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December 2, 2021

BY ELECTRONIC FILING

Mr. Bernard Logan, Clerk
c/o Document Control Center
State Corporation Commission
1300 East Main Street
Tyler Building – 1st Floor
Richmond, Virginia 23219

Application of Virginia Electric and Power Company for approval and certification of electric transmission facilities: DTC 230 kV Line Loop and DTC Substation
Case No. PUR-2021-00280

Dear Mr. Logan:

Please find enclosed for electronic filing in the above-captioned proceeding the application for approval of electric facilities on behalf of Virginia Electric and Power Company (the "Company"). This filing contains the Application, Appendix, Direct Testimony, DEQ Supplement, and Environmental Routing Study, including attachments.

As indicated in Section II.A.12.b of the Appendix, a copy of the map of the Virginia Department of Transportation "General Highway Map" for Loudoun County, as well as the digital geographic information system ("GIS") map required by § 56-46.1 of the Code of Virginia, which is Attachment II.A.2 to the Appendix, were provided via an e-room to the Commission's Division of Energy Regulation on November 30, 2021.

Please do not hesitate to call if you have any questions in regard to the enclosed.

Very truly yours,

Vishwa B. Link

Enclosures

cc: William H. Chambliss, Esq.
Mr. David Essah (without enclosures)
Mr. Neil Joshipura (without enclosures)
Mr. Michael A. Cizenski (without enclosures)

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Dominion Energy®

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

Before the State Corporation Commission of Virginia

DTC 230 kV Line Loop and DTC Substation

Application No. 311

Case No. PUR-2021-00280

Filed: December 2, 2021

Volume 1 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

DTC 230 kV Line Loop and DTC Substation

Application No. 311

Case No. PUR-2021-00280

Filed: December 2, 2021

COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

APPLICATION OF	)	
	)	
VIRGINIA ELECTRIC AND POWER COMPANY	)	Case No. PUR-2021-00280
	)	
For approval and certification of electric transmission facilities: DTC 230 kV Line Loop and DTC Substation	)	

APPLICATION OF VIRGINIA ELECTRIC AND POWER COMPANY FOR APPROVAL AND CERTIFICATION OF ELECTRIC TRANSMISSION FACILITIES: DTC 230 kV LINE LOOP AND DTC SUBSTATION

Pursuant to § 56-46.1 of the Code of Virginia ("Va. Code") and the Utility Facilities Act, Va. Code § 56-265.1 *et seq.*, Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company"), by counsel, files with the State Corporation Commission of Virginia (the "Commission") this application for approval and certification of electric transmission facilities (the "Application"). In support of its Application, Dominion Energy Virginia respectfully states as follows:

1. Dominion Energy Virginia is a public service corporation organized under the laws of the Commonwealth of Virginia furnishing electric service to the public within its Virginia service territory. The Company also furnishes electric service to the public in portions of North Carolina. Dominion Energy Virginia's electric system—consisting of facilities for the generation, transmission, and distribution of electric energy—is interconnected with the electric systems of neighboring utilities and is a part of the interconnected network of electric systems serving the continental United States. By reason of its operation in two states and its interconnections with other utilities, the Company is engaged in interstate commerce.

2. In order to perform its legal duty to furnish adequate and reliable electric service, Dominion Energy Virginia must, from time to time, replace existing transmission facilities or

construct new transmission facilities in its system. The electric facilities proposed in this Application are necessary so that Dominion Energy Virginia can continue to provide reliable electric service to its customers, consistent with applicable reliability standards.

3. In this Application, in order to provide service requested by three retail electric service customers (the "Customers"), to maintain reliable service for the overall growth in the area, and to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia proposes in Loudoun County, Virginia, to:

(i) Construct a new approximately 1.30-mile overhead 230 kV double circuit transmission line loop on new 100-foot-wide right-of-way[1] by cutting 230 kV Beaumeade-BECO Line #2143 at a junction located between Structures #2143/12-13 adjacent to the Company's existing BECO Substation, resulting in (i) 230 kV Beaumeade-DTC Line #2143, and (ii) 230 kV BECO-DTC Line #2249 ("DTC Loop"). From the junction, the DTC Loop will extend along the Proposed Route approximately 1.30 mile generally northeast to the proposed DTC Substation. While the proposed junction is located in existing right-of-way, the proposed DTC Loop will be constructed on new right-of-way supported by 15 double circuit, single-shaft galvanized steel poles, and two double circuit galvanized steel 2-pole structures, utilizing three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,574 MVA[2]; and

(ii) Construct a new 230-34.5 kV substation in Loudoun County, Virginia ("DTC Substation"), and upgrade line protection at the Company's existing BECO and Beaumeade Substations.

[1] While only 100 feet of new right-of-way is necessary for the proposed Project, the Company proposes to seek to acquire a 160-foot-wide right-of-way to accommodate installation of a third circuit in the same corridor in the future. To be clear, only the proposed 100-foot right-of-way will be cleared and utilized for the proposed Project. Dominion Energy Virginia asks that the State Corporation Commission ("Commission") not prohibit the Company from voluntarily obtaining the full 160-foot-wide right-of-way, with the understanding that the Company could not condemn for more than the 100 feet of right-of-way needed for the proposed Project. This approach is consistent with the approach approved by the Commission in the Company's Evergreen Mills proceeding. *See Application of Virginia Electric and Power Company for approval and certification of electric facilities: Evergreen Mills 230 kV Line Loops and Evergreen Mills Switching Station*, Case No. PUR-2019-00191, Final Order at 9 (May 22, 2020). The Company will seek Commission approval to install a third circuit in the proposed Project corridor when needed in the future.

[2] Apparent power, measured in megavolt amperes ("MVA"), is made up of real power (megawatt or "MW") and reactive power megavolt ampere reactive ("MVAR"). The power factor ("pf") is the ratio of real power to apparent power. For loads with a high pf (approaching unity), real power will approach apparent power and the two can be used interchangeably. Load loss criteria specify real power (MW) units because that represents the real power that will be dropped; however, MVA is used to describe the equipment ratings to handle the apparent power, which includes the real and reactive load components.

The DTC Loop, DTC Substation and related substation work are collectively referred to as the "Project."

4. The Project is necessary to assure that Dominion Energy Virginia can maintain and improve reliable electric service to customers in the load area surrounding the Company's existing BECO Substation in Loudoun County, Virginia.

5. The Customers have requested retail electric service from Dominion Energy Virginia to support multiple data center development sites. This load area where these data centers are being developed is currently served by BECO Substation. If the summation of these data center projects' unserved load (175 MVA) were connected to the existing BECO Substation, the existing distribution substation equipment would overload. Connecting these Customers' requested load to BECO Substation alone would result in (i) substation transformer thermal overloads, and (ii) violation of the Company's transmission system reliability criteria set forth in the Facilities Interconnection Requirement ("FIR") document.[3]

6. Accordingly, the proposed Project is needed to meet the load requirements of the Customers' existing and planned new development projects along with future load growth in the area, which will, in turn, facilitate economic growth in the Commonwealth. With the proposed Project and existing BECO Substation sharing the existing and planned load in the area, the transformers are not overloaded, and reliability criteria are met.

7. The Company identified an approximately 1.30-mile overhead proposed route for the Project ("Overhead Route 1C" or "Proposed Route"), as well as two approximately 1.31-mile overhead alternative routes ("Overhead Alternative Route 1A" and "Overhead Alternative Route

[3] The Company's FIR document (effective Apr. 1, 2021) is available at: https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/virginia/parallel-generation/facility-connection-requirements.pdf?la=en&rev=f280781e90cf47f69ea526c944c9c347&hash=82DD2567D0B033C47536134B8C4D5C5E.

1B"). The Company is proposing all three of these routes for notice. Discussion of the Proposed Route and Alternative Routes, as well as other underground and overhead routes that the Company studied but ultimately rejected, is provided in Section II of the Appendix and in the Environmental Routing Study included with the Application.

8. The proposed DTC Substation initially will be constructed with four 230 kV breakers in a ring bus arrangement, five 230-34.5 kV transformers (two 112 MVA and three 84 MVA), twelve 34.5 kV distribution circuits, and other associated equipment. In total, it will be designed to accommodate future growth in the area with a build-out of six 230 kV breakers in a ring bus arrangement, and up to twenty-five 34.5 kV distribution circuits. A more detailed description of the proposed Project, including the DTC Loop and DTC Substation, is provided in Sections I and II of the Appendix attached to this Application.

9. The desired in-service target date for the proposed Project is June 15, 2024. The Company estimates it will take approximately 24 months for detailed engineering, materials procurement, permitting, real estate, and construction after a final order from the Commission. Accordingly, to support this estimated construction timeline and construction plan, the Company respectfully requests a final order by June 15, 2022.[4] Should the Commission issue a final order by June 15, 2022, the Company estimates that construction should begin around July 2022, and be completed by June 15, 2024. This schedule is contingent upon obtaining the necessary permits. Dates may need to be adjusted based on permitting delays or design modifications to comply with additional agency requirements identified during the permitting application process. Additionally, the positioning of the physical location of a segment of new Line #2249 through

[4] The Company believes that its request for a final order by June 15, 2022, should provide adequate time for Commission review and consideration because the Loudoun County Board of Supervisors has approved conveyance of the right-of-way for 6.85 acres (45.8% of the acreage for the transmission line right-of-way for the Project) and landowners have been informed of the routes in multiple conversations with the Company.

wetlands and crossing of Broad Run may result in additional construction delays to ensure environmental compliance.

10. The estimated conceptual cost of the Project utilizing the Proposed Route is approximately $102.5 million, which includes approximately $36.7 million for transmission-related work and approximately $65.8 million[5] for substation-related work (2021 dollars).

11. The proposed Project will afford the best means of meeting the continuing need for reliable service while reasonably minimizing adverse impacts on the scenic, environmental, and historic features of the area. Overhead Route 1C is slightly shorter than the other alternatives and would require correspondingly less acreage. In addition, Route 1C would cross the smallest area of the planned data center and would not conflict with the development of this facility. The Proposed Route also would require less clearing of forested lands than the other two routes. Route 1C would have visual impacts to commuters/through travelers along Sully Road as well as impacts to occupants arriving and leaving the Lerner office building via the northern parking lot. Sully Road has higher volumes of traffic (average daily traffic count of 93,000) than Russell Branch Parkway; however, based on speed limit, activity, and expectations of the most common user group (commuters/through travelers), sensitivity to changes in visual character should be low. Additionally, a small screen of trees would be left in place between Sully Road and the right-of-way. The Proposed Route focuses impacts on the least sensitive user group, lowers potential visual change for sensitive user groups, and limits changes to sensitive resources. For these reasons, the Company selected Overhead Route 1C as the Proposed Route.

12. Based on consultations with the Virginia Department of Environmental Quality

[5] Includes value of substation property that is being conveyed to Loudoun County in exchange for transmission line easements for the Project that have been negotiated with the Loudoun County Board of Supervisors. See Attachment II.A.9 of the Appendix.

("DEQ"), the Company has developed a supplement ("DEQ Supplement") containing information designed to facilitate review and analysis of the proposed facilities by the DEQ and other relevant agencies. The DEQ Supplement is attached to this Application.

13. Based on the Company's experience, the advice of consultants, and a review of published studies by experts in the field, the Company believes that there is no causal link to harmful health or safety effects from electric and magnetic fields generated by the Company's existing or proposed facilities. Section IV of the Appendix provides further details on Dominion Energy Virginia's consideration of the health aspects of electric and magnetic fields.

14. Section V of the Appendix provides a proposed route description for public notice purposes and a list of federal, state, and local agencies and officials that the Company has or will notify about the Application.

15. In addition to the information provided in the Appendix, the DEQ Supplement, and the Environmental Routing Study, this Application is supported by the pre-filed direct testimony of Company Witnesses Harrison S. Potter, David M. Burnam, Sherrill A. Crenshaw, Santosh Bhattarai, Greg R. Baka, and Jon M. Berkin filed with this Application.

WHEREFORE, Dominion Energy Virginia respectfully requests that the Commission:

(a) direct that notice of this Application be given as required by § 56-46.1 of the Code of Virginia;

(b) approve pursuant to § 56-46.1 of the Code of Virginia the construction of the Project; and,

(c) grant a certificate of public convenience and necessity for the Project under the Utility Facilities Act, § 56-265.1 *et seq.* of the Code of Virginia.

VIRGINIA ELECTRIC AND POWER COMPANY

By: ___*[s] Vishwa B. Link*_____
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Counsel for Applicant Virginia Electric and Power Company

December 2, 2021

COMMONWEALTH OF VIRGINIA
BEFORE THE
STATE CORPORATION COMMISSION

APPLICATION OF

VIRGINIA ELECTRIC AND POWER COMPANY

FOR APPROVAL AND CERTIFICATION
OF ELECTRIC TRANSMISSION FACILITIES

DTC 230 kV Line Loop and DTC Substation

Application No. 311

Appendix

Containing Information in Response to
"Guidelines for Transmission Line Applications Filed Under Title 56 of the Code of Virginia"

Case No. PUR-2021-00280

Filed: December 2, 2021

TABLE OF CONTENTS

EXECUTIVE SUMMARY

In order to provide service requested by three retail electric service customers (the "Customers"); to maintain reliable service for the overall growth in the area; and to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company") proposes in Loudoun County, Virginia, to:

(1) Construct a new approximately 1.30-mile overhead 230 kV double circuit transmission line loop on new 100-foot-wide right-of-way[1] by cutting 230 kV Beaumeade-BECO Line #2143 at a junction located between Structures #2143/12-13 adjacent to the Company's existing BECO Substation, resulting in (i) 230 kV Beaumeade-DTC Line #2143, and (ii) 230 kV BECO-DTC Line #2249 ("DTC Loop"). From the junction, the DTC Loop will extend along the Proposed Route approximately 1.30 mile generally northeast to the proposed DTC Substation. While the proposed junction is located in existing right-of-way, the proposed DTC Loop will be constructed on new right-of-way supported by 15 double circuit, single-shaft galvanized steel poles, and two double circuit galvanized steel 2-pole structures, utilizing three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,574 MVA[2]; and

(2) Construct a new 230-34.5 kV substation in Loudoun County, Virginia ("DTC Substation"), and upgrade line protection at the Company's existing BECO and Beaumeade Substations.

The DTC Loop, DTC Substation and related substation work are collectively referred to as the "Project."

The Project is necessary to assure that Dominion Energy Virginia can maintain and improve reliable electric service to customers in the load area surrounding the Company's existing BECO Substation ("Atlantic Boulevard/Maries Road Load Area") in Loudoun County, Virginia. The Customers have requested retail electric service from Dominion Energy Virginia to support multiple data center development sites. This load area where these data centers are being

[1] While only 100 feet of new right-of-way is necessary for the proposed Project, the Company proposes to seek to acquire a 160-foot-wide right-of-way to accommodate installation of a third circuit in the same corridor in the future. To be clear, only the proposed 100-foot right-of-way will be cleared and utilized for the proposed Project. Dominion Energy Virginia asks that the State Corporation Commission ("Commission") not prohibit the Company from voluntarily obtaining the full 160-foot-wide right-of-way, with the understanding that the Company could not condemn for more than the 100 feet of right-of-way needed for the proposed Project. This approach is consistent with the approach approved by the Commission in the Company's Evergreen Mills proceeding. *See Application of Virginia Electric and Power Company for approval and certification of electric facilities: Evergreen Mills 230 kV Line Loops and Evergreen Mills Switching Station*, Case No. PUR-2019-00191, Final Order at 9 (May 22, 2020). The Company will seek Commission approval to install a third circuit in the proposed Project corridor when needed in the future.

[2] Apparent power, measured in megavolt amperes ("MVA"), is made up of real power (megawatt or "MW") and reactive power megavolt ampere reactive ("MVAR"). The power factor ("pf") is the ratio of real power to apparent power. For loads with a high pf (approaching unity), real power will approach apparent power and the two can be used interchangeably. Load loss criteria specify real power (MW) units because that represents the real power that will be dropped; however, MVA is used to describe the equipment ratings to handle the apparent power, which includes the real and reactive load components.

developed is currently served by BECO Substation. If the summation of these data center projects' unserved load (175 MVA) were connected to the existing BECO Substation, the existing distribution substation equipment would overload. Connecting these Customers' requested load to BECO Substation alone would result in (i) substation transformer thermal overloads, and (ii) violation of the Company's transmission system reliability criteria set forth in the Facilities Interconnection Requirement ("FIR") document.[3] Accordingly, the proposed Project is needed to meet the load requirements of the Customers' existing and planned new development projects along with future load growth in the area, which will, in turn, facilitate economic growth in the Commonwealth. With the proposed Project and existing BECO Substation sharing the existing and planned load in the area, the transformers are not overloaded, and reliability criteria are met.

The Company identified an approximately 1.30-mile overhead proposed route for the Project ("Overhead Route 1C" or "Proposed Route"), as well as two approximately 1.31-mile overhead alternative routes ("Overhead Alternative Route 1A" and "Overhead Alternative Route 1B"). The Company is proposing all three of these routes for notice. Discussion of the Proposed Route and Alternative Routes, as well as other underground and overhead routes that the Company studied but ultimately rejected, is provided in Section II of the Appendix and in the Environmental Routing Study included with the Application.

The proposed DTC Substation initially will be constructed with four 230 kV breakers in a ring bus arrangement, five 230-34.5 kV transformers (two 112 MVA and three 84 MVA), twelve 34.5 kV distribution circuits, and other associated equipment. In total, it will be designed to accommodate future growth in the area with a build-out of six 230 kV breakers in a ring bus arrangement, and up to twenty-five 34.5 kV distribution circuits.

The estimated conceptual cost of the Project utilizing the Proposed Route is approximately $102.5 million, which includes approximately $36.7 million for transmission-related work and approximately $65.8 million[4] for substation-related work (2021 dollars).

The desired in-service target date for the proposed Project is June 15, 2024. The Company estimates it will take approximately 24 months for detailed engineering, materials procurement, permitting, real estate, and construction after a final order from the Commission. Accordingly, to support this estimated construction timeline and construction plan, the Company respectfully requests a final order by June 15, 2022. Should the Commission issue a final order by June 15, 2022, the Company estimates that construction should begin around July 2022, and be completed by June 15, 2024. This schedule is contingent upon obtaining the necessary permits. Dates may need to be adjusted based on permitting delays or design modifications to comply with additional agency requirements identified during the permitting application process. Additionally, the positioning of the physical location of a segment of new Line #2249 through wetlands and crossing of Broad Run may result in additional construction delays to ensure environmental compliance.

[3] The Company's FIR document (effective Apr. 1, 2021) is available at: https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/virginia/parallel-generation/facility-connection-requirements.pdf?la=en&rev=f280781e90cf47f69ea526c944c9c347&hash=82DD2567D0B033C47536134B8C4D5C5E. See Section I.C.

[4] Includes value of substation property that is being conveyed to Loudoun County in exchange for transmission line easements for the Project that have been negotiated with the Loudoun County Board of Supervisors ("BOS"). See Attachment II.A.9.

I. NECESSITY FOR THE PROPOSED PROJECT

A. State the primary justification for the proposed project (for example, the most critical contingency violation including the first year and season in which the violation occurs). In addition, identify each transmission planning standard(s) (of the Applicant, regional transmission organization ("RTO"), or North American Electric Reliability Corporation) projected to be violated absent construction of the facility.

Response: The Project is necessary to provide service requested by three Customers in Loudoun County, Virginia, to maintain reliable service for the overall growth in the Project area, and to comply with mandatory NERC Reliability Standards.

Dominion Energy Virginia's transmission system is responsible for providing transmission service (i) for redelivery to the Company's retail customers; (ii) to Appalachian Power Company, Old Dominion Electric Cooperative, Northern Virginia Electric Cooperative ("NOVEC"), Central Virginia Electric Cooperative, and Virginia Municipal Electric Association for redelivery to their retail customers in Virginia; and, (iii) to North Carolina Electric Membership Corporation and North Carolina Eastern Municipal Power Agency for redelivery to their customers in North Carolina (collectively, the "Dominion Energy Zone" or "DOM Zone"). The Company needs to be able to maintain the overall, long-term reliability of its transmission system as its customers require more power in the future.

Dominion Energy Virginia is part of the PJM Interconnection, L.L.C. ("PJM") regional transmission organization ("RTO"), which provides service to a large portion of the eastern United States. PJM is currently responsible for ensuring the reliability and coordinating the movement of electricity through all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia. This service area has a population of approximately 65 million and, on August 2, 2006, set a record high of 166,929 megawatts ("MW") for summer peak demand, of which Dominion Energy Virginia's load portion was approximately 19,256 MW. On July 20, 2020, the Company set a record high of 20,087 MW for summer peak demand. On February 20, 2015, the Company set a winter and all-time record demand of 21,651 MW. Based on the 2021 PJM Load Forecast, the Dominion Energy Zone is expected to grow with average growth rates of 0.5% summer and 0.9% winter over the next 10 years compared to the PJM average of 0.3% and 0.3% over the same period for the summer and winter, respectively.

Dominion Energy Virginia is also part of the Eastern Interconnection transmission grid, meaning its transmission system is interconnected, directly or indirectly, with all of the other transmission systems in the United States and Canada between the Rocky Mountains and the Atlantic coast, except for Quebec and most of Texas. All of the transmission systems in the Eastern Interconnection are dependent on each other for moving bulk power through the transmission system and for reliability

support. Dominion Energy Virginia's service to its customers is extremely reliant on a robust and reliable regional transmission system.

NERC has been designated by the Federal Energy Regulatory Commission ("FERC") as the electric reliability organization for the United States. Accordingly, NERC requires that the planning authority and transmission planner develop planning criteria to ensure compliance with NERC Reliability Standards. Mandatory NERC Reliability Standards require that a transmission owner ("TO") develop facility interconnection requirements that identify load and generation interconnection minimum requirements for a TO's transmission system, as well as the TO's reliability criteria.[5]

Federally mandated NERC Reliability Standards constitute minimum criteria with which all public utilities must comply as components of the interstate electric transmission system. Moreover, the Energy Policy Act of 2005 mandates that electric utilities must follow these NERC Reliability Standards, and imposes fines on utilities found to be in noncompliance up to $1.3 million a day per violation.

PJM's Regional Transmission Expansion Plan ("RTEP") is the culmination of a FERC-approved annual transmission planning process that includes extensive analysis of the electric transmission system to determine any needed improvements.[6] PJM's annual RTEP is based on the effective criteria in place at the time of the analyses, including applicable standards and criteria of NERC, PJM, and local reliability planning criteria, among others.[7] Projects identified through the RTEP process are developed by TO in coordination with PJM, and are presented at the Transmission Expansion Advisory Committee ("TEAC") meetings prior to inclusion in the RTEP, which is then presented for approval to the PJM Board of Managers (the "PJM Board").

Outcomes of the RTEP process include three types of transmission system upgrades or projects: (i) baseline upgrades are those that resolve a system reliability criteria violation, which can include planning criteria from NERC, ReliabilityFirst, SERC Reliability Corporation, PJM, and TOs; (ii) network upgrades are new or upgraded facilities required primarily to eliminate reliability criteria violations caused by proposed generation, merchant transmission, or long-term firm transmission service requests; and (iii) supplemental projects are projects initiated by the TO in order to interconnect new customer load, address degraded equipment performance, improve operational flexibility and efficiency, and increase infrastructure resilience. The Project is classified as a supplemental project initiated by the TO to interconnect new customer load. While supplemental projects are included in the RTEP, the PJM Board does not actually approve such

[5] *See* FAC-001-3 (R1, R3) (effective April 1, 2021), which can be found at https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/virginia/parallel-generation/facility-interconnection-requirements-signed.pdf?la=en&rev=38f51ffb04b1489f921b32a41d9887c8.

[6] PJM Manual 14B (effective July 1, 2021) focuses on the RTEP process and can be found at https://www.pjm.com/-/media/documents/manuals/m14b.ashx.

[7] *See* PJM Manual 14B, Attachment D: PJM Reliability Planning Criteria.

projects. See Section I.J for a discussion of the PJM process as it relates to this Project.

The Northern Virginia data center market is spread across Loudoun, Fairfax, and Prince William Counties. The largest concentration of data centers in Loudoun County's Data Center Alley is in the area of Ashburn and Sterling. The combination of competitive colocation/cloud environment, fiber connectivity, strategic geographic location, low risk of business disruptions, affordable and reliable power, and the business climate in Virginia has created the largest market for data center capacity in the United States. This Project is in this concentrated area of Loudoun County.

Multiple data center customers on multiple development sites are the load driver for this Project. For purposes of this Application, there are three customers (Customer #1, Customer #2, and Customer #3) and their data center projects are identified as follows:

- Customer #1 located in three buildings at a site along Atlantic Boulevard ("Customer #1–Atlantic"). The buildings are owned by and were constructed by Customer #2 ("Customer #2–Atlantic").

- Customer #2 located at a site along Maries Road ("Customer #2–Maries").

- Customer #1 located at a site along Maries Road ("Customer #1–Maries").

- Customer #3 located at a site along Maries Road ("Customer #3–Maries").

Customer #2–Atlantic is developing three data center buildings on a site along Atlantic Boulevard on approximately 36 acres (Loudoun County Parcel Identification Number 02915180900). As the developer, Customer #2 will lease data center space in the three buildings to Customer #1. Customer #1–Atlantic has provided the Company with load letters for three buildings with a load of 60 MVA per building for a total campus load of 180 MVA. Note that 120 MVA of this load will be supplied from four bridging circuits from the Company's existing BECO Substation prior to connection to the future proposed DTC Substation. Therefore, Customer #1–Atlantic will have 60 MVA of unserved load prior to energization of the DTC Substation. All three of these data center buildings are under construction. The Company is scheduled to connect bridging power to the first building in the first quarter of 2022.

Customer #2 has placed under contract to purchase a site on Maries Road (Customer #2–Maries) for the purpose of developing one data center building with 66.7 MVA of load. The parcel (Loudoun County Parcel Identification Number 030292034000) consists of approximately 10 acres. Customer #2 has provided a load letter outlining the load requirements and timing needs for power for this site. There is no available bridging power capacity; therefore, Customer #2–Maries will have 66.7 MVA of unserved load prior to the energization of the DTC Substation.

Customer #1 plans to construct a new data center on a site on Maries Road (Customer #1–Maries) with a building load of 41.3 MVA. The parcel (Loudoun County Parcel Identification Number 030286764000) consists of approximately 10 acres. There is no available bridging capacity. The distribution power plan is to split up the total 41.3 MVA of load into two equal parts. One 20.7 MVA block will be fed from a future distribution circuit from DTC Substation, and the second 20.7 MVA block will be fed from a distribution circuit out of BECO Substation that is freed up after DTC Substation is energized. Therefore, Customer #1–Maries will have 41.3 MVA of load unserved until completion of the Project.

Customer #3 has an existing, fully constructed data center building along Maries Road (Customer #3–Maries). The parcel (Loudoun County Parcel Identification Number 030296913000) consists of approximately 9.68 acres. Customer #3–Maries is connected to power with an existing Agreement for Electrical Service, but is only partially fed. Customer #3–Maries desires 34 MVA of total load for the building, but because of capacity constraints, is currently limited to a total of 27 MVA on two existing meters. Therefore, Customer #3–Maries has 7 MVA of unserved load that is awaiting energization of DTC Substation.

To summarize, there is a total of 305 MVA of load that will be contracted from these three data center projects. Of that total customer requested contract load, 175 MVA of customer load from the planned data center projects is unserved pending completion of the Project. As described above, these data center projects are in the Atlantic Boulevard/Maries Road Load Area in Loudoun County, Virginia. See Attachment I.A.1 for a map of the load area and the data center project locations.

This load area where these data centers are being developed is currently served by BECO Substation. If the summation of these projects' unserved load (175 MVA) were connected to the existing BECO Substation, the existing distribution substation equipment would overload. Connecting these Customers' requested load to BECO Substation alone would result in (i) substation transformer thermal overloads, and (ii) violation of the Company's transmission system reliability criteria set forth in the FIR document.[8] Section I.C. of this Appendix describes these violations in further detail.

In order to serve the Customers' data center projects without overloading existing facilities, the in-service date for the proposed Project is June 15, 2024. The total loading at the future DTC Substation, including the Customers' load described above, is projected to be approximately 246 MVA at full build-out.

Moreover, there are other parcels within this area that have the potential to be developed as data centers, and there are many existing buildings within this load area that could be redeveloped into data centers. Constructing the proposed Project within this high potential growth area will allow the Company to continue to serve economic growth in the area in a timely manner through the continued construction

[8] *See supra* n. 3.

of facilities in the area.

Accordingly, the proposed Project is needed to meet the load requirements of the Customers' planned new development projects along with future load growth in the area.

As part of the Project, the Company proposes to construct the approximately 1.30-mile DTC Loop by cutting 230 kV Beaumeade-BECO Line #2143 at a junction located between Structures #2143/12-13 adjacent to BECO Substation, resulting in (i) 230 kV Beaumeade-DTC Line #2143, and (ii) 230 kV BECO-DTC Line #2249. From the junction, the DTC Loop will extend along the Proposed Route approximately 1.30 mile generally northeast to the proposed DTC Substation. While the proposed junction is located in existing right-of-way, the proposed DTC Loop will be constructed on new right-of-way supported by 15 double circuit, single-shaft galvanized steel poles, and two double circuit galvanized steel 2-pole structures, utilizing three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,574 MVA.

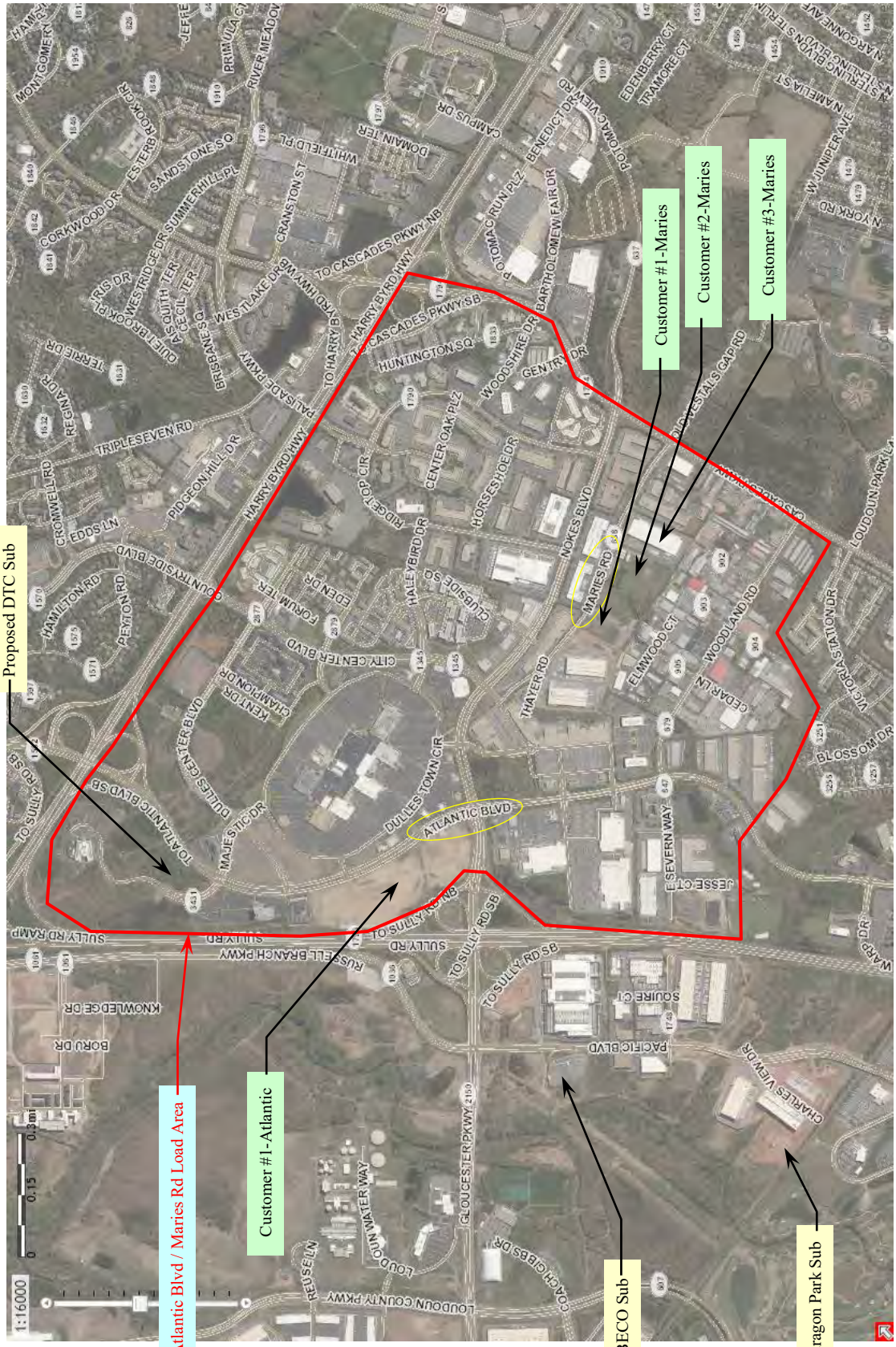
The Company identified an approximately 1.30-mile overhead Proposed Route (Overhead Route 1C), as well two approximately 1.31-mile overhead Alternative Routes (Overhead Alternative Route 1A and Overhead Alternative Route 1B). The Company is proposing all three of these routes for notice. Discussion of the Proposed Route and Alternative Routes, as well as other overhead and underground routes that the Company studied but ultimately rejected, is provided in Section II of the Appendix and in the Environmental Routing Study included with the Application.

The Company also proposes to construct the DTC Substation as part of the Project. The proposed DTC Substation initially will be constructed with four 230 kV breakers in a ring bus arrangement, five 230-34.5 kV transformers (two 112 MVA and three 84 MVA), twelve 34.5 kV distribution circuits, and other associated equipment. In total, it will be designed to accommodate future growth in the area with a build-out of six 230 kV breakers in a ring bus arrangement, and up to twenty-five 34.5 kV distribution circuits.

Attachment I.A.2 provides the existing one-line diagram of the area transmission system. Attachment I.A.3 provides the proposed Project one-line diagram. See Attachment II.A.2 for a map depicting the proposed Project.

***

In summary, the proposed Project will provide service requested by the Customers in Loudoun County, Virginia, maintain reliable service for the overall growth in the Project area, and comply with mandatory NERC Reliability Standards.



Attachment I.A.1: Atlantic Blvd / Maries Rd Load Area Map

11.12.2021

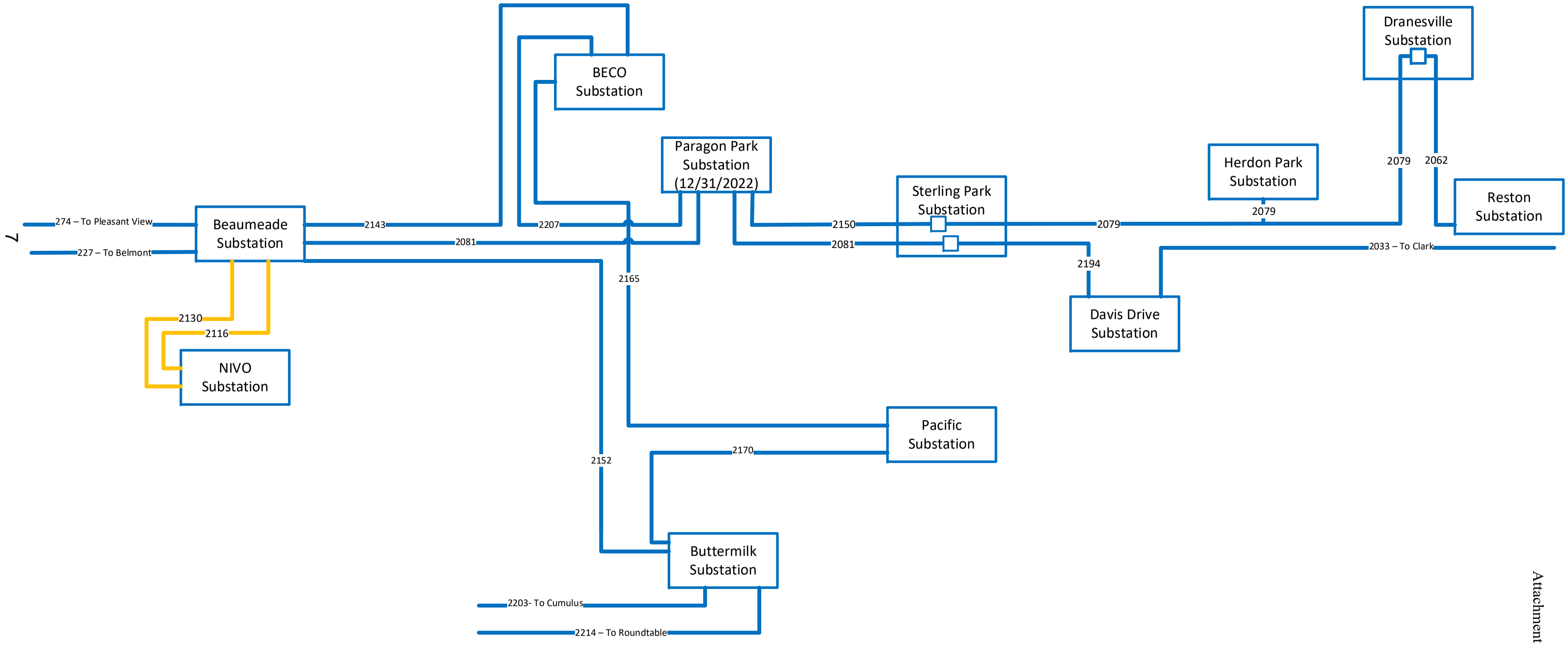
Existing One-Line Diagram

New 230KV OH Lines (CPCN)

New 230KV UG Lines (CPCN)

Existing 230KV OH Lines

Existing 230kV UG Lines



Attachment I.A.2

One-Line Diagram Proposed Route 1A/1B/1C

New 230KV OH Lines (CPCN)
New 230KV UG Lines (CPCN)
Existing 230KV OH Lines
Existing 230kV UG Lines

DTC Substation
2143
2249
DTC Junction
2249
BECO Substation
Paragon Park Substation (12/31/2022)
Sterling Park Substation
Herdon Park Substation
Dranesville Substation
2079
2062
Reston Substation
2033 – To Clark
274 – To Pleasant View
227 – To Belmont
Beaumeade Substation
2143
2081
2207
2150
2081
2079
2079
2194
Davis Drive Substation
2130
2116
NIVO Substation
2165
Pacific Substation
2170
2152
Buttermilk Substation
2203- To Cumulus
2214 – To Roundtable

I. NECESSITY FOR THE PROPOSED PROJECT

B. Detail the [1] engineering justifications for the proposed project (for example, provide narrative to support whether the proposed project is necessary to upgrade or replace an existing facility, to significantly increase system reliability, to connect a new generating station to the Applicant's system, etc.). Describe any [2] known future project(s), including but not limited to generation, transmission, delivery point or retail customer projects, that require the proposed project to be constructed. Verify that the [3] planning studies used to justify the need for the proposed project considered all other generation and transmission facilities impacting the affected load area, including generation and transmission facilities that have not yet been placed into service. Provide a [4] list of those facilities that are not yet in service.

Response: **[1] Engineering Justification for Project**

See Section I.A of the Appendix.

[2] Known Future Projects

The proposed Project is needed to serve future data center developments in the Project area as described in Section I.A. See Attachment I.A.1 for existing and future distribution facilities in the affected load area, including the proposed Project, which will work together to continue to serve existing and future customers in Data Center Alley. While future Company projects are located generally within the same load area of the proposed DTC Substation (as shown on Attachment I.A.1), each has its own unique load growth drivers, and as such, these future projects do not "require" the proposed Project to be constructed.

[3] Planning Studies

For this Project, the Company's Distribution Planning group first used the Customers' load projections information for the various projects and other load growth information for other customers in the area to create a composite load projection. Starting with the scenario to feed the entire projected load from an existing substation (*i.e.*, BECO Substation), Distribution Planning determined that overloads would occur on equipment and loading criteria would be violated. When the projected load was divided between existing BECO Substation and the proposed DTC Substation, the overloads and violations are avoided.

Distribution Planning then conferred with the Company's Electric Transmission Planning group to analyze the effects of the projected growth and the addition of a DTC Substation on the transmission system.

Dominion Energy Virginia's Electric Transmission Planning group performs planning studies to ensure delivery of bulk power to a continuously changing customer demand under a wide variety of operating conditions. Studies are performed in coordination with the Company's RTO (*i.e.*, PJM) and in accordance

with NERC Reliability Standards. In completing these studies, the Company considered all other known generation and transmission facilities impacting the affected load area.

In order to maintain reliable service to customers of the Company and to comply with mandatory NERC Reliability Standards, specifically Facility Connection ("FAC") standard FAC-001,[9] the Company's FIR[10] document addresses the interconnection requirements of generation, transmission, and electricity end-user facilities. The purpose of the NERC FAC standards is to avoid adverse impacts on reliability by requiring each TO to establish facility connection and performance requirements in accordance with FAC-001, and the TO's and end-users meet and adhere to the established facility connection and performance requirements in accordance with FAC-002.

NERC Reliability Standards TPL-001 requirements R2, R5, and R6 require PJM, the Planning Coordinator ("PC") and the TO, to have criteria. PJM's planning criteria outlined in Attachment D of Manual 14B requires the Company, as a TO, to follow NERC and Regional Planning Standards and criteria as well as the TO Standards filed in Dominion Energy Virginia's FERC 715 filings. The Company's FERC 715 filing contains the Dominion Energy Virginia Transmission Planning Criteria in Exhibit A of the FIR document.

The four major criteria considered as part of this Project were:

1) Ring bus arrangement is required for load interconnections in excess of 100 MW (Company's FIR, Section 6.2);

2) The amount of direct-connected load at any substation is limited to 300 MW (Company's Transmission Planning Criteria Exhibit A, Section C.2.8);

3) N-1-1 contingencies load loss is limited to 300 MW (PJM Manual 14B Section 2.3.8, Attachment D, Attachment D-1, Attachment F); and

4) The minimum load levels within a 10-year planning horizon for the direct interconnection to existing transmission lines is 30 MW for a 230 kV delivery (Company's FAC-001 Section 6, Load Criteria – End User).

The Project is being constructed as a double circuit loop instead of a single circuit tap to comply with Section 6.2 of the Company's FIR, which requires a ring bus arrangement for load interconnections in excess of 100 MW.

The Project is electrically more robust than the electric alternatives described in Section I.E of this Appendix, as it allows DTC Substation to be loaded to 300 MW and still meet all NERC Reliability Standards. See Section I.C of the Appendix

[9] *See supra* n. 5.
[10] *See supra* n. 3.

for further discussion of the NERC Criteria regarding 300 MW total substation loading.

[4] Facilities List

See Attachment I.A.1 for existing and future distribution facilities in the affected Atlantic Boulevard/Maries Road Load Area. See Attachment I.G.1 for existing transmission facilities.

I. NECESSITY FOR THE PROPOSED PROJECT

C. Describe the present system and detail how the proposed project will effectively satisfy present and projected future electrical load demand requirements. Provide pertinent load growth data (at least five years of historical summer and winter peak demands and ten years of projected summer and winter peak loads where applicable). Provide all assumptions inherent within the projected data and describe why the existing system cannot adequately serve the needs of the Applicant (if that is the case). Indicate the date by which the existing system is projected to be inadequate.

Response: The existing Atlantic Boulevard/Maries Road Load Area is located in the Sterling area of Loudoun County and is generally bounded by Route 28 (Sully Road) to the west, Cascades Boulevard to the east, Route 7 (Harry Byrd Highway) to the north, and Woodland Road and E. Severn Way to the south. See Attachment I.A.1 for a map of the load area and the locations of the data center projects that comprise the need for the Project. See Attachment I.G.1 for the portion of the Company's transmission facilities in the area of the Project. The existing BECO Substation is the primary source of distribution power to the load area. The projected load at the Customers' four project sites combined in 10 years is projected to be approximately 265 MVA. Adding these Customers' existing and planned new load to BECO Substation would result in overload conditions and violations of the Company's FIR document.

Attachment I.C.1 shows loading (MVA), as follows:

- Attachment I.C.1.a shows loading at BECO Substation:
    - With Customer #1–Atlantic's first and second buildings connected via bridging circuits,
    - Without Customer #1–Atlantic's third building connected,
    - Without Customer #2–Maries,
    - Without Customer #1–Maries,
    - Without Customer #3–Maries, and
    - Without DTC Substation.
- Attachment I.C.1.b shows loading at BECO Substation
    - With Customer #1–Atlantic (all three buildings connected),
    - With Customer #2–Maries,
    - With Customer #1–Maries,

- With Customer #3–Maries, and
- Without DTC Substation.

- Attachment I.C.1.c shows loading at BECO Substation and at DTC Substation:
  - With Customer #1–Atlantic (all three buildings connected),
  - With Customer #2–Maries,
  - With Customer #1–Maries, and
  - With Customer #3–Maries.

Note that Attachments I.C.1.a, I.C.1.b and I.C.1.c include only the normal feed circuits to the Customers' data center projects; they do not include any alternate feed loads.

Existing BECO Substation is designed ultimately to have five transformers; one 75 MVA, 230-34.5 kV unit with a normal overload rating ("NOL") of 90 MVA and four 84 MVA, 230-34.5 kV transformers, each with a NOL rating of 90 MVA. Each of the five substation transformers has a number of feeder circuits connected to it that ultimately connect to customers through distribution facilities. These distribution circuits each have a thermal overload rating that is based on the type of equipment and the configuration of the equipment in the field. To prevent overloads that could damage or fail equipment, the maximum capacity limits of the distribution circuits and the substation transformers cannot be exceeded.

The Company's FIR document (Section C.2.8) requires that the total load in any distribution substation not exceed 300 MW to ensure system reliability and to remain in compliance with NERC mandated reliability criteria.

To ensure reliability to its customers, the Company maintains a substation transformer contingency plan. Because of the negative impact to customers due to outage duration if a substation transformer were to fail, the Company creates a switching plan that allows customer load to be picked up on other equipment for loss of any substation transformer. There are various switching methods that can be used for these substation transformer contingency plans. If the contingency plan creates overloads in other equipment because of the switching, new substation capacity is necessary.

As shown in Attachment I.C.1.b, the BECO Substation is projected to have TX#1 and TX#5 overloads starting in summer 2024 (with all existing load, planned load, and load from the listed data center projects). All the BECO Substation transformers (except TX #2) will be overloaded starting by summer 2027.

The 300 MW total substation loading criterion set forth in Section C.2.8 of the

Company's FIR document is exceeded starting in summer 2022 at BECO Substation with the existing and planned data center projects and without DTC Substation, as shown in Attachment I.C.1.b. In summer 2022, the total substation load is projected to be at 309 MW (325 MVA at 95% power factor). The overload continues to get worse as time advances as shown in Attachment I.C.1.b.

Based on all these stated projected overloads and criteria violations above, the Company needs to construct the DTC Substation as soon as possible to address these issues.

Attachment I.C.1.a

BECO Substation WITHOUT DTC Substation

Includes:
Customer#1-Atlantic Buildings 1 and 2 bridging

Excludes:
Customer#1-Atlantic Building 3
Customer#2-Maries
Customer#1-Maries
Customer#3-Maries

Load and Ratings in MVA

				Load (MVA) S2016 Actual	Load (MVA) S2017 Actual	Load (MVA) S2018 Actual	Load (MVA) S2019 Actual	Load (MVA) S2020 Actual	Load (MVA) S2021 Projection	Load (MVA) S2022 Projection	Load (MVA) S2023 Projection	Load (MVA) S2024 Projection	Load (MVA) S2025 Projection	Load (MVA) S2026 Projection	Load (MVA) S2027 Projection	Load (MVA) S2028 Projection	Load (MVA) S2029 Projection	Load (MVA) S2030 Projection	Load (MVA) S2031 Projection
				T-5	T-4	T-3	T-2	T-1	T=0	T+1	T+2	T+3	T+4	T+5	T+6	T+7	T+8	T+9	T+10
	Substation Total			*153.4*	*118.1*	*135.0*	*178.6*	*226.9*	*203.9*	*292.3*	*366.7*	*370.7*	*370.7*	*370.7*	*370.7*	*370.7*	*370.7*	*370.7*	*370.7*
Transformer	Nameplate	NOL																	
TX#1	75	90		41.9	34.2	48.5	88.2	61.9	70.9	76.5	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0
TX#2	84	90		38.2	40.3	39.0	44.1	57.9	71.6	35.3	36.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3
TX#3	84	90		73.3	43.5	47.5	46.3	57.6	61.4	66.2	90.4	89.4	89.4	89.4	89.4	89.4	89.4	89.4	89.4
TX#4	84	90								67.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
TX#5	84	90						49.4	0.0	47.3	80.0	84.0	84.0	84.0	84.0	84.0	84.0	84.0	84.0

Attachment I.C.1.b

BECO Substation WITHOUT DTC Substation

Includes:
Customer#1-Atlantic Buildings 1, 2, and 3
Customer#2-Maries
Customer#1-Maries
Customer#3-Maries

Excludes:
none

Load and Ratings in MVA

				Load (MVA) S2016 Actual	Load (MVA) S2017 Actual	Load (MVA) S2018 Actual	Load (MVA) S2019 Actual	Load (MVA) S2020 Actual	Load (MVA) S2021 Projection	Load (MVA) S2022 Projection	Load (MVA) S2023 Projection	Load (MVA) S2024 Projection	Load (MVA) S2025 Projection	Load (MVA) S2026 Projection	Load (MVA) S2027 Projection	Load (MVA) S2028 Projection	Load (MVA) S2029 Projection	Load (MVA) S2030 Projection	Load (MVA) S2031 Projection
				T-5	T-4	T-3	T-2	T-1	T=0	T+1	T+2	T+3	T+4	T+5	T+6	T+7	T+8	T+9	T+10
	Substation Total			*153.4*	*118.1*	*135.0*	*178.6*	*226.9*	*251.2*	*325.0*	*322.7*	*363.2*	*433.1*	*486.3*	*506.2*	*506.2*	*506.2*	*506.2*	*506.2*
Transformer	Nameplate	NOL																	
TX#1	75	90		41.9	34.2	48.5	88.2	61.9	70.9	76.5	90.0	92.0	116.0	140.0	144.0	144.0	144.0	144.0	144.0
TX#2	84	90		38.2	40.3	39.0	44.1	57.9	71.6	35.3	36.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3
TX#3	84	90		73.3	43.5	47.5	46.3	57.6	61.4	66.2	69.4	69.9	87.9	105.9	121.8	121.8	121.8	121.8	121.8
TX#4	84	90								67.0	43.0	72.0	96.0	107.2	107.2	107.2	107.2	107.2	107.2
TX#5	84	90						49.4	47.3	80.0	84.0	92.0	95.9	95.9	95.9	95.9	95.9	95.9	95.9

Attachment I.C.1.c

BECO Substation WITH DTC Substation

Includes:
Customer#1-Maries (1/2 Building)

Excludes:
none

Load and Ratings in MVA

				Load (MVA) S2016 Actual	Load (MVA) S2017 Actual	Load (MVA) S2018 Actual	Load (MVA) S2019 Actual	Load (MVA) S2020 Actual	Load (MVA) S2021 Projection	Load (MVA) S2022 Projection	Load (MVA) S2023 Projection	Load (MVA) S2024 Projection	Load (MVA) S2025 Projection	Load (MVA) S2026 Projection	Load (MVA) S2027 Projection	Load (MVA) S2028 Projection	Load (MVA) S2029 Projection	Load (MVA) S2030 Projection	Load (MVA) S2031 Projection
				T-5	T-4	T-3	T-2	T-1	T=0	T+1	T+2	T+3	T+4	T+5	T+6	T+7	T+8	T+9	T+10
	Substation Total			*153.4*	*118.1*	*135.0*	*178.6*	*226.9*	*304.7*	*325.0*	*349.7*	*242.7*	*254.7*	*260.3*	*260.3*	*260.3*	*260.3*	*260.3*	*260.3*
Transformer	Nameplate	NOL																	
TX#1	75	90		41.9	34.2	48.5	88.2	61.9	70.9	76.5	90.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0
TX#2	84	90		38.2	40.3	39.0	44.1	57.9	69.1	35.3	36.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3
TX#3	84	90		73.3	43.5	47.5	46.3	57.6	78.5	89.2	69.4	68.4	68.4	68.4	68.4	68.4	68.4	68.4	68.4
TX#4	84	90								67.0	70.0	44.0	56.0	61.6	61.6	61.6	61.6	61.6	61.6
TX#5	84	90						49.4	86.2	57.0	84.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0

DTC Substation

Includes:
Customer#1-Atlantic Buildings 1, 2, and 3
Customer#2-Maries
Customer#1-Maries (1/2 Building)
Customer#3-Maries

Excludes:
none

Load and Ratings in MVA

				Load (MVA) S2016 Actual	Load (MVA) S2017 Actual	Load (MVA) S2018 Actual	Load (MVA) S2019 Actual	Load (MVA) S2020 Actual	Load (MVA) S2021 Projection	Load (MVA) S2022 Projection	Load (MVA) S2023 Projection	Load (MVA) S2024 Projection	Load (MVA) S2025 Projection	Load (MVA) S2026 Projection	Load (MVA) S2027 Projection	Load (MVA) S2028 Projection	Load (MVA) S2029 Projection	Load (MVA) S2030 Projection	Load (MVA) S2031 Projection
				T-5	T-4	T-3	T-2	T-1	T=0	T+1	T+2	T+3	T+4	T+5	T+6	T+7	T+8	T+9	T+10
	Substation Total											*120.5*	*178.4*	*226.0*	*245.9*	*245.9*	*245.9*	*245.9*	*245.9*
Transformer	Nameplate	NOL																	
TX#1	112	120										1.8	22.8	37.4	45.3	45.3	45.3	45.3	45.3
TX#2	84	90										54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0
TX#3	84	90										54.8	63.8	72.8	80.7	80.7	80.7	80.7	80.7
TX#4	84	90										10.0	37.9	61.9	65.9	65.9	65.9	65.9	65.9
TX#5	112	120										0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

I. NECESSITY FOR THE PROPOSED PROJECT

D. If power flow modeling indicates that the existing system is, or will at some future time be, inadequate under certain contingency situations, provide a list of all these contingencies and the associated violations. Describe the critical contingencies including the affected elements and the year and season when the violation(s) is first noted in the planning studies. Provide the applicable computer screenshots of single-line diagrams from power flow simulations depicting the circuits and substations experiencing thermal overloads and voltage violations during the critical contingencies described above.

Response: Not applicable.

I. NECESSITY FOR THE PROPOSED PROJECT

E. Describe the feasible project alternatives, if any, considered for meeting the identified need including any associated studies conducted by the Applicant or analysis provided to the RTO. Explain why each alternative was rejected.

Response: The Company identified the following transmission electrical alternative to the Project. No distribution alternatives other than the proposed Project were considered, consistent with the overload conditions and violations described in Sections I.A and I.C.

Transmission Alternatives:

The Company analyzed a single transmission alternative (referred to as "Option 2") that was ultimately rejected due to routing constraints. The transmission alternative is similar in scope to the Project as described requiring (i) DTC Substation and (ii) a similar DTC Loop as proposed to be constructed on new right-of-way using double circuit, single-shaft galvanized steel poles with three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1574 MVA. The major difference between the Project and the alternative is the 230 kV line being cut and the possible routing scenarios along with the available capacity for DTC Substation prior to a NERC 300 MW N-1-1 criteria violation requiring a future project.

Transmission Alternative – Option 2: *Cut the 230 kV Line #2150 between Paragon Park and Sterling Park Substations*

By cutting Line #2150 between Paragon Park and Sterling Park Substations, Transmission Alternative – Option 2 would create two new 230 kV lines to be designated 230 kV DTC-Paragon Park Line #22XX and 230 kV DTC-Sterling Park #2150, as shown in Attachment I.E.1. Existing 230 kV Line #2150 sources Sterling Park TX#3, thereby limiting the available capacity at DTC Substation. See Section II of this Appendix for additional discussion of the alternative routes associated with Transmission Alternative – Option 2.

Analysis of Demand-Side Resources:

Pursuant to the Commission's November 26, 2013, Order entered in Case No. PUE-2012-00029, and its November 1, 2018, Final Order entered in Case No. PUR-2018-00075 ("2018 Final Order"), the Company is required to provide analysis of demand-side resources ("DSM") incorporated into the Company's planning studies. DSM is the broad term that includes both energy efficiency ("EE") and demand response ("DR"). In this case, the Company has identified a need for the proposed Project based on the need to provide service to data center customers and to comply with mandatory NERC Reliability Standards, while

maintaining the overall long-term reliability of the transmission system.[11] Notwithstanding, when performing an analysis based on PJM's 50/50 load forecast, there is no adjustment in load for DR programs that are bid into the PJM reliability pricing model ("RPM") auction because PJM only dispatches DR when the system is under stress (i.e., a system emergency). Accordingly, while existing DSM is considered to the extent the load forecast accounts for it, DR that has been bid into PJM's RPM market is not a factor in this particular application because of the identified need for the Project. Based on these considerations, the evaluation of the Project demonstrated that despite accounting for DSM consistent with PJM's methods, the Project is necessary.

Incremental DSM also will not absolve the need for the Project. As reflected in Attachment I.C.1, the projected load at BECO Substation without the Project and with all three Customers' data centers fully built out is 506.2 MW. By way of comparison, statewide, the Company achieved demand savings of 120.4 MW from its DSM Programs in 2020.

[11] While the PJM load forecast does not directly incorporate DR, its load forecast incorporates variables derived from Itron that reflect EE by modeling the stock of end-use equipment and its usages. Further, because PJM's load forecast considers the historical non-coincident peak ("NCP") for each load serving entity ("LSE") within PJM, it reflects the actual load reductions achieved by DSM programs to the extent an LSE has used DSM to reduce its NCPs.

One-Line Diagram - Option 2

New 230KV OH Lines (CPCN)
New 230KV UG Lines (CPCN)
Existing 230KV OH Lines
Existing 230kV UG Lines

DTC Substation
BECO Substation
Paragon Park Substation (12/31/2022)
Sterling Park Substation
Herdon Park Substation
Dranesville Substation
Davis Drive Substation
Beaumeade Substation
NIVO Substation
Pacific Substation
Buttermilk Substation
Davis Drive Substation

274 – To Pleasant View
227 – To Belmont
2143
2207
2081
2165
22##
2150
2081
2079
2079
2079
2062
2033 – To Clark
2194
2130
2116
2152
2170
2203- To Cumulus
2214 – To Roundtable

I. NECESSITY FOR THE PROPOSED PROJECT

F. Describe any lines or facilities that will be removed, replaced, or taken out of service upon completion of the proposed project, including the number of circuits and normal and emergency ratings of the facilities.

Response: Not applicable.

I. NECESSITY FOR THE PROPOSED PROJECT

G. Provide a system map, in color and of suitable scale, showing the location and voltage of the Applicant's transmission lines, substations, generating facilities, etc., that would affect or be affected by the new transmission line and are relevant to the necessity for the proposed line. Clearly label on this map all points referenced in the necessity statement.

Response: See Attachment I.G.1.

DTC SUB PROJECT

230kV Transmission Line

Switching Station, Substation, DP

0 0.25 0.5 1 Miles

227
274
BEAUMEADE SUB
2116
2130
NIVO SUB
BECO SUB
2150
2165
2152
2143
PARAGON PARK SUB
2081
2203
BUTTERMILK SUB
2165
2214
2170
2150
PACIFIC SUB
STERLING PARK SUB
2194
2079
DAVIS DRIVE SUB
2033
2079
Sterling Park

24

Attachment I.G.1

I. NECESSITY FOR THE PROPOSED PROJECT

H. Provide the desired in-service date of the proposed project and the estimated construction time.

Response: The desired in-service target date for the proposed Project is June 15, 2024.

The Company estimates it will take approximately 24 months for detailed engineering, materials procurement, permitting, real estate, and construction after a final order from the Commission. Accordingly, to support this estimated construction timeline and construction plan, the Company respectfully requests a final order by June 15, 2022. Should the Commission issue a final order by June 15, 2022, the Company estimates that construction should begin around July 2022, and be completed by June 15, 2024. This schedule is contingent upon obtaining the necessary permits. Dates may need to be adjusted based on permitting delays or design modifications to comply with additional agency requirements identified during the permitting application process. Additionally, the positioning of the physical location of a segment of new Line #2249 through wetlands and crossing of Broad Run may result in additional construction delays to ensure environmental compliance.

I. NECESSITY FOR THE PROPOSED PROJECT

I. Provide the estimated total cost of the project as well as total transmission-related costs and total substation-related costs. Provide the total estimated cost for each feasible alternative considered. Identify and describe the cost classification (e.g. "conceptual cost," "detailed cost," etc.) for each cost provided.

Response: The estimated conceptual cost of the Project along Proposed Route 1C is approximately $102.5 million, which includes approximately $36.7 million for transmission-related work and approximately $65.8 million[12] for substation-related work (2021 dollars).

The estimated conceptual costs for the transmission-related work associated with Overhead Alternative Routes 1A and 1B are provided in Section II.A.9. The substation-related costs associated with those routes are the same as Proposed Route 1C.

[12] *See supra*, n. 4.

I. NECESSITY FOR THE PROPOSED PROJECT

J. If the proposed project has been approved by the RTO, provide the line number, regional transmission expansion plan number, cost responsibility assignments, and cost allocation methodology. State whether the proposed project is considered to be a baseline or supplemental project.

Response: The Project is classified as a supplemental project (Supplemental Project DOM-2018-0013) initiated by the TO to interconnect new customer load. The Project was submitted to PJM on September 13, 2018, and the solution slide was submitted to PJM on May 16, 2019. See Attachments I.J.1 and I.J.2, respectively. The Project has been assigned Supplemental Project No. s2101 and was accepted into the 2019 Local Plan. See Attachment I.J.3. The Company presented revised slides at the TEAC Meeting on October 5, 2021. See Attachment I.J.4. The Company plans to present revised slides to PJM as to Project scope and cost updates that are reflected in this Appendix. As this is a supplemental project, the Company anticipates that these revisions will have no impact, and the Project will be included in the RTEP.

The Project is presently 100% cost allocated to DOM Zone.

Dominion Supplemental Projects Needs

Transmission Expansion Advisory Committee

September 13, 2018

Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2018-0013

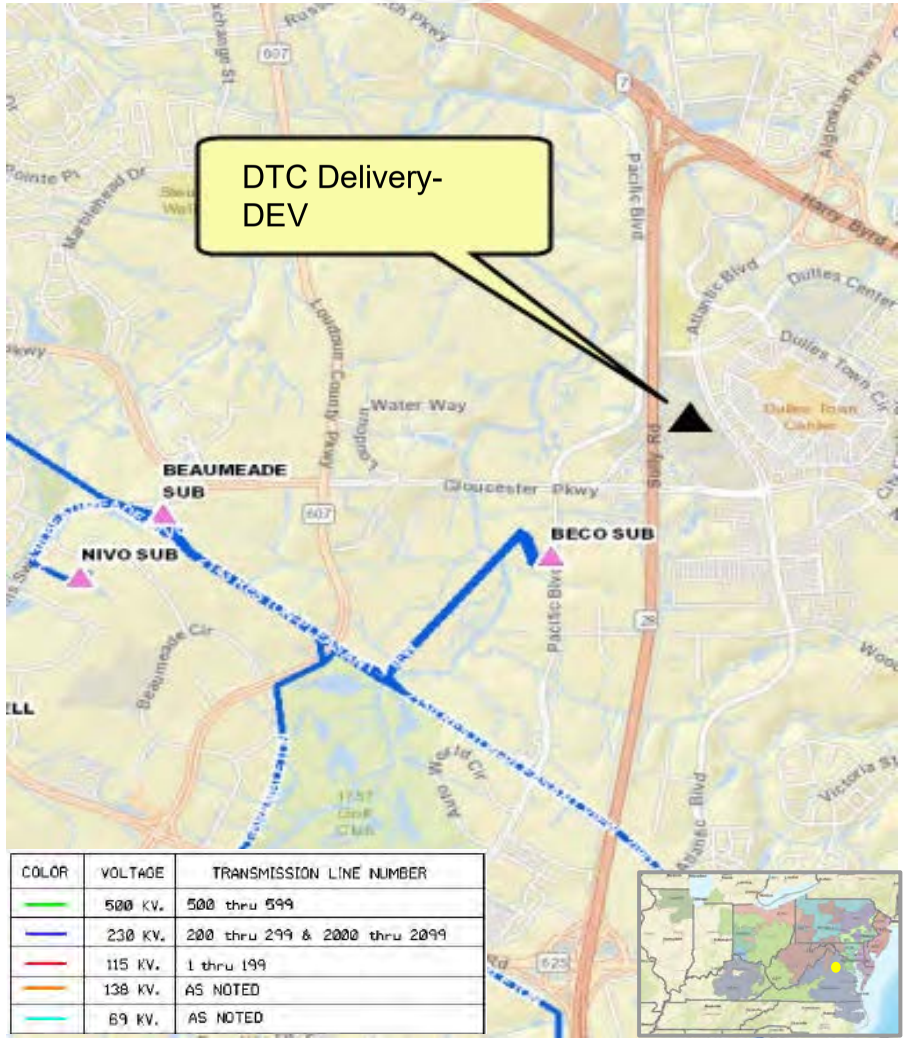
Meeting Date: 09/13/2018
Process Stage: NEED
Supplemental Project Driver: Customer Service

Problem Statement:
DEV Distribution has submitted a DP Request for a new substation (DTC) to accommodate a new datacenter campus in Loudoun County with a total load in excess of 100 MW. Requested in-service date is 11/15/2021.

29

Projected 2023 Load
Summer: 75.7 MW
Winter: 57.5 MW

Specific Assumption References:
Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria.



Dominion Supplemental Projects

Transmission Expansion Advisory Committee

May 16, 2019

Solutions

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2018-0013

Meeting Date: 05/16/2019

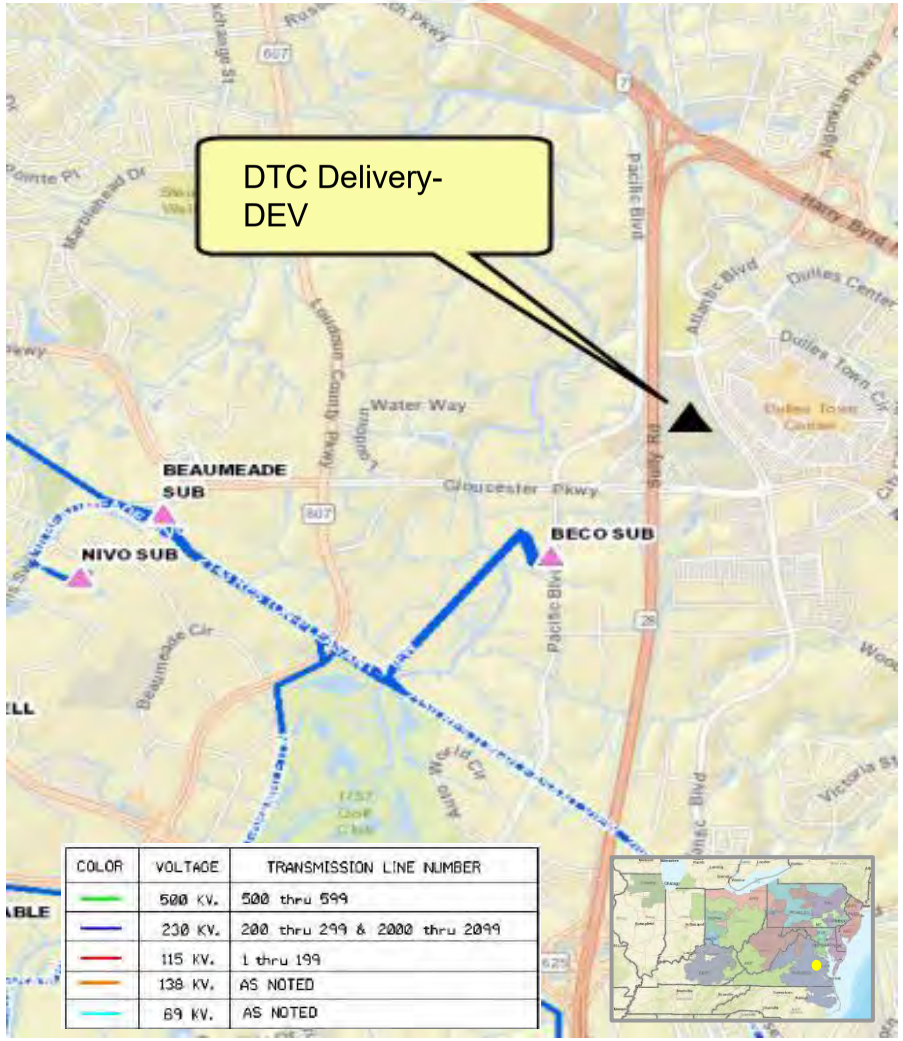
Process Stage: SOLUTIONS
Need Presented: 09/13/2018
Supplemental Project Driver: Customer Service

Problem Statement:
DEV Distribution has submitted a DP Request for a new substation (DTC) to accommodate a new datacenter campus in Loudoun County with a total load in excess of 100 MW. The new substation will be configured to accommodate five 84 MVA transformers with two transformers installed initially. Requested in-service date is 11/15/2021.

32

Initial In-Service Load	Projected 2024 Load
Summer: 46.5 MW	Summer: 130.3 MW

Specific Assumption References:
Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria



Dominion Transmission Zone: Supplemental DTC 230 kV Delivery - DEV

Need Number: DOM-2018-0013

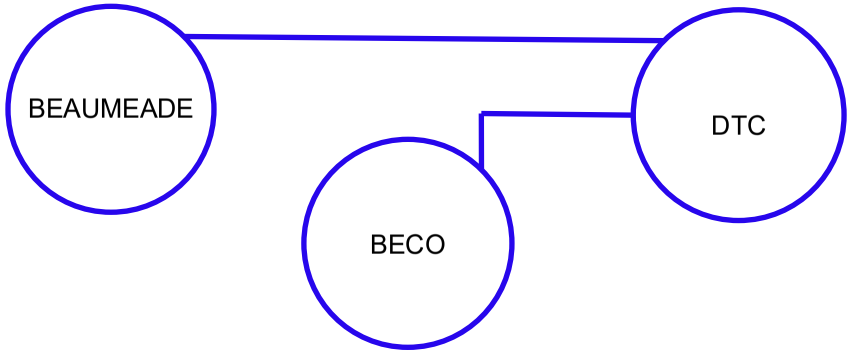
Proposed Solution :
Interconnect the new substation by cutting and extending Line #2143 (Beaumeade-BECO) approximately 1.5 miles to the proposed DTC Substation. Terminate both ends into a six-breaker ring bus arrangement with four breakers installed to create a Beaumeade-DTC line and a BECO-DTC line. Install two 230kV circuit switchers and any necessary high side switches and bus work for the new transformers.

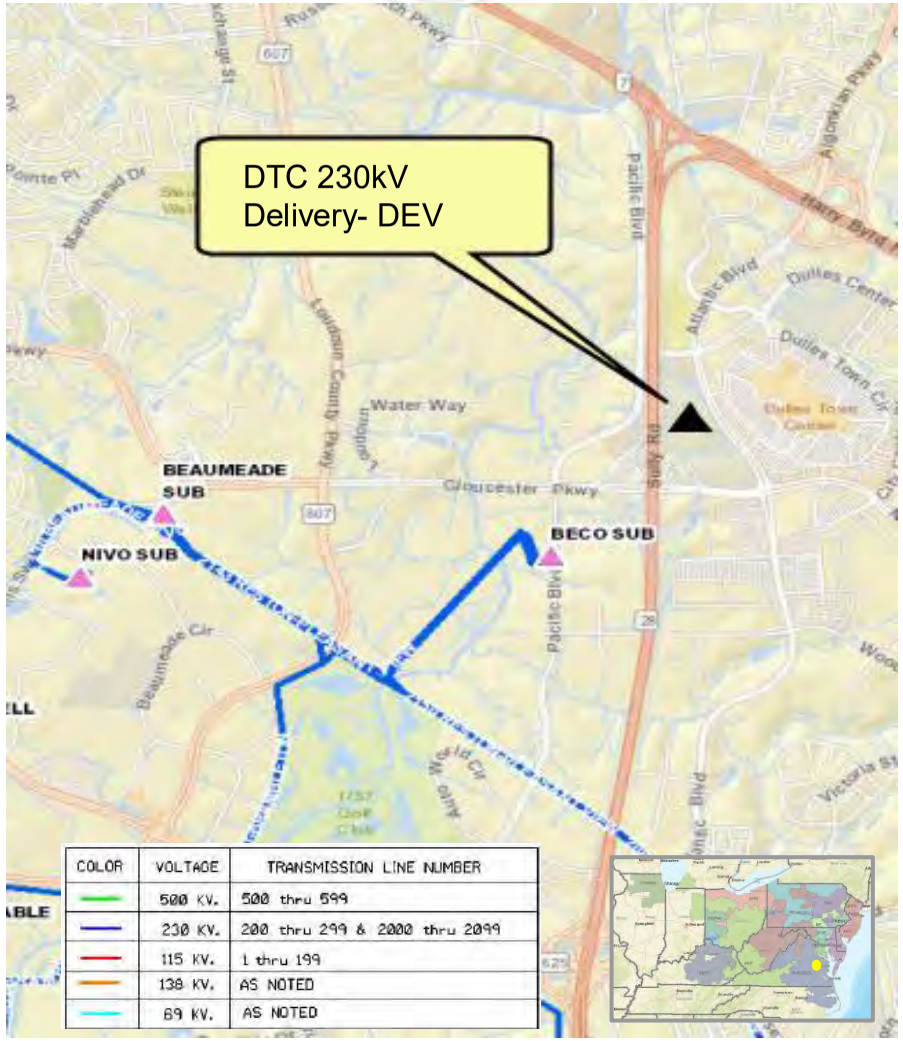
TO Alternatives Considered :
No feasible alternatives

33

Estimated cost: $ 25.0M

Projected In-service Date: 11/15/2021





Submission of Supplemental Projects for Inclusion in the Local Plan

Dominion Transmission Zone M-3 Process
DTC 230 kV Delivery - DEV

Need Number: DOM-2018-0013

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan – 12/17/2019

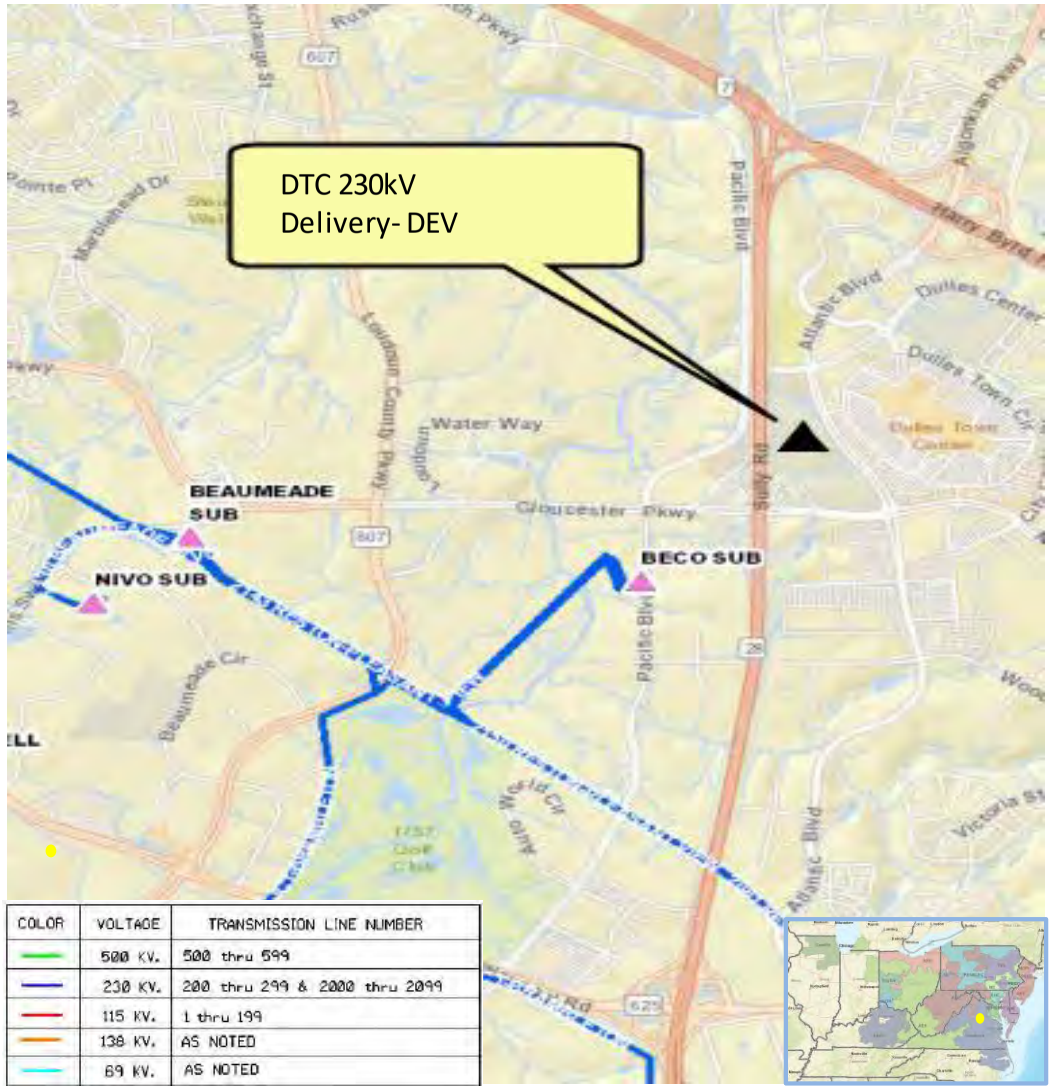
Previously Presented:
Need – 9/13/2018
Solution – 05/16/2019

Project Driver:
Customer Service

Specific Assumption Reference:
Customer load request will be evaluated per Dominion's Facility Interconnections Requirements Document & Dominion's Transmission Planning Criteria.

Problem Statement:
DEV Distribution has submitted a DP Request for a new substation (DTC) to accommodate a new datacenter campus in Loudoun County with a total load in excess of 100 MW. The new substation will be configured to accommodate five 84 MVA transformers with two transformers installed initially. Requested in-service date is 11/15/2021.

Projected 2023 load
Summer: 75.7 MW
Winter: 57.5 MW



DTC 230 kV Delivery - DEV

Need Number: DOM-2018-0013

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan – 12/17/2019

Selected Solution:

Interconnect the new substation by cutting and extending Line #2143 (Beaumeade-BECO) approximately 1.5 miles to the proposed DTC Substation. Terminate both ends into a six-breaker ring bus arrangement with four breakers installed to create a Beaumeade-DTC line and a BECO-DTC line. Install two 230kV circuit switchers and any necessary high side switches and bus work for the new transformers.

36

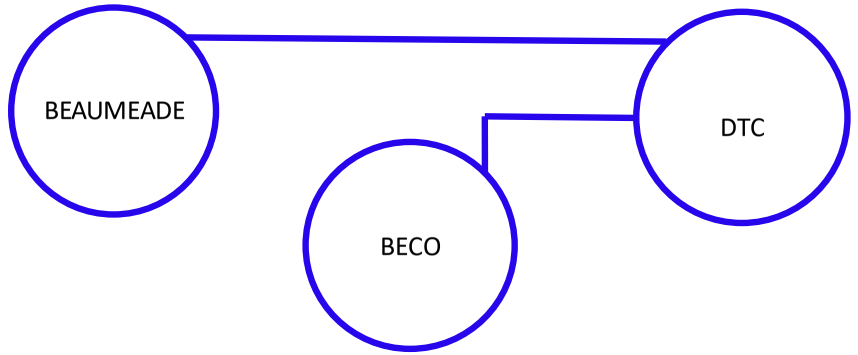
Estimated Cost: $25.0 M

Projected In-Service: 11/15/2021

Supplemental Project ID: s2101

Project Status: Conceptual

Model: 2023 RTEP



Dominion Supplemental Projects

Transmission Expansion Advisory Committee
October 5, 2021

Solution Slides

Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2018-0013 (Update)
Process Stage: Solutions Meeting 10/05/2021
Previously Presented: Solutions Meeting 05/16/2019
Project Driver: Customer Service

Specific Assumption References:

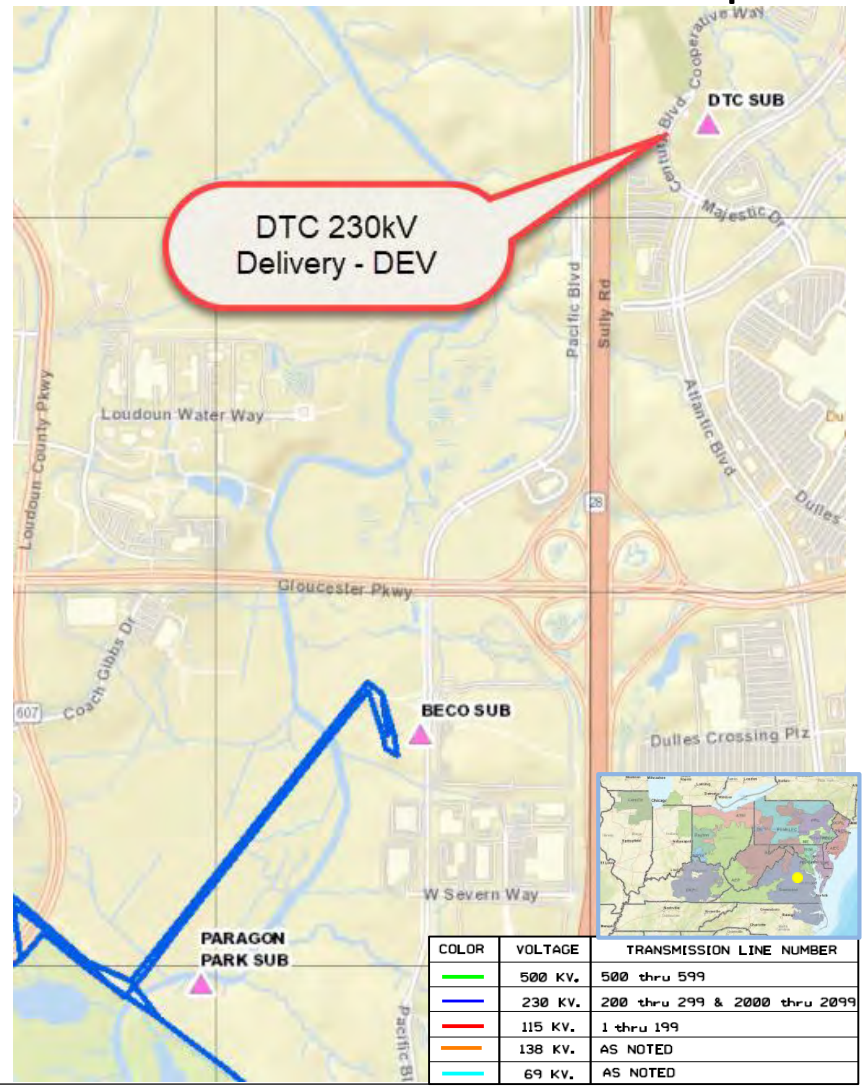
Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria.

Problem Statement:

DEV Distribution has submitted a DP Request for a new substation (DTC) to accommodate a new datacenter campus in Loudoun County with a total load in excess of 100 MW. The new substation will be configured to accommodate five 84 MVA transformers with two transformers installed initially. Requested in-service date is ~~11/15/2021~~ 06/30/2024. In-service date changed due to permitting, routing, and land acquisition delays.

Initial In-Service Load	Projected ~~2024~~ 2026 Load
Summer: ~~46.5~~ 122.0 MW	Summer: ~~130.3~~ 263.5 MW

*Load projections updated



Dominion Transmission Zone: Supplemental DTC 230kV Delivery - DEV

Need Number: DOM-2018-0013 (Update)

Process Stage: Solutions Meeting 10/05/2021

Proposed Solution to Interconnect Customer Load:

Interconnect the new substation by cutting and extending Line #2143 (Beaumeade-BECO) approximately 1.5 miles to the proposed DTC Substation. Terminate both ends into a six-breaker ring bus arrangement with four breakers installed to create a Beaumeade-DTC line and a BECO-DTC line. Install two 230kV circuit switchers and any necessary high side switches and bus work for the new transformers.

Estimated Project Cost: ~~$25.0M~~ $41.0M (Total)

DTC Substation - $10.0M

Line Extension - $15.0 M

DTC Land Purchase - $16.0M (Land cost was not included as part of previous estimate)

Alternatives Considered:

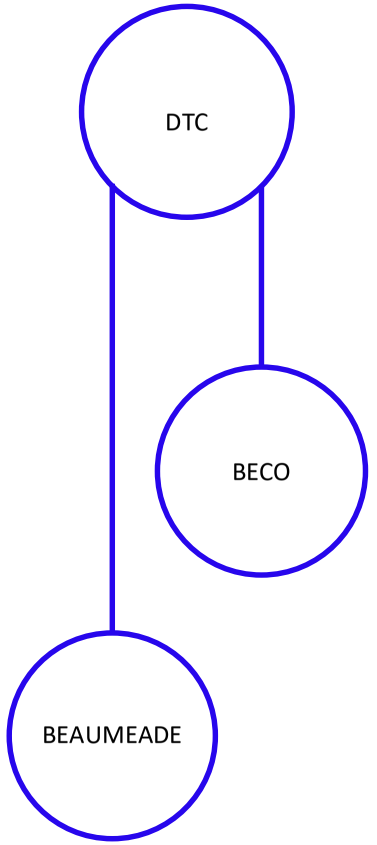
No feasible alternatives

Projected In-service Date:

Customer Service – 06/30/2024

Project Status: Engineering

Model: 2025 RTEP



I. NECESSITY FOR THE PROPOSED PROJECT

K. If the need for the proposed project is due in part to reliability issues and the proposed project is a rebuild of an existing transmission line(s), provide five years of outage history for the line(s), including for each outage the cause, duration and number of customers affected. Include a summary of the average annual number and duration of outages. Provide the average annual number and duration of outages on all Applicant circuits of the same voltage, as well as the total number of such circuits. In addition to outage history, provide five years of maintenance history on the line(s) to be rebuilt including a description of the work performed as well as the cost to complete the maintenance. Describe any system work already undertaken to address this outage history.

Response: Not applicable. The need for the proposed Project is not due to reliability issues. See Section I.A.

I. NECESSITY FOR THE PROPOSED PROJECT

L. If the need for the proposed project is due in part to deterioration of structures and associated equipment, provide representative photographs and inspection records detailing their condition.

Response: Not applicable. See Sections I.A and I.C.

I. NECESSITY FOR THE PROPOSED PROJECT

M. In addition to the other information required by these guidelines, applications for approval to construct facilities and transmission lines interconnecting a Non-Utility Generator ("NUG") and a utility shall include the following information:

1. The full name of the NUG as it appears in its contract with the utility and the dates of initial contract and any amendments;

2. A description of the arrangements for financing the facilities, including information on the allocation of costs between the utility and the NUG;

3. a. For Qualifying Facilities ("QFs") certificated by Federal Energy Regulatory Commission ("FERC") order, provide the QF or docket number, the dates of all certification or recertification orders, and the citation to FERC Reports, if available;

b. For self-certificated QFs, provide a copy of the notice filed with FERC;

4. Provide the project number and project name used by FERC in licensing hydroelectric projects; also provide the dates of all orders and citations to FERC Reports, if available; and

5. If the name provided in 1 above differs from the name provided in 3 above, give a full explanation.

Response: Not applicable.

I. NECESSITY FOR THE PROPOSED PROJECT

N. Describe the proposed and existing generating sources, distribution circuits or load centers planned to be served by all new substations, switching stations and other ground facilities associated with the proposed project.

Response: The DTC Substation will serve the Atlantic Boulevard/Maries Road Load Area described in Section I.C. See also Attachment I.A.1. The Project may also be used to support future load centers in the area.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

1. Provide the length of the proposed corridor and viable alternatives.

Response: The approximate lengths of the Proposed and Alternative Routes for the DTC 230 kV Line Loop are as follows:

Overhead Route 1C (Proposed Route): 1.30 mile (1.2997 miles)

Overhead Alternative Route 1A: 1.31 mile (1.3065 miles)

Overhead Alternative Route 1B: 1.31 mile (1.3065 miles)

See Section II.A.9 for an explanation of the Company's route selection process, as well as the Environmental Routing Study referenced therein.

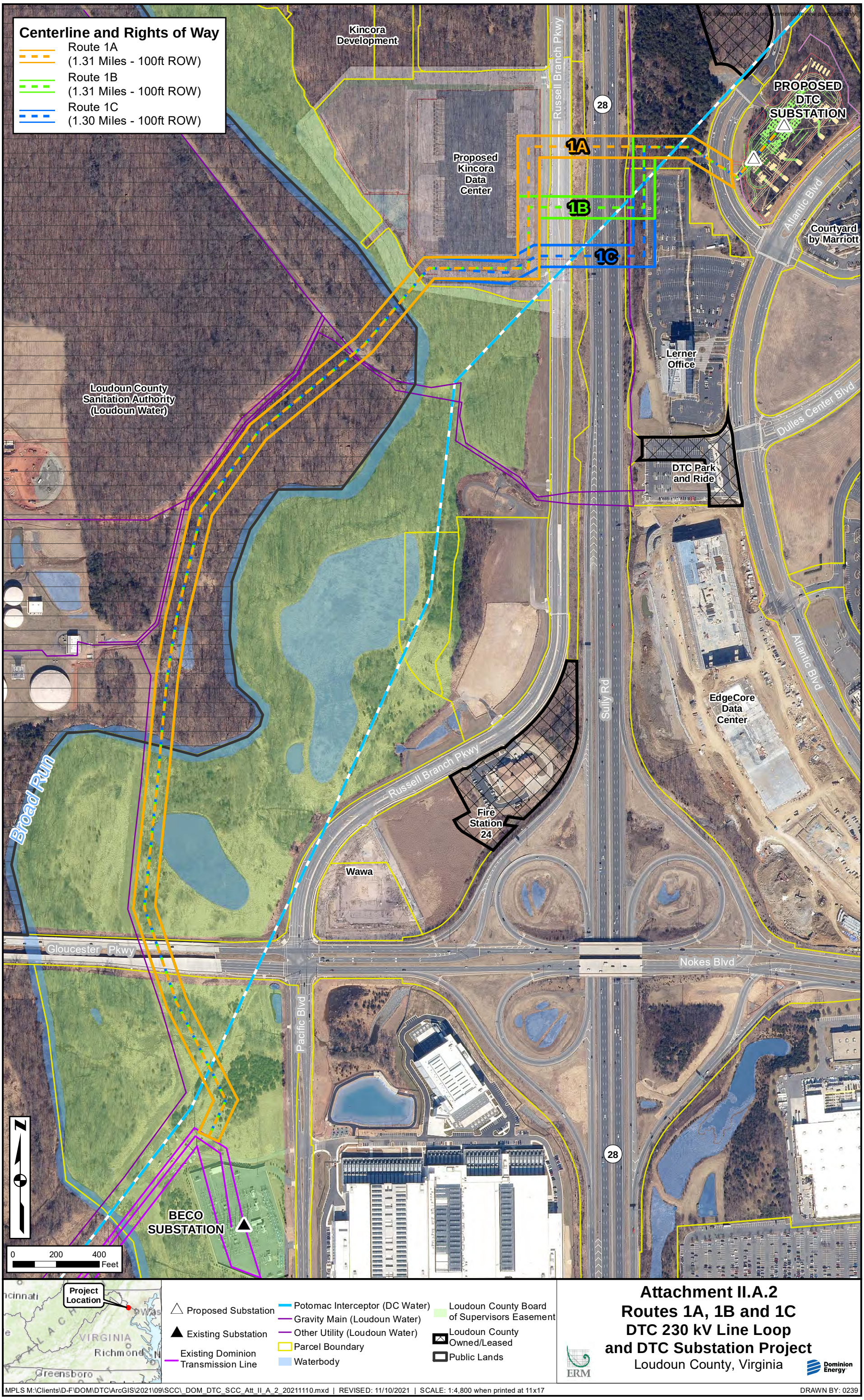
II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

2. Provide color maps of suitable scale (including both general location mapping and more detailed GIS-based constraints mapping) showing the route of the proposed line and its relation to: the facilities of other public utilities that could influence the route selection, highways, streets, parks and recreational areas, scenic and historic areas, open space and conservation easements, schools, convalescent centers, churches, hospitals, burial grounds/cemeteries, airports and other notable structures close to the proposed project. Indicate the existing linear utility facilities that the line is proposed to parallel, such as electric transmission lines, natural gas transmission lines, pipelines, highways, and railroads. Indicate any existing transmission ROW sections that are to be quitclaimed or otherwise relinquished. Additionally, identify the manner in which the Applicant will make available to interested persons, including state and local governmental entities, the digital GIS shape file for the route of the proposed line.

Response: See Attachment II.A.2. No portion of the right-of-way is proposed to be quitclaimed or relinquished.

Dominion Energy Virginia will make the digital Geographic Information Systems ("GIS") shape file available to interested persons upon request to the Company's legal counsel as listed in the Project Application.


Centerline and Rights of Way
Route 1A
(1.31 Miles - 100ft ROW)
Route 1B
(1.31 Miles - 100ft ROW)
Route 1C
(1.30 Miles - 100ft ROW)
This information is for environmental review purposes only
Kincora Development
Russell Branch Pkwy
28
PROPOSED DTC SUBSTATION
1A
Proposed Kincora Data Center
1B
1C
Atlantic Blvd
Courtyard by Marriott
Lerner Office
Loudoun County Sanitation Authority (Loudoun Water)
Dulles Center Blvd
DTC Park and Ride
Atlantic Blvd
Sully Rd
EdgeCore Data Center
Broad Run
Russell Branch Pkwy
Fire Station 24
Wawa
Gloucester Pkwy
Nokes Blvd
Pacific Blvd
28
BECO SUBSTATION
N
0
200
400
Feet
Project Location
VIRGINIA
Richmond
Greensboro
Proposed Substation
Existing Substation
Existing Dominion Transmission Line
Potomac Interceptor (DC Water)
Gravity Main (Loudoun Water)
Other Utility (Loudoun Water)
Parcel Boundary
Waterbody
Loudoun County Board of Supervisors Easement
Loudoun County Owned/Leased
Public Lands
ERM
Attachment II.A.2
Routes 1A, 1B and 1C
DTC 230 kV Line Loop
and DTC Substation Project
Loudoun County, Virginia
Dominion Energy
MPLS M:\Clients\D-F\DOM\DTC\ArcGIS\2021\09\SCC_DOM_DTC_SCC_Att_II_A_2_20211110.mxd | REVISED: 11/10/2021 | SCALE: 1:4,800 when printed at 11x17
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II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

3. Provide a separate color map of a suitable scale showing all the Applicant's transmission line ROWs, either existing or proposed, in the vicinity of the proposed project.

Response: See Attachment I.G.1.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

4. To the extent the proposed route is not entirely within existing ROW, explain why existing ROW cannot adequately service the needs of the Applicant.

Response: There is no existing Company-owned right-of-way that serves the Customers' sites.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

5. Provide drawings of the ROW cross section showing typical transmission line structure placements referenced to the edge of the ROW. These drawings should include:

a. ROW width for each cross section drawing;

b. Lateral distance between the conductors and edge of ROW;

c. Existing utility facilities on the ROW; and

d. For lines being rebuilt in existing ROW, provide all of the above (i) as it currently exists, and (ii) as it will exist at the conclusion of the proposed project.

Response: See Attachment II.A.5.a.

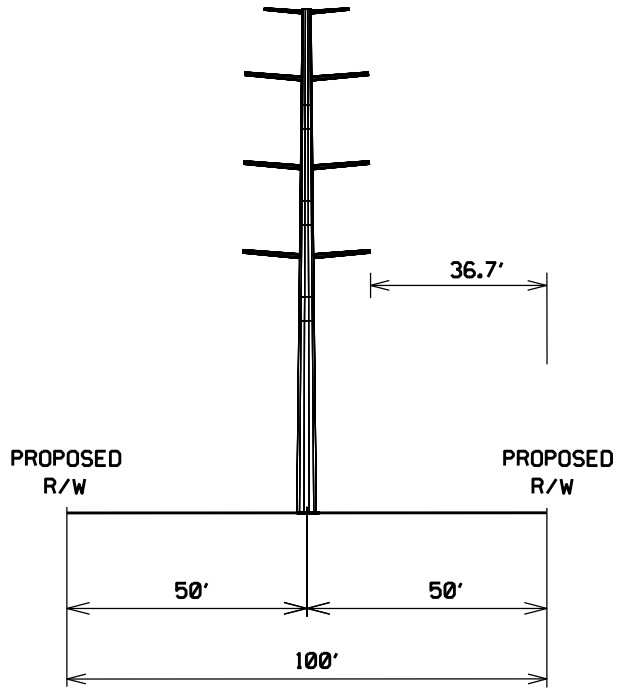
For additional information on the structures, see Section II.B.3.

DTC

PRELIMINARY

PROPOSED
230KV CIRCUIT
(LINE •2143)

PROPOSED
230KV CIRCUIT
(LINE •2249)



PROPOSED CONFIGURATION
TYPICAL CORRIDOR LOOKING TOWARD DTC

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

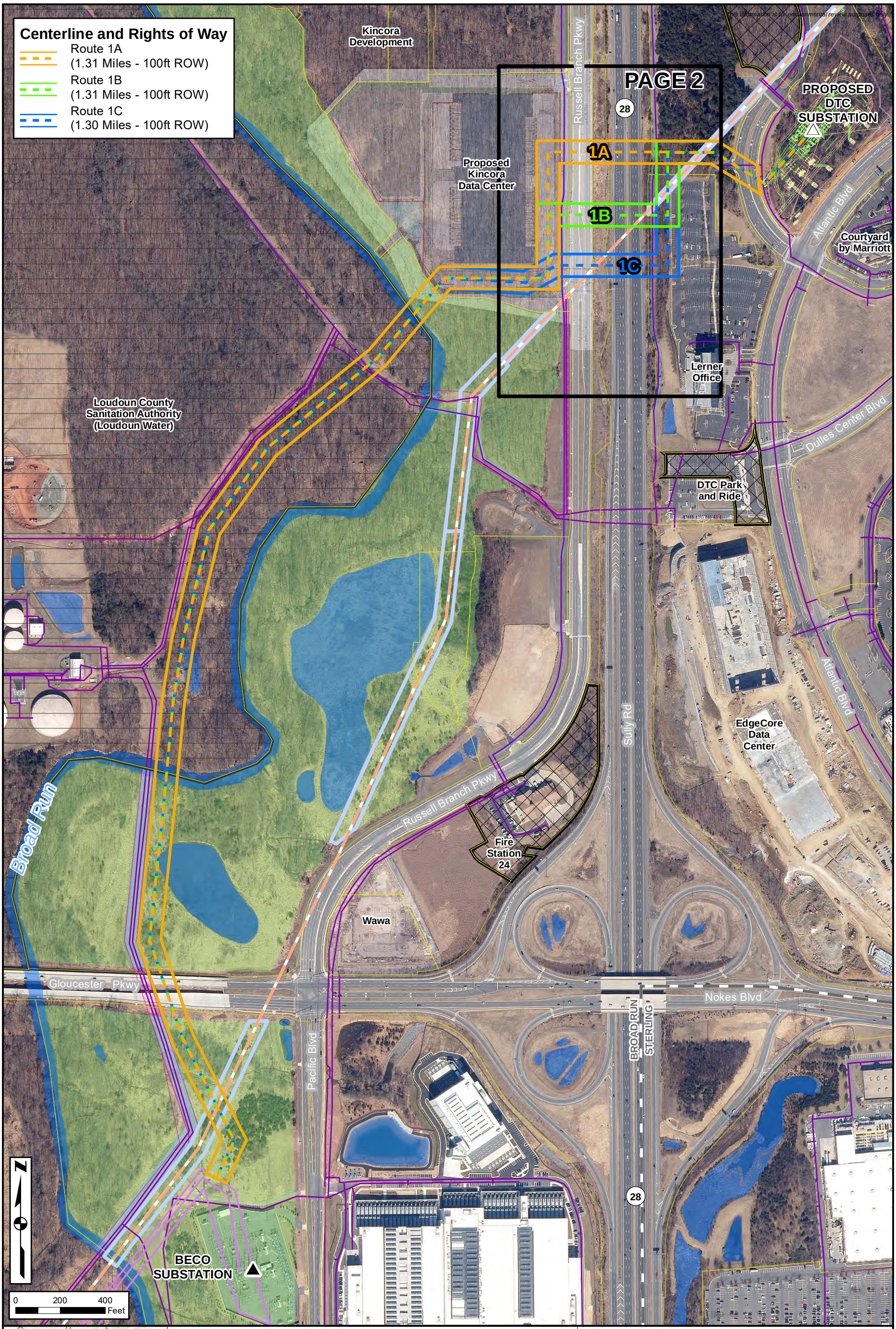
$DGNSPEC$

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

6. Detail what portions of the ROW are subject to existing easements and over what portions new easements will be needed.

Response: As discussed in Section II.A.4, there is no existing Company-owned right-of-way that serves the Customers' sites. Therefore, the entire right-of-way for the Project will require easements for a new-build transmission line. However, portions of the routes will parallel existing, non-transmission line easements—namely, existing Loudoun Water lines. No overlap between existing easements and the proposed easements for the Project will occur. See Attachment II.A.6.


Centerline and Rights of Way
Route 1A
(1.31 Miles - 100ft ROW)
Route 1B
(1.31 Miles - 100ft ROW)
Route 1C
(1.30 Miles - 100ft ROW)
This information is for environmental review purposes only
Kincora Development
Russell Branch Pkwy
PAGE 2
28
PROPOSED DTC SUBSTATION
1A
1B
1C
Proposed Kincora Data Center
Atlantic Blvd
Courtyard by Marriott
Lerner Office
Loudoun County Sanitation Authority (Loudoun Water)
Dulles Center Blvd
DTC Park and Ride
Atlantic Blvd
Sully Rd
EdgeCore Data Center
Broad Run
Russell Branch Pkwy
Fire Station 24
Wawa
Gloucester Pkwy
Pacific Blvd
BROAD RUN
STERLING
Nokes Blvd
28
BECO SUBSTATION
N
0 200 400 Feet
Project Location
VIRGINIA
Richmond
Greensboro
Proposed Substation
Existing Substation
Existing Dominion Transmission Line
Potomac Interceptor (DC Water)
Gravity Main (Loudoun Water)
Other Utility (Loudoun Water)
Parcel Boundary
Magisterial District Boundary
Waterbody (Loudoun County)
Loudoun County Board of Supervisors Easement
Loudoun County Owned/Leased
Public Lands
Waterline Easement
Sanitary Easement
Page 1
Attachment II.A.6
Existing Rights of Way
DTC 230 kV Line Loop
and DTC Substation Project
Loudoun County, Virginia
ERM
Dominion Energy
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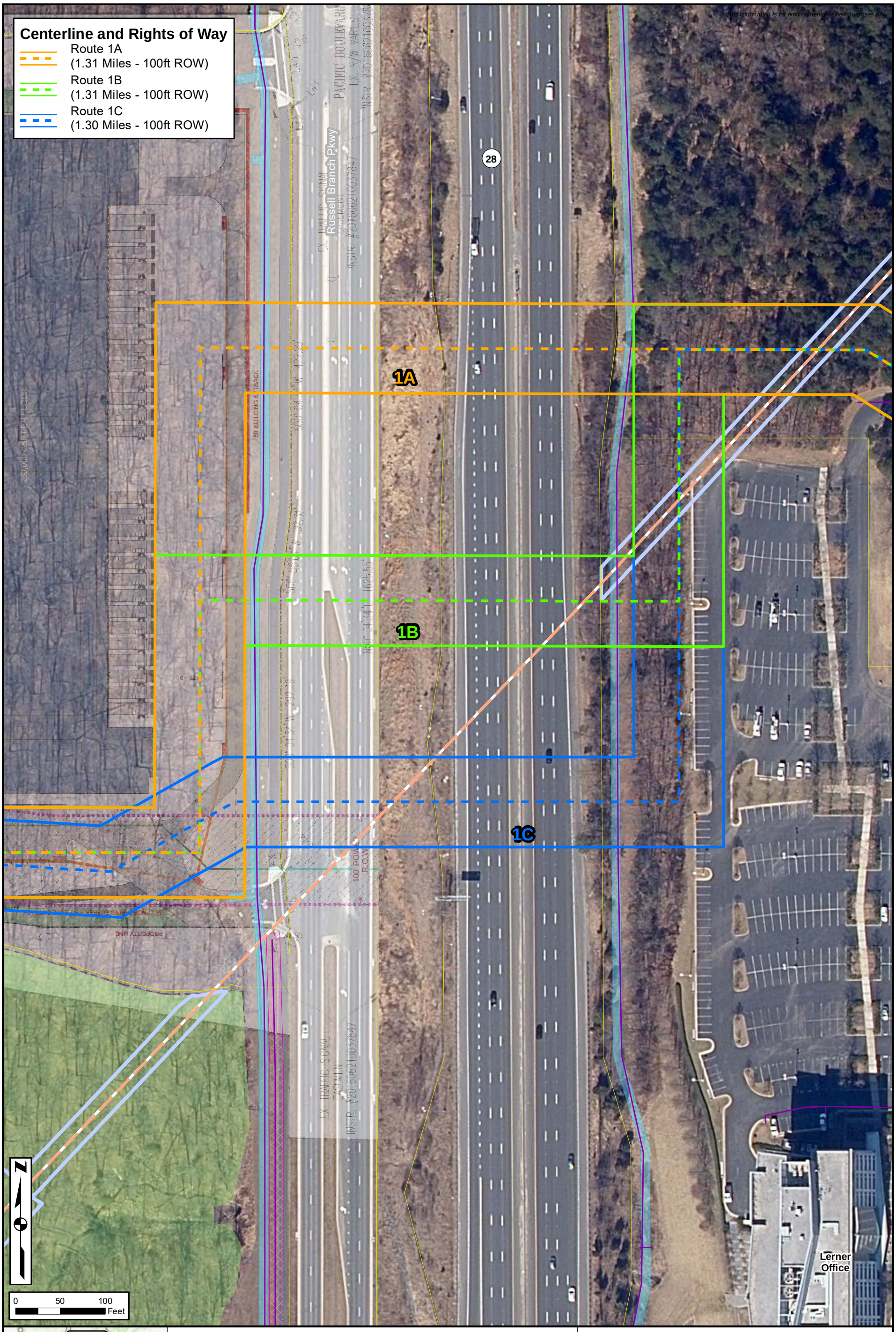

Page 2

Attachment II.A.6
Existing Rights of Way
DTC 230 kV Line Loop and DTC Substation Project

Loudoun County, Virginia

ERM

Dominion Energy

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II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

7. Detail the proposed ROW clearing methods to be used and the ROW restoration and maintenance practices planned for the proposed project.

Response: The right-of-way width for the Proposed Route will be 100 feet wide. In general, the entire 100-foot-wide right-of-way will require clearing.[13]

Trimming of tree limbs along the edge of the right-of-way also may be conducted to support construction activities for the Project. For any such minimal clearing within the right-of-way, trees will be cut to no more than three inches above ground level. Trees located outside of the right-of-way that are tall enough to potentially impact the transmission facilities, commonly referred to as "danger trees," may also need to be cut. Danger trees will be cut to be no more than three inches above ground level, limbed, and will remain where felled. Debris that is adjacent to homes will be disposed of by chipping or removal. In other areas, debris may be mulched or chipped as practicable. Danger tree removal will be accomplished by hand in wetland areas and within 100 feet of streams, if applicable. Care will be taken not to leave debris in streams or wetland areas. Matting will be used for heavy equipment in these areas. Erosion control devices will be used on an ongoing basis during all clearing and construction activities accompanied by weekly Virginia Stormwater Management Program inspections.

Erosion control will be maintained and temporary stabilization for all soil disturbing activities will be used until the right-of-way has been restored. Upon completion of the Project, the Company will restore the right-of-way utilizing site rehabilitation procedures outlined in the Company's *Standards & Specifications for Erosion & Sediment Control and Stormwater Management for Construction and Maintenance of Linear Electric Transmission Facilities* that was approved by the Virginia Department of Environmental Quality ("DEQ"). Time of year and weather conditions may affect when permanent stabilization takes place.

This right-of-way will continue to be maintained on a regular cycle to prevent interruptions to electric service and provide ready access to the right-of-way to patrol and make emergency repairs. Periodic maintenance to control woody growth will consist of hand cutting, machine mowing and herbicide application.

[13] *See supra* n. 1.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

8. Indicate the permitted uses of the proposed ROW by the easement landowner and the Applicant.

Response: Any non-transmission use will be permitted that:

- Is in accordance with the terms of the easement agreement for the right-of-way;
- Is consistent with the safe maintenance and operation of the transmission lines;
- Will not restrict future line design flexibility; and
- Will not permanently interfere with future construction.

Subject to the terms of the easement, examples of typical permitted uses include but are not limited to:

- Agriculture
- Hiking Trails
- Fences
- Perpendicular Road Crossings
- Perpendicular Utility Crossings
- Residential Driveways
- Wildlife / Pollinator Habitat

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

9. Describe the Applicant's route selection procedures. Detail the feasible alternative routes considered. For each such route, provide the estimated cost and identify and describe the cost classification (e.g. "conceptual cost," "detailed cost," etc.). Describe the Applicant's efforts in considering these feasible alternatives. Detail why the proposed route was selected and other feasible alternatives were rejected. In the event that the proposed route crosses, or one of the feasible routes was rejected in part due to the need to cross, land managed by federal, state, or local agencies or conservation easements or open space easements qualifying under §§ 10.1-1009 – 1016 or §§ 10.1-1700 – 1705 of the Code (or a comparable prior or subsequent provision of the Code), describe the Applicant's efforts to secure the necessary ROW.

Response: The Company's route selection for a new transmission line typically begins with identification of the project "origin" and "termination" points provided by the Company's Transmission Planning Department. This is followed by the development of a study area for the project. The study area represents a circumscribed geographic area from which potential routes that may be suitable for a transmission line can be identified.

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

Option 1 involved connecting the existing Line #2143 from a point just north of the existing BECO Substation on the west side of Pacific Boulevard and just south of Gloucester Parkway, and extending a new 230 kV double circuit transmission line northeast to the proposed DTC Substation. The DTC Substation site is located on the east side of Route 28 between Atlantic Boulevard and Century Boulevard.

Option 2 involved tapping the existing Line #2150 near the intersection of the Washington & Old Dominion Trail and Sully Road and extending a new 230 kV double circuit transmission line northeast to the proposed DTC Substation.

A study area was then developed that encompassed the area surrounding the proposed DTC Substation and potential junction locations with Line #2143 and Line #2150. The route development process for the Project is described in more detail in the Environmental Routing Study.

Three viable route alternatives (all overhead) were identified for Option 1. ERM and Dominion Energy Virginia originally identified additional potential routes for Option 1 between the BECO Substation and the DTC Substation. These routes were subsequently rejected from further consideration study. All of the Option 2 routes were determined to not be viable and were excluded from further study. Option 1 and Option 2 Routes that were determined to not be viable and were excluded from further consideration are described in Section 2.5 of the Environmental Routing Study.

A total of three viable overhead routes were identified between Line #2143 and the proposed DTC Substation. Since the three routes follow a common alignment for the majority of their lengths, the differences in their impacts are restricted to the location where they diverge in the northeastern portion of the project area at the crossing of Russell Branch Parkway and Sully Road. In general, most of the differences in the impacts of the routes largely are incremental. For example, the lengths of the routes differ by less than a hundredth of a mile, all three routes cross the same amount of wetlands, and there is only a slight difference in the number of parcels crossed by the routes (5 versus 6). The most significant differences in the routes, as discussed in more detail below, are the amounts of forested land to be cleared, impacts of the routes on a planned data center, and their visual impacts.

The Proposed and Alternative Routes will all cross a Loudoun County BOS managed open space easement for approximately 0.35 mile. At the November 10, 2021, Loudoun County BOS public hearing, the BOS approved conveyance of approximately 6.85 acres of easements to the Company required for the Project. See Attachment II.A.9.

Of these three routes, one route, Overhead Route 1C, was identified as the Proposed Route. Two overhead routes (Overhead Routes 1A and 1B) were identified as viable alternatives to the Proposed Route.

PROPOSED AND ALTERNATIVE ROUTES

Overhead Route 1C (Proposed Route)

This route would construct an overhead double circuit 230 kV line from the existing Line #2143 just north of BECO Substation to the proposed DTC Substation. The estimated conceptual cost of the Proposed Route is approximately $36.7 million (2021 dollars).

Overhead Route 1C is approximately 1.30 mile in length. Beginning just north of the BECO Substation, Route 1C heads northwest for about 0.19 mile adjacent to the right-of-way for a Loudoun County Water line and across Gloucester Parkway. A portion of this segment of the route also crosses a Loudoun County BOS easement which the BOS has agreed to convey to the Company for this Project. After crossing Gloucester Parkway, the route then continues generally north for 0.57 mile, generally following the Loudoun Water line, and includes an additional

crossing of the BOS easement and a crossing of Broad Run. The transmission line route then turns to the north and east for 0.20 mile before intersecting Russell Branch Parkway. This segment includes a second crossing of Broad Run and another short crossing of the BOS easement. The route then turns northeast to avoid a Virginia Department of Transportation ("VDOT") traffic signal easement.[14] After a 0.09-mile crossing of Russell Branch Parkway and Sully Road, the line next turns north and parallels the eastern side of Sully Road, crossing the western edge of a parking lot associated with the adjacent Lerner 21000 Atlantic office building for 0.10 mile. From that point, the line turns east and southeast for 0.08 mile crossing Century Boulevard. Finally, the route heads northeast for 0.07 mile and then enters the proposed DTC Substation property.

Construction of Overhead Route 1C will cross a total of 1.30 miles of land affecting 21.15 acres of right-of-way (including 6.21 acres for the proposed DTC Substation). All six parcels crossed are privately owned. Land use along the Proposed Route right-of-way consists of 14.08 acres of forested land, 5.26 acres of open space, 1.49 acres of developed land, and 0.32 acre of open water.

Based on ERM's desktop wetland and waterbody analysis, the right-of-way of Overhead Route 1C will encompass approximately 14.00% (2.96 acres) of land with a medium/high or higher probability of containing wetlands and waterbodies. Of these 2.96 acres, the majority (2.02 acres) consist of forested wetlands. Overhead Route 1C has four waterbody crossings: two crossings of Broad Run (a perennial waterbody), and two crossings of smaller intermittent creeks/tributaries to Broad Run. Lastly, Overhead Route 1C will require the clearing of about 14.08 acres of forested land, which is the least amount of forest clearing needed for any of the route alternatives.

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

The Company has learned that US Kincora Purchaser LLC ("Kincora") intends to construct a data center on a portion of its property along Russell Branch Parkway. Based on a review Kincora's preliminary site design, Overhead Route 1C would have the least impacts to Kincora's planned data center development. Kincora has expressed significant concerns regarding the development of an overhead transmission line on its property in areas where it would conflict with the planned data center. While Kincora has not yet filed a site plan for the data center with the County, the Company has met with Kincora to discuss their plans and the constraints the route would have on the development of the data center. Route 1C will not cross any areas currently identified by Kincora that would conflict with its

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

planned data center.

Overhead Route 1C is slightly shorter than the other alternatives and would require correspondingly less acreage. In addition, Route 1C would cross the smallest area of the planned data center and would not conflict with the development of this facility. The Proposed Route also would require less clearing of forested lands than the other two routes. Route 1C would have visual impacts to commuters/ through travelers along Sully Road as well as impacts to occupants arriving and leaving the Lerner office building via the northern parking lot. Sully Road has higher volumes of traffic (average daily traffic count of 93,000) than Russell Branch Parkway; however, based on speed limit, activity, and expectations of the most common user group (commuters/through travelers), sensitivity to changes in visual character should be low. Additionally, a small screen of trees would be left in place between Sully Road and the right-of-way. The Proposed Route focuses impacts on the least sensitive user group, lowers potential visual change for sensitive user groups, and limits changes to sensitive resources. For these reasons, the Company selected Overhead Route 1C as the Proposed Route.

Overhead Alternative Route 1A

This route would construct an overhead double circuit 230 kV line from the existing Line #2143 just north of BECO to the proposed DTC Substation. The estimated conceptual cost of Overhead Alternative Route 1A is approximately $36.2 million (2021 dollars).

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

Construction of Overhead Alternative Route 1A will cross a total of 1.31 miles of land affecting 21.24 acres of right-of-way (including 6.21 acres for the proposed DTC substation). All five parcels crossed are privately owned. Land use along the Overhead Alternative 1A right-of-way consists of 14.22 acres of forested land, 5.54 acres of open land, 1.15 acres of developed land, and 0.32 acre of open water.

Based on ERM's desktop wetland and waterbody analysis, the right-of-way of

Overhead Route 1A will encompass approximately 13.82% (2.96 acres) of land with a medium/high or higher probability of containing wetlands and waterbodies. Of these 12.96 acres, the majority (2.02 acres) consist of forested wetlands. Overhead Alternative Route 1A has four waterbody crossings: two crossings of Broad Run (a perennial waterbody), and two crossings of smaller intermittent creeks/tributaries to Broad Run. Lastly, Overhead Alternative Route 1A will require the clearing of about 14.22 acres of forested land, the largest amount of any of the routes.

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

Overhead Alternative 1A crosses the longest distance of Kincora's planned data center parcel (0.22 mile) and consequently would have the greatest impact on the data center. Based on preliminary development plans, the route crosses portions of the parcel slated for placement of generators associated with the data center. The placement of such generators under a transmission line are not permissible for safety reasons and also would conflict with the maintenance of the transmission line. Therefore, for Overhead Alternative Route 1A to be built, the data center developer would need to reduce the size of the planned development to allow space for the transmission line right-of-way and relocate the generators elsewhere on the property. It is the Company's understanding that the developer purchased this parcel in August 2021 with the intention of being able to develop the entirety of the parcel and has indicated that the placement of a transmission line in the location of Overhead Alternative 1A would render their development plan non-viable.

Overhead Alternative Route 1A has the greatest impact on both forested land and on the planned data center. This route also would have the longest crossing of VDOT right-of-way. Visual impacts of Overhead Alternative Route 1A include impacts on users (local residents, and recreational users) traveling and recreating along the pedestrian/multiuse path and adjacent Russell Branch Parkway. Russell Branch Parkway has a lower volume of traffic than Sully Road; however, users are traveling at a lower speed and the user group (local residents vs. commuters/through travelers) has more sensitivity to changes in visual character. On the other hand, Route 1A crosses one fewer parcel than the other two routes thereby avoiding crossing a parking lot associated with an adjacent office building, which is crossed by both the Proposed Route and Overhead Alternative Route 1B.

Overhead Alternative Route 1B

This route would construct an overhead double circuit 230 kV line from the existing Line #2143 just north of BECO to the proposed DTC Substation. The estimated conceptual cost of Overhead Alternative Route 1B is approximately $37.9 million (2021 dollars).

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

Construction of Overhead Route 1B will cross a total of 1.31 miles of land affecting 21.24 acres of right-of-way (including 6.21 acres for the proposed DTC substation). All six parcels crossed are privately owned. Land use along Overhead Alternative Route 1B right-of-way consists of 14.18 acres of forested land, 5.40 acres of open space, 1.33 acres of developed land, and 0.32 acre of open water.

Based on ERM's desktop wetland and waterbody analysis, the right-of-way of Overhead Route 1B will encompass approximately 13.82% (2.96 acres) of land with a medium/high or higher probability of containing wetlands and waterbodies. Of these 2.96 acres, the majority (2.02 acres) consist of forested wetlands. Overhead Route 1B has four waterbody crossings: two crossings of Broad Run (a perennial waterbody), and two crossings of smaller intermittent creeks/tributaries to Broad Run. Lastly, Overhead Route 1B will require the clearing of about 14.18 acres of forested land.

Overhead Route 1B will be collocated for a total of 0.93 mile, including 0.59 mile of paralleled Loudoun Water sewer and/or water lines, 0.25 mile of paralleling roads, and 0.09 mile paralleling both Loudoun Water and roads.

Overhead Alternative 1B crosses the second longest distance of Kincora's planned data center parcel (0.17 mile). Based on preliminary development plans, the route crosses portions of the parcel slated for placement of generators associated with the data center. The placement of such generators under a transmission line are not permissible for safety reasons and also would conflict with the maintenance of the transmission line. Therefore, for Overhead Alternative Route 1B to be built, the data center developer would need to reduce the size of the planned development to allow space for the transmission line right-of-way and relocate the generators

elsewhere on the property. It is the Company's understanding that the developer purchased this parcel in August 2021 with the intention of being able to develop the entirety of the parcel and has indicated that the placement of a transmission line in the location of Overhead Alternative 1B would render their development plan non-viable.

Route 1B would require slightly less clearing of forested land than Route 1A (14.18 versus 14.22 acres). While Route 1B would impact the planned data center to a lesser degree than Route 1A, it still would conflict with the development of this facility. Visual impacts of Overhead Alternative Route 1B include impacts on local residents and recreational users on the multiuse path, drivers on Russell Branch Parkway, commuters/through travelers on Sully Road (average daily traffic count of 93,000 for Sully Road), and impacts to occupants arriving and leaving the Lerner office building via the northern parking lot.

Loudoun County, Virginia
www.loudoun.gov
Office of the County Administrator
1 Harrison Street, S.E., 5th Floor, P.O. Box 7000, Leesburg, VA 20177-7000
Telephone (703) 777-0200 • Fax (703) 777-0325

At a public hearing of the Board of Supervisors of Loudoun County, Virginia, held in the County Government Center, Board of Supervisors' Meeting Room, 1 Harrison Street, S.E., Leesburg, Virginia, on Wednesday, November 10, 2021, at 6:00 p.m.

IN RE: Proposed Conveyance and of County Property – Conveyance of County Easement to Dominion Electric and Power Company (Broad Run and Sterling)

Supervisor Glass moved that the Board of Supervisors approve the conveyance of 6.85+/- acres of easements over 21391 Pacific Boulevard to Dominion in exchange for 10.1829 acres of land, 45336 Century Boulevard, less and except for a retained transmission line easement of 0.95+/- acres.

Supervisor Glass further moved that the Board of Supervisors authorize the Chairman, the Vice Chairman, and the County Administrator, or his duly authorized designee, to execute the necessary deeds of conveyance or exchange deemed acceptable by the County Attorney.

Seconded by Vice Chair Saines.

Voting on the Motion: Supervisors Briskman, Buffington, Glass, Kershner, Letourneau, Randall, Saines, Turner, and Umstattd – Yes; None – No.

A COPY TESTE:

Jennifer L. Grimmell

_____
DEPUTY CLERK TO THE LOUDOUN
COUNTY BOARD OF SUPERVISORS

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

10. Describe the Applicant's construction plans for the project, including how the Applicant will minimize service disruption to the affected load area. Include requested and approved line outage schedules for affected lines as appropriate.

Response: The Company plans to construct the DTC Loop in a manner that minimizes outage time on Line #2143. Assuming construction commences around August 2022, the cut-in of the lines going to DTC Substation should start around March 2024. The cut-in process will require a PJM outage eDart ticket on the Beaumeade-BECO Line #2143. The line cut-in should only require a 90-day outage. Assuming a final order from the Commission by June 15, 2022, as requested in Section I.H. of this Appendix, the Company estimates that construction of the new Project will commence around August 2022, and be completed by June 15, 2024.

The Company will request this outage from PJM prior to the date of such outages. It is customary for PJM not to grant approval of outages until shortly before the outages are expected to occur and, therefore, it may be subject to change.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

11. Indicate how the construction of this transmission line follows the provisions discussed in Attachment 1 of these Guidelines.

Response: Attachment 1 to these Guidelines provides a tool routinely used by the Company in routing its transmission line projects.

The Company utilized Guideline #1 (existing rights-of-way should be given priority when adding additional facilities) by siting portions of the route for the proposed Project along several existing rights-of-way, including a Loudoun County Water line for 0.7 mile, Russell Branch Parkway for less than 0.1 mile, and Sully Road for 0.2 mile. Collocation numbers for the alternative routes are presented in Section III.D.

The proposed Project will have no impact to any site listed on the National Register of Historic Places ("NRHP"). Thus, it is consistent with Guideline #2 (where practical, rights-of-way should avoid sites listed on the NRHP). A Stage I Pre-Application Analysis prepared by Dutton & Associates on behalf of the Company, which is included with the Environmental Routing Study as Attachment Appendix F, and was submitted to the Virginia Department of Historic Resources ("VDHR") on November 18, 2021.

The Company follows recommended construction methods in the Guidelines on a site-specific basis for typical construction projects (Guidelines #8, #10, #11, #15, #16, #18, and #22).

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

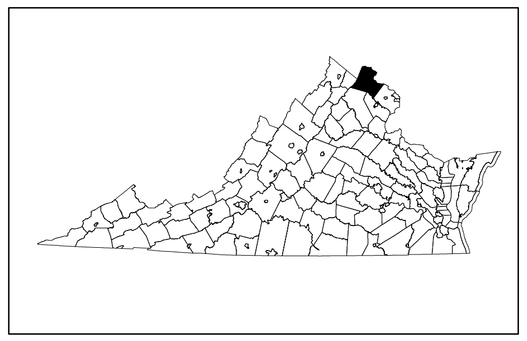
12. a. Detail counties and localities through which the line will pass. If any portion of the line will be located outside of the Applicant's certificated service area: (1) identify each electric utility affected; (2) state whether any affected electric utility objects to such construction; and (3) identify the length of line(s) proposed to be located in the service area of an electric utility other than the Applicant; and

b. Provide three (3) color copies of the Virginia Department of Transportation "General Highway Map" for each county and city through which the line will pass. On the maps show the proposed line and all previously approved and certificated facilities of the Applicant. Also, where the line will be located outside of the Applicant's certificated service area, show the boundaries between the Applicant and each affected electric utility. On each map where the proposed line would be outside of the Applicant's certificated service area, the map must include a signature of an appropriate representative of the affected electric utility indicating that the affected utility is not opposed to the proposed construction within its service area.

Response: a. The proposed Project traverses Loudoun County for a total of 1.30 miles and is located entirely within Dominion Energy Virginia's service territory.

b. An electronic copy of the VDOT "General Highway Map" for Loudoun County has been marked as required and submitted with the Application. A reduced copy of the map is provided as Attachment II.A.12.b.

Loudoun County Road Map



This digital map depicts the Virginia Electric and Power Company ("Company") transmission facilities in this county as approved by the Virginia State Corporation Commission ("SCC"), and any proposed transmission facilities in this county, as of November 23, 2021. Other Company facilities previously authorized by the SCC may be depicted on prior SCC approved county maps.

VIRGINIA ELECTRIC AND POWER COMPANY PLANS TO BUILD TRANSMISSION LINES AND SUBSTATIONS AS SHOWN IN BLACK DASHES ON THIS MAP.

Legend

- Proposed Project
- Under Consideration by SCC
- Number of Lines of Structures/Number of Circuits
- Proposed Substation
- Existing Substation
- 115 kV
- 230 kV
- 500 kV

Provider Service Territory

- NOVEC
- VEPCO

West Virginia

Maryland

Clarke County

Fauquier County

Prince William County

Fairfax County

HAMILTON SUB

BREEZY KNOLL SUB

DRY MILL SOUTH SUB

GOOSE CREEK SUB

PLEASANT VIEW SUB

BELMONT SUB

STONEWATER SUB

ASHBURN SUB

BEAUMEADE SUB

DTC SUB

WAXPOOL SUB

FARMWELL SUB

ENTERPRISE SUB

NIVO SUB

CUMULUS SUB

BECO SUB

BELLHORN ROAD SUB

LOCKRIDGE SUB

PACIFIC SUB

STERLING PARK SUB

DAVIS DRIVE SUB

CABIN RUN SUB

YARDLEY RIDGE SUB

EVERGREEN MILLS SUB

BRAMBLETON SUB

NEW ROAD SUB

MIDDLEBURG SUB

LOUDOUN SUB

MOSBY SUB

POLAND ROAD SUB

WASHINGTON-DULLES INTL AIRPORT

Miles 2 1 0 2 4 6

*VDOT and other road data obtained from Navteq and County data, current as of June 2016.

Loudoun

68

Attachment II.A.12.b

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

1. Detail the number of circuits and their design voltage, initial operational voltage, any anticipated voltage upgrade, and transfer capabilities.

Response: The proposed double circuit 230 kV line will be designed and operated at 230 kV with no anticipated voltage upgrade and have a transfer capability of 1,574 MVA.

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

2. Detail the number, size(s), type(s), coating and typical configurations of conductors. Provide the rationale for the type(s) of conductor(s) to be used.

Response: The proposed double circuit 230 kV line will include 3-phase twin-bundled 768.2 ACSS/TW/HS conductors arranged as shown in Attachments II.B.3.i-ii. The twin-bundled 768.2 ACSS/TW/HS conductors are a Company standard for new 230 kV construction.

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

3. With regard to the proposed supporting structures over each portion of the ROW for the preferred route, provide diagrams (including foundation reveal) and descriptions of all the structure types, to include:

a. mapping that identifies each portion of the preferred route;

b. the rationale for the selection of the structure type;

c. the number of each type of structure and the length of each portion of the ROW;

d. the structure material and rationale for the selection of such material;

e. the foundation material;

f. the average width at cross arms;

g. the average width at the base;

h. the maximum, minimum and average structure heights;

i. the average span length; and

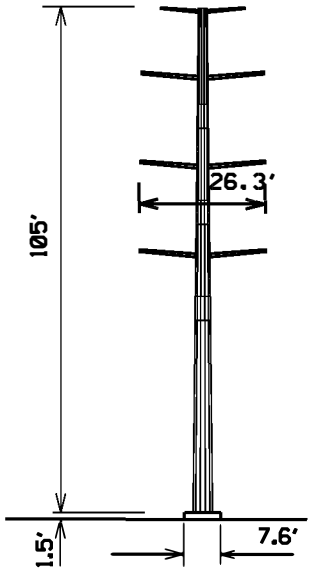
j. the minimum conductor-to-ground clearances under maximum operating conditions.

Response: See Attachments II.B.3.i-ii.

See Attachment II.B.3.iii for approximate mapping of the proposed structures along the Proposed Route, which is subject to change during final engineering.

DOUBLE CIRCUIT DOUBLE DEADEND STEEL POLE

PRELIMINARY



PROPOSED STRUCTURES

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

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

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

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

e. FOUNDATION MATERIAL: CONCRETE

F. AVERAGE WIDTH AT CROSSARM: 26.3'

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

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

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

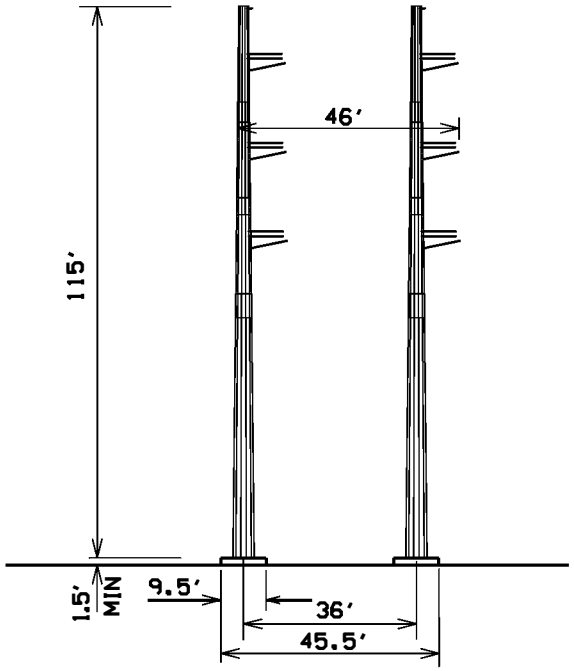
j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS: 22.5'

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

$DGNSPEC$

DOUBLE CIRCUIT DOUBLE DEADEND STEEL 2-POLE

PRELIMINARY



PROPOSED STRUCTURES

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

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

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

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

e. FOUNDATION MATERIAL: CONCRETE

F. AVERAGE WIDTH AT CROSSARM: 46'

G. AVERAGE WIDTH AT BASE: 45.5'

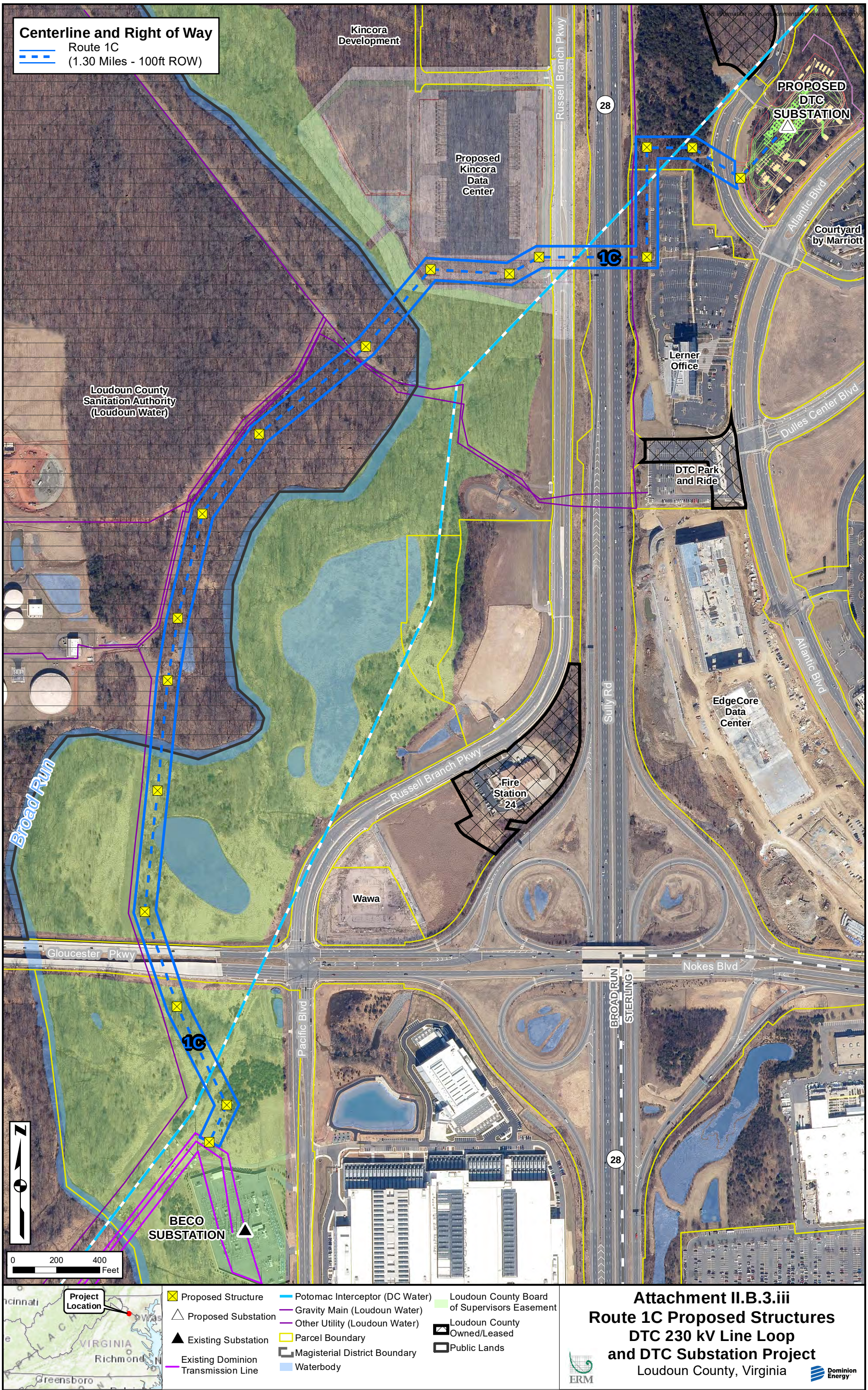
H. MAX. MIN. AND AVERAGE STRUCTURE HEIGHTS: 120 FEET, 110', AND 115'
(DOES NOT INCLUDE FOUNDATION REVEAL)

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

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

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

$DGNSPEC$



Attachment II.B.3.iii
Route 1C Proposed Structures
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia

ERM

Dominion Energy

MPLS M:\Clients\D-F\DOM\DTC\ArcGIS\2021\09\SCC_DOM_DTC_SCC_Att_II_B_3_iii_20211111.mxd | REVISED: 11/11/2021 | SCALE: 1:4,800 when printed at 11x17 DRAWN BY: 0239

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

4. With regard to the proposed supporting structures for all feasible alternate routes, provide the maximum, minimum and average structure heights with respect to the whole route.

Response: The approximate structure heights along the Proposed and Alternative Routes are provided in the table below, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

Route	Minimum (ft.)	Maximum (ft.)	Average (ft.)
Overhead Alternative Route 1A	90	120	105
Overhead Alternative Route 1B	90	120	106
Overhead Route 1C (Proposed Route)	90	120	106

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

5. For lines being rebuilt, provide mapping showing existing and proposed structure heights for each individual structure within the ROW, as proposed in the application.

Response: Not applicable.

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

6. Provide photographs for [a] typical existing facilities to be removed, [b] comparable photographs or representations for proposed structures, and [c] visual simulations showing the appearance of all planned transmission structures at identified historic locations within one mile of the proposed centerline and in key locations identified by the Applicant.

Response: [a] Not applicable. There are no existing structures proposed for removal pursuant to the Project.

[b] See Attachment II.B.6.b for representative photographs of the proposed structures.

[c] Visual simulations showing the appearance of the proposed transmission structures at identified historic locations within 1.0 mile of the proposed Project centerline of the Proposed Route are provided. See Attachment II.B.6.c for a map of the simulation location, the existing views at the historic property, and simulated proposed views. These simulations were created using GIS modeling to depict whether the proposed structures will be visible from the identified historic property. The historic property evaluated is described below. See also the Stage I Pre-Application Analysis Report contained in Appendix F of the Environmental Routing Study.

There is one NRHP-listed property located within 1-mile of the proposed Project: Broad Run Bridge and Toll House/VDHR# 053-0110. Inspection from the NRHP-listed resource found that it is set within a rapidly developing suburban area with large-scale commercial and industrial properties in the vicinity. Coupled with transportation network and vegetation patterns, it is anticipated that all of the Project route alternatives will be completely screened from view from the resource, which is supported by photo simulation of the nearest alternative (Overhead Alternative 1A).

See Attachment III.B.4 for visual simulations of key locations evaluated.

230 kV Double Circuit Double Deadend Steel 2-Pole Structure

230 kV Double Circuit
Double Deadend Steel Pole

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350

Location:
Broad Run Toll Keepers House

Project:
DTC 230kV Line Loop and DTC Substation

Structure	Distance (ft)	Height (ft)
New 1	7893	100.0
New 2	7734	100.0
New 3	7328	110.0
New 4	6928	110.0
New 5	6354	100.0
New 6	5874	90.0
New 7	5580	90.0
New 8	5092	95.0

Structure	Distance (ft)	Height (ft)
New 9	4677	90.0
New 10	4412	90.0
New 11	4081	90.0
New 12	3871	95.0
New 13	3873	110.0
New 14	3270	120.0
New 15	3412	120.0
New 16	3565	110.0

Broad Run Bridge and Tollkeepers House Photo Simulation – Simulation location, direction of view, and structures modeled on Route 1A. Source: GTTE, LLC

Photo simulations prepared by: GTTE LLC email: info@gttellc.com 703 447 1350	**Project:** DTC 230kV Line Loop and DTC Substation	**Location:** Broad Run Toll Keepers House	**Existing View**	0 1" 2" 3" 4"
	Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.		This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.	

Broad Run Bridge and Tollkeepers House Photo Simulation – Existing view towards Route 1A (roughly 0.57 mile away). Source: GTTE, LLC

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350

Project: DTC 230kV Line Loop and DTC Substation

Location: Broad Run Toll Keepers House

Proposed View
(Location of towers not visible are overlaid with yellow tower icon)

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Broad Run Bridge and Tollkeepers House Photo Simulation – Proposed view towards Route 1A (Roughly 0.57 miles away - Structures not visible- shown in yellow). Source: GTTE, LLC

II. DESCRIPTION OF THE PROPOSED PROJECT

C. Describe and furnish plan drawings of all new substations, switching stations, and other ground facilities associated with the proposed project. Include size, acreage, and bus configurations. Describe substation expansion capability and plans. Provide one-line diagrams for each.

Response: The proposed Project requires construction of the new 230-34.5 kV DTC Substation in Loudoun County, Virginia. Additionally, the line protection will be upgraded at the Company's existing BECO and Beaumeade Substations.

The proposed DTC Substation initially will be constructed with four 230 kV breakers in a ring bus arrangement, five 230-34.5 kV transformers (two 112 MVA and three 84 MVA), twelve 34.5 kV distribution circuits, and other associated equipment. In total, it will be designed to accommodate future growth in the area with a build-out of six 230 kV breakers in a ring bus arrangement, and up to twenty-five 34.5 kV distribution circuits. The total area required to build the Substation is approximately 8.2 acres.

The one-line and general arrangement diagrams for the proposed DTC Substation are provided as Attachment II.C.1 and Attachment II.C.2, respectively.

Additionally, protection upgrades will be required at the Company's existing BECO and Beaumeade Substations (the two ends of existing Line #2143). The line protective relays currently located inside the BECO and Beaumeade Substations' Control Enclosures will be replaced with new standard relays to be compatible with relays being installed at the new DTC Substation.

ATTACHMENT II.C 1

LEGEND

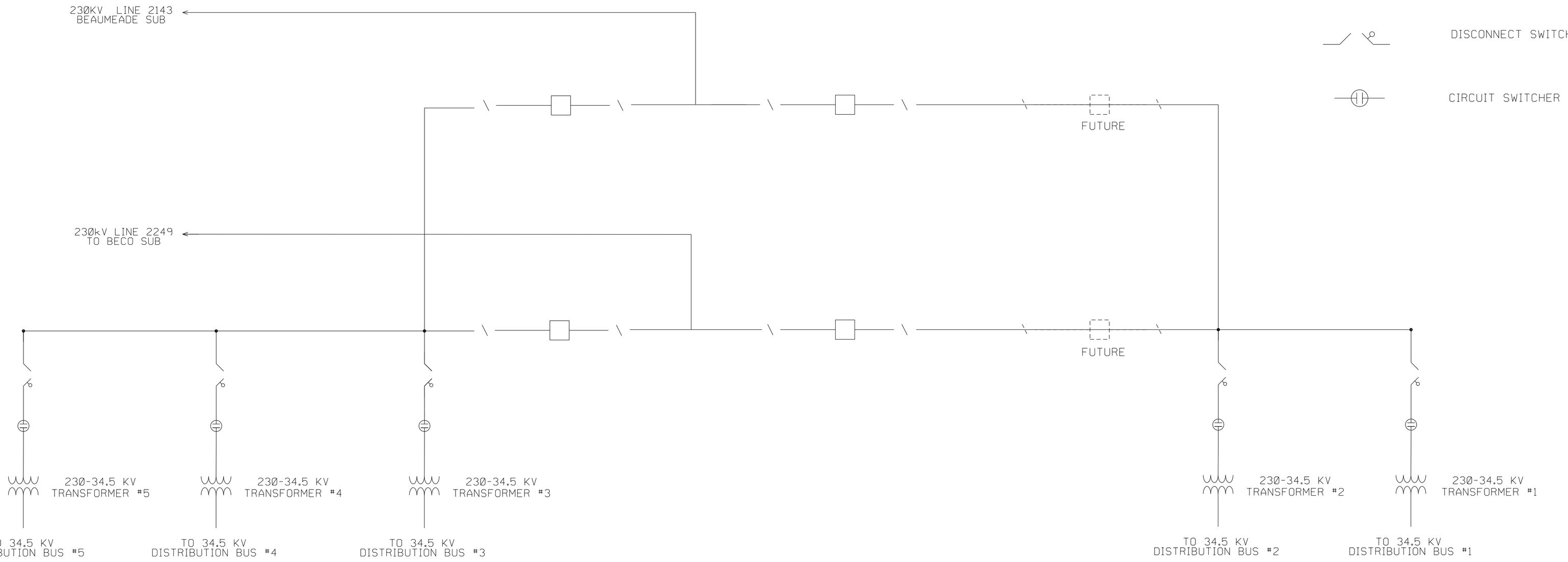
CIRCUIT BREAKER

POWER TREANSFOREMR

DISCONNECT SWITCH

DISCONNECT SWITCH WITH MOTOR OPERATOR

CIRCUIT SWITCHER



PRELIMINARY
NOT FOR CONSTRUCTION

By	Approval	Revisions
Issue		
Project No.		
BM No.		
Description		

Dominion Energy

One Line Diagram

Drawn By:	Date	Substation DTC
Approval	Date	Drawing No.

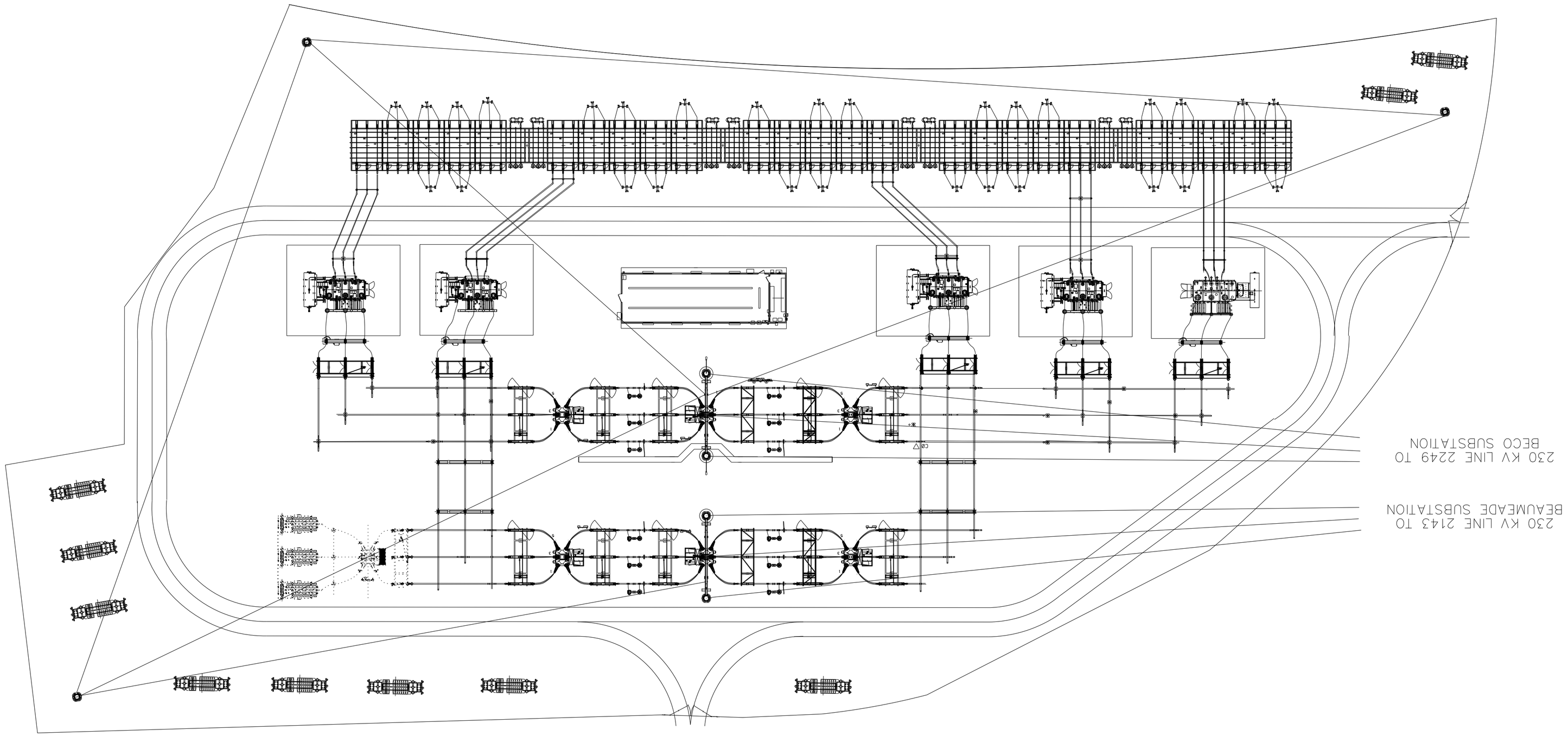
84

Attachment II.C.1

USERNAME

Attachment II.C.2

PRELIMINARY
NOT FOR CONSTRUCTION



ATTACHMENT II.C 2

Dominion Energy	ULTIMATE GENERAL ARRANGEMENT DTC SUBSTATION LOUDOUN COUNTY, VIRGINIA			
	Name	Date	Project No.	Sheet No.
Designed by:	SB	09/30/21		
Approvals			Scale	1 OF 1
Approvals				
Approvals			B/M No.	Revisions

Cad File Name	Drawing No.
PLOTTED: $$$$$$$$$$SYSTIME	GEN ARR

$$FILENAME$$
PLOTTED: $$$$$$$$$$SYSTIME
$$USERNAME

$USERNAME	Typical Drawing Information	Library Location	Cell Name	B/M Assembly	Pipe Stand Foundation Cells (Pier)	Pipe Stand Foundation Cells (Spread)	Foundation Cells for Other Typical Structures (Pier) (Spread)	Steel Detail & Assembly

Revisions					
No.	Date	By	Description	Project Number B/M	Checked/Appr.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

A. Describe the character of the area that will be traversed by this line, including land use, wetlands, etc. Provide the number of dwellings within 500 feet, 250 feet and 100 feet of the centerline, and within the ROW for each route considered. Provide the estimated amount of farmland and forestland within the ROW that the proposed project would impact.

Response: **Proposed Route (Overhead Route 1C)**

Land Use

The Proposed Route traverses approximately 1.30 miles through Loudoun County in an area that is largely characterized by industrial and commercial development, undeveloped forested areas planned for data center and commercial development, the Loudoun Water Ashburn Campus, and VDOT rights-of-way. The area is surrounded by existing data centers, scattered light industrial and other business/commercial land use.

Dwellings

According to the Loudoun County GIS parcel and zoning data and aerial photo analysis, there are no dwellings located within 500 feet, 250 feet, or 100 feet or within the right-of-way of the Proposed Route.

Farmland/Forest

A review of Natural Resources Conservation Service Data ("NRCS") soils data indicates that approximately 1.40 acres of the footprint of the Proposed Route are classified as prime farmland, 3.60 acres of prime farmland with mitigation (flood protection), and 10.36 acres are classified as farmland of statewide importance. According to a review of recent 2021 aerial photography, there is no land being used for agricultural purposes within or near the right-of-way of the Proposed Route. The Proposed Route parallels an existing right-of-way for a Loudoun Water utility line for about 0.7 mile that is regularly maintained to keep vegetation at the emergent and scrub-shrub level for the safe operation of the existing facilities. About 14.08 acres of existing forestland will be impacted by the construction of the Proposed Route. See Attachment III.A.1.

Wetlands

Based on an analysis of the U.S. Geological Survey ("USGS") 7.5-minute current (2014-2017) and historic (1988-2012) topographic mapping, USGS National Hydrography Dataset ("NHD"), Loudoun County Hydrology (water feature lines) and Hydrology (water feature polygons) Datasets (Loudoun County Streams), and Loudoun County Wetlands (wetland feature polygons) Dataset (Loudoun County Wetlands), the Proposed Route crosses Broad Run, a perennial waterbody, in two

locations. Approximately 0.57 acre of emergent wetlands, 2.02 acres of forested wetlands, and 0.37 acre of riverine wetlands occur within the right-of-way of the Proposed Route. Of these, 0.03 acre of forested wetlands are within the footprint of the proposed DTC Substation.

Historic Features

A review of the VDHR Virginia Cultural Resource Information System ("VCRIS") indicates that two previously recorded archaeological sites (44LD0107 and 44LD0727) fall within or adjacent to the rights-of-way for the Proposed Route and Overhead Alternatives 1A and 1B (see Table 1 below). Neither have been listed as eligible for consideration by the VDHR. Because a formal archaeological survey has not been conducted as part of this Project, impacts have not yet been fully determined; however, it is anticipated that these sites will be spanned and no impacts are likely.

One resource defined in accordance with VDHR Guidelines is associated with the Proposed Route and Overhead Alternative Routes 1A and 1B. The Broad Run Bridge and Toll House (053-0110) is a circa 1820 stone building with later frame additions that served as a toll house for an adjacent bridge that historically carried the Leesburg Turnpike over Broad Run. All that remains of the bridge are stone abutments on either side of Broad Run. The landscape between the resource and the routes is undulating, with undeveloped portions remaining thickly wooded. However, there has been extensive development between the resource and the study routes, including several transportation networks, a large campus of the Virginia Cooperative Extension, and townhouses. Due to this extensive development, and topography, it is anticipated that there would be no visibility of any of the routes from the Broad Run Bridge and Toll House (053-0110), nor any publicly accessible locations in the immediate vicinity. See Appendix F of the Environmental Routing Study for additional information on this resource.

Table 1. Previously recorded cultural resources within their respective tiered buffer zones for the DTC 230 kV Transmission Line Project as specified in the VDHR Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia

Buffer (miles)	Considered Resources	VDHR #	Description
1.5	National Historic Landmarks	None	None
1.0	National Register-Listed	053-0110	Broad Run Bridge and Toll House
	Battlefields	None	None
	Historic Landscapes	None	None

Buffer (miles)	Considered Resources	VDHR #	Description
0.5	National Register-Listed	None	None
	Battlefields	None	None
	Historic Landscapes	None	None
	National Register-Eligible	None	None
0.0 (ROW)	National Register-Listed	None	None
	Battlefields	None	None
	Historic Landscapes	None	None
	National Register-Eligible	None	None
	Archaeology Sites	44LD0107	Woodland Site (DHR: Not Eligible)
		44LD0727	Prehistoric Camp (DHR: Not Eligible)

Wildlife

The U.S. Fish and Wildlife Service ("FWS") Information for Planning and Consultation IPaC ("IPaC") database query identified two federally listed species: northern long-eared bat (*Myotis septentrionalis*) and dwarf wedgemussel (*Alasmidonta heterodon*) that may potentially occur within the Project area, however, neither have confirmed occurrences. The Virginia Department of Conservation and Recreation ("DCR") and Virginia Department of Wildlife Resources ("DWR") database queries identified 13 state-listed species (which includes the 2 federally listed species previously mentioned) and one additional federally listed species (yellow lance [*Elliptio lanceolate*]) that have the potential to occur within 2 miles of the geographic center of the natural resources Project area. The ten state-only listed species include: little brown bat (*Myotis lucifugus*), tri-colored bat (*Perimyotis subflavus*), brook floater *(Alasmidonta varicosa*), green floater (*Lasmigona subviridis*), Appalachian grizzled skipper (*Pyrgus centaureae Wyandot*), wood turtle (*Glyptemys insculpta*), Henslow's sparrow (*Ammodramus henslowii*), loggerhead shrike (*Lanius ludovicianus*), migrant loggerhead shrike, (*Lanius ludovicianus migrans*), and peregrine falcon (*Falco peregrinus*).

Of the 13 species identified, only the Wood turtle has been historically documented by state agencies in areas adjacent to or crossed by any of the routes.

Based on landscape and vegetation within the Project area, each route alternative crosses a variety of potential habitat types. These habitats include forested land, shrub land, grass land, and waterbodies with intermittent and perennial stream flow. Within the Proposed Route and Overhead Alternative Routes 1A and 1B, these habitat types each could have potential to provide suitable habitat for one or more of the species listed above.

No instream work will be performed for the Project, however forested floodplains will be cleared during construction. Dominion Energy Virginia will coordinate

with state and federal agencies as needed to determine if any surveys, construction-timing windows, or other mitigation would be required for the Project.

Overhead Alternative Route 1A

Land Use

Overhead Alternative Route 1A traverses approximately 1.31 miles through Loudoun County in an area that is largely characterized by industrial and commercial development, undeveloped forested areas planned for data center and commercial development, the Loudoun Water Ashburn Campus, and VDOT rights-of-way. The area is surrounded by existing data centers, scattered light industrial and other business/commercial land use.

Dwellings

According to the Loudoun County GIS parcel and zoning data and aerial photo analysis, there are no dwellings located within 500 feet, 250 feet, or 100 feet or within the right-of-way of the Overhead Alternative Route 1A.

Farmland/Forest

A review of NRCS soils data indicates that approximately 1.40 acres of the footprint of Overhead Alternative Route 1A are classified as prime farmland, 3.60 acres of prime farmland with mitigation (flood protection), and 10.44 acres are classified as farmland of statewide importance. According to a review of recent 2021 aerial photography, there is no land being used for agricultural purposes within or near the right-of-way of the Overhead Alternative 1A. The route parallels an existing right-of-way for a Loudoun Water utility line for about 0.7 mile that is regularly maintained to keep vegetation at the emergent and scrub-shrub level for the safe operation of the existing facilities. About 14.22 acres of existing forestland will be impacted by the construction of the Overhead Alternative 1A. See Attachment III.A.1.

Wetlands

Impacts on wetlands would be the same for Overhead Alternative Route 1A as those for the Proposed Route discussed above.

Historic Features

Impacts on historic features would be the same for Overhead Alternative Route 1A as those for the Proposed Route discussed above.

Wildlife

Impacts on wildlife would be the same for Overhead Alternative Route 1A as those for the Proposed Route discussed above.

Overhead Alternative Route 1B

Land Use

The Overhead Alternative Route 1B traverses approximately 1.31 miles through Loudoun County in an area that is largely characterized by industrial and commercial development, undeveloped forested areas planned for data center and commercial development, the Loudoun Water Ashburn Campus, and VDOT rights-of-way. The area is surrounded by existing data centers, scattered light industrial and other business/commercial land use.

Dwellings

According to the Loudoun County GIS parcel and zoning data and aerial photo analysis, there are no dwellings located within 500 feet, 250 feet, or 100 feet or within the right-of-way of Overhead Alternative Route 1B.

Farmland/Forest

A review of NRCS soils data indicates that approximately 1.40 acres of the footprint of the Overhead Alternative Route 1B are classified as prime farmland, 3.60 acres of prime farmland with mitigation (flood protection), and 10.44 acres are classified as farmland of statewide importance. According to a review of recent 2021 aerial photography, there is no land being used for agricultural purposes within or near the right-of-way of Overhead Alternative Route 1B. The route parallels an existing right-of-way for a Loudoun Water utility line for about 0.7 mile that is regularly maintained to keep vegetation at the emergent and scrub-shrub level for the safe operation of the existing facilities. About 14.18 acres of existing forestland will be impacted by the construction of Overhead Alternative Route 1B. See Attachment III.A.1.

Wetlands

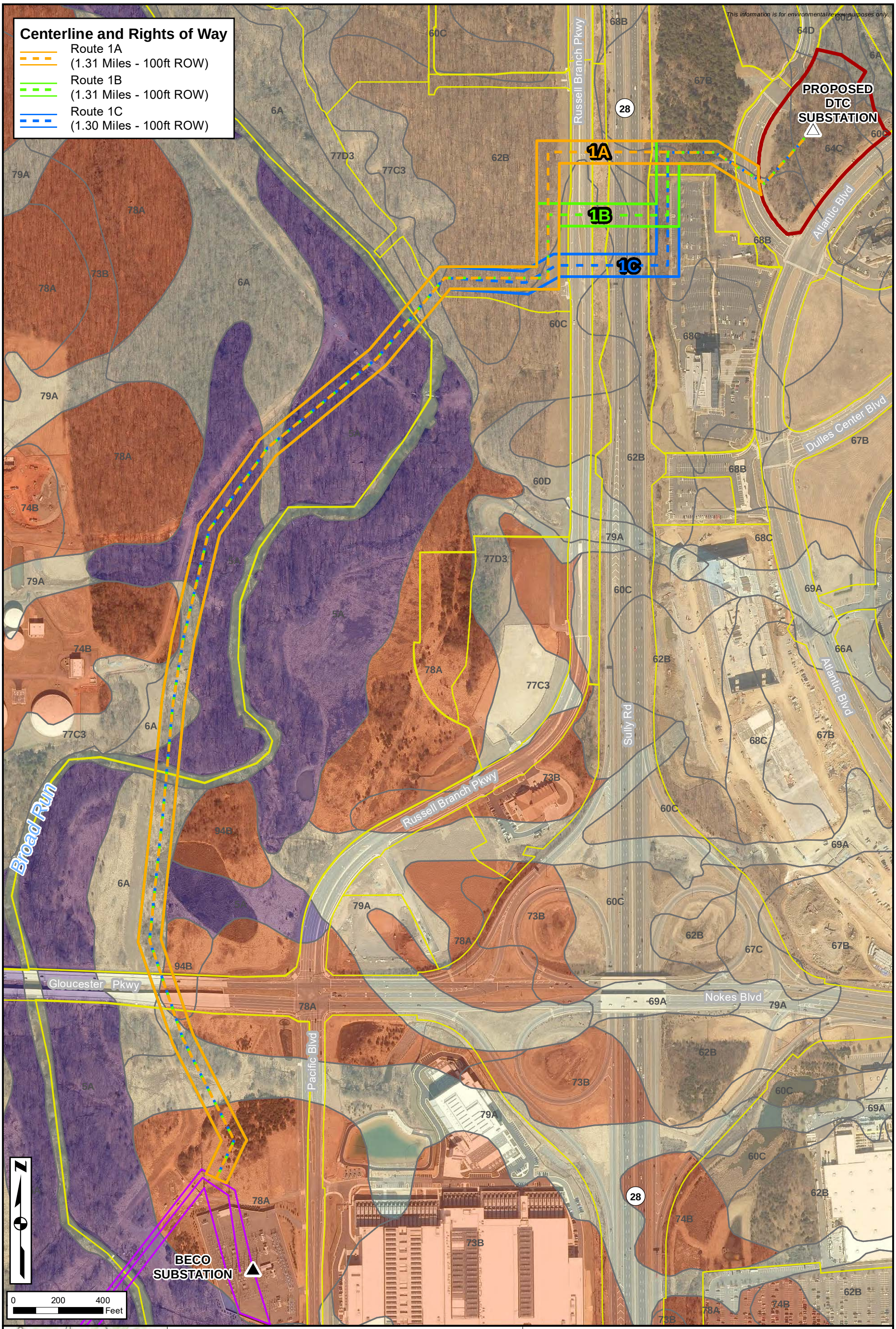
Impacts on wetlands would be the same for Overhead Alternative Route 1B as those for the Proposed Route discussed above.

Historic Features

Impacts on historic features would be the same for Overhead Alternative Route 1B as those for the Proposed Route discussed above.

Wildlife

Impacts on wildlife would be the same for Overhead Alternative Route 1B as those for the Proposed Route discussed above.


Centerline and Rights of Way
Route 1A
(1.31 Miles - 100ft ROW)
Route 1B
(1.31 Miles - 100ft ROW)
Route 1C
(1.30 Miles - 100ft ROW)
This information is for environmental review purposes only.
PROPOSED DTC SUBSTATION
1A
1B
1C
Russell Branch Pkwy
Atlantic Blvd
Dulles Center Blvd
Sully Rd
Broad Run
Gloucester Pkwy
Nokes Blvd
Pacific Blvd
BECO SUBSTATION
28
0 200 400 Feet
N
Project Location
VIRGINIA
Richmond
Greensboro
Proposed Substation
Existing Substation
Existing Dominion Transmission Line
DTC Substation
Parcel Boundary
SSURGO Soils Farmland Class
All areas are prime farmland
Prime farmland if protected from flooding
Farmland of statewide importance
Not prime farmland
Attachment III.A.1
Prime Farmland and Farmland of Statewide Importance
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia
ERM
Dominion Energy
MPLS M:\Clients\D-F\DOM\DTC\ArcGIS\2021\09\SCC_DOM_DTC_SCC_Att_III_A_1_20211111.mxd | REVISED: 11/11/2021 | SCALE: 1:4,800 when printed at 11x17
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III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

B. Describe any public meetings the Applicant has had with neighborhood associations and/or officials of local, state or federal governments that would have an interest or responsibility with respect to the affected area or areas.

Response: Beginning in May 2021, the Company has engaged with the Loudoun County staff regarding the proposed Project, including the following.

- In May 2021, Company representatives approached the Loudoun County staff to discuss siting the right-of-way near Broad Run.
- In June 2021, the Company held a follow-up meeting with Loudoun County staff to discuss the route near Broad Run and constraints in the Project area.
- In July 2021, the Loudoun County BOS voted to authorize a public hearing that would amend the existing Loudoun County BOS easement on Kincora property for the specific purpose to allow a transmission right-of-way within it.
- The Loudoun County Board of Supervisors held a public hearing on this matter on November 10, 2021. See Attachment II.A.9.

In June 2021, the Company launched an internet website dedicated to the proposed Project: www.dominionenergy.com/DTC. The website includes a description and benefits of the proposed Project, an explanation of need, route map, photo simulations, a recording of the virtual open house meeting, and information on the Commission review process.

In November 2021, the Company sent project announcement postcards to approximately 25 property owners and residents, including a first postcard sent to those owners and residents within 500 feet of the Project and a second to those within 1,000 feet of the Project. Each postcard included information about the need for the Project and an overview map. The postcards also advised that due to COVID-19, the Company would not host a traditional in-person open house event, but would host a virtual community meeting. In addition, the communication indicated that detailed materials would be posted to the dedicated Project website and how to contact the Project team to provide any feedback or questions. Templates of the postcards and map are included as Attachment III.B.1.

Newspaper print advertisements regarding the project and virtual open house were placed in Loudoun Now and Loudon Local Living (Washington Post). A copy of the advertisement placed in the Loudoun papers is included as Attachment III.B.2.

Additionally, from November 12, 2021 to November 18, 2021, the Company used paid digital and social media campaigns to drive awareness and educate the public

regarding the Company's Project and the virtual open house meeting . A copy of those digital advertisements are included as Attachment III.B.3. The event campaigns ran within Google AdWords, Google Display, Google Video, Facebook and Twitter. All phases urged local residents to visit the www.dominionenergy.com/DTC website to learn more about the meeting and to participate virtually. Campaign results include 960,911 Impressions Delivered, .58% Click Thru Rate, 2,330 Link Clicks and 13,983 ad engagements, including reactions, likes, comments, shares and saves.

A virtual open house was held on November 18, 2021, at 5:00 p.m. At the virtual open house, the Company made available details about construction, project timing, and the Commission approval process. Traditional open house materials have been posted on the website for the proposed Project, including simulations of the proposed Project from key locations. The key location simulations are included as Attachment III.B.4.

In addition, the Company researched the demographics of the surrounding communities using the U.S. Environmental Protection Agency ("EPA") environmental justice mapping and screening tool, EJSCREEN, and census data from the U.S. Census Bureau 2014–2018 American Community Survey to determine that there are 17 Census Block Groups ("CBGs") within the Project area that fall within a mile of the proposed transmission line, two of which would be crossed by the Project. A review of minority, income, and education census data identified populations within the study area that meet the EPA-defined threshold for Environmental Justice protections ("EJ Communities").

Of the 17 CBGs within the analysis area, 15 CBGs within 1 mile of the Project have at least one race or ethnic group, or a cumulative "total minority" population, that meets the definition for a community of color. The most common race or ethnic group identified in the study area is Asian, Non-Hispanic. Among the 15 CBGs, all 15 contain above-average Asian populations, five contain above-average Hispanic populations, five contain populations of more than one race, two contain above-average African American populations, and one contains an above-average Native American or Alaska Native population.

Of the 17 CBGs within the analysis area, 2 CBGs within 1 mile of the Project have low-income populations greater than or equal to the 30% threshold for low-income populations identified by the Commonwealth. Additionally, one CBG within 1 mile of the Project met both the minority and low-income definitions. No CBGs with low-income populations, or both minority and low- income populations, that exceed Commonwealth average are crossed by the routes.

Of the 17 CBGs within the analysis area, 1 has a population of 98% over age 64. This CBG is home to the Ashby Ponds Senior Living Community. The 1,600 persons residing in this community account for the larger, over age 64 population in the CBG that is crossed by the Project.

During operation, the long-term presence of new structures along overhead routes are not expected to result in disproportionately high or adverse impacts on EJ populations because they cross primarily developed areas, commercial/industrial land, and existing road rights-of-way rather than visually sensitive areas.

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

As discussed in more detail in Section IV.B, scientific evidence does not show that common sources of EMF in the environment, including transmission lines and other parts of the electric system, are a cause of any adverse health effects. As such, the impacts of constructing and operating any of the proposed alternatives on the natural and human environments are not anticipated to be significant.

Based on the analysis of the Project, the Company does not anticipate disproportionately high or adverse impacts to the surrounding community and the EJ Communities located within the study area, consistent with the Project design to reasonably minimize such impacts. See Sections 3.1.10 and 4.1.7 of the Environmental Routing Study for the results of the Company's EJ analysis.

In addition to its evaluation of impacts, the Company has and will continue to engage the EJ Communities in a manner that allows them to meaningfully participate in the Project development and approval process so that the Company can take their views and input into consideration. See Attachment III.B.5 for a copy of the Company's Environmental Justice Policy.

Investing in Our Communities

Dominion Energy image. Not project specific.

Electric Transmission
P.O. Box 26666
Richmond, VA 23261

Dominion Energy®

Actions Speak Louder

YOU'RE INVITED TO A VIRTUAL COMMUNITY MEETING

DETAILS ENCLOSED

NAME
ADDRESS

IMPORTANT

Local Power Line Project Information

Use your iPhone camera or the QR reader app on other smartphones to visit the project page on our website.

BECO to DTC 230 kV Electric Transmission Project

AT DOMINION ENERGY, we are committed to continually reviewing and analyzing our energy infrastructure to provide safe, reliable, and affordable electricity to our neighbors. You are receiving this postcard because we are currently preparing to build a new DTC Substation off Atlantic Boulevard near Route 28 in Loudoun County, Virginia. We are also planning to build a new 230 kilovolt (kV) electric transmission line and one of the options is to connect the new substation to our existing BECO Substation.

Rapid growth in electrical demand, particularly in the commercial/high-tech sector in Loudoun County, has resulted in the need for this project. Our work will help improve electric reliability for all customers in the region.

We invite you to participate in a virtual community meeting Nov.18, 2021 to learn more about this project, our construction plans, and meet our team.

Please know that we are dedicated to working safely and courteously in your community and we will continue to keep you updated on our progress.

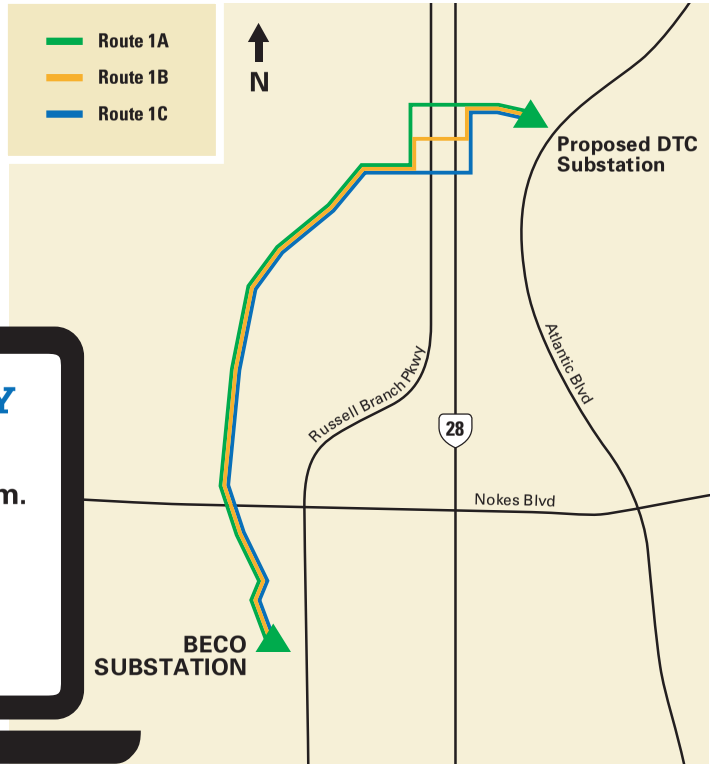
At Dominion Energy, we know many of our customers are facing challenges due to the COVID-19 pandemic. We're here to help. In accordance with the law recently passed in Virginia, we're offering flexible payment arrangements up to 24 months. To set up a payment plan, or view additional assistance options, please visit DominionEnergy.com or call 1-866-366-4357.

VIRTUAL COMMUNITY MEETING

Thursday, Nov. 18, 2021 • 5–6 p.m.
Live Via Webex Events

First 20 minutes will be a project overview presentation.

Visit DominionEnergy.com/dtc for more information.



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

CONTACT US — Visit DominionEnergy.com/dtc for project updates. Or contact us by calling 888-291-0190 or sending an email to powerline@dominionenergy.com.

Investing in Our Communities

Dominion Energy image. Not project specific.

Electric Transmission
P.O. Box 26666
Richmond, VA 23261

Dominion Energy®

Actions Speak Louder

YOU'RE INVITED TO A VIRTUAL COMMUNITY MEETING

DETAILS ENCLOSED

NAME
ADDRESS

IMPORTANT

Local Power Line Project Information

Use your iPhone camera or the QR reader app on other smartphones to visit the project page on our website.

BECO to DTC 230 kV Electric Transmission Project

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We invite you to participate in a virtual community meeting Nov.18, 2021 to learn more about this project, our construction plans, and meet our team.

Please know that we are dedicated to working safely and courteously in your community and we will continue to keep you updated on our progress.

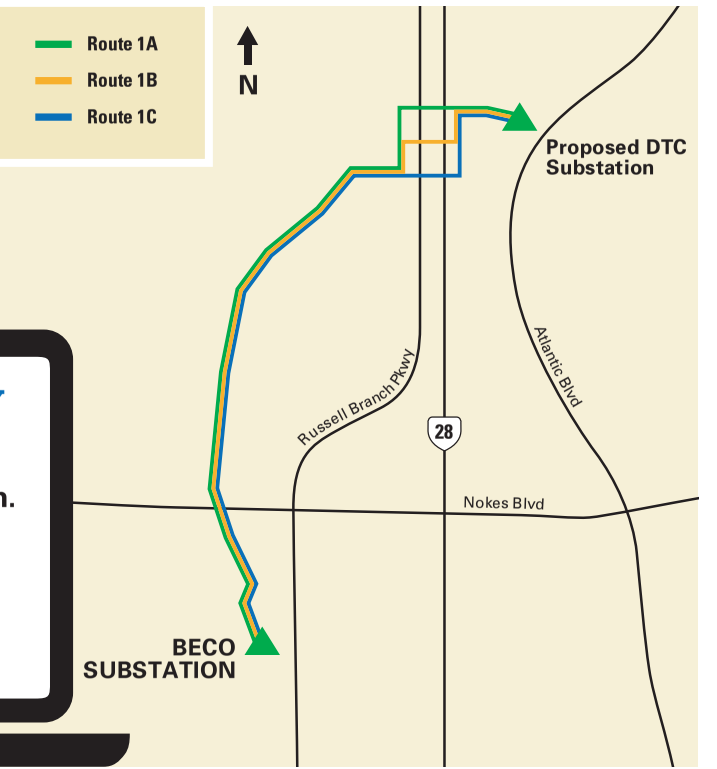
At Dominion Energy, we know many of our customers are facing challenges due to the COVID-19 pandemic. We're here to help. In accordance with the law recently passed in Virginia, we're offering flexible payment arrangements up to 24 months. To set up a payment plan, or view additional assistance options, please visit DominionEnergy.com or call 1-866-366-4357.

VIRTUAL COMMUNITY MEETING

Thursday, Nov. 18, 2021 • 5–6 p.m.
Live Via Webex Events

First 20 minutes will be a project overview presentation.

Visit DominionEnergy.com/dtc for more information.

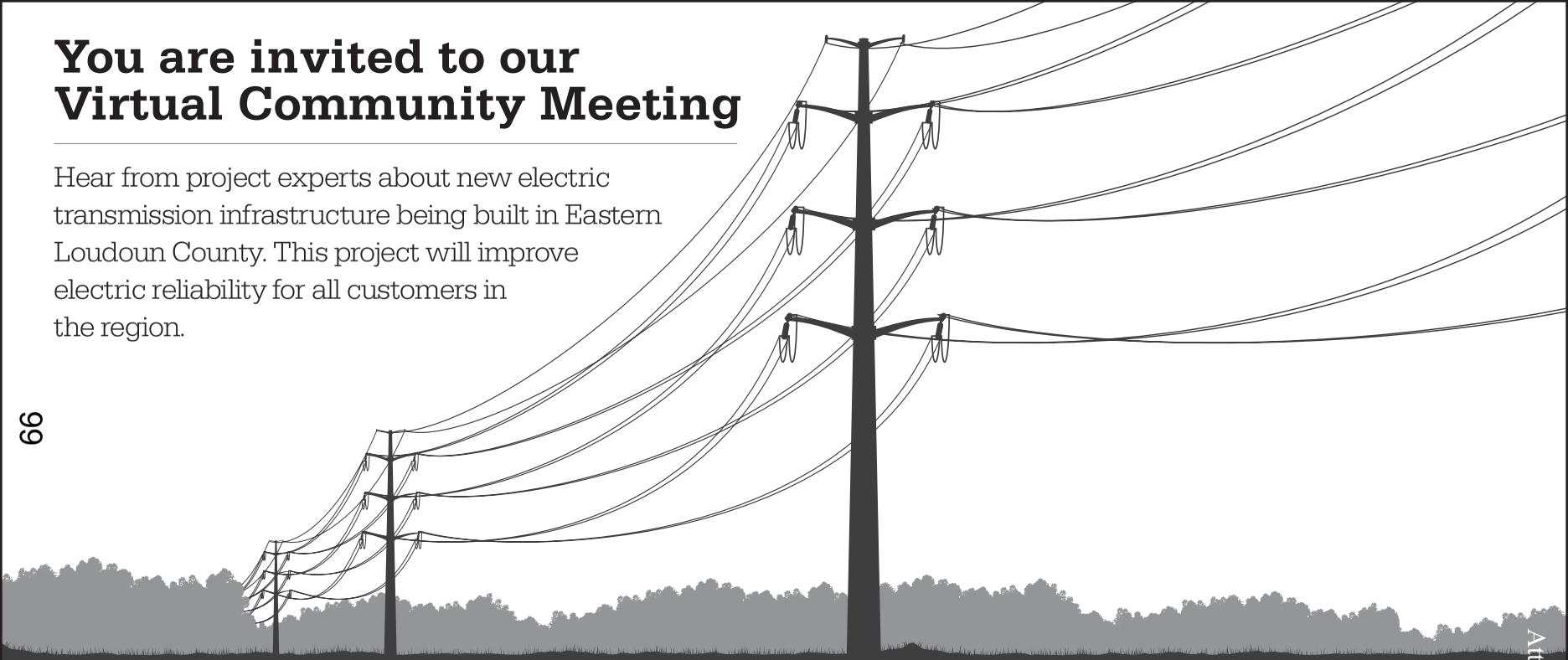


This map is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

CONTACT US — Visit DominionEnergy.com/dtc for project updates. Or contact us by calling 888-291-0190 or sending an email to powerline@dominionenergy.com.

You are invited to our Virtual Community Meeting

Hear from project experts about new electric transmission infrastructure being built in Eastern Loudoun County. This project will improve electric reliability for all customers in the region.



Use your phone's camera or QR reader app to visit the project page directly.

Join us live online on Thursday, November 18 at 5 p.m.

You can find event details at DominionEnergy.com/dtc

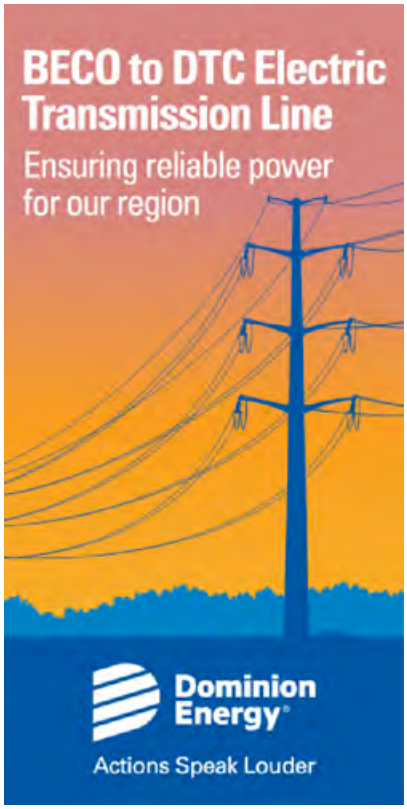
Dominion Energy®

Actions Speak Louder

charles ryan associates

Dominion Energy
Electric Transmission

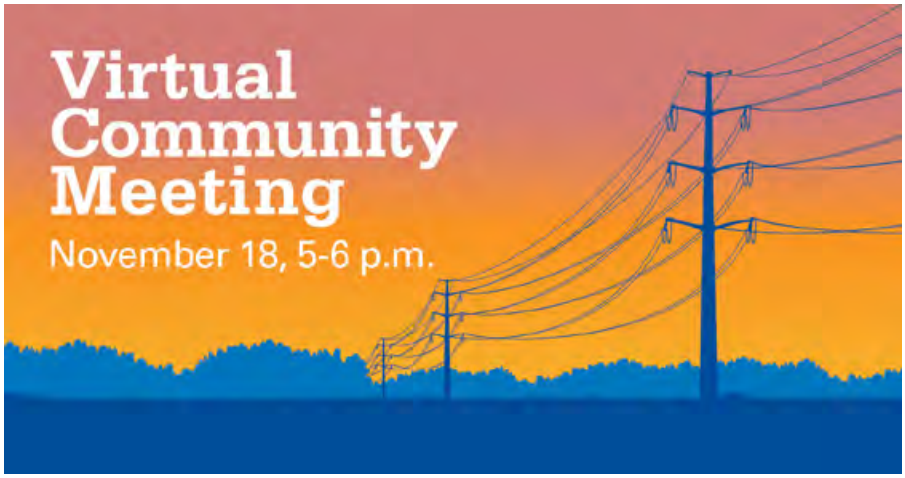
DTC Awareness Display



Dominion Energy Electric Transmission

DTC Nextdoor Imagery

Event Post Image:



Awareness Post Image:

DTC

Substation and 230 kV Transmission Project

Dulles Town Center Mall

Atlantic Blvd

Russell Branch Pkwy

28

Sully Rd

Kincora Fire & Rescue Station Co 24/35

Lowe's

Loudoun County Water

102

Gloucester Pkwy

28

Data Center

Broad Run

Pacific Blvd

Beco Substation

N

Dominion Energy®

Existing Conditions

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

Attachment III.B.4

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

Route 1A

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

DTC

Substation and 230 kV Transmission Project

Proposed Conditions 1A

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DTC

Substation and 230 kV Transmission Project

Dominion Energy®

Route 1B

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

DTC

Substation and 230 kV Transmission Project

Proposed DTC Substation

Dulles Town Center Mall

Russell Branch Pkwy

28

Atlantic Blvd

Sully Rd

Kincora Fire & Rescue Station Co 24/35

Lowe's

Loudoun County Water

106

Gloucester Pkwy

Broad Run

Data Center

28

Pacific Blvd

Beco Substation

N

Dominion Energy®

Proposed Conditions 1B

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

DTC

Substation and 230 kV Transmission Project

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

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DTC

Substation and 230 kV Transmission Project

Proposed Conditions 1C

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

Dominion Energy®

DTC

Substation and 230 kV Transmission Project

W&OD Trail

28

Lowe's

Atlantic Blvd

Data Center

Pacific Blvd

Beco Substation

Dulles Town Center Mall

Gloucester Pkwy

Kincora Fire & Rescue Station Co 24/35

Broad Run

Sully Rd

Loudoun County Water

N

28

Russell Branch Pkwy

Dominion Energy®

Existing Conditions

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

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

Route 1A

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

DTC

Substation and 230 kV Transmission Project

W&OD Trail

Atlantic Blvd

Lowe's

28

Data Center

Beco Substation

Dulles Town Center Mall

Pacific Blvd

Gloucester Pkwy

Kincora Fire & Rescue Station Co 24/35

Broad Run

Sully Rd

28

Russell Branch Pkwy

Loudoun County Water

Proposed DTC Substation

N

Dominion Energy®

Proposed Conditions 1A

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

DTC

Substation and 230 kV Transmission Project

Route 1B

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

Dominion Energy®

DTC

Substation and 230 kV Transmission Project

W&OD Trail

28

Lowe's

Atlantic Blvd

Data Center

Beco Substation

Pacific Blvd

Dulles Town Center Mall

Gloucester Pkwy

Kincora Fire & Rescue Station Co 24/35

Broad Run

Sully Rd

28

Russell Branch Pkwy

Loudoun County Water

Proposed DTC Substation

N

Dominion Energy®

Proposed Conditions 1B

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

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

Route 1C

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

DTC

Substation and 230 kV Transmission Project

W&OD Trail

28

Lowe's

Atlantic Blvd

Data Center

Beco Substation

Pacific Blvd

Dulles Town Center Mall

Gloucester Pkwy

Kincora Fire & Rescue Station Co 24/35

Broad Run

Sully Rd

28

Russell Branch Pkwy

Loudoun County Water

Proposed DTC Substation

N

Dominion Energy®

Proposed Conditions 1C

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DTC

Substation and 230 kV Transmission Project

Viewpoint Locations

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

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DTC

Substation and 230 kV Transmission Project

Viewpoint 1

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

Direction: Southeast

Looking Southeast Along Century Blvd

Existing Conditions

Proposed Conditions

Galvanized Steel

Routes 1A, 1B, 1C

117

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

DTC

Substation and 230 kV Transmission Project

Viewpoint 2

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

Direction: North

Looking North From Lerner Office Bldg

Existing Conditions

Proposed Conditions

Galvanized Steel | **Route 1A**

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DTC

Substation and 230 kV Transmission Project

Viewpoint 2

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

Direction: North

Looking North From Lerner Office Bldg

Existing Conditions

Proposed Conditions

Galvanized Steel | **Route 1B**

Dominion Energy®

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DTC

Substation and 230 kV Transmission Project

Viewpoint 2

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

Direction: North

Looking North From Lerner Office Bldg

Existing Conditions

Proposed Conditions

Galvanized Steel | **Route 1C**

120

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DTC

Substation and 230 kV Transmission Project

Viewpoint 3

Date: 8/24/21 Time: 12:02 pm

Direction: North

Looking North Along Russell Branch Pkwy

Existing Conditions

Proposed Conditions

Galvanized Steel | Route 1A

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DTC

Substation and 230 kV Transmission Project

Viewpoint 3

Date: 8/24/21 Time: 12:02 pm

Direction: North

Looking North Along Russell Branch Pkwy

Existing Conditions

Proposed Conditions

Galvanized Steel | **Route 1B**

122

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DTC

Substation and 230 kV Transmission Project

Viewpoint 3

Date: 8/24/21 Time: 12:02 pm

Direction: North

Looking North Along Russell Branch Pkwy

Existing Conditions

Proposed Conditions

Galvanized Steel | **Route 1C**

123

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

DTC

Substation and 230 kV Transmission Project

Viewpoint 4

Date: 6/24/21 Time: 10:37 am

Direction: Southwest

Looking West Down Gloucester Pkwy

Existing Conditions

Proposed Conditions

Galvanized Steel

Routes 1A, 1B, 1C

124

Dominion Energy®

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

DTC

Substation and 230 kV Transmission Project

Viewpoint 5

Date: 6/24/21 Time: 10:37 am

Direction: South

Looking South Across Gloucester Pkwy

Existing Conditions

Proposed Conditions

Galvanized Steel

Routes 1A, 1B, 1C

Dominion Energy®

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

DTC

Substation and 230 kV Transmission Project

W&OD Trail

28

Lowe's

Atlantic Blvd

Data Center

Pacific Blvd

Beco Substation

Dulles Town Center Mall

Gloucester Pkwy

Kincora Fire & Rescue Station Co 24/35

Broad Run

Sully Rd

6

Proposed DTC Substation

Loudoun County Water

28

Russell Branch Pkwy

N

Dominion Energy®

Aerial Render Location

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

DTC

Substation and 230 kV Transmission Project

Viewpoint 6

Dominion Energy®

Existing Conditions

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

DTC

Substation and 230 kV Transmission Project

Viewpoint 6

Dominion Energy®

Proposed Conditions 1C

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

Environmental Justice: Ongoing Commitment to Our Communities

At Dominion Energy, we are committed to providing reliable, affordable, clean energy in accordance with our values of safety, ethics, excellence, embrace change and team work. This includes listening to and learning all we can from the communities we are privileged to serve.

Our values also recognize that environmental justice considerations must be part of our everyday decisions, community outreach and evaluations as we move forward with projects to modernize the generation and delivery of energy.

To that end, communities should have a meaningful voice in our planning and development process, regardless of race, color, national origin, or income. Our neighbors should have early and continuing opportunities to work with us. We pledge to undertake collaborative efforts to work to resolve issues. We will advance purposeful inclusion to ensure a diversity of views in our public engagement processes.

Dominion Energy will be guided in meeting environmental justice expectations of fair treatment and sincere involvement by being inclusive, understanding, dedicated to finding solutions, and effectively communicating with our customers and our neighbors. We pledge to be a positive catalyst in our communities.

November 2018

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

C. Detail the nature, location, and ownership of each building that would have to be demolished or relocated if the project is built as proposed.

Response: No buildings would have to be demolished or relocated to construct the proposed Project along the Proposed Route or Alternative Routes.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

D. Identify existing physical facilities that the line will parallel, if any, such as existing transmission lines, railroad tracks, highways, pipelines, etc. Describe the current use and physical appearance and characteristics of the existing ROW that would be paralleled, as well as the length of time the transmission ROW has been in use.

Response: The Proposed Route would be collocated for a total of about 0.92 mile, including 0.59 mile of paralleled Loudoun Water lines, 0.24 mile of paralleling and crossing roads, and 0.09 mile paralleling both Loudoun Water lines and roads. The Loudoun Water line rights-of-way currently are maintained cleared of large trees for their entire length. The Proposed Route also parallels and crosses Gloucester Parkway, Russell Branch Parkway, Sully Road, and Century Boulevard. These are all public roads maintained by VDOT and consist of paved multi-lane roads.

Overhead Alternative Route 1A would be collocated for a total of 0.93 mile, including 0.59 mile of paralleled Loudoun Water lines, 0.25 mile of paralleling and crossing roads, and 0.09 mile paralleling both Loudoun Water lines and roads. The Loudoun Water line rights-of-way currently are maintained cleared of large trees for their entire length. Overhead Alternative Route 1A also parallels and crosses Gloucester Parkway, Russell Branch Parkway, Sully Road, and Century Boulevard. These are all public roads maintained by VDOT and consist of paved multi-lane roads.

Overhead Alternative Route 1B would be collocated for a total of 0.93 mile, including 0.59 mile of paralleled Loudoun Water lines, 0.25 mile of paralleling and crossing roads, and 0.09 mile paralleling both Loudoun Water lines and roads. The Loudoun Water line rights-of-way currently are maintained cleared of large trees for their entire length. Overhead Alternative Route 1B also parallels and crosses Gloucester Parkway, Russell Branch Parkway, Sully Road, and Century Boulevard. These are all public roads maintained by VDOT and consist of paved multi-lane roads.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

E. Indicate whether the Applicant has investigated land use plans in the areas of the proposed route and indicate how the building of the proposed line would affect any proposed land use.

Response: The Loudoun County 2019 General Plan ("General Plan")[15] and the Loudoun County 2019 Countywide Transportation Plan ("2019 CTP")[16] were reviewed to evaluate the potential effect the Proposed and Alternative Routes could have on future development. The General Plan and 2019 CTP do not address electric transmission lines within their land use policies and strategies explicitly; however, the General Plan recognizes that the area in proximity to the Proposed Route north of Washington Dulles International Airport is expected to continue to be a key location for industrial uses, airport-related businesses, and data center development. Future demand for data centers will need to be accommodated in places that have access to utilities, including electricity. The General Plan acknowledges that electrical demand in the County has grown dramatically in recent years with the development of data centers in eastern Loudoun County. Demand is expected to continue to grow with new data center construction, the operation of the Silver Line Metrorail, and other land development near the proposed route.

Additionally, the Company consulted with Loudoun County Planning and Zoning staff, the Kincora developers, Lerner, DC Water, and Loudoun Water to discuss the Project and determine if there were any constraints present that would conflict with existing or proposed land uses. No conflicting land uses were identified by Loudoun County Planning and Zoning, Loudoun Water, DC Water, or Lerner. Kincora has developed a preliminary site plan for a data center along the west side of Russell Branch Parkway. Overhead Alternative Routes 1A and 1B would both conflict with the data center as currently designed.

Review of publicly available information (including the 2019 CTP) and consultations with Loudoun County Department of Transportation and Capital Infrastructure ("DTCI") and VDOT staff were completed to determine the impact of the Proposed Route on future road projects. No future road projects were identified in the Project area. See Appendix Section II.A.9 and Sections 3.1.8 and 4.1.5 of the Environmental Routing Study.

[15] *See* https://www.loudoun.gov/DocumentCenter/View/152285/General-Plan---Combined-with-small-maps-bookmarked.
[16] *See* https://www.loudoun.gov/DocumentCenter/View/152287/CTP---Combined-with-small-maps-bookmarked.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

F. Government Bodies

1. Indicate if the Applicant determined from the governing bodies of each county, city and town in which the proposed facilities will be located whether those bodies have designated the important farmlands within their jurisdictions, as required by § 3.2-205 B of the Code.

2. If so, and if any portion of the proposed facilities will be located on any such important farmland:

a. Include maps and other evidence showing the nature and extent of the impact on such farmlands;

b. Describe what alternatives exist to locating the proposed facilities on the affected farmlands, and why those alternatives are not suitable; and

c. Describe the Applicant's proposals to minimize the impact of the facilities on the affected farmland.

Response: (1) Coordination with Loudoun County has concluded that no land is designated as important farmlands within the study area.

(2) Not applicable.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

G. Identify the following that lie within or adjacent to the proposed ROW:

1. **Any district, site, building, structure, or other object included in the National Register of Historic Places maintained by the U.S. Secretary of the Interior;**

2. **Any historic architectural, archeological, and cultural resources, such as historic landmarks, battlefields, sites, buildings, structures, districts or objects listed or determined eligible by the Virginia Department of Historic Resources ("DHR");**

3. **Any historic district designated by the governing body of any city or county;**

4. **Any state archaeological site or zone designated by the Director of the DHR, or its predecessor, and any site designated by a local archaeological commission, or similar body;**

5. **Any underwater historic assets designated by the DHR, or predecessor agency or board;**

6. **Any National Natural Landmark designated by the U.S. Secretary of the Interior;**

7. **Any area or feature included in the Virginia Registry of Natural Areas maintained by the Virginia Department of Conservation and Recreation ("DCR");**

8. **Any area accepted by the Director of the DCR for the Virginia Natural Area Preserves System;**

9. **Any conservation easement or open space easement qualifying under §§ 10.1-1009 – 1016, or §§ 10.1-1700 – 1705, of the Code (or a comparable prior or subsequent provision of the Code);**

10. **Any state scenic river;**

11. **Any lands owned by a municipality or school district; and**

12. **Any federal, state or local battlefield, park, forest, game or wildlife preserve, recreational area, or similar facility. Features, sites, and the like listed in 1 through 11 above need not be identified again.**

Response: Proposed and Alternative Routes

1. None

2. None

3. None

4. Two archaeological sites (44LD0107 and 44LD0727) lie within or adjacent to the proposed right-of-way, neither of which are recommended eligible for inclusion on the NRHP.

5. None

6. None

7. None

8. None

9. One Loudoun County BOS managed open space easement is crossed by the Proposed Route for approximately 0.35 mile.

10. None

11. None

12. None

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

H. List any registered aeronautical facilities (airports, helipads) where the proposed route would place a structure or conductor within the federally-defined airspace of the facilities. Advise of contacts, and results of contacts, made with appropriate officials regarding the effect on the facilities' operations.

Response: The Federal Aviation Administration ("FAA") is responsible for overseeing air transportation in the United States. The FAA manages air traffic in the United States and evaluates physical objects that may affect the safety of aeronautical operations through an obstruction evaluation. The prime objective of the FAA in conducting an obstruction evaluation is to ensure the safety of air navigation and the efficient utilization of navigable airspace by aircraft.

The Company has reviewed the FAA's website[17] to identify airports within 10 miles of the proposed Project. Based on this review, the following FAA-restricted airports are located within 10 miles of the Project:

- Dulles International Airport, approximately 2.7 miles south of the Project
- Leesburg Executive Airport, approximately 6.6 miles west of the Project

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

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

The Project would be within approximately 3.8 miles of Runway 19C of the Dulles Airport. The airport surveyed ground elevation is 313 above mean sea level

[17] *See* https://oeaaa.faa.gov/oeaaa/external/portal.jsp.

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

On October 6, 2021, the Company received a response from the Virginia Department of Aviation ("DOAv") indicating that although the Project is beyond the 20,000 feet that would mandate a 7460 form submission, DOAv recommends that the Company submit an airspace study request to the FAA for evaluation. Dominion Energy Virginia responded to the DOAv on October 19, 2021 providing the results of the Airport Study which showed that the Project would not trigger the 7460 submission. The Company will coordinate with DOAv and the FAA as necessary to obtain all appropriate permits. Since the FAA manages air traffic in the United States, it will evaluate any physical objects that may affect the safety of aeronautical operations through an obstruction evaluation. If required during the permitting process, Dominion Energy Virginia will submit an FAA Form 7460-1 Notice pursuant to 14 CFR Part 77, for any tower locations that meet the review criteria. See Section 2.N of the DEQ Supplement.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

I. Advise of any scenic byways that are in close proximity to or that will be crossed by the proposed transmission line and describe what steps will be taken to mitigate any visual impacts on such byways. Describe typical mitigation techniques for other highways' crossings.

Response: No scenic byways are in close proximity to the study area for the proposed Project or would be crossed by the transmission line routes.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

J. Identify coordination with appropriate municipal, state, and federal agencies.

Response: As described in detail in Sections III.B and V.D of the Appendix, the Company solicited feedback from Loudoun County regarding the proposed Project. Below is a list of coordination that has occurred with municipal, state, and federal agencies:

- Coordination with the Corps, DEQ, and VDOT will take place as appropriate to obtain necessary approvals for the Project.
- A letter dated October 5, 2021, was submitted to Loudoun County to describe the Project and request comments. See Section V.D.
- A letter was submitted to the agencies listed in Section V.C on October 5, 2021, describing the Project and requesting comment. See Attachment 2 to the DEQ Supplement.
- A Stage I Pre-Application Analysis has been prepared and was submitted to VDHR on November 18, 2021. See Attachment 2.H.1 to the DEQ Supplement.
- In early November 2021, the Company solicited comments via letter from several federally recognized Native American tribes, including the Chickahominy, Eastern Chickahominy, Nansemond, Pamunkey, Rappahannock, and Upper Mattaponi, and several state-recognized Native American tribes, including the Cheroenhaka, Mattaponi, Nottoway of Virginia, and Patawomeck. A copy of the letter template is included as Attachment III.J.1.

See also Sections III.B, III.K and V.D of this Appendix, and the DEQ Supplement.

Dominion Energy Virginia
Electric Transmission
P.O. Box 26666, Richmond, VA 23261-6666
DominionEnergy.com

Nov. 9, 2021

BECO – DTC 230 kV Electric Transmission Line Project

Dear _____:

At Dominion Energy, we are dedicated to finding the best solution for our long-term needs in the communities we serve. As a valued stakeholder with a vested interest in the community, we invite you to participate in the development of a 1-mile 230 kilovolt (kV) electric transmission line project in Loudoun County, Virginia.

Rapid growth in electrical demand, particularly in the commercial/high-tech sector in eastern Loudoun County, has resulted in the need to build a new transmission line and substation. This project will improve electric reliability for all customers in the region.

Construction is scheduled to begin in 2022 with an anticipated completion date of December 2024.

We are currently in the conceptual phase and are seeking input as we prepare to submit an application with the Virginia State Corporation Commission (SCC) in November 2021. Doing so allows us to hear any concerns you may have as we work to meet the needs of the project. To see a project overview map and photo simulations of the project, please visit our webpage at DominionEnergy.com/dtc.

Due to the ongoing public health concerns resulting from the spread of the coronavirus, we do not plan to host formal community open house events at this time. In lieu of our traditional in-person meetings, we will hold a virtual community meeting Nov. 18, 2021 from 5-6 p.m. You can find meeting details as well as project information on our project webpage.

If you would like any additional information, have questions, or would like to set up a meeting to discuss the project, please do not hesitate to contact Ken Custalow, our Tribal Liaison. He can be reached by email at ken.custalow@dominionenergy.com. Thank you for your willingness to join us in our commitment to serving the community.

Sincerely,

Robert E. Richardson

Robert Richardson
Communications Consultant
The Electric Transmission Project Team
Robert.E.Richardson@DominionEnergy.com
(804) 248-1698

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

K. Identify coordination with any non-governmental organizations or private citizen groups.

Response: In early November 2021, the Company solicited comments via letter from the community leaders, environmental groups, and business groups identified below. A copy of the letter template is included as Attachment III.K.1.

Name	Organization
Ms. Elizabeth S. Kostelny	Preservation Virginia
Mr. Jack Gary	Council of Virginia Archaeologists
Ms. Leighton Powell	Scenic Virginia
Ms. Sharee Williamson	National Trust for Historic Preservation
Mr. Dan Holmes	Piedmont Environmental Council
Mr. Thomas Gilmore	Civil War Trust
Mr. Jim Campri	Civil War Trust
Mr. Adam Gillenwater	Civil War Trust
Ms. Kym Hall	Colonial National Historical Park
Mr. Alexander Macaulay	Attorney, Macaulay and Jamerson
Dr. Newby Alexander	Professor of History – Norfolk State University
Mary Frances Wilkerson	Cheroenhaka (Nottoway) Indian Tribe
Mr. Dave Dutton	Dutton and Associates, LLC

Dominion Energy Virginia
Electric Transmission
P.O. Box 26666, Richmond, VA 23261-6666
DominionEnergy.com

Nov. 9, 2021

BECO- DTC 230 kV Electric Transmission Line Project

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We are currently in the conceptual phase and are seeking input as we prepare to submit an application with the Virginia State Corporation Commission (SCC) in November 2021. Doing so allows us to hear any concerns you may have as we work to meet the needs of the project.

To see a project overview map and photo simulations, please visit our webpage at DominionEnergy.com/dtc.

Please feel free to notify other relevant organizations that may have an interest in the project area. For reference, recipients of this letter include other county and statewide historic, cultural and scenic organizations and Native American Tribes.

Due to the ongoing public health concerns resulting from the spread of the coronavirus, we do not plan to host formal community open house events at this time. In lieu of our traditional in-person meetings, we will hold a virtual community meeting Nov. 18, 2021 from 5-6 p.m. You can find meeting details, as well as project information, on our project webpage.

If you would like any additional information, have questions, or would like to set up a meeting to discuss the project, please contact me by sending an email to Robert.E.Richardson@dominionenergy.com or calling 888-291-0190.

Thank you for your willingness to join us in our commitment to serving the community.

Sincerely,

Robert E. Richardson

Rob Richardson
Communications Consultant
The Electric Transmission Project Team

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

L. Identify any environmental permits or special permissions anticipated to be needed.

Response: The permits or special permissions that are likely to be required for the proposed Project are listed below.

Potential Permits

Activity	Potential Permit	Agency/Organization
Impacts to wetlands and other waters of the U.S.	Nationwide Permit 57	U.S. Army Corps of Engineers
Impacts to wetlands and other waters of the U.S.	Virginia Water Protection Permit	Virginia Department of Environmental Quality
Discharge of stormwater from construction	Construction General Permit	Virginia Department of Environmental Quality
Work within VDOT rights-of-way	Land Use Permit	Virginia Department of Transportation
Airspace obstruction evaluation	FAA 7460-1	Dulles International Airport

IV. HEALTH ASPECTS OF ELECTROMAGNETIC FIELDS ("EMF")

A. Provide the calculated maximum electric and magnetic field levels that are expected to occur at the edge of the ROW. If the new transmission line is to be constructed on an existing electric transmission line ROW, provide the present levels as well as the maximum levels calculated at the edge of ROW after the new line is operational.

Response: Public exposure to magnetic fields is best estimated by field levels from power lines calculated at annual average loading. For any day of the year, the EMF levels associated with average conditions provide the best estimate of potential exposure. Maximum (peak) values are less relevant as they may occur for only a few minutes or hours each year.

This section describes the levels of EMF associated with the proposed transmission lines. EMF levels are provided for future (2025) annual average and maximum (peak) loading conditions.

Proposed project – Projected average loading in 2025

EMF levels were calculated for the proposed Project at the ***projected average*** load condition (457 amps for Line #2143 and 268 amps for Line #2249) and at an operating voltage of 241.5 kV when supported on the proposed Project structures – see Attachment II.A.5. a.

These field levels were calculated at mid-span where the conductors are closest to the ground and the conductors are at a projected average load operating temperature.

EMF levels at the edge of the rights-of-way for the proposed Project at the projected average loading:

	Left Edge		**Right Edge**	
	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
Attachment II.A.5.a	0.703	22.376	0.704	8.744

Proposed project – Projected Peak loading in 2025

EMF levels were calculated for the proposed Project at the ***projected peak*** load condition (572 amps for Line #2143 and 336 amps for Line #2249) and at an

operating voltage of 241.5 kV when supported on the proposed Project structures – see Attachment II.A.5. a.

These field levels were calculated at mid-span where the conductors are closest to the ground and the conductors are at a projected peak load operating temperature.

EMF levels at the edge of the rights-of-way for the proposed Project at the projected peak loading:

	Left Edge		**Right Edge**	
	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
Attachment II.A.5.a	0.702	28.018	0.703	10.972

IV. HEALTH ASPECTS OF ELECTROMAGNETIC FIELDS ("EMF")

B. If the Applicant is of the opinion that no significant health effects will result from the construction and operation of the line, describe in detail the reasons for that opinion and provide references or citations to supporting documentation.

Response: The conclusions of multidisciplinary scientific review panels assembled by national and international scientific agencies during the past two decades are the foundation of the Company's opinion that no adverse health effects will result from the operation of the proposed Project. Each of these panels has evaluated the scientific research related to health and power-frequency EMF and provided conclusions that form the basis of guidance to governments and industries. The Company regularly monitors the recommendations of these expert panels to guide their approach to EMF.

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

The reviews of EMF biological and health research have been conducted by numerous scientific and health agencies, including the European Health Risk Assessment Network on Electromagnetic Fields Exposure ("EFHRAN"), the International Commission on Non-Ionizing Radiation Protection ("ICNIRP"), the World Health Organization ("WHO"), the IEEE's International Committee on Electromagnetic Safety ("ICES"), the Scientific Committee on Emerging and Newly Identified Health Risks ("SCENIHR") of the European Commission, and the Swedish Radiation Safety Authority ("SSM") (formerly the Swedish Radiation Protection Authority ["SSI"]) (WHO, 2007; SCENIHR, 2009, 2015; EFHRAN, 2010, 2012; ICNIRP, 2010; SSM, 2015, 2016, 2018, 2019, 2020, 2021; ICES, 2019). The general scientific consensus of the agencies that have reviewed this research, relying on generally accepted scientific methods, is that the scientific evidence does not confirm that common sources of EMF in the environment, including transmission lines and other parts of the electric system, appliances, etc., are a cause of any adverse health effects.

The most recent reviews on this topic include the 2015 report by SCENIHR and annual reviews published by SSM (*e.g.*, for the years 2015 through 2021). These reports, similar to previous reviews, found that the scientific evidence does not

confirm the existence of any adverse health effects caused by environmental or community exposure to EMF.

The WHO has recommended that countries adopt recognized international standards published ICNIRP and ICES. Typical levels of EMF from Dominion's power lines outside its property and rights-of-way are far below the screening reference levels of EMF recommended for the general public and still lower than exposures equivalent to restrictions to limits on fields within the body (ICNIRP, 2010; ICES, 2019).

Thus, based on the conclusions of scientific reviews and the levels of EMF associated with the proposed Project, the Company has determined that no adverse health effects are anticipated to result from the operation of the proposed Project.

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IV. HEALTH ASPECTS OF ELECTROMAGNETIC FIELDS ("EMF")

C. Describe and cite any research studies on EMF the Applicant is aware of that meet the following criteria:

1. Became available for consideration since the completion of the Virginia Department of Health's most recent review of studies on EMF and its subsequent report to the Virginia General Assembly in compliance with 1985 Senate Joint Resolution No. 126;

2. Include findings regarding EMF that have not been reported previously and/or provide substantial additional insight into findings; and

3. Have been subjected to peer review.

Response: The Virginia Department of Health ("VDH") conducted its most recent review and issued its report on the scientific evidence on potential health effects of extremely low frequency ("ELF") EMF in 2000: "[T]he Virginia Department of Health is of the opinion that there is no conclusive and convincing evidence that exposure to extremely low frequency EMF emanated from nearby high voltage transmission lines is causally associated with an increased incidence of cancer or other detrimental health effects in humans."[18]

The continuing scientific research on EMF exposure and health has resulted in many peer-reviewed publications since 2000. The accumulating research results have been regularly and repeatedly reviewed and evaluated by national and international health, scientific, and government agencies, including most notably:

- The WHO, which published one of the most comprehensive and detailed reviews of the relevant scientific peer-reviewed literature in 2007;
- SCENIHR, a committee of the European Commission, which published its assessments in 2009 and 2015;
- The SSM, which has published annual reviews of the relevant peer-reviewed scientific literature since 2003, with its most recent review published in 2021; and,
- EFHRAN, which published its reviews in 2010 and 2012.

The above reviews provide detailed analyses and summaries of relevant recent peer-reviewed scientific publications. The conclusions of these reviews that the evidence overall does not confirm the existence of any adverse health effects due to exposure to EMF below scientifically established guideline values are consistent with the conclusions of the VDH report. With respect to the statistical association observed in some of the childhood leukemia epidemiologic studies, the most recent

[18] *See* http://www.vdh.virginia.gov/content/uploads/sites/12/2016/02/highfinal.pdf.

comprehensive review of the literature by SCENIHR, published in 2015, concluded that "no mechanisms have been identified and no support is existing [*sic*] from experimental studies that could explain these findings, which, together with shortcomings of the epidemiological studies prevent a causal interpretation" (SCENIHR, 2015, p. 16).

While research is continuing on multiple aspects of EMF exposure and health, many of the recent publications have focused on an epidemiologic assessment of the relationship between EMF exposure and childhood leukemia and EMF exposure and neurodegenerative diseases. Of these, the following recent publications, published following the inclusion date (June 2014) for the SCENIHR (2015) report through May 2021, provided additional evidence and contributed to clarification of previous findings. Overall, new research studies have not provided evidence to alter the previous conclusions of scientific and health organizations, including the WHO and SCENIHR.

Recent epidemiologic studies of EMF and childhood leukemia include:

- Bunch et al. (2015) assessed the potential association between residential proximity to high-voltage underground cables and development of childhood cancer in the United Kingdom largely using the same epidemiologic data as in a previously published study on overhead transmission lines (Bunch et al., 2014). No statistically significant associations or trends were reported with either distance to underground cables or calculated magnetic fields from underground cables for any type of childhood cancers.

- Pedersen et al. (2015) published a case-control study that investigated the potential association between residential proximity to power lines and childhood cancer in Denmark. The study included all cases of leukemia (n=1,536), central nervous system tumor, and malignant lymphoma (n=417) diagnosed before the age of 15 between 1968 and 2003 in Denmark, along with 9,129 healthy control children matched on sex and year of birth. Considering the entire study period, no statistically significant increases were reported for any of the childhood cancer types.

- Salvan et al. (2015) compared measured magnetic-field levels in the bedroom for 412 cases of childhood leukemia under the age of 10 and 587 healthy control children in Italy. Although the statistical power of the study was limited because of the small number of highly exposed subjects, no consistent statistical associations or trends were reported between measured magnetic-field levels and the occurrence of leukemia among children in the study.

- Bunch et al. (2016) and Swanson and Bunch (2018) published additional analyses using data from an earlier study (Bunch et al., 2014). Bunch et al. (2016) reported that the association with distance to power lines observed in earlier years was linked to calendar year of birth or year of cancer diagnosis, rather than the age of the power lines. Swanson and Bunch (2018) re-analyzed

data using finer exposure categories (e.g., cut-points of every 50-meter distance) and broader groupings of diagnosis date (e.g., 1960-1979, 1980-1999, and 2000-on) and reported no overall associations between exposure categories and childhood leukemia for the later periods (1980 and on), and consistent pattern for the periods prior to 1980.

- Crespi et al. (2016) conducted a case-control epidemiologic study of childhood cancers and residential proximity to high-voltage power lines (60 kilovolts ["kV"] to 500 kV) in California. Childhood cancer cases, including 5,788 cases of leukemia and 3,308 cases of brain tumor, diagnosed under the age of 16 between 1986 and 2008, were identified from the California Cancer Registry. Controls, matched on age and sex, were selected from the California Birth Registry. Overall, no consistent statistically significant associations for leukemia or brain tumor and residential distance to power lines were reported.

- Kheifets et al. (2017) assessed the relationship between calculated magnetic-field levels from power lines and development of childhood leukemia within the same study population evaluated in Crespi et al. (2016). In the main analyses, which included 4,824 cases of leukemia and 4,782 controls matched on age and sex, the authors reported no consistent patterns, or statistically significant associations between calculated magnetic-field levels and childhood leukemia development. Similar results were reported in subgroup and sensitivity analyses. In two subsequent studies, Amoon et al. (2018a, 2019) examined the potential impact of residential mobility (i.e., moving residences between birth and diagnosis) on the associations reported in Crespi et al. (2016) and Kheifets et al. (2017). Amoon et al. (2018a) concluded that changing residences was not associated with either calculated magnetic-field levels or proximity to the power lines, while Amoon et al. (2019) concluded that while uncontrolled confounding by residential mobility had some impact on the association between EMF exposure and childhood leukemia, it was unlikely to be the primary driving force behind the previously reported associations in Crespi et al. (2016) and Kheifets et al. (2017).

- Amoon et al. (2018b) conducted a pooled analysis of 29,049 cases and 68,231 controls from 11 epidemiologic studies of childhood leukemia and residential distance from high-voltage power lines. The authors reported no statistically-significant association between childhood leukemia and proximity to transmission lines of any voltage. Among subgroup analyses, the reported associations were slightly stronger for leukemia cases diagnosed before 5 years of age and in study periods prior to 1980. Adjustment for various potential confounders (*e.g.*, socioeconomic status, dwelling type, residential mobility) had little effect on the estimated associations.

- Kyriakopoulou et al. (2018) assessed the association between childhood acute leukemia and parental occupational exposure to social contacts, chemicals, and electromagnetic fields. The study was conducted at a major pediatric hospital in Greece and included 108 cases and 108 controls matched for age, gender,

and ethnicity. Statistically non-significant associations were observed between paternal exposure to magnetic fields and childhood acute leukemia for any of the exposure periods examined (1 year before conception; during pregnancy; during breastfeeding; and from birth until diagnosis); maternal exposure was not assessed due to the limited sample size. No associations were observed between childhood acute leukemia and exposure to social contacts or chemicals.

- Auger et al. (2019) examined the relationship between exposure to EMF during pregnancy and risk of childhood cancer in a cohort of 784,000 children born in Quebéc. Exposure was defined using residential distance to the nearest high-voltage transmission line or transformer station. The authors reported statistically non-significant associations between proximity to transformer stations and any cancer, hematopoietic cancer, or solid tumors. No associations were reported with distance to transmission lines.

- Crespi et al. (2019) investigated the relationship between childhood leukemia and distance from high-voltage lines and calculated magnetic-field exposure, separately and combined, within the California study population previously analyzed in Crespi et al. (2016) and Kheifets et al. (2017). The authors reported that neither close proximity to high-voltage lines nor exposure to calculated magnetic fields alone were associated with childhood leukemia; an association was observed only for those participants who were both close to high-voltage lines (< 50 meters) and had high calculated magnetic fields (≥ 0.4 microtesla [i.e., ≥ 4 milligauss]). No associations were observed with low-voltage power lines (< 200 kV). In a subsequent study, Amoon et al. (2020) examined the potential impact of dwelling type on the associations reported in Crespi et al. (2019). Amoon et al. (2020) concluded that while the type of dwelling at which a child resides (e.g., single-family home, apartment, duplex, mobile home) was associated with socioeconomic status and race or ethnicity, it was not associated with childhood leukemia and did not appear to be a potential confounder in the relationship between childhood leukemia and magnetic-field exposure in this study population.

- Swanson et al. (2019) conducted a meta-analysis of 41 epidemiologic studies of childhood leukemia and magnetic-field exposure published between 1979 and 2017 to examine trends in childhood leukemia development over time. The authors reported that while the estimated risk of childhood leukemia initially increased during the earlier period, a statistically non-significant decline in estimated risk has been observed from the mid-1990s until the present (*i.e.*, 2019).

- Talibov et al. (2019) conducted a pooled analysis of 9,723 cases and 17,099 controls from 11 epidemiologic studies to examine the relationship between parental occupational exposure to magnetic fields and childhood leukemia. No statistically significant association was found between either paternal or

maternal exposure and leukemia (overall or by subtype). No associations were observed in the meta-analyses.

- Núñez-Enríquez et al. (2020) assessed the relationship between residential magnetic-field exposure and B-lineage acute lymphoblastic leukemia ("B-ALL") in children under 16 years of age in Mexico. The study included 290 cases and 407 controls matched on age, gender, and health institution; magnetic-field exposure was assessed through the collection of 24-hour measurements in the participants' bedrooms. While the authors reported some statistically significant associations between elevated magnetic-field levels and development of B-ALL, the results were dependent on the chosen cut-points.

- Seomun et al. (2021) performed a meta-analysis based on 33 previously published epidemiologic studies investigating the potential relationship between magnetic-field exposure and childhood cancers, including leukemia and brain cancer. For childhood leukemia, the authors reported statistically significant associations with some, but not all, of the chosen cut-points for magnetic-field exposure. The associations between magnetic-field exposure and childhood brain cancer were statistically non-significant. The study provided limited new insight as most of the studies included in the current meta-analysis, were included in previously conducted meta- and pooled analyses.

Recent epidemiologic studies of EMF and neurodegenerative diseases include:

- Seelen et al. (2014) conducted a population-based case-control study in the Netherlands and included 1,139 cases diagnosed with amyotrophic lateral sclerosis ("ALS") between 2006 and 2013 and 2,864 frequency-matched controls. The shortest distance from the case and control residences to the nearest high-voltage power line (50 to 380 kilovolts [kV]) was determined by geocoding. No statistically significant associations between residential proximity to power lines with voltages of either 50 to 150 kV or 220 to 380 kV and ALS were reported.

- Sorahan and Mohammed (2014) analyzed mortality from neurodegenerative diseases in a cohort of approximately 73,000 electricity supply workers in the United Kingdom. Cumulative occupational exposure to magnetic-fields was calculated for each worker in the cohort based on their job titles and job locations. Death certificates were used to identify deaths from neurodegenerative diseases. No associations or trends for any of the included neurodegenerative diseases (Alzheimer's disease, Parkinson's disease, and ALS) were observed with various measures of calculated magnetic fields.

- Koeman et al. (2015, 2017) analyzed data from the Netherlands Cohort Study of approximately 120,000 men and women who were enrolled in the cohort in 1986 and followed up until 2003. Lifetime occupational history, obtained through questionnaires, and job-exposure matrices on ELF magnetic fields and other occupational exposures were used to assign exposure to study subjects.

Based on 1,552 deaths from vascular dementia, the researchers reported a statistically not significant association of vascular dementia with estimated exposure to metals, chlorinated solvents, and ELF magnetic fields. However, because no exposure-response relationship for cumulative exposure was observed and because magnetic fields and solvent exposures were highly correlated with exposure to metals, the authors attributed the association with ELF magnetic fields and solvents to confounding by exposure to metals (Koeman et al., 2015). Based on a total of 136 deaths from ALS among the cohort members, the authors reported a statistically significant, approximately two-fold association with ELF magnetic fields in the highest exposure category. This association, however, was no longer statistically significant when adjusted for exposure to insecticides (Koeman et al., 2017).

- Fischer et al. (2015) conducted a population-based case-control study that included 4,709 cases of ALS diagnosed between 1990 and 2010 in Sweden and 23,335 controls matched to cases on year of birth and sex. The study subjects' occupational exposures to ELF magnetic fields and electric shocks were classified based on their occupations, as recorded in the censuses and corresponding job-exposure matrices. Overall, neither magnetic fields nor electric shocks were related to ALS.

- Vergara et al. (2015) conducted a mortality case-control study of occupational exposure to electric shock and magnetic fields and ALS. They analyzed data on 5,886 deaths due to ALS and over 58,000 deaths from other causes in the United States between 1991 and 1999. Information on occupation was obtained from death certificates and job-exposure matrices were used to categorize exposure to electric shocks and magnetic fields. Occupations classified as "electric occupations" were moderately associated with ALS. The authors reported no consistent associations for ALS, however, with either electric shocks or magnetic fields, and they concluded that their findings did not support the hypothesis that exposure to either electric shocks or magnetic fields explained the observed association of ALS with "electric occupations."

- Pedersen et al. (2017) investigated the occurrence of central nervous system diseases among approximately 32,000 male Danish electric power company workers. Cases were identified through the national patient registry between 1982 and 2010. Exposure to ELF magnetic fields was determined for each worker based on their job titles and area of work. A statistically significant increase was reported for dementia in the high exposure category when compared to the general population, but no exposure-response pattern was identified, and no similar increase was reported in the internal comparisons among the workers. No other statistically significant increases among workers were reported for the incidence of Alzheimer's disease, Parkinson's disease, motor neuron disease, multiple sclerosis, or epilepsy, when compared to the general population, or when incidence among workers was analyzed across estimated exposure levels.

- Vinceti et al. (2017) examined the association between ALS and calculated magnetic-field levels from high-voltage power lines in Italy. The authors included 703 ALS cases and 2,737 controls; exposure was assessed based on residential proximity to high-voltage power lines. No statistically significant associations were reported and no exposure-response trend was observed. Similar results were reported in subgroup analyses by age, calendar period of disease diagnosis, and study area.

- Checkoway et al. (2018) investigated the association between Parkinsonism[19] and occupational exposure to magnetic fields and several other agents (endotoxins, solvents, shift work) among 800 female textile workers in Shanghai. Exposure to magnetic fields was assessed based on the participants' work histories. The authors reported no statistically significant associations between Parkinsonism and occupational exposure to any of the agents under study, including magnetic fields.

- Gunnarsson and Bodin (2018) conducted a meta-analysis of occupational risk factors for ALS. The authors reported a statistically significant association between occupational exposures to EMF, estimated using a job-exposure matrix, and ALS among the 11 studies included. Statistically significant associations were also reported between ALS and jobs that involve working with electricity, heavy physical work, exposure to metals (including lead) and chemicals (including pesticides), and working as a nurse or physician. The authors reported some evidence for publication bias. In a subsequent publication, Gunnarsson and Bodin (2019) updated their previous meta-analysis to also include Parkinson's disease and Alzheimer's disease. A slight, statistically significant association was reported between occupational exposure to EMF and Alzheimer's disease; no association was observed for Parkinson's disease.

- Huss et al. (2018) conducted a meta-analysis of 20 epidemiologic studies of ALS and occupational exposure to magnetic fields. The authors reported a weak overall association; a slightly stronger association was observed in a subset analysis of six studies with full occupational histories available. The authors noted substantial heterogeneity among studies, evidence for publication bias, and a lack of a clear exposure-response relationship between exposure and ALS.

- Jalilian et al. (2018) conducted a meta-analysis of 20 epidemiologic studies of occupational exposure to magnetic fields and Alzheimer's disease. The authors reported a moderate, statistically significant overall association; however, they

[19] Parkinsonism is defined by Checkoway et al. (2018) as "*a syndrome whose cardinal clinical features are bradykinesia, rest tremor, muscle rigidity, and postural instability. Parkinson disease is the most common neurodegenerative form of [parkinsonism]"* (p. 887).

noted substantial heterogeneity among studies and evidence for publication bias.

- Röösli and Jalilian (2018) performed a meta-analysis using data from five epidemiologic studies examining residential exposure to magnetic fields and ALS. A statistically non-significant negative association was reported between ALS and the highest exposed group, where exposure was defined based on distance from power lines or calculated magnetic-field level.

- Gervasi et al. (2019) assessed the relationship between residential distance to overhead power lines in Italy and risk of Alzheimer's dementia and Parkinson's disease. The authors included 9,835 cases of Alzheimer's dementia and 6,810 cases of Parkinson's disease; controls were matched by sex, year of birth, and municipality of residence. A weak, statistically non-significant association was observed between residences within 50 meters of overhead power lines and both Alzheimer's dementia and Parkinson's disease, compared to distances of over 600 meters.

- Peters et al. (2019) examined the relationship between ALS and occupational exposure to both magnetic fields and electric shock in a pooled study of data from three European countries. The study included 1,323 ALS cases and 2,704 controls matched for sex, age, and geographic location; exposure was assessed based on occupational title and defined as low (background), medium, or high. Statistically significant associations were observed between ALS and ever having been exposed above background levels to either magnetic fields or electric shocks; however, no clear exposure-response trends were observed with exposure duration or cumulative exposure. The authors also noted significant heterogeneity in risk by study location.

- Filippini et al. (2020) investigated the associations between ALS and several environmental and occupational exposures, including electromagnetic fields, within a case-control study in Italy. The study included 95 cases and 135 controls matched on age, gender, and residential province; exposure to electromagnetic fields was assessed using the participants' responses to questions related to occupational use of electric and electronic equipment, occupational EMF exposure, and residential distance to overhead power lines. The authors reported a statistically significant association between ALS and residential proximity to overhead power lines and a statistically non-significant association between ALS and occupational exposure to EMF; occupational use of electric and electronic equipment was associated with a statistically non-significant decrease in ALS development.

- Huang et al. (2020) conducted a meta-analysis of 43 epidemiologic studies examining potential occupational risk factors for dementia or mild cognitive impairment. The authors included five cohort studies and seven case-control studies related to magnetic-field exposure. For both study types, the authors reported positive associations between dementia and work-related magnetic-

field exposures. The paper, however, provided no information on the occupations held by the study participants, their magnetic-field exposure levels, or how magnetic-field levels were assessed; therefore, the results are difficult to interpret. The authors also reported a high level of heterogeneity among studies. Thus, this analysis adds little, if any, to the overall weight of evidence on a potential association between dementia and magnetic fields.

- Jalilian et al. (2020) conducted a meta-analysis of ALS and occupational exposure to both magnetic fields and electric shocks within 27 studies from Europe, the United States, and New Zealand. A weak, statistically significant association was reported between magnetic-field exposure and ALS; however, the authors noted evidence of study heterogeneity and publication bias. No association was observed between ALS and electric shocks.

- Chen et al. (2021) conducted a case-control study to examine the association between occupational exposure to electric shocks, magnetic fields, and motor neuron disease ("MND") in New Zealand. The study included 319 cases with a MND diagnosis (including ALS) and 604 controls, matched on age and gender; exposure was assessed using the participants' occupational history questionnaire responses and previously developed job-exposure matrices for electric shocks and magnetic fields. The authors reported no associations between MND and exposure to magnetic fields; positive associations were reported between MND and working at a job with the potential for electric shock exposure.

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V. NOTICE

A. Furnish a proposed route description to be used for public notice purposes. Provide a map of suitable scale showing the route of the proposed project. For all routes that the Applicant proposed to be noticed, provide minimum, maximum and average structure heights.

Response: A map showing the overhead Proposed Route and two overhead Alternative Routes for the proposed DTC 230 kV Line Loop is provided in Attachment V.A. Please note that route names are abbreviated on Attachment V.A as identified in parenthesis in the headings below. A written description of the Proposed and Alternative Routes is as follows:

Proposed Route – Overhead Route 1C (Proposed Route 1C)

The Proposed Route of the proposed DTC 230 kV Line Loop is approximately 1.30 miles in length. The Proposed Route originates between Structures #2143/12-13, which are located northwest of the Company's existing BECO Substation. The line then heads northwest for about 0.19 mile adjacent to the right-of-way for a Loudoun County Water line and across Gloucester Parkway. From that point, the transmission line continues to the north for 0.57 mile, generally following the Loudoun County Water line. The transmission line then turns to the north and east for 0.20 mile before intersecting Russell Branch Parkway. After a 0.09-mile crossing of Russell Branch Parkway and Sully Road, the line next turns north and parallels the eastern side Sully Road for 0.10 mile. From that point, the line turns east and southeast for 0.08 mile crossing Century Boulevard. Finally, the route heads northeast for 0.07 mile and then enters the proposed DTC Substation property.

The DTC Loop along the Proposed Route will be constructed on new right-of-way supported by 15 double circuit, single-shaft galvanized steel poles, and two double circuit galvanized steel 2-pole structures with a minimum structure height of approximately 90 feet, a maximum structure height of approximately 120 feet, and an average proposed structure height of approximately 106 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

Overhead Alternative Route 1A (Route 1A)

The Overhead Alternative Route 1A of the proposed DTC 230 kV Line Loop is approximately 1.31 miles in length. Overhead Alternative Route 1A originates between Structures #2143/12-13, which are located northwest of the Company's existing BECO Substation. The line then heads northwest for about 0.19 mile adjacent to the right-of-way for a Loudoun County Water line and across Gloucester Parkway. From that point, the transmission line continues to the north for 0.57 mile, generally following the Loudoun County Water line. The transmission line then turns to the north and east for 0.19 mile before heading due

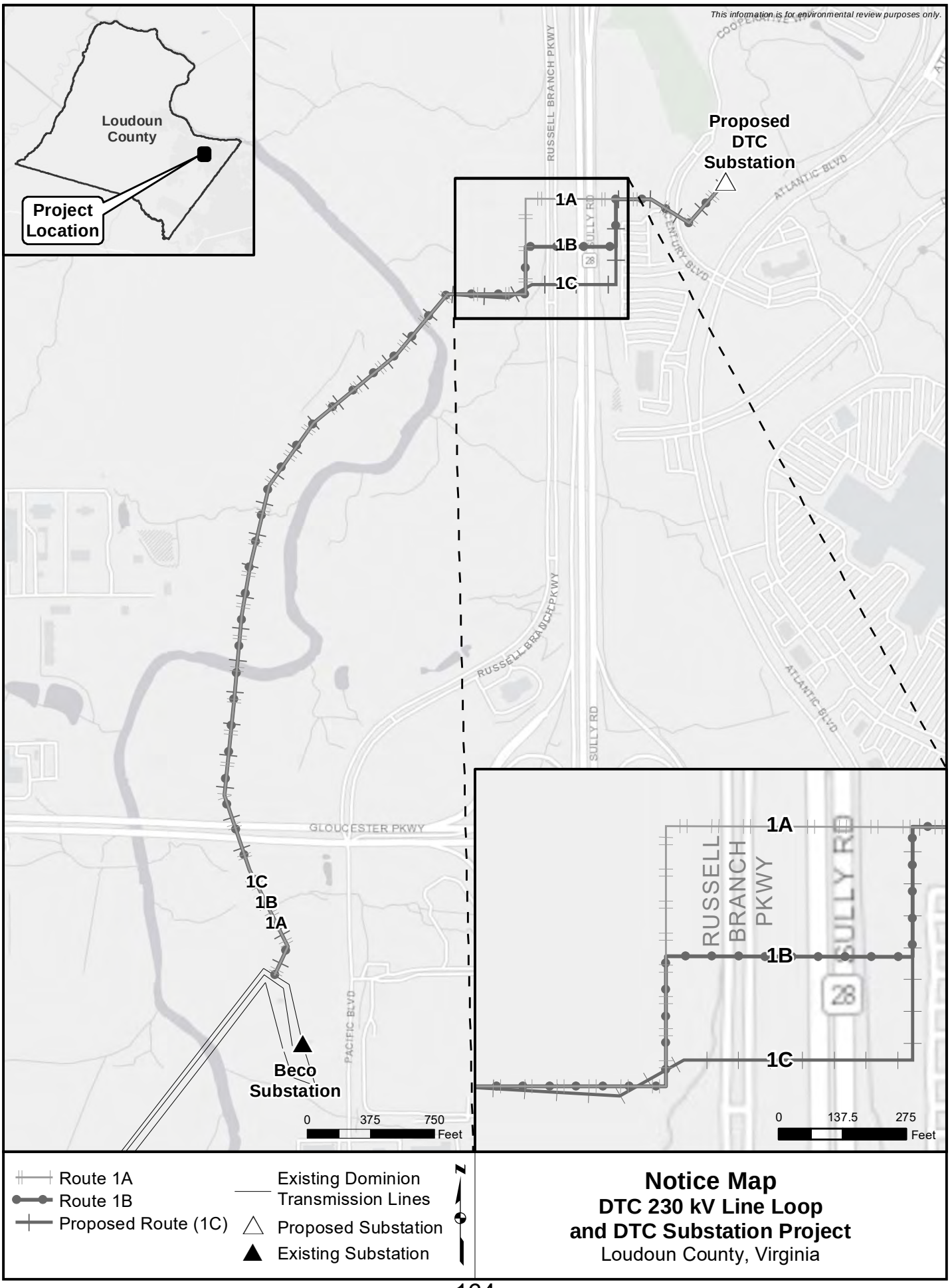
north for 0.11 mile following the west side of Russell Branch Parkway. After a 0.09 mile crossing of Russell Branch Parkway and Sully Road, the line then continues east and southeast for 0.09 mile crossing Century Boulevard. Finally, the route heads northeast for 0.07 mile and then enters the proposed DTC Substation property.

The DTC Loop along the Overhead Alternative 1A Route will be constructed on new right-of-way supported by 13 double circuit, single-shaft galvanized steel poles, and two double circuit galvanized steel 2-pole structures with a minimum structure height of approximately 90 feet, a maximum structure height of approximately 120 feet, and an average proposed structure height of approximately 105 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

Overhead Alternative 1B (Route 1B)

The Overhead Alternative Route 1B of the proposed DTC 230 kV Line Loop is approximately 1.31 miles in length. Overhead Alternative Route 1B originates between Structures #2143/12-13, which are located northwest of the Company's existing BECO Substation. The line then heads northwest for about 0.19 mile adjacent to the right-of-way for a Loudoun County Water line and across Gloucester Parkway. From that point, the transmission line continues to the north for 0.57 mile, generally following the Loudoun County Water line. The transmission line then turns to the north and east for 0.19 mile before heading due north for 0.05 mile following the west side of Russell Branch Parkway. After a 0.10-mile crossing of Russell Branch Parkway and Sully Road, the line then turns north for 0.05 mile paralleling the east side of Sully Road. The route then continues east and southeast for 0.08 mile crossing Century Boulevard. Finally, the route heads northeast for 0.07 mile and then enters the proposed DTC Substation property.

The DTC Loop along Overhead Alternative Route 1B will be constructed on new right-of-way supported by 13 double circuit, single-shaft galvanized steel poles, and four double circuit galvanized steel 2-pole structures with a minimum structure height of approximately 90 feet, a maximum structure height of approximately 120 feet, and an average proposed structure height of approximately 106 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.


This information is for environmental review purposes only.
Loudoun County
Project Location
Proposed DTC Substation
1A
1B
1C
RUSSELL BRANCH PKWY
SULLY RD
ATLANTIC BLVD
CENTURY BLVD
GLOUCESTER PKWY
PACIFIC BLVD
Beco Substation
0 375 750 Feet
0 137.5 275 Feet
Route 1A
Route 1B
Proposed Route (1C)
Existing Dominion Transmission Lines
Proposed Substation
Existing Substation
N
Notice Map
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia

V. NOTICE

B. List Applicant offices where members of the public may inspect the application. If applicable, provide a link to website(s) where the application may be found.

Response: Due to COVID-19, the Application will be made available electronically for public inspection at: www.dominionenergy.com/DTC.

V. NOTICE

C. List all federal, state, and local agencies and/or officials that may reasonably be expected to have an interest in the proposed construction and to whom the Applicant has furnished or will furnish a copy of the application.

Response:

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

Ms. S. Rene Hypes
Virginia Department of Conservation and Recreation
Environmental Review Coordinator, Natural Heritage Program
600 East Main Street, Suite 1400
Richmond, Virginia 23219

Ms. Robbie Rhur
Department of Conservation and Recreation, Planning Bureau
600 East Main Street, 17th Floor
Richmond, Virginia 23219

Mr. Roger Kirchen
Department of Historic Resources
Review and Compliance Division
2801 Kensington Avenue
Richmond, Virginia 23221

Ms. Amy M. Ewing
Virginia Department of Wildlife Resources
P.O. Box 90778
Henrico, Virginia 23228

Mr. Keith Tignor
Endangered Plant and Insect Species Program
Virginia Department of Agriculture and Consumer Affairs
102 Governor Street
Richmond, Virginia 23219

Mr. Terry Lasher
Virginia Department of Forestry
Forestland Conservation Division
900 Natural Resources Drive, Suite 800
Charlottesville, Virginia 22903

Mr. Mark Eversole
Virginia Marine Resources Commission
Habitat Management Division
Building 96, 380 Fenwick Road
Ft. Monroe, Virginia 23651

Mr. Troy Andersen
US Fish and Wildlife Service
Virginia Field Office, Ecological Services
6669 Short Lane
Gloucester, Virginia 23061

Regulator of the Day
US Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Mike Helvey
Obstruction Evaluation Group Manager
Federal Aviation Administration, FAA Eastern Regional Office
800 Independence Ave, SW, Room 400 East
Washington, DC 20591

Sunil Rabindranath
Project Manager, Engineering Division
Metropolitan Washington Airports Authority
P.O. Box 17045, MA-224
Washington, DC 20041

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

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

John D. Lynch
Northern Virginia District Engineer
Virginia Department of Transportation, Northern Virginia District Office
4975 Alliance Drive
Fairfax, Virginia 22030

Kamal Suliman
Regional Operations Director
Virginia Department of Transportation, Northern Virginia District Office
4975 Alliance Drive
Fairfax, Virginia 22030

Tim Hemstreet
Loudoun County Administrator
PO Box 7000
Leesburg, Virginia 20177

V. NOTICE

D. If the application is for a transmission line with a voltage of 138 kV or greater, provide a statement and any associated correspondence indicating that prior to the filing of the application with the SCC the Applicant has notified the chief administrative officer of every locality in which it plans to undertake construction of the proposed line of its intention to file such an application, and that the Applicant gave the locality a reasonable opportunity for consultation about the proposed line (similar to the requirements of § 15.2-2202 of the Code for electric transmission lines of 150 kV or more).

Response: In accordance with Va. Code §15.2-2202 E, a letter dated October 5, 2021, was delivered to Mr. Tim Hemstreet, Administrator of Loudoun County, where the Project is located. The letter stated the Company's intention to file this Application and invited the County to consult with the Company about the Project. This letter is included as Attachment V.D.1.

Dominion Energy Virginia
10900 Nuckols Road, 4th Floor, Glen Allen, Virginia 23060

October 5, 2021

Tim Hemstreet
Loudoun County Administrator
PO Box 7000
Leesburg, VA 20177

RE: Dominion Energy Virginia's Proposed DTC 230 kV Line Loop and DTC Substation Loudoun County, Virginia
Notice Pursuant to Va. Code § 15.2-2202 E

Dear Mr. Hemstreet:

Dominion Energy Virginia (the "Company") is proposing the DTC 230 kV Line Loop and DTC Substation Project (the "Project") within Loudoun County, Virginia. The Project is necessary to ensure that Dominion Energy can address increased load demand for power and maintain reliable electric service to customers in Loudoun County.

Specifically, the Company is proposing to construct a new overhead 230 kV double circuit transmission loop on new right-of-way by cutting the existing Dominion Energy Virginia Line #2143 at a junction just north of the BECO Substation. From that junction, the Project corridor will extend approximately 1.3 miles generally northeast to the proposed DTC Substation.

The Company is preparing an application for a Certificate of Public Convenience and Necessity ("CPCN") from the State Corporation Commission (SCC). Pursuant to Va. Code § 15.2-2202, the Company is writing to notify Loudoun County of the proposed project in advance of the SCC filing.

We respectfully request 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 route and project location. If you would like to receive a GIS shapefile of the route to assist in your project review or if you have any questions, please do not hesitate to contact me at (804) 201-3053 or greg.r.baka@dominionenergy.com.

Dominion Energy Virginia
10900 Nuckols Road, 4th Floor, Glen Allen, Virginia 23060

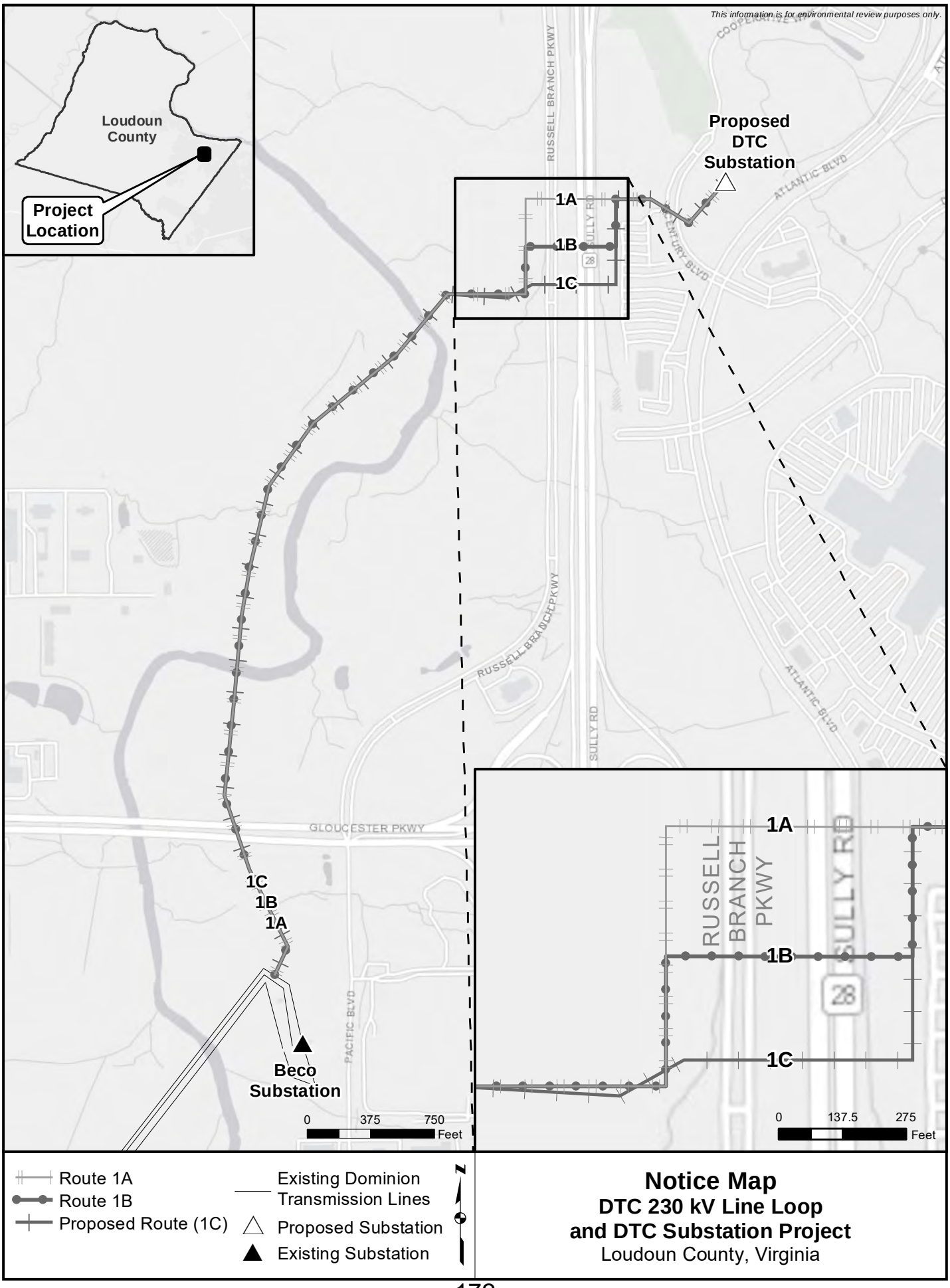
Dominion Energy appreciates your assistance with this project review and looks forward to any additional information you may have to offer.

Sincerely,

Greg Baka

Greg Baka
Local Permitting Consultant

Attachment: Project Overview Map



Notice Map
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia

COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

APPLICATION OF	)	
	)	
VIRGINIA ELECTRIC AND POWER COMPANY	)	Case No. PUR-2021-00280
	)	
For approval and certification of electric transmission facilities: DTC 230 kV Line Loop and DTC Substation	)	

IDENTIFICATION, SUMMARIES, AND TESTIMONY OF DIRECT WITNESSES OF VIRGINIA ELECTRIC AND POWER COMPANY

Harrison S. Potter

Witness Direct Testimony Summary
Direct Testimony
Appendix A: Background and Qualifications

David M. Burnam

Witness Direct Testimony Summary
Direct Testimony
Appendix A: Background and Qualifications

Sherrill A. Crenshaw

Witness Direct Testimony Summary
Direct Testimony
Appendix A: Background and Qualifications

Santosh Bhattarai

Witness Direct Testimony Summary
Direct Testimony
Appendix A: Background and Qualifications

Greg R. Baka

Witness Direct Testimony Summary
Direct Testimony
Appendix A: Background and Qualifications

Jon M. Berkin, PhD

Witness Direct Testimony Summary
Direct Testimony
Appendix A: Background and Qualifications

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Harrison S. Potter

Title: Consulting Engineer – Electric Transmission Planning

Summary:

Company Witness Harrison S. Potter sponsors those sections of the Appendix describing the Company's electric transmission system and the need for, and benefits of, the proposed Project, as follows:

- Section I.G: This section provides a system map for the affected area.
- Section I.J: This section provides information about the project if approved by the RTO.
- Section I.K: This section, when applicable, provides outage history and maintenance history for existing transmission lines if the proposed project is a rebuild and is due in part to reliability issues.
- Section I.M: This section, when applicable, contains information for transmission lines interconnecting a non-utility generator.
- Section II.A.3: This section provides color maps of existing or proposed rights-of-way in the vicinity of the proposed project.
- Section II.A.10: This section provides details of the construction plans for the proposed project, including requested line outage schedules.

Additionally, Company Witness Potter co-sponsors the following sections of the Appendix:

- Section I.A (co-sponsored with Company Witnesses David M. Burnam, Sherrill A. Crenshaw, Santosh Bhattarai, Greg R. Baka, and Jon M. Berkin): This section details the primary justifications for the proposed project.
- Section I.B (co-sponsored with Company Witness David M. Burnam): This section details the engineering justifications for the proposed project.
- Section I.C (co-sponsored with Company Witness David M. Burnam): This section describes the present system and details how the proposed project will effectively satisfy present and projected future load demand requirements.
- Section I.D (co-sponsored with Company Witness David M. Burnam): This section, when applicable, describes critical contingencies and associated violations due to the inadequacy of the existing system.
- Section I.E (co-sponsored with Company Witness David M. Burnam): This section explains feasible project alternatives, when applicable.
- Section I.H (co-sponsored with Company Witnesses David M. Burnam and Greg R. Baka): This section provides the desired in-service date of the proposed project and the estimated construction time.
- Section I.I. (co-sponsored with Company Witnesses Sherrill A. Crenshaw and Santosh Bhattarai): This section provides the estimated total cost of the proposed project.
- Section I.L (co-sponsored with Company Witness Sherrill A. Crenshaw): This section, when applicable, provides details on the deterioration of structures and associated equipment.
- Section I.N (co-sponsored with Company Witness David M. Burnam): This section provides the proposed and existing generating sources, distribution circuits or load centers planned to be served by all new substations, switching stations, and other ground facilities associated with the proposed project.

A statement of Mr. Potter's background and qualifications is attached to his testimony as Appendix A.

DIRECT TESTIMONY
OF
HARRISON S. POTTER
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2021-00280

Q. Please state your name, business address and position with Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company").

A. My name is Harrison S. Potter, and I am a Consulting Engineer in Electric Transmission Planning for the Company. My business address is 10900 Nuckols Road, Glen Allen, Virginia 23060. A statement of my qualifications and background is provided as Appendix A.

Q. Please describe your areas of responsibility with the Company.

A. I am responsible for planning the Company's electric transmission system for voltages of 69 kilovolt ("kV") through 500 kV.

Q. What is the purpose of your testimony in this proceeding?

A. In order to provide service requested by three retail electric service customers (the "Customers"); to maintain reliable service for the overall growth in the area; and to comply with mandatory North American Electric Reliability Corporation Reliability Standards, Dominion Energy Virginia proposes in Loudoun County, Virginia, to:

(1) Construct a new approximately 1.30-mile overhead 230 kV double circuit transmission line loop on new 100-foot-wide right-of-way by cutting 230 kV Beaumeade-BECO Line #2143 at a junction located between Structures #2143/12-13 adjacent to the Company's existing BECO Substation, resulting in (i) 230 kV Beaumeade-DTC Line #2143, and (ii) 230 kV BECO-DTC Line #2249 ("DTC Loop"). From the junction, the DTC Loop will extend along the Proposed Route approximately 1.30 mile generally northeast to the proposed DTC Substation. While the proposed junction is located in existing right-of-way, the

proposed DTC Loop will be constructed on new right-of-way supported by 15 double circuit, single-shaft galvanized steel poles, and two double circuit galvanized steel 2-pole structures, utilizing three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,574 MVA; and

(2) Construct a new 230-34.5 kV substation in Loudoun County, Virginia ("DTC Substation"), and upgrade line protection at the Company's existing BECO and Beaumeade Substations.

The DTC Loop, DTC Substation and related substation work are collectively referred to as the "Project."

The purpose of my testimony is to describe the Company's electric transmission system and the need for, and benefits of, the proposed Project. I am sponsoring Sections I.G, I.J, I.K, I.M, II.A.3, and II.A.10 of the Appendix. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses David M. Burnam, Sherrill A. Crenshaw, Santosh Bhattarai, Greg R. Baka, and Jon M. Berkin; Sections I.B, I.C, I.D, I.E, and I.N with Company Witness David M. Burnam; Section I.H with Company Witnesses David M. Burnam and Greg R. Baka; Section I.I with Company Witnesses Sherrill A. Crenshaw and Santosh Bhattarai; and Section I.L with Company Witness Sherrill A. Crenshaw.

Q. Does this conclude your pre-filed direct testimony?

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
HARRISON S. POTTER

Harrison Potter is a 2012 graduate from Virginia Commonwealth University with a Masters in Business Administration and a 2005 graduate from Virginia Polytechnic Institute and State University with a Bachelor of Science in Mechanical Engineering. Mr. Potter has been employed by the Company for 17 years. His experience with the Company includes transmission planning (two years), distribution planning (11 years), distribution design (two years), and GIS services (two years). Mr. Potter was promoted to his current role in transmission planning in 2019.

Mr. Potter has previously testified before the Virginia State Corporation Commission.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: David M. Burnam

Title: Consulting Engineer – Distribution Grid Planning

Summary:

Company Witness David M. Burnam co-sponsors those sections of the Appendix describing the Company's electric distribution system and the need for, and benefits of, the proposed Project, as follows:

- Section I.A (co-sponsored with Company Witnesses Harrison S. Potter, Sherrill A. Crenshaw, Santosh Bhattarai, Greg R. Baka, and Jon M. Berkin): This section details the primary justifications for the proposed project.

- Section I.B (co-sponsored with Company Witness Harrison S. Potter): This section details the engineering justifications for the proposed project.

- Section I.C (co-sponsored with Company Witness Harrison S. Potter): This section describes the present system and details how the proposed project will effectively satisfy present and projected future load demand requirements.

- Section I.D (co-sponsored with Company Witness Harrison S. Potter): Although not applicable to the proposed project, this section, when applicable, describes critical contingencies and associated violations due to the inadequacy of the existing system.

- Section I.E (co-sponsored with Company Witness Harrison S. Potter): This section explains feasible project alternatives, when applicable.

- Section I.H (co-sponsored with Company Witnesses Harrison S. Potter and Greg R. Baka): This section provides the desired in-service date of the proposed project and the estimated construction time.

- Section I.N (co-sponsored with Company Witness Harrison S. Potter): This section provides the proposed and existing generating sources, distribution circuits or load centers planned to be served by all new substations, switching stations, and other ground facilities associated with the proposed project.

A statement of Mr. Burnam's background and qualifications is attached to his testimony as Appendix A.

DIRECT TESTIMONY
OF
DAVID M. BURNAM
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2021-00280

Q. Please state your name, business address and position with Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company").

A. My name is David M. Burnam, and I am a Consulting Engineer – Distribution Grid Planning for the Company. My business address is 600 E. Canal Street, Richmond, Virginia 23219. A statement of my qualifications and background is provided as Appendix A.

Q. Please describe your areas of responsibility with the Company.

A. I am responsible for planning the Company's electric distribution system that serves data centers, primarily in the Company's Northern Virginia offices, for voltage under 69 kV.

Q. What is the purpose of your testimony in this proceeding?

A. In order to provide service requested by three retail electric service customers (the "Customers"); to maintain reliable service for the overall growth in the area; and to comply with mandatory North American Electric Reliability Corporation Reliability Standards, Dominion Energy Virginia proposes in Loudoun County, Virginia, to:

(1) Construct a new approximately 1.30-mile overhead 230 kV double circuit transmission line loop on new 100-foot-wide right-of-way by cutting 230 kV Beaumeade-BECO Line #2143 at a junction located between Structures #2143/12-13 adjacent to the Company's existing BECO Substation, resulting in (i) 230 kV Beaumeade-DTC Line #2143, and (ii) 230 kV BECO-DTC Line #2249 ("DTC Loop"). From the junction, the DTC Loop will extend along the Proposed Route approximately 1.30 mile generally northeast to the proposed DTC Substation. While the proposed junction is located in existing right-of-way, the

proposed DTC Loop will be constructed on new right-of-way supported by 15 double circuit, single-shaft galvanized steel poles, and two double circuit galvanized steel 2-pole structures, utilizing three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,574 MVA; and

(2) Construct a new 230-34.5 kV substation in Loudoun County, Virginia ("DTC Substation"), and upgrade line protection at the Company's existing BECO and Beaumeade Substations.

The DTC Loop, DTC Substation and related substation work are collectively referred to as the "Project."

The purpose of my testimony is to describe the Company's electric distribution system and the need for, and benefits of, the proposed Project. I co-sponsor the Executive Summary and Section I.A with Company Witnesses Harrison S. Potter, Sherrill A. Crenshaw, Santosh Bhattarai, Greg R. Baka, and Jon M. Berkin. Additionally, I co-sponsor Sections I.B, I.C, I.D, I.E, and I.N of the Appendix with Company Witness Harrison S. Potter; and Section I.H with Company Witnesses Harrison S. Potter and Greg R. Baka.

Q. Does this conclude your pre-filed direct testimony?

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
DAVID M. BURNAM

David M. Burnam received a Bachelor of Science degree in Electrical Engineering from the Virginia Polytechnic Institute and State University in 1985. He is licensed as a Professional Engineer in the Commonwealth of Virginia. He has been employed by the Company since 1990. Mr. Burnam's experience with the Company includes distribution planning (23 years), energy efficiency (four years), and nuclear engineering and nuclear training (four years). Prior to working for the Company, Mr. Burnam worked as a plant engineer and consulting engineer for five years.

Mr. Burnam has previously testified before the Virginia State Corporation Commission.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Sherrill A. Crenshaw

Title: Consulting Engineer – Electric Transmission Line Engineering

Summary:

Company Witness Sherrill A. Crenshaw sponsors those sections of the Appendix providing an overview of the design characteristics of the transmission facilities for the proposed Project, and discussing electric and magnetic field levels, as follows:

- Section I.F: This section, when applicable, describes any lines or facilities that will be removed, replaced, or taken out of service upon completion of the proposed project.
- Section II.A.5: This section provides drawings of the right-of-way cross section showing typical transmission lines structure placements.
- Sections II.B.1 to II.B.2: These sections provide the line design and operational features of the proposed project, as applicable.
- Section IV: This section provides analysis on the health aspects of electric and magnetic field levels.

Additionally, Company Witness Crenshaw co-sponsors the following sections of the Appendix:

- Section I.A (co-sponsored with Company Witnesses Harrison S. Potter, David M. Burnam, Santosh Bhattarai, Greg R. Baka, and Jon M. Berkin): This section details the primary justifications for the proposed project.
- Section I.I. (co-sponsored with Company Witnesses Harrison S. Potter and Santosh Bhattarai): This section provides the estimated total cost of the proposed project.
- Section I.L (co-sponsored with Company Witness Harrison S. Potter): This section, when applicable, provides details on the deterioration of structures and associated equipment.
- Sections II.B.3 to II.B.5 (co-sponsored with Company Witness Greg R. Baka): These sections, when applicable, provide supporting structure details along the proposed and alternative routes.
- Section II.B.6 (co-sponsored with Company Witnesses Greg R. Baka and Jon M. Berkin): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section V.A (co-sponsored with Company Witnesses Greg R. Baka and Jon M. Berkin): This section provides the proposed route description and structure heights for notice purposes.

A statement of Mr. Crenshaw's background and qualifications is attached to his testimony as Appendix A.

DIRECT TESTIMONY
OF
SHERRILL A. CRENSHAW
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2021-00280

Q. Please state your name, business address and position with Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company").

A. My name is Sherrill A. Crenshaw, and I am a Consulting Engineer in the Electric Transmission Line Engineering Department of the Company. My business address is 10900 Nuckols Road, Glen Allen, Virginia 23060. A statement of my qualifications and background is provided as Appendix A.

Q. Please describe your areas of responsibility with the Company.

A. I am responsible for the estimating, conceptual, and final design of high voltage transmission line projects from 69 kilovolt ("kV") to 500 kV.

Q. What is the purpose of your testimony in this proceeding?

A. In order to provide service requested by three retail electric service customers (the "Customers"); to maintain reliable service for the overall growth in the area; and to comply with mandatory North American Electric Reliability Corporation Reliability Standards, Dominion Energy Virginia proposes in Loudoun County, Virginia, to:

(1) Construct a new approximately 1.30-mile overhead 230 kV double circuit transmission line loop on new 100-foot-wide right-of-way by cutting 230 kV Beaumeade-BECO Line #2143 at a junction located between Structures #2143/12-13 adjacent to the Company's existing BECO Substation, resulting in (i) 230 kV Beaumeade-DTC Line #2143, and (ii) 230 kV BECO-DTC Line #2249 ("DTC Loop"). From the junction, the DTC Loop will extend along the Proposed Route approximately 1.30 mile generally northeast to the proposed DTC Substation. While the proposed junction is located in existing right-of-way, the

proposed DTC Loop will be constructed on new right-of-way supported by 15 double circuit, single-shaft galvanized steel poles, and two double circuit galvanized steel 2-pole structures, utilizing three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,574 MVA; and

(2) Construct a new 230-34.5 kV substation in Loudoun County, Virginia ("DTC Substation"), and upgrade line protection at the Company's existing BECO and Beaumeade Substations.

The DTC Loop, DTC Substation and related substation work are collectively referred to as the "Project."

The purpose of my testimony is to describe the design characteristics of the transmission facilities for the proposed Project, and also to discuss electric and magnetic field ("EMF") levels. I am sponsoring Sections I.F, II.A.5, II.B.1, II.B.2, and IV of the Appendix. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Harrison S. Potter, David M. Burnam, Santosh Bhattarai, Greg R. Baka, and Jon M. Berkin; Section I.I with Company Witnesses Harrison S. Potter and Santosh Bhattarai; Section I.L with Company Witness Harrison S. Potter; Sections II.B.3 to II.B.5 with Company Witness Baka; and Sections II.B.6 and V.A with Company Witnesses Greg R. Baka and Jon M. Berkin.

Q. Does this conclude your pre-filed direct testimony?

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
SHERRILL A. CRENSHAW

Sherrill A. Crenshaw graduated from Virginia Polytechnic Institute and State University in 1985 with a Bachelor of Science in Civil Engineering. He joined the Company in 1986 and has held various engineering titles within the Electric Transmission Engineering department, where he currently works as a Consulting Engineer. Mr. Crenshaw is a licensed engineer in the Commonwealth of Virginia.

Mr. Crenshaw has previously testified before the Virginia State Corporation

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Santosh Bhattarai

Title: Consulting Engineer – Substation Engineering

Summary:

Company Witness Santosh Bhattarai sponsors or co-sponsors the following sections of the Appendix describing the substation work to be performed for the proposed Project as follows:

- Section I.A (co-sponsored with Company Witnesses Harrison S. Potter, David M. Burnam, Sherrill A. Crenshaw, Greg R. Baka, and Jon M. Berkin): This section details the primary justifications for the proposed project.

- Section I.I (co-sponsored with Company Witnesses Harrison S. Potter and Sherrill A. Crenshaw): This section provides the estimated total cost of the proposed project.

- Section II.C: This section describes and furnishes a one-line diagram of the substation associated with the proposed project.

A statement of Mr. Bhattarai's background and qualifications is attached to his testimony as Appendix A.

DIRECT TESTIMONY
OF
SANTOSH BHATTARAI
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2021-00280

Q. Please state your name, business address and position with Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company").

A. My name is Santosh Bhattarai, and I am a Consulting Engineer in the Substation Engineering section of the Electric Transmission group of the Company. My business address is 2400 Grayland Avenue, Richmond, Virginia 23220. A statement of my qualifications and background is provided as Appendix A.

Q. What are your responsibilities as a Consulting Engineer?

A. I am responsible for evaluation of the substation project requirements, feasibility studies, conceptual physical design, scope development, preliminary engineering and cost estimating for high voltage transmission and distribution substations.

Q. What is the purpose of your testimony in this proceeding?

A. In order to provide service requested by three retail electric service customers (the "Customers"); to maintain reliable service for the overall growth in the area; and to comply with mandatory North American Electric Reliability Corporation Reliability Standards, Dominion Energy Virginia proposes in Loudoun County, Virginia, to:

(3) Construct a new approximately 1.30-mile overhead 230 kV double circuit transmission line loop on new 100-foot-wide right-of-way by cutting 230 kV Beaumeade-BECO Line #2143 at a junction located between Structures #2143/12-13 adjacent to the Company's existing BECO Substation, resulting in (i) 230 kV Beaumeade-DTC Line #2143, and (ii) 230 kV BECO-DTC Line #2249 ("DTC Loop"). From the junction, the DTC Loop will extend along the Proposed

Route approximately 1.30 mile generally northeast to the proposed DTC Substation. While the proposed junction is located in existing right-of-way, the proposed DTC Loop will be constructed on new right-of-way supported by 15 double circuit, single-shaft galvanized steel poles, and two double circuit galvanized steel 2-pole structures, utilizing three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,574 MVA; and

(4) Construct a new 230-34.5 kV substation in Loudoun County, Virginia ("DTC Substation"), and upgrade line protection at the Company's existing BECO and Beaumeade Substations.

The DTC Loop, DTC Substation and related substation work are collectively referred to as the "Project."

The purpose of my testimony is to describe the work to be performed as part of the Project at the Lockridge Substation. As it pertains to station work, I sponsor Section II.C of the Appendix. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Harrison S. Potter, David M. Burnam, Sherrill A. Crenshaw, Greg R. Baka, and Jon M. Berkin; and Section I.I of the Appendix with Company Witnesses Harrison S. Potter and Sherrill A. Crenshaw.

Q. Does this conclude your pre-filed direct testimony?

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
SANTOSH BHATTARAI

Santosh Bhattarai received a Master of Science degree in Electrical Engineering from South Dakota State University in 2006. Before working for the Company, Mr. Bhattarai worked at Electrical Consultants, Inc. from 2006 to 2009 in Billings, Montana as a Substation Design Engineer. Then, from 2010 to 2013, he worked at Electrical Consultants, Inc. in Madison, Wisconsin as a Substation Project Engineer. Mr. Bhattarai's responsibilities included the evaluation of the substation project requirements, development of project scope documents, estimates and schedules, preparation of specifications and bid documents, material procurement, development of detailed physical drawings, bill of materials, electrical schematics and wiring diagrams. Mr. Bhattarai joined the Dominion Energy Virginia Substation Engineering department in November 2013 as an Engineer III. He was promoted to Consulting Engineer in July 2019. He has been licensed as a Professional Engineer in the Commonwealth of Virginia since 2015. In recognition of his professional standing, the Institute of Electrical and Electronics Engineers ("IEEE") board elected him to the grade of Senior Member in 2017.

Mr. Bhattarai has previously testified before the Virginia State Corporation Commission.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Greg R. Baka

Title: Electric Transmission Local Permitting Consultant

Summary:

Company Witness Greg R. Baka will sponsor those sections of the Appendix providing an overview of the design of the route for the proposed Project, and related permitting, as follows:

- Section II.A.12: This section identifies the counties and localities through which the proposed project will pass and provides General Highway Maps for these localities.
- Sections V.B-D: These sections provide information related to public notice of the proposed project.

Additionally, Mr. Baka co-sponsors the following portion of the Appendix:

- Section I.A (co-sponsored with Company Witnesses Harrison S. Potter, David M. Burnam, Sherrill A. Crenshaw, Santosh Bhattarai, and Jon M. Berkin): This section details the primary justifications for the proposed project.
- Section I.H (co-sponsored with Company Witnesses Harrison S. Potter and David M. Burnam): This section provides the desired in-service date of the proposed project and the estimated construction time.
- Section II.A.1 (co-sponsored with Company Witness Jon M. Berkin): This section provides the length of the proposed corridor and viable alternatives to the proposed project.
- Section II.A.2 (co-sponsored with Company Witness Jon M. Berkin): This section provides a map showing the route of the proposed project in relation to notable points close to the proposed project.
- Section II.A.4 (co-sponsored with Company Witness Jon M. Berkin): This section explains why the existing right-of-way is not adequate to serve the need.
- Sections II.A.6 to II.A.8 (co-sponsored with Company Witness Jon M. Berkin): These sections provide detail regarding the right-of-way for the proposed project.
- Section II.A.9 (co-sponsored with Company Witness Jon M. Berkin): This section describes the proposed route selection procedures and details alternative routes considered.
- Section II.A.11 (co-sponsored with Company Witness Jon M. Berkin): This section details how the construction of the proposed project follows the provisions discussed in Attachment 1 of the Transmission Appendix Guidelines.
- Sections II.B.3 to II.B.5 (co-sponsored with Company Witness Sherrill A. Crenshaw): These sections, when applicable, provide supporting structure details along the proposed and alternative routes.
- Section II.B.6 (co-sponsored with Company Witnesses Sherrill A. Crenshaw and Jon M. Berkin): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section III (co-sponsored with Company Witness Jon M. Berkin): This section details the impact of the proposed project on scenic, environmental, and historic features.
- Section V.A (co-sponsored with Company Witnesses Sherrill A. Crenshaw and Jon M. Berkin): This section provides the proposed route description and structure heights for notice purposes.

Finally, Mr. Baka co-sponsors the DEQ Supplement filed with the Application with Company Witness Jon M. Berkin. A statement of Mr. Baka's background and qualifications is attached to his testimony as Appendix A.

DIRECT TESTIMONY
OF
GREG R. BAKA
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2021-00280

Q. Please state your name, business address and position with Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company").

A. My name is Greg R. Baka, and I am an Electric Transmission Local Permitting Consultant for the Company. My business address is 10900 Nuckols Road, Glen Allen, Virginia 23060. A statement of my qualifications and background is provided as Appendix A.

Q. Please describe your areas of responsibility with the Company.

A. I am responsible for identifying appropriate routes for transmission lines and obtaining necessary federal, state, and local approvals and environmental permits for those facilities. In this position, I work closely with government officials, permitting agencies, property owners, and other interested parties, as well as with other Company personnel, to develop facilities needed by the public so as to reasonably minimize environmental and other impacts on the public in a reliable, cost-effective manner.

Q. What is the purpose of your testimony in this proceeding?

A. In order to provide service requested by three retail electric service customers (the "Customers"); to maintain reliable service for the overall growth in the area; and to comply with mandatory North American Electric Reliability Corporation Reliability Standards, Dominion Energy Virginia proposes in Loudoun County, Virginia, to:

(1) Construct a new approximately 1.30-mile overhead 230 kV double circuit transmission line loop on new 100-foot-wide right-of-way by cutting 230 kV Beaumeade-BECO Line #2143 at a junction located between Structures #2143/12-13 adjacent to the Company's existing BECO Substation, resulting in (i) 230 kV Beaumeade-DTC Line #2143, and (ii) 230 kV BECO-DTC Line #2249 ("DTC Loop"). From the junction, the DTC Loop will extend along the Proposed Route approximately 1.30 mile generally northeast to the proposed DTC Substation. While the proposed junction is located in existing right-of-way, the proposed DTC Loop will be constructed on new right-of-way supported by 15 double circuit, single-shaft galvanized steel poles, and two double circuit galvanized steel 2-pole structures, utilizing three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,574 MVA; and

(2) Construct a new 230-34.5 kV substation in Loudoun County, Virginia ("DTC Substation"), and upgrade line protection at the Company's existing BECO and Beaumeade Substations.

The DTC Loop, DTC Substation and related substation work are collectively referred to as the "Project."

The purpose of my testimony is to provide an overview of the route and permitting for the proposed Project. I sponsor Sections II.A.12 and V.B to V.D of the Appendix. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Harrison S. Potter, David M. Burnam, Sherrill A. Crenshaw, Santosh Bhattarai, and Jon M. Berkin; Section I.H with Company Witnesses Harrison S. Potter and David M. Burnam; Sections II.A.1, II.A.2, II.A.4, II.A.6 to II.A.9, II.A.11, and III with Company Witness Jon M. Berkin; Sections II.B.3 to II.B.5 with Company Witness Sherrill A. Crenshaw; and Sections II.B.6 and V.A with Company Witnesses Sherrill A. Crenshaw and Jon M. Berkin. Finally, I co-sponsor the DEQ Supplement with Company Witness Jon M. Berkin.

Q. Has the Company complied with Va. Code § 15.2-2202 E?

A. Yes. In accordance with Va. Code §15.2-2202 E, a letter dated October 5, 2021, was delivered to Mr. Tim Hemstreet, Administrator of Loudoun County, where the Project is located. The letter stated the Company's intention to file this Application and invited the County to consult with the Company about the Project. This letter is included as Attachment V.D.1.

Q. Does this conclude your pre-filed direct testimony?

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
GREG R. BAKA

Mr. Greg R. Baka graduated from the University of Richmond in 1989 with a Bachelor of Arts degree in Urban Studies and Political Science. From 1990 to 1992, he worked as a Zoning Analyst for the City of Gaithersburg, Maryland. From 1992 to 1995, he worked as the Zoning Administrator for King William County, Virginia. From 1995 to 1998, he served Hanover County, Virginia as a Planner and was promoted to Senior Comprehensive Planner. He returned to King William County from 1998 to 2000 and served as their Director of Planning and Community Development. He then worked at Resource International, Ltd. as a Municipal Planner between 2001 and 2003. From 2004 to 2011, Mr. Baka owned and operated Viewshed Consulting, LLC, serving clients as a Land Planning Consultant. From 2011 to 2013, he worked as the Director of Economic Development for Cumberland County, Virginia. He joined the Company's Transmission Right-of-Way group in 2013 as Senior Siting & Permitting Specialist, was promoted to Supervisor of Siting, Permitting, and Real Estate in 2015, and became a Local Permitting Consultant, his current position, in 2019. Mr. Baka has served on several land planning and development-related local boards and commissions.

Mr. Baka has previously submitted pre-filed testimony to the Virginia State Corporation Commission.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Jon M. Berkin, PhD

Title: Partner, Environmental Resource Management

Summary:

Company Witness Jon M. Berkin sponsors the Environmental Routing Study provided as part of the Company's Application.

Additionally, Dr. Berkin co-sponsors the following portion of the Appendix:

- Section I.A (co-sponsored with Company Witnesses Harrison S. Potter, David M. Burnam, Sherrill A. Crenshaw, Santosh Bhattarai, and Greg R. Baka): This section details the primary justifications for the proposed project.
- Section II.A.1 (co-sponsored with Company Witness Greg R. Baka): This section provides the length of the proposed corridor and viable alternatives to the proposed project.
- Section II.A.2 (co-sponsored with Company Witness Greg R. Baka): This section provides a map showing the route of the proposed project in relation to notable points close to the proposed project.
- Section II.A.4 (co-sponsored with Company Witness Greg R. Baka): This section explains why the existing right-of-way is not adequate to serve the need.
- Sections II.A.6 to II.A.8 (co-sponsored with Company Witness Greg R. Baka): These sections provide detail regarding the right-of-way for the proposed project.
- Section II.A.9 (co-sponsored with Company Witness Greg R. Baka): This section describes the proposed route selection procedures and details alternative routes considered.
- Section II.A.11 (co-sponsored with Company Witness Greg R. Baka): This section details how the construction of the proposed project follows the provisions discussed in Attachment 1 of the Transmission Appendix Guidelines.
- Section II.B.6 (co-sponsored with Company Witnesses Sherrill A. Crenshaw and Jon M. Berkin): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section III (co-sponsored with Company Witness Greg R. Baka): This section details the impact of the proposed project on scenic, environmental, and historic features.
- Section V.A (co-sponsored with Company Witnesses Sherrill A. Crenshaw and Greg R. Baka): This section provides the proposed route description and structure heights for notice purposes.

Finally, Dr. Berkin co-sponsors the DEQ Supplement filed with this Application with Company Witness Greg R. Baka.

A statement of Dr. Berkin's background and qualifications is attached to his testimony as Appendix A.

DIRECT TESTIMONY
OF
JON M. BERKIN, PhD
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2021-00280

Q. Please state your name, position and place of employment and business address.

A. My name is Jon M. Berkin. I am employed as a Partner with Environmental Resource Management ("ERM"). My business address is 222 South 9th Street, Suite 2900, Minneapolis, Minnesota 55402. A statement of my qualifications and background is provided as Appendix A.

Q. What professional experience does ERM have with the routing of linear energy transportation facilities?

A. ERM has extensive experience in the routing, feasibility assessments, and permitting of energy infrastructure projects. It has assisted its clients in the identification, evaluation and development of linear energy facilities for the past 30 years. During this time it has developed a consistent approach for linear facility routing and route selection based on the identification, mapping and comparative evaluation of routing constraints and opportunities within defined study areas. ERM uses data-intensive Geographic Information System spatial and dimensional analysis and the most current and refined data layers and aerial photography resources available for the identification, evaluation and selection of transmission line routes. In addition to Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company"), its clients include some of the largest energy companies in the United States, Canada and the world, including ExxonMobil, TC Energy, Shell, NextEra Energy, Phillips 66, Kinder Morgan, British

Petroleum, Enbridge Energy and others. ERM also routinely assists the staff of the Federal Energy Regulatory Commission, United States Army Corps of Engineers, and the U.S. Forest Service in the identification and/or evaluation of linear energy routes to support federal National Environmental Policy Act evaluations. ERM works on both small and large energy projects and has assisted in or conducted the routing and route evaluation of some of the largest electric transmission line and pipeline facilities in North America.

In Virginia, we served as routing consultant to Dominion Energy Virginia for its Cannon Branch-Cloverhill 230 kV transmission line project in the City of Manassas and Prince William County, approved by the Commission in Case No. PUE-2011-00011. We similarly served as the routing consultant for the Company's Dahlgren 230 kV double circuit transmission line project in King George County, approved by the Commission in Case No. PUE-2011-00113. ERM also served as the routing consultant for the Company's Surry-Skiffes Creek-Whealton 500 and 230 kV transmission lines in Case No. PUE-2012-00029; for the Company's Remington CT-Warrenton 230 kV Double Circuit transmission line, approved by the Commission in Case No. PUE-2014-00025; for the Haymarket 230 kV Line and Substation Project in Case No. PUE-2015-00107; for the Remington-Gordonsville Electric Transmission Project, approved by the Commission in Case No. PUE-2015-00117; for the Norris Bridge project approved by the Commission in Case No. PUE-2016-00021; for the Company's Idylwood-Tysons 230 kV single circuit underground transmission line, Tysons Substation rebuild and related transmission facilities, approved by the Commission in Case No. PUR-2017-00143, and most recently

the Lockridge 230 kV Line Loop and Substation project approved by the Commission in Case No. PUR-2019-00215.

ERM's role as routing consultant for each of these transmission line projects included preparation of an Environmental Routing Study for the project and submission of testimony sponsoring it.

Q. What were you asked to do in connection with this case?

A. In order to provide service requested by three retail electric service customers (the "Customers"); to maintain reliable service for the overall growth in the area; and to comply with mandatory North American Electric Reliability Corporation Reliability Standards, Dominion Energy Virginia proposes in Loudoun County, Virginia, to:

(1) Construct a new approximately 1.30-mile overhead 230 kV double circuit transmission line loop on new 100-foot-wide right-of-way by cutting 230 kV Beaumeade-BECO Line #2143 at a junction located between Structures #2143/12-13 adjacent to the Company's existing BECO Substation, resulting in (i) 230 kV Beaumeade-DTC Line #2143, and (ii) 230 kV BECO-DTC Line #2249 ("DTC Loop"). From the junction, the DTC Loop will extend along the Proposed Route approximately 1.30 mile generally northeast to the proposed DTC Substation. While the proposed junction is located in existing right-of-way, the proposed DTC Loop will be constructed on new right-of-way supported by 15 double circuit, single-shaft galvanized steel poles, and two double circuit galvanized steel 2-pole structures, utilizing three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,574 MVA; and

(2) Construct a new 230-34.5 kV substation in Loudoun County, Virginia ("DTC Substation"), and upgrade line protection at the Company's existing BECO and Beaumeade Substations.

The DTC Loop, DTC Substation and related substation work are collectively referred to as the "Project."

ERM was engaged on behalf of the Company to assist it in the identification and evaluation of route alternatives to resolve the identified electrical need that would meet

the applicable criteria of Virginia law and the Company's operating needs.

The purpose of my testimony is to introduce and sponsor the Environmental Routing Study, which is included as part of the Application filed by the Company in this proceeding. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Harrison S. Potter, David M. Burnam, Sherrill A. Crenshaw, Santosh Bhattarai, and Greg R. Baka; Sections II.A.1, II.A.2, II.A.4, II.A.6 to II.A.9, II.A.11, and III with Company Witness Greg M. Baka; and Sections II.B.6 and V.A with Company Witnesses Sherrill A. Crenshaw and Greg R. Baka. Lastly, I co-sponsor the DEQ Supplement with Company Witness Greg R. Baka.

Q. Does this conclude your pre-filed direct testimony?

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS OF JON M. BERKIN

Jon M. Berkin earned a Bachelor of Arts degree from Boston University and a Master of Arts and a Doctoral degree from Bryn Mawr College. He has 29 years of experience working in the energy-related consulting field specializing in the siting and regulatory permitting of major linear energy facilities, including both interstate and intrastate electric transmission lines and gas and oil pipelines throughout the United States. During this time he was employed for 5 years with R. Christopher Goodwin and Associates, Inc. and 24 years with ERM, a privately-owned consulting company specializing in the siting, licensing and environmental construction compliance of large, multi-state energy transportation facilities.

Dr. Berkin's professional experience related to electric transmission line projects includes the direct management of field studies, impact assessments and agency consultations associated with the routing and licensing of multiple transmission line projects in the mid-Atlantic region, including the management and/or supervision of the routing and permitting. Work on these projects included studies to identify and delineate routing constraints and options; identification and evaluation of route alternatives; and the direction of field studies to inventory wetlands, stream crossings, cultural resources and sensitive habitats and land uses. Within the last several years he has managed or directed the identification and evaluation of over 150 miles of 230 and 500 kV transmission line route alternatives in the Commonwealth for Virginia Electric and Power Company.

Dr. Berkin has previously testified before the Virginia State Corporation Commission.