet west of the cut-in location. The route then turns and heads southwest for about 0.32 mile to a crossing of the CSX Railroad right-of-way. Route 4 next turns and continues west for about 1.28 miles mostly parallel and adjacent to the south side of the railroad right-of-way, across White Oak Swamp. At a point just east of Elko Road, the route turns and heads

southwest away from the railroad for about 0.41 mile to avoid residences along the road as well as the Elko Game Preserve. At the intersection of Elko Road and Hughes Road, Route 4 turns and continues for 0.50 mile to the west before heading about 0.69 mile to the northwest to an intersection with the CSX Railroad right-of-way. The route then parallels the south side of the railroad tracks for 1.39 miles across White Oak Swamp, crossing the Company's existing right-of-way for Lines #2091 and #286 about 0.60 mile south of Portugee Road. After crossing to the north side of the tracks, Route 4 continues to the north/northwest for about 1.07 miles, crossing Portugee Road. The route then turns sharply southeast and continues for 0.07 mile, then follows the same alignment as Route 1 for about 0.15 mile east to a terminus on the west side of the expanded White Oak Substation. In total, Route 4 measures approximately 5.94 miles in length.

Management Recommendations

Six known archaeological sites are located in the right-of-way of the route alternatives discussed in this study. Two sites are within the right-of-way for Route 1, one site is within the right-of-way for Route 3, and three sites are within the right-of-way for Route 4. There are no archaeological sites within the right-of-way for Route 2. While no transmission structures for the routes are planned to be placed within any of the site boundaries, the sites could be impacted by construction traffic or clearing within the right-of-way depending on the route selected for the Project. A confident determination regarding the nature of archaeological deposits at each site and impacts on the sites from prior land use activities would require a field survey.

Nine previously recorded historic resources meeting criteria specified in the Guidelines fall within study tiers defined by the VDHR for consideration in the pre-application analysis. Routes 1, 2, and 4 pass near the fewest (five each) considered historic resources. While Route 3 passes near the largest number of considered resources (seven), the severity of impacts are the highest for Route 4. ERM recommends that Route 1 would have no impact on two resources and a minimal impact on three; that Route 2 would have no impact on one resource and a minimal impact on four resources; that Route 3 would have no impact on four resources, a minimal impact on one, and a moderate impact on two; and that Route 4 would have no impact on two resources, a minimal impact on two, and a moderate impact on one.

Based on the above discussion, ERM recommends that Route 4 would have the greatest impact on previously recorded archaeological and historic resources. There are three archaeological sites in the right-of-way of Route 4, including one that has not been evaluated to determine its National Register of Historic Places (NRHP) eligibility. Additionally, of five considered historic resources, there would be no impact on two, a minimal impact on one, and a moderate impact on two. Conversely, ERM recommends that Route 2 appears to present the least impact on cultural resources, with no archaeological sites in the right-of-way and only minimal impacts on four historic resources. The remaining route options have impacts between those of Routes 2 and 4. In the case of Route 3, there is one archaeological site in the right-of-way that is not evaluated for NRHP eligibility, and the route would have minimal impact on one historic resource and moderate impact on two resources. In the case of Route 1, there are two archaeological sites in the right-of-way (considered not eligible for the NRHP), and the route would have minimal impact on three historic resources. More information about each resource and the nature of potential impacts for the various route alternatives are found in the sections that follow.

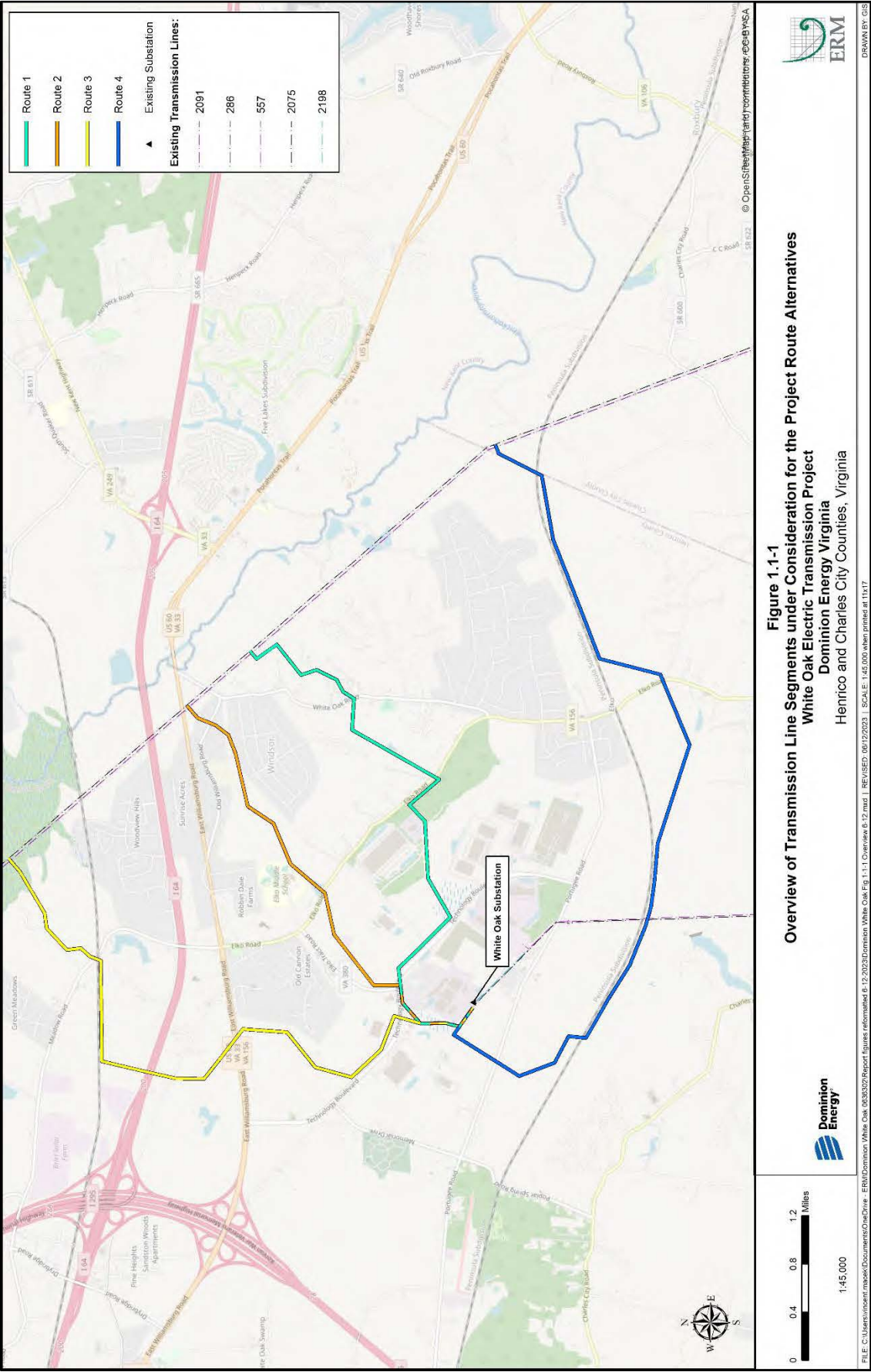


Figure 1.1-1: Overview of Transmission Line Segments under Consideration for the Project Route Alternatives

RECORDS REVIEW

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 alternative route.

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

In addition to the VCRIS, ERM reviewed information from the Henrico County Historical Society (2023) and the Charles City County Richard M Bowman Center for Local History (2023). ERM also collected information on battlefields surveyed and assessed by the National Park Service's (NPS) American Battlefield Protection Program (ABPP). No additional resources (locally significant sites and ABPP study areas, Core Areas, or potential NRHP boundaries for battlefields) were identified within the relevant study tiers for the various route alternatives, beyond those included in the VCRIS.

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 and three dimensional (3D) aerial renderings were then prepared to assess the potential for visual impacts from the new transmission infrastructure on the resources. For previously recorded archaeological sites under consideration, aerial photographs were examined to assess the current land condition and the spatial relationship between the sites and any existing or planned transmission lines.

Archaeological Resources

Crossings of archaeological sites were considered a constraint in this study due to the potential for an electric transmission line to impact archaeological deposits in these areas (for example, due to transmission structure placement, tree clearing, or heavy equipment traffic within a site). The known archaeological sites in the right-of-way for each alternative transmission line route are summarized in Table 2.2-1 and their locations are depicted on Figure 2.2-1. Individual maps for each alternative route are provided in Attachment 1.

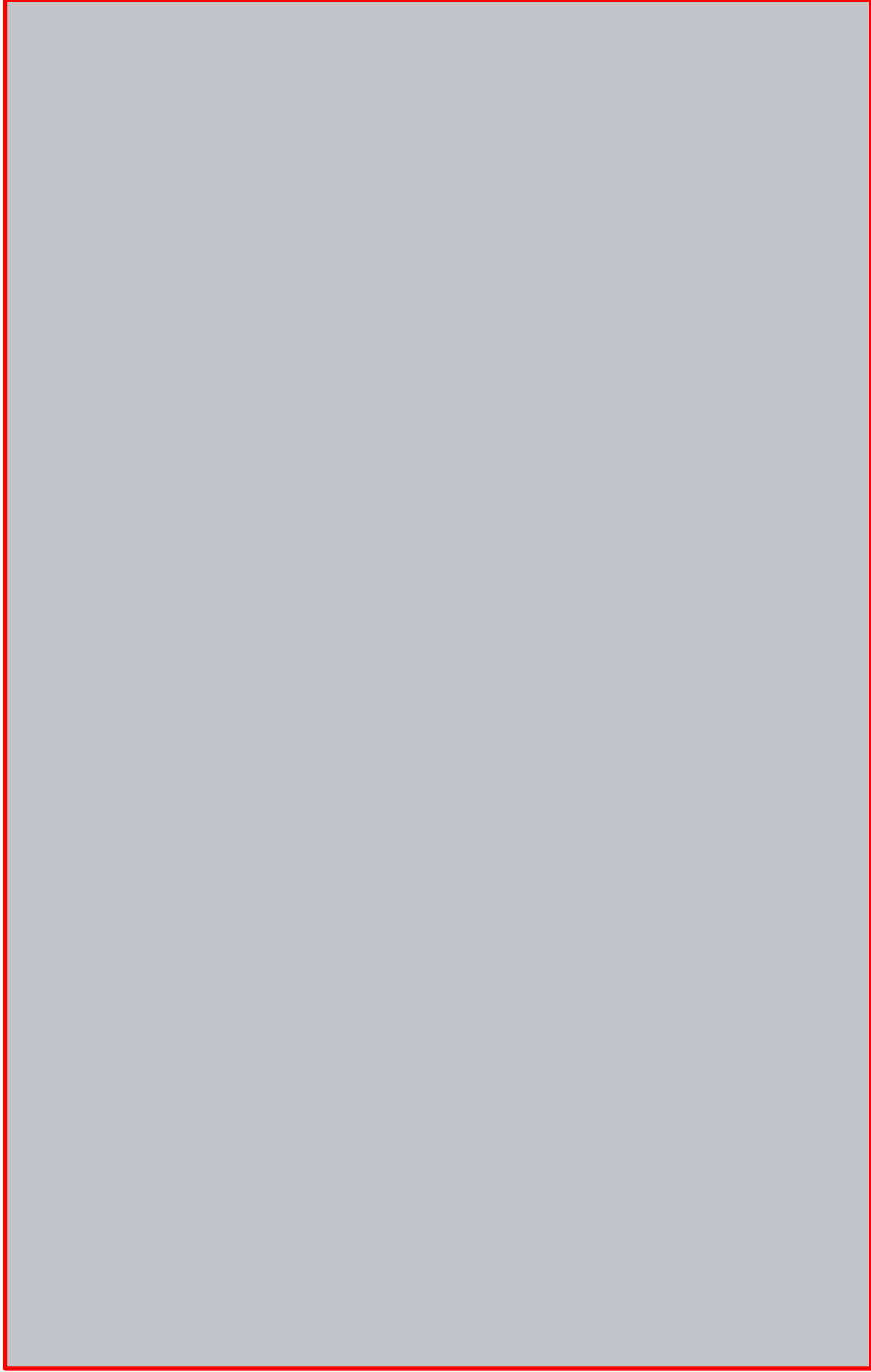
Of the six previously recorded sites within the right-of-way for the various route alternatives, four are not eligible for the NRHP and two are currently unevaluated with respect to NRHP eligibility. A confident and complete assessment of the current integrity and condition of each site would require archaeological field investigations, which would be completed for the approved alternative in a subsequent phase of studies for the Project.

WHITE OAK ELECTRIC TRANSMISSION PROJECT**RECORDS REVIEW**

Pre-Application Analysis, Henrico and Charles City Counties, Virginia (Redacted)

Table 2.2-1: Archaeological Resources in the Right-of-Way of Route Alternatives

Route Alternative	Greenfield or Existing/Expanded Right-of-way?	Site Number	Description	NRHP Status
Route 1	Greenfield Alignment	44HE0683	Decoy Airfield (1925-1949)	Not Eligible
	Greenfield Alignment	44HE0708	Farmstead (1925-1949)	Not Eligible
Route 2	-	-	-	-
Route 3	Greenfield Alignment	44HE0898	Dwelling (20 th Century)	Unevaluated
Route 4	Greenfield Alignment	44HE0702	Camp, temporary (Prehistoric)	Unevaluated
	Greenfield Alignment	44HE0704	Cemetery (1900-1939) and farmstead (1900-1999)	Not Eligible
	Greenfield Alignment	44HE0923	Camp, temporary (Pre-Contact)	Not Eligible



**Figure 2.2-1: Locations of Archaeological Resources within the Right-of-Way for Each Route Alternative
(Redacted)**

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 locations of the considered historic resources and the route alternatives are shown on Figure 2.3-1. Individual maps for each Route Alternative are presented in Attachment 1.

The resources located within the rights-of-way for the route alternatives 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 outside the proposed right-of-way would be subject only to viewshed effects. In the 0.5-mile tier, for example, resources may 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.

Both because portions of the route alternatives share common alignments and because of the large size of several resources considered in the study, some of the same cultural resources would be impacted by different routes. The nature of the impacts, while estimated in this study with the assistance of photo simulations, will depend on the final Project design in which the exact placement and height of transmission structures is determined. Moreover, a complete, identification-phase historic architectural survey would be completed along the route approved by the SCC for the White Oak Lines. The survey area for that investigation would be based on the height of the transmission line structures as well as topography, tree cover, and any other factors impacting the line-of-sight from historic resources to the selected route.

Route 1

The considered resources that lie within the VDHR study tiers for Route 1 are presented in Table 2.3-1 and depicted in Attachment 1, Sheet 1. Five aboveground historic properties were identified within the VDHR tiers for Route 1. The five considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

Table 2.3-1: Historic Resources in the VDHR Study Tiers for Route 1

Buffer (miles)	Resource Category	Resource Number	Description
0.5 to 1.0	National Register - potentially eligible	043-5080	Second Deep Bottom Battlefield
0.0 to 0.5	National Register - eligible	043-5081	Seven Pines Battlefield
0.0 (within right-of-way)	National Register - eligible	043-0308	Savage Station Battlefield
	National Register- potentially eligible	042-5017	Second Cold Harbor Battlefield
		043-5077	Glendale Battlefield

Note: The White Oak Substation Expansion did not add any additional cultural resources to the analysis of Route 1.

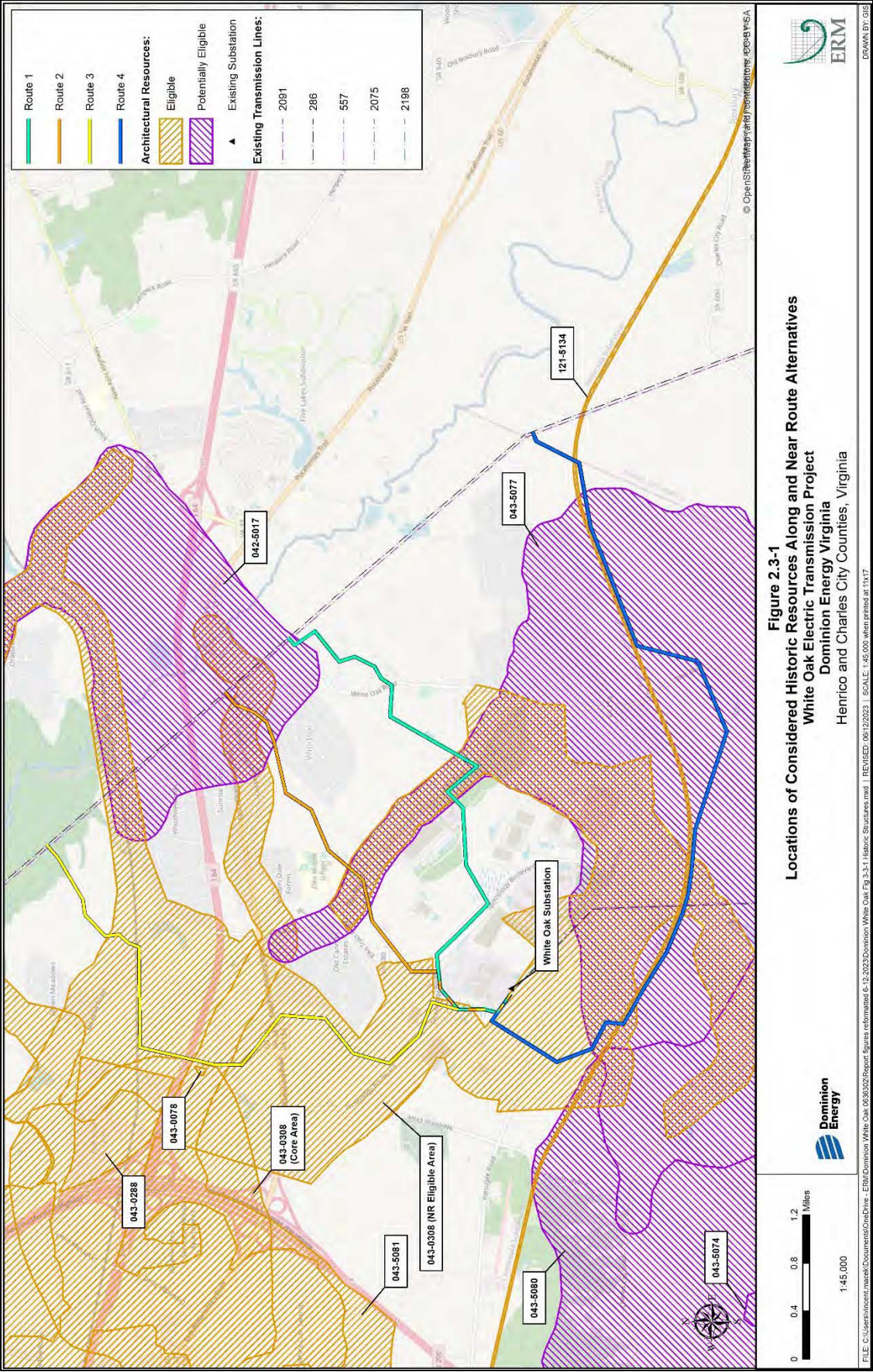


Figure 2.3-1: Locations of Considered Historic Resources Along and Near Route Alternatives

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RECORDS REVIEW**Route 2**

The considered resources that lie within the VDHR study tiers for Route 2 are presented in Table 2.3-2 and depicted in Attachment 1, Sheet 2. Five aboveground historic properties were identified within the VDHR tiers for Route 2. The five considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

Table 2.3-2: Historic Resources in the VDHR Study Tiers for Route 2

Buffer (miles)	Resource Category	Resource Number	Description
0.5 to 1.0	National Register - potentially eligible properties	043-5080	Second Deep Bottom Battlefield
0.0 (within right-of-way)	National Register - eligible	043-0308	Savage Station Battlefield
		043-5081	Seven Pines Battlefield
	National Register - potentially eligible	042-5017	Second Cold Harbor Battlefield
		043-5077	Glendale Battlefield

Note: The White Oak Substation Expansion did not add any additional cultural resources to the analysis of Route 2.

Route 3

The considered resources that lie within the VDHR study tiers for Route 3 are presented in Table 2.3-3 and depicted in Attachment 1, Sheet 3. Seven aboveground historic properties were identified within the VDHR tiers for Route 3. The seven considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

Table 2.3-3: Historic Resources in the VDHR Study Tiers for Route 3

Buffer (miles)	Resource Category	Resource Number	Description
0.5 to 1.0	National Register - potentially eligible	043-5080	Second Deep Bottom Battlefield
0.0 to 0.5	National Register - eligible	043-0078	Cedar Knoll
		043-0288	Savage Station Farm and Cemetery
	National Register - potentially eligible	042-5017	Second Cold Harbor Battlefield
		043-5077	Glendale Battlefield
0.0 (within right-of-way)	National Register - eligible	043-0308	Savage Station Battlefield
		043-5081	Seven Pines Battlefield

Note: The White Oak Substation Expansion did not add any additional cultural resources to the analysis of Route 3.

Route 4

The considered resources that lie within the VDHR study tiers for Route 4 are presented in Table 2.3-4 and depicted in Attachment 1, Sheet 4. Five aboveground historic properties were identified within the VDHR tiers for Route 4. The five considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

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RECORDS REVIEW**Table 2.3-4: Historic Resources in the VDHR Study Tiers for Route 4**

Buffer (miles)	Resource Category	Resource Number	Description
0.5 to 1.0	National Register - eligible	043-5074	First Deep Bottom Battlefield
0.0 to 0.5	National Register - potentially eligible	043-5080	Second Deep Bottom Battlefield
0.0 (within right-of-way)	National Register - eligible	043-0308	Savage Station Battlefield
		043-5077	Glendale Battlefield
		121-5134	Chesapeake and Ohio Railroad

Note: The White Oak Substation Expansion did not add any additional cultural resources to the analysis of Route 4.

Previous Surveys

Portions of the various route alternatives have previously been surveyed for cultural resources. Thirty previous cultural resource surveys are located within the prescribed VDHR tiers of study. Information on these previous surveys—including VDHR survey number, report title, report authors, and report date—is provided in Table 2.4-1. The extent of the previous survey coverage is depicted on maps provided in Attachment 2. Below is a summary of the survey coverage as it pertains to the route alternatives discussed in the study:

- Nine previous surveys covered the White Oak Substation and the surrounding area. These surveys include archaeological studies of the Elko Tract (HE-132, HE-144, HE-146), gravity sewer pumps (HE-145), Dominion Energy Virginia corridor options (HE-122), White Oak semiconductor tract (HE-142), evaluations of the former Hood Estate (HE-122, HE-228), and the proposed Memorial Drive expansion (HE-130). All four route options overlap portions of these nine previous survey areas.
- One previous survey was associated with a sewer and pump station in Henrico County (HE-219). Routes 1 and 2 each cross this survey area.
- One previous survey was associated with work on Interstate 95 west of the Project area (HN-079). None of the route alternatives cross the survey area.
- Two previous surveys were completed around the intersection of Interstate 295 and Interstate 95, with one survey associated with the Briel Farm Solar Project, where the previously recorded Savage Station Farm and Cemetery (043-0288) is located (HE-358). The other survey was conducted on the Harmon-Hayes Property (HE-143). None of the route alternatives cross the survey area.
- Three surveys were clustered around the intersection of Interstate 295 and Interstate 64 and farther south along Interstate 295. The two near the interchange of the two interstates (HE-039 and HN-011) were archaeological reconnaissance investigations of Interstate 295, while the third (HE-072) was conducted on Interstate 95 in Henrico, Chesterfield, and Prince George Counties. None of the route alternatives cross the survey areas.
- Three surveys focused on Interstate 64 in and around the Project area. Two were archaeological surveys completed for improvement projects to Interstate 64, including improvements to the roadway through Henrico and New Kent Counties (NK-013) and the widening of approximately 2.5 miles along the highway in Henrico County (HE-381). Route 3 intersects both the NK-013 and HE-381 survey areas where the route crosses over Interstate 64. The third survey occurred

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Pre-Application Analysis, Henrico and Charles City Counties, Virginia
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RECORDS REVIEW

farther east (NK-032) between Interstate 64 and Interstate 95. None of the route alternatives cross the survey area.

- Seven previous Phase I surveys were completed in an area east of the Company's existing right-of-way for Lines #2075 and #557. Three of the surveys were near or related to the Patriot's Landing development (NK-019, NK-029, NK-045). Two previous surveys were farther south and associated with a wetland mitigation (NK-014) and a survey on the Cunningham Tract (NK-021). The last survey east of the existing right-of-way for Lines #2075 and #557, associated with the Phillip Nase site (HE-002), occurred on the opposite side of Route 3. None of the route alternatives cross these survey areas.
- The survey area for HE-438 is closest to Route 4. It was an archaeological survey conducted for the Bridleton Solar Project in Henrico County. None of the route alternatives cross the survey area.

Table 2.4-1: Cultural Resource Surveys Covering Portions of the Route Alternatives

VDHR Survey #	Title	Author(s)	Date
HE-002	The Phillip Nase Site, 44HE1, Henrico County, Virginia	Howard A. MacCord	1963
HE-039	An Archeological Reconnaissance of Route 295, Richmond, Virginia	Lawrence Lindberg	1975
HE-072	Phase I Archaeological Survey I-95, Henrico, Chesterfield, and Prince George Counties, Virginia	Wesley R. Stinson, Thomas R. Wheaton, Jr.	1982
HE-122	Phase I Archaeological Investigations for the Proposed Virginia Power Utility Corridor, Henrico County, Virginia	Carol D. Tyrer, Martha McCartney, Alain C. Outlaw	1997
HE-130	Phase I and Phase II Archaeological Investigations for the Proposed Memorial Drive Extension, Henrico County, Virginia	Carol D. Tyrer, Martha McCartney, Alain C. Outlaw	1997
HE-132	An Archaeological Investigation of the Elko Tract, Henrico County, Virginia	Charles J. Rinehart, Phillip E. Pendleton	1998
HE-142	Phase I and Phase II Archaeological Investigations for Five Permit Areas at the White Oak Semiconductor Tract, Henrico County, Virginia	Carol D. Tyrer, Martha McCartney, Alain C. Outlaw	1997
HE-143	Phase I Cultural Resources Survey of the Harmon-Hayes Property, Henrico County, Virginia	Bradley Bowden, Ashley Neville, Robyn Osl	2001
HE-144	Phase I Archaeological Reconnaissance Survey of The Elko Tract, Henrico County, Virginia	Lyle Browning	1989
HE-145	Phase I Archaeological Survey of a Gravity Sewer Line, Force Main and Pump Station Location in Eastern Henrico County, Virginia	Douglas C. McLearn, Christopher P. Egghart	1996
HE-146	Phase I Archaeological Reconnaissance Survey, Proposed Public Safety Complex, Elko Tract, Henrico County, Virginia	Lyle Browning	1989

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VDHR Survey #	Title	Author(s)	Date
HE-158	Archaeological Identification Survey Associated with the Proposed Ponderosa Drive Tract Capital Outlay Project, Henrico County, Virginia	John R. Underwood, Stevan C. Pullins	1999
HE-210	Phase I Archaeological Survey for Approximately 113 Acres at the Former Hood Property, Henrico County, Virginia	Nancy Phaup, Martha McCartney, Carol Tyrer	2006
HE-219	Phase I Archaeological Survey for the Henrico County Sewerline and Pump Station, Henrico County, Virginia	Nancy Phaup, Martha McCartney, Carol Tyrer	2006
HE-228	Phase I Archaeological Survey for Approximately 105 Acres at the Former Hood Property, Henrico County, Virginia	Nancy Phaup, Martha McCartney, Carol Tyrer	2006
HE-358	Phase I Cultural Resources Survey of the Briel Farm Solar Project, Henrico County, Virginia	David H. Dutton, Robert J. Taylor, Jr.	2017
HE-381	An Archaeological Survey of Approximately 2.5 Miles Associated with Segment A of the Interstate 64 Widening Project, Henrico County, Virginia	Brynn Stewart, Ellen Brady	2016
HE-438	Phase I Cultural Resource Survey of the 105-Hectare (260-Acre) Bridleton Solar Project Area, Henrico County, Virginia	David H. Dutton, Robert Taylor, Dara Friedberg	2021
HN-011	Second Archaeological Reconnaissance of Route 295, Richmond, Virginia	Ray Sasser	1976
HN-079	Phase I Cultural Resources Survey of the Elmont-Chickahominy 230kV Line from the Old Church Substation in Hanover County to the Chickahominy Substation in Charles City County	Ellen M. Brady, Joshua Lay, John P. Cooke	2004
NK-004	Review and Compliance Phase I Reconnaissance Summary, Citizens and Farmers Bank, Quinton Branch, New Kent County, Virginia	Keith Bott	1980
NK-013	Archaeological Survey of Proposed Improvements to Interstate 64, Henrico and New Kent Counties, Virginia	Erica Jeter	2002
NK-014	Phase I Archaeological Survey of Proposed and Potential Wetlands Mitigation Areas on Capital Region Airport Commission Property in New Kent County, Virginia	Douglas C. McLearn, Matthew R. Laird, R. Taft Kiser, Carol D. Tyrer	1999
NK-017	Phase I Archaeological Survey of the Capital Region Airport Commission Property in New Kent County, Virginia	Bradley M. McDonald, David M. Givens, Martha McCartney	1995
NK-019	Phase I Cultural Resources Survey for the Proposed Patriot's Landing Development, New Kent County, Virginia	Dane Magoon, Jocelyn Pitts	2005
NK-021	Phase I Archaeological Survey for Approximately 14 Acres at the Cunningham Tract, New Kent County, Virginia	Nancy Phaup, Martha McCartney, Carol Tyrer	2006
NK-029	Phase I Cultural Resources Survey of Bicounty Way Property, New Kent County, Virginia	Amy Humphries, Dawn Frost, Carol Tyrer	2010

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Pre-Application Analysis, Henrico and Charles City Counties, Virginia
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VDHR Survey #	Title	Author(s)	Date
NK-032	A Phase I Archaeological Survey of Selected Areas within the Interstate 64 Peninsula Study from Interstate 664 in Hampton to Interstate 95 in Richmond, Virginia	Marco González, Carthon Davis, III, Michael Carmody	2012
NK-033	Archaeological Survey of the Route 613 Widening Project, New Kent County, Virginia	Elizabeth Bell, Elizabeth Monroe	2013
NK-045	Phase I Cultural Resources Survey of Permit Areas within the Bottoms Bridge Tract, New Kent County, Virginia	Aaron Levinthal, Dawn M. Frost, Carol D. Tyrer	2008

STAGE I PRE-APPLICATION ANALYSIS FINDINGS

Methods for Analysis

Fieldwork for the pre-application analysis was conducted by Secretary of the Interior Qualified architectural historians Emily Dodson and MacKenzie Carroll between April 20 and April 25, 2022. Additional fieldwork was completed between October 14 and October 16, 2022, by Secretary of the Interior Qualified architectural historians Emily Dodson and Michael Langmyer, and January 3 through January 8, 2023, by Emily Dodson and MacKenzie Carroll. The fieldwork involved photographing nine resources requiring visual assessment according to the Guidelines and examining potential line-of-sight views from each resource toward the route alternatives. For resources where property owner approval was granted for historic resource documentation, photographs were taken toward the Route Alternative(s) from the property at the most prominent view of the landscape. When permission to access such locations was not available, photographs were taken from the public right-of-way (typically a road) nearest to the resource facing toward the applicable route(s).

Panoramic photographs were taken from each resource, with an effort to capture the direction with the clearest, most unobstructed view toward the applicable route or routes. The precise location of the photograph was captured with a mobile tablet device connected to a sub-meter accurate Global Navigation Satellite System (GNSS) receiver, the Trimble R1. The locations where photographs were taken were noted as Key Observation Points (KOPs). Site visits to the KOPs were prioritized based on their location relative to the resource, so that viewpoints east of the resource were visited in the morning and viewpoints west of the resource were visited in the afternoon. This helped ensure, where possible, that the sun was behind the photographer at the time the viewpoint photography was captured. Additionally, minor adjustments to position were made to obtain as clear a view to the site center as possible, avoiding trees, landscaping, or built obstructions. Tablets recorded the center bearing, angle of view, altitude, and camera lens height. Upon receipt of the viewpoint location information, the viewpoints were plotted onto open source mapping from the Environmental Systems Research Institute (ESRI) using the Universal Transverse Mercator (UTM) 18N coordinate system.

The process of taking panoramas included setting up the tripod and camera. The camera was placed on the panoramic head in a landscape orientation where its lens height was confirmed and set at 1.5 meters (note: a portrait camera orientation was sometimes used in situations where the viewpoint is very close to a development so that the top of the development is not cut off by the image boundaries). The tripod head and camera combination were then leveled. With the camera's viewfinder centered on the perceived site center, exposure and focus settings were taken. These were then fixed manually on the camera so that they could not be inadvertently altered. The head was rotated 90 degrees to the left where the first frame of the 360-degree sequence was then taken. Each subsequent frame was taken using a 50 percent overlap of the previous frame until the full 360-degree sequence was captured. The camera was then

removed from the tripod and a viewpoint location photograph was captured showing the tripod in its position.

The following camera and tripod configuration was used:

- Camera body: Nikon D800 professional specification digital SLR (full frame CMOS sensor)
- Camera lens: Nikkor AF 50mm f1.8 prime
- Tripod: Manfrotto 055MF4 with Manfrotto 438 ball leveller
- Panoramic head: Manfrotto 303SPH

The following camera settings were used for all photography:

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

After the photos were complete, they were uploaded to a server to begin the simulation/visualization process. The single-frame photographs were opened in Adobe Photoshop CC 2022 where they were checked and any camera sensor dust spots were removed before being saved as high-resolution JPEG images. If required, discrete color and tonal adjustments were made to each frame before they were saved. The single-frame photographs were stitched together in PTGui Pro version 12.11 professional photographic stitching software using cylindrical projection settings. The camera locations were plotted in Global Mapper version 23.1. Digital models of the transmission line structures were provided by Dominion Energy Virginia, then edited for visualization and textured in Autodesk 3DS Max 2021. The position of each structure was provided by Dominion Energy Virginia for Routes 2 and 3. For the other routes, typical spacing was provided by Dominion Energy Virginia, and iToo RailClone for Autodesk 3DS Max 2021 was used to project structure locations. The transmission structures along each route were rendered in Vray version 5.2 from each KOP camera location. 3D imagery was produced at the field of view using camera matching. Renderings for each route and each transmission line structure combination were then exported for use as an overlay.

Detailed, correctly dimensioned 3D computer models of the transmission structures along each route were generated using Autodesk 3DS Max 2021 and iToo RailClone. The virtual 3D model of the structures was created using real-world measurements and elevation drawings provided by the Company. These were textured using Vray PBR materials to simulate the weathering steel texture of the proposed structures. The detailed, textured models were rendered to a digital image using a simulated physical camera and a sun and sky simulation lighting model in the computer software consistent with conditions within the original viewpoint photography.

Photomontages were produced by overlaying the rendered image on the photograph, using known control points and the wireline imagery showing the tower columns at the correct height and distance. Final adjustments were then made to the brightness and contrast of the rendered images to match them to the photograph. Final photomontages were prepared from each viewpoint for each route. These were then opened in Adobe Photoshop CC 2022 where minor changes were made such as placing relevant tree/building/hedge screening or telegraph wires over the proposed development renders where necessary. The final images were then cropped to the proportions required for the visual simulation figures, and the visualization figures were prepared in Adobe InDesign CC2022 and exported in a PDF format.

Four simulations were completed through aerial 3D rendering, as those resource locations could not be accessed due to the proximity of the route to the resource. An existing conditions 3D model of the study area, including terrain, generic vegetation, and simple generic structures, were created from publicly

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available GIS data. The 3D model was geo-referenced and compiled with aerial imagery and GIS USGS 3DEP Elevation data. Structures, vegetation clusters, and skylines were cross-referenced with aerial imagery to ensure an accurate representation of scale and placement within the 3D rendering. In addition, atmospheric data were imported into the 3D model to develop a sun and atmospheric system that matches the location-specific reference data. Based on computer-aided design, GIS, and transmission line systems computer-aided design data provided by the client, a 3D model of the Project was constructed. All information was imported into the 3D existing conditions model using the same geo-references and projections and then validated for accuracy. 3D materials and associated specular reflectance information were applied to the proposed 3D information. Easement right-of-way expansion was created by deleting 3D trees that fall within this expansion from the existing conditions model. After all of the information was properly aligned, atmospherics checked, and materials applied, the 3D information was then rendered using highly accurate raytraced render engines. Cameras for each location were placed several hundred feet in the air to best show the complete area. A 3D north arrow was placed to easily depict the direction of each view. Finally, photo editing software was used to color-correct the final images and export them in a PDF format. It should be noted that the resources that are impacted by these renderings do not show up on the simulation itself as the resource covers the entire frame of the simulation and detracts from the overall visual aid these renderings provide.

Structure Types and Right-of-Way Widths

The Company proposes to use primarily double circuit weathering steel monopoles for the White Oak Lines, which will be constructed within a new right-of-way measuring predominantly 100 feet in width. Within the existing 230 kV Chickahominy-Elmont Line #2075 right-of-way, the Company will install two new single circuit three-pole structures to support the proposed 230 kV Elmont-White Oak Line #2075 and the proposed 230 kV Chickahominy-White Oak Line #2294. In order for the conductors to meet clearance requirements when passing beneath the existing 500 kV Chickahominy-Elmont Line #557 that is collocated with Line #2075 in the existing transmission corridor, the width of the White Oak Lines corridor will gradually taper from 180 feet to a 100-foot-wide right-of-way for a total approximately 0.06 mile. The first 0.025 mile will begin at the structure cut-in location in the existing right-of-way and continue to the edge of the existing right-of-way. From the edge of the existing right-of-way, the proposed White Oak Lines will continue to gradually decrease to a 100-foot-wide right-of-way for approximately 0.035 mile. At the cut-in location on Line #2075 between Structures #2075/150 and #2075/151, existing Structure #2075/150 (a double circuit 230 kV weathering steel H-frame structure that is currently supporting only one circuit) will be removed and replaced with two new 230 kV single circuit weathering steel three-pole structures (proposed Structures #2075/150 and #2294/150).

The proposed structures will be located within the existing transmission corridor and are estimated to be within 20% of the existing structure heights. The conductors for the White Oak Lines will begin in a horizontal configuration at the cut-in location (using the two new single circuit three-pole structures installed side-by-side) then pass under the existing Line #557. Within that 0.06-mile segment, the White Oak Lines will transition from horizontal arrangement (using two single circuit H-frame structures installed side-by-side) to vertical arrangement (using one double circuit monopole). As the White Oak Lines rotate to a vertical arrangement, the corridor will gradually taper from 180-foot-wide beginning within the existing transmission corridor to a 100-foot-wide right-of-way. A 100-foot-wide right-of-way would then be needed for the remainder of the route (approximately 4.63 miles) to maintain adequate clearances for blowout and forestry maintenance for the double circuit monopole structures. It should be noted that the planned structure design and locations are preliminary and subject to change pending final engineering. Final engineering will be completed after a Certificate for Public Convenience and Necessity is issued for the Project by the Virginia SCC.

Assessment of Potential Impacts

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

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

Historic Resource Descriptions

042-5017, Second Cold Harbor Battlefield

The Second Cold Harbor Battlefield (042-5017) is a Civil War battlefield that was determined potentially eligible for listing in the NRHP in 2007. It lies within the study area for Routes 1, 2, and 3. The resource consists of monuments and plaques, rifle pits, earthworks, a cemetery, and trenches associated with the Second Battle of Cold Harbor. The battlefield is located primarily in Hanover County between the Chickahominy River and McClellan Road approximately nine miles northeast of Richmond around the unincorporated town of Cold Harbor. The southernmost portion is located in Henrico County (Attachment 4, Figure 1). The boundaries of the resource conform to the ABPP Study Area and encompass approximately 46,819 acres, including a 439-acre unit that is part of the Richmond National Battlefield Park.

The Battle of Second Cold Harbor took place between May 31 and June 15, 1864, as part of General Ulysses S. Grant's Overland Campaign against Richmond. On May 31, General Philip Sheridan's cavalry seized the vital crossroads of Cold Harbor, a small community outside of the Confederate capital. Early on June 1, Sheridan's troopers engaged Confederate cavalry under the command of General Fitzhugh Lee, followed shortly by a Confederate infantry division under the command of General Robert Hoke. Late on June 1, the Union VI Corps, commanded by General John Sedgwick, and the XVIII Corps, commanded by General William Farrar Smith, reached Cold Harbor and assaulted the Confederate works with some success. By June 2, both armies were on the field forming on a 7-mile front that extended from Bethesda Church to the Chickahominy River. At dawn on June 3, the Union II Corps, under the command of Major General Winfield S. Hancock, and XVIII Corps, followed later by the IX Corps, assaulted along the Bethesda Church-Cold Harbor line and were slaughtered at all points. The armies confronted each other on these lines until the night of June 12, when Grant again advanced by his left flank, marching to the James River. On June 14, the II Corps was ferried across the river at Wilcox's Landing by transports. On June 15, the rest of the army began crossing on a 2,200-foot-long pontoon bridge at Weyanoke. Abandoning the well-defended approaches to Richmond, Grant sought to shift his armies quickly south of the river to threaten Petersburg (Civil War Sites Advisory Commission [CWSAC] 1993). In total, 108,000 Union soldiers fought against 62,000 well entrenched Confederate soldiers, resulting in a total of 17,332 casualties—12,737 Union and 4,595 Confederate (American Battlefield Trust 2023).

The southern portion of Second Cold Harbor Battlefield is within the northeastern end of VDHR's 1-mile tier where Routes 1, 2 and 3 connect to an existing line. This area of the battlefield is outside of the bounds of the Cold Harbor unit of Richmond National Battlefield Park and the Core Area of the battlefield

as defined by ABPP. However, the Project is within the portion of 042-5017 that is potentially eligible for NRHP listing according to the ABPP. The area outside of the Richmond National Battlefield Park has been largely developed for commercial, residential, and industrial purposes, and the area where the Routes 1, 2, and 3 are closest to the resource boundary (the battlefield's Study Area) is largely developed with residential dwellings set between forested areas. Interstate 64 and East Williamsburg Road bisect the southern end of the battlefield where the proposed Project is located.

043-0078, Cedar Knoll House

The Cedar Knoll House (043-0078) is located on the north side of Old Williamsburg Road in Sandston. The resource is situated on a 3.13-acre parcel with a dense line of trees to the north, south, and west of the parcel. A paved drive extends from the north side of Old Williamsburg Road along the east side of the dwelling, ending in a small parking area along the south elevation (Attachment 4, Figure 2). The resource is approximately 64.55 feet north of Old Williamsburg Road. Due to lack of access, ERM architectural historians took photographs from the nearest public right-of-way.

043-0078 was previously surveyed in 1937 by Benjamin G. Garner, Jr. as part of the Works Progress Administration (WPA) Virginia Historical Inventory. The 1937 WPA survey noted a primary dwelling and described it as built in 1816, with the owner at the time taking interest in the restoration of the building (Garner 1937). A later survey completed in 2011 by Marc Holma described the dwelling, a barn, and a shed in more detail, indicating that the dwelling is one-and-a-half stories with a gable roof clad in slate shingles, weatherboard siding, and set on a raised brick basement. Three gable dormers pierce the roofline on both the façade and rear elevations. There are two, exterior-end, stepped brick chimneys laid in 7-course American Bond. The wood windows were six-over-six and one-over-one, double-hung sash. The porch facing Old Williamsburg Road was removed after 1975. The single-leaf, wood door has two recessed panels and multiple lights. Lastly, there is a one-story, two-bay shed roof porch on the east elevation with square wood posts (Holma 2011). Historic aerial photographs show that all additions to the building were finished prior to 1952 (NETROnline 2023).

Aerial views show two historic buildings, the Cape Cod style dwelling and the barn. The shed was constructed in ca. 2010 and does not appear on earlier aerial photographs. The barn is a wooden framed structure with a side-gable roof clad in standing seam metal while the exterior of the barn is sheathed with vertical plank siding. 043-0078 was determined eligible for listing on the NRHP in 1975. It lies within the study tier for Route 3.

043-0288, Savage Station Farm and Cemetery

The Savage Station Farm and Cemetery (043-0288) is located at the northeast corner of Interstate 64 (east-west), and Interstate 295 (north-south) in the town of Sandston. The resource is situated on a 227-acre parcel with woodlands to the east and north. A stand of trees also runs through the center of the parcel. Much of the boundary consists of the Briel Solar Farm (Attachment 4, Figure 3). The primary dwelling is located approximately 0.48 mile south of the closest public right-of-way, Meadow Road. Due to lack of access, ERM architectural historians took photographs from the nearest public right-of-way.

043-0288 was previously recorded in 1976 by J.M. O'Dell and in 2017 by Blythe Rowe (O'Dell 1976; Rowe 2017), who described the dwelling as in poor condition, with extant sections that deteriorated or collapsed. These sections had been a part of a larger building that was demolished prior to 1976. Little detail is provided about the primary resource in the 1976 and 2017 surveys. Other structures and features recorded on the property include two dairy barns, a tenant dwelling, several smaller concrete block outbuildings, and a cemetery. There had been a smokehouse and barn at the time of the 1976 survey; however, they were no longer extant by 2017. In total, the 2017 survey identified 13 secondary resources ranging in age between ca. 1800 and ca. 1950.

ERM was not able to see any structures in the current survey. However, the previous survey stated that the resource and associated outbuildings were in a ruinous state and were likely abandoned. Current aerial views corroborate that statement from the previous survey (NETROnline 2023). It appears that the structures are no longer extant, and a circa 2020 solar farm, the Briel Solar Farm was built on the property. The resource was determined eligible for listing in the NRHP by the VDHR in 1990 and lies within the study tier for Route 3.

043-0308, Savage Station Battlefield

The Savage Station Battlefield (043-0308) was determined by VDHR to be eligible for listing in the NRHP in 1990. All four route alternatives cross portions of the Savage Station Battlefield. The battlefield represents the site of the Battle of Savage Station, which took place in late June 1862, during the Peninsula Campaign of the Civil War. None of the lands related to the battle are publicly accessible or protected at this time. The resource is located in Hanover, Henrico, and New Kent Counties on the east side of Richmond, between the Chickahominy and James Rivers (Attachment 4, Figure 4). The boundaries of the resource were originally defined by the ABPP Study Area and encompassed approximately 17,279 acres. However, in 2015, the VDHR determined that the ABPP Study Area was obsolete, and that only the Core Area and Potential National Register Area should be considered NRHP-eligible for environmental review purposes. This consists of about 8,491 acres, including much of the area crossed by the route alternatives, and mirrors much of the obsolete study area in and around where the four route alternatives are located.

Route 3 is within the study tier for the Core Area located in the redefined boundary of the Core Area, which is situated around the interchange of Interstate 64 and Interstate 295 in Sandston and contains 1,925 acres. Route 3 passes just to the east of the Core Area. Routes 1 through 4 are within the study tier for the National Register Area of 043-0308. An additional area significant to the battlefield is the Richmond and York River Railroad, constructed in 1853 as a line connecting Richmond to West Point on the York River, north of Richmond. This railroad was used as a major supply line in McClellan's Peninsula Campaign of 1862. Route 3 would cross over this railroad between mile post (MP) 0.9 and 1.0 and parallel the south side of the railroad from approximate MP 1.0 to 1.6.

The Savage Station Battlefield took place on June 29, 1862, during the Union Army's Peninsula Campaign, planned and executed by Union General George B. McClellan. This campaign started in March of 1862 with the Army of the Potomac's landing at Hampton Roads and embarked up the James River Peninsula towards Richmond, the Capital of the Confederacy. Savage Station was first occupied while the Army of the Potomac was on the offensive, with Union forces setting up federal headquarters as well as a field hospital at this location. A major supply line for the Army of the Potomac was the Richmond and York River Railroad, connecting the army to a supply station near the army's landing zone (Rowe 2017). Confederate General in command of the southern forces, Joseph E. Johnston, was wounded at the Battle of Seven Pines outside of Richmond, leading to his replacement, General Robert E. Lee, taking command. While the transition of command was taking place in the Confederate Army, the Union Army was preparing for a siege of Richmond to force the city to surrender. Lee took the offensive and advanced on the Union Army, causing the Army of the Potomac to lose the first of the Seven Days Battles. Savage Station was the fourth day of the Seven Days Battles, forcing a retreat of the Union Army towards their base on the James River. The Confederate Army of Northern Virginia captured 2,500 wounded Union soldiers as well as a wealth of supplies and munitions during the battle. Ultimately the Army of Northern Virginia claimed victory over the Army of the Potomac in the Seven Days Battles, allowing the Army of Northern Virginia to leave Richmond and cross the Potomac into Maryland in September of 1862 (CWSAC 1993). The Battle of Savage Station was a single day within a larger framework of events that happened during the Peninsula Campaign and the Seven Days Battles.

The Savage Station Battlefield (043-0308) was first reviewed in 1989 by Victoria Mitchell, followed by an eligibility determination by the VDHR staff in 1990 (VDHR 1993a). However, according to a VDHR review file (2021-0034), VDHR refined the boundaries of the battlefield so that it only included lands eligible for NRHP listing, rendering the Study Area boundary obsolete (Birge-Wilson 2021). Based on aerial photographs and GIS mapping, it appears that the change in the boundary was related to development within the battlefield's Study Area. The portions of the battlefield that are within the Potential National Register boundary are largely undeveloped forested areas whereas the areas that have been currently recommended as not eligible have been developed, either for residential or commercial purposes. A review of all four route alternatives shows that the difference in impact between the original study area and the revised boundary to include the Core Area and the Potential National Register Area is minimal, with all four route alternatives within different areas of the Potential National Register Areas and Route 3 within a small portion of the Core Area.

The battlefield is currently unprotected, leaving it altered and fragmented. Much of the battlefield has been developed or altered to accommodate current needs and demands, one example being the Briel Solar Farm in the middle of the battlefield (Rowe 2017). Previous surveys of the battlefield do not identify any places or fortifications associated with the battle. Portions of the 043-0308 Core Area and Potentially Eligible National Register Areas lie within the rights-of-way for all routes alternatives.

043-5074, First Deep Bottom Battlefield

First Deep Bottom Battlefield (043-5074) was determined potentially eligible for listing in the NRHP in 2019. The resource represents the site of the First Battle of Deep Bottom, part of the Petersburg Campaign in July 1864. It is located in eastern Henrico County between Darbytown Road and Deep Bottom on the James River (Attachment 4, Figure 5). The boundaries of the resource are defined by the ABPP Study Area and encompass approximately 14,938 acres, including a 5,684-acre Core Area. The resource lies to the south of the route alternatives. None of the route alternatives fall within the battlefield Core Area; however, a small portion of the Potential National Register Area of the battlefield is located within the 1-mile study tier for Route 4.

The Battle of First Deep Bottom, also known as the Battle of Darbytown or Strawberry Plains, took place in late July of 1864 during the Union's Petersburg Campaign. The engagement pitted the Union's Second Corps under Major General Winfield Scott Hancock and two brigades of Major General Phillip Sheridan's cavalry against two divisions under Confederate Major General Richard H. Anderson. Over two days, Hancock pressed the Confederate line along New Market Road just north of a sharp bend of the James River known as Deep Bottom in an attempt to gain ground against the defense of Richmond. The primary purpose of the action was to draw attention away from General Ulysses S. Grant's efforts to dig a tunnel under the fortifications at Richmond and place an explosive device to open a hole in the city's defenses. Although Hancock could make no headway at Deep Bottom, the diversion was a success, and on July 30, the mine was detonated, blasting a giant hole in the Confederate line (American Battlefield Trust 2023).

Hancock and Sheridan crossed the James River during the night of July 26, 1864, and were deployed along Long Bridge Road, with Sheridan's cavalry under Brigadier Generals Alfred Torbert and David Gregg deployed on the right between Carters Mill Road and Bradbury Road to the south of the Project. On July 28, four brigades of Confederates advanced toward the Union cavalry through the woods south of Darbytown Road. The Confederates attacked the Union line and drove them backward, before eventually retreating back to Fussell's Mill on Bailey's Creek, at today's Yahley Mill Road. Another attempt to turn the Confederates left with Sheridan's cavalry was unsuccessful on July 28. Hancock retreated back across the river on the night of July 29 (American Battlefield Trust 2023; Searles 2023).

043-5077, Glendale Battlefield

Glendale Battlefield (043-5077), determined to be potentially eligible for listing in the NRHP in 2021, lies within the study area for all four route alternatives. The resource represents the site of the Battle of Glendale, which took place in late June 1862 as part of the Union Peninsular Campaign of the Civil War. The battlefield is located along Charles City and Willis Church roads, between Portugee and New Market roads in southeastern Henrico County (Attachment 4, Figure 6). The boundaries of the resource are defined by the ABPP Study Area and encompass approximately 17,725 acres, including the contributing resources of a 540-acre portion of the battlefield that is part of the Richmond National Battlefield Park and two markers noting the location of the action. The Glendale National Cemetery, established in 1866 for Union casualties, is also located within the ABPP Study Area on Willis Church Road. None of the route alternatives fall within the battlefield Core Area. Much of Route 4 lies within the Potential National Register Area for 043-5077, and Routes 1, 2, and 3 are within the 1-mile study tier.

The Battle of Glendale (also called the Battle of Frazier's Farm) took place on June 30, 1862, during the Union Army's Peninsula Campaign, planned and executed by Union General George B. McClellan. This campaign started in March of 1862 with the Army of the Potomac landing at Hampton Roads and embarking up the James River Peninsula towards Richmond, the capital of the Confederacy. After winning a series of battles on the peninsula, McClellan reached the outskirts of Richmond in late May and began to make preparations to lay siege to the city. After the Battle of Seven Pines (May 31–June 1, 1862), Major General Robert E. Lee assumed command of the Army of Northern Virginia and began to improve the defenses around the city and made plans to take the offensive. During the week of June 26–July 2, Lee launched a series of attacks that have since become known as the Seven Days Battles. Although technically a Union victory, the Battle of Beaver Dam Creek on June 26 convinced McClellan that he could not maintain his forward position, and he began to withdraw to the James River below Richmond. Lee followed in pursuit and scored victories at the Battle of Gaines' Mill on the 27th and Savage Station on the 29th. By that time, McClellan became despondent and remained in his headquarters (American Battlefield Trust 2023).

With little oversight, on June 30, McClellan's commanders established a line along Charles City Road and Willis Church Road to the north and south of the crossroads village of Glendale to cover the Union withdrawal to the strong line at Malvern Hill. Lee had devised a series of movements that he hoped would strike a crushing blow to McClellan before he could get back to the cover of the federal gunboats on the James River. Miscommunications and indecisiveness on the part of his generals prevented the coordinated attack that Lee had hoped for, however. Around 4 p.m., Generals Longstreet and Hill initiated the main offensive moving along the Darbytown and Long Bridge roads through the Project vicinity, meeting McCall's division of the Fifth Corps at Western Run. McCall's forces faltered and the Confederates broke through the line. But without support, the offensive stalled and the Union line held, as more reinforcements reached the field and night fell. Disappointed in his failure to score a decisive victory, Lee ordered an attack on the strong Union position at Malvern Hill the following day. That effort was a failure, as well, and McClellan was able to withdraw down the James River. However, despite allowing McClellan to escape, Lee was able to force the cautious McClellan to abandon his campaign (American Battlefield Trust 2023; CWSAC 1993).

Glendale Battlefield is currently unprotected and has been developed for residential, commercial, and industrial use. The areas that are not developed are covered with thick vegetation. Remaining sites at the battlefield include interpretive markers (state and Freeman markers), a cemetery (National cemetery), historic roadbeds (Willis Church Road), ruins (Willis Church parsonage), trenches/field fortifications (trenches from 1864), identified archeological sites (Whitlock, Nelson and Warner Houses site; Willis Church site; and Riddel's Shop site), and Brackett's Ford. However, none of these sites within the battlefield are located within the study tiers for the route alternatives.

043-5080, Second Deep Bottom Battlefield

The Second Deep Bottom Battlefield (043-5080), determined to be potentially eligible for listing in the NRHP by VDHR in 2007, falls within the 1-mile study tier for all route alternatives. The resource represents the site of the Second Battle of Deep Bottom, which took place in August 1864 as part of the Union Petersburg Campaign of the Civil War. The battlefield is located between Charles City Road and the James River west of Willis Church Road in southeastern Henrico County (Attachment 4, Figure 7). The boundaries of the resource are defined by the ABPP Study Area and encompass approximately 23,338 acres, including three discontinuous Core Areas containing approximately 8,784 acres. The battlefield is south of the proposed Project, closest to where the route alternatives terminate at the White Oak Substation. None of the route alternatives fall within the battlefield Core Area or Potential National Register Area; however, the Core Area does fall within the 1-mile study tier for all of the route alternatives.

The Second Battle of Deep Bottom occurred between August 13 and 14, 1864 when General Winfield S. Hancock crossed the James River to apply pressure on the City of Richmond, the Confederate capital. On August 14, the X Corps closed on New Market Heights while the II Corps extended the Union line to the right along Bailey's Creek. During the night, the X Corps was moved to the far right flank of the Union line near Fussell's Mill. On August 16, Union assaults near Fussell's Mill were initially successful, but Confederate counterattacks drove the Union out of a line of captured works. Heavy fighting continued throughout the remainder of the day. After continual skirmishing, the Union returned to the south side of the James River on the 20th, maintaining their bridgehead at Deep Bottom (CWSAC 1993).

The battlefield is currently unprotected and has been developed for residential, commercial, and industrial uses. The areas that are not developed are covered with thick vegetation. Remaining sites at the battlefield include period buildings, trenches/field fortifications, and archeological sites. None of the previously identified sites within the battlefield fall within the study tiers for the route alternatives, though the overall battlefield does. The Second Deep Bottom Battlefield lies within the study tiers for all route alternatives.

043-5081, Seven Pines Battlefield

The Seven Pines Battlefield (043-5081) was determined to be eligible for listing on the NRHP for environmental review purposes by the VDHR. Located east of Richmond, the resource is concentrated around the Richmond International Airport and the Interstate 64-Interstate 295 interchange. This area has been subject to residential development and change, impacting a large portion of the original battlefield. Features associated with the battlefield include interpretive markers, historic roads, stone walls, and a cemetery (Attachment 4, Figure 8). The boundaries of the resource are defined by the ABPP Study Area and encompass approximately 13,808 acres, including three discontinuous Core Areas containing approximately 4,037 acres. The battlefield is west of the Project.

The Battle of Seven Pines was an encounter between Confederate troops, led by General Joseph E. Johnston, and Union troops, led by General George McClellan. It took place between May 31 and June 1, 1862. The Battle of Seven Pines was a part of the Peninsula Campaign undertaken by George McClellan. It was the last attempt by the Confederate forces to push back the Union advance and avert a siege of Richmond. On May 31, 1862, Confederate General Johnston attempted to overwhelm two Union corps south of the Chickahominy River. The Confederate assaults, though not well coordinated, succeeded in driving back Union forces. Both sides fed more and more troops into the action. With support from additional forces, the Union position was finally stabilized. General Johnston was seriously wounded during the action, and command of the army temporarily fell to Major General G.W. Smith. On June 1, the Confederates renewed their assaults against the Union troops, which had brought up more reinforcements but made little headway and eventually withdrew back to defenses around Richmond.

This was the final assault of the Confederate Army under the command of Joseph E. Johnston prior to the Union siege. After the battle was over, command of the Confederate forces was transferred to Robert E. Lee, who renewed the assault with the beginning of the Seven Days Battles (Rowe 2017).

The Seven Pines Battlefield consists of interpretive markers, historic roads, stone walls, and a cemetery. Currently, it is heavily developed with industrial complexes, residential neighborhoods, and commercial spaces. None of the route alternatives fall within the battlefield Core Area or Potential National Register Area; however, Routes 1, 2, and 3 fall within the overall battlefield Study Area as defined by the ABPP.

121-5134, Peninsula Extension of the Chesapeake and Ohio Railroad

The current CSX Railroad was constructed in 1881 as the Peninsula Extension of the Chesapeake and Ohio (C&O) Railroad (121-5134), completed between Richmond and the Ohio River in 1873 under the direction of industrialist Collis P. Huntington. The C&O was reorganized in 1873 as the C&O Railway. The Peninsula Extension was constructed from Richmond to Newport News to provide a connection to a deepwater port for the transportation of coal from mines in West Virginia. The railroad transformed Newport News from a rural enclave to a major shipping center, as well as the home of the world's largest shipyard (Chesapeake and Ohio Historical Society 2023; Grymes 2020; Nolte 2021).

To increase capacity for the long coal trains on the route, the Peninsula Extension was constructed as a double line, one of the few double-track sections in the eastern portion of the C&O system. This double-track configuration is not preserved within the section located in the vicinity of the Project. This railroad is still active according to CSX (CSX 2023).

The Peninsula Extension of the C&O Railroad has been determined eligible for listing in the NRHP by the VDHR for its significant contributions to commerce, industry, and transportation in the region (Attachment 4, Figure 9). Although only a portion of the railroad is located within the area surveyed for the current Project, the railroad corridor retains its original alignment and functional characteristics. The railbed, tracks, and ties have been replaced over the years as part of the maintenance of the line; however, within the survey area, it is ERM's opinion that the railroad corridor retains sufficient integrity of location, setting, feeling, and association to convey its historical significance in the areas of transportation, industry, and commerce. In the vicinity of Route Alternative 4, most of the CSX corridor is bordered by trees, except at road crossings.

Historic Resource 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. No 3D renderings were completed for Route 1.

042-5017, Second Cold Harbor Battlefield

The Route 1 right-of-way would run through the Second Cold Harbor Battlefield along a greenfield alignment, cutting into Dominion Energy Virginia's existing Line #2075 approximately 2.77 miles east of the White Oak Substation (Attachment 5, Figure 1). If selected for the Project, Route 1 would create a right-of-way through 042-5017 that would initially be 160-feet wide from the edge of the existing Line #2075 right-of-way and taper down to 100-feet-wide over a distance of approximately 500 feet, from which vegetation would be cleared during construction of the new transmission line. Only 2.19 acres of the proposed Route 1 right-of-way (0.11 mile of its linear extent) are within the battlefield's boundary, which encompasses the entire roughly 46,819-acre ABPP Study Area. Only a portion of the battlefield's southern boundary is within Route 1's right-of-way. This portion of the battlefield is located 3.5 miles south of the Core Area, closer to Richmond National Battlefield Park, to the northwest of this route. Additionally, two existing transmission lines (Lines #2075 and #557) run through the southernmost portion

of the battlefield at Route 1's cut-in location, so similar infrastructure already occupies the viewshed in this area.

One photo simulation was prepared from KOP 35 along White Oak Road. This point was chosen because it is the closest location on public right-of-way from the battlefield's southern boundary nearest to the route. As shown in the simulation, from this vantage point at the southern edge of the battlefield, the view to Route 1 would be blocked by dense tree cover and other vegetation to the east and west, with additional residential development to the west along White Oak Road (Attachment 5, Figure 2). Not only are sight lines to Route 1 screened from view along the public roads in the southern portion of the battlefield, but those roads are lined with residential development post-dating the Civil War era, which have already compromised the integrity of the battlefield's setting in this area. Furthermore, while Route 1 would traverse a small portion of the battlefield, two existing transmission lines (Lines #2075 and #557) run through this area at Route 1's cut-in location, which have already diminished the integrity of the battlefield's setting at this location. The addition of Route 1 would have little additional impact on 042-5017 since it is in a very small portion of the overall battlefield. Tree removal likely would not be fully visible from the public right-of-way, while the structures and conductors of Route 1 could be visible only from a limited vantage point along White Oak Road.

Since the right-of-way of Route 1 intersects Second Cold Harbor Battlefield, the route would have an impact on the resource. However, the portion of the battlefield that would be affected by the route is a tiny fraction of the overall battlefield. In addition, Route 1 is located well south of the battlefield's Core Area, would be screened from view by vegetation, and would not be visible except within a limited area at the southern extent of the resource where other development has already impacted the setting. Therefore, Route 1 would result in a **Minimal Impact** on the Second Cold Harbor Battlefield.

043-0308, Savage Station Battlefield

The Route 1 right-of-way would run through the Savage Station Battlefield ABPP Potential National Register Area along a greenfield alignment, cutting into existing Dominion Energy Virginia's existing Lines #2075 approximately 2.77 miles east of the White Oak Substation (Attachment 5, Figure 3). If Route 1 is selected for the Project, it would create a right-of-way through 043-0308 measuring 100-feet-wide, from which vegetation would be removed for the installation of the new transmission line. The recorded boundary for the resource encompasses approximately 13,458 acres, but only 10.43 acres of the Route 1 right-of-way (1.6 miles of its linear extent) are within the battlefield's National Register eligible boundary.

Route 1 is proposed to run through three separate sections of the battlefield's Potential National Register Area, including a segment along Elko Road and twice near the White Oak Substation on the southern end of the battlefield. These portions of the battlefield are located 1.65 miles south of the Core Area to the northwest of the route. Additionally, two existing transmission lines (Lines #2075 and #557) run through the easternmost portion of the battlefield, north of the cut-in location along Route 1.

Two photo simulations were prepared, one from KOP 12, located on Technology Boulevard, and the second from KOP 36, located along Elko Road. KOP 12 was chosen because of its central location on the edge of 043-0308 where Routes 1, 2, and 3 coverage along Technology Boulevard. KOP 36 was chosen because it is along the other major segment of public right-of-way where Route 1 intersects 043-0308. KOP 12 shows Route 1 running parallel to Technology Boulevard through a greenfield alignment before turning south to connect to the existing White Oak Substation. Where the route would traverse portions of the mapped battlefield, the setting contains modern development that has already introduced incompatible non-historic elements to the battlefield. The construction of the White Oak Lines along Route 1 would only add additional modern elements in an already compromised setting. From the nearest public right-of-way, tree cover fully screens the entirety of the proposed transmission line structures and conductors in the vicinity of KOP 12. The simulation from KOP 12 shows Route 1 behind a line of trees

outside of the Potential National Register boundary (Attachment 5, Figure 4). To the east at KOP 36, the simulation shows Route 1 traversing open fields to the east of Elko Road and crossing into dense tree cover on the west side of the road (Attachment 5, Figure 5). The route would be visible in areas where there is no tree coverage on the east side of the road; however, some of these areas are outside of the Potential National Register boundary for 043-0308.

The route is within the battlefield's boundary at the crossing of Elko Road and again just north of the White Oak Substation, which has been developed with various types of industries, including data centers. Vegetated portions of the route would not be visible from other parts of the battlefield due to the tree coverage along the route's proposed alignment and the distance between those sections. The developed areas near the existing White Oak Substation have already impacted the setting of the battlefield with existing infrastructure, including two Dominion Energy Virginia substations (White Oak and Portugee), and two existing transmission lines (Lines #286 and #2198). The areas where the route might be visible are small within the overall viewscape of the battlefield, and these limited vantage points to the Project would not have a significant impact on the battlefield overall. There is also an existing transmission line corridor containing Lines #2075, #557, #286, and #2198 that already runs through different portions of the battlefield, and which has affected the viewshed of the battlefield in terms with the presence of electrical lines. Due to existing development in the western end of Route 1 and vegetative screening along the central and eastern end of Route 1 where it will cut into the existing Line #2075 and #557, Route 1 would have a **Minimal Impact** on Savage Station Battlefield.

043-5077, Glendale Battlefield

Route 1's right-of-way would run through Glendale Battlefield between MP 1.6 and 2.2 using a greenfield alignment (Attachment 5, Figure 6). If Route 1 is selected for the Project, Route 1 it would create a new 100-foot-wide right-of-way. Where Route 1 intersects the battlefield, there are open fields and woodlands where vegetation would be removed for the installation of the new transmission lines. The recorded boundary for the resource encompasses approximately 17,725 acres, but only 5.7 acres of the Route 1 right-of-way (0.6 mile of its linear extent) are within the battlefield's boundary. Only a portion of the battlefield's boundary along Elko Road is within Route 1's proposed right-of-way. This portion of the battlefield is located 1.53 miles south of the ABPP Core Area, which is closer to the Glendale Section of the Richmond National Battlefield Park. Two existing transmission line corridors, Lines #286 and #2091, are located 1.2 miles away from where Route 1 would intersect the battlefield, and they span approximately 6.09 miles through the center of the battlefield's Core Area.

One photo simulation was prepared from KOP 36 located along Elko Road. This point was chosen because it is inside the resource boundary and adjacent to the location of Route 1. As shown by the simulation, Route 1 would be visible to drivers and pedestrians along Elko Road when looking to the northeast in the open field where the route crosses Elko Road (Attachment 5, Figure 7). In addition, Route 1 could potentially be visible from Elko Road looking to the southwest since the construction of the route would include vegetation removal and tree cutting, which could allow for a clearer view of the transmission structures during off-leaf season. This would introduce modern elements to the area visible from KOP 36 where no modern infrastructure currently exists. However, to the north and west of Route 1, in and adjacent to the resource, there is considerable modern development including data centers and existing Dominion Energy Virginia White Oak and Portugee Substations. Furthermore, two existing transmission lines, Lines #286 and #2091, are located to the southwest within the battlefield. The substations and transmission lines have already introduced modern infrastructure into the historic landscape.

In summary, the portion of the battlefield in the area of Route 1 is small in comparison to the resource as a whole. The portion of the battlefield that is within the proposed right-of-way is 5.7 acres (0.6 mile) compared to the battlefield's 18,674 total acres. Views to the north and south from the resource where it

WHITE OAK ELECTRIC TRANSMISSION PROJECT**STAGE I PRE-APPLICATION ANALYSIS FINDINGS**

Pre-Application Analysis, Henrico and Charles City Counties, Virginia
(Redacted)

is crossed by Route 1 would remain unchanged. The majority of the battlefield would be unaffected by the new transmission line, with sight lines to the new transmission infrastructure largely limited to views along Elko Road where the simulation was conducted. However, as the proposed route would introduce modern elements to the battlefield, ERM recommends that there would be a **Minimal Impact** to this resource from Route 1.

043-5080, Second Deep Bottom Battlefield

The Second Deep Bottom Battlefield is located approximately 0.91 mile southwest of Route 1 along a greenfield segment of the route, where the route would terminate at the White Oak Substation (Attachment 5, Figure 8). If Route 1 is selected for the Project, it would create a new 100-foot-wide right-of-way in the area northeast of the battlefield. However, due to distance and intervening vegetation, there would be no view to the route from this resource, as shown in the simulation from KOP 14 (Attachment 5, Figure 9). Because of the above mentioned reasons, the Second Deep Bottom Battlefield would be entirely screened. Therefore, there would be **No Impact** on this resource from Route 1.

043-5081, Seven Pines Battlefield

Seven Pines Battlefield (043-5081) is situated approximately 0.25 mile northwest of the point from which Route 1 cuts into the Company's existing transmission line corridor containing Lines #557 and #2075, then trends southwest away from the resource (Attachment 5, Figure 10). The area between the route and the resource is forested with pockets of residential development, except where the existing transmission lines intersect the battlefield near its eastern boundary. If Route 1 is selected for the Project, it would create a new right-of-way measuring 100-feet-wide extending southwest from the existing corridor. Vegetation would be removed for the installation of the new transmission line where the right-of-way traverses woodlands.

One photo simulation was prepared from KOP 38, along White Oak Road (Attachment 5, Figure 11). This point was chosen because it was the closest point on a public right-of-way from the battlefield to Route 1. The simulation shows that Route 1 would not be visible from the KOP due to distance, vegetation, and intervening residential development. Although ERM was unable to access the existing right-of-way, it is important to mention that Route 1 would not be visible from the southernmost point of where the battlefield and existing Lines #557 and #2075 intersect, approximately 0.15 mile northeast from KOP 38. This is because the existing routes would block the view of Route 1 farther to the south. Thus, ERM recommends that Route 1 would have **No Impact** on Seven Pines Battlefield.

Historic Resource Findings for Route 2

The impacts on each resource in the Route 2 study tiers are discussed below. Photo simulations are provided in Attachment 5. ERM used visual modeling from GoogleEarth imagery where images were unavailable due to lack of access and restricted views. GoogleEarth images are provided in Attachment 6.

042-5017, Second Cold Harbor Battlefield

The Route 2 right-of-way would run through the Second Cold Harbor Battlefield along a greenfield alignment, extending southwest from the cut in location along Dominion Energy Virginia's existing Line #2075 (Attachment 6, Figures 1 and 3). If Route 2 is selected for the Project, it would create a new right-of-way through 042-5017 that would initially be 160-feet wide from the edge of the existing Line #2075 right-of-way and taper down to 100-feet-wide over a distance of approximately 500 feet. Vegetation would be removed for the installation of the new transmission line within the right-of-way. The recorded

boundary for the resource encompasses approximately 46,819 acres, but only 2.19 acres of the Route 2 right-of-way (0.11 mile of its linear extent) are within the battlefield's boundary.

Only a portion of the battlefield's southern boundary is intersected by Route 2's proposed right-of-way. This portion of the battlefield is located 3.63 miles south of the ABPP Core Area, which is closer to Richmond National Battlefield Park to the northwest of the route. Additionally, two existing transmission lines (Lines #2075 and #557) run through the southernmost portion of the battlefield at Route 2's cut-in location between Structures #2075/159 and #2075/160.

Due to lack of access and restricted views from dense vegetation in the area, ERM did not include a KOP for 042-5017 in this report. Instead, ERM used visual modeling from GoogleEarth imagery to portray a closer approximation of potential Project impacts on the resource (Attachment 6, Figure 3). As shown in the rendering, the portion of the battlefield intersected by Route 2 consists of dense tree coverage and other vegetation to the north and east towards the more important areas of the battlefield. There are pockets of residential areas with open sight lines along Old Williamsburg Road where Route 2 crosses. Route 2's crossing over Old Williamsburg Road would be visible due to tree clearing and the height of the towers. Two existing transmission lines (Lines #2075 and #557) run through this area of the battlefield, however, and have already diminished the historic viewshed. Sight lines to the battlefield from the public right-of-way here would be obstructed by trees and other vegetation, as seen from the rendered aerial, showing Old Williamsburg Road, which extends southeast to northwest across the area represented in Attachment 6, Figure 3. The addition of Route 2 would have little additional impact on 042-5017 since it would traverse a small portion of the overall battlefield in the southern corner. Tree removal would not likely be visible from the public right-of-way, while the structures and conductors of Route 2 could be visible from limited vantage points along White Oak Road.

Since the resource would be traversed by the right-of-way of Route 2, the Project would have an impact on 042-5017 if this route is selected; however, the portion of the battlefield that is within the Route 2 right-of-way is a fraction of the overall size of the battlefield, it is in an area that is not significant to the overall battle, and the proposed route would be contained within surrounding vegetation and would not be visible from other parts of the battlefield, and only minimally visible from public rights-of-way. Therefore, the Second Cold Harbor Battlefield would experience a **Minimal Impact** from Route 2.

043-0308, Savage Station Battlefield

The Route 2 right-of-way would run through Savage Station Battlefield ABPP Potential National Register Area where the route uses a greenfield alignment (Attachment 5, Figure 12). If Route 2 is selected for the Project, it would create a new right-of-way measuring 100-feet-wide. Vegetation would be removed for the installation of the new transmission line in areas where it passes through woodlands. The recorded boundary for the resource encompasses approximately 13,458 acres, but only 13.18 acres of the Route 2 right-of-way (1.48 miles of its linear extent) are within the battlefield's Potential National Register boundary. In addition, the route would intersect the Company's existing right-of-way for Lines #2075 and #557 in the location of the battlefield.

Route 2 would traverse the battlefield's Potential National Register Area three times. These areas of the battlefield are located 1.67 miles south of the battlefield's Core Area.

Two photo simulations were prepared, one from KOP 12, located along Technology Boulevard, and one from KOP 37, located on Elko Road. These locations were selected because they are the closest points where there are vantage points from the nearest public rights-of-way where the route would be visible intersecting portions of the battlefield. KOP 12 shows that Route 2 would only be visible from the public right-of-way during off-leaf seasons; otherwise, despite its proximity, foliage would largely obscure the view of the line except at the point where the line crosses the road. However, the route would be visible from areas inside the resource boundary where the route intersects it. The area around KOP 12 is highly

developed with existing infrastructure that has already introduced modern elements to the battlefield's viewscape. The construction of Route 2 would add an additional modern element to the resource's setting (Attachment 5, Figure 13).

Route 2 also would be visible from KOP 37; however, it would only be visible in the direct area where it crosses Elko Road and would not be visible from other areas around KOP 37 due to the surrounding vegetation (Attachment 5, Figure 14). Thus, Route 2 would only be visible in areas where it intersects the resource boundary. Sight lines to the route from vantage points elsewhere within the battlefield would be blocked by tree cover. Furthermore, the developed areas near the existing White Oak Substation have already impacted the setting of the battlefield with existing infrastructure, including two Dominion Energy Virginia substations (White Oak and Portugee) and two existing transmission lines (Lines #286 and #2198). These substations and the existing transmission lines are located south of Route 2 near Portugee Road. There would be few vantage points within and adjacent to the battlefield from which Route 2 would be visible and these represent a small fraction of the resource's overall viewscape. As the existing transmission lines and substations have already introduced modern elements to the battlefield, and the route would affect a small area in relation to the battlefield as a whole, ERM recommends that Route 2 would have a **Minimal Impact** on Savage Station Battlefield.

043-5077, Glendale Battlefield

Route 2's right-of-way would pass through Glendale Battlefield between MP 1.5 and 1.8 (Attachment 5, Figure 15). Route 2 is selected for the Project, it would create a new 100-foot-wide corridor through 043-5077, from which vegetation would be removed for the installation of the new transmission line where it passes through woodlands. The recorded boundary for the battlefield encompasses approximately 17,725 acres, but only 3.93 acres of the proposed Route 2 right-of-way (0.31 mile of its linear extent) are within the battlefield's boundary. Only a small portion of the battlefield along Elko Road is within Route 2's right-of-way, and the route is 2.25 miles to the north of the ABPP Core Area.

One photo simulation was prepared from KOP 37, located along Elko Road where the resource would be crossed by Route 2. As shown in the simulation, Route 2 would be visible from the KOP (Attachment 5, Figure 16); however, the route would not be visible from any other areas in the battlefield, due to the presence of dense screening vegetation. The portion of the route that would traverse 043-5077 across Elko Road would require tree clearing as seen in the simulation from KOP 37. The visual impact this tree clearing would have on the battlefield as a whole is small in comparison to the overall size of the battlefield, and only affects a peripheral portion of the battlefield. Route 2 would cross over Elko Road near the northern end of the battlefield along a marching path. Furthermore, this section of the battlefield is not included within the ABPP Potential National Register boundary, located approximately 1.43 miles south, or the ABPP Core Area, located approximately 2.25 mile south, both of which are well outside the range of potential impacts from Route 2. Because the construction of Route 2 would introduce modern elements that would be visible from within the resource, and because such impacts would be relevant within a small portion of the resource well outside the battlefield's core area, ERM recommends that Route 2 would have a **Minimal Impact** on Glendale Battlefield.

043-5080, Second Deep Bottom Battlefield

The Second Deep Bottom Battlefield is located approximately 0.91 mile southwest of where Route 2 would terminate at the White Oak Substation (Attachment 5, Figure 17). The surrounding area is heavily forested to the south of the existing Dominion Energy Virginia infrastructure, which includes the Portugee and White Oak Substations. If Route 2 is selected for the Project, it would create a new right-of-way measuring 100-feet-wide from which vegetation would be removed for the installation of the new transmission line where it passes through wooded areas. Due to distance and intervening vegetation, however, the battlefield would have no view to the route (Attachment 5, Figure 18). Since Route 2 would

not be visible from any part of the battlefield and the battlefield already contains existing electrical transmission lines, ERM recommends that Route 2 would have **No Impact** on 043-5080.

043-5081, Seven Pines Battlefield

The Route 2 right-of-way would run through 043-5081 then continue to the northwest, where it would intersect the Company's existing Line #2075 (Attachment 5, Figure 19). The battlefield encompasses approximately 13,808 acres; however, only approximately 3 acres (0.23 mile) of Route 2 are within the battlefield's boundary. This route would cross the eastern area of the battlefield, which is within a sparsely developed area with residential dwellings along Old Williamsburg Road. Along and around this roadway are trees of varying density and size. Route 2 uses a greenfield alignment to cross northeast to southwest over the road. If Route 2 is selected for the Project, it would require a new right-of-way measuring 100-foot-wide from which vegetation would be removed for the installation of the new transmission line where it passes through wooded areas.

Route 2 would be visible from the battlefield because of its location within the battlefield boundary. Rather than only including a photo simulation of the intersection of the battlefield and the route, visual modeling was completed from GoogleEarth imagery to depict the full extent of the route where it intersects the battlefield (Attachment 6, Figures 2 and 3). This shows that the route would only be visible where it crosses the road or from inside Route 2's right-of-way. All other areas of the battlefield along Old Williamsburg Road would have no line of sight towards the route due to the heavy foliage that surrounds the right-of-way.

One photo simulation was prepared from KOP 1a, which is located along Old Williamsburg Road (Attachment 5, Figure 20). This point was chosen to show how Route 2 would only be visible at the intersection of the route and Old Williamsburg Road and would not be visible from any other vantage point in the battlefield due to the dense vegetation in the area. As shown in the simulation, the transmission line would not be visible from the vantage point.

The Company's existing transmission Lines #557 and #2075 are located within the battlefield's boundary, approximately 0.21 mile east from where Route 2 would cross Old Williamsburg Road. The route cuts-in to Line #2075 approximately 240 feet to the northeast of the battlefield. Furthermore, the portion of the battlefield that Route 2 would cross was used as a marching path to the main battlefield, located approximately 3 miles west of Route 2. This area of the battlefield already contains non-historic development, with residential structures along the Old Williamsburg Road. The buildings along Old Williamsburg Road are not from the same time period as the battlefield itself and were mostly constructed in the twentieth century (USGS 1920, 1965, 1987). Residential development along with the existing transmission lines have compromised the historic setting of the battlefield directly adjacent to Route 2.

In summary, the portion of the route that would cross the battlefield is small in comparison to the resource as a whole. Other than at the intersection of the route and battlefield, views would remain unchanged. The majority of the battlefield would be unaffected by the new transmission line, with sight lines to the new transmission infrastructure largely limited to views from inside the Route 2 right-of-way. Furthermore, as two existing transmission lines are present in the vicinity of Route 2, modern infrastructure has already been introduced to the eastern section of the battlefield. As the route would intersect a small portion of the resource and would constitute a minor change in the viewshed, ERM recommends that Route 2 would have a **Minimal Impact** on 043-5081.

Historic Resource Findings for Route 3

The impacts to each resource in the Route 3 study tiers are discussed below. Photo simulations are provided in Attachment 5. ERM used visual modeling from GoogleEarth imagery where images were

unavailable due to lack of access and restricted views. GoogleEarth images are provided in Attachment 6.

042-5017, Second Cold Harbor Battlefield

Route 3 is located approximately 0.45 mile to the northwest of the Second Cold Harbor Battlefield in an area where the route uses a greenfield alignment (Attachment 5, Figure 21). If Route 3 is selected for the Project, it would create a new right-of-way measuring 100-feet-wide from which vegetation would be removed for installation of the new transmission line in wooded areas. Due to distance and dense, intervening vegetation, however, 042-5017 would have no view to the route, as shown by the simulation from KOP 40 (Attachment 5, Figure 22). Because the view from the Second Cold Harbor Battlefield would be entirely screened, there would be **No Impact** on this resource from Route 3.

043-0078, Cedar Knoll House

Cedar Knoll is located approximately 0.07 mile east of Route 3 in an area where the route would follow a greenfield alignment (Attachment 5, Figure 23). Cedar Knoll is located on Old Williamsburg Road, surrounded by dense tree growth to the north, east, and west, and farther to the south beyond a residential property on the south side of Old Williamsburg Road. If Route 3 is selected for the Project, it would create a new right-of-way measuring 100-feet-wide from which vegetation would be removed for installation of the new transmission line in wooded areas.

One simulation was prepared from KOP 41, along Old Williamsburg Road (Attachment 5, Figure 24). This simulation shows that Route 3 would be visible from the southeastern corner of the resource boundary and the transmission line would be visible from some vantage points within the boundary of the resource during off-leaf seasons when looking up through the trees to the east. However, it is not likely that Route 3 would be visible from the resource's northern boundary, as the route angles to the northeast, away from the dwelling. Although there is an existing overhead electrical distribution line in the southeastern viewshed, the construction of Route 3 would result in the construction of larger, more obtrusive transmission line infrastructure, and would change the current viewshed to the southeast and east. Thus, ERM recommends that there would be a **Moderate Impact** to this resource from Route 3.

043-0288, Savage Station Farm and Cemetery

Savage Station Farm and Cemetery is located approximately 0.15 mile west of Route 3 along a greenfield route segment between the Norfolk Southern Railroad and Interstate 64 (Attachment 5, Figure 25). Savage Station Farm and Cemetery is contained within a 240-acre parcel that is currently used as a photovoltaic generating site developed by NextEra Energy. The farm and cemetery are on the southern boundary of the site, which is surrounded by stands of trees that vary in thickness. The solar farm, which occupies the majority of the Savage Station Farm and Cemetery acreage, is off Meadow Road with restricted access to the site.

One simulation was prepared from KOP 42 along Meadow Road, as it was unsafe to photograph along Interstate 64 (Attachment 5, Figure 26). This simulation shows that there would be no view of the proposed route from the resource due to dense intervening vegetation. In addition, the resource has been heavily developed as a solar farm, which has introduced modern elements inside the actual resource boundary. As Route 3 is located outside of the boundary of Savage Station Farm and Cemetery, obscured from view due to dense intervening vegetation, ERM recommends that the placement of Route 3 would have **No Impact** on 043-0288.

043-0308, Savage Station Battlefield

Route 3 would intersect a contiguous portion of Savage Station Battlefield ABPP Potential National Register Area for a distance of approximately 3.69 miles along a greenfield alignment for 3.03 miles and is collocated along the historic Richmond and York River Railroad for 0.66-mile (Attachment 5, Figure 27). If Route 3 is selected for the Project, it would create a new 100-foot-wide right-of-way through 043-0308 within which vegetation would be removed for the installation of the new transmission lines where the route traverses woodlands.

The recorded boundary for Savage Station Battlefield encompasses approximately 13,458 acres, but only 36.42 acres of the Route 3 right-of-way (3.69 miles of its linear extent) are within the battlefield's Potential National Register boundary, with approximately 2.5 acres of right-of-way (0.2 mile of its linear extent) within the battlefield's 1,925 acres of ABPP Core Area. Route 3 would run through one large section of the battlefield's Potential National Register Area, east of the battlefield's Core Area, including near the White Oak Substation towards the southern end of the battlefield. Between the remaining areas of the battlefield's Core Area and Route 3 is Interstate 295 cutting through the center of the battlefield's Core Area. Additionally, Interstate 64 goes through the battlefield's Core Area in an east-west direction, and the interchange of Interstates 295 and 64 is located 0.85 mile west from MP 2.0 along Route 3. The portion of the route between its crossing of Interstate 64 and Technology Boulevard follows the boundaries of residential neighborhoods to the east. This minimizes the route's impact on the battlefield by routing it within developed areas rather than crossing undeveloped land that would be more consistent with the battlefield's historic setting.

Two photo simulations were prepared, one from KOP 12, located on Technology Boulevard, and one from KOP 15, located along Crib Lane, 0.12-mile northeast from the intersection of Crib Lane and Meadow Road. KOP 12 was selected because of its central location to the edge of 043-0308 where Routes 1, 2, and 3 coverage along Technology Boulevard near the southern end of the Project where it will connect to the White Oak Substation. KOP 15 was chosen because it is the closest point accessible to Route 3 from the resource's northern boundary.

The simulation from KOP 12 shows Route 3 running along the boundary of the battlefield south towards the White Oak substation. The route would be within a partially wooded area surrounded by a heavily developed area (Attachment 5, Figure 28). The route would be visible as it crosses over Technology Boulevard; however, it would largely be the conductors visible rather than the structures, which would be located within the dense forested areas adjacent to the road. KOP 15 shows how Route 2 would cross over Meadow Road, largely screened by trees on either side of the road. Route 3 uses a greenfield alignment in this area; however, there is no public right-of-way access in its immediate vicinity. The route then would cross over Meadow Road and the Norfolk Southern Railroad.

The railroad, historically the Richmond York and River Railroad, was significant to the Seven Days Battles and the Savage Station Battle, used to transport artillery, equipment, and troops during the Peninsula Campaign of 1862 as the Union Army's main supply line. Route 3 crosses over this railroad between MP 0.9 and MP 1 and is collocated with it for approximately 0.66 mile, impacting a key feature of the battlefield's setting: the railroad's association with the battle. The impact to the portion of the battlefield containing the railroad is partially mitigated by the fact that the route would not be visible from other parts of the battlefield nor from vantage points along public rights-of-way. In addition, two existing Dominion Energy Virginia electrical transmission lines cross over this railroad 1.05 miles to the east within the bounds of the battlefield, such that the setting has already been altered in similar fashion. For these reasons, Route 3 would not have a significant impact on the portion of Savage Station Battlefield associated with the Norfolk Southern Railroad.

Route 3 would be visible from public right-of-way at the Meadow Road crossing and the tops of transmission line structures would potentially be visible where the route is parallel to Crib Lane,

depending on the height and fullness of the tree coverage in different areas. Additional visual modeling was completed from GoogleEarth imagery to portray a closer approximation of proposed Project effects on the resource. The GoogleEarth rendering was prepared along East Williamsburg Road, due to the restricted views from dense vegetation in this portion of the battlefield. As shown in the rendering, Route 3 crosses over East Williamsburg Road from the northwest to the south following a greenfield alignment (Attachment 6, Figures 4 Figure 5). Route 3 would be visible where it crosses over East Williamsburg Road; however, dense tree coverage on each side of the road would obstruct further views past its crossing of the road.

Sections of the route are routed through undeveloped areas and others through heavily developed areas. Where Route 3 traverses wooded areas, it would mostly not be obscured from vantage points in other parts of the battlefield. Much of the battlefield area traversed by Route 3 is undeveloped and thickly forested. The areas within the battlefield with potential sight lines to Route 3 are focused on areas where the route would cross over open corridors, including Meadow Road, Interstate 64, East Williamsburg Road, and Technology Boulevard. Although these areas would be visible to other parts of the battlefield, Interstate 64, East Williamsburg Road, and Technology Boulevard are all developed areas, either residential or commercial development, which have already lost any sense of the battlefield's historic setting. The developed areas near the existing White Oak Substation have already impacted the viewscape of the battlefield with existing infrastructure, including two Dominion Energy Virginia substations (White Oak and Portugee), and two existing electrical transmission lines (Lines #286 and #2198). Existing Lines #2075, #557, #286, and #2198 already run through different portions of the battlefield, which has also affected its historic viewshed. Although the route is proposed to follow a greenfield alignment for a majority of its length across the resource, the route would be visible within the battlefield and from public rights-of-way in several areas, including four road crossings and the crossing of the Norfolk Southern Railroad, which was significant to Savage Station Battlefield. Since the route would have a minor negative impact on areas that are previously undeveloped but would directly impact a 3.69-mile-long swath of the battlefield, ERM recommends that Route 3 would have a **Moderate Impact** on Savage Station Battlefield.

043-5077, Glendale Battlefield

The Glendale Battlefield is located approximately 0.33 mile to the east from the closest point of Route 3 (Attachment 5, Figure 30). This portion of the route would cross over East Williamsburg Road into densely forested areas to the north and south of that road. If Route 3 is selected for the Project, it would create a new 100-foot-wide right-of-way in the area west of the site from which vegetation would be removed for the installation of the transmission line where it traverses woodlands. However, due to intervening vegetation, residential development, and distance, 043-5077 would have no view of Route 3, as evidenced by the simulation from KOP 4 (Attachment 5, Figure 31). Therefore, ERM recommends that Route 3 would have **No Impact** on Glendale Battlefield.

043-5080, Second Deep Bottom Battlefield

Route 3 is located approximately 0.91 mile to the northeast of the Second Deep Bottom Battlefield (Attachment 5, Figure 32). The surrounding area is heavily forested and includes the White Oak Substation. If Route 3 is selected for the Project, it would create a new 100-foot-wide right-of-way in the area northeast of the site from which vegetation would be removed for the installation of the transmission line. Due to intervening vegetation and distance, however, the battlefield would have no view to Route 3, as evidenced by the simulation from KOP 14 (Attachment 5, Figure 33). Thus, ERM recommends that Route 3 would have **No Impact** on 043-5080.

043-5081, Seven Pines Battlefield

Route 3 would cross through the boundary of Seven Pines Battlefield (043-5081) directly south of its crossing of Interstate 64 between MP 2.0 and MP 2.3, where the route crosses Old Williamsburg Road (Attachment 5, Figure 34). The eastern area of the battlefield where Route 3 crosses through the battlefield's boundary (0.28 mile) is within a developed residential area along Old Williamsburg Road with dense tree cover on either side of the road. If Route 3 is selected for the Project, it would create a new 100-foot-wide right-of-way in the area west of the site from which vegetation would be removed for the installation of the transmission line where it traverses woodlands. The battlefield encompasses approximately 13,808 acres; however, only approximately 3.28 acres of the Route 3 right-of-way (0.28 mile of its linear extent) would be within the battlefield's boundary.

Only a portion of the battlefield's southern boundary is intersected by Route 3's proposed right-of-way. This portion of the battlefield is located 1.38 mile east of the ABPP Core Area. Additionally, two existing transmission lines (Lines #2075 and #557) run through this easternmost portion of the battlefield about 1.6 miles southeast from Route 3's cut-in location. The boundary of the battlefield where Route 3 would cross was a marching path to the main battlefield, located approximately 1 mile west of Route 3. This area of the battlefield has some development with residential structures along the Old Williamsburg Road. The buildings along Old Williamsburg Road are not from the same time period as the battlefield itself and were mostly constructed in the twentieth century (USGS 1920, 1965, 1987). This change in the landscape has already diminished the historic integrity of the battlefield's setting.

One photo simulation was prepared from KOP 41 located along Old Williamsburg Road approximately 0.06 mile from where Route 3 crosses Old Williamsburg Road. The simulation from KOP 41 shows Route 3 crossing over Old Williamsburg Road. This portion of the route uses a greenfield alignment and would be visible from this area of public right-of-way at the crossing from the immediate surrounding area (Attachment 5, Figure 35). If Route 3 is selected, the transmission line structures would be visible at the crossing of Old Williamsburg Road; however, they would not be visible from nearby areas because of the dense surrounding forest cover.

In summary, the portion of the battlefield that would be impacted by Route 3 is only a fraction of the size of the entire battlefield. Views to the north and south are completely blocked by dense tree cover and pockets of residential dwellings between the battlefield and Route 3's crossing of Old Williamsburg Road. While the view of Route 3 to the east and west along Old Williamsburg Road would represent a notable change to the setting, visible from public right-of-way, the vantage points for this viewscape change are limited in relation to the resource overall. Furthermore, there are already existing transmission lines that run through the battlefield to the east, diminishing the historic viewshed of the battlefield through the introduction of modern infrastructure. Since Route 3 would be visible in a small part of the battlefield and the battlefield already contains electrical transmission lines, ERM recommends that Route 3 would have a **Minimal Impact** on 043-5081.

Historic Resource Findings for Route 4

The impacts to each resource in the Route 4 study tiers are discussed below. Photo simulations are provided in Attachment 5. ERM used visual modeling from GoogleEarth imagery where images were unavailable due to lack of access and restricted views. GoogleEarth images are provided in Attachment 6.

043-0308, Savage Station Battlefield

Route 4 is proposed to run through two separate sections of Savage Station Battlefield ABPP Potential National Register Area, near the White Oak Substation on the southern end of the battlefield (Attachment 5, Figure 36). One of the crossings includes this route's termination at the White Oak Substation, which is

itself partially located within the battlefield's Potential National Register Area. These portions of the battlefield are located 2.06 miles south of the battlefield Core Area northwest of Route 4. Additionally, three existing transmission lines (Lines #286, #2091, and #2198) which run through the southern portion of the battlefield are intersected by Route 4 between MP 3.7 and 3.8 within the battlefield's boundary. If Route 4 is selected for the Project, it would create a 100-foot-wide corridor through 043-0308 within which vegetation would be removed for the installation of the new transmission lines across woodlands. The recorded boundary for the resource encompasses approximately 13,458 acres, but only 26.26 acres of the Route 4 right-of-way (1.86 miles of its linear extent) are within the battlefield's boundary.

One photo simulation was prepared from KOP 22, along Portugee Road, which was selected because it shows a typical view from a public right-of-way. The point was taken here, instead of at the intersection of the road and the route, to show that views of the route would be limited except at the actual point of the road crossing (Attachment 5, Figure 37). Additional visual modeling was completed from GoogleEarth imagery to portray a closer approximation of Project effects on the resource due to the restricted views from the dense vegetation in the area. This rendering shows the intersection of Portugee Road and the route, which would be where the greatest visible impact from the route would be observable (Attachment 6, Figures 6 and 7). Similar impacts would be observable at the Elko Road crossing.

Route 4 would be visible from its crossing at Portugee Road and Elko Road within 043-0308; however, it would only be visible in the direct area where it crosses each roadway. This visual impact would have a minor effect on the battlefield historic viewshed, especially given that the existing Lines #286, #2091, and #2198 already cross over Portugee Road 1 mile to the southeast within the battlefield's boundary, along with the Portugee Substation and the White Oak Substation.

In summary, Route 4 would traverse undeveloped areas as well as heavily developed areas in Henrico County near the White Oak Substation and the Portugee Substation. Heavily vegetated segments of the route would not be visible from other parts of the battlefield due to the tree coverage surrounding the route's alignment and the distance between those sections and the battlefield's Core Area, over 2 miles from the route at its closest point. These areas are undeveloped and mostly forested. The developed areas near the existing White Oak Substation have already impacted the setting of the battlefield, and contain comparable existing infrastructure, including two Dominion Energy Virginia Substations (White Oak and Portugee) and three existing electrical transmission lines (Lines #286, #2091, and #2198). The areas where the route might be visible would have a small window of visibility and would not have a significant impact on the battlefield overall. Because of existing development in the portion of the battlefield that would be affected by the western end of Route 4 and given the presence of abundant screening vegetation that would limit sights lines to the transmission line, ERM recommends that Route 4 would have a **Minimal Impact** on Savage Station Battlefield.

043-5074, First Deep Bottom Battlefield

The First Deep Bottom Battlefield is located approximately 0.83 mile south from Route 4 between MP 3.9 and MP 4.0 (Attachment 5, Figure 38). The portion of the route nearest to the battlefield follows a greenfield alignment parallel to the C&O Railroad (121-5134). If Route 4 is selected for the Project, it would create a 100-foot-wide corridor from which vegetation would be removed for the installation of the new transmission line. Only a small portion of the battlefield is in the 1-mile study tier for Route 4—approximately 38.52 acres of the battlefield's total 14,938 acres. The battlefield would have no view to the route due to distance and intervening vegetation, evidenced by the simulation from KOP 20 (Attachment 5, Figure 39). Thus, ERM recommends that Route 4 would have **No Impact** on the First Deep Bottom Battlefield.

043-5077, Glendale Battlefield

Route 4's right-of-way would intersect the Glendale Battlefield between MP 0.6 and MP 5.0, for a total of 4.4 miles (Attachment 6, Figures 8 and 9). In this area, the route would follow a greenfield alignment for approximately 3.28-miles and is collocated next to the C&O Railroad for approximately 2.64 miles between MP 0.4 to 1.7 and 3.3 to 4.6. Glendale Battlefield is approximately 0.65 mile south of the White Oak Substation. If Route 4 is selected for the Project, it would create a 100-foot-wide corridor from which vegetation would be removed for the installation of the new transmission line as well as an area between MP 3.5 and 3.9 where the route crosses Dominion's existing Lines #286 and #2091. In this area, up to 160 feet of right-of-way would be cleared to provide sufficient space to cross-over the existing transmission lines. The recorded boundary for the resource encompasses approximately 17,725 acres, of which approximately 58.06 acres are intersected by the Route 4 right-of-way (4.4 miles of its linear extent).

The majority of Route 4 runs through a largely undeveloped area of the battlefield, approximately 4.4 miles of the route's total 6-mile length. Route 4 intersects the northern portion of the battlefield's Core Area, but the Glendale Battlefield ABPP Core Area has already been impacted by the introduction of transmission line infrastructure, with Lines #286 and #2091 running north-south through the Core Area for 2.9 miles, and Lines #287 and #2050 running east-west through the center of the battlefield's Core Area for approximately 3.19 miles, diminishing the battlefield's overall historic setting. From this standpoint, the placement of Route 4 would not have as large of an impact since the general historic viewshed has already been altered by overhead electrical transmission lines, although Route 4 would require clearing of a different, undeveloped area within the battlefield.

A GoogleEarth rendering was prepared for the area where Route 4 crosses Elko Road (Attachment 6, Figures 8 and 9). This area was chosen because its location within the boundary of 043-5077 would have the greatest visual impact. As shown in the rendering, Route 4 would cross through a forested area to the east of Elko Road. Route 4 would not be visible from publicly accessible vantage points except in close proximity to the crossing of Elko Road. At this point, both the tops of the structures and the conductors would be visible from the public right-of-way due to the height of the trees compared to the structure height of 120 feet.

North of Route 4 is developed land with data centers and existing Dominion Energy Virginia substations, including White Oak Substation where Route 4 will connect, and the Portugee Substation. East of these substations are additional developments within the boundaries of the battlefield, resulting in a diminished historic viewscape north of Route 4. Two existing Dominion Energy Virginia transmission lines, Lines #286 and #2091, are crossed by Route 4 in this area. Because the setting of the battlefield has already been impacted by modern development, including transmission line infrastructure, Route 4 would not constitute a major new element incompatible with the historic landscape. However, Route 4 would affect a part of the battlefield that is currently undeveloped, diminishing the historic feeling of this portion of the battlefield's setting. Therefore, ERM recommends that Route 4 would have a **Moderate Impact** on Glendale Battlefield.

043-5080, Second Deep Bottom Battlefield

The Second Deep Bottom Battlefield is located approximately 274 feet to the southwest of Route 4 (Attachment 5, Figure 40). The surrounding area is heavily forested and contains existing Dominion Energy Virginia infrastructure, including the White Oak Substation, 0.91 mile away, and the Portugee Substation, approximately 0.79 mile away. Existing Lines #286, #287, #2050, and #2091 are also within the eastern portion of the battlefield. The area between the battlefield and Route 4's closest point to the battlefield is heavily forested. This forested area continues between the C&O Railroad and Portugee Road, where Route 4 would be located within a greenfield alignment. If Route 4 is selected for the

Project, it would create a 100-foot-wide corridor from which vegetation would be removed for the installation of the new transmission line. The battlefield encompasses approximately 23,338 acres; however, only a small portion of heavily forested area and residential development falls within the 1-mile study tier for Route 4. The route would not pass through any areas within the battlefield's boundary.

Two photo simulations were prepared from KOP 14 and KOP 47. Both locations were chosen because they are the closest points that could be taken toward the route from a public right-of-way inside the resource boundary. KOP 14 is located at the intersection of Poplar Spring Road and the C&O Railroad (Attachment 5, Figure 41). There is a thick screen of trees directly around and north of Poplar Spring Road, which bends shortly after the C&O Railroad crossing. The bend in the road coupled with the dense tree coverage leaves only a small visual distance, approximately 400 feet, where access to public right-of-way from the battlefield is closest to Route 4. For this reason, none of the transmission line structures for Route 4 would be visible from 043-5080 at this KOP. KOP 47 is located at the end of the Fisher Crest Lane cul-de-sac. Between this area of public right-of-way and Route 4 is dense tree growth, which would block any view of the route (Attachment 5, Figure 42). Since Route 4 would not be visible from any part of the battlefield due to dense intervening vegetation, ERM recommends that Route 4 would have **No Impact** on 043-5080.

121-5134, Peninsula Extension of the Chesapeake and Ohio Railroad

Route 4 would cross the C&O Railroad, a linear resource, between MP 0.3 and 0.4, and be collocated to the railroad between MP 0.4 through 1.7 and 3.3 through 4.6, where the route would cross over the railroad once again (Attachment 5, Figure 43). The route in these areas would not be visible from public right-of-way access points, such as Elko Road or Poplar Springs Road where the railroad tracks cross. If Route 4 is selected for the Project, it would create a 100-foot-wide corridor from which vegetation would be removed for the installation of the new transmission line. This would expand the cleared rail corridor where the route is parallel and adjacent to the resource. The C&O Railroad is a linear resource, extending well beyond Route 4, which in total would run parallel to the railroad for approximately 2.37 miles and would cross over it in two different locations.

Two photo simulations were prepared: from KOP 14 along Poplar Springs Road, and from KOP 19 on Elko Road, both of which are near their respective road's intersection with the C&O Railroad.¹ The simulation from KOP 14 shows that Route 4 would not be visible from this crossing of the railroad, which is the closest point from a public right-of-way to the route's west crossing of the railroad (Attachment 5, Figure 44). From KOP 14 along Poplar Spring Road, the route is approximately 0.75 mile east with the view obscured by dense tree growth. KOP 19 is located where Route 4 would diverge south from the railroad and would run approximately 0.37 mile southeast from the C&O Railroad's crossing of Elko Road. The simulation shows that Route 4 would not be visible from the railroad along public right-of-way due to tree coverage and slight bends in Elko Road south from the railroad crossing, blocking sight lines (Attachment 5, Figure 45). In addition to Route 4 not being visible from public road right-of-way in the vicinity of the railroad, an existing Dominion Energy Virginia transmission line corridor containing Lines #286 and #2091 already crosses over the C&O Railroad between MP 3.7 and 3.8.

In summary, Route 4 would run parallel to and cross the C&O Railroad twice. There would be no views of the route from public right-of-way, and the route would mainly affect the viewscape of the railroad for observers traveling the railroad itself. Only along the railroad corridor would Route 4 be visible where it parallels the resource. Route 4 would require a large amount of tree clearing along the length of the railroad. While Route 4 would add modern infrastructure to an area that currently is primarily forested, the route would only impact a small portion of the overall resource, totaling 2.64 miles of the railroad's

¹ KOP 14 is used as a simulation for Figures 9, 33, and 41 for 043-5080 and Figure 44 for 121-5134. All of these are located at the same location, but Figure 44 is facing southeast, while Figures 3, 33, and 41 are facing northeast.

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(Redacted)

approximately 23-mile-long previously surveyed length. For these reasons, ERM recommends that Route 4 would have a **Minimal Impact** on 121-5134.

Archaeology Findings

Six known archaeological sites are located in the right-of-way of the proposed transmission line route alternatives (Table 3.9-1). 44HE0683 and 44HE0708 are within the right-of-way of Route 1, while 44HE0898 is within the right-of-way of Route 3. Three archaeological resources are within the right-of-way of Route 4, consisting of 44HE0702, 44HE0704, and 44HE0923. There are no sites within the right-of-way of Route 2.

The sites that would be impacted by each alternative route are described below. The descriptions include information on the eligibility of each site for listing in the NRHP as well as an assessment of each site's condition based on desktop review. A confident determination about the nature of archaeological deposits at each site and impacts from prior land use activities would require a field survey to verify the desktop analysis.

Table 3.9-1: Archaeological Resources within the Right-of-way for the Routes

Considered Resource	Route Alternative			
	Route 1	Route 2	Route 3	Route 4
44HE0683	X	-	-	-
44HE0708	X	-	-	-
44HE0898	-	-	X	-
44HE0702	-	-	-	X
44HE0704	-	-	-	X
44HE0923	-	-	-	X
Total Resources	2	0	1	3

^a "X" indicates that the resource is within the right-of-way of the route.

Route 1

Two archaeological sites lie within the right-of-way for Route 1: 44HE0683 and 44HE0708. Site 44HE0683 is recorded as a 1,489.61-acre airport dating from 1925 to 1949 that was used as a decoy airport during World War II. The northern portion of the archaeological site is mapped to span from Route 1 [REDACTED]. This portion of the route is currently vegetated. The majority of the site is south of Route 1 and contains extensive commercial, industrial, and residential development. Included in this development are the Portugee and Elko substations, commercial retail outlets, manufacturing facilities, and data centers. Site [REDACTED]. The site has been determined not eligible for listing in the NRHP. [REDACTED]. The overall integrity of the archaeological deposits at the site is unknown however, it is unlikely that any would be encountered where Route 1 impinges upon the site boundary. The condition of the site would be confirmed during the Phase I survey to be completed for the Project.

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Site 44HE0708 is located off Elk Road in Sandston, Virginia, and is identified as a historic, domestic farmstead dating to the New Dominion and World War I to II periods, from approximately 1925 to 1949. Initial Phase I investigations were conducted in 1997 by Browning and Associates who identified multiple components of the site consisting of four poured concrete foundations, a 10-foot diameter circular concrete pit, a pair of 6-foot-tall concrete gate posts and two old roadways. Architectural and domestic remains were collected in plow zone contexts, and no artifacts were recovered through subsurface testing. Based on these findings, this site has been determined ineligible for NRHP listing. While no transmission structures for Route 1 would be placed within the site boundaries, the site could be impacted by construction traffic or clearing within the new right-of-way. Aerial photography spanning from 1963 to 2018 shows no change in the condition of the site area.

Route 2

No previously recorded archaeological sites fall within the right-of-way for this route.

Route 3

One archaeological site lies within the right-of-way for Route 3. Site 44HE0898, which has not been evaluated for listing in the NRHP, is located off Technology Boulevard in Sandston, Virginia. 44HE0898 is mapped within Route 3 between MP [REDACTED].

[REDACTED] Based on a Phase I survey by Cultural Resources Inc. in 1996, the site is a historic house dating to the twentieth century. The overall integrity of the archaeological deposits at the site is unknown. While no transmission structures for Route 3 would be placed within the site boundaries, the site could be impacted by construction traffic or clearing within the expanded right-of-way. Aerial photography spanning the period from 1952 to 2018 shows the structure still extant in 1968 but gone by 1984. Subsequent aerial photographs show no change to the site conditions through 2018.

Route 4

Three archaeological sites are mapped within the right-of-way for Route 4: 44HE0702, 44HE0704, and 44HE0923. 44HE0704 and 44HE0923 were previously determined not eligible for listing in the NRHP, and 44HE0702 is unevaluated.

Site 44HE0702 is a previously recorded prehistoric temporary camp site mapped at Route 4 [REDACTED]. [REDACTED] The site is situated within a grove of trees. Based on Phase I investigations completed by Browning and Associates in 1997, 44HE0702 is a likely Archaic period camp based on the presence of lithic artifacts, though no diagnostic artifacts were collected to positively identify a cultural affiliation. While no transmission structures for Route 4 are planned to be placed within the site boundaries, the site could be impacted by construction traffic or clearing within the expanded right-of-way. Aerial imagery spanning the period from 1963 to 2018 shows no apparent change to conditions at the site area.

Site 44HE0704 is an ineligible multicomponent site [REDACTED] in Sandston, Virginia. The site consists of a historic period domestic farmstead on the northern end and a historic African American cemetery to the extreme south. The farmstead component was not definitively dated, but Phase I survey conducted by Browning and Associates in 1997 recovered a high density of domestic refuse consisting of historic ceramics, bottle glass, a small button, architectural hardware, and handmade bricks. [REDACTED]. The cemetery component has been positively dated from 1900 to 1939 based on historic research and census records. Based on boundary delineations conducted by AECOM-Germantown, the

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cemetery is roughly 0.11 acre and consists of one headstone and eight probable graves, although it is likely that more burials exist. More specific additional information on site components, their location, and extent in relation to the Route 4 right-of-way is not currently known, although a site plan in a 1998 report by the Louis Berger Group indicates that the cemetery may be immediately adjacent to the east side of the right-of-way. While no transmission structures for Route 4 are planned to be placed within the site boundaries, any surviving portions of the site could be impacted by construction traffic or clearing within the expanded right-of-way. Although aerial imagery from 1963 and 1968 potentially reveals the results of the previously mentioned logging activity, subsequent images through 2018 show no evidence of further disturbance to the site area.

Site 44HE0923 is a small, ineligible site [REDACTED] in Sandston, Virginia. Site 44HE0923 is a multicomponent site consisting of a Pre-Contact, Native American, temporary camp. No diagnostic artifacts were recovered for an approximate date to be established. Phase I reconnaissance was conducted by LBA, Inc. in 1997, which resulted in the identification of a small lithic debitage scatter including a complete hammerstone within the plow zone. Subsequent to the LBA, Inc. survey, the entire site was destroyed. While no transmission structures for Route 4 are planned to be placed within the site boundaries, any potential surviving portions of the site could be impacted by construction traffic or clearing within the expanded right-of-way. Aerial photographs from 1963 through 2018 show no indications of changing conditions at the site location.

CONCLUSIONS AND RECOMMENDATIONS

The pre-application analysis gathered information on archaeological and historic architectural resources that qualify for consideration according to the VDHR Guidelines for transmission line projects.

Six known archaeological sites are located in the right-of-way of the transmission line route alternatives. An assessment of the condition and research potential of those sites is contingent upon archaeological field investigations, which will be conducted at relevant sites once a preferred alternative is selected by the SCC. Potential impacts to sites along the preferred route will be assessed as part of the field survey.

Nine historic resources fall within the VDHR study tiers for the route alternatives under consideration. Since portions of several routes share common alignments, some resources could be affected regardless of the alternative route selected by the SCC for the Project. A comparison of the number of resources impacted and the degree of impact for each alternative route is presented in Table 4-1. The specific resources affected by each alternative are covered in the subsections that follow.

Table 4-1: Comparison of Project Impacts on Historic Resources in the Study Areas of the Routes

Route Alternative	Number of Considered Resources in Each Impact Category				
	None	Minimal	Moderate	Severe	Total
Route 1	2	3	0	0	5
Route 2	1	4	0	0	5
Route 3	4	1	2	0	7
Route 4	2	2	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 and review of survey results by VDHR and other consulting parties. For any resources where the agencies concur in a finding of moderate or severe impact, the Company will propose treatments to avoid, minimize, or mitigate those impacts. Treatment options for archaeological sites could include selective structure placement to avoid direct impacts on sites, minor route adjustments to avoid crossing sites, or archaeological data recovery. Treatment options for aboveground historic resources could include detailed site documentation, historic research, and historic preservation studies; preparation of digital media or museum-type exhibits on sites for public interpretation; installation of historic markers or signs; installation of vegetative screening; or contributions to historical preservation organizations or specific preservation projects. Additional mitigation could be identified through consultation with VDHR and other consulting parties.

Route 1

Five previously recorded historic architectural resources meet the criteria specified in the Guidelines within the VDHR study tiers for Route 1 (Table 4.1-1). The route would have no impact on two of these and a minimal impact on three.

WHITE OAK ELECTRIC TRANSMISSION PROJECT**CONCLUSIONS AND RECOMMENDATIONS**

Pre-Application Analysis, Henrico and Charles City Counties, Virginia
(Redacted)

Table 4.1-1: Impacts to Historic Resources in the VDHR Study Tiers for Route 1

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 – potentially eligible	043-5080	Second Deep Bottom Battlefield	None
0.0 to 0.5	National Register – eligible	043-5081	Seven Pines Battlefield	None
0.0 (within right-of-way)	National Register – eligible	043-0308	Savage Station Battlefield	Minimal
	National Register – potentially eligible	042-5017	Second Cold Harbor Battlefield	Minimal
		043-5077	Glendale Battlefield	Minimal

Route 2

Five previously recorded historic architectural resources meet the criteria specified in the Guidelines within the VDHR study tiers for Route 2 (Table 4.2-1). The route would have no impact on one resource and a minimal impact on four resources.

Table 4.2-1: Impacts to Historic Resources in the VDHR Study Tiers for Route 2

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	-	-	-
0.5 to 1.0	National Register Properties (Listed)	-	-	-
	National Register – potentially eligible	043-5080	Second Deep Bottom Battlefield	None
0.0 to 0.5	National Register – eligible	-	-	-
0.0 (within right-of-way)	National Register – eligible	043-0308	Savage Station Battlefield	Minimal
		043-5081	Seven Pines Battlefield	Minimal
	National Register – potentially eligible	042-5017	Second Cold Harbor Battlefield	Minimal
		043-5077	Glendale Battlefield	Minimal

Route 3

Seven previously recorded historic architectural resources meet the criteria specified in the Guidelines within the VDHR study tiers for Route 3 (Table 4.3-1). The route would have no impact on four resources, a minimal impact on one resource, and a moderate impact on two resources.

WHITE OAK ELECTRIC TRANSMISSION PROJECT**CONCLUSIONS AND RECOMMENDATIONS**

Pre-Application Analysis, Henrico and Charles City Counties, Virginia
(Redacted)

Table 4.3-1: Impacts to Historic Resources in the VDHR Study Tiers for Route 3

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 – potentially eligible	043-5080	Second Deep Bottom Battlefield	None
0.0 to 0.5	National Register – eligible	043-0078	Cedar Knoll	Moderate
		043-0288	Savage Station Farm and Cemetery	None
	National Register – potentially eligible	042-5017	Second Cold Harbor Battlefield	None
		043-5077	Glendale Battlefield	None
0.0 (within right-of-way)	National Register – eligible	043-0308	Savage Station Battlefield	Moderate
		043-5081	Seven Pines Battlefield	Minimal

Route 4

Five previously recorded historic architectural resources meet the criteria specified in the Guidelines within the VDHR study tiers for Route 4 (Table 4.4-1). The route would have no impact on two resources, a minimal impact on two resources, and a moderate impact on one resource.

Table 4.4-1: Impacts to Historic Resources in the VDHR Study Tiers 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 – potentially eligible	043-5074	First Deep Bottom Battlefield	None
0.0 to 0.5	National Register – eligible	-	-	-
	National Register – potentially eligible	043-5080	Second Deep Bottom Battlefield	None
0.0 (within right-of-way)	National Register – eligible	043-0308	Savage Station Battlefield	Minimal
		043-5077	Glendale Battlefield	Moderate
		121-5134	Chesapeake and Ohio Railroad	Minimal

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 route selected by the SCC for the Project. Survey of the approved route alternative 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 (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 any additional as-of-yet unrecorded resources in the survey area defined in the Guidelines as applied to the Project design. The archaeological survey will adhere to VDHR survey standards (VDHR 2017), and will entail systematic coverage of the approved route's right-of-way, as well as associated facilities, staging areas, etc. 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.

During the course of the historic architectural survey, all structures determined to be of age will be photographed and marked on the applicable U.S. Geological Survey (USGS) quadrangle map. While NPS Bulletin 15 (NPS 1995) defines a historic property as a resource that is 50 years or older, for the purposes of this Project, survey will include those 45 years or older to accommodate the length of time needed to complete the permitting phase for the Project. Furthermore, the survey will also record those resources that may have reached significance prior to the 50 (45) year age threshold, in accordance with NPS guidance, if they are integral parts of districts, or have sufficient merit to be considered eligible for the NRHP on their own.

Digital photographs will be taken to record the historic resources' overall appearance and details. Sketch maps will be drawn depicting the relationship of dwellings to outbuildings and associated landscape features. Additional information on the structures' appearance and integrity will be recorded to assist in making recommendations of NRHP eligibility. Historic maps, aerial photographs, and tax assessor data will be consulted to assist in dating the resources. Resources identified in the field effort will be reported to the VDHR, V-CRIS 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.

Any resources identified that have potential for listing on the NRHP may require intensive architectural inventory or phase II testing to assess project impacts. For any resource negatively impacted by the Project, avoidance of the impact should be considered. If the impact cannot be avoided, then a mitigation plan will be needed. Both minimization and mitigation plans should be developed in consultation with the VDHR.

WHITE OAK ELECTRIC TRANSMISSION PROJECT

Pre-Application Analysis, Henrico and Charles City Counties, Virginia
(Redacted)

REFERENCES**REFERENCES**

- American Battlefield Trust. 2023. Cold Harbor. Electronic document, <https://www.battlefields.org/learn/civil-war/battles/cold-harbor>. Accessed January 12, 2023.
2023. First Battle of Deep Bottom, Darbytown or Strawberry Plains. <https://www.battlefields.org/learn/civil-war/battles/first-battle-deep-bottom>. Accessed January 13, 2023.
2023. Second Deep Bottom Battle, Fussell's Mill. <https://www.battlefields.org/learn/civil-war/battles/second-deep-bottom>. Accessed January 13, 2023.
- Bell, Elizabeth, and Elizabeth Monroe. 2013. *Archaeological Survey of the Route 613 Widening Project, New Kent County, Virginia*. (College of) William and Mary Center for Archaeological Research. Virginia Department of Historic Resources.
- Brady, Ellen M., Joshua Lay, John P. Cooke. 2004. *Phase I Cultural Resources Survey of the Elmont-Chickahominy 230kV Line from the Old Church Substation in Hanover County to the Chickahominy Substation in Charles City County*. Cultural Resources, Inc. Virginia Department of Historic Resources.
- Bott, Keith. 1980. *Review and Compliance Phase I Reconnaissance Summary, Citizens and Farmers Bank, Quinton Branch, New Kent County, Virginia*. Virginia Research Center for Archaeology. Virginia Department of Historic Resources.
- Bowden, Bradley, Ashley Neville, and Robyn Osl. 2001. *Phase I Cultural Resources Survey of the Harmon-Hayes Property, Henrico County, Virginia*. Gray & Pape, Inc. Virginia Department of Historic Resources.
- Birge-Wilson, Adrienne. 2021. 043-0308 Savage Station Battlefield, Review File No. 2021-0034: Considered Not Eligible for Environmental Review Purposes Only. On file, Virginia Department of Historic Resources, Richmond.
- Browning, Lyle. 1989. *Phase I Archaeological Reconnaissance Survey of The Elko Tract, Henrico County, Virginia*. Browning Associates, Ltd. Virginia Department of Historic Resources.
1989. *Phase I Archaeological Reconnaissance Survey, Proposed Public Safety Complex, Elko Tract, Henrico County, Virginia*. Browning Associates, Ltd. Virginia Department of Historic Resources.
- Charles City County Center for Local History. 2023. Historical Markers. <https://charlescity.org/learn/historical-markers/>. Accessed February 14, 2023.
- Chesapeake and Ohio Historical Society. 2023. History of the C&O Railway. <https://cohs.org/history/>. Accessed November 15, 2022.
- CSX. 2023. CSX System Map. <https://www.csx.com/index.cfm/customers/maps/csx-system-map/>. Accessed February 14, 2023.
- CWSAC (Civil War Sites Advisory Commission). 1993. VCRIS Architecture Form, 042-5017, 043-0308, 043-5077, and 043-5080. On file, Virginia Department of Historic Resources.
- Dutton, David H., and Robert J. Taylor Jr. 2017. *Phase I Cultural Resources Survey of the Briel Farm Solar Project, Henrico County, Virginia*. Dutton & Associates. Virginia Department of Historic Resources.

WHITE OAK ELECTRIC TRANSMISSION PROJECT

Pre-Application Analysis, Henrico and Charles City Counties, Virginia
(Redacted)

REFERENCES

- Dutton, David H., Robert J. Taylor Jr., Dara Friedberg, 2021. *Phase I Cultural Resource Survey of the 105-Hectare (260-Acre) Bridleton Solar Project Area, Henrico County, Virginia*. Dutton & Associates. Virginia Department of Historic Resources.
- Garner, Benjamin G. Jr. 1937. Work Progress Administration of Virginia Historical Inventory, Cedar Knolls. On file, Virginia Department of Historic Resources.
- González, Marco, Carthon Davis, III, Michael Carmody. 2012. *A Phase I Archaeological Survey of Selected Areas within the Interstate 64 Peninsula Study from Interstate 664 in Hampton to Interstate 95 in Richmond, Virginia*. Dovetail Cultural Resource Group, LLC. Virginia Department of Historic Resources.
- Grymes, Charles A. 2020. Chesapeake and Ohio Railway. <https://www.dailypress.com/history/dp-nw-lee-hall-depot-restoration-20210627-snwuqlfxzvdtdbovaewrp5f6tve-story.html>. Accessed November 15, 2022
- Nolte, Jessica. 2021. <https://www.dailypress.com/history/dp-nw-lee-hall-depot-restoration-20210627-snwuqlfxzvdtdbovaewrp5f6tve-story.html>. [Newport News] *Daily Press*. Accessed November 15, 2022.
- Henrico County Historical Society. 2023. <http://www.henricohistoricalsociety.org/>. Accessed November 18, 2022.
- Holma, Marc. 2011. VCRIS Architecture Form, 043-0078. On file, Virginia Department of Historic Resources.
- Humphries, Amy, Dawn Frost, and Carol Tyrer. 2010. *Phase I Cultural Resources Survey of Bicounty Way Property, New Kent County, Virginia*. Virginia Department of Historic Resources.
- Jeter, Erica. 2002. *Archaeological Survey of Proposed Improvements to Interstate 64, Henrico and New Kent Counties, Virginia*. Virginia Department of Transportation (Highways and Transportation). Virginia Department of Historic Resources.
- Levinthal, Aaron, Dawn Frost, and Carol Tyrer. 2008. *Phase I Cultural Resources Survey of Permit Areas within the Bottoms Bridge Tract, New Kent County, Virginia*. Circa-Cultural Resource Management, LLC. Virginia Department of Historic Resources.
- Lindberg, Lawrence. 1975. *An Archeological Reconnaissance of Route 295, Richmond, Virginia*. Virginia State Library. Virginia Department of Historic Resources.
- MacCord, Howard A. 1963. *The Phillip Nase Site, 44HE1, Henrico County, Virginia*. Virginia State Library. Virginia Department of Historic Resources.
- Magoon, Dane, and Jocelyn Pitts. 2005. *Phase I Cultural Resources Survey for the Proposed Patriot's Landing Development, New Kent County, Virginia*. Cultural Resources, Inc. Virginia Department of Historic Resources.
- McDonald, Bradley M., David M. Givens, Martha McCartney. 1995. *Phase I Archaeological Survey of the Capital Region Airport Commission Property in New Kent County, Virginia*. James River Institute for Archaeology. Virginia Department of Historic Resources.
- McLearen, Douglas C., Matthew R. Laird, R. Taft Kiser, and Carol D. Tyrer. 1999. *Phase I Archaeological Survey of Proposed and Potential Wetlands Mitigation Areas on Capital Region Airport Commission Property in New Kent County, Virginia*. Cultural Resources, Inc. Virginia Department of Historic Resources.

WHITE OAK ELECTRIC TRANSMISSION PROJECT**REFERENCES**

Pre-Application Analysis, Henrico and Charles City Counties, Virginia
(Redacted)

- McLearn, Douglas C., and Christopher P. Egghart. 1996. *Phase I Archaeological Survey of a Gravity Sewer Line, Force Main and Pump Station Location in Eastern Henrico County, Virginia*. Virginia Commonwealth University Archaeology Research Center. Virginia Department of Historic Resources.
- NPS (National Park Service). 1995. *National Register Bulletin: How to Apply the National Register Criteria for Evaluation (NRB 15)*. Revised for Internet 1995. Accessed: June 25, 2021. Retrieved from: <https://www.nps.gov>
- NETROnline (National Environmental Title Research). 2023. Historic Aerials and Topographic Maps, Virginia. Accessed: May 2022. Retrieved from: <https://www.historicaerials.com/viewer>.
- O'Dell, Jeffrey. 1975. VCRIS Architecture Form, 043-0078. On file, Virginia Department of Historic Resources.
- O'Dell, J.M. 1976. VCRIS Architecture Form, 043-0288. On file, Virginia Department of Historic Resources.
- Phaup, Nancy, Martha McCartney, Carol Tyrer. 2006. *Phase I Archaeological Survey for Approximately 113 Acres at the Former Hood Property, Henrico County, Virginia*. Circa-Cultural Resource Management, LLC. Virginia Department of Historic Resources.
2006. *Phase I Archaeological Survey for the Henrico County Sewerline and Pump Station, Henrico County, Virginia*. Circa-Cultural Resource Management, LLC. Virginia Department of Historic Resources.
2006. *Phase I Archaeological Survey for Approximately 105 Acres at the Former Hood Property, Henrico County, Virginia*. Circa-Cultural Resource Management, LLC. Virginia Department of Historic Resources.
2006. *Phase I Archaeological Survey for Approximately 14 Acres at the Cunningham Tract, New Kent County, Virginia*. Circa-Cultural Resource Management, LLC. Virginia Department of Historic Resources.
- Rinehart, Charles J., Phillip E. Pendleton. 1998. *An Archaeological Investigation of the Elko Tract, Henrico County, Virginia*. Louis Berger Group (Louis Berger and Associates). Virginia Department of Historic Resources.
- Rowe, Blythe. 2017. VCRIS Architecture Form, 043-0308 and 043-5081. On file, Virginia Department of Historic Resources.
- Sasser, Ray. 1976. *Second Archaeological Reconnaissance of Route 295, Richmond, Virginia*. Virginia State Library. Virginia Department of Historic Resources.
- Searles, Harry. 2023. First Battle of Deep Bottom, July 27–29, 2023. <https://www.americanhistorycentral.com/entries/first-battle-of-deep-bottom/>. Accessed January 13, 2023.
- State Corporation Commission (SCC). 2017. *Commonwealth of Virginia State Corporation Commission Division of Public Utility Regulation Guidelines for Transmission Line Applications Filed Under Title 56 of the Code of Virginia*. Available online at: <https://www.scc.virginia.gov/getattachment/921b6b42-4e06-4ab5-b296-e73fdcd60cac/Trans.pdf>. Accessed August 2021.
- Stewart, Brynn, and Ellen Brady. 2016. *An Archaeological Survey of Approximately 2.5 Miles Associated with Segment A of the Interstate 64 Widening Project, Henrico County, Virginia*. Stantec Consulting Services. Virginia Department of Historic Resources.

WHITE OAK ELECTRIC TRANSMISSION PROJECT**REFERENCES**

Pre-Application Analysis, Henrico and Charles City Counties, Virginia
(Redacted)

Stinson, Wesley R., and Thomas R. Wheaton, Jr. 1982. *Phase I Archaeological Survey I-95, Henrico, Chesterfield, and Prince George Counties, Virginia*. Soil Systems, Inc. Virginia Department of Historic Resources.

Thomas F. Higgins III, Joe B. Jones, Oliver Mueller-Heubach. 2021. *An Archaeological Assessment and Survey for the 39-Acre Tract at 4900 Long Bridge Road, Henrico, Virginia*. (College of) William and Mary Center for Archaeological Research. Virginia Department of Historic Resources.

Tyrer, Carol D., Martha McCartney, Alain C. Outlaw. 1997. *Phase I and Phase II Archaeological Investigations for the Proposed Memorial Drive Extension, Henrico County, Virginia*. Cultural Resources, Inc. Virginia Department of Historic Resources.

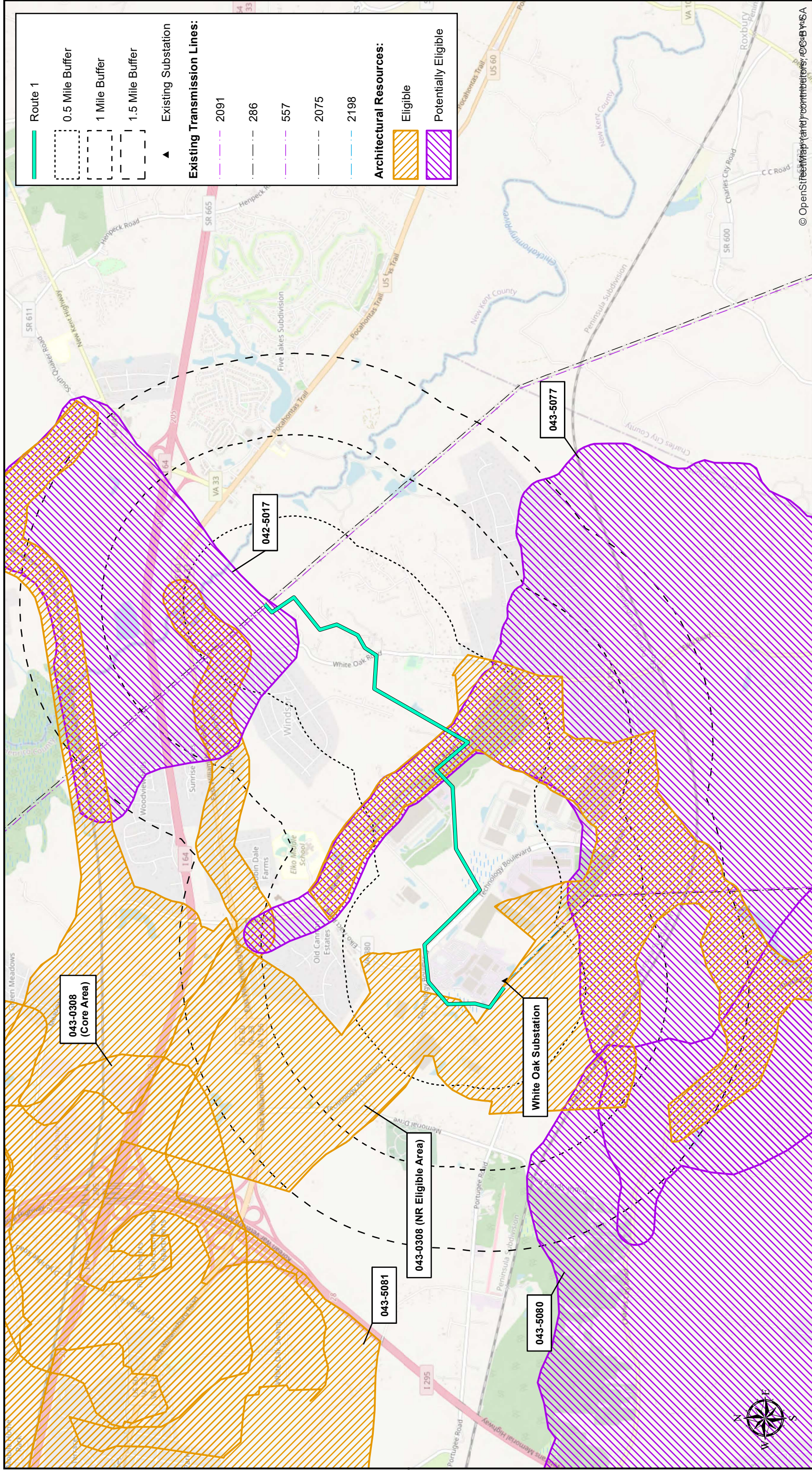
1997. *Phase I and Phase II Archaeological Investigations for Five Permit Areas at the White Oak Semiconductor Tract, Henrico County, Virginia*. Cultural Resources, Inc. Virginia Department of Historic Resources.

1997. *Phase I Archaeological Investigations for the Proposed Virginia Power Utility Corridor, Henrico County, Virginia*. Cultural Resources, Inc. Virginia Department of Historic Resources.

Underwood, John R., and Stevan C. Pullins. 1999. *Archaeological Identification Survey Associated with the Proposed Ponderosa Drive Tract Capital Outlay Project, Henrico County, Virginia*. (College of) William and Mary Center for Archaeological Research. Virginia Department of Historic Resources.

VDHR (Virginia Department of Historic Resources). 2008. *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia*. Accessed: June 2022. Retrieved from:
https://www.dhr.virginia.gov/wp-content/uploads/2018/08/DHR_Guidelines_for_Transmission_Line_Assessment.pdf

ATTACHMENT 1 LOCATIONS OF CONSIDERED RESOURCES ASSOCIATED WITH ROUTE ALTERNATIVES FOR PROPOSED PROJECT



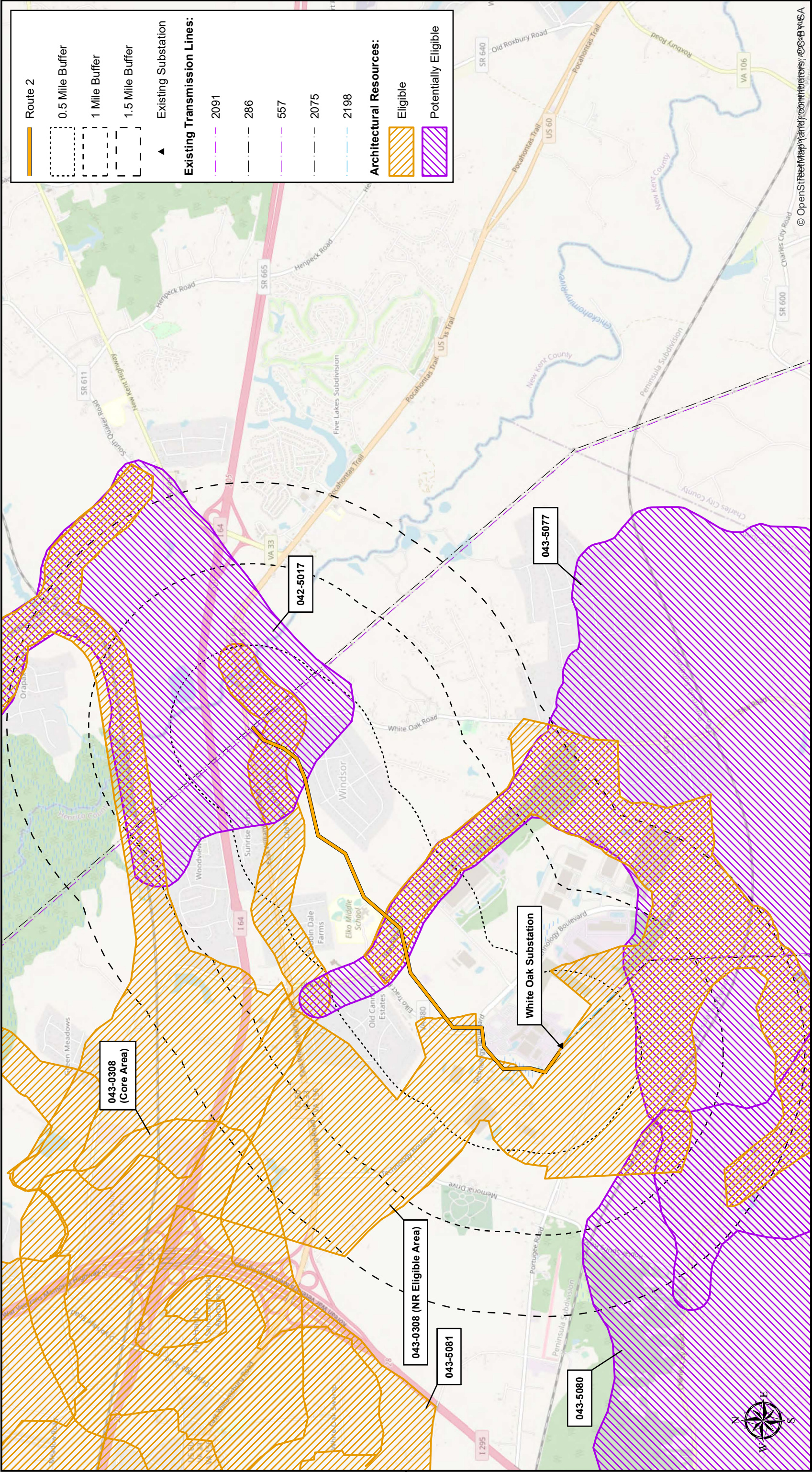
Attachment 1

Locations of Considered Resources Associated with Route Alternatives for Proposed Project – Route 1

White Oak Electric Transmission Project
Dominion Energy Virginia
Henrico County, VA



1:45,000



Attachment 1

Locations of Considered Resources Associated with Route Alternatives for Proposed Project – Route 2

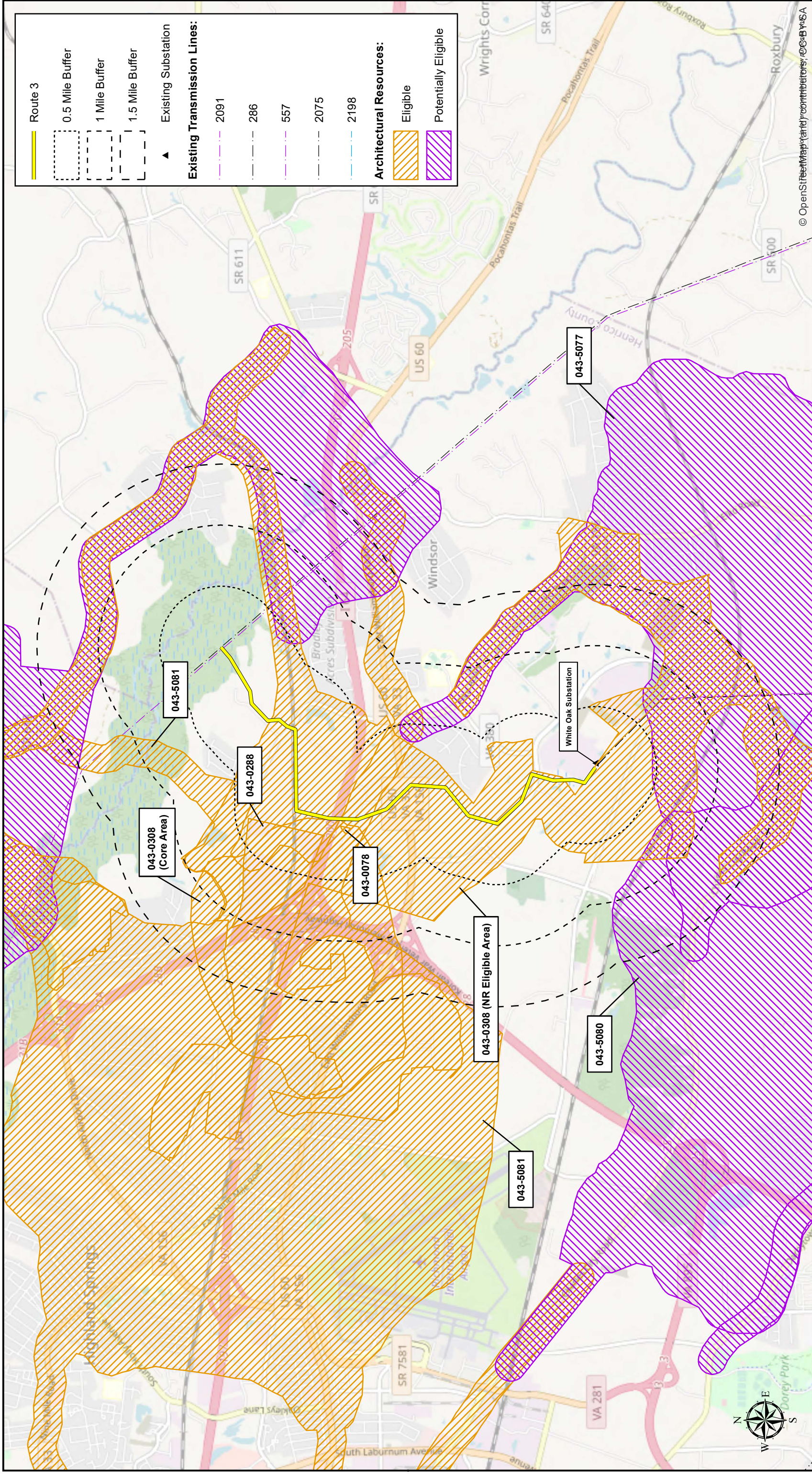
White Oak Electric Transmission Project

Dominion Energy Virginia

Henrico County, VA



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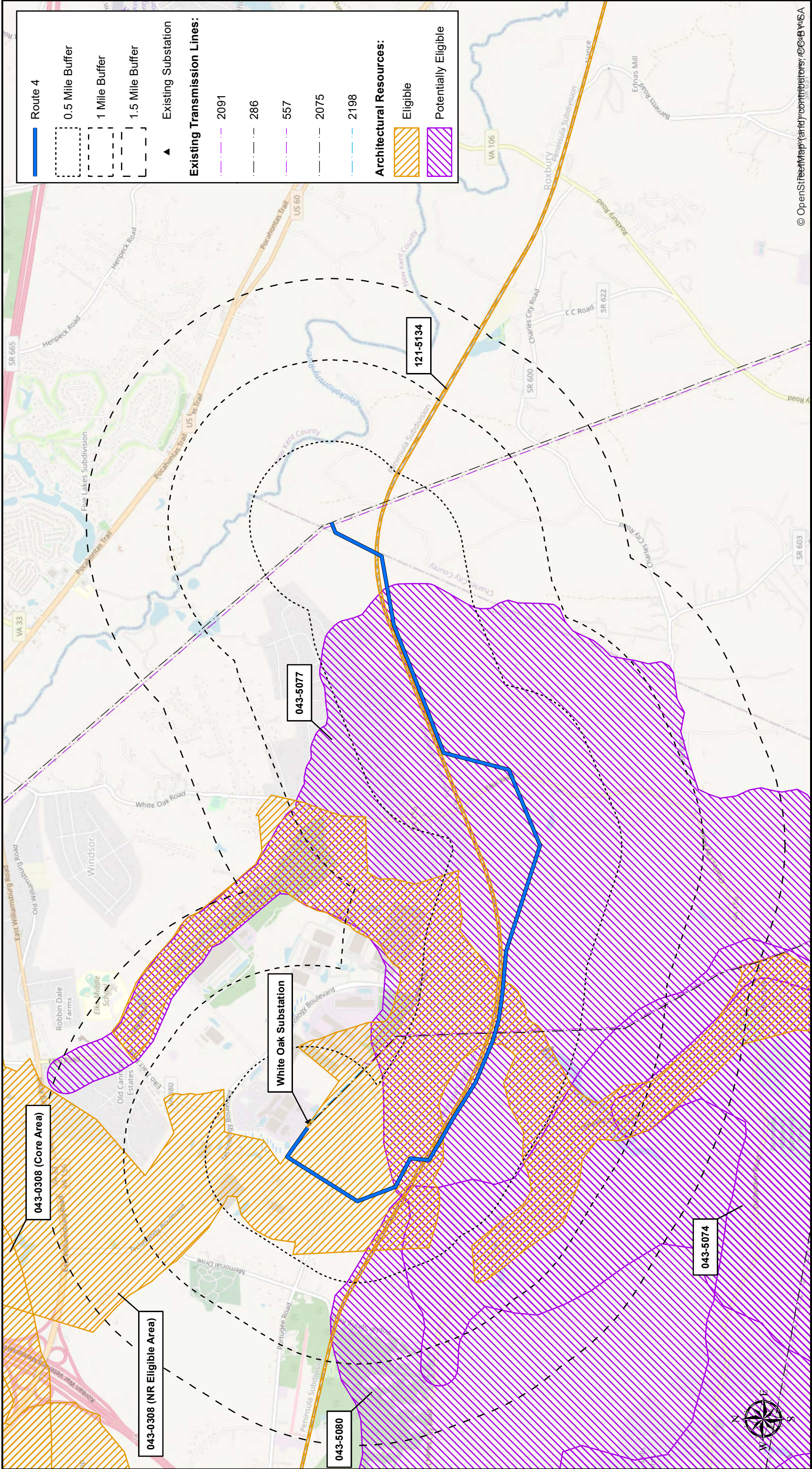


Attachment 1

Locations of Considered Resources Associated with Route Alternatives for Proposed Project – Route 3



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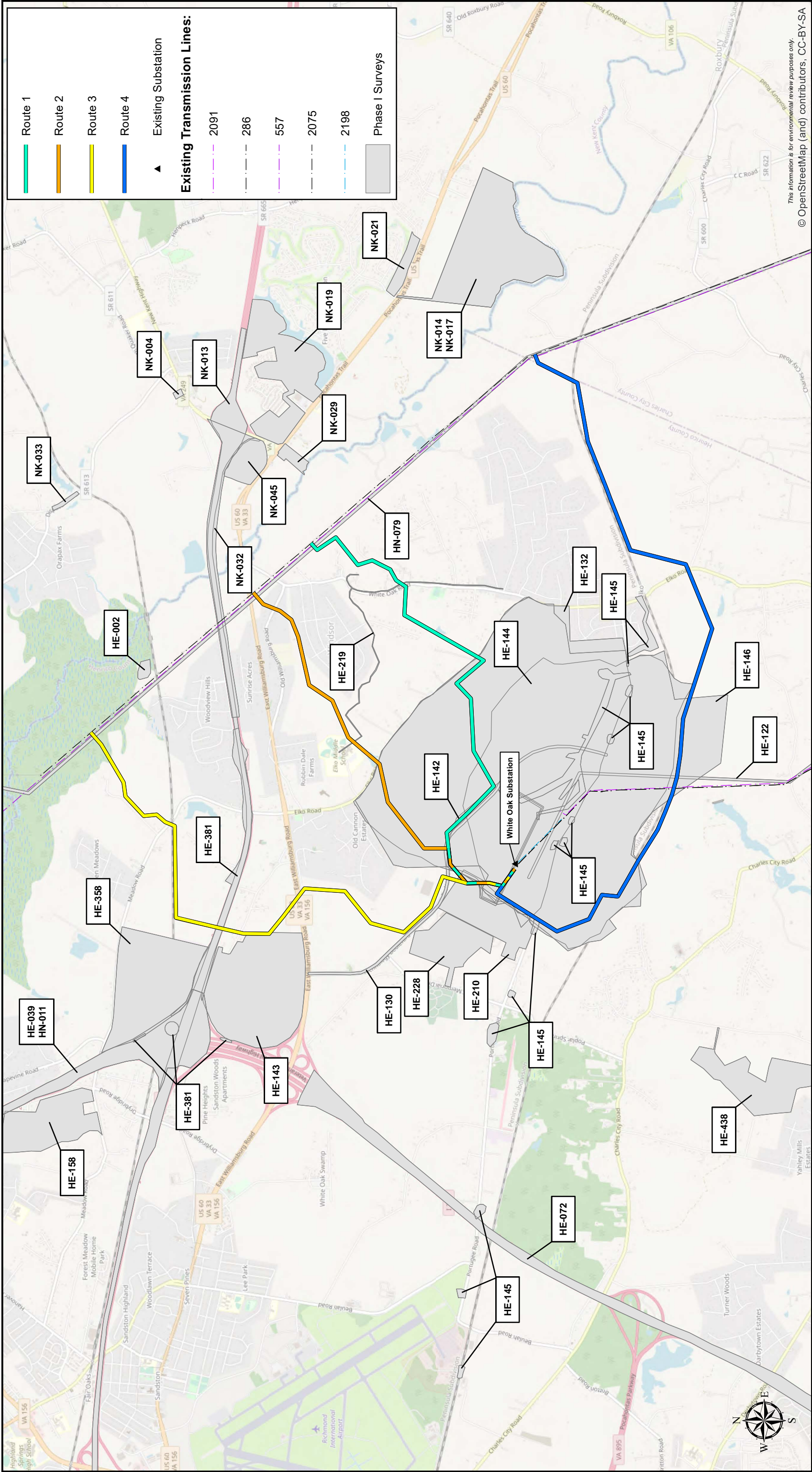


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Attachment 1
Locations of Considered Resources Associated with Route Alternatives for Proposed Project – Route 4
White Oak Electric Transmission Project
Dominion Energy Virginia
Henrico and Charles City Counties, Virginia

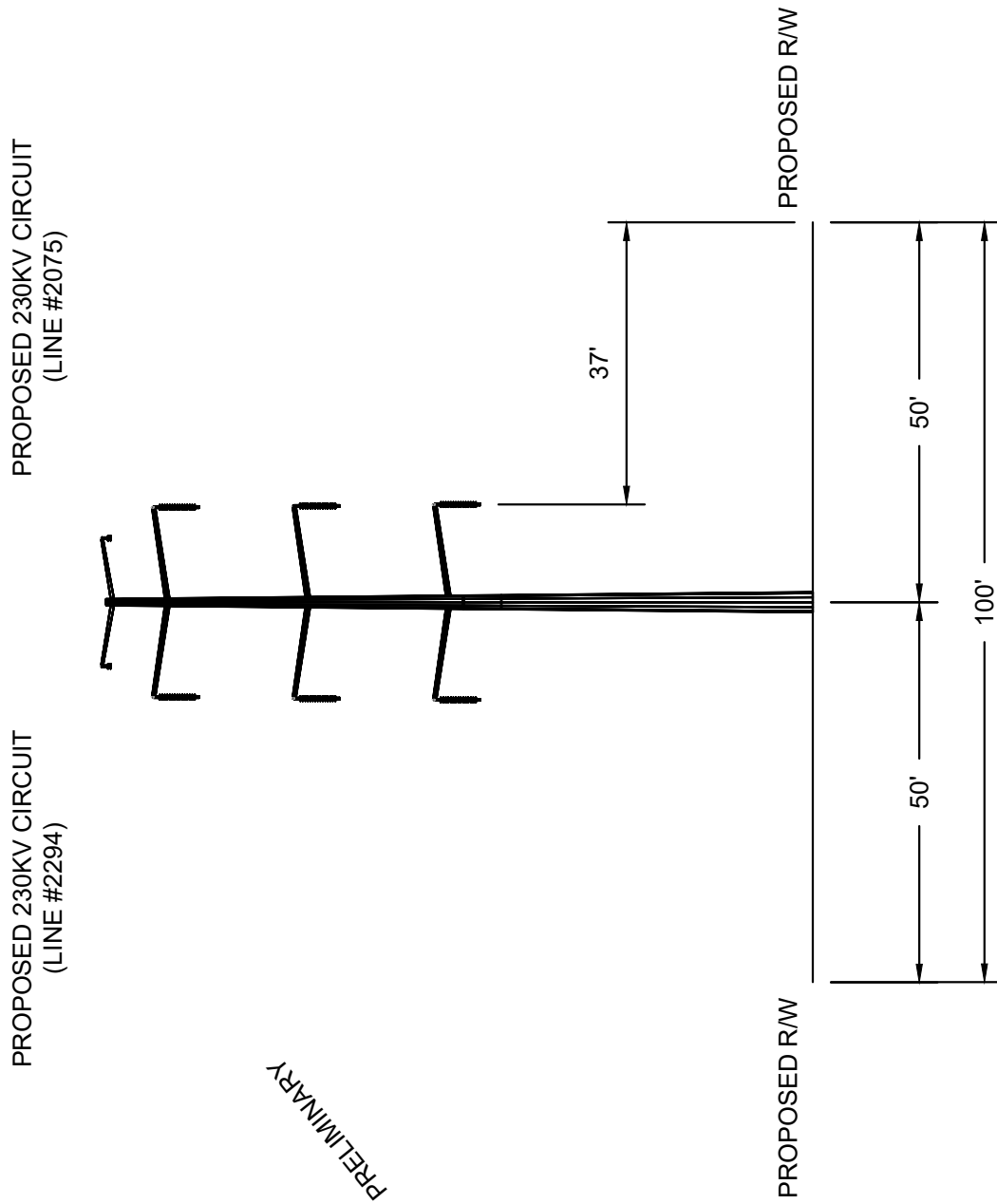


ATTACHMENT 2 CULTURAL RESOURCE SURVEYS COVERING PORTIONS OF ROUTE ALTERNATIVES



ATTACHMENT 3 TYPICAL DESIGN AND LAYOUT

WHITE OAK LINES

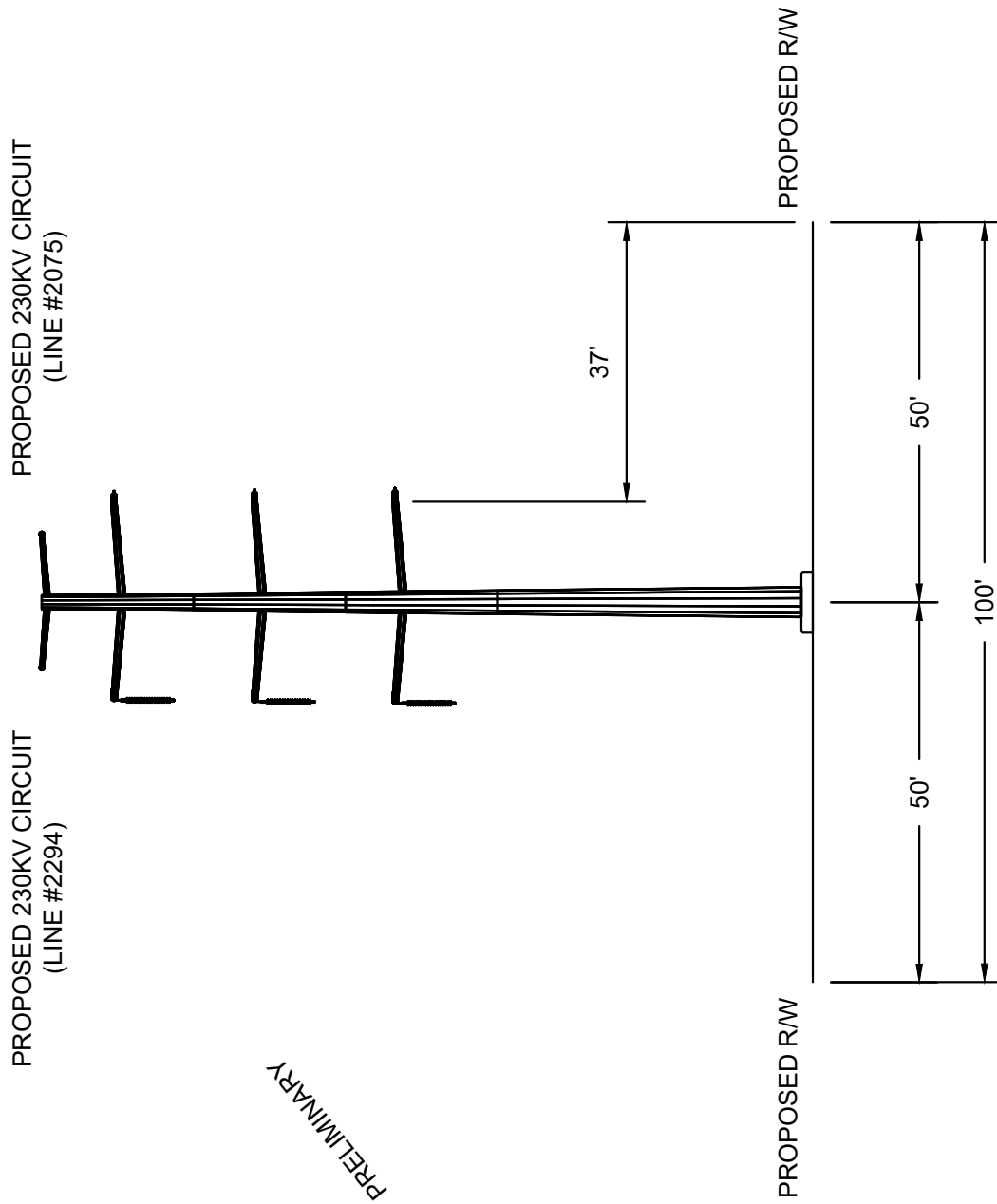


PRELIMINARY

PROPOSED CONFIGURATION
TYPICAL RIGHT OF WAY LOOKING TOWARD WHITE OAK

NOTE: INFORMATION CONTAINED ON DRAWING IS TO BE CONSIDERED PRELIMINARY IN NATURE AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.

WHITE OAK LINES

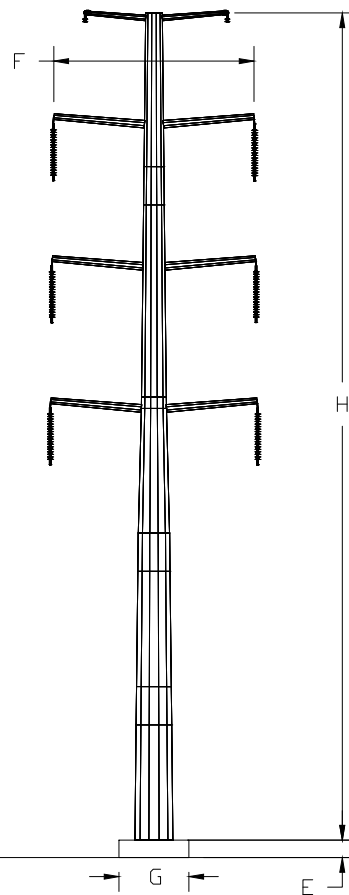


PROPOSED CONFIGURATION
TYPICAL RIGHT OF WAY LOOKING TOWARD WHITE OAK

NOTE: INFORMATION CONTAINED ON DRAWING IS TO BE CONSIDERED PRELIMINARY IN NATURE AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.

WHITE OAK LINES

PROPOSED 230KV CIRCUIT
(LINE #2294)



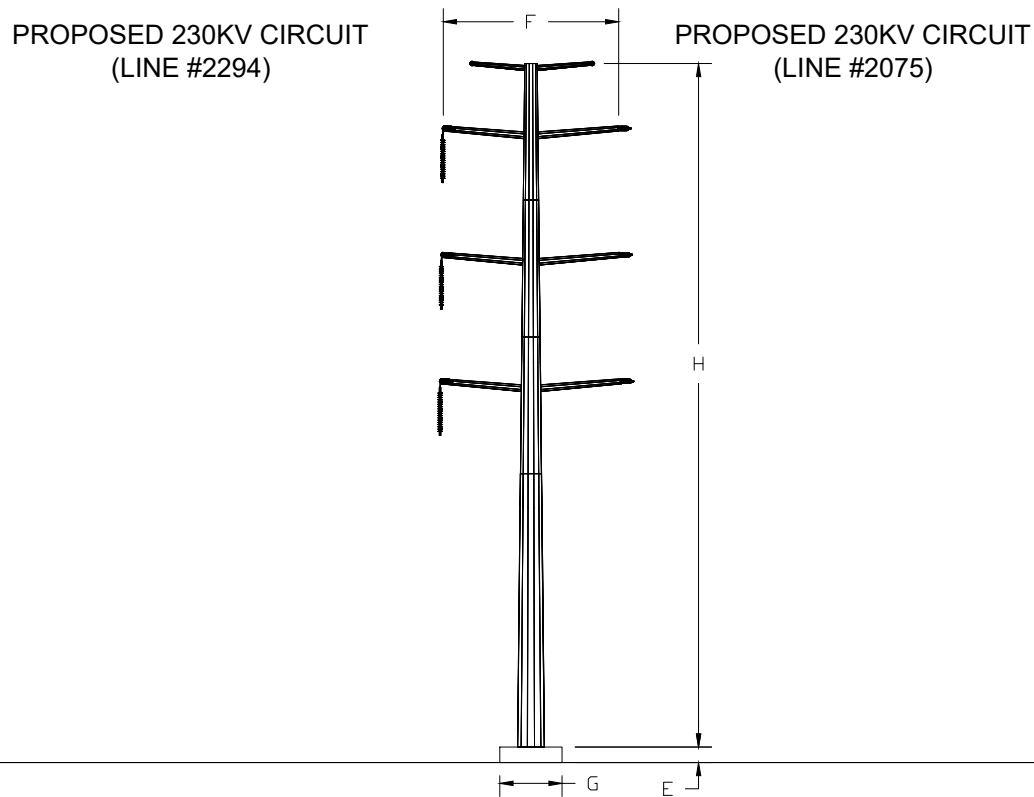
PROPOSED 230KV CIRCUIT
(LINE #2075)

DOUBLE CIRCUIT 1-POLE DEAD END STRUCTURE

- | | |
|-----------------------------------|---|
| A. MAPPING OF THE ROUTE: | SEE ATTACHEMENT II.B.3.e |
| B. RATIONALE FOR STRUCTURE TYPE: | TYPICAL CONFIGURATION FOR DOUBLE CIRCUIT SUSPENSION STRUCTURES. |
| C. LENGTH OF R/W (STRUCTURE QTY): | 4.6 MILES (14) |
| D. STRUCTURE MATERIAL: | WEATHERING STEEL |
| RATIONALE FOR MATERIAL: | THE COMPANY'S STANDARD FOR DRILLED PIER MONOPOLE CONSTRUCTION IS WEATHERING STEEL |
| E. FOUNDATION MATERIAL: | CONCRETE |
| AVERAGE FOUNDATION REVEAL: | SEE NOTE 2 |
| F. AVERAGE WIDTH AT CROSS ARM: | 26' |
| G. AVERAGE WIDTH AT BASE: | 6' DIAMETER FOUNDATION (SEE NOTE 3) |
| H. MINIMUM STRUCTURE HEIGHT: | 105' |
| MAXIMUM STRUCTURE HEIGHT: | 130' |
| AVERAGE STRUCTURE HEIGHT: | 116' |
| I. AVERAGE SPAN LENGTH (RANGE): | 716' (463' - 881') |
| J. MINIMUM CONDUCTOR-TO-GROUND: | 25.5' (AT MAXIMUM OPERATING TEMPERATURE) |

NOTE: 1. INFORMATION CONTAINED ON DRAWING IS PRELIMINARY IN NATURE AND SUBJECT TO CHANGE DURING FINAL DESIGN.
2. MINIMUM FOUNDATION REVEAL SHALL BE 1.5'.
3. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING.
4. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE.

WHITE OAK LINES



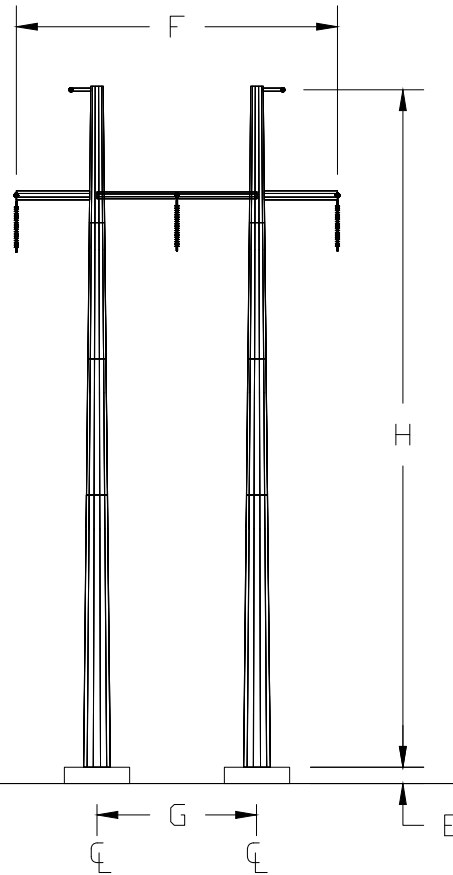
DOUBLE CIRCUIT 1-POLE DEAD END STRUCTURE

- | | |
|-----------------------------------|---|
| A. MAPPING OF THE ROUTE: | SEE ATTACHEMENT II.B.3.e |
| B. RATIONALE FOR STRUCTURE TYPE: | TYPICAL CONFIGURATION FOR DOUBLE CIRCUIT DEAD END STRUCTURES. |
| C. LENGTH OF R/W (STRUCTURE QTY): | 4.6 MILES (22) |
| D. STRUCTURE MATERIAL: | WEATHERING STEEL |
| RATIONALE FOR MATERIAL: | THE COMPANY'S STANDARD FOR DRILLED PIER MONOPOLE CONSTRUCTION IS WEATHERING STEEL |
| E. FOUNDATION MATERIAL: | CONCRETE |
| AVERAGE FOUNDATION REVEAL: | SEE NOTE 2 |
| F. AVERAGE WIDTH AT CROSS ARM: | 26' |
| G. AVERAGE WIDTH AT BASE: | 8' DIAMETER FOUNDATION (SEE NOTE 3) |
| H. MINIMUM STRUCTURE HEIGHT: | 85' |
| MAXIMUM STRUCTURE HEIGHT: | 125' |
| AVERAGE STRUCTURE HEIGHT: | 109' |
| I. AVERAGE SPAN LENGTH (RANGE): | 657' (285' - 981') |
| J. MINIMUM CONDUCTOR-TO-GROUND: | 25.5' (AT MAXIMUM OPERATING TEMPERATURE) |

NOTE: 1. INFORMATION CONTAINED ON DRAWING IS PRELIMINARY IN NATURE AND SUBJECT TO CHANGE DURING FINAL DESIGN.
 2. MINIMUM FOUNDATION REVEAL SHALL BE 1.5'.
 3. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING.
 4. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE.

WHITE OAK LINES

PROPOSED 230KV CIRCUIT
(LINE #2075 & LINE #2294)



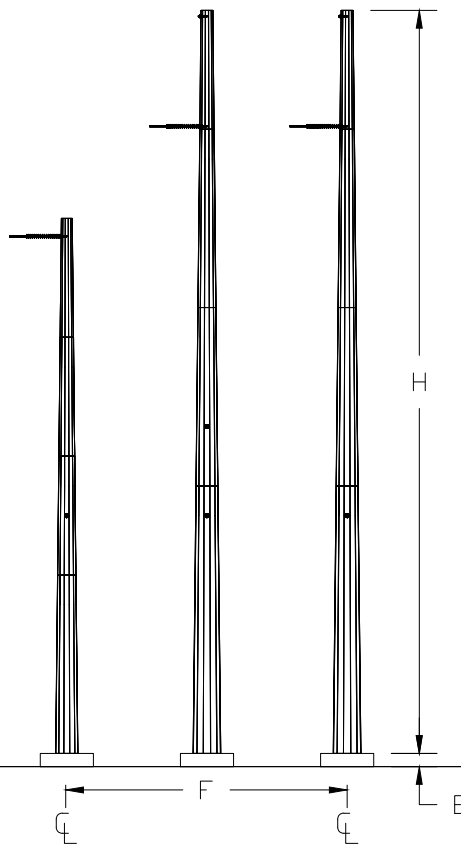
DOUBLE CIRCUIT 1-POLE DEAD END STRUCTURE

- | | |
|-----------------------------------|--|
| A. MAPPING OF THE ROUTE: | SEE ATTACHEMENT II.B.3.e |
| B. RATIONALE FOR STRUCTURE TYPE: | MAINTAINS CLEARANCES BELOW EXISTING CONDUCTOR AND ROLLING CLEARANCES. |
| C. LENGTH OF R/W (STRUCTURE QTY): | 4.6 MILES (2) |
| D. STRUCTURE MATERIAL: | WEATHERING STEEL |
| RATIONALE FOR MATERIAL: | THE COMPANY'S STANDARD FOR DRILLED PIER H-FRAME CONSTRUCTION IS WEATHERING STEEL |
| E. FOUNDATION MATERIAL: | CONCRETE |
| AVERAGE FOUNDATION REVEAL: | SEE NOTE 2 |
| F. AVERAGE WIDTH AT CROSS ARM: | 47' |
| G. AVERAGE WIDTH AT BASE: | 23.5' |
| H. MINIMUM STRUCTURE HEIGHT: | 55' |
| MAXIMUM STRUCTURE HEIGHT: | 55' |
| AVERAGE STRUCTURE HEIGHT: | 55' |
| I. AVERAGE SPAN LENGTH (RANGE): | 147' |
| J. MINIMUM CONDUCTOR-TO-GROUND: | 25.5' (AT MAXIMUM OPERATING TEMPERATURE) |

NOTE: 1. INFORMATION CONTAINED ON DRAWING IS PRELIMINARY IN NATURE AND SUBJECT TO CHANGE DURING FINAL DESIGN.
 2. MINIMUM FOUNDATION REVEAL SHALL BE 1.5'.
 3. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING.
 4. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE.

WHITE OAK LINES

PROPOSED 230KV CIRCUIT (LINE #2075 & LINE #2294)



SINGLE CIRCUIT 3-POLE DEAD END TAP STRUCTURE

- | | |
|-----------------------------------|---|
| A. MAPPING OF THE ROUTE: | SEE ATTACHEMENT II.B.3.e |
| B. RATIONALE FOR STRUCTURE TYPE: | MAINTAINS UNDERCROSSING CLEARANCE AND LINE ANGLE WITH EXISTING STRUCTURES. |
| C. LENGTH OF R/W (STRUCTURE QTY): | 4.6 MILES (2) |
| D. STRUCTURE MATERIAL: | WEATHERING STEEL |
| RATIONALE FOR MATERIAL: | THE COMPANY'S STANDARD FOR DRILLED PIER THREE POLE CONSTRUCTION IS WEATHERING STEEL |
| E. FOUNDATION MATERIAL: | CONCRETE |
| AVERAGE FOUNDATION REVEAL: | SEE NOTE 3 |
| F. AVERAGE WIDTH AT CROSS ARM: | 48' (OUTSIDE POLE TO OUTSIDE POLE) |
| G. AVERAGE WIDTH AT BASE: | 6' DIAMETER (SEE NOTE 4) |
| H. MINIMUM STRUCTURE HEIGHT: | 125' |
| MAXIMUM STRUCTURE HEIGHT: | 125' |
| AVERAGE STRUCTURE HEIGHT: | 125' |
| I. AVERAGE SPAN LENGTH (RANGE): | 174' |
| J. MINIMUM CONDUCTOR-TO-GROUND: | 25.5' (AT MAXIMUM OPERATING TEMPERATURE) |

NOTE: 1. INFORMATION CONTAINED ON DRAWING IS PRELIMINARY IN NATURE AND SUBJECT TO CHANGE DURING FINAL DESIGN.
 2. INDIVIDUAL POLE HEIGHTS MAY VARY, SUBJECT FINAL ENGINEERING.
 3. MINIMUM FOUNDATION REVEAL SHALL BE 1.5'.
 4. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING.
 5. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE.

ATTACHMENT 4 HISTORIC RESOURCE PHOTOS

ATTACHMENT 4 - RESOURCE PHOTOS
White Oak Electric Transmission Project



Figure 1. 042-5017, Second Cold Harbor Battlefield, view to the northwest.



Figure 2. 043-0078, Cedar Knoll, dwelling, south elevation, view to the northeast.

ATTACHMENT 4 - RESOURCE PHOTOS
White Oak Electric Transmission Project



Figure 3. 043-0288, Savage Station Farm and Cemetery, view to the southeast.



Figure 4. 043-0308, Savage Station Battlefield, view to the southwest.

ATTACHMENT 4 - RESOURCE PHOTOS
White Oak Electric Transmission Project



Figure 5. 043-5074, First Deep Bottom Battlefield, view to the south.



Figure 6. 043-5077, Glendale Battlefield, view to the southeast.

ATTACHMENT 4 - RESOURCE PHOTOS
White Oak Electric Transmission Project



Figure 7. 043-5080, Second Deep Bottom Battlefield, view to the southwest.



Figure 8. 043-5081, Seven Pines Battlefield, view to the north.

ATTACHMENT 4 - RESOURCE PHOTOS
White Oak Electric Transmission Project



Figure 9. 121-5134, Peninsula Extension of the Chesapeake and Ohio Railroad, view to the west.

ATTACHMENT 5 PHOTO SIMULATIONS

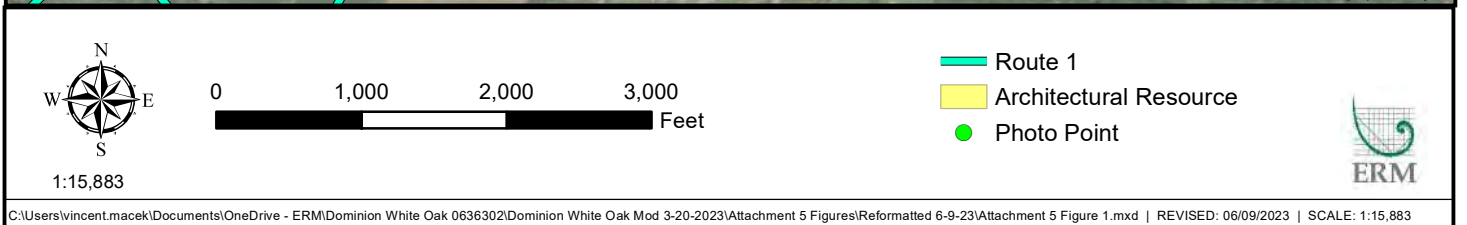
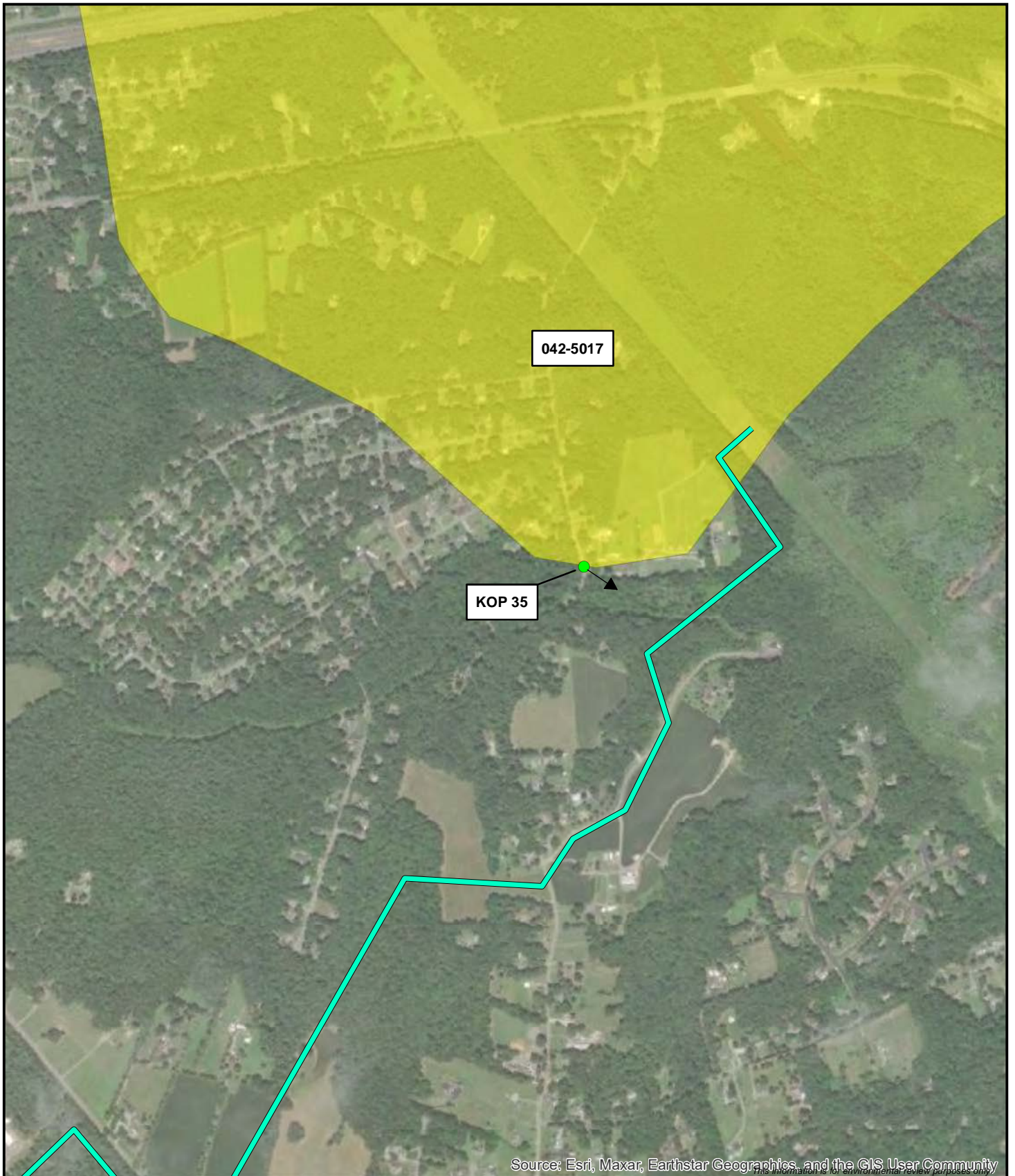




Figure 1. Aerial photograph depicting land use and photo view for 042-5017.

Existing View



Proposed View - Hidden



Viewpoint Location	UTM Zone 18S	304699E	4153123N
View Direction:	122 degrees	74 feet	
Viewpoint Elevation:		1024 feet	
Distance to Development:			89 degrees
Horizontal Field of View:			

Date of Photography:	24th February 2023	13.33
Camera:	Nikon D800	
Lens:	Nikkor 50mm	1.4
Camera Height:	56 inches	



Figure 2 Viewpoint KOP 35 - Route 1 White Oak Rd N of Cables Farm Rd 042-5017
Pre-Application Analysis White Oak

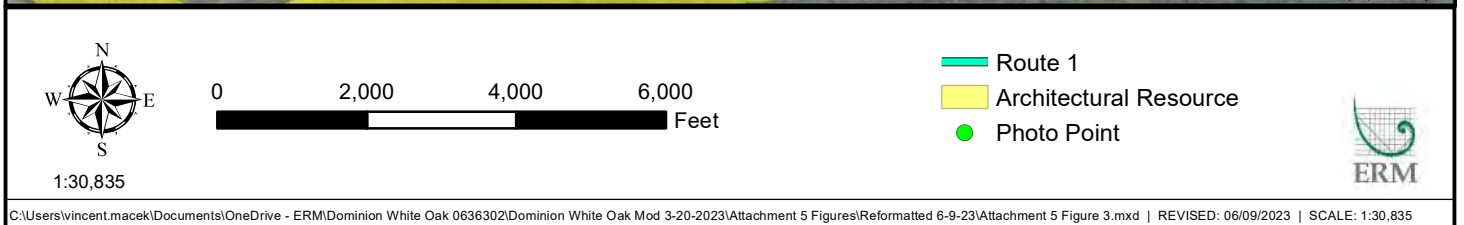
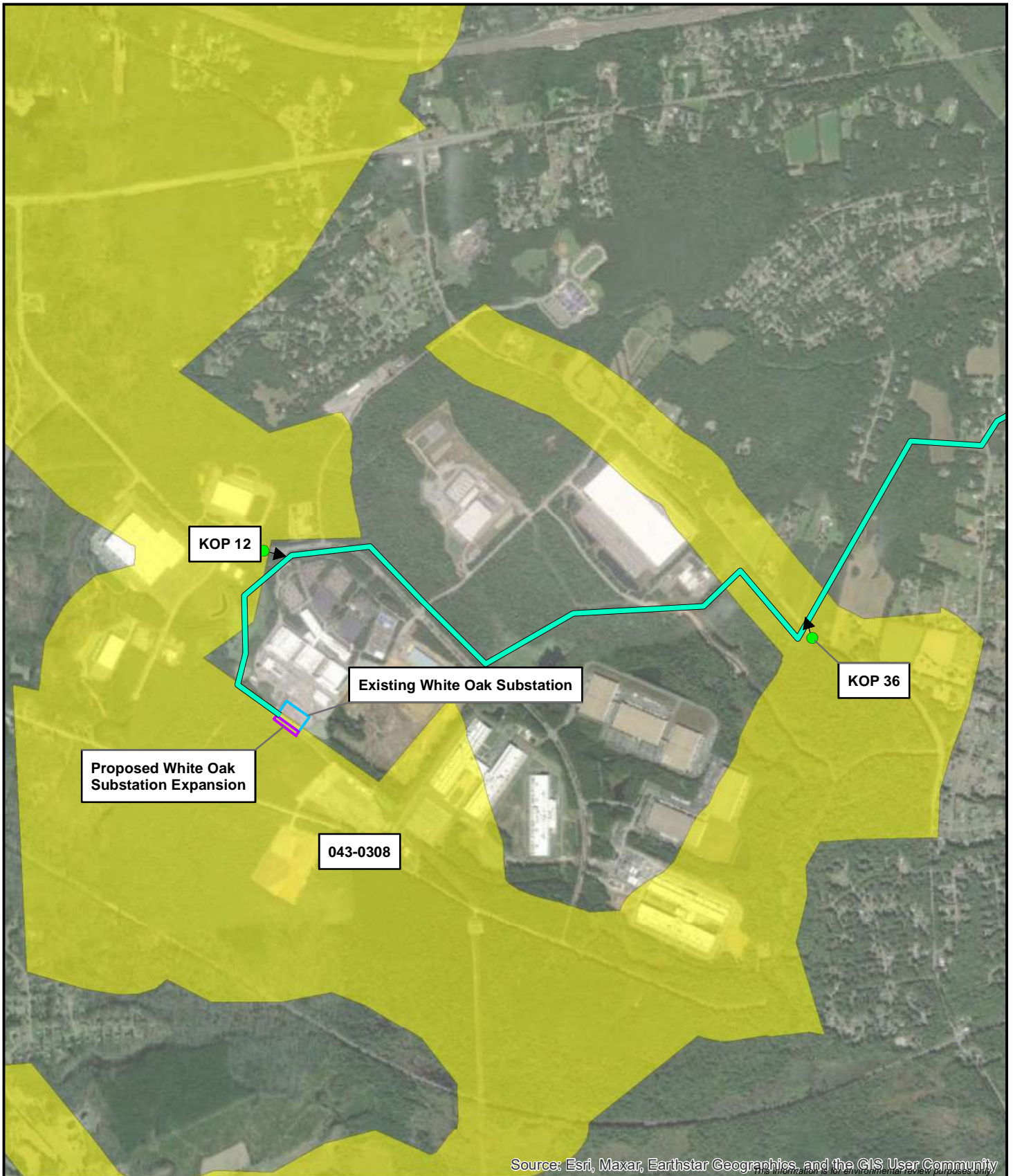




Figure 3. Aerial photograph depicting land use and photo view for 043-0308.

Existing View



Proposed View - Hidden



Viewpoint Location UTM Zone 18S: 301209E 4151948N
View Direction: 105 degrees
Viewpoint Elevation: 146 feet
Distance to Development: 356 feet
Horizontal Field of View: 90 degrees

Date of Photography: 17th August 2022 9:05
Camera: Nikon D800
Lens: Nikkor 50mm 1.4
Camera Height: 58 inches

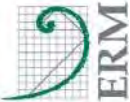



Figure 4 Viewpoint KOP 12 - Route 1 Technology Blvd E of Techpark Pl 043-0308
Pre-Application Analysis White Oak

Existing View



Proposed View - Visible



Viewpoint Location UTM Zone 18S:303767E 4151478N
View Direction: 343 degrees
Viewpoint Elevation: 139 feet
Distance to Development: 356 feet
Horizontal Field of View: 100 degrees

Date of Photography: 24th February 2023 10:05
Camera: Nikon D800
Lens: Nikkor 50mm 1.4
Camera Height: 59 inches

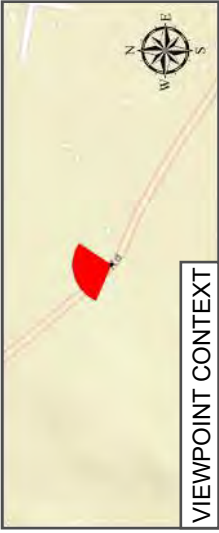
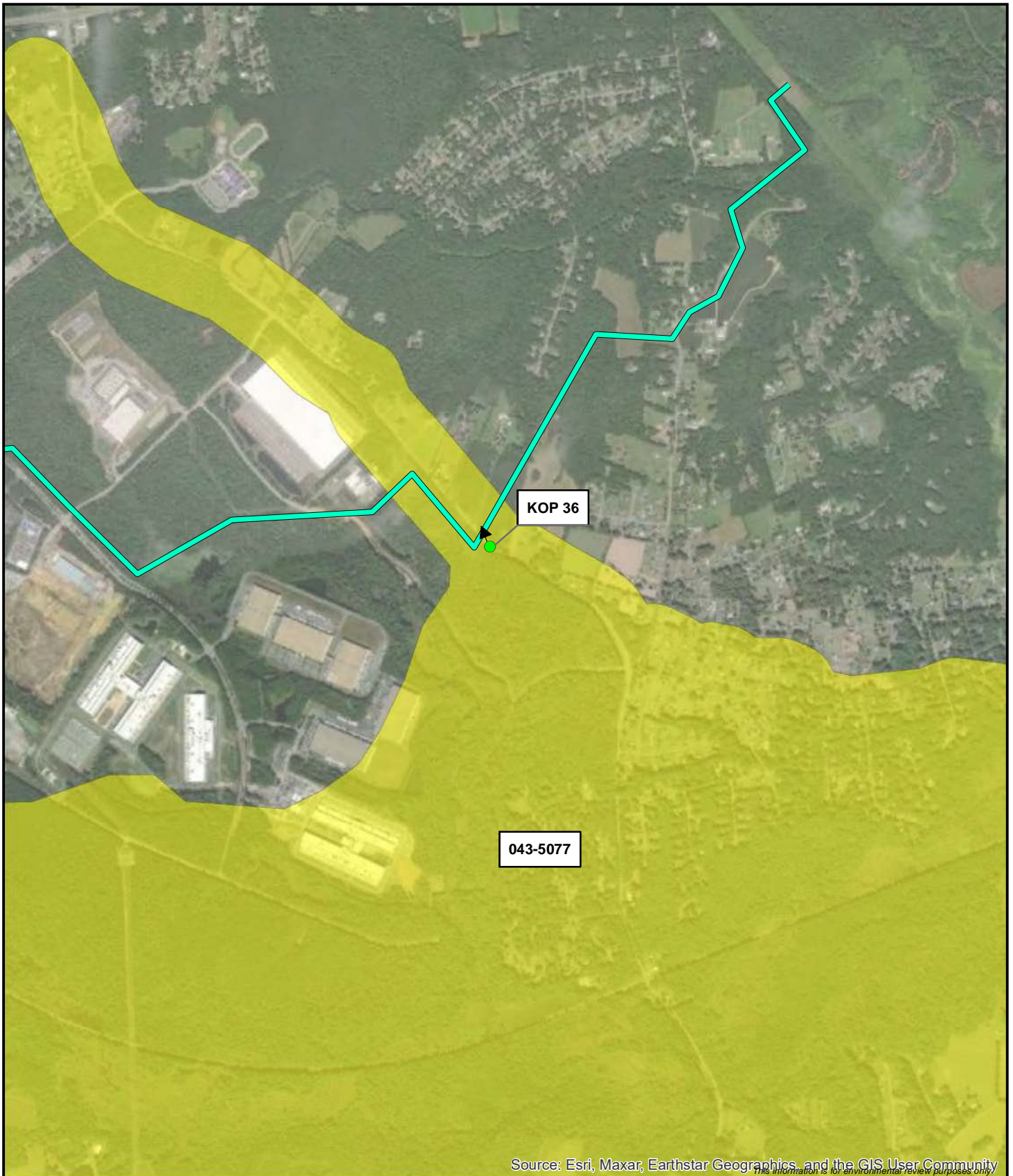


Figure 5
Viewpoint KOP 36 - Route 1
Elko Rd NW of White Oak Rd
043-0308

Pre-Application Analysis
White Oak



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



1:28,598

0 2,000 4,000 6,000 Feet

- Route 1
- Architectural Resource
- Photo Point





Figure 6. Aerial photograph depicting land use and photo view for 043-5077.

Existing View



Proposed View - Visible



Viewpoint Location UTM Zone 18S: 303767E 4151478N
View Direction: 343 degrees
Viewpoint Elevation: 139 feet
Distance to Development: 356 feet
Horizontal Field of View: 100 degrees

Date of Photography: 24th February 2023 10:05
Camera: Nikon D800
Lens: Nikkor 50mm 1.4
Camera Height: 59 inches

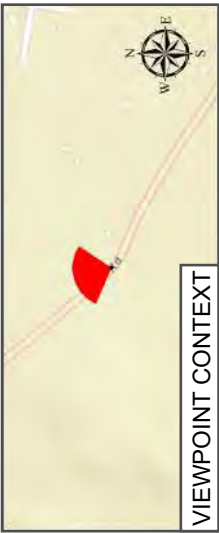


Figure 7
Viewpoint KOP 36 - Route 1
Elko Rd NW of White Oak Rd
043-5077

Pre-Application Analysis
White Oak

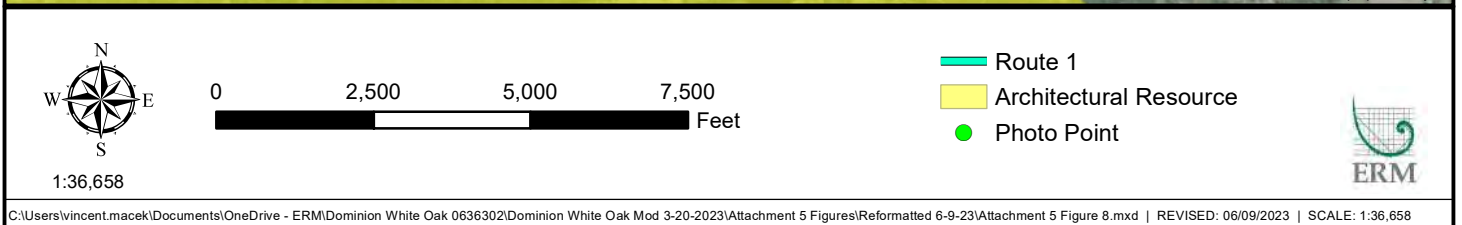
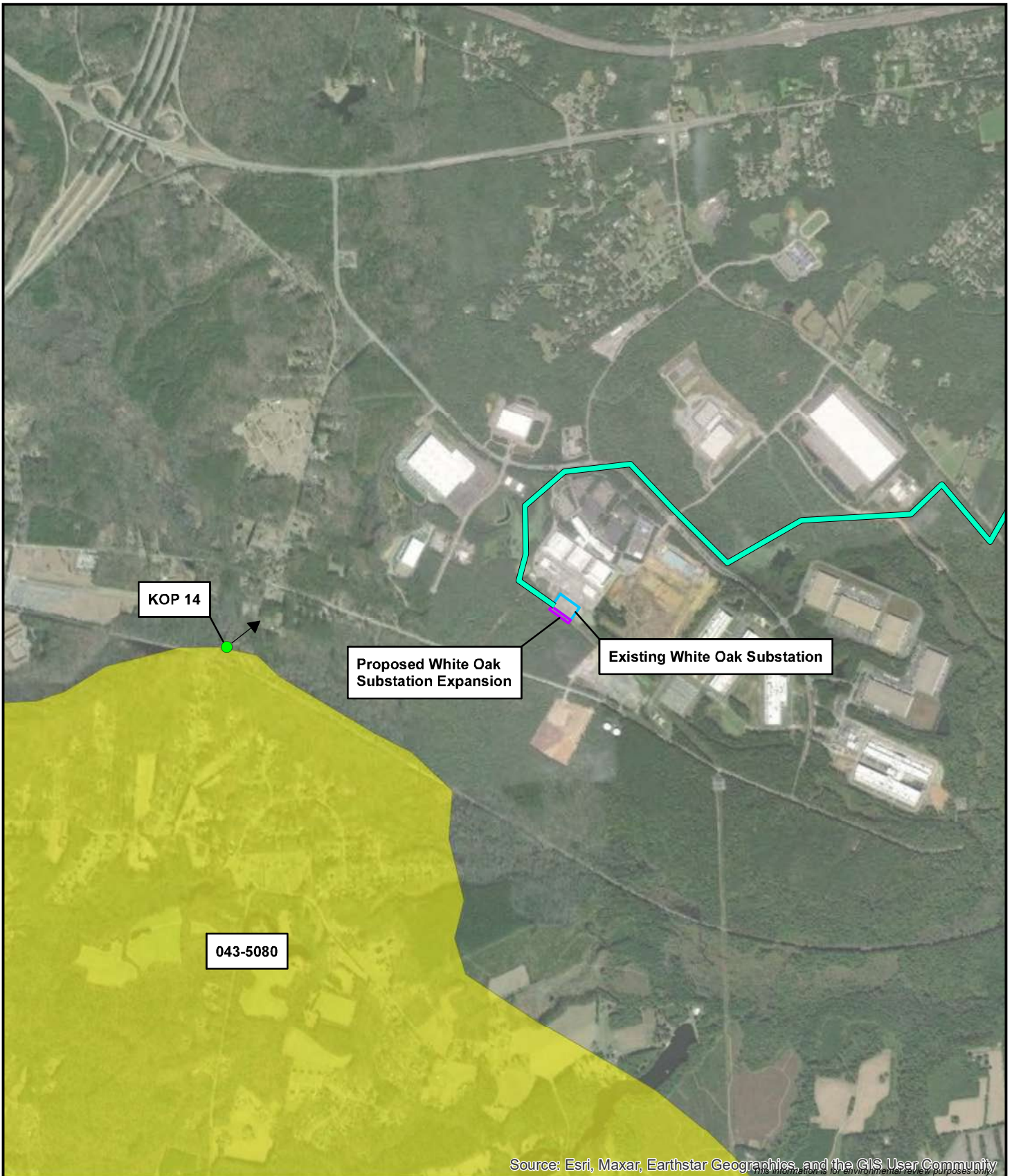




Figure 8. Aerial photograph depicting land use and photo view for 043-5080.

Existing View



Proposed View - Hidden



Viewpoint Location UTM Zone 18S:299436E 4150996N

View Direction: 50 degrees

Viewpoint Elevation: 129 feet

Distance to Development: 6950 feet

Horizontal Field of View: 90 degrees

Date of Photography: 17th August 2022 09:32

Camera: Nikon D800

Lens: Nikkor 50mm 1.4

Camera Height: 57.25 inches



Figure 9

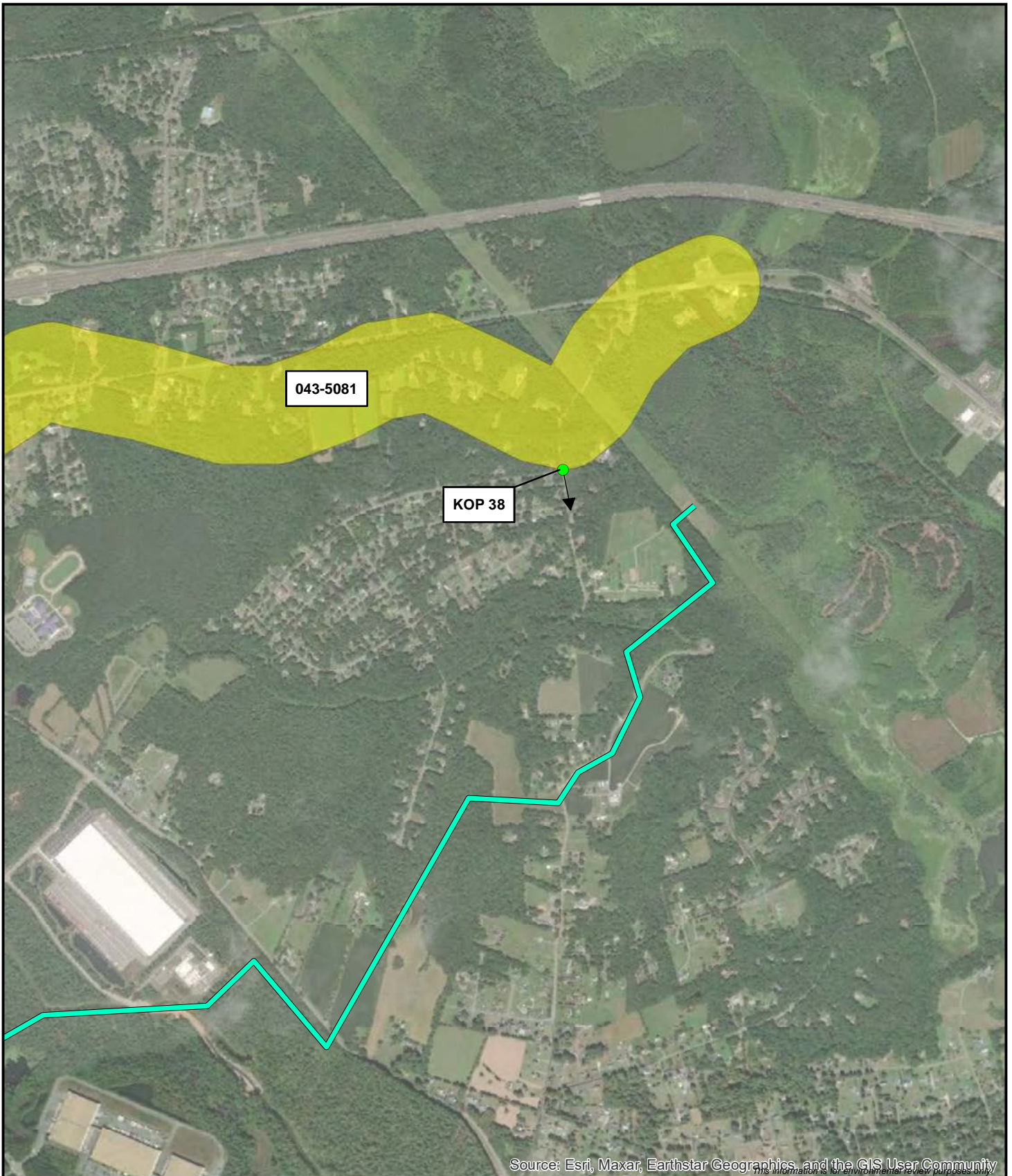
Viewpoint KOP 14 - Route 1

Poplar Spring Rd S of Portugee Rd

043-5080

Pre-Application Analysis

White Oak



1:24,439

0 2,000 4,000 6,000
Feet

- Route 1
- Architectural Resource
- Photo Point



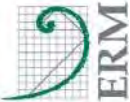

C:\Users\vincent.macek\Documents\OneDrive - ERM\Dominion White Oak 0636302\Dominion White Oak Mod 3-20-2023\Attachment 5 Figures\Reformatted 6-9-23\Attachment 5 Figure 10.mxd | REVISED: 06/09/2023 | SCALE: 1:24,439

Figure 10. Aerial photograph depicting land use and photo view for 043-5081.

Existing View



Proposed View - Hidden



Viewpoint Location UTM Zone 18S:304627E 4153592N
View Direction: 167 degrees
Viewpoint Elevation: 76 feet
Distance to Development: 1743 feet
Horizontal Field of View: 89 degrees

Date of Photography: 24th February 2023 13:04
Camera: Nikon D800
Lens: Nikkor 50mm 1.4
Camera Height: 57.5 inches



Figure 11
Viewpoint KOP 38 - Route 1
Eberlys Pl E of White Oak Rd
043-5081
Pre-Application Analysis
White Oak

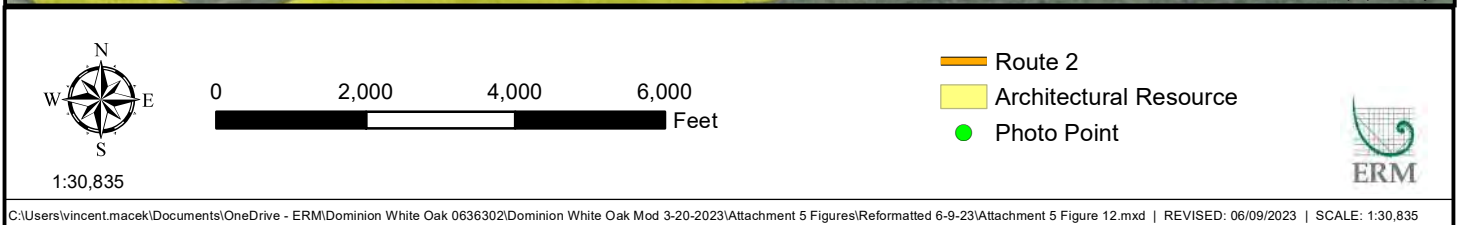
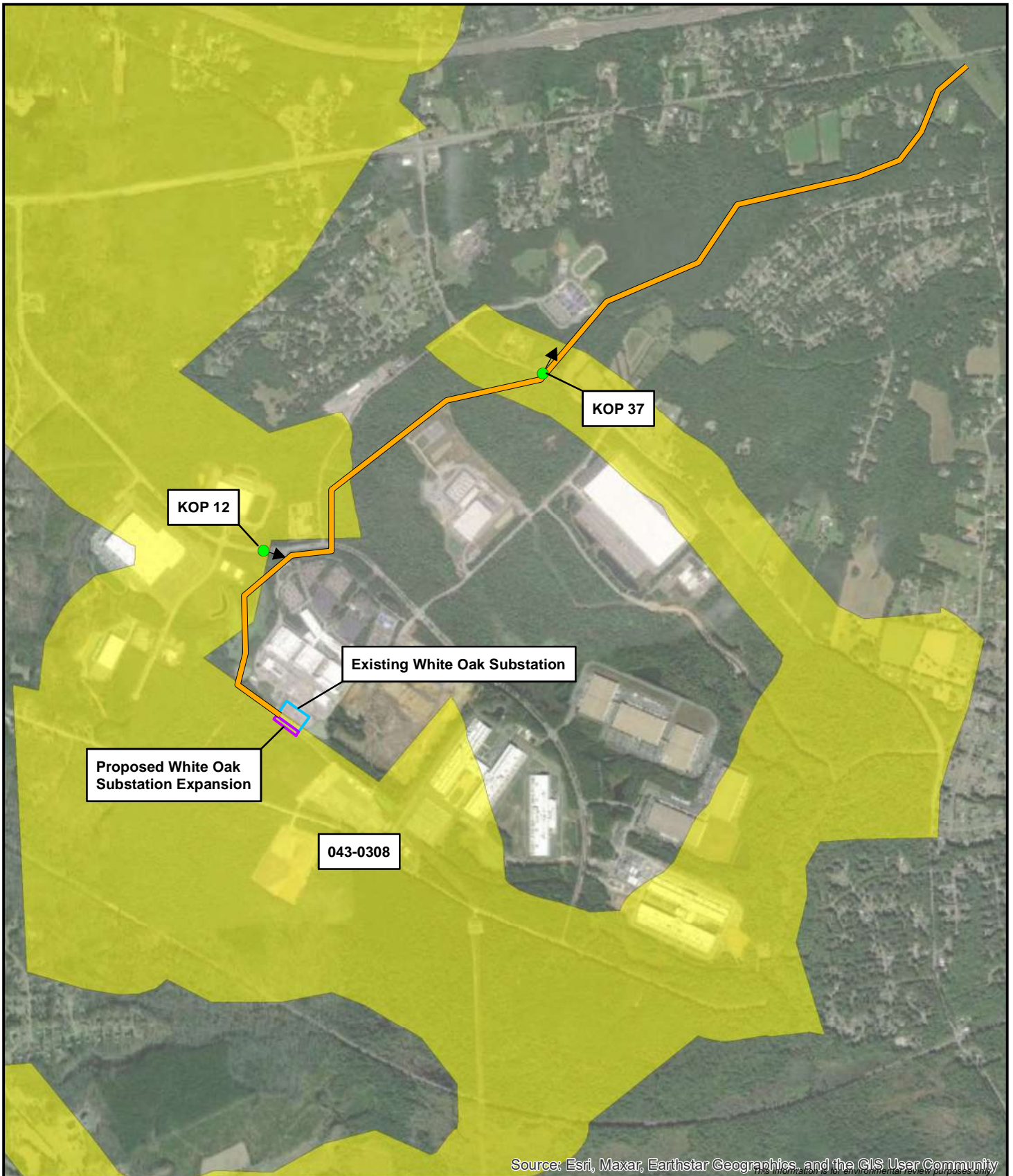




Figure 12. Aerial photograph depicting land use and photo view for 043-0308.

Existing View



Proposed View - Hidden



Viewpoint Location UTM Zone 18S: 301209E 4151948N
View Direction: 150 degrees
Viewpoint Elevation: 149 feet
Distance to Development: 1189 feet
Horizontal Field of View: 90 degrees

Date of Photography: 17th August 2022 09:05
Camera: Nikon D800
Lens: Nikkor 50mm 1.4
Camera Height: 58 inches



Figure 13

Viewpoint KOP 12 - Route 2

Technology Blvd E of Techpark Pl

043-0308



Pre-Application Analysis

White Oak

Existing View



Proposed View - Visible



Viewpoint Location UTM Zone 18S:302534E 4152741N
View Direction: 30 degrees
Viewpoint Elevation: 136 feet
Distance to Development: 0 feet
Horizontal Field of View: 89 degrees

Date of Photography: 24th February 2023 10:36
Camera: Nikon D800
Lens: Nikkor 50mm 1.4
Camera Height: 63 inches



Figure 14
Viewpoint KOP 37 - Route 2
Elko Rd SE of Elko School Rd
043-0308

Pre-Application Analysis
White Oak

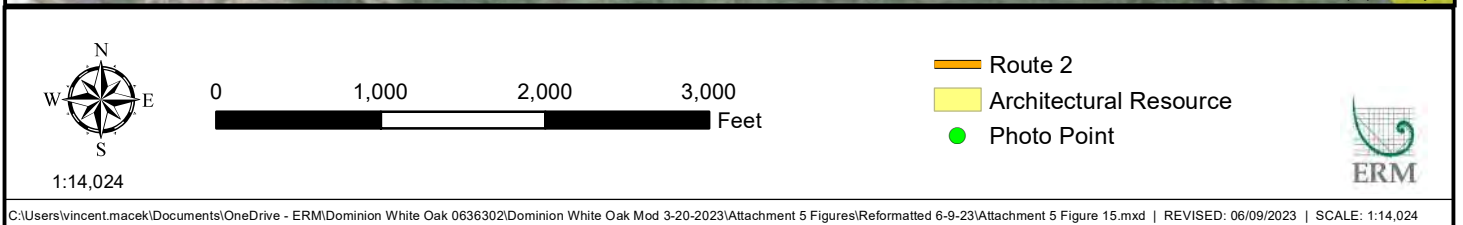




Figure 15. Aerial photograph depicting land use and photo view for 043-5077.

Existing View



Proposed View - Visible



Viewpoint Location UTM Zone 18S:302534E 4152741N
View Direction: 30 degrees
Viewpoint Elevation: 136 feet
Distance to Development: 0 feet
Horizontal Field of View: 89 degrees

Date of Photography: 24th February 2023 10:36
Camera: Nikon D800
Lens: Nikkor 50mm 1.4
Camera Height: 63 inches



Figure 16

Viewpoint KOP 37 - Route 2

Elko Rd SE of Elko School Rd

043-5077

Pre-Application Analysis

White Oak

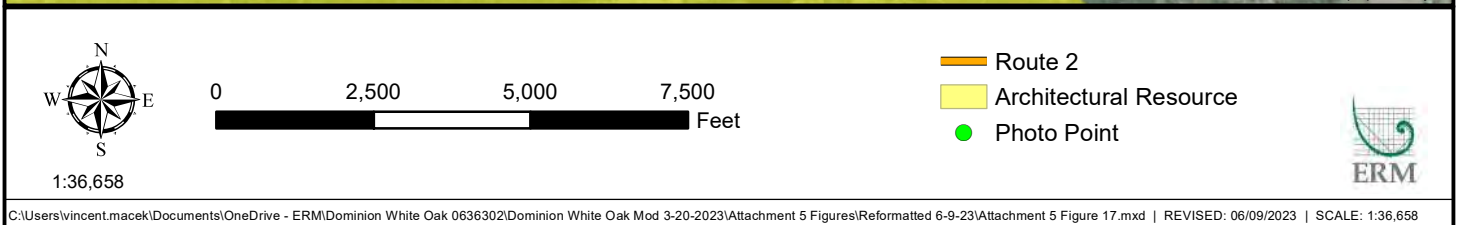
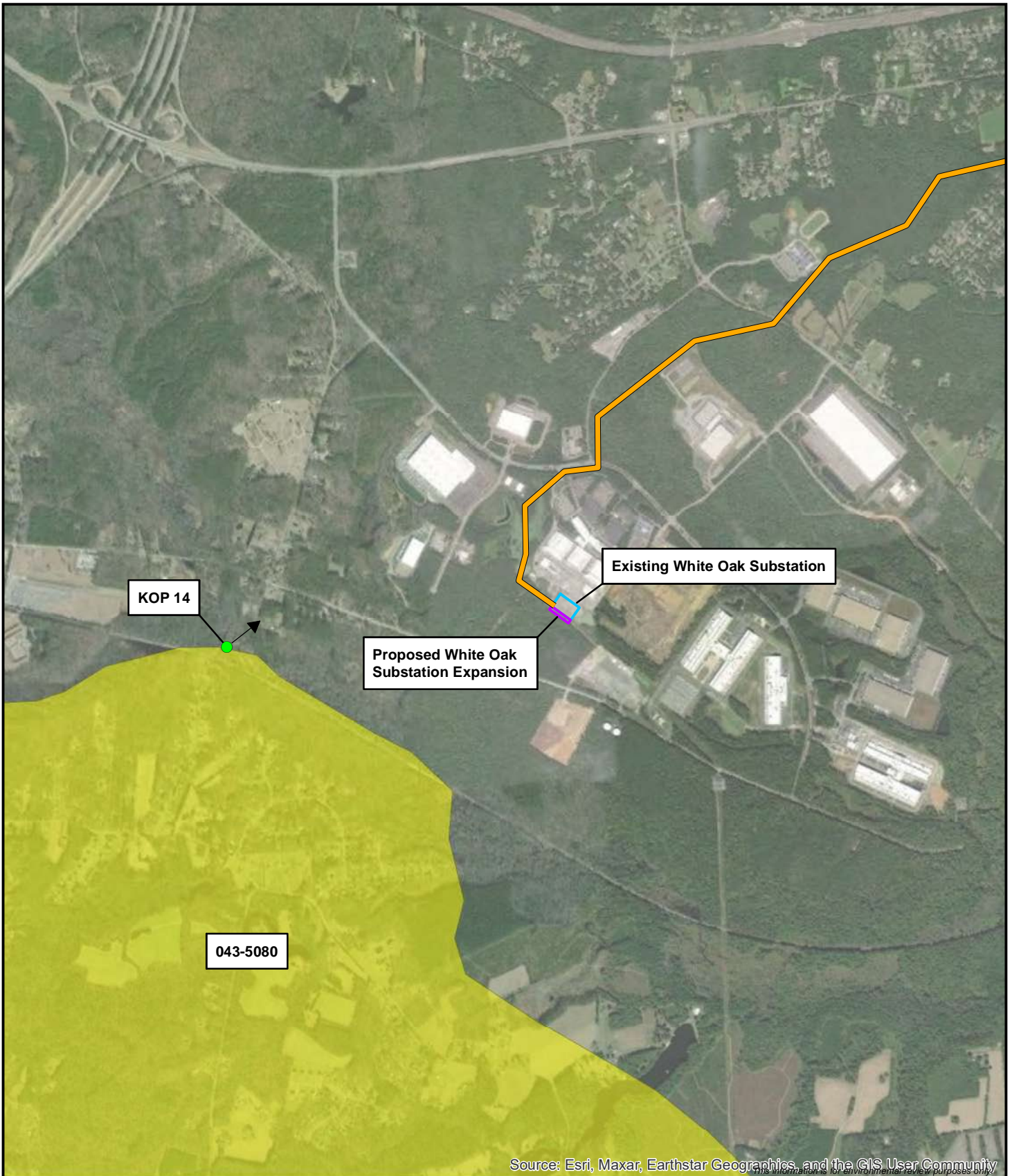




Figure 17. Aerial photograph depicting land use and photo view for 043-5080.

Existing View



Proposed View - Hidden



Viewpoint Location	UTM Zone 18S:299436E 4150996N
View Direction:	50 degrees
Viewpoint Elevation:	129 feet
Distance to Development:	6950 feet
Horizontal Field of View:	90 degrees

Date of Photography:	17th August 2022 09:32
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	57.25 inches



Figure 18 Viewpoint KOP 14 - Route 2 Poplar Spring Rd S of Portugee Rd 043-5080	Pre-Application Analysis White Oak
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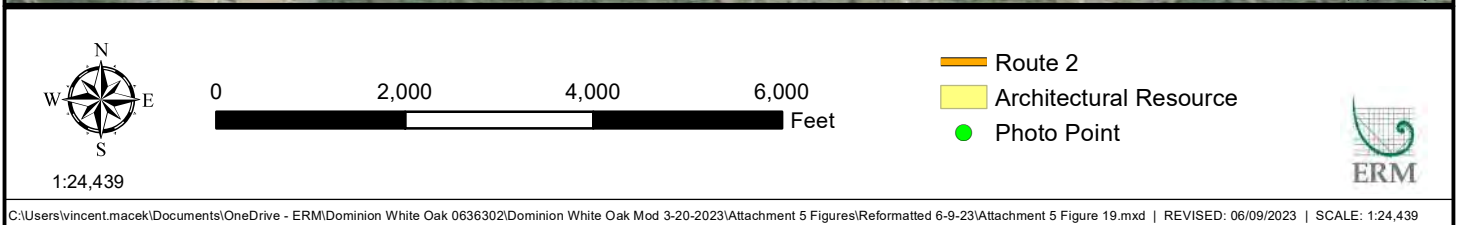
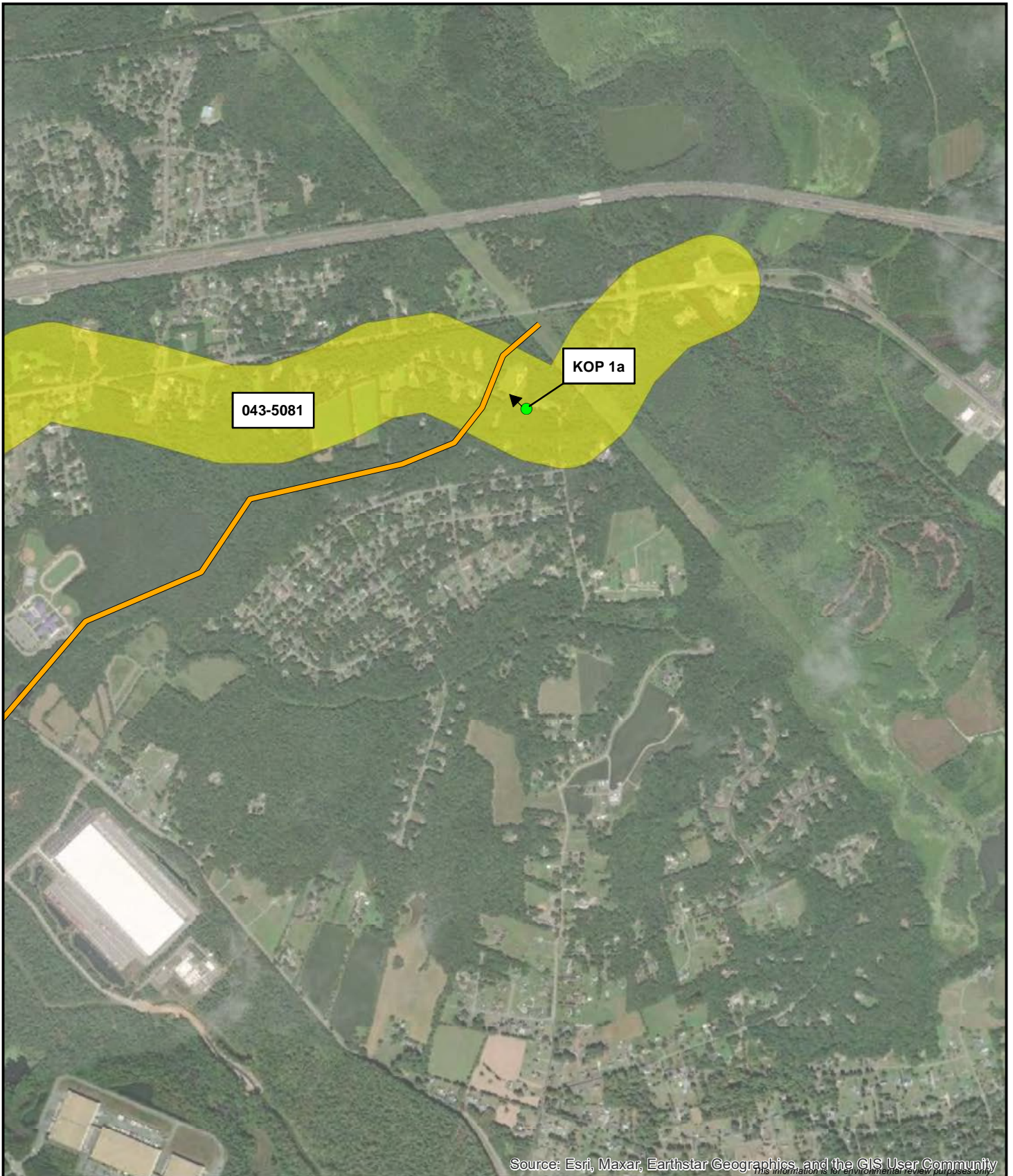




Figure 19. Aerial photograph depicting land use and photo view for 043-5081.

Existing View



Proposed View - Hidden



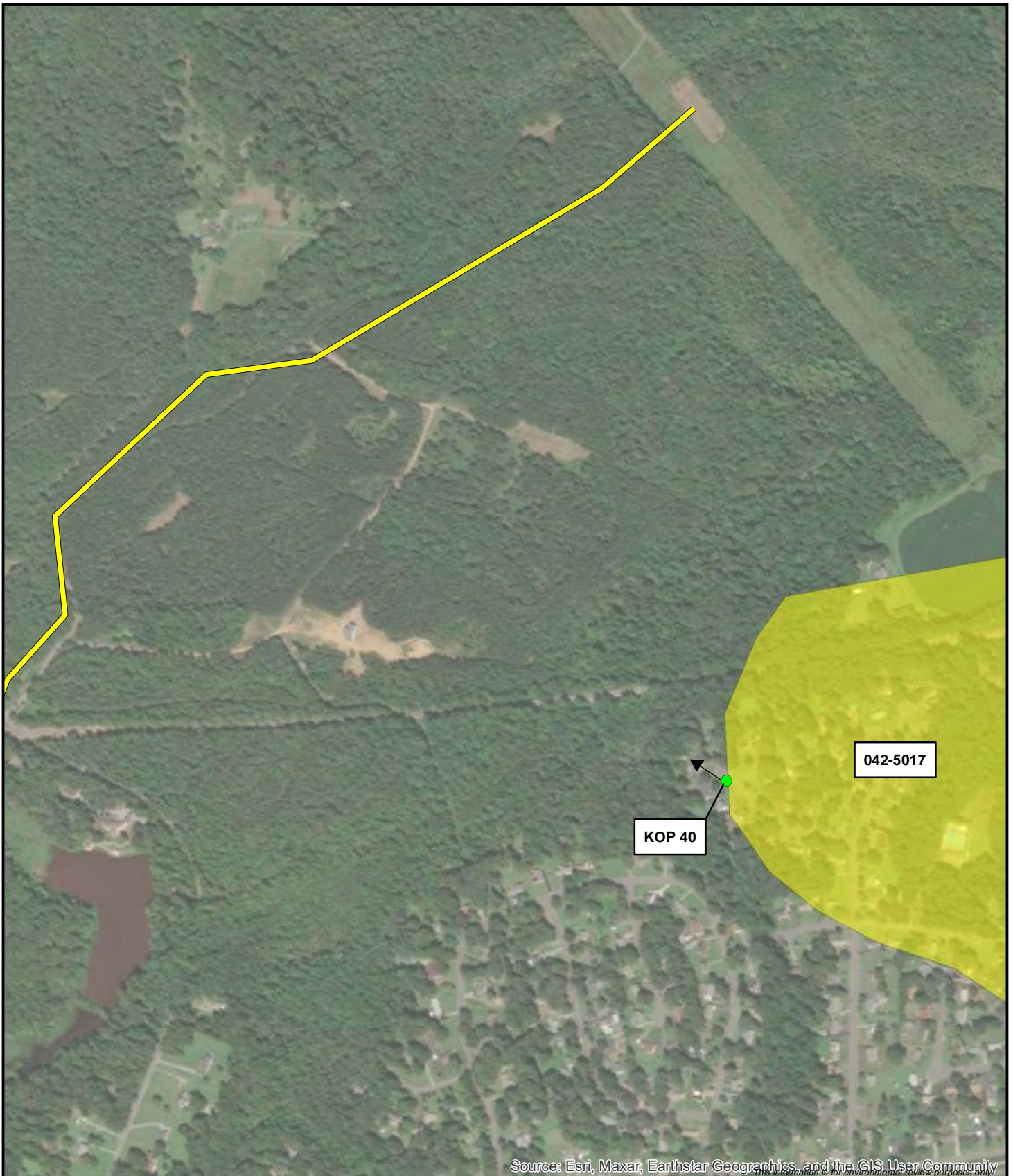
Viewpoint Location UTM Zone 18S:304496E 4153815N
View Direction: 315 degrees
Viewpoint Elevation: 73 feet
Distance to Development: 575 feet
Horizontal Field of View: 90 degrees

Date of Photography: 16th August 2022 10:25
Camera: Nikon D800
Lens: Nikkor 50mm 1.4
Camera Height: 57.5 inches



Figure 20
Viewpoint KOP 1a - Route 2
Old Williamsburg Rd W of White Oak Rd
043-0308

Pre-Application Analysis
White Oak



1:10,000

0 500 1,000 1,500 2,000
Feet

- Route 3
- Architectural Resource
- Photo Point





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Figure 21. Aerial photograph depicting land use and photo view for 042-5017.

Existing View



Proposed View - Hidden



Viewpoint Location	UTM Zone 18S	302994E	4155035N
View Direction:	301 degrees	155 feet	
Viewpoint Elevation:		3488 feet	
Distance to Development:			89 degrees
Horizontal Field of View:			

Date of Photography:	24th February 2023	11:07
Camera:	Nikon D800	
Lens:	Nikkor 50mm	1.4
Camera Height:	61 inches	



Figure 22 Viewpoint KOP 40 - Route 3 Booth Dr N of Rollingview Dr 042-5017
Pre-Application Analysis White Oak

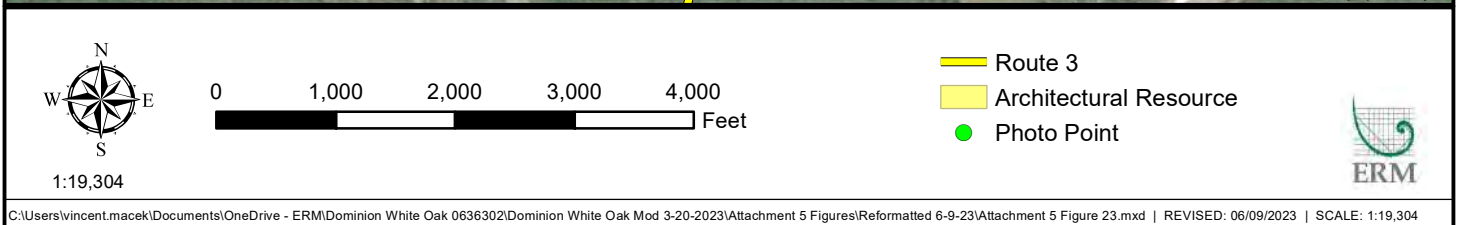




Figure 23. Aerial photograph depicting land use and photo view for 043-0078.

Existing View



Proposed View - Visible



Viewpoint Location UTM Zone 18S:300535E 4154416N

View Direction: 99 degrees

Viewpoint Elevation: 155 feet

Distance to Development: 213 feet

Horizontal Field of View: 89 degrees

Date of Photography: 24th February 2023 17:12

Camera: Nikon D800

Lens: Nikkor 50mm 1.4

Camera Height: 60.5 inches

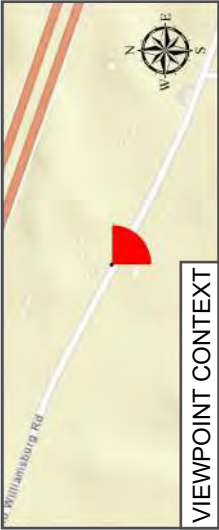


Figure 24

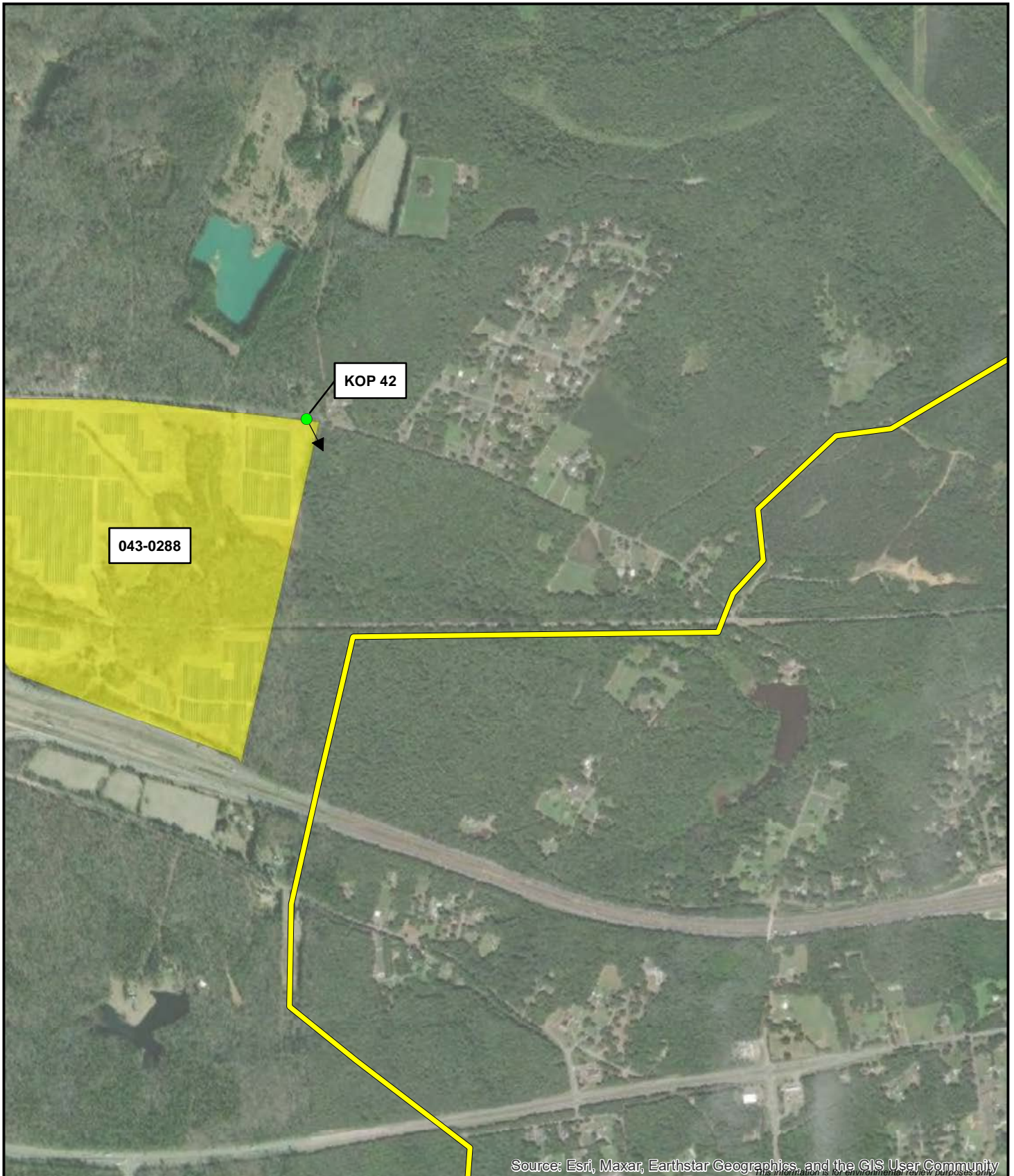
Viewpoint KOP 41 - Route 3

Old Williamsburg Rd W of Wendy Ln

043-0078

Pre-Application Analysis

White Oak



1:19,304

0 1,000 2,000 3,000 4,000 Feet

- Route 3
- Architectural Resource
- Photo Point





Figure 25. Aerial photograph depicting land use and photo view for 043-0288.

Existing View



Proposed View - Hidden



Viewpoint Location UTM Zone 18S:300671E 4155753N

View Direction: 148 degrees

Viewpoint Elevation: 133 feet

Distance to Development: 2591 feet


Horizontal Field of View: 70 degrees

Date of Photography: 24th February 2023 15:48

Camera: Nikon D800

Lens: Nikkor 50mm 1.4

Camera Height: 58 inches



VIEWPOINT CONTEXT

Figure 26

Viewpoint KOP 42 - Route 3

Meadow Rd W of Candlewood Ln

043-0288

Pre-Application Analysis

White Oak

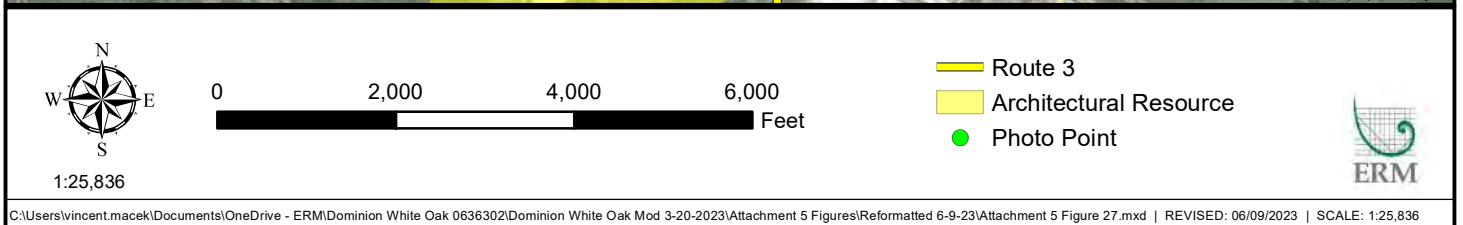
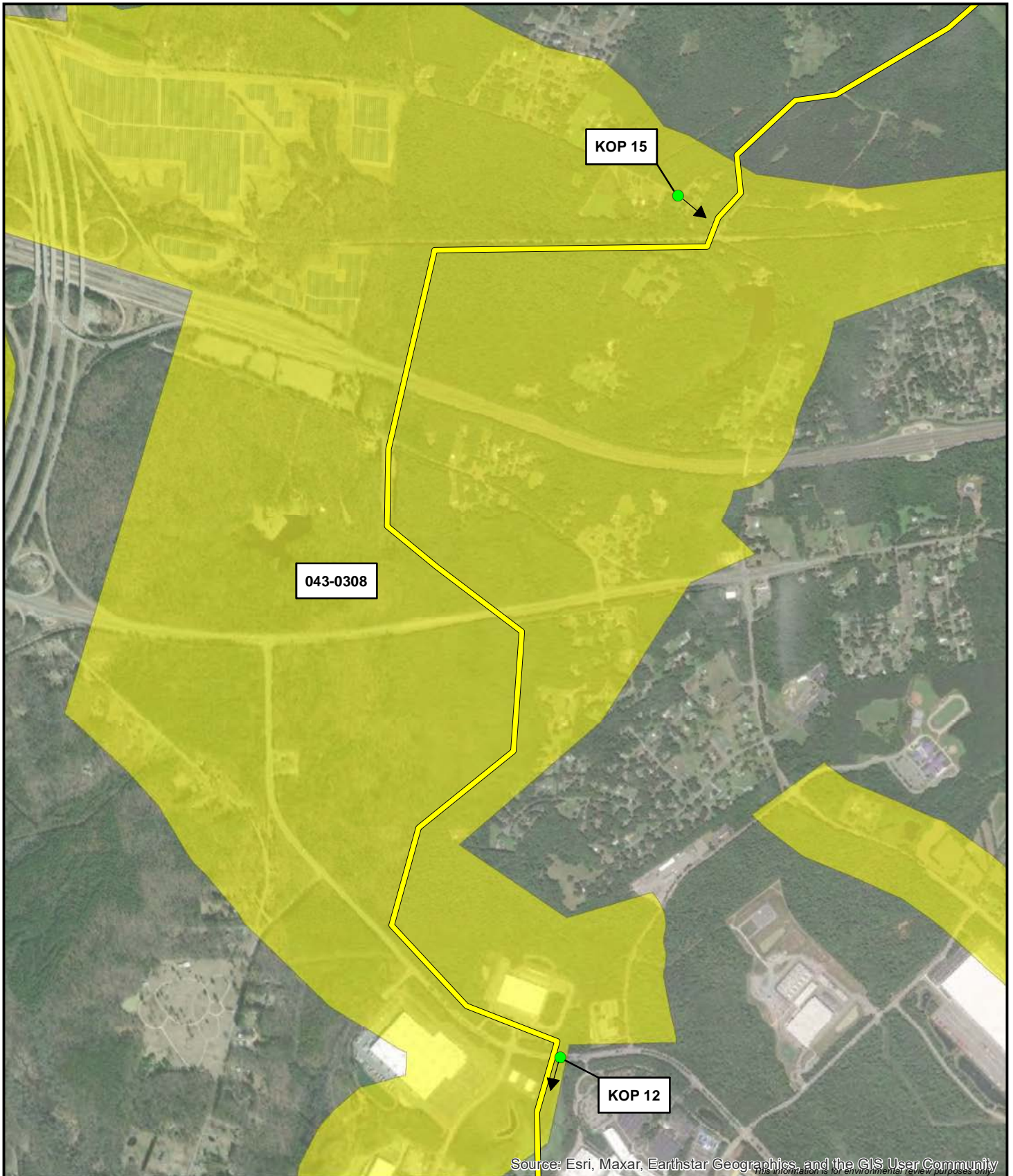
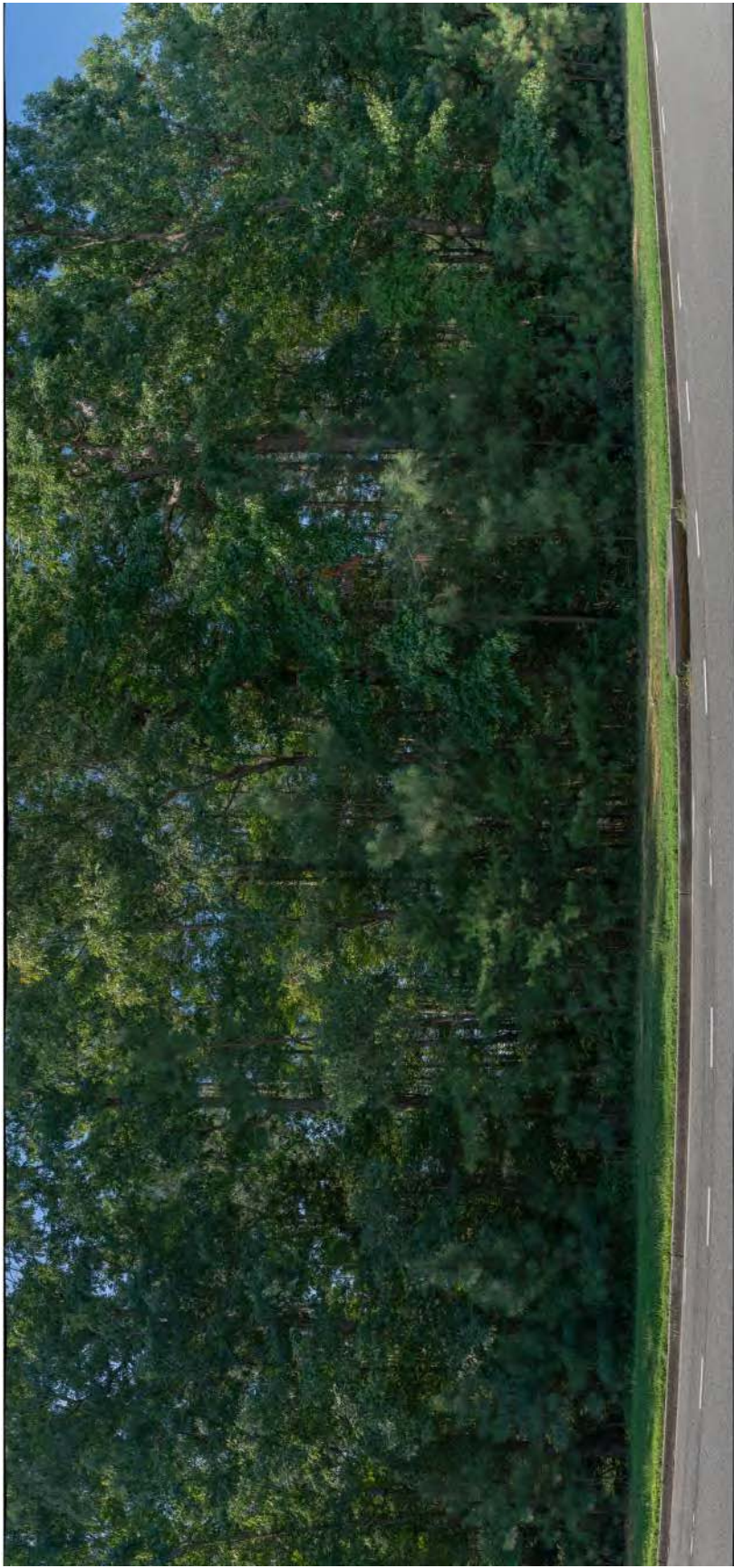




Figure 27. Aerial photograph depicting land use and photo view for 043-0308.



Existing View



Proposed View - Hidden



Viewpoint Location UTM Zone 18S:301209E 4151948N
View Direction: 150 degrees
Viewpoint Elevation: 146 feet
Distance to Development: 97 feet
Horizontal Field of View: 90 degrees

Date of Photography: 17th August 2022 09:05
Camera: Nikon D800
Lens: Nikkor 50mm 1.4
Camera Height: 58 inches





Figure 28
Viewpoint KOP 12 - Route 3
Technology Blvd E of Techpark Pl
043-0308

Pre-Application Analysis
White Oak

Existing View



Proposed View - Hidden



Viewpoint Location UTM Zone 18S:301753E 4155305N

View Direction: 200 degrees

Viewpoint Elevation: 128 feet

Distance to Development: 668 feet

Horizontal Field of View: 90 degrees

Date of Photography: 17th August 2022 11:38

Camera: Nikon D800

Lens: Nikkor 50mm 1.4

Camera Height: 60.25 inches



Figure 29

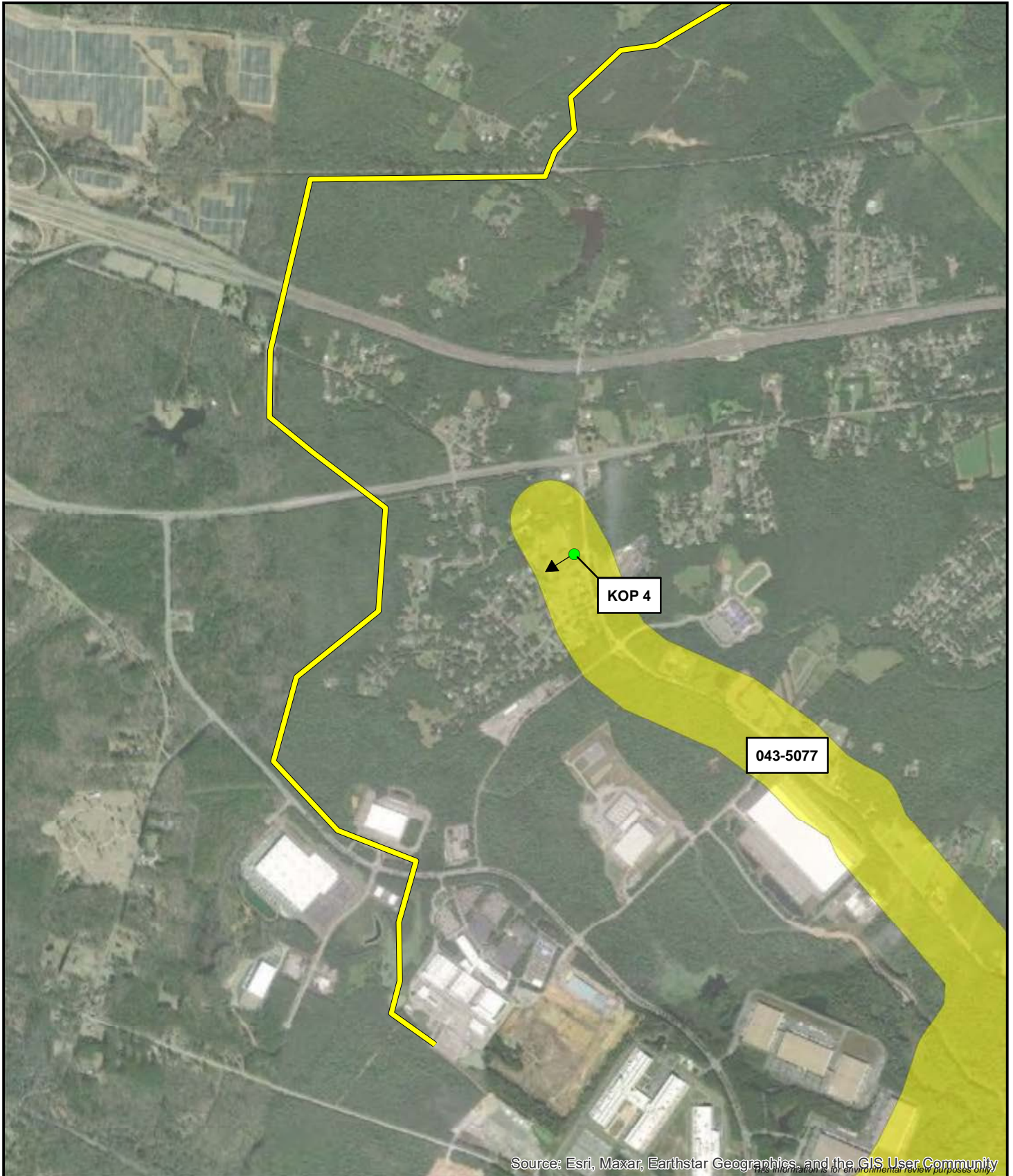
Viewpoint KOP 15 - Route 3

Meadow Rd at Crib Ln

043-0308

Pre-Application Analysis

White Oak



1:30,000

0 2,000 4,000 6,000 8,000 Feet

- Route 3
- Architectural Resource
- Photo Point



C:\Users\vincent.macek\Documents\OneDrive - ERM\Dominion White Oak 0636302\Dominion White Oak Mod 3-20-2023\Attachment 5 Figures\Reformatted 6-9-23\Attachment 5 Figure 31.mxd | REVISED: 06/09/2023 | SCALE: 1:30,000



Figure 30. Aerial photograph depicting land use and photo view for 043-5077.

Existing View



Proposed View - Hidden



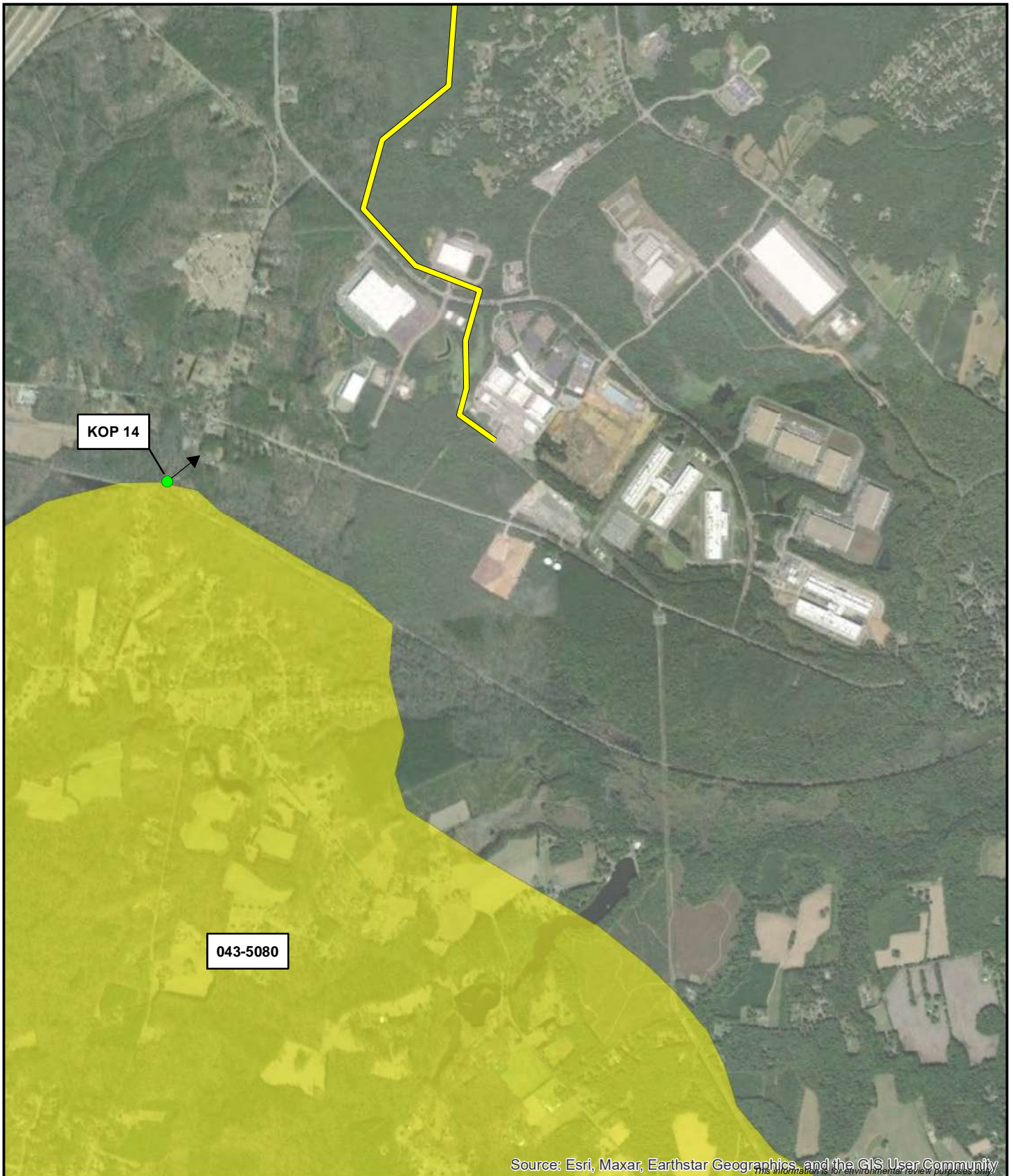


Viewpoint Location	UTM Zone 18S:301951E 4153388N
View Direction:	0 degrees
Viewpoint Elevation:	159 feet
Distance to Development:	3511 feet
Horizontal Field of View:	90 degrees

Date of Photography:	17th August 2022 12:05
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	59 inches



Figure 31 Viewpoint KOP 4 - Route 3 Old Elko Rd N of Ruritan Ln 043-5077	Pre-Application Analysis White Oak
---	---



1:36,658

0 2,500 5,000 7,500
Feet

- Route 3
- Architectural Resource
- Photo Point





Figure 32. Aerial photograph depicting land use and photo view for 043-5080.

Existing View



Proposed View - Hidden



Viewpoint Location UTM Zone 18S:299436E 4150996N

View Direction: 50 degrees

Viewpoint Elevation: 129 feet

Distance to Development: 6950 feet

Horizontal Field of View: 90 degrees

Date of Photography: 17th August 2022 09:32

Camera: Nikon D800

Lens: Nikkor 50mm 1.4

Camera Height: 57.25 inches



Figure 33

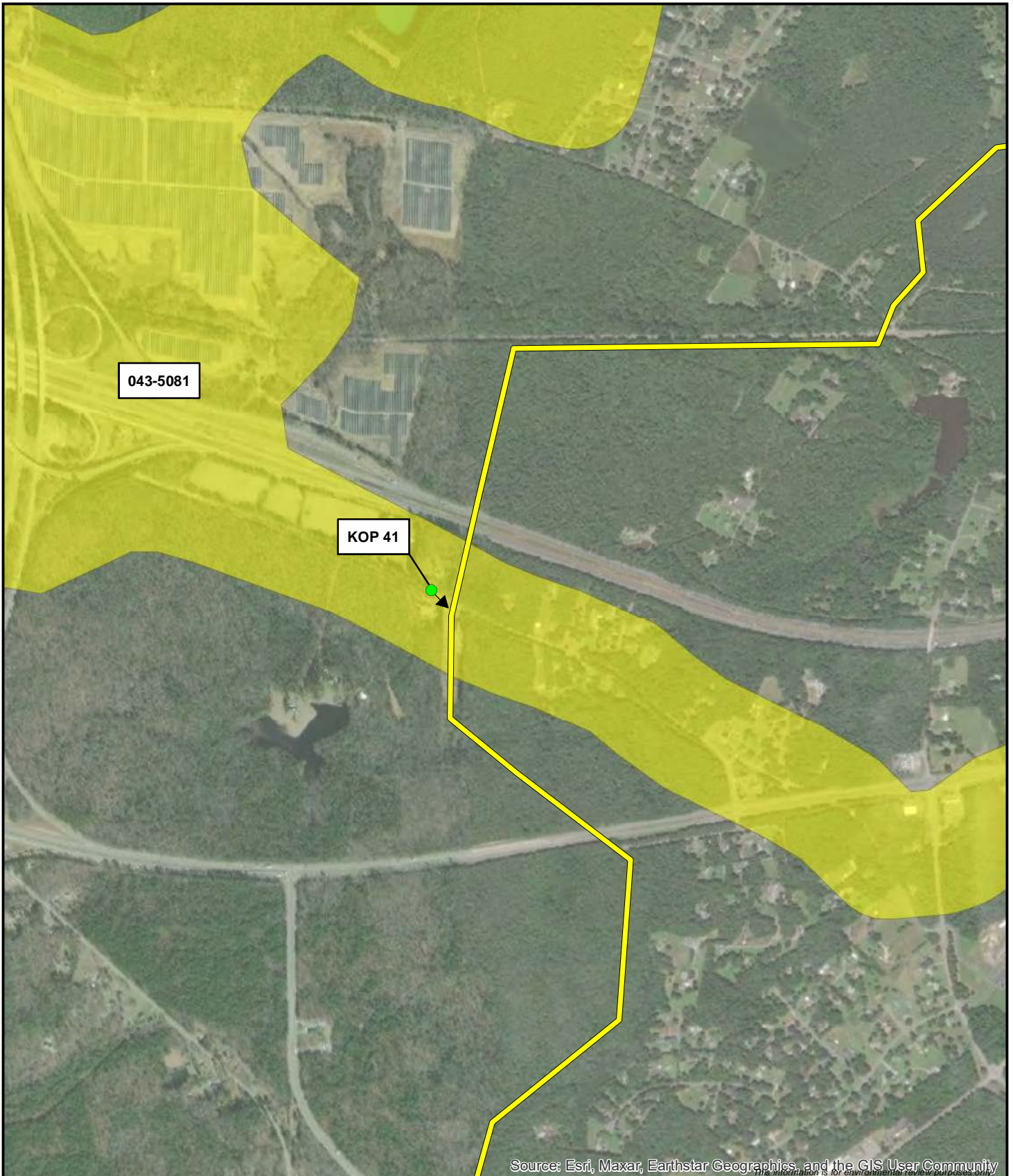
Viewpoint KOP 14 - Route 3

Poplar Spring Rd S of Portugee Rd

043-5080

Pre-Application Analysis

White Oak



1:19,304

0 1,000 2,000 3,000 4,000 Feet

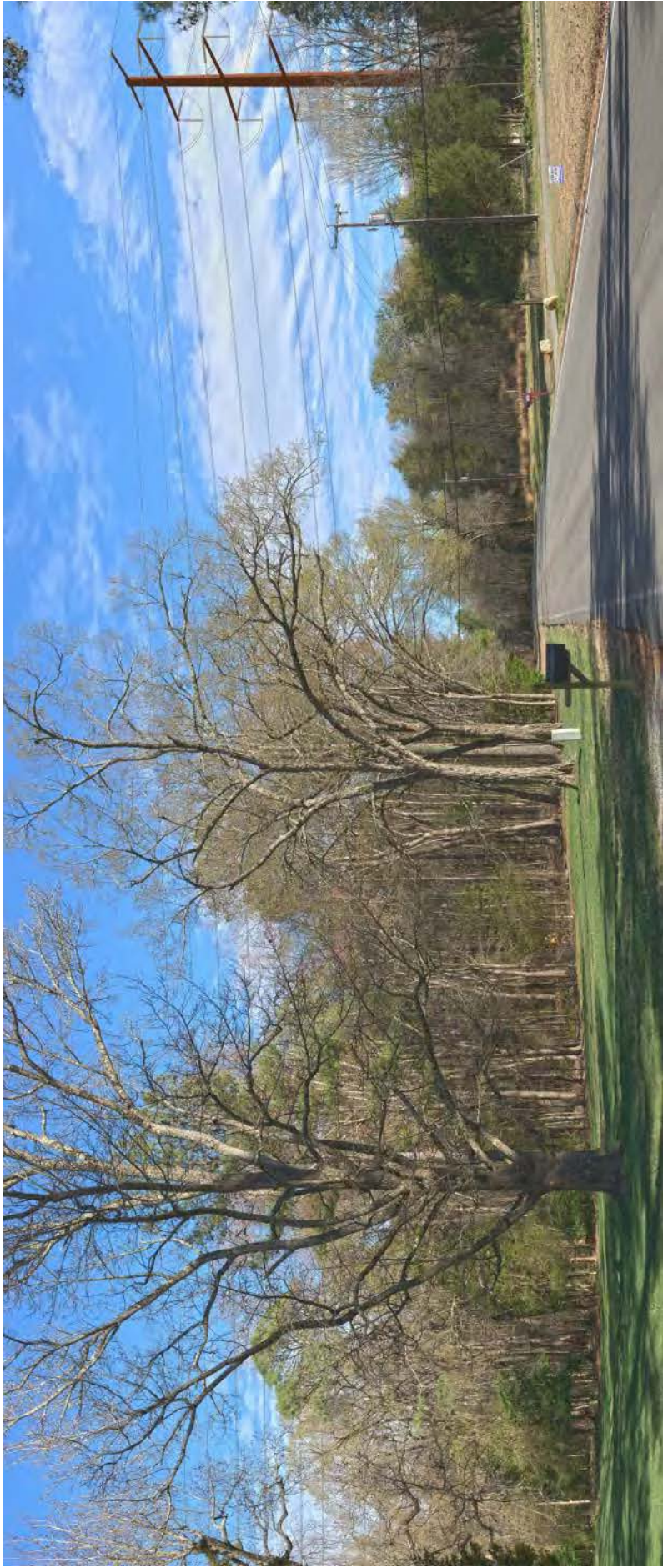
- Route 3
- Architectural Resource
- Photo Point





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Figure 34. Aerial photograph depicting land use and photo view for 043-5081.

Existing View



Proposed View - Visible



Viewpoint Location UTM Zone 18S:300535E 4154416N
View Direction: 99 degrees
Viewpoint Elevation: 155 feet
Distance to Development: 213 feet
Horizontal Field of View: 89 degrees

Date of Photography: 24th February 2023 17:12
Camera: Nikon D800
Lens: Nikkor 50mm 1.4
Camera Height: 60.5 inches

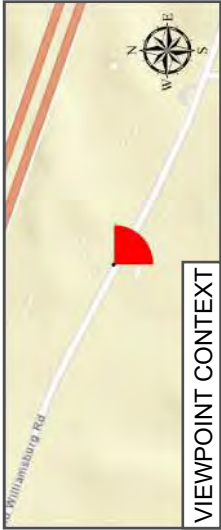


Figure 35
Viewpoint KOP 41 - Route 3
Old Williamsburg Rd W of Wendy Ln
043-0078

Pre-Application Analysis
White Oak

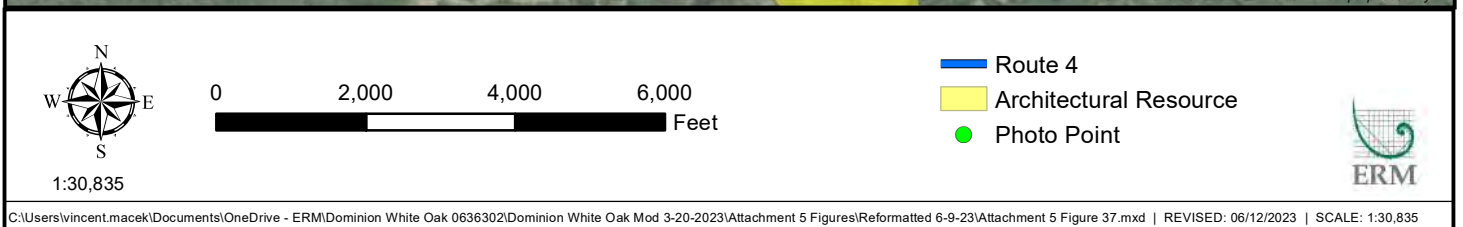
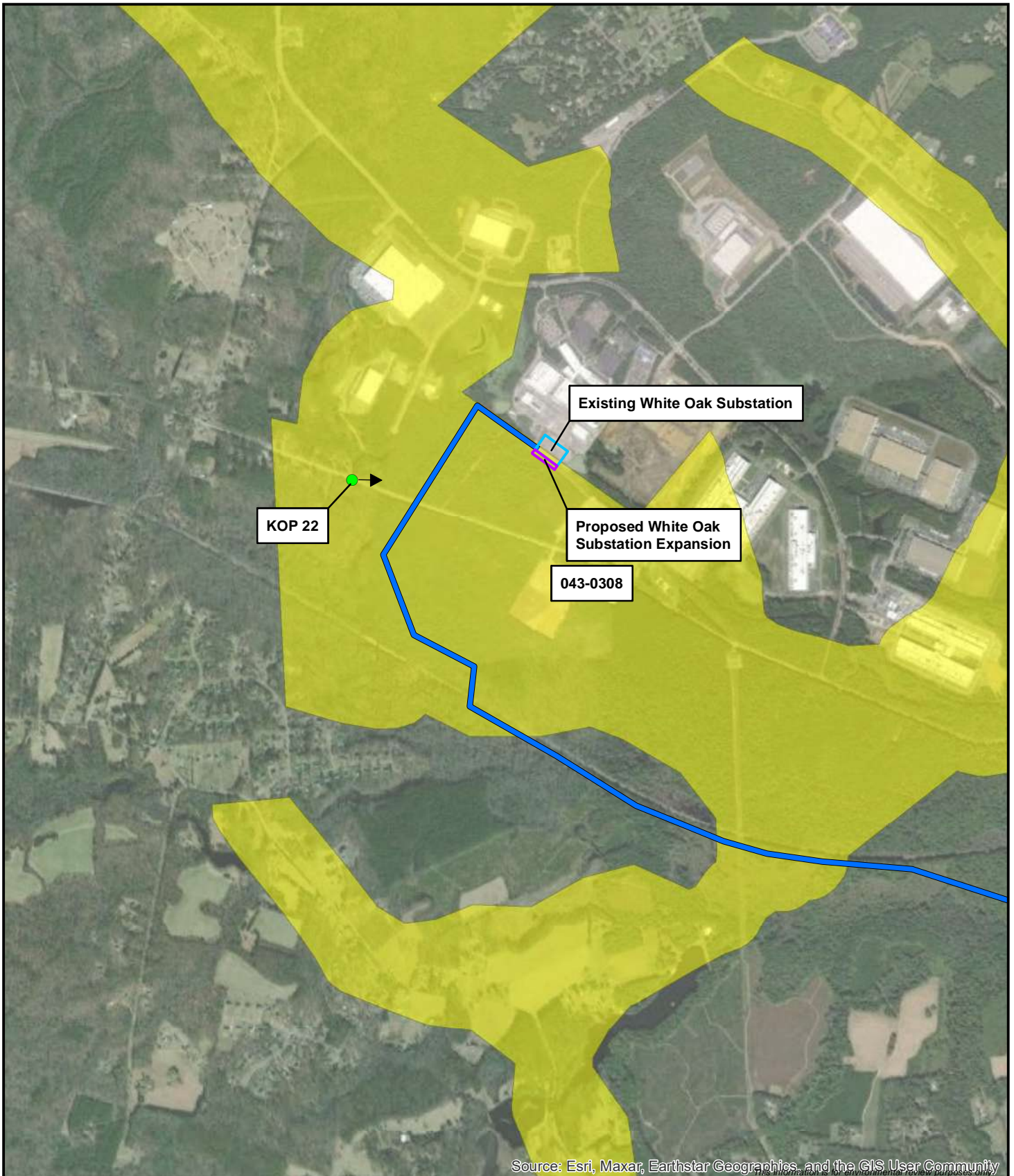




Figure 36. Aerial photograph depicting land use and photo view for 043-0308.

Existing View



Proposed View - Hidden



Viewpoint Location UTM Zone 18S:300392E 4151057N

View Direction: 90 degrees

Viewpoint Elevation: 138 feet

Distance to Development: 1307 feet

Horizontal Field of View: 140 degrees

Date of Photography: 14th October 2022 14:24

Camera: Nikon D800

Lens: Nikkor 50mm 1.4

Camera Height: 59.25 inches



Figure 37

Viewpoint KOP 22 - Route 4

Portuguese Rd E of Memorial Dr

043-0308

Pre-Application Analysis

White Oak

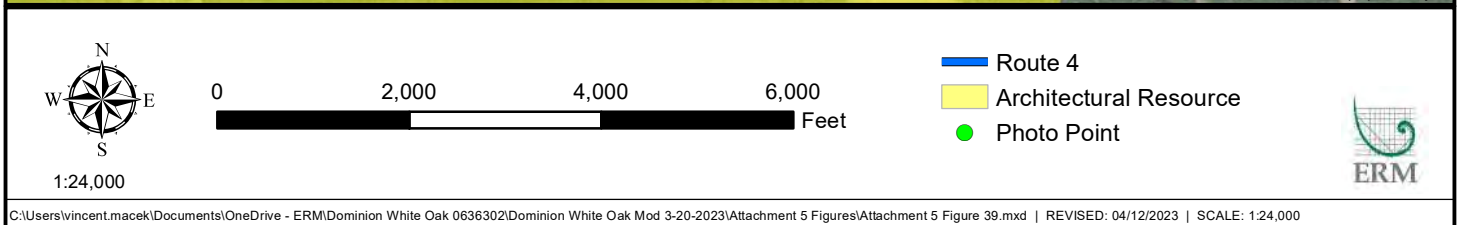
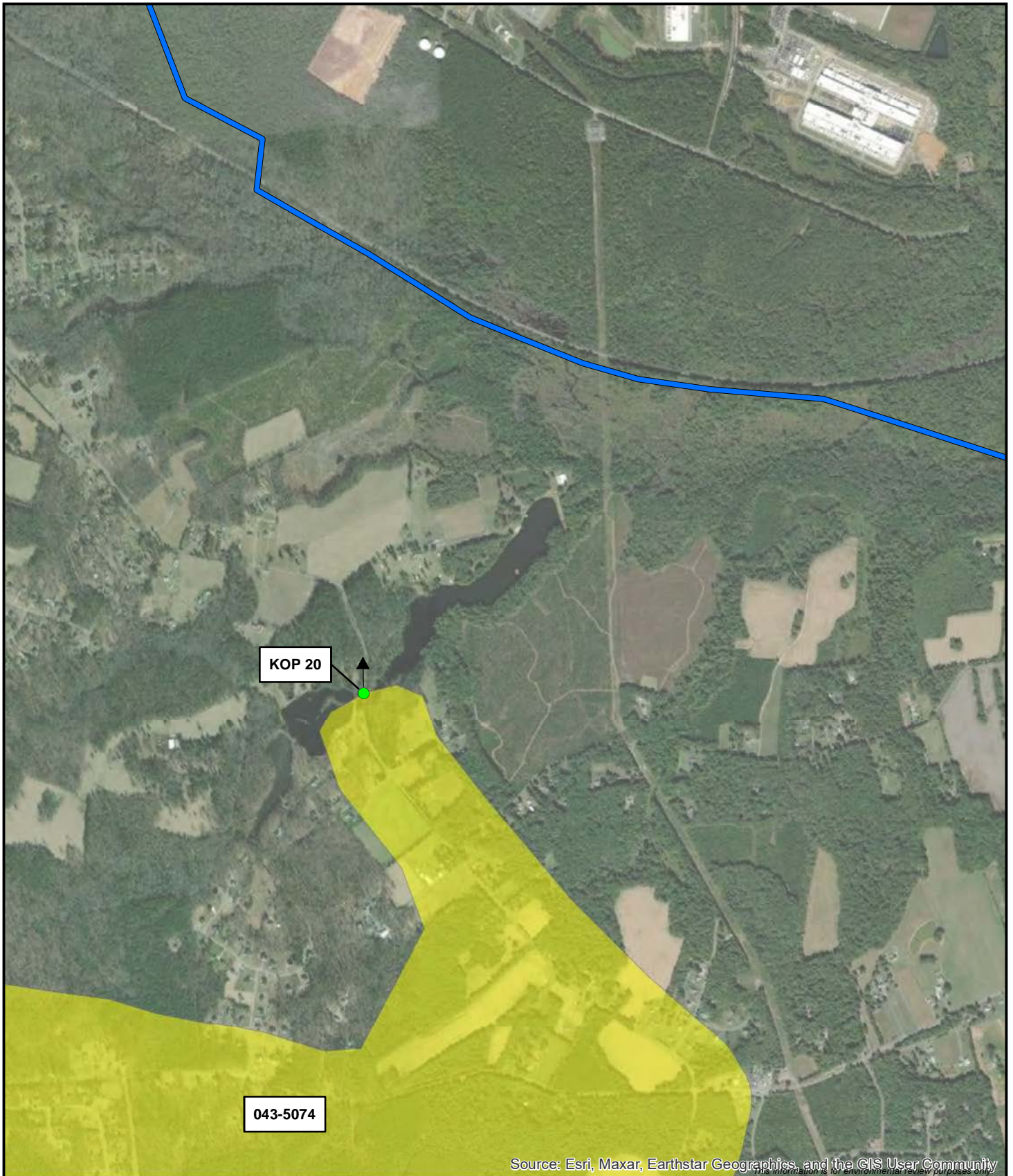
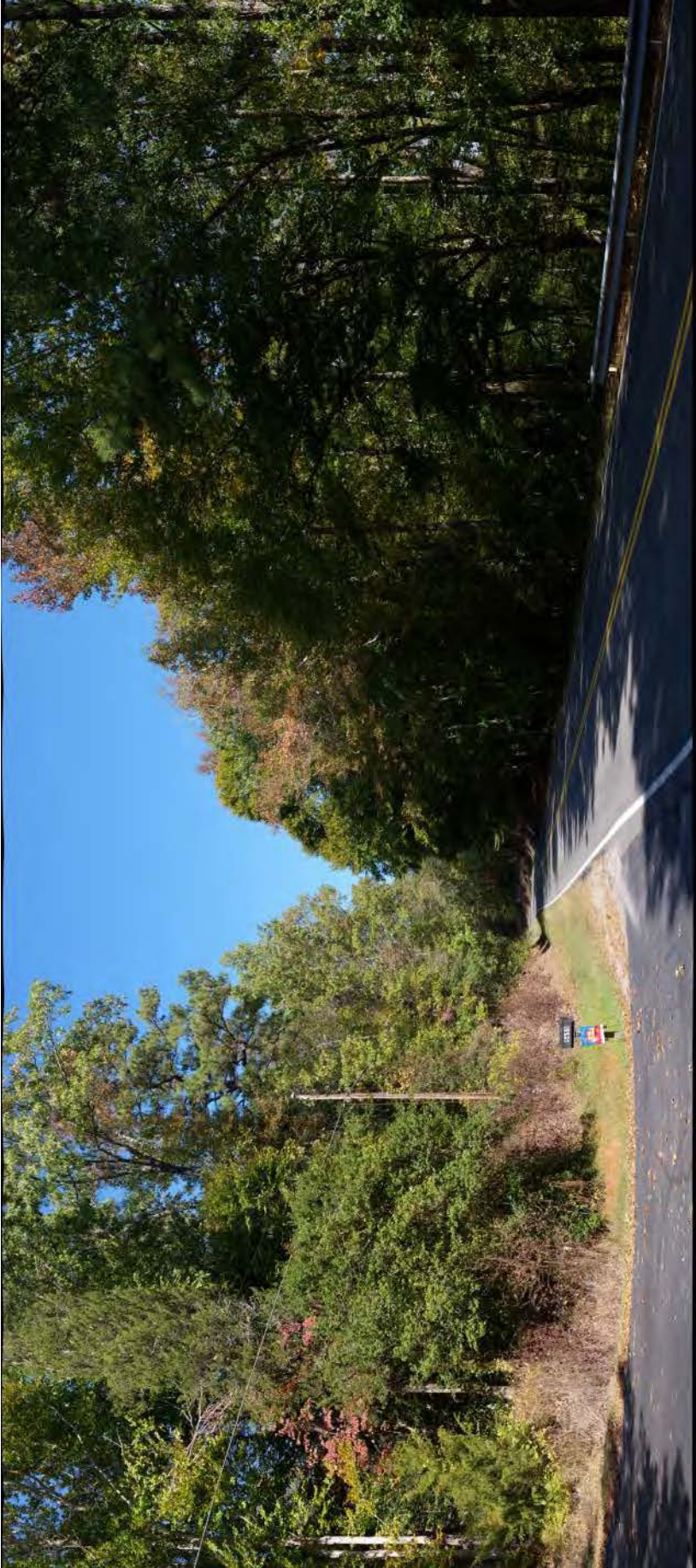




Figure 38. Aerial photograph depicting land use and photo view for 043-5074.

Existing View



Proposed View - Hidden



Viewpoint Location UTM Zone 18S:301264E 4148153N

View Direction: 0 degrees

Viewpoint Elevation: 120 feet

Distance to Development: 5785 feet

Horizontal Field of View: 100 degrees

Date of Photography: 14th October 2022 11:55

Camera: Nikon D800

Lens: Nikkor 50mm 1.4

Camera Height: 60.25 inches



VIEWPOINT CONTEXT

Figure 39

Viewpoint KOP 20 - Route 4

Charles City Rd N of Osbourne Ln

043-5074

Pre-Application Analysis

White Oak

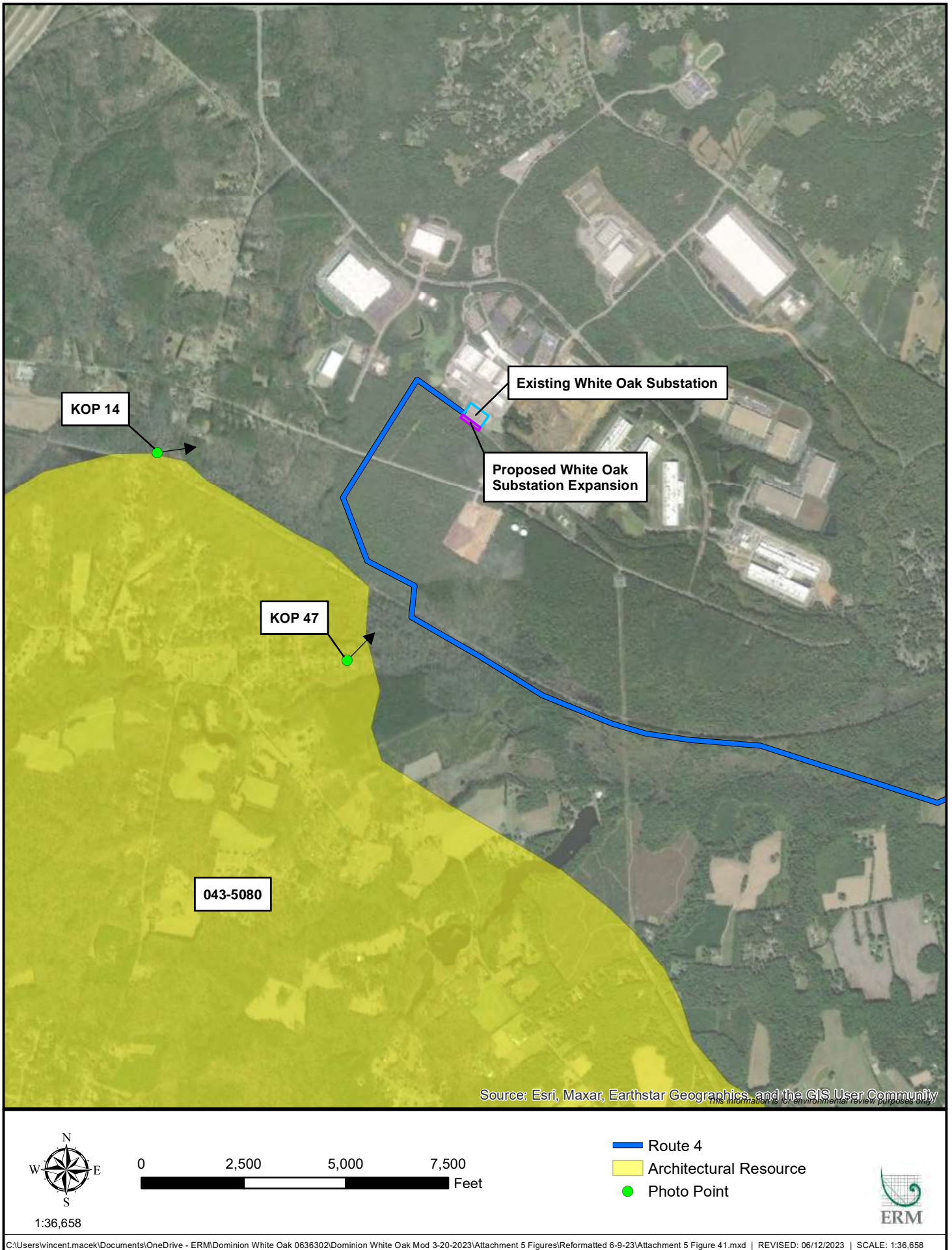




Figure 40. Aerial photograph depicting land use and photo view for 043-5080.

Existing View



Proposed View - Hidden



Viewpoint Location UTM Zone 18S:299436E 4150996N

View Direction: 50 degrees

Viewpoint Elevation: 129 feet

Distance to Development: 6950 feet

Horizontal Field of View: 90 degrees

Date of Photography: 17th August 2022 09:32

Camera: Nikon D800

Lens: Nikkor 50mm 1.4

Camera Height: 57.25 inches



Figure 41

Viewpoint KOP 14 - Route 4

Poplar Spring Rd S of Portugee Rd

043-5080

Pre-Application Analysis



White Oak



Existing View



Proposed View - Hidden



Viewpoint Location UTM Zone 18S: 300531E 4149743N
View Direction: 50 degrees
Viewpoint Elevation: 135 feet
Distance to Development: 1801 feet
Horizontal Field of View: 80 degrees

Date of Photography: 24th February 2023 14:56
Camera: Nikon D800
Lens: Nikkor 50mm 1.4
Camera Height: 61 inches

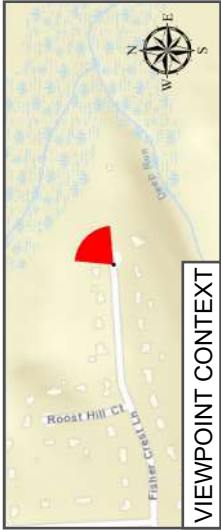


Figure 42
Viewpoint KOP 47 - Route 4
Fisher Crest Ln E of Roost Hill Ct
043-5080

Pre-Application Analysis
White Oak

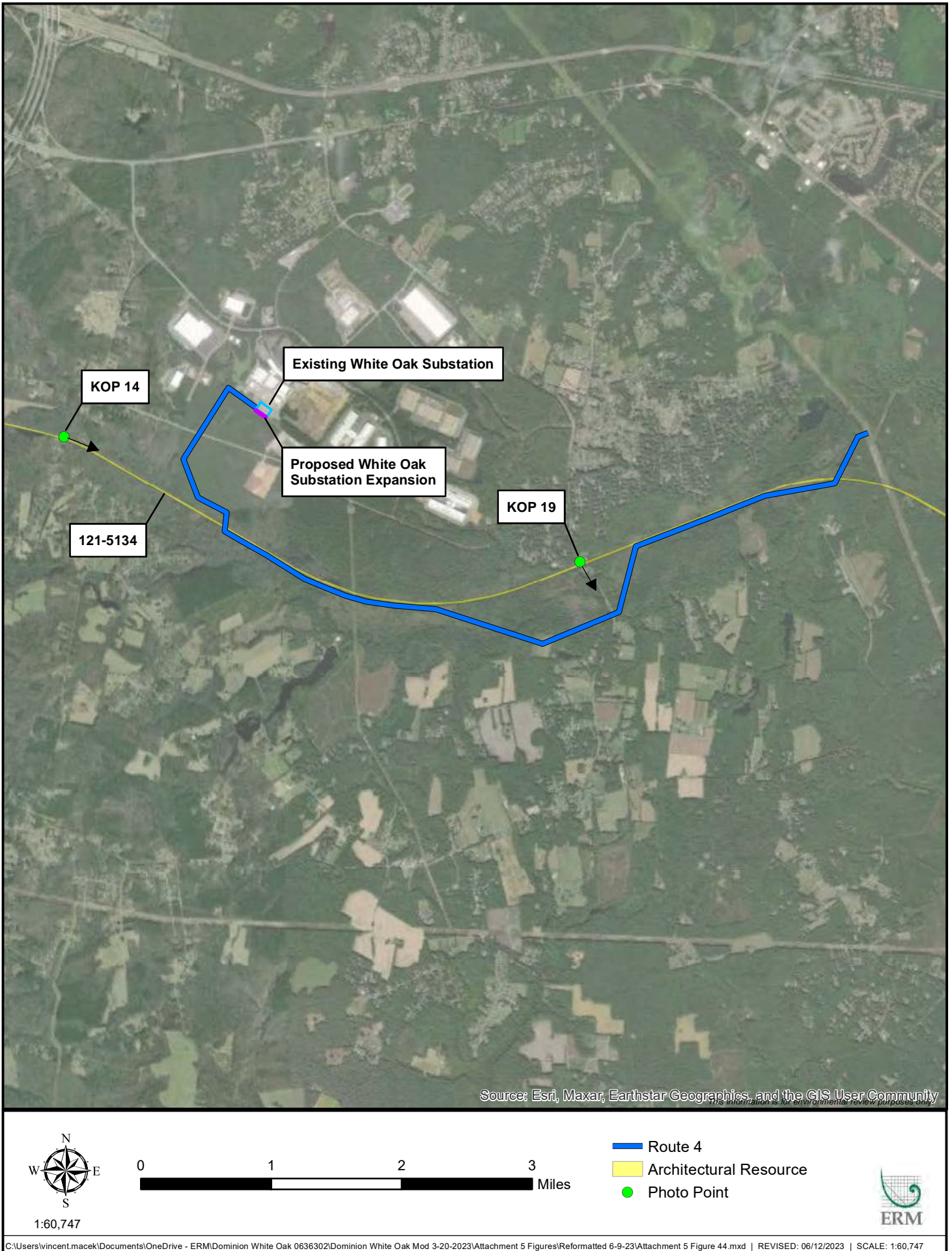
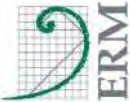



Figure 43. Aerial photograph depicting land use and photo view for 121-5134.

Existing View



Proposed View - Hidden



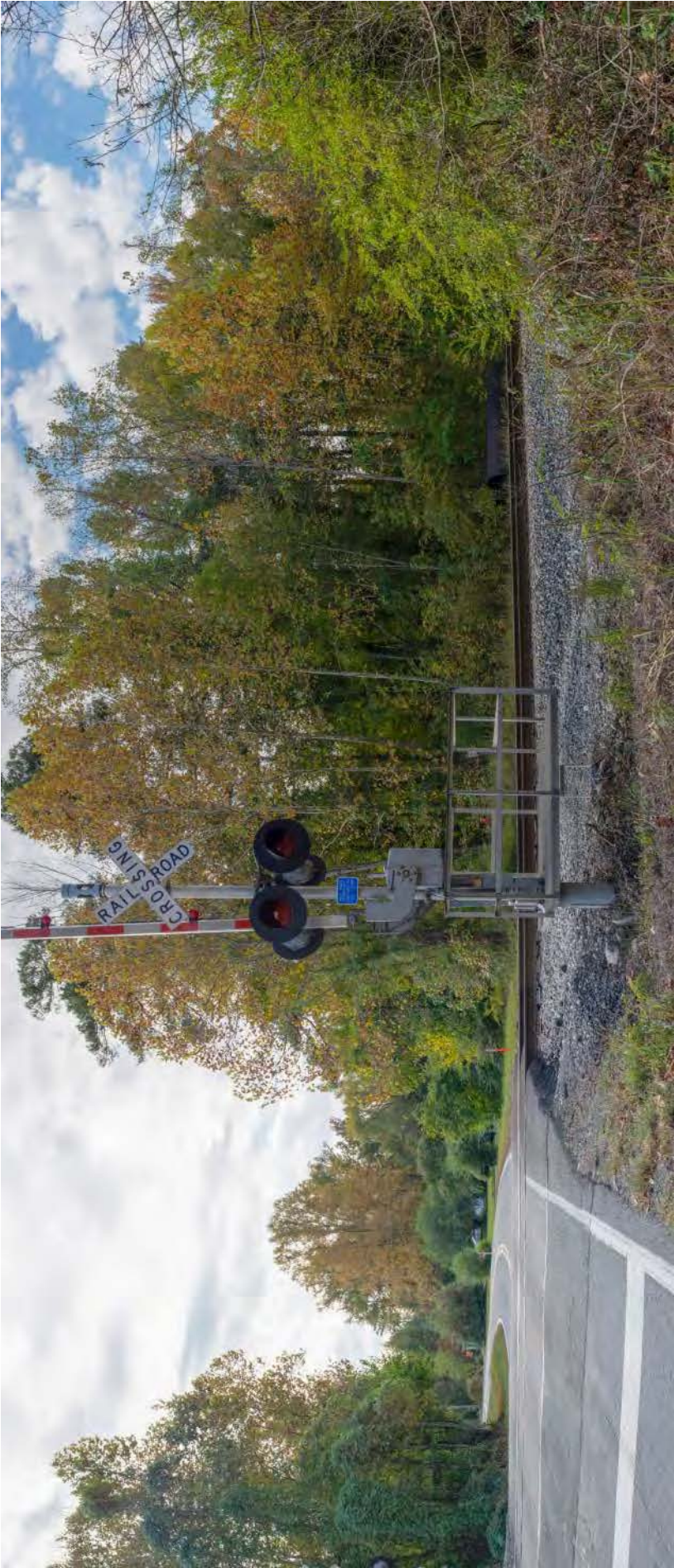
Viewpoint Location UTM Zone 18S:299436E 4150996N
View Direction: 50 degrees
Viewpoint Elevation: 129 feet
Distance to Development: 6950 feet
Horizontal Field of View: 90 degrees

Date of Photography: 17th August 2022 09:32
Camera: Nikon D800
Lens: Nikkor 50mm 1.4
Camera Height: 57.25 inches





Figure 44
Viewpoint KOP 14 - Route 4
Poplar Spring Rd S of Portugee Rd
121-5134
Pre-Application Analysis
White Oak

Existing View



Proposed View - Hidden



Viewpoint Location UTM Zone 18S:304394E 4149610N
View Direction: 150 degrees
Viewpoint Elevation: 83 feet
Distance to Development: 2014 feet
Horizontal Field of View: 100 degrees

Date of Photography: 14th October 2022 09:54
Camera: Nikon D800
Lens: Nikkor 50mm 1.4
Camera Height: 53 inches



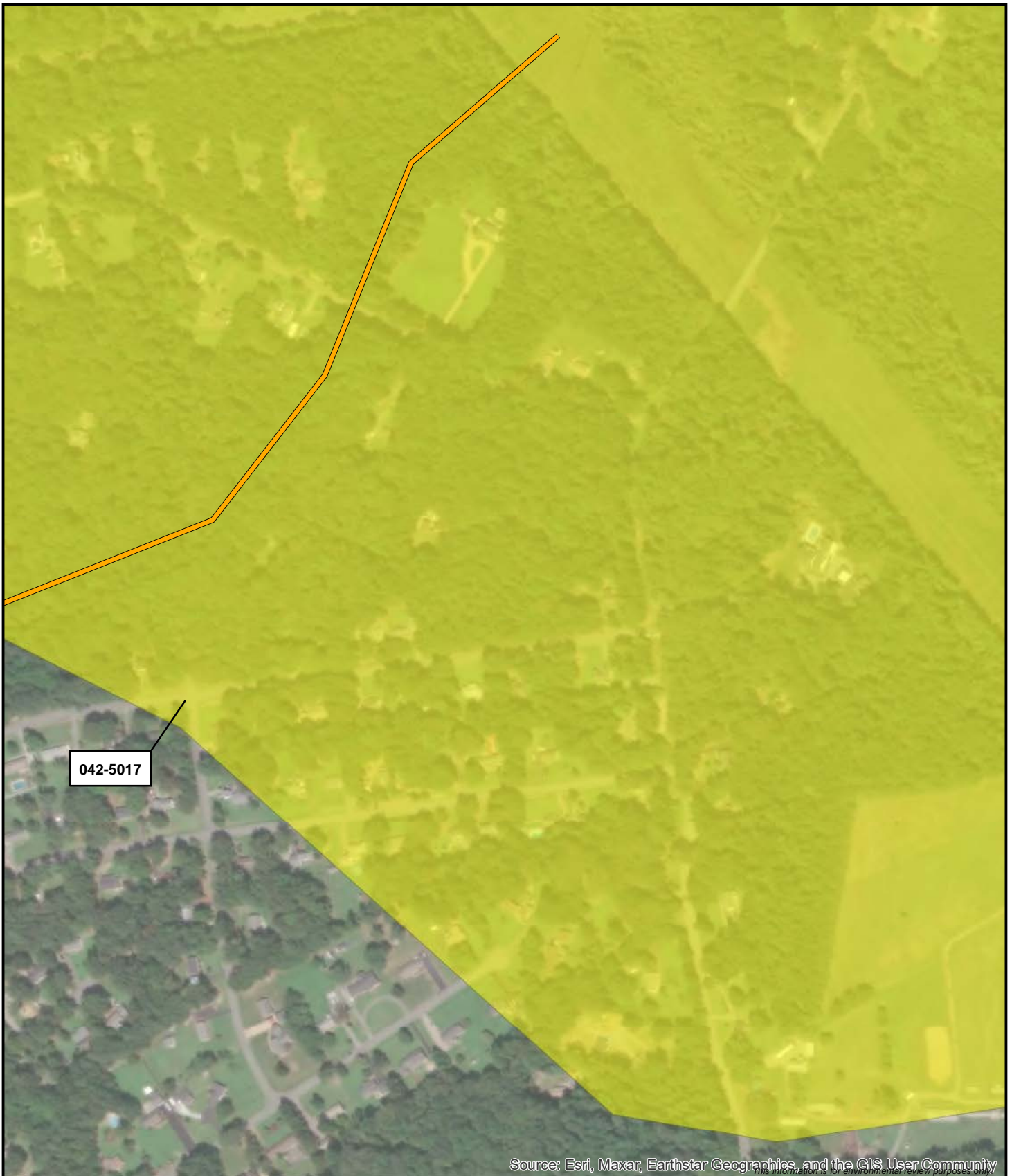
Figure 45
Viewpoint KOP 19 - Route 4
Elko Rd S of Portugee Rd
121-5134

Pre-Application Analysis
White Oak

ATTACHMENT 6 GOOGLE EARTH RENDERINGS

GOOGLE EARTH RENDERINGS FOR WHITE OAK LINES

Route 2

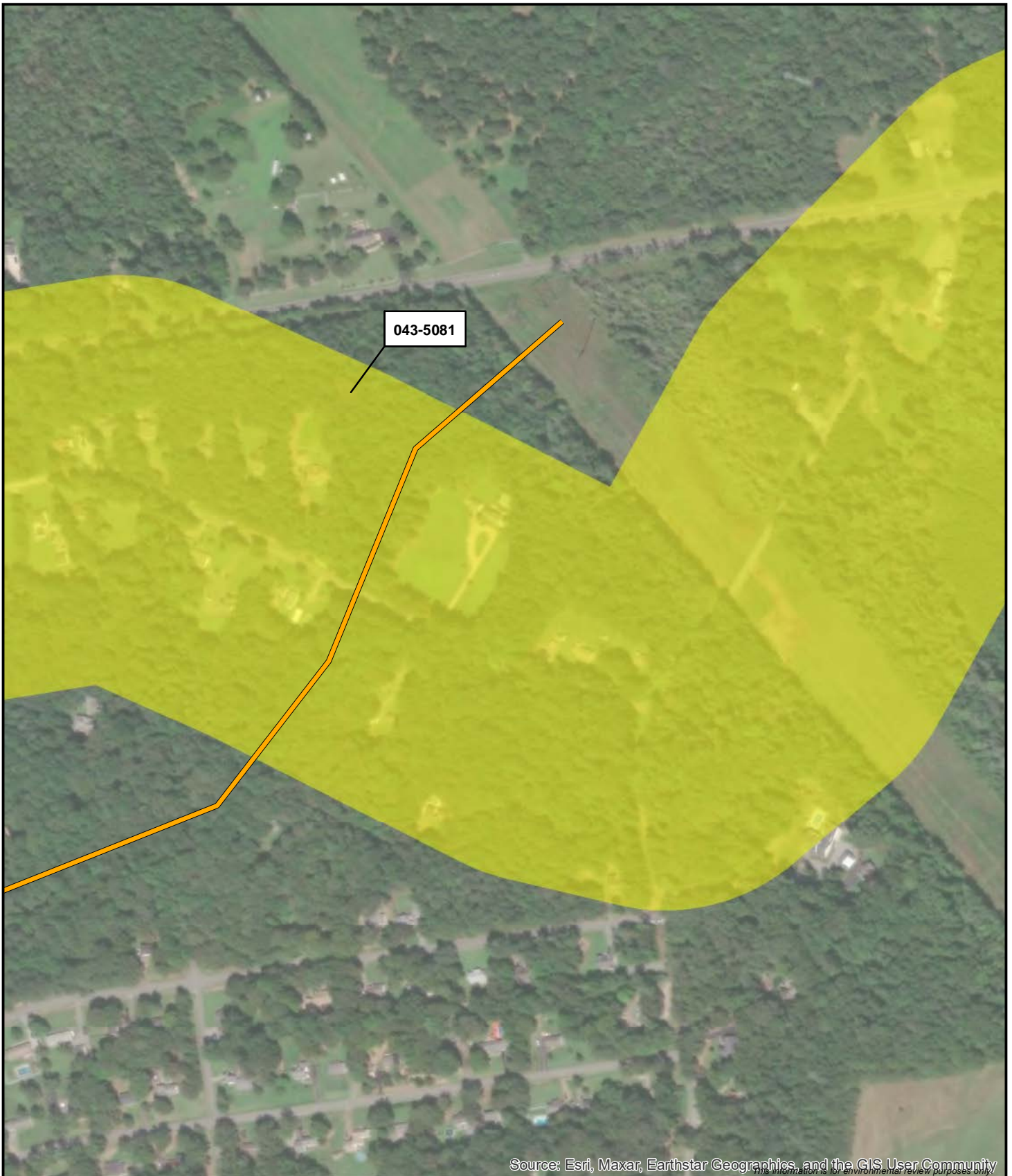


0 400 800 1,200
Feet

Route 2
Architectural Resource



Figure 1. Aerial photograph depicting land use for 042-5017.



1:6,000

0 400 800 1,200
Feet

Route 2
Architectural Resource



Figure 2. Aerial photograph depicting land use for 043-5081.



Existing View

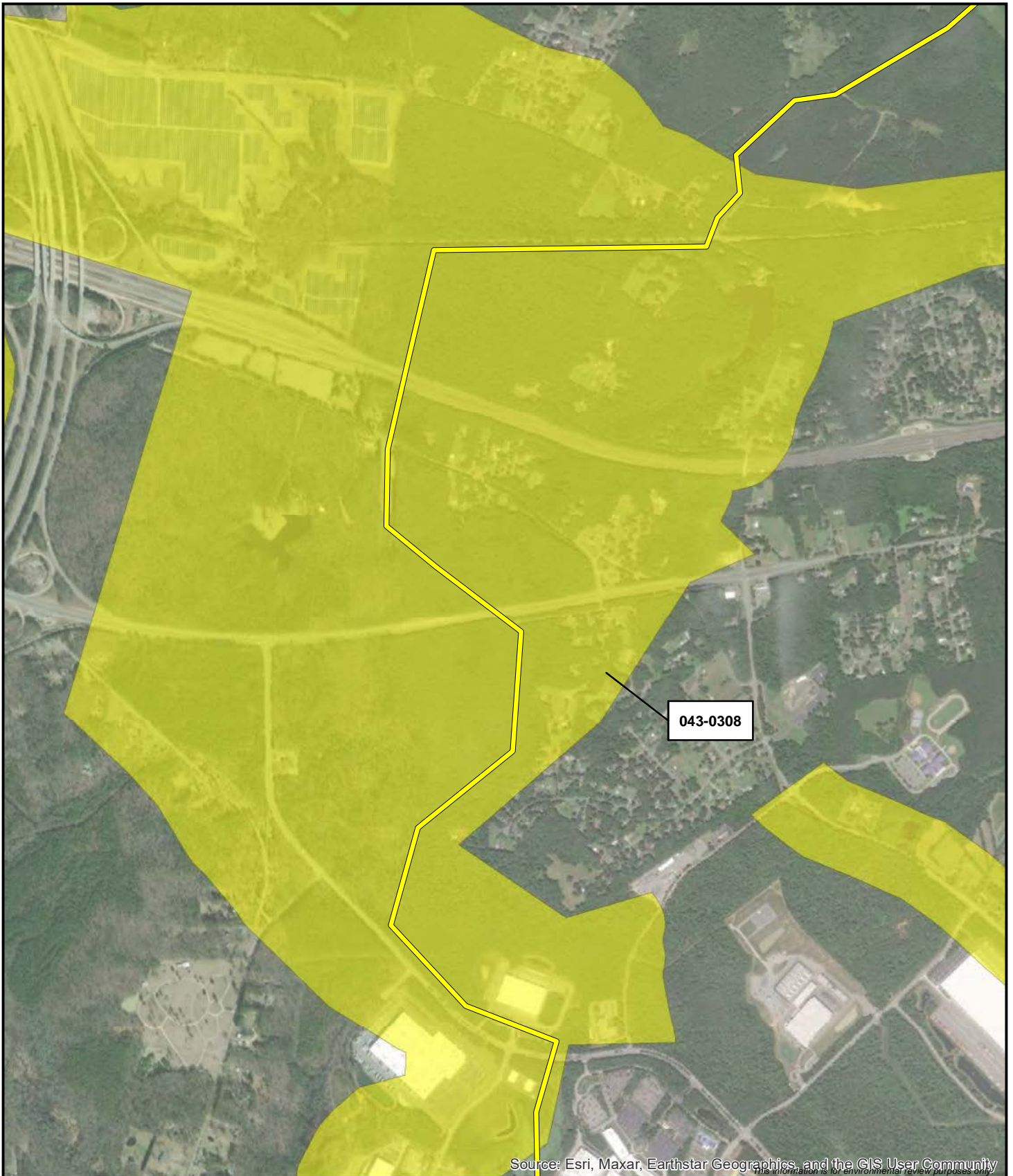


Proposed View

Figure 3. GoogleEarth rendering showing the relationship between Route 2 and 042-5017/043-5081.

GOOGLE EARTH RENDERINGS FOR WHITE OAK LINES

Route 3



1:25,836

0 2,000 4,000 6,000
Feet

— Route 3
— Architectural Resource



Figure 4. Aerial photograph depicting land use for 043-0308.



Existing View

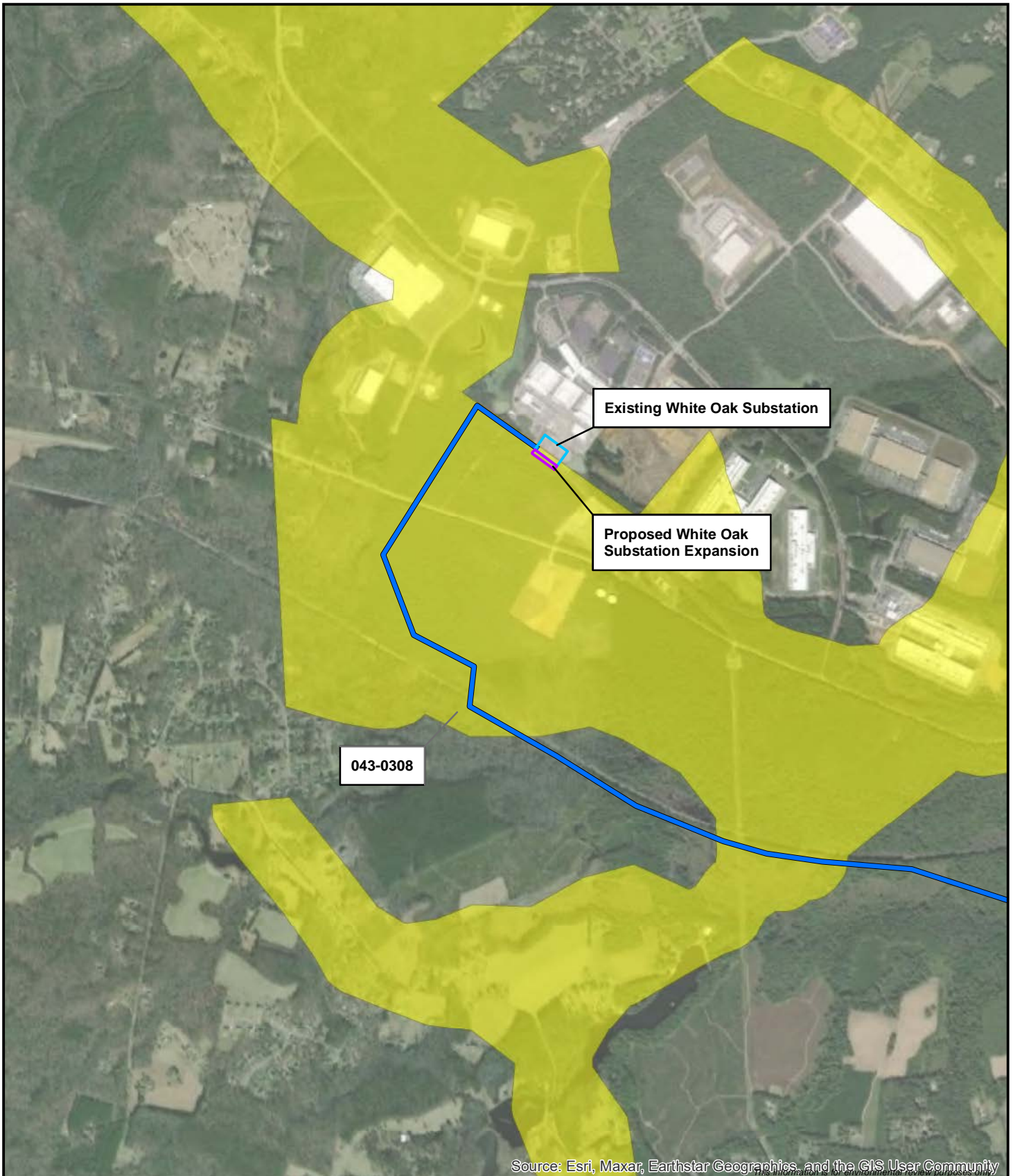


Proposed View

Figure 5. GoogleEarth rendering showing the relationship between Route 3 and 043-0308.

GOOGLE EARTH RENDERINGS FOR WHITE OAK LINES

Route 4



1:30,835

0 2,000 4,000 6,000
Feet

Route 4
Architectural Resource



C:\Users\vincent.macek\Documents\OneDrive - ERM\Dominion White Oak 0636302\Report figures reformatted 6-12-2023\Attachment 6 Figure 7.mxd | REVISED: 06/12/2023 | SCALE: 1:30,835

Figure 6. Aerial photograph depicting land use for 043-0308.



Existing View



Proposed View

Figure 7. GoogleEarth rendering showing the relationship between Route 4 and 043-0308.

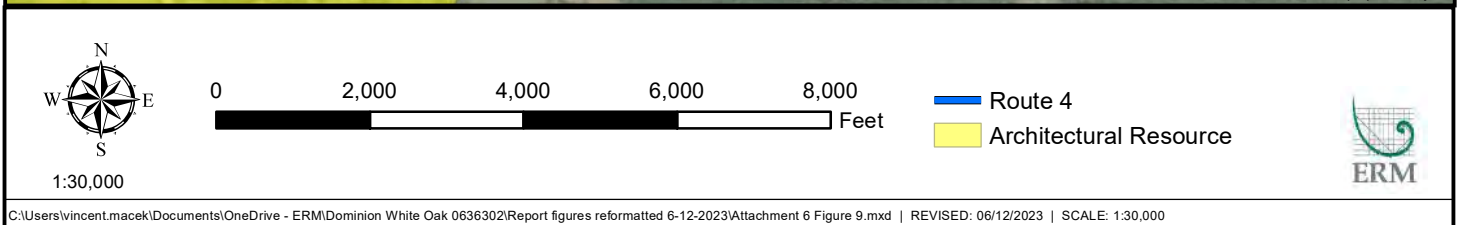
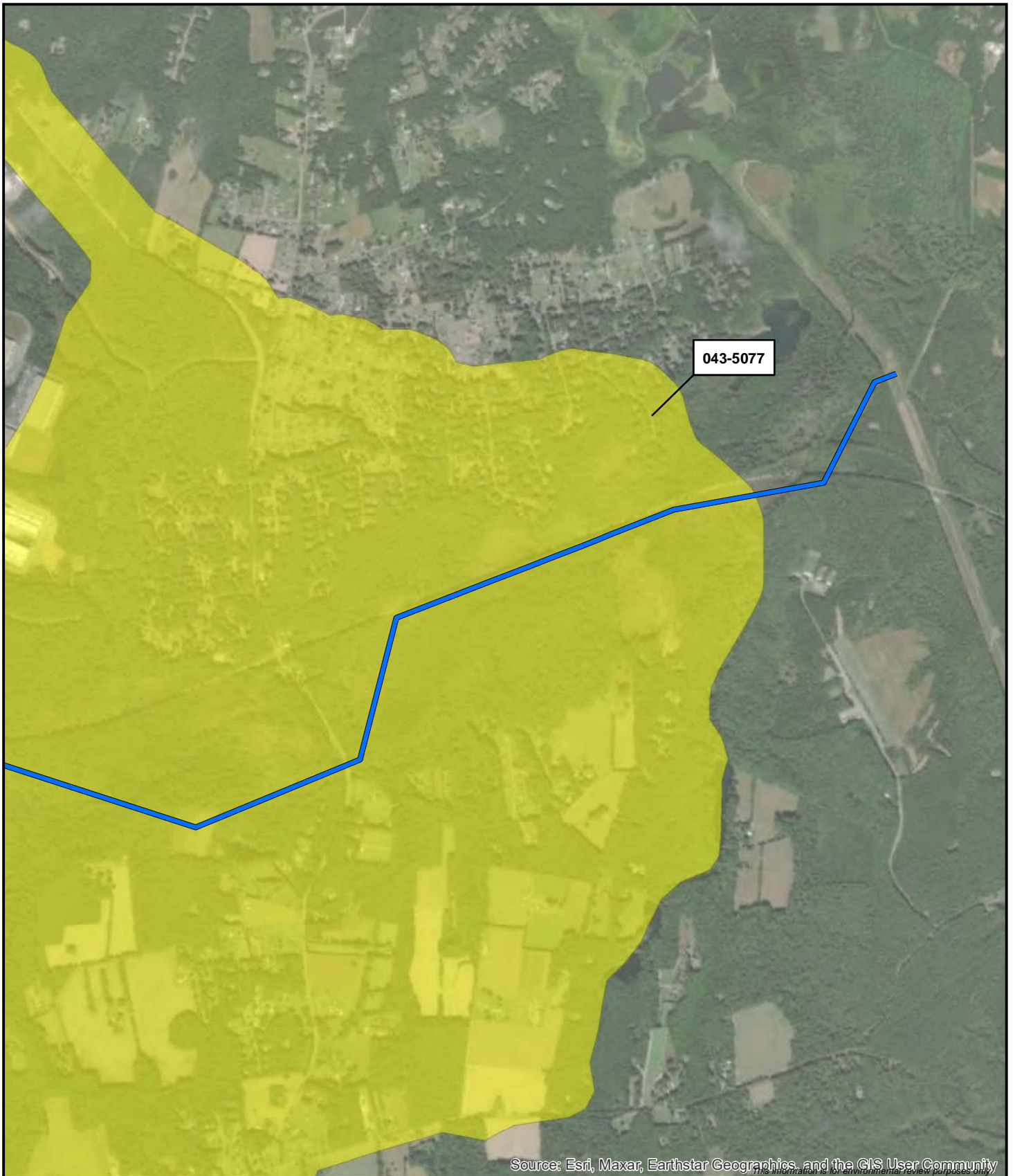


Figure 8. Aerial photograph depicting land use for 043-5077.



Existing View



Proposed View

Figure 9. GoogleEarth rendering showing the relationship between Route 4 and 043-5077.

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India	South Korea
Indonesia	Spain
Ireland	Sweden
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Japan	Taiwan
Kazakhstan	Thailand
Kenya	UAE
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The Netherlands	Vietnam

ERM

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Duluth, Georgia, USA 30096

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Travis A. Voyles
Acting Secretary of Natural
and Historic Resources

Department of Historic Resources
2801 Kensington Avenue, Richmond, Virginia 23221

Julie V. Langan
Director
Tel: (804) 367-2323
Fax: (804) 367-2391
www.dhr.virginia.gov

Heather E.B. Kennedy
Dominion Energy Virginia
Electric Transmission
P.O. Box 26666
Richmond, VA 23261

December 14, 2022

RE- Dominion Energy Virginia's Proposed White Oak 230 kV Electric Transmission Line
Henrico County, VA
DHR File No. 2022-4614

Dear Ms. Kennedy

We have received your request for comments on the project referenced above. The undertaking, as presented, involves the construction of a two new overhead 230 kV transmission lines on double circuit structures in a new, primarily 100-foot-wide right-of-way (the "White Oak Lines") and to expand its existing White Oak Substation in order to accommodate the White Oak Lines (the "White Oak Substation Expansion"). Our comments are provided as technical assistance to Dominion. We have not been notified by any state or federal agency of their involvement in this project; however, we reserve the right to provide additional comment pursuant to the National Historic Preservation Act, if applicable.

Based on the submission, Dominion plans to prepare an application for a certificate of public convenience and necessity (CPCN) from the State Corporation Commission (SCC). Typically, we recommend that Dominion follow the *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* developed by DHR to assist project proponents in developing transmission line projects that minimize impacts to historic resources.

Generally, we recommend that the project proponent establish a study area for each route alternative under consideration and gather information on known resources. A qualified cultural resources consultant in the appropriate discipline should perform an assessment of impact for each known historic resource present within the proposed study area.

Western Region Office
962 Kime Lane
Salem, VA 24153
Tel: (540) 387-5443
Fax: (540) 387-5446

Northern Region Office
5357 Main Street
PO Box 519
Stephens City, VA 22655
Tel: (540) 868-7029
Fax: (540) 868-7033

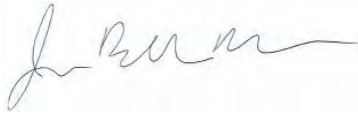
Eastern Region Office
2801 Kensington Avenue
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

Page 2
DHR File No. 2022-4614
December 14, 2022

Once the route alternatives have been finalized, DHR recommends that full archaeological and architectural surveys be performed to determine the effect of the project on all historic resources listed in or eligible for listing in the National Register. This process involves the identification and recordation of all archaeological sites and structures greater than 50 years of age, the evaluation of those resources for listing in the National Register, determining the degree of impact of the project on eligible resources, and developing a plan to avoid, minimize, or mitigate any negative impacts. Comments received from the public or other stakeholder regarding impacts to specific historic resources should be addressed as part of this survey and assessment process.

Thank you for seeking our comments on this project. If you have any questions at this time, please do not hesitate to contact me at jennifer.bellville-marrion@dhr.virginia.gov.

Sincerely,

A handwritten signature in dark ink, appearing to read "J. Bellville-Marrion", with a stylized flourish at the end.

Jenny Bellville-Marrion
Project Review Archaeologist
Review and Compliance Division

Western Region Office
962 Kime Lane
Salem, VA 24153
Tel: (540) 387-5443
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Eastern Region Office
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Fax: (804) 367-2391



COMMONWEALTH of VIRGINIA

Travis A. Voyles
Secretary of Natural and
Historic Resources

Department of Historic Resources
2801 Kensington Avenue, Richmond, Virginia 23221

Julie V. Langan
Director
Tel: (804) 367-2323
Fax: (804) 367-2391
www.dhr.virginia.gov

Heather E.B. Kennedy
Dominion Energy Virginia
Electric Transmission
P.O. Box 26666
Richmond, VA 23261

June 13, 2023

RE- Dominion Energy Virginia's Proposed 230 kV Elmont-White Oak Line #2075, 230 kV
Chickahominy-White Oak Line #2294 and White Oak Substation Expansion
Henrico County, VA
DHR File No. 2022-4614

Dear Ms. Kennedy

We have received your request for comments on the project referenced above. The undertaking, as presented, involves the construction of a two new overhead 230 kV transmission lines on double circuit structures in a new, primarily 100-foot-wide right-of-way (the "White Oak Lines") and to expand its existing White Oak Substation in order to accommodate the White Oak Lines (the "White Oak Substation Expansion"). Our comments are provided as technical assistance to Dominion. We have not been notified by any state or federal agency of their involvement in this project; however, we reserve the right to provide additional comment pursuant to the National Historic Preservation Act, if applicable.

Based on the submission, Dominion plans to prepare an application for a certificate of public convenience and necessity (CPCN) from the State Corporation Commission (SCC). Typically, we recommend that Dominion follow the *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* developed by DHR to assist project proponents in developing transmission line projects that minimize impacts to historic resources.

Generally, we recommend that the project proponent establish a study area for each route alternative under consideration and gather information on known resources. A qualified cultural resources consultant in the appropriate discipline should perform an assessment of impact for each known historic resource present within the proposed study area.

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Tel: (540) 387-5443
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Eastern Region Office
2801 Kensington Avenue
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

Page 2
June 13, 2023
DHR File No. 2022-4614

Once the route alternatives have been finalized, DHR recommends that full archaeological and architectural surveys be performed to determine the effect of the project on all historic resources listed in or eligible for listing in the National Register. This process involves the identification and recordation of all archaeological sites and structures greater than 50 years of age, the evaluation of those resources for listing in the National Register, determining the degree of impact of the project on eligible resources, and developing a plan to avoid, minimize, or mitigate any negative impacts. Comments received from the public or other stakeholder regarding impacts to specific historic resources should be addressed as part of this survey and assessment process.

Thank you for seeking our comments on this project. If you have any questions at this time, please do not hesitate to contact me at jennifer.bellville-marrion@dhr.virginia.gov.

Sincerely,



Jenny Bellville-Marrion
Project Review Archaeologist
Review and Compliance Division

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Fax: (540) 868-7033

Eastern Region Office
2801 Kensington Avenue
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

From: Winn, Marshall (VDOT) <Marshall.Winn@VDOT.Virginia.gov>
Sent: Friday, June 2, 2023 11:30 AM
To: Stefan R Brooks (DEV Trans Distribution - 1) <Stefan.R.Brooks@dominionenergy.com>; Winn, Marshall (VDOT) <Marshall.Winn@VDOT.Virginia.gov>; Moore, Adam PE (VDOT) <Adam.Moore@vdot.virginia.gov>
Cc: Totten, Dale P.E. (VDOT) <Dale.Totten@VDOT.Virginia.gov>; Ellis, Lezlie (VDOT) <Lezlie.Ellis@VDOT.Virginia.gov>
Subject: [EXTERNAL] Re: Dominion Energy Virginia's Proposed 230 kV White Oak and White Oak Substation Expansion

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Stefan,

As we discuss by phone this morning I don't see any true fatal flaws in any of the routes. Adam and I both would recommend Routes 1 and 2 over Route 3 due to the MOT necessary for installation and perpetual maintenance of a line crossing I-64 and Route 60. If we need to discuss anything else concerning this subject please don't hesitate to reach out to me.

Thanks,



Marshall Winn

Ashland Residency Administrator

Virginia Department of Transportation

804-585-3566

marshall.winn@vdot.virginia.gov

From:

Stefan.R.Brooks@dominionenergy.com <Stefan.R.Brooks@dominionenergy.com>

Sent: Friday, June 2, 2023 10:59 AM

To: Moore, Adam PE (VDOT) <Adam.Moore@vdot.virginia.gov>; Winn, Marshall (VDOT) <Marshall.Winn@VDOT.Virginia.gov>

Cc: Joseph, Harley E., PE (VDOT) <Harley.Joseph@vdot.virginia.gov>; Hofrichter, Robert W. (VDOT) <Robert.Hofrichter@VDOT.Virginia.gov>

Subject: RE: Dominion Energy Virginia's Proposed 230 kV White Oak and White Oak Substation Expansion

Good morning, Adam.

Thank you for your reply about our outreach to VDOT for Dominion Energy Virginia's Proposed White Oak Project in Henrico County, Virginia. I have forwarded this to our project team.

Since you mentioned that Marshall Winn may reply, I thought I'd wait a few days before I write back to say that we've not seen anything. Should we expect any reply with additional comment?

Thank you,

Stefan R Brooks, P.E.

Contractor - Electric Transmission Siting & Permitting

Mobile: 804-514-3129

Email: stefan.r.brooks@dominionenergy.com

5000 Dominion Boulevard, 3rd Floor
Glen Allen, VA 23060

* Licensed PE in VA

From: Moore, Adam PE (VDOT) <Adam.Moore@vdot.virginia.gov>

Sent: Wednesday, May 31, 2023 4:02 PM

To: Stefan R Brooks (DEV Trans Distribution - 1) <stefan.r.brooks@dominionenergy.com>

Cc: Joseph, Harley E., PE (VDOT) <Harley.Joseph@vdot.virginia.gov>; Winn, Marshall (VDOT)

<Marshall.Winn@VDOT.Virginia.gov>; Hofrichter, Robert W. (VDOT) <Robert.Hofrichter@VDOT.Virginia.gov>

Subject: [EXTERNAL] Fw: Dominion Energy Virginia's Proposed 230 kV White Oak and White Oak Substation Expansion

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Good afternoon Stefan,

Marshall Winn and I have looked at the routes provided. You may have already received Marshall's feedback, but I was asked separately so I've included everyone. I don't see any true fatal flaws in any of the routes. We would recommend Routes 1 and 2 over Route 3 due to the MOT necessary for installation and perpetual maintenance of a line crossing the interstate. If you have any questions, please don't hesitate to reach out to me. Thanks.

Adam J. Moore, P.E.

Area Land Use Engineer Ashland Residency

Virginia Department of Transportation

Office: 804-585-3585

Cell: 804-385-3746

adam.moore@vdot.virginia.gov



From: Hofrichter, Robert W. (VDOT) <Robert.Hofrichter@VDOT.Virginia.gov>

Sent: Wednesday, May 31, 2023 3:01 PM

To: Moore, Adam PE (VDOT) <Adam.Moore@vdot.virginia.gov>

Cc: Huckabee-Mayfield, Jorg (VDOT) <Jorg.Huckabee-Mayfield@VDOT.Virginia.gov>; Pollard, Brent (VDOT)

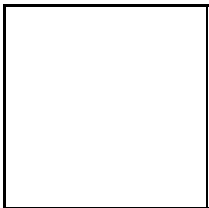
<Brent.Pollard@VDOT.Virginia.gov>; McGrath, Ryan (VDOT) <Ryan.McGrath@VDOT.Virginia.gov>; Joseph, Harley E., PE (VDOT) <Harley.Joseph@vdot.virginia.gov>

Subject: Fw: Dominion Energy Virginia's Proposed 230 kV White Oak and White Oak Substation Expansion

Adam,

Hope your short week is going well. If you see any fatal flaws in the Dominion routes shown on the attached, please let Stefan Brooks of Dominion know (and copy me). Thanks.

Rob



Robert Hofrichter

Director / Office of Land Use

804-786-0780

Robert.Hofrichter@VDOT.Virginia.gov

From: Gregg, Kevin (VDOT) <Kevin.Gregg@vdot.virginia.gov>

Sent: Wednesday, May 31, 2023 11:11 AM

To: Hofrichter, Robert W. (VDOT) <Robert.Hofrichter@VDOT.Virginia.gov>

Subject: Fw: Dominion Energy Virginia's Proposed 230 kV White Oak and White Oak Substation Expansion

Rob,

Please review and coordinate with the Residency.

E. Kevin Gregg

Chief of Maintenance and Operations

Virginia Department of Transportation

Email: kevin.gregg@vdot.virginia.gov

Office: 804-786-5369

Mobile: 757-620-3691

Safety is a mission, not an intermission.

From: Stefan.R.Brooks@dominionenergy.com <Stefan.R.Brooks@dominionenergy.com>

Sent: Thursday, May 18, 2023 3:03 PM

To: Gregg, Kevin (VDOT) <Kevin.Gregg@vdot.virginia.gov>

Cc: brandon.g.luck@dominionenergy.com <brandon.g.luck@dominionenergy.com>

Subject: Dominion Energy Virginia's Proposed 230 kV White Oak and White Oak Substation Expansion

Mr. Gregg,

Please see the attached project notification and associated project overview map for the Dominion Energy Virginia's Proposed White Oak Project in Henrico County, Virginia. If you have any questions, please feel free to contact me.

Thank you,

Stefan R Brooks, P.E.

Contractor - Electric Transmission Siting & Permitting

Mobile: 804-514-3129

Email: stefan.r.brooks@dominionenergy.com

5000 Dominion Boulevard, 3rd Floor
Glen Allen, VA 23060

* Licensed PE in VA

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From: Denny, S. Scott (DOAV) <Scott.Denny@doav.virginia.gov>
Sent: Monday, May 22, 2023 1:50 PM
To: Stefan R Brooks (DEV Trans Distribution - 1) <Stefan.R.Brooks@dominionenergy.com>
Subject: [EXTERNAL] Re: Dominion Energy Virginia's Proposed 230 kV White Oak and White Oak Substation Expansion

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Dear Mr. Brooks:

The Virginia Department of Aviation has reviewed the three proposed White Oak Transmission Lines alternatives as described in your May 18, 2023 email to the Department. Following our review it appears as though all three alternatives would be located within 20,000' of the Richmond International Airport. Therefore, a 7460 must be submitted to the Federal Aviation Administration (FAA) for the alternatives. The submission of the 7460 form will initiate an airspace study to determine if the proposed development would constitute a hazard to air navigation. Provided the FAA determines the proposed development does not create a hazard to air navigation or result in the increase to any instrument approach procedure minimums, the Department will not object to any of the alternatives as they have been presented.

Please feel free to contact me at (804) 236-3638 if you have any questions regarding this matter.

Sincerely,

S. Scott Denny
Senior Aviation Planner
Virginia Department of Aviation

From: Stefan.R.Brooks@dominionenergy.com <Stefan.R.Brooks@dominionenergy.com>
Sent: Thursday, May 18, 2023 3:02 PM
To: Denny, S. Scott (DOAV) <Scott.Denny@doav.virginia.gov>
Subject: Dominion Energy Virginia's Proposed 230 kV White Oak and White Oak Substation Expansion

Mr. Denny,
Please see the attached project notification and associated project overview map for the Dominion Energy Virginia's Proposed White Oak Project in Henrico County, Virginia. If you have any questions, please feel free to contact me.
Thank you,

Stefan R Brooks, P.E.
Contractor - Electric Transmission Siting & Permitting
Mobile: 804-514-3129
Email: stefan.r.brooks@dominionenergy.com
5000 Dominion Boulevard, 3rd Floor

Glen Allen, VA 23060

* Licensed PE in VA

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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

#



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Haynes, Anne Hampton

From: Warren, Arlene <arlene.warren@vdh.virginia.gov>
Sent: Friday, December 9, 2022 9:51 AM
To: Heather.E.Kennedy@dominionenergy.com
Cc: rr Environmental Impact Review
Subject: [EXTERNAL] Re: NEW SCOPING Elmont-White Oake Line #2075 and Line 2294

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Project Name: SCOPING Elmont-White Oake Line #2075 and Line 2294

Project #: N/A

UPC #: N/A

Location: Henrico County

VDH – Office of Drinking Water has reviewed the above project. Below are our comments as they relate to proximity to **public drinking water sources** (groundwater wells, springs and surface water intakes). Potential impacts to public water distribution systems or sanitary sewage collection systems **must be verified by the local utility**.

The following public groundwater wells are located within a 1-mile radius of the project site:

PWS ID Number	City/County	System Name	Facility Name
4087928	HENRICO COUNTY	WHITE OAK EARLY CHILDCARE CENTER	WELL 1

There are no surface water intakes located within a 5-mile radius of the project site.

The project is within the watershed of the following public surface water sources:

PWS ID Number	System Name	Facility Name
3700500	NEWPORT NEWS, CITY OF	CHICKAHOMINY R

Best Management Practices should be employed, including Erosion & Sedimentation Controls and Spill Prevention Controls & Countermeasures on the project site.

The Virginia Department of Health – Office of Drinking Water appreciates the opportunity to provide comments. If you have any questions, please let me know.

Best Regards,

Arlene F. Warren
GIS Program Support Technician
Virginia Department of Health, Office of Drinking Water
109 Governor Street, 6th Floor
Richmond, VA 23219
804-356-6658 (office/cell/text)

On Wed, Nov 23, 2022 at 11:55 AM Fulcher, Valerie <valerie.fulcher@deq.virginia.gov> wrote:

Good morning—attached is a request for scoping comments on the following:

Proposed 230 kV Elmont-White Oak Line #2075, 230 kV Chickahominy-White Oak Line #2294 and White Oak Substation Expansion in Henrico County, Virginia

If you choose to make comments, please send them directly to the project sponsor (Heather.E.Kennedy@dominionenergy.com) and copy the DEQ Office of Environmental Impact Review: eir@deq.virginia.gov. We will coordinate a review when the environmental document is completed.

DEQ-OEIR's scoping response is also attached.

If you have any questions regarding this request, please email our office at eir@deq.virginia.gov.

Valerie

--

Valerie A. Fulcher, CAP, OM, Admin/Data Coordinator Senior

Department of Environmental Quality

Environmental Enhancement - Office of Environmental Impact Review

1111 East Main Street

Richmond, VA 23219

NEW PHONE NUMBER: 804-659-1550

Email: Valerie.Fulcher@deq.virginia.gov

<https://www.deq.virginia.gov/permits-regulations/environmental-impact-review>

OUR ENFORCEABLE POLICIES HAVE BEEN UPDATED FOR 2021: <https://www.deq.virginia.gov/permits-regulations/environmental-impact-review/federal-consistency>

For program updates and public notices please subscribe to Constant
Contact: <https://lp.constantcontact.com/su/MVcCump/EIR>

From: Warren, Arlene (VDH) <Arlene.Warren@vdh.virginia.gov>
Sent: Friday, May 19, 2023 9:55 AM
To: Heather E Kennedy (Services - 6) <Heather.E.Kennedy@dominionenergy.com>
Cc: Environmental Impact Review (DEQ) <eir@deq.virginia.gov>
Subject: [EXTERNAL] RE: Dominion Energy Virginia's Proposed 230 kV White Oak Lines and White Oak Substation Expansion

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Project Name: Dominion Energy Virginia's Proposed 230 kV White Oak Lines and White Oak Substation Expansion

Project #: N/A

UPC #: N/A

Location: Henrico & Charles City Counties

VDH – Office of Drinking Water has reviewed the above project. Below are our comments as they relate to proximity to **public drinking water sources** (groundwater wells, springs, and surface water intakes). Potential impacts to public water distribution systems or sanitary sewage collection systems **must be verified by the local utility**.

The following public groundwater wells are located within a 1-mile radius of the project:

PWS ID Number	City/County	System Name	Facility Name
4087928	HENRICO CO	WHITE OAK EARLY CHILDCARE CENTER	WELL 1

There are no surface water intakes located within a 5-mile radius of the project site.

The project is within the watershed of the following public surface water sources:

PWS ID Number	System Name	Facility Name
3700500	NEWPORT NEWS, CITY OF	CHICKAHOMINY R

Best Management Practices should be employed, including Erosion & Sedimentation Controls and Spill Prevention Controls & Countermeasures on the project site.

The Virginia Department of Health – Office of Drinking Water appreciates the opportunity to provide comments. If you have any questions, please let me know.

From: Heather.E.Kennedy@dominionenergy.com <Heather.E.Kennedy@dominionenergy.com>
Sent: Thursday, May 18, 2023 3:31 PM
To: Rayfield, Bettina (DEQ) <Bettina.Rayfield@deq.virginia.gov>; Hypes, Rene (DCR) <Rene.Hypes@dcr.virginia.gov>; DCR-PRR Environmental Review (DCR) <envreview@dcr.virginia.gov>; Martin, Amy (DWR) <Amy.Martin@dwr.virginia.gov>; Tignor, Keith (VDACS) <Keith.Tignor@vdacs.virginia.gov>; Didier, Karl (Virginia) <Karl.Didier@dof.virginia.gov>; MRC - Scoping (MRC) <Scoping@mrc.virginia.gov>; Troy Andersen <troy_andersen@fws.gov>; Keith.R.Goodwin@usace.army.mil; Warren, Arlene (VDH) <Arlene.Warren@vdh.virginia.gov>; Skorupa, James (Energy) <Phil.Skorupa@energy.virginia.gov>; Kirchen, Roger (DHR) <Roger.Kirchen@dhr.virginia.gov>
Cc: David.J.Depippo@dominionenergy.com; annie.c.larson@dominionenergy.com; VLink@mcguirewoods.com; JValaika@mcguirewoods.com; snilsen@mcguirewoods.com; ahaynes@mcguirewoods.com; brandon.g.luck@dominionenergy.com; Stefan.R.Brooks@dominionenergy.com
Subject: Dominion Energy Virginia's Proposed 230 kV White Oak Lines and White Oak Substation Expansion

Hello,

Please see the attached project agency notification for Dominion Energy's Certificate of Public Convenience and Necessity (CPCN) application with the State Corporation Commission (SCC) and associated project location map for the Dominion Energy Virginia Proposed 230 kV White Oak Lines and White Oak Substation Expansion in Henrico County, Virginia.

A shapefile of the proposed project alignment(s) has also been included. Project notifications were originally submitted In November 2022. Due to changes in our proposed routes after that notification, we are providing our updated proposed routes and we welcome any additional comments you may have.

If you have any questions, please feel free to contact me directly.

Thank you,

 #she/her)
Environmental Specialist II
Dominion Energy Services
120 Tredegar Street, Richmond, VA 23219
(804) 317-9930
Heather.E.Kennedy@Dominionenergy.com



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