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July 17, 2024

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: 230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Case No. PUR-2024-00131

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 Routing Study, including attachments.

As indicated in Section II.A.12.b of the Appendix, electronic copies of the Virginia Department of Transportation "General Highway Map" for Fairfax and Loudoun Counties, 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 Public Utility Regulation on July 15, 2024.

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

Highest regards,

Vishwa B. Link

Enclosures

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Dominion Energy®

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

Before the State Corporation Commission of Virginia

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation

Application No. 337

Case No. PUR-2024-00131

Filed: July 17, 2024

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

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation

Application No. 337

Case No. PUR-2024-00131

Filed: July 17, 2024

COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

APPLICATION OF	)	
	)	
VIRGINIA ELECTRIC AND POWER COMPANY	)	Case No. PUR-2024-00131
	)	
For approval and certification of electric transmission facilities: 230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation	)	

APPLICATION OF VIRGINIA ELECTRIC AND POWER COMPANY FOR APPROVAL AND CERTIFICATION OF ELECTRIC TRANSMISSION FACILITIES: 230 KV REBUILD, RECONDUCTORING, AND NEW LINE PROJECTS TO NETWORK TAKEOFF 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 relieve identified violations of mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, to provide service requested by a data center customer (the "Customer") of Dominion Energy Virginia, and to maintain the structural integrity and reliability of its transmission system, the Company proposes in the Counties of Fairfax and Loudoun, Virginia, to:

(i) Construct two new overhead double circuit 230 kilovolt ("kV") transmission lines by cutting the Company's existing 230 kV Lincoln Park-Loudoun Line #2008[1] and existing 230 kV Bull Run-Sully Line #265,[2] which are collocated within an existing variable 100- to 120-foot-wide right-of-way. As proposed, existing Lincoln Park-Loudoun Line #2008 will be cut at a location between Structures #2008/66 and #2008/67, and existing Bull Run-Sully Line #265 will be cut at a location between Structures #265/88 and #265/89. The two new double circuit lines will extend approximately 0.3 mile from the respective cut-in locations before terminating at a

[1] The existing approximately 11.8-mile 230 kV overhead Line #2008 begins at the Company's existing Loudoun Substation and terminates at the Company's existing Lincoln Park Substation and, therefore, is currently Lincoln Park-Loudoun Line #2008. *See* Appendix Attachment I.A.2. Upon completion of the Project as defined herein, Line #2008 will terminate at the proposed Takeoff Substation, between the existing Loudoun and Lincoln Park Substations. *See* Appendix Attachment I.A.5. Accordingly, at that time, the portion of the line between the existing Loudoun Substation and the proposed Takeoff Substation will be Loudoun-Takeoff Line #2008, and the portion of the line between the existing Lincoln Park Substation and the proposed Takeoff Substation will be Lincoln Park-Takeoff Line #2356, as discussed herein. For clarity, this filing refers to the *existing* Line #2008 as the existing Lincoln Park-Loudoun Line #2008. Any references to the *proposed* Line #2008 will be to the proposed Loudoun-Takeoff Line #2008 (or simply proposed Line #2008).

[2] The existing Line #265 begins at the Company's existing Bull Run Substation and terminates at the Company's existing Sully Substation and, therefore, is currently Bull Run-Sully Line #265. *See* Appendix Attachment I.A.2. By September 2026, the Company anticipates cutting in the new Bear Run Substation, resulting at that time in Line #265 terminating at Bear Run (Bear Run-Bull Run Line #265), and a new 230 kV Bear Run-Sully Line #2285. *See* Appendix Attachment I.A.4. Upon completion of the Project as defined herein, Line #2285 will terminate at the proposed Takeoff Substation, between Bear Run and Sully Substations. *See* Appendix Attachment I.A.5. Accordingly, at that time, the portion of the line between Bear Run Substation and the proposed Takeoff Substation will be Bear Run-Takeoff Line #2285, and the portion of the line between the existing Sully Substation and the proposed Takeoff Substation will be Sully-Takeoff Line #2357, as discussed herein. For ease of reference, this filing describes cutting the *existing* Bull Run-Sully Line #265 (or simply existing Line #265).

new proposed 230-34.5 kV substation located in Fairfax County, Virginia ("Takeoff Substation") on property to be owned by the Company (the "Takeoff Loop"). The cut-ins ultimately will result in (i) 230 kV Loudoun-Takeoff Line #2008, (ii) 230 kV Lincoln Park-Takeoff Line #2356, (iii) 230 kV Bear Run-Takeoff Line #2285 and (iv) 230 kV Sully-Takeoff Line #2357.[3] At the cut-in between Structures #2008/66 and #2008/67, the Company will install two new monopole structures to provide a network connection to the Takeoff Substation. Similarly, at the cut-in between Structures #265/88 and #265/89, the Company will install two new monopole structures to provide a network connection to the Takeoff Substation. These network connections will allow the Takeoff Substation to connect to other existing substations for increased reliability. While the structures installed at the proposed cut-in locations are within the existing right-of-way, the proposed 0.3-mile Takeoff Loop will be constructed in a new 160-foot-wide right-of-way supported primarily by double circuit weathering steel 2-pole structures and utilizing three-phase twin-bundled 768.2 thousand circular mils ("kcmil") 20/7 Aluminum Conductor Steel Supported/Trapezoidal Wire/High Strength ("ACSS/TW/HS") type conductor with a summer transfer capability of 1,573 MVA,[4] with one new Design Number ("DNO")-11410 shield wire over each circuit. Collectively, this proposed work is referred to as the "Takeoff Loop and Substation."

(ii) Partially reconductor and rebuild Sully-Takeoff Line #2357 entirely within existing right-of-way in Fairfax County, Virginia ("Sully-Takeoff Partial Reconductor/Rebuild").[5] As discussed above, Sully-Takeoff Line #2357 will result from cutting existing Bull Run-Sully Line #265 between Structures #265/88 and #265/89 (the "Sully-Takeoff Cut-in") and extending 0.3 mile of new double circuit lines to the proposed Takeoff Substation. Accordingly, the resulting approximately 2.2-mile Sully-Takeoff Line #2357 will consist of the new 0.3-mile segment from

[3] To be clear, as defined herein, the proposed Takeoff Loop only includes the approximately 0.3 mile of new right-of-way between the proposed Takeoff Substation and the proposed cut-in locations on the existing Lincoln Park-Loudoun Line #2008 and existing Bull Run-Sully Line #265. *See* Appendix Attachment I.A.1.

[4] Apparent power, measured in megavolt amperes ("MVA"), is made up of real power (megawatt or "MW") and reactive power (megavolt ampere reactive or "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 retail customer projected load, reflecting representative pf, and the equipment ratings to handle the apparent power, which includes the real and reactive load components.

[5] Importantly, the Sully-Takeoff Partial Reconductor/Rebuild will be undertaken as a component of this Project only if the Takeoff Loop Proposed Route (Takeoff Loop Route 1) is selected by the Commission, as space constraints due to existing buildings and roadways on Takeoff Loop Alternative Route 2 do not allow for the cut-in of existing Bull Run-Sully Line #265. As a result, if the Commission were to select Takeoff Loop Alternative Route 2 instead of the Takeoff Loop Proposed Route (Route 1) as described herein, the Company would cut only existing Lincoln-Park-Loudoun Line #2008 for the proposed Takeoff Loop, resulting in one new double circuit line (230 kV Loudoun-Takeoff Line #2008 and 230 kV Lincoln Park-Takeoff Line #2356) in a new 100-foot-wide right-of-way. As such, the Company would not pursue the Sully-Takeoff Partial Reconductor/Rebuild as a component of the Project, meaning a second 300 MW N-1-1 load drop violation identified by the Company's Transmission Planning group would be left unresolved at this time. *See* Appendix Section I.A.

the Takeoff Substation to the Sully-Takeoff Cut-in, and the existing 1.9-mile segment from the Sully Takeoff Cut-in to the Sully Substation. Hence, only a "partial" reconductor and rebuild of Sully-Takeoff Line #2357—namely, within the 1.9-mile existing segment—is required, as follows.

a. Sully-Takeoff Partial Reconductor: reconductor the existing 1.9-mile segment of Sully-Takeoff Line #2357 between the Sully-Takeoff Cut-in and the existing Sully Substation by uprating the existing conductors from three-phase 1590 kcmil 45/7 Aluminum Conductor Steel Reinforced ("ACSR") type conductor and 1534 Aluminum Conductor Alloy Reinforced ("ACAR") 42 EC/19 type conductor to three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS with a summer transfer capability of 1,573 MVA.

b. Sully-Takeoff Partial Rebuild: rebuild five of the existing painted steel double circuit monopole structures supporting Line #2357 (*i.e.*, supporting the existing Bull Run-Sully Line #265) and existing Discovery-Sully Line #2107 (existing Structures #265/98 / #2107/72, #265/99 / #2107/71, #265/102 / #2107/68, #265/104 / #2107/66, and #265/107 / #2107/63) in order to maintain proper clearances.[6] The five structures proposed for rebuild are located within an existing 0.9-mile segment between existing Structure #265/98 / #2107/72 and Sully Substation (the "Sully-Takeoff Partial Rebuild Segment"). The five removed structures will be replaced with five double circuit dulled galvanized steel monopole structures.

(iii) Construct a new overhead double circuit 230 kV transmission line beginning at the Company's future Aviator Substation[7] located in Loudoun County, Virginia, and

[6] Four of the structures (Structures #265/99 / #2107/71, #265/102 / #2107/68, #265/104 / #2107/66, and #265/107 / #2107/63) are being rebuilt in order to maintain proper clearances for the reconductored 1.9-mile segment of Line #2357, as described herein. One of the structures (Structure #265/98 / #2107/72) is being rebuilt in order to maintain proper clearances for Line #2107, which the Company plans to uprate as a separate project after the Sully-Takeoff Partial Reconductor/Rebuild is completed. While in the same transmission corridor and taking an outage to complete the Sully-Takeoff Partial Rebuild, the Company determined that it would be reasonable, prudent, and consistent with sound engineering judgment to rebuild this one structure supporting Line #2107 (Structure #265/98 / #2107/72) for proper clearance purposes for the future uprate of Line #2107. While a component of the proposed Project, the Company considers the rebuild of this one structure supporting Line #2107, which is entirely within existing right-of-way, to qualify as an "ordinary extension[] or improvement[] in the usual course of business" (*i.e.*, "ordinary course") pursuant to Va. Code § 56-265.2 A 1 and, therefore, does not require approval pursuant to Va. Code § 56-46.1 B or a certificate of public convenience and necessity ("CPCN") from the Commission. As a component of the proposed Project, the costs associated with the rebuild of one structure supporting Line #2107 (Structure #265/98 / #2107/72) have been included in the total transmission-related conceptual costs. Should the Commission determine that a CPCN is required for the rebuild of Structure #265/98 / #2107/72 as described herein, the Company requests that the Commission grant such CPCN as part of its final order in this proceeding. The Company plans to transfer the existing Line #2107 conductor to the five rebuilt structures until such time as it is uprated.

[7] The Aviator Substation was approved by Final Order of the Commission on November 28, 2022, in Case No. PUR-2022-00012, with an in-service date of September 30, 2024. *See Application of Virginia Electric and Power Company for approval and certification of electric transmission facilities: Aviator 230 kV Line Loop and Aviator*

extending approximately 3.2 miles to terminate at the Company's new proposed Takeoff Substation located in Fairfax County, Virginia, resulting in (i) 230 kV Aviator-Takeoff Line #2358, and (ii) 230 kV Aviator-Takeoff Line #2359 (the "Aviator-Takeoff Lines"). While the proposed Aviator-Takeoff Lines will commence and terminate on Company-owned or to-be-owned property (from Structure #2358/25 / #2359/25 at Aviator Substation to Structure #2358/1 / #2359/1 at Takeoff Substation), the proposed Aviator-Takeoff Lines will be constructed in new 100-foot-wide right-of-way supported primarily by double circuit dulled galvanized steel monopole structures and will utilize three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS type conductors with a summer transfer capability of 1,573 MVA, with one new DNO-11410 shield wire over each new circuit.

(iv) Perform minor substation-related work at the Company's future Aviator Substation.

The Takeoff Loop and Substation, the Sully-Takeoff Partial Reconductor/Rebuild, the Aviator-Takeoff Lines, and minor substation-related work are collectively referred to as the "230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation" or the "Project."

4. The Project is necessary to relieve identified violations of NERC Reliability Standards in order to maintain and improve reliable electric service to customers in the load area extending generally southeast from the future Aviator Substation in Fairfax and Loudoun Counties (the "Aviator Load Area") and to ensure that Dominion Energy Virginia can provide service requested by its Customer in Fairfax County, Virginia.

5. As to the need to relieve reliability violations, two NERC reliability violations were identified. First, in its do no harm ("DNH") analysis of the Aviator Substation, PJM Interconnection, L.L.C. ("PJM") identified a 300 MW N-1-1 load drop violation expected to occur within the Project area surrounding the Aviator Substation. Second, in consideration of the state of the transmission system at the time and consistent with prudent planning, the Company's Transmission Planning group identified a separate 300 MW N-1-1 load drop violation expected to occur within the Project area surrounding existing Bull Run-Sully Line #265. If not relieved, these

Substation, Case No. PUR-2022-00012, Final Order (Nov. 28, 2022) at Ordering Paragraph (6). *See also* Appendix Attachment I.A.3.

NERC reliability violations would severely impact the transmission system's ability to provide reliable service to Dominion Energy Virginia's customers in the Aviator Load Area. Accordingly, the Project as proposed herein—including the Takeoff Loop and Substation, the Sully-Takeoff Partial Reconductor/Rebuild, and the Aviator-Takeoff Lines—is required to mitigate identified NERC reliability violations and to maintain reliable service for overall load growth in the Project area.

6. As to the need to provide requested service, the Customer's projected load combined with emerging load in the area (approximately 250 MW in total) would overload the existing and future distribution substation equipment if it were to be connected to the existing Poland Road or Walney Substations or to the future Aviator Substation, absent the proposed Takeoff Loop and Substation. Accordingly, the proposed Takeoff Loop and Substation also are needed to reliably serve the Customer as well as emerging load in the Aviator Load Area.

7. For the Takeoff Loop, the Company identified an approximately 0.3-mile overhead proposed route with two double circuit lines in an approximately 160-foot-wide right-of-way ("Takeoff Loop Proposed Route" or "Takeoff Loop Route 1") as well as an approximately 0.3-mile overhead alternative route with one double circuit line in an approximately 100-foot-wide right-of-way ("Takeoff Loop Alternative Route 2").[8] While the Takeoff Loop Proposed Route has a larger right-of-way and crosses more forested land than Takeoff Loop Alternative Route 2, it allows for a more robust electrical solution than the alternative route.[9] In addition, the Takeoff Loop Proposed Route crosses fewer landowners, avoids crossing Route 50, has the same amount

[8] *See supra*, n. 5. Note that the entire approximately 0.3-mile Takeoff Loop Proposed Route is located on property owned by Metropolitan Washington Airports Authority ("MWAA"), except for approximately 0.04 mile of the Proposed Route that is on the to-be-Company-owned Takeoff Substation parcel. The Company is working with MWAA to obtain property rights for the Takeoff Loop Proposed Route where it crosses MWAA-owned property.

[9] *See* Appendix Section I.A.

of collocation as the alternative route, and avoids all wetlands and waterbodies. For all these reasons, Takeoff Loop Route 1 was selected as the Proposed Route.

8. For the Sully-Takeoff Partial Reconductor/Rebuild, the total length of the existing right-of-way is approximately 1.9 miles.[10] Because the existing right-of-way and Company-owned property is adequate for the Sully-Takeoff Partial Reconductor/Rebuild, no new right-of-way is required. Accordingly, the existing right-of-way for the Sully-Takeoff Partial Reconductor/Rebuild has been identified as the proposed route ("Reconductor/Rebuild Proposed Route"). Given the availability of existing right-of-way and the statutory preference given to use of existing rights-of-way, and because additional costs and environmental impacts would be associated with the acquisition of and construction on new right-of-way, the Company did not consider any alternative routes requiring new right-of-way for the Sully-Takeoff Partial Reconductor/Rebuild.

9. For the Aviator-Takeoff Lines, the Company identified an approximately 3.2-mile overhead proposed route ("Aviator-Takeoff Proposed Route" or "Aviator-Takeoff Route 1"),[11] an approximately 3.3-mile overhead alternative route ("Aviator-Takeoff Alternative Route 2"), and

[10] To be clear, the "existing right-of-way" referenced is the existing 100-foot-wide right-of-way from the Sully-Takeoff Cut-in location to the existing triple circuit structure #2008/74 / #265/96 / #2107/74, which currently contains the existing Bull Run-Sully Line #265 and Loudoun-Lincoln Park Line #2008, and the 120-foot-wide right-of-way from the existing triple circuit structure #2008/74 / #265/96 / #2107/74 to the Sully Substation, which currently contains the existing Bull Run-Sully Line #265 and Discovery-Sully Line #2107. It is not inclusive of the 0.3 mile of new right-of-way for the proposed Takeoff Loop. For purposes of calculating impacts of the Sully-Takeoff Partial Reconductor/Rebuild, such impacts are limited to the 0.9-mile segment where five structures are proposed for rebuild, as described herein (*i.e.*, the Sully-Takeoff Partial Rebuild Segment). As only reconductoring and no structure replacements are proposed for the remaining 1.0-mile segment of Sully-Takeoff Partial Reconductor/Rebuild, there will be no impacts to that segment from the Project. Further, any impacts associated with the 0.3-mile segment of new right-of-way from the proposed Takeoff Substation to the Sully-Takeoff Cut-in will be described in the context of the Takeoff Loop.

[11] Note that the Company selected Aviator-Takeoff Route 1 as the Proposed Route because it is the least impactful route. *See* Appendix Section II.A.9. The Company is working with the MWAA to obtain property rights for the approximately 3.2-mile Aviator-Takeoff Proposed Route where it crosses MWAA-owned property for approximately 2.9 miles. *See infra*, n. 13.

an approximately 3.1-mile overhead alternative route ("Aviator-Takeoff Alternative Route 3"). While the Aviator-Takeoff Proposed Route has more forested impacts than the alternative routes, it is similar in overall length, reduces impacts to private landowners, avoids residential dwellings, reduces impacts to the Cub Run Resource Protection Area and River and Stream Corridor Resources, does not have any cemeteries, schools, or places of worship within 500 feet of the centerline, and maximizes collocation with existing infrastructure. For all these reasons, Aviator-Takeoff Route 1 was selected as the Proposed Route.

10. Accordingly, the Company supports the Takeoff Loop Proposed Route (Route 1), the Reconductor/Rebuild Proposed Route, and the Aviator-Takeoff Proposed Route (Route 1) as the Project routes that avoid or reasonably minimize adverse impact to the greatest extent reasonably practicable on the scenic assets, historic and cultural resources, and environment of the area concerned.

11. The Company is proposing all of these Proposed and Alternative Routes for Commission consideration and notice. Discussion of these Proposed and Alternative Routes, as well as other overhead routes that the Company studied but ultimately rejected, is provided in Section II of the Appendix and discussed in more detail in the Environmental Routing Study included with the Application.

12. The Takeoff Substation will be constructed with three 112 MVA 230-34.5 kV transformers, two 84 MVA 230-34.5 kV transformers, and nine 230 kV breakers arranged in a breaker-and-a-half configuration. The total area of the Takeoff Substation is approximately 4.3 acres.

13. The desired in-service target date for the proposed Project is August 1, 2027. The Company estimates it will take approximately 30 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 February 17, 2025. Should the Commission issue a final order by February 17, 2025, to accommodate long-lead materials procurement, the Company estimates that construction should begin around January 2026, and be completed by August 1, 2027. This schedule is contingent upon obtaining the necessary permits and outages, the latter of which may be particularly challenging due to the amount of new load growth, rebuilds, and new builds scheduled to occur in this load area. 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, as well as the ability to schedule outages, and unpredictable delays due to labor shortages, or materials/supply issues. This schedule is also contingent upon the Company's ability to negotiate for easements with property owners along the approved routes and to purchase land for substation use without the need for additional litigation. In addition, the Company is actively monitoring the regulatory changes and requirements associated with the Northern long-eared bat ("NLEB") and how they could potentially impact construction timing associated with time of year restrictions. The U.S. Fish and Wildlife Service ("USFWS") previously indicated that it planned to issue final NLEB guidance to replace the interim guidance by April 1, 2024; however, the interim guidance has been extended by USFWS until late summer 2024. The Company actively is tracking updates from the USFWS with respect to the final guidance. Once issued, the Company plans to review and follow the final guidance to the extent it applies to the Company's projects. Until the final guidance is issued, the Company will continue following the interim guidance. For projects that may require additional coordination, the Company will coordinate with the USFWS. The Company is also monitoring potential regulatory

changes associated with the potential listing of the Tricolored bat ("TCB"). On September 14, 2022, the USFWS published a proposed rule in the Federal Register proposing to list the TCB as endangered under the Endangered Species Act. USFWS extended its Final Rule issuance target from September 2023 to September 2024. The Company is actively tracking this ruling and evaluating the effects of potential outcomes on Company projects' permitting, construction, and in-service dates, including electric transmission projects.

14. Any adjustments to this Project schedule resulting from these or similar challenges could necessitate a minimum of a six- to twelve-month delay in the targeted in-service date. Accordingly, for purposes of judicial economy, the Company requests that the Commission issue a final order approving both a desired in-service target date (*i.e.*, August 1, 2027) and an authorization sunset date (*i.e.*, August 1, 2028) for energization of the Project.

15. The estimated conceptual cost of the Project as proposed is approximately $168.3 million,[12] which includes approximately $93.1 million for transmission-related work[13] and approximately $75.2 million for substation-related work (2024 dollars).

16. Based on consultations with the Virginia Department of Environmental Quality ("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.

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[12] These total Project costs include the excess facilities charges that will be collected from the Customer (*see* Appendix Section I.C); the costs associated with rebuilding Structure #265/98 / #2107/72 in order to maintain proper clearances for Line #2107 (*see supra*, n. 6); the projected real estate costs that the Company anticipates will be required to acquire property rights for the Aviator-Takeoff Lines, the Takeoff Loop, and the Takeoff Substation, as proposed; and the transmission-related work described in Appendix Section I.F. *See also infra*, n. 13.

[13] The conceptual transmission-related estimates for the Takeoff Loop Proposed Route (Route 1) and the Aviator-Takeoff Proposed Route (Route 1) include placeholders for MWAA negotiations that will continue through the proceeding. These estimates were developed using the same methodology used to develop the conceptual transmission-related cost estimates for Takeoff Loop Alternative Route 2 and Aviator-Takeoff Alternative Routes 2 and 3.

17. 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.

18. 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.

19. 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 Kunal S. Amare, Brittany S. Rieckmann, Cale B. Armstrong, Brian L. Obermeier, Greg R. Baka, and Jared Brandell-Douglas filed with this Application.

20. Finally, Dominion Energy Virginia requests that, to the extent the Commission modifies the deadline for responses to interrogatories and requests for production of documents in 5 VAC 5-20-260, the Commission grant Staff and the parties seven calendar days in order to afford the Company adequate time to provide comprehensive responses to discovery.

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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July 17, 2024

COMMONWEALTH OF VIRGINIA
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APPLICATION OF

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FOR APPROVAL AND CERTIFICATION
OF ELECTRIC TRANSMISSION FACILITIES

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation

Application No. 337

Appendix

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

Case No. PUR-2024-00131

Filed: July 17, 2024

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V. Notice 285

EXECUTIVE SUMMARY

In order to relieve identified violations of mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, to provide service requested by a data center customer (the "Customer") of Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company"), and to maintain the structural integrity and reliability of its transmission system, Dominion Energy Virginia proposes in the Counties of Fairfax and Loudoun, Virginia, to:

(1) Construct two new overhead double circuit 230 kilovolt ("kV") transmission lines by cutting the Company's existing 230 kV Lincoln Park-Loudoun Line #2008[1] and existing 230 kV Bull Run-Sully Line #265,[2] which are collocated within an existing variable 100- to 120-foot-wide right-of-way. As proposed, existing Lincoln Park-Loudoun Line #2008 will be cut at a location between Structures #2008/66 and #2008/67, and existing Bull Run-Sully Line #265 will be cut at a location between Structures #265/88 and #265/89. The two new double circuit lines will extend approximately 0.3 mile from the respective cut-in locations before terminating at a new proposed 230-34.5 kV substation located in Fairfax County, Virginia ("Takeoff Substation") on property to be owned by the Company (the "Takeoff Loop"). The cut-ins ultimately will result in (i) 230 kV Loudoun-Takeoff Line #2008, (ii) 230 kV Lincoln Park-Takeoff Line #2356, (iii) 230 kV Bear Run-Takeoff Line #2285 and (iv) 230 kV Sully-Takeoff Line #2357.[3] At the cut-in between Structures #2008/66 and #2008/67, the Company will install two new monopole structures to provide a network connection to the Takeoff Substation. Similarly, at the cut-in between Structures #265/88 and #265/89, the Company will install two new monopole structures to provide a network connection to the Takeoff

[1] The existing approximately 11.8-mile 230 kV overhead Line #2008 begins at the Company's existing Loudoun Substation and terminates at the Company's existing Lincoln Park Substation and, therefore, is currently Lincoln Park-Loudoun Line #2008. *See* Attachment I.A.2. Upon completion of the Project as defined herein, Line #2008 will terminate at the proposed Takeoff Substation, between the existing Loudoun and Lincoln Park Substations. *See* Attachment I.A.5. Accordingly, at that time, the portion of the line between the existing Loudoun Substation and the proposed Takeoff Substation will be Loudoun-Takeoff Line #2008, and the portion of the line between the existing Lincoln Park Substation and the proposed Takeoff Substation will be Lincoln Park-Takeoff Line #2356, as discussed herein. For clarity, the Appendix refers to the *existing* Line #2008 as the existing Lincoln Park-Loudoun Line #2008. Any references to the *proposed* Line #2008 will be to the proposed Loudoun-Takeoff Line #2008 (or simply proposed Line #2008).

[2] The existing Line #265 begins at the Company's existing Bull Run Substation and terminates at the Company's existing Sully Substation and, therefore, is currently Bull Run-Sully Line #265. *See* Attachment I.A.2. By September 2026, the Company anticipates cutting in the new Bear Run Substation, resulting at that time in Line #265 terminating at Bear Run (Bear Run-Bull Run Line #265), and a new 230 kV Bear Run-Sully Line #2285. *See* Attachment I.A.4. Upon completion of the Project as defined herein, Line #2285 will terminate at the proposed Takeoff Substation, between Bear Run and Sully Substations. *See* Attachment I.A.5. Accordingly, at that time, the portion of the line between Bear Run Substation and the proposed Takeoff Substation will be Bear Run-Takeoff Line #2285, and the portion of the line between the existing Sully Substation and the proposed Takeoff Substation will be Sully-Takeoff Line #2357, as discussed herein. For ease of reference, the Appendix describes cutting the *existing* Bull Run-Sully Line #265 (or simply existing Line #265).

[3] To be clear, as defined herein, the proposed Takeoff Loop only includes the approximately 0.3 mile of new right-of-way between the proposed Takeoff Substation and the proposed cut-in locations on the existing Lincoln Park-Loudoun Line #2008 and existing Bull Run-Sully Line #265. *See* Attachment I.A.1.

Substation. These network connections will allow the Takeoff Substation to connect to other existing substations for increased reliability. While the structures installed at the proposed cut-in locations are within the existing right-of-way, the proposed 0.3-mile Takeoff Loop will be constructed in a new 160-foot-wide right-of-way supported primarily by double circuit weathering steel 2-pole structures and utilizing three-phase twin-bundled 768.2 thousand circular mils ("kcmil") 20/7 Aluminum Conductor Steel Supported/Trapezoidal Wire/High Strength ("ACSS/TW/HS") type conductor with a summer transfer capability of 1,573 MVA,[4] with one new Design Number ("DNO")-11410 shield wire over each circuit. Collectively, this proposed work is referred to as the "Takeoff Loop and Substation."

(2) Partially reconductor and rebuild Sully-Takeoff Line #2357 entirely within existing right-of-way in Fairfax County, Virginia ("Sully-Takeoff Partial Reconductor/Rebuild").[5] As discussed above, Sully-Takeoff Line #2357 will result from cutting existing Bull Run-Sully Line #265 between Structures #265/88 and #265/89 (the "Sully-Takeoff Cut-in") and extending 0.3 mile of new double circuit lines to the proposed Takeoff Substation. Accordingly, the resulting approximately 2.2-mile Sully-Takeoff Line #2357 will consist of the new 0.3-mile segment from the Takeoff Substation to the Sully-Takeoff Cut-in, and the existing 1.9-mile segment from the Sully-Takeoff Cut-in to the Sully Substation. Hence, only a "partial" reconductor and rebuild of Sully-Takeoff Line #2357—namely, within the 1.9-mile existing segment—is required, as follows.

a. Sully-Takeoff Partial Reconductor: reconductor the existing 1.9-mile segment of Sully-Takeoff Line #2357 between the Sully-Takeoff Cut-in and the existing Sully Substation by uprating the existing conductors from three-phase 1590 kcmil 45/7 Aluminum Conductor Steel Reinforced ("ACSR") type conductor and 1534 Aluminum Conductor Alloy Reinforced ("ACAR") 42 EC/19 type conductor to three-phase

[4] Apparent power, measured in megavolt amperes ("MVA"), is made up of real power (megawatt or "MW") and reactive power (megavolt ampere reactive or "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 retail customer projected load, reflecting representative pf, and the equipment ratings to handle the apparent power, which includes the real and reactive load components.

[5] Importantly, the Sully-Takeoff Partial Reconductor/Rebuild will be undertaken as a component of this Project only if the Takeoff Loop Proposed Route (Takeoff Loop Route 1) is selected by the State Corporation Commission (the "Commission"), as space constraints due to existing buildings and roadways on Takeoff Loop Alternative Route 2 do not allow for the cut-in of existing Bull Run-Sully Line #265. As a result, if the Commission were to select Takeoff Loop Alternative Route 2 instead of the Takeoff Loop Proposed Route (Route 1) as described herein, the Company would cut only existing Lincoln-Park-Loudoun Line #2008 for the proposed Takeoff Loop, resulting in one new double circuit line (230 kV Loudoun-Takeoff Line #2008 and 230 kV Lincoln Park-Takeoff Line #2356) in a new 100-foot-wide right-of-way. As such, the Company would not pursue the Sully-Takeoff Partial Reconductor/Rebuild as a component of the Project, meaning a second 300 MW N-1-1 load drop violation identified by the Company's Transmission Planning group would be left unresolved at this time. *See* Section I.A.

twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS with a summer transfer capability of 1,573 MVA.

b. Sully-Takeoff Partial Rebuild: rebuild five of the existing painted steel double circuit monopole structures supporting Line #2357 (*i.e.*, supporting the existing Bull Run-Sully Line #265) and existing Discovery-Sully Line #2107 (existing Structures #265/98 / #2107/72, #265/99 / #2107/71, #265/102 / #2107/68, #265/104 / #2107/66, and #265/107 / #2107/63) in order to maintain proper clearances.[6] The five structures proposed for rebuild are located within an existing 0.9-mile segment between existing Structure #265/98 / #2107/72 and Sully Substation (the "Sully-Takeoff Partial Rebuild Segment"). The five removed structures will be replaced with five double circuit dulled galvanized steel monopole structures.

(3) Construct a new overhead double circuit 230 kV transmission line beginning at the Company's future Aviator Substation[7] located in Loudoun County, Virginia, and extending approximately 3.2 miles to terminate at the Company's new proposed Takeoff Substation located in Fairfax County, Virginia, resulting in (i) 230 kV Aviator-Takeoff Line #2358, and (ii) 230 kV Aviator-Takeoff Line #2359 (the "Aviator-Takeoff Lines"). While the proposed Aviator-Takeoff Lines will commence and terminate on Company-owned or to-be-owned property (from Structure #2358/25 / #2359/25 at Aviator Substation to Structure #2358/1 / #2359/1 at Takeoff Substation), the proposed Aviator-Takeoff Lines will be constructed in new 100-foot-wide right-of-way supported primarily by double circuit dulled galvanized steel monopole structures and will utilize three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS type conductors with a summer transfer capability

[6] Four of the structures (Structures #265/99 / #2107/71, #265/102 / #2107/68, #265/104 / #2107/66, and #265/107 / #2107/63) are being rebuilt in order to maintain proper clearances for the reconductored 1.9-mile segment of Line #2357, as described herein. One of the structures (Structure #265/98 / #2107/72) is being rebuilt in order to maintain proper clearances for Line #2107, which the Company plans to uprate as a separate project after the Sully-Takeoff Partial Reconductor/Rebuild is completed. While in the same transmission corridor and taking an outage to complete the Sully-Takeoff Partial Rebuild, the Company determined that it would be reasonable, prudent, and consistent with sound engineering judgment to rebuild this one structure supporting Line #2107 (Structure #265/98 / #2107/72) for proper clearance purposes for the future uprate of Line #2107. While a component of the proposed Project, the Company considers the rebuild of this one structure supporting Line #2107, which is entirely within existing right-of-way, to qualify as an "ordinary extension[] or improvement[] in the usual course of business" (*i.e.*, "ordinary course") pursuant to § 56-265.2 A 1 of the Code of Virginia ("Va. Code") and, therefore, does not require approval pursuant to Va. Code § 56-46.1 B or a certificate of public convenience and necessity ("CPCN") from the Commission. As a component of the proposed Project, the costs associated with the rebuild of one structure supporting Line #2107 (Structure #265/98 / #2107/72) have been included in the total transmission-related conceptual costs. Should the Commission determine that a CPCN is required for the rebuild of Structure #265/98 / #2107/72 as described herein, the Company requests that the Commission grant such CPCN as part of its final order in this proceeding. The Company plans to transfer the existing Line #2107 conductor to the five rebuilt structures until such time as it is uprated.

[7] The Aviator Substation was approved by Final Order of the Commission on November 28, 2022, in Case No. PUR-2022-00012, with an in-service date of September 30, 2024. *See Application of Virginia Electric and Power Company for approval and certification of electric transmission facilities: Aviator 230 kV Line Loop and Aviator Substation*, Case No. PUR-2022-00012, Final Order (Nov. 28, 2022) at Ordering Paragraph (6). *See also* Attachment I.A.3.

of 1,573 MVA, with one new DNO-11410 shield wire over each new circuit.

(4) Perform minor substation-related work at the Company's future Aviator Substation.

The Takeoff Loop and Substation, the Sully-Takeoff Partial Reconductor/Rebuild, the Aviator-Takeoff Lines, and minor substation-related work are collectively referred to as the "230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation" or the "Project."

The Project is necessary to relieve identified violations of NERC Reliability Standards in order to maintain and improve reliable electric service to customers in the load area extending generally southeast from the future Aviator Substation in Fairfax and Loudoun Counties (the "Aviator Load Area") and to ensure that Dominion Energy Virginia can provide service requested by its Customer in Fairfax County, Virginia.

As to the need to relieve reliability violations, two NERC reliability violations were identified. First, in its do no harm ("DNH") analysis of the Aviator Substation, PJM Interconnection, L.L.C. ("PJM") identified a 300 MW N-1-1 load drop violation expected to occur within the Project area surrounding the Aviator Substation. Second, in consideration of the state of the transmission system at the time and consistent with prudent planning, the Company's Transmission Planning group identified a separate 300 MW N-1-1 load drop violation expected to occur within the Project area surrounding existing Bull Run-Sully Line #265. If not relieved, these NERC reliability violations would severely impact the transmission system's ability to provide reliable service to Dominion Energy Virginia's customers in the Aviator Load Area. Accordingly, the Project as proposed herein—including the Takeoff Loop and Substation, the Sully-Takeoff Partial Reconductor/Rebuild, and the Aviator-Takeoff Lines—is required to mitigate identified NERC reliability violations and maintain reliable service for overall load growth in the Project area.

As to the need to provide requested service, the Customer's projected load combined with emerging load in the area (approximately 250 MW in total) would overload the existing and future distribution substation equipment if it were to be connected to the existing Poland Road or Walney Substations or to the future Aviator Substation, absent the proposed Takeoff Loop and Substation. Accordingly, the proposed Takeoff Loop and Substation also are needed to reliably serve the Customer as well as emerging load in the Aviator Load Area.

For the Takeoff Loop, the Company identified an approximately 0.3-mile overhead proposed route with two double circuit lines in an approximately 160-foot-wide right-of-way ("Takeoff Loop Proposed Route" or "Takeoff Loop Route 1") as well as an approximately 0.3-mile overhead alternative route with one double circuit line in an approximately 100-foot-wide right-of-way ("Takeoff Loop Alternative Route 2").[8]

[8] *See supra*, n. 5. Note that the entire approximately 0.3-mile Takeoff Loop Proposed Route is located on property owned by Metropolitan Washington Airports Authority ("MWAA"), except for approximately 0.04 mile of the Proposed Route that is on the to-be-Company-owned Takeoff Substation parcel. The Company is working with MWAA to obtain property rights for the Takeoff Loop Proposed Route where it crosses MWAA-owned property.

For the Sully-Takeoff Partial Reconductor/Rebuild, the total length of the existing right-of-way is approximately 1.9 miles.[9] Because the existing right-of-way and Company-owned property is adequate for the Sully-Takeoff Partial Reconductor/Rebuild, no new right-of-way is required. Accordingly, the existing right-of-way for the Sully-Takeoff Partial Reconductor/Rebuild has been identified as the proposed route ("Reconductor/Rebuild Proposed Route"). Given the availability of existing right-of-way and the statutory preference given to use of existing rights-of-way, and because additional costs and environmental impacts would be associated with the acquisition of and construction on new right-of-way, the Company did not consider any alternative routes requiring new right-of-way for the Sully-Takeoff Partial Reconductor/Rebuild.

For the Aviator-Takeoff Lines, the Company identified an approximately 3.2-mile overhead proposed route ("Aviator-Takeoff Proposed Route" or "Aviator-Takeoff Route 1"),[10] as well as an approximately 3.3-mile overhead alternative route ("Aviator-Takeoff Alternative Route 2" or "Aviator-Takeoff Route 2") and an approximately 3.1-mile overhead alternative route ("Aviator-Takeoff Alternative Route 3" or "Aviator-Takeoff Route 3").

The Company is proposing all of these Proposed and Alternative Routes for Commission consideration and notice. Discussion of these Proposed and Alternative Routes, as well as other overhead routes that the Company studied but ultimately rejected, is provided in Section II of the Appendix and discussed in more detail in the Environmental Routing Study (or "Routing Study") included with the Application.

The Takeoff Substation will be constructed with three 112 MVA 230-34.5 kV transformers, two 84 MVA 230-34.5 kV transformers, and nine 230 kV breakers arranged in a breaker-and-a-half configuration. The total area of the Takeoff Substation is approximately 4.3 acres.

The estimated conceptual cost of the Project as proposed is approximately $168.3 million,[11] which includes approximately $93.1 million for transmission-related work and approximately $75.2

[9] To be clear, the "existing right-of-way" referenced is the existing 100-foot-wide right-of-way from the Sully-Takeoff Cut-in location to the existing triple circuit structure #2008/74 / #265/96 / #2107/74, which currently contains the existing Bull Run-Sully Line #265 and Loudoun-Lincoln Park Line #2008, and the 120-foot-wide right-of-way from the existing triple circuit structure #2008/74 / #265/96 / #2107/74 to the Sully Substation, which currently contains the existing Bull Run-Sully Line #265 and Discovery-Sully Line #2107. It is not inclusive of the 0.3 mile of new right-of-way for the proposed Takeoff Loop. For purposes of calculating impacts of the Sully-Takeoff Partial Reconductor/Rebuild, such impacts are limited to the 0.9-mile segment where five structures are proposed for rebuild, as described herein (*i.e.*, the Sully-Takeoff Partial Rebuild Segment). As only reconductoring and no structure replacements are proposed for the remaining 1.0-mile segment of Sully-Takeoff Partial Reconductor/Rebuild, there will be no impacts to that segment from the Project. Further, any impacts associated with the 0.3-mile segment of new right-of-way from the proposed Takeoff Substation to the Sully-Takeoff Cut-in will be described in the context of the Takeoff Loop.

[10] Note that the Company selected Aviator-Takeoff Route 1 as the Proposed Route because it is the least impactful route. *See* Section II.A.9. The Company is working with MWAA to obtain property rights for the approximately 3.2-mile Aviator-Takeoff Proposed Route where it crosses MWAA-owned property for approximately 2.9 miles. *See infra* n. 31.

[11] These total Project costs include the excess facilities charges that will be collected from the Customer (*see* Section I.C); the costs associated with rebuilding Structure #265/98 / #2107/72 in order to maintain proper clearances for Line #2107 (*see supra*, n. 6); the projected real estate costs that the Company anticipates will be required to acquire property rights for the Aviator-Takeoff Lines, the Takeoff Loop, and the Takeoff Substation, as proposed; and the transmission-related work described in Section I.F. *See also infra*, n. 31.

million for substation-related work (2024 dollars).

The desired in-service target date for the proposed Project is August 1, 2027. The Company estimates it will take approximately 30 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 February 17, 2025. Should the Commission issue a final order by February 17, 2025, to accommodate long-lead materials procurement, the Company estimates that construction should begin around January 2026, and be completed by August 1, 2027. This schedule is contingent upon obtaining the necessary permits and outages, the latter of which may be particularly challenging due to the amount of new load growth, rebuilds, and new builds scheduled to occur in this load area. 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, as well as the ability to schedule outages, and unpredictable delays due to labor shortages, or materials/supply issues. This schedule is also contingent upon the Company's ability to negotiate for easements with property owners along the approved routes and to purchase land for substation use without the need for additional litigation.

In addition, the Company is actively monitoring the regulatory changes and requirements associated with the Northern long-eared bat ("NLEB") and how they could potentially impact construction timing associated with time of year restrictions ("TOYRs"). The U.S. Fish and Wildlife Service ("USFWS") previously indicated that it planned to issue final NLEB guidance to replace the interim guidance by April 1, 2024; however, the interim guidance has been extended by USFWS until late summer 2024. The Company actively is tracking updates from the USFWS with respect to the final guidance. Once issued, the Company plans to review and follow the final guidance to the extent it applies to the Company's projects. Until the final guidance is issued, the Company will continue following the interim guidance. For projects that may require additional coordination, the Company will coordinate with the USFWS.

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

Any adjustments to this Project schedule resulting from these or similar challenges could necessitate a minimum of a six- to twelve-month delay in the targeted in-service date. Accordingly, for purposes of judicial economy, the Company requests that the Commission issue a final order approving both a desired in-service target date (*i.e.*, August 1, 2027) and an authorization sunset date (*i.e.*, August 1, 2028) for energization of the Project.

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 relieve identified violations of NERC Reliability Standards; to provide service requested by the Company's Customer in Fairfax County, Virginia; and to maintain reliable service for the overall load growth in the Project area. See Attachment I.A.1 for an overview map of the proposed Project.

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 "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 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 165,563 MW for summer peak demand, of which Dominion Energy Virginia's load portion was approximately 19,256 MW. On July 28, 2023, the Company set a record high of 21,993 MW for summer peak demand. On December 24, 2022, the Company set a winter and all-time record demand of 22,189 MW. Based on the 2024 PJM Load Forecast, the DOM Zone is expected to grow with average growth rates of 5.6% summer and 5.1% winter over the next 10 years compared to the PJM average of 1.7% and 2.0% over the same period for the summer and winter, respectively.[12]

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

[12] *See* https://www.pjm.com/-/media/library/reports-notices/load-forecast/2024-load-report.ashx at 3 (PJM) and 28, 35, 39 (DOM Zone).

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.[13]

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.[14] 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.[15] 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

[13] *See* Facility Connection ("FAC") Standard FAC-001-4 (effective June 14, 2022), which can be found at https://www.nerc.com/pa/Stand/Reliability%20Standards/FAC-001-4.pdf.

[14] PJM Manual 14B (effective December 20, 2023) focuses on the RTEP process and can be found at https://www.pjm.com/-/media/documents/manuals/m14b.ashx.

[15] *See* PJM Manual 14B, Attachment D: PJM Reliability Planning Criteria. *See supra*, n. 14 for a link to PJM Manual 14B.

infrastructure resilience. While supplemental projects, such as the proposed Project, are included in the RTEP, the PJM Board does not actually approve such projects. See Section I.J for a discussion of the PJM process as it relates to this Project.

NEED FOR THE PROJECT

The Project is necessary to relieve identified violations of NERC Reliability Standards in order to maintain and improve reliable electric service to customers in the Aviator Load Area and to ensure that Dominion Energy Virginia can provide service requested by its Customer in Fairfax County, Virginia.

NERC Reliability Violations

The Project is needed to resolve two NERC reliability violations.

First, in its DNH analysis of the Aviator Substation, PJM identified a 300 MW N-1-1 load drop violation expected to occur within the Project area surrounding the Aviator Substation. Second, in consideration of the state of the transmission system at the time and consistent with prudent planning, the Company's Transmission Planning group identified a separate 300 MW N-1-1 load drop violation expected to occur within the Project area surrounding existing Bull Run-Sully Line #265.

In 2020, the Company received a delivery point ("DP") request for a new substation (*i.e.*, the future Aviator Substation) to accommodate a new data center development in Loudoun County, Virginia, with a total projected load exceeding 100 MW. As a result, the Company presented the need for the future Aviator Substation to PJM at the March 10, 2020 TEAC Meeting, and the solution at the May 12, 2020 TEAC Meeting. See Attachment I.J.1 and Attachment I.J.2. That project was classified as a supplemental project (Supplemental Project DOM-2020-0003), assigned Supplemental Project No. s2324, and accepted into the 2020 Local Plan. The Aviator Substation was approved by Final Order of the Commission on November 28, 2022, in Case No. PUR-2022-00012, with an in-service date of September 30, 2024.[16]

Prior to integrating the Aviator Substation to the existing transmission system, PJM performed a DNH analysis to evaluate whether integration of the Aviator Substation would impact the reliability of the transmission system, as represented in the Company's Facility Interconnection Requirements ("FIR") document and consistent with the Company's mandatory electric transmission planning criteria ("Planning Criteria").[17] As a result of this DNH analysis of the Aviator Substation,

[16] *See* n. 7, *supra*.

[17] The Company's Planning Criteria can be found in Attachment 1 of the Company's FIR document (effective January 1, 2024), pursuant to FAC-001 (R1, R3), which is available online at https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/virginia/parallel-generation/facility-connection-requirements.pdf?la=en&rev=f280781e90cf47f69ea526c944c9c347&hash=82DD2567D0B033C47536134B8C4D5C5E.

PJM identified a 300 MW N-1-1 load drop violation (NERC Category P6 contingency) for the loss of both 230 kV Shellhorn-Sojourner Line #2218 and 230 kV Evergreen Mills-Poland Road Line #2183. As part of the same DNH analysis, PJM identified thermal violations requiring the reconductor of existing 230 kV Lines #2008 and #265, which will increase the line capacity from the existing 583 MVA to 1,573 MVA. See Section I.J and Attachment I.J.3. The scope of the proposed solution, which includes the Takeoff Loop and Substation, the Sully-Takeoff Partial Reconductor/Rebuild, and the Aviator-Takeoff Lines (*i.e.*, the proposed Project), was updated at the June 8, 2021 TEAC Meeting. See Attachment I.J.6. The proposed Project resolves the potential NERC reliability and thermal violations identified by PJM's DNH analysis of the Aviator Substation by providing a network connection to the Takeoff Substation that increases reliability.

Consistent with prudent planning, the Company's Transmission Planning group identified a separate 300 MW N-1-1 load drop violation expected to occur within the Project area surrounding existing Bull Run-Sully Line #265. Specifically, the existing Johnson DP (26 MW), Walney Substation (83 MW), Sully Substation (101 MW), and Discovery Substation (11 MW) are served by existing Bull Run-Sully Line #265 and existing Discovery-Lincoln Park Line #2232. See Attachment I.A.2. By September 2026, NOVEC's Cub Run DP load (87 MW) will be transferred to the Bear Run Substation, adding to the load served by existing Lines #265 and #2232. The ultimate load for the Bear Run Substation is 110 MW. See Attachment I.A.4. Accordingly, in evaluating the proposed Project to resolve the 300 MW load drop violation identified at the Aviator Substation end of the Project, the Transmission Planning group identified a second 300 MW N-1-1 load drop violation due to the loss of existing Lines #265 and #2232. The Project—including the Sully-Takeoff Partial Reconductor/Rebuild and cut-in of existing Bull Run-Sully Line #265 into the proposed Takeoff Substation—resolves this violation.

It is important to note that the second identified 300 MW N-1-1 load drop violation is only resolved by the Project if the Takeoff Loop Proposed Route (Route 1) is selected. If Takeoff Loop Alternative Route 2 were selected, the Company would cut only one new double circuit line into Line #2008, instead of cutting a double circuit line into both existing Line #2008 and Line #265 as proposed by the Takeoff Loop Proposed Route (Route 1). Without the second double circuit line, the second 300 MW N-1-1 load drop violation will be left unresolved by the Project.

Customer Requested Service

In addition to resolving the identified 300 MW N-1-1 load drop violations discussed above, the Takeoff Loop and Substation as proposed are needed to interconnect and serve the Customer's new data center development located in Fairfax County, Virginia, and to maintain reliable service for the overall load growth in the Aviator Load Area, in compliance with mandatory NERC Reliability Standards. See Attachment I.A.1.

In April 2024, the Distribution Planning group submitted an updated DP request to the Transmission Planning group for construction of a new substation (*i.e.*, the

proposed Takeoff Substation) to serve the Customer's new data center development in Fairfax County, Virginia, as well as emerging load in the area. The updated DP request projected a summer peak of 72 MW in 2026, growing to 250 MW in 2036, and requested an in-service date of 2026.

In order to meet the Customer's ramp up schedule for its data center development, the Company determined that bridging power would be required to serve the development from the Company's existing Walney Substation (ramping ultimately to 70 MVA) and Poland Road Substation (ramping ultimately to 20 MVA) until the Project is energized in August 2027, at which time the full load will be transferred to the proposed Takeoff Substation. See Section I.C for the Customer's projected load (excluding emerging load in the area).

Given the Customer's projected load in the DP request, the Company presented the need for additional transformers at the proposed Takeoff Substation as a Supplemental Project to PJM (DOM-2021-0003) at the April 6, 2021 TEAC Meeting, and presented the proposed solution to PJM at the May 11, 2021 TEAC Meeting. See Attachment I.J.4 and Attachment I.J.5. Accordingly, the Project—including the additional transformers and associated equipment at the Takeoff Substation—is needed to serve the Customer's new data center development, and maintain reliable service for the overall load growth in the Aviator Load Area, consistent with NERC Reliability Standards.

Summary of Need

In summary, as part of the RTEP process, Dominion Energy Virginia has determined that the Project will provide the most comprehensive solution for resolving two projected NERC reliability violations, serve the load requested by the Customer, and provide for future load growth. See Section I.J for a discussion of the Company's presentation of the Project to PJM. Construction of the Project will relieve the identified NERC reliability violations, serve the load requested by the Customer, and provide the Aviator Load Area with additional transmission sources to reliably serve future load growth.

EXISTING & PROPOSED TRANSMISSION SYSTEM

Attachment I.A.2 provides the existing one-line diagram of the area transmission system as of June 2024. Attachment I.A.3 provides a one-line diagram of the area transmission system as of December 2024, including the future Aviator Substation. Attachment I.A.4 provides a one-line diagram of the area transmission system as of September 2026, including Bear Run Substation and the transfer of NOVEC's Cub Run DP load to Bear Run Substation. Attachment I.A.5 provides a one-line diagram of the area transmission system as of December 2026, including the proposed Project and other future substations presented to PJM in the Aviator Load Area.

See Attachment II.A.2 for a map depicting the proposed Project area and constraints.

DESCRIPTION OF THE PROJECT

Takeoff Loop and Substation

As part of the Project, the Company proposes to construct two new overhead double circuit 230 kV transmission lines (*i.e.*, the Takeoff Loop) by cutting the Company's existing 230 kV Lincoln Park-Loudoun Line #2008 and existing 230 kV Bull Run-Sully Line #265, which are collocated within an existing variable 100- to 120-foot-wide right-of-way. As proposed, existing Lincoln Park-Loudoun Line #2008 will be cut at a location between Structures #2008/66 and #2008/67, and existing Bull Run-Sully Line #265 will be cut at a location between Structures #265/88 and #265/89. The two new double circuit lines will extend approximately 0.3 mile from the respective cut-in locations before terminating at the new proposed 230-34.5 kV Takeoff Substation located on property to be owned by the Company in Fairfax County, Virginia, resulting in (i) 230 kV Loudoun-Takeoff Line #2008, (ii) 230 kV Lincoln Park-Takeoff Line #2356, (iii) 230 kV Bear Run-Takeoff Line #2285 and (iv) 230 kV Sully-Takeoff Line #2357.

At the cut-in locations, the Company will install two new monopole structures between Structures #2008/66 and #2008/67 and between Structures #265/88 and #265/89 to provide a network connection that will allow the Takeoff Substation to connect to other existing substations for increased reliability. While the structures installed at the proposed cut-in locations are within the existing right-of-way, the proposed 0.3-mile Takeoff Loop will be constructed in a new 160-foot-wide right-of-way supported primarily by double circuit weathering steel 2-pole structures and utilizing three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS type conductors with a summer transfer capability of 1,573 MVA, with one new DNO-11410 shield wire over each circuit.

For the Takeoff Loop, the Company identified an approximately 0.3-mile overhead Takeoff Loop Proposed Route (Route 1) with two double circuit lines in an approximately 160-foot-wide right-of-way located on MWAA-owned property, as well as an approximately 0.3-mile overhead Takeoff Loop Alternative Route 2 with one double circuit line in an approximately 100-foot-wide right-of-way,[18] both of which the Company is proposing for Commission consideration and notice.

The Company also proposes to construct the 230-34.5 kV Takeoff Substation in Fairfax County, Virginia, as part of the Project. See Section II.C for a description of the substation, as well as a one-line diagram and general arrangement.

Sully-Takeoff Partial Reconductor/Rebuild

As part of the Project, the Company proposes to partially reconductor and rebuild Sully-Takeoff Line #2357 entirely within existing right-of-way in Fairfax County, Virginia (*i.e.*, the Sully-Takeoff Partial Reconductor/Rebuild).[19] As discussed

[18] *See supra*, n. 5.

[19] *See supra*, n. 5.

above, Sully-Takeoff Line #2357 will result from cutting existing Bull Run-Sully Line #265 at the Sully-Takeoff Cut-in (*i.e.*, between Structures #265/88 and 89) and extending 0.3 mile of new double circuit lines to the proposed Takeoff Substation. Accordingly, the resulting approximately 2.2-mile Sully-Takeoff Line #2357 will consist of the new 0.3-mile segment from the Takeoff Substation to the Sully-Takeoff Cut-in, and the existing 1.9-mile segment from the Sully-Takeoff Cut-in to the Sully Substation. Hence, only a "partial" reconductor and rebuild of Sully-Takeoff Line #2357—namely, within the 1.9-mile existing segment—is required, as follows.

> Sully-Takeoff Partial Reconductor: The Company proposes to reconductor the existing 1.9-mile segment of Sully-Takeoff Line #2357 between the Sully-Takeoff Cut-in and the existing Sully Substation by uprating the existing conductors from three-phase 1590 kcmil 45/7 ACSR type conductor and 1534 ACAR 42 EC/19 type conductor to three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS.
>
> Sully-Takeoff Partial Rebuild: The Company proposes to rebuild five of the existing painted steel double circuit monopole structures supporting Line #2357 (*i.e.*, supporting the existing Bull Run-Sully Line #265) and existing Discovery-Sully Line #2107 (existing Structures #265/98 / #2107/72, #265/99 / #2107/71, #265/102 / #2107/68, #265/104 / #2107/66, and #265/107 / #2107/63) in order to maintain proper clearances.[20] The five structures proposed for rebuild are located within an existing 0.9-mile segment of resulting Line #2357 between Structure #265/98 / #2107/72 and Sully Substation (*i.e.*, the Sully-Takeoff Partial Rebuild Segment). The five removed structures will be replaced with five double circuit dulled galvanized steel monopole structures.

For the Sully-Takeoff Partial Reconductor/Rebuild, the total length of the existing right-of-way to be used is approximately 1.9 miles.[21] Because the existing right-of-way and Company-owned property is adequate for the proposed Sully-Takeoff Partial Reconductor/Rebuild, no new right-of-way is required. Accordingly, the right-of-way for the Sully-Takeoff Partial Reconductor/Rebuild has been identified as the Reconductor/Rebuild Proposed Route. Given the availability of existing right-of-way and the statutory preference given to use of existing rights-of-way, and because additional costs and environmental impacts would be associated with the acquisition of and construction on new right-of-way, the Company did not consider any alternative routes requiring new right-of-way for the Sully-Takeoff Partial Reconductor/Rebuild. Accordingly, the Company is proposing the Reconductor/Rebuild Proposed Route for Commission consideration and notice.

[20] *See supra*, n. 6.

[21] *See supra*, n. 9.

Aviator-Takeoff Lines

As part of the Project, the Company proposes to construct the new overhead double circuit 230 kV Aviator-Takeoff Lines beginning at the Company's future Aviator Substation located in Loudoun County, Virginia,[22] and extending approximately 3.2 miles to terminate at the Company's new proposed Takeoff Substation located in Fairfax County, Virginia, resulting in (i) 230 kV Aviator-Takeoff Line #2358, and (ii) 230 kV Aviator-Takeoff Line #2359. While the proposed Aviator-Takeoff Lines will commence and terminate on Company-owned or to-be-owned property (from Structure #2358/25 / #2359/25 at Aviator Substation to Structure #2358/1 / #2359/1 at Takeoff Substation), the proposed Aviator-Takeoff Lines will be constructed in new 100-foot-wide right-of-way supported primarily by double circuit dulled galvanized steel monopole structures and will utilize three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS type conductors with a summer transfer capability of 1,573 MVA, with one new DNO-11410 shield wire over each new circuit.

The Company identified an approximately 3.2-mile overhead Aviator-Takeoff Proposed Route (Aviator-Takeoff Route 1),[23] as well as an approximately 3.3-mile overhead Aviator-Takeoff Alternative Route 2 and an approximately 3.1-mile overhead Aviator-Takeoff Alternative Route 3, all of which the Company is proposing for Commission consideration and notice.

The Company also proposes minor substation-related work at the future Aviator Substation, located in Loudoun County, as part of the Project. See Section II.C for a description of this work.

***

In summary, the proposed Project will relieve identified violations of mandatory NERC Reliability Standards; provide service requested by the Customer in Fairfax County, Virginia; and maintain the structural integrity and reliability of the transmission system for the overall load growth in the Project area.

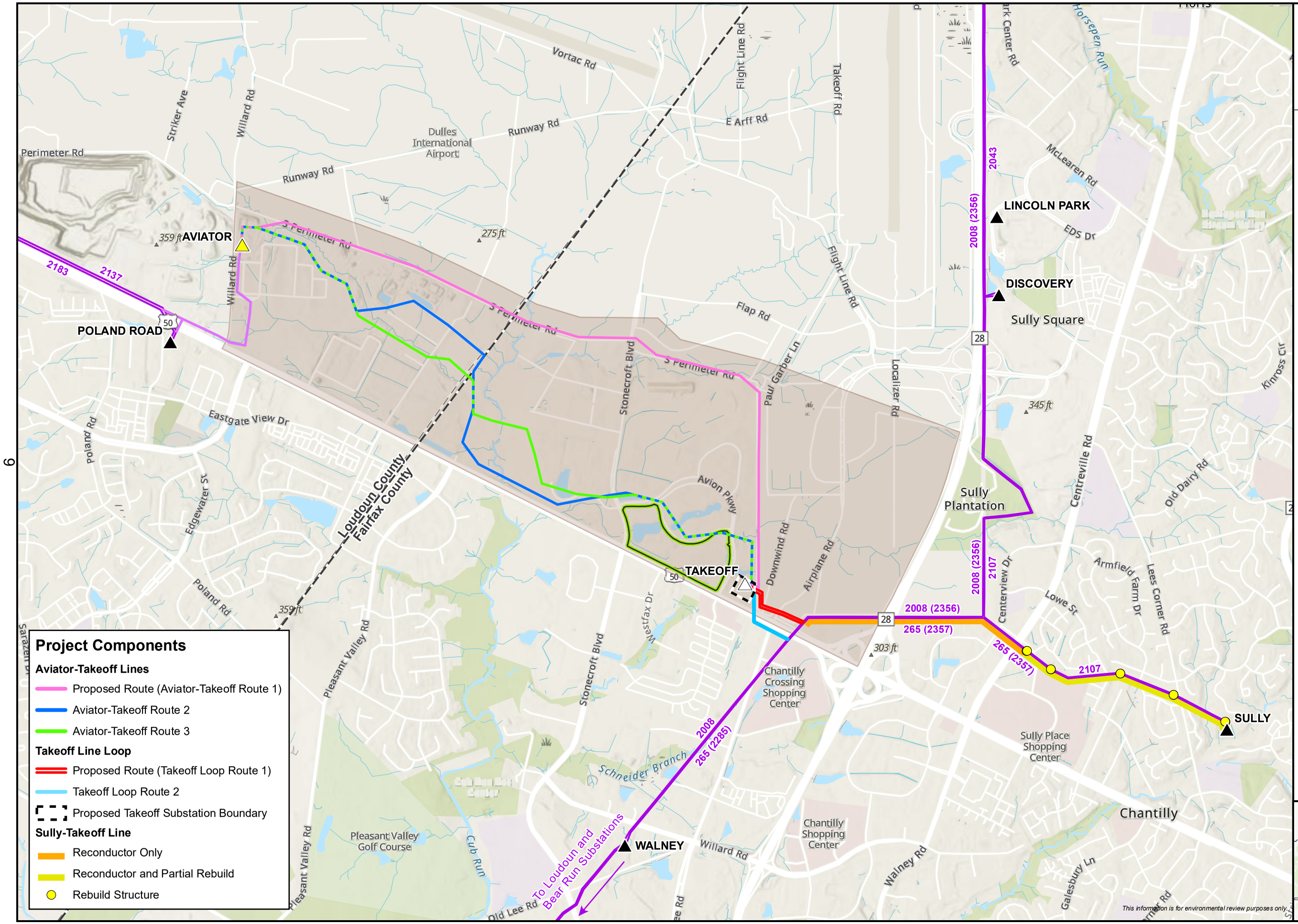
[22] *See supra*, n. 7.

[23] *See supra*, n. 10; *see also infra*, n. 31.

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Attachment I.A.1
Project Overview and Aviator Load Area

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Fairfax and Loudoun Counties, Virginia



Project Components

Aviator-Takeoff Lines
- Proposed Route (Aviator-Takeoff Route 1)
- Aviator-Takeoff Route 2
- Aviator-Takeoff Route 3

Takeoff Line Loop
- Proposed Route (Takeoff Loop Route 1)
- Takeoff Loop Route 2
- Proposed Takeoff Substation Boundary

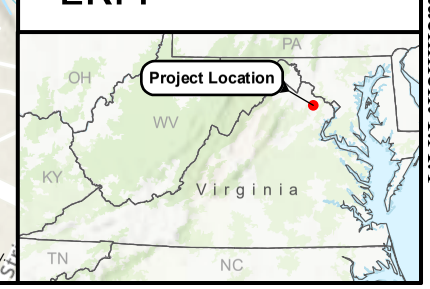
Sully-Takeoff Line
- Reconductor Only
- Reconductor and Partial Rebuild
- Rebuild Structure

- Aviator Load Area
- Customer Data Center
- Existing Substation
- Future Substation
- Proposed Substation
- Future Dominion Transmission Line
- Existing Dominion Transmission Line Labeled with Current (Future) Number
- County Boundary

0 1,000 2,000
Feet

1:24,000

ERM



This information is for environmental review purposes only.

System as of June 2024

Legend

230kV Line

Reston

Line #2015

Line #2043

Dulles

Line #2242

Lincoln Park

Line #2232

Discovery

Line #2107

Sully

Line #265

Walney

Johnson DP

Bull Run

Shellhorn

Line #2218

Runway DP

Sojourner

Line#2261

Celestial

Line #2137

Brambleton

Line #2183

Poland Road

Cub Run DP

Loudoun

Line #2008

Line#2173

Line#295

Elklick DP

Attachment I.A.2

System as of December 2024

Legend

230kV Line

Reston

Line #2015

Line #2043

Dulles

Line #2242

Lincoln Park

Line #2232

Discovery

Line #2107

Sully

Line #265

Walney

Johnson DP

Bull Run

Shellhorn

Line #2218

Runway DP

Sojourner

Line#2261

Celestial

Line #2137

Aviator

Line #2221

Brambleton

Line #2183

Poland Road

Cub Run DP

Loudoun

Line #2008

Line#2173

Line#295

Elklick DP

System as of September 2026

Legend

230kV Line

Reston

Line #2015

Line #2043

Dulles

Line #2242

Lincoln Park

Line #2232

Discovery

Line #2107

Sully

Line #2285

Walney

Bear Run
(Cub Run)

Line #265

Johnson DP

Bull Run

Shellhorn

Line #2218

Runway DP

Sojourner

Line#2261

Celestial

Line #2137

Aviator

Line #2221

Poland Road

Brambleton

Line #2183

Loudoun

Line #2008

Line#2173

Line#295

Elklick DP

System as of August 2027

Legend

230kV Line

Reston

Line #2015

Line #2043

Dulles

Line #2242

Lincoln Park

Line #2232

Discovery

Line #2107

Sully

Line #2356

Line #2357

Line #2285

Walney

Bear Run (Cub Run)

Line #265

Johnson DP

Bull Run

Line#295

Shellhorn

Line #2218

Runway DP

Sojourner

Line#2261

Celestial

Line #2137

Aviator

Line #2358

Line #2359

Takeoff

Line #2221

Brambleton

Line #2183

Poland Road

Loudoun

Line #2008

Line#2173

Elklick DP

Attachment I.A.5

I. NECESSITY FOR THE PROPOSED PROJECT

B. Detail the 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 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 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 list of those facilities that are not yet in service.

Response: **Engineering Justification for Project**

Detail the 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.).

See Section I.A of the Appendix.

Known Future Projects

Describe any 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.

The proposed Project is needed to resolve violations of mandatory NERC Reliability Standards, to interconnect the Customer's new data center development in Fairfax County, and to maintain the structural integrity and reliability of the transmission system for the overall load growth in the Project area. See Section I.A. While future distribution and transmission projects are located generally within the same load area, each has its own unique load growth driver, and as such, these future projects do not "require" that the proposed Project be constructed.

Planning Studies

Verify that the 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.

NERC Reliability Violations

As discussed in Section I.A, as a result of DNH analysis of the Aviator Substation, PJM identified a 300 MW N-1-1 load drop violation (NERC Category P6

contingency) for the loss of both 230 kV Shellhorn-Sojourner Line #2218 and 230 kV Evergreen Mills-Poland Road Line #2183. As part of the same DNH analysis, PJM identified thermal violations requiring the reconductor of certain existing 230 kV lines. The proposed Project resolves the potential NERC reliability and thermal violations by providing a network connection to the Takeoff Substation that increases reliability.

Additionally, consistent with prudent planning, the Company's Transmission Planning group identified a separate 300 MW N-1-1 load drop violation expected to occur within the Project area surrounding existing Bull Run-Sully Line #265. The Project—including the Sully-Takeoff Partial Reconductor/Rebuild and cut-in of existing Bull Run-Sully Line #265 into the proposed Takeoff Substation—resolves this violation.

Customer Requested Service

For the Customer's request for service, the Company's Distribution Planning group first used the Customer's load projection information for the data center development. After analyzing the information, the Distribution Planning group determined that it was not feasible to serve the Customer's total projected load at full buildout from the Company's existing area substations without resulting in overload conditions. See Sections I.A and I.C.

In order to maintain reliable service to the Company's customers and to comply with mandatory NERC Reliability Standards, specifically FAC standard FAC-001, the Company's FIR document addresses the interconnection requirements of generation, transmission, and electricity end-user facilities.[24] The purpose of the NERC FAC standards is to avoid adverse impacts on reliability by requiring each TO in order 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.[25]

NERC Reliability Standards TPL-001 requirements R2, R5, and R6 require PJM, the Planning Coordinator ("PC") and the 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 were:

1) Ring bus arrangement is required for load interconnections in excess of 100

[24] *See supra*, n. 17.

[25] *See* https://www.nerc.com/pa/Stand/Reliability%20Standards/FAC-002-2.pdf.

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).

Facilities List

Provide a list of those facilities that are not yet in service.

See Attachment I.A.1 for the affected Aviator Load Area, and Attachment I.A.5 for a one-line diagram of the area transmission system as of August 2027, including the proposed Project and other future substations presented to PJM in the Aviator Load Area.

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: For purposes of this Application, the Aviator Load Area encompasses portions of Fairfax and Loudoun Counties and is defined generally as the area south of Washington Dulles International Airport ("Dulles Airport"), west of Route 28 (Sully Road), north of Route 50 (Little River Turnpike/Lee Jackson Highway), and east of Willard Road. See Attachment I.G.1 for the portion of the Company's transmission facilities in the area of the Project and Attachment I.A.1 for the approximate boundary of the Aviator Load Area.

Takeoff Loop and Substation

The primary sources of distribution in the Aviator Load Area include the Company's Poland Road and Walney Substations (existing) and the Aviator Substation (future). The load at the Customer's data center development is projected to be approximately 128 MVA in 10 years.[26] Adding the load from the Customer's data center development to those existing and future substations would result in overload conditions and NERC transmission system reliability criteria violations. Specifically, connecting the Customer's requested load to Poland Road Substation would result in (i) substation transformer thermal overloads, (ii) substation transformer contingency plan overloads, and (iii) violation of NERC transmission system reliability criteria. Connecting the Customer's requested load to Walney Substation would result in (i) substation transformer thermal overloads, and (ii) substation transformer contingency plan overloads. Connecting the Customer's requested load to future Aviator Substation would result in (i) substation transformer thermal overloads, (ii) substation transformer contingency plan overloads, and (iii) violation of NERC transmission system reliability criteria.

The results, which are provided and discussed in more detail below, support the need for the Takeoff Substation to provide the primary source of distribution power for the Customer's data center development, as well as for future load growth in

[26] Distribution load forecasts for data centers typically involve use of customer-requested load ramps to project load growth based on historical knowledge of the customer requesting service for the new data center. The data center customer typically requests the full maximum capacity that their data center building can support to ensure they are able to fully utilize or lease their building investment. The Company has applied a diversification factor to the Customers' block load request to project load at full build out.

the Aviator Load Area.

Attachment I.C.1 shows loading (MVA) at Poland Road Substation, as follows:

- Attachment I.C.1.a shows historical and projected peak loading at Poland Road Substation with existing project loads and without the Customer's projected load.

- Attachment I.C.1.b shows historical and projected peak loading at Poland Road Substation with existing project loads, with the Customer's full projected load, and without Takeoff Substation.

- Attachment I.C.1.c shows historical and projected peak loading at Poland Road Substation with existing project loads and with the Customer's full projected load until Takeoff Substation is energized (2027). At that time, all of the Customer's data center development load will move to Takeoff Substation.

- Attachment I.C.1.d shows historical and projected peak loading at Poland Road Substation with existing project loads and with the Customer's bridging power until Takeoff Substation is energized (2027). At that time, all of the Customer's data center development load will move to Takeoff Substation.

Attachment I.C.2 shows loading (MVA) at Walney Substation, as follows:

- Attachment I.C.2.a shows historical and projected peak loading at Walney Substation with existing project loads and without the Customer's projected load.

- Attachment I.C.2.b shows historical and projected peak loading at Walney Substation with the existing project loads, with the Customer's full projected load, and without Takeoff Substation.

- Attachment I.C.2.c shows historical and projected peak loading at Walney Substation with existing project loads and with the Customer's full projected load until Takeoff Substation is energized (2027). At that time, all of the Customer's data center development load will move to Takeoff Substation.

- Attachment I.C.2.d shows historical and projected peak loading at Walney Substation with existing project loads and with the Customer's bridging power until Takeoff Substation is energized (2027). At that time, all of the Customer's data center development load will move to Takeoff Substation.

Attachment I.C.3 shows loading (MVA) at Aviator Substation, as follows:

- Attachment I.C.3.a shows historic and projected peak loading at Aviator Substation (2024) with existing project loads and without the Customer's projected load.

- Attachment I.C.3.b shows historic and projected peak loading at Aviator Substation (2024) with existing project loads, with the Customer's full projected load, and without Takeoff Substation.

- Attachment I.C.3.c shows historic and projected peak loading at Aviator Substation (2024) with existing project loads and with the Customer's full projected load until Takeoff Substation is energized (2027). At that time, all of the Customer's data center development load will move to Takeoff Substation.

- Attachment I.C.3.d shows historical and projected peak loading at Aviator Substation (2024) with existing project loads and with the Customer's bridging power at Poland Road and Walney Substations until Takeoff Substation is energized (2027). At that time, all of the Customer's data center development load will move to Takeoff Substation.

Note that all of the Section I.C attachments include only normal feed circuits to the Company's customers; they do not include any alternate feed loads. To be clear, that means there are no circuits normally open that serve as alternate feeds for the Customer or for other customers with existing alternate feed arrangements shown in any of the Section I.C attachments. Also note that the load tables in the Section I.C attachments show actual and projected peak loading in MVA based on the Customer's load projections, exclusive of emerging load in the Aviator Load Area.

For this Project, the Customer has requested that each of its data center buildings include a totally independent, redundant distribution feed. This is referred to as an alternate feed. At any customer's request, the Company will endeavor to design a distribution system that provides a back-up source of power should the normal feed have an outage. The estimated cost of this alternate feed arrangement is then compared to the normal arrangement of service, and the difference in cost is collected through an excess facilities charge. This Customer's business plan relies on the requested alternate feed plan to meet the non-outage demands of its data center build-out. Therefore, the Company plans to serve each of the Customer's data center buildings with both normal feed circuits and alternate feed circuits. This essentially doubles the required substation transformer capacity in the Customer contract, and doubles the number of distribution circuits otherwise required for normal feed service.

All substation transformers on the Company's existing transmission system have a normal overload ("NOL") rating that cannot be exceeded. 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.

To ensure reliability to its customers, the Company maintains a substation transformer contingency plan. Because of the negative impact to customers due to the 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, such as constructing a new substation like the proposed Takeoff Substation, is necessary.

NERC criteria restrict total substation loading to no more than 300 MW. If the projected load inside a given substation will exceed 300 MW, the Company must create a project that eliminates the overload, such as constructing a new substation like the proposed Takeoff Substation. See Section I.B.

As shown in Attachment I.C.1.b and Attachment I.C.2.b, Poland Road Substation and Walney Substation are projected to have transformer overloads beginning in 2025 with the Customer's full projected load, and without Takeoff Substation.

As shown in Attachment I.C.1.b and Attachment I.C.3.b, Poland Road Substation and Aviator Substation will violate the NERC 300 MW criteria beginning in 2024 and 2025, respectively, if the new Customer's initial bridging and full load were added without Takeoff Substation.

As shown in Attachment I.C.1.c and Attachment I.C.2.c, Poland Road Substation and Walney Substation are expected to have transformer overloads in 2025-2027, with the Customer's full projected load until Takeoff Substation is energized.

As shown in Attachment I.C.1.c and Attachment I.C.3.c, Poland Road Substation and Aviator Substation will violate the NERC 300 MW criteria in 2024-2027 and 2025-2027, respectively, with the Customer's initial bridging and full projected load until Takeoff Substation is energized.

Based on the stated projected overloads and criteria violations above, the Company needs to construct the Takeoff Loop and Substation to serve the Customer's full load at its data center development. To address these issues until the Project comes online in August 2027, the Company's Distribution Planning group has arranged to provide bridging power (limited to 90 MVA) from the Poland Road and Walney Substations, as discussed in Section I.A.

Proposed Project

Collectively, the proposed Project—including the Takeoff Substation and Loop, the Sully-Takeoff Partial Reconductor/Rebuild, and the Aviator-Takeoff Lines—provides the most comprehensive solution for resolving the identified thermal and NERC criteria violations by 2027; provides service requested by the Customer; and maintains the structural integrity and reliability of the transmission system for the overall load growth in the Project area. See Sections I.A. and I.B.

Table I.C.1.a																	
Poland Rd Load Area			(Load and Ratings in MVA)														
Poland Rd Substation (Loads contain existing project loads loads only)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total			54.1	89.8	158.9	219.9	208.9	288.26	299.2	299.2	266.2	266.2	266.2	266.2	266.2	266.2	266.2
Substation Total Calculation for 300MW NERC Limit			51.4	85.3	151	208.9	198.5	273.8	284.2	284.2	252.9	252.9	252.9	252.9	252.9	252.9	252.9
Transformer	Nameplate	NOL															
TX #3	84	90	46.6	77.1	41.8	73.7	62.9	63.3	72.7	72.7	72.7	72.7	72.7	72.7	72.7	72.7	72.7
TX #2	84	90	0	0	63.4	58.5	59.5	77.96	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5
TX #1	84	90	7.5	12.7	53.7	87.7	86.5	87	87	87	87	87	87	87	87	87	87
TX #6	84	90	0	0	0	0	0	60	60	60	27	27	27	27	27	27	27

Table I.C.1.b																	
Poland Rd Load Area			(Load and Ratings in MVA)														
Poland Rd Substation (Loads contain existing project loads and new Customer Load, no Takeoff)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total			54.1	89.8	158.9	219.9	208.9	320.28	355.5	391.2	391.1	403.1	403.1	403.1	403.1	403.1	403.1
Substation Total Calculation for 300MW NERC Limit			51.4	85.3	151	208.9	198.5	304.3	337.7	371.6	371.5	382.9	382.9	382.9	382.9	382.9	382.9
Transformer	Nameplate	NOL															
TX #3	84	90	46.6	77.1	41.8	73.7	62.9	78.32	99.7	111.7	118.15	118.15	118.15	118.15	118.15	118.15	118.15
TX #2	84	90	0	0	63.4	58.5	59.5	77.96	79.8	91.5	103.5	115.5	115.5	115.5	115.5	115.5	115.5
TX #1	84	90	7.5	12.7	53.7	87.7	86.5	87	87	87	87	87	87	87	87	87	87
TX #6	84	90	0	0	0	0	0	77	89	101	82.45	82.45	82.45	82.45	82.45	82.45	82.45

Table I.C.1.c																	
Poland Rd Load Area			(Load and Ratings in MVA)														
Poland Rd Substation (Loads contain existing project loads and new Customer Load until Takeoff is Energized)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total			54.1	89.8	158.9	219.9	208.9	320.28	355.5	391.2	391.1	276.2	276.2	276.2	276.2	276.2	276.2
Substation Total Calculation for 300MW NERC Limit			51.4	85.3	151	208.9	198.5	304.3	337.7	371.6	371.5	262.4	262.4	262.4	262.4	262.4	262.4
Transformer	Nameplate	NOL															
TX #3	84	90	46.6	77.1	41.8	73.7	62.9	78.32	99.7	111.7	118.15	72.7	72.7	72.7	72.7	72.7	72.7
TX #2	84	90	0	0	63.4	58.5	59.5	77.96	79.8	91.5	103.5	79.5	79.5	79.5	79.5	79.5	79.5
TX #1	84	90	7.5	12.7	53.7	87.7	86.5	87	87	87	87	87	87	87	87	87	87
TX #6	84	90	0	0	0	0	0	77	89	101	82.45	37	37	37	37	37	37
Takeoff Substation (Loads contain new Customer Load)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total			0	0	0	0	0	0	0	0	86	116.95	127.4	127.4	127.4	127.4	127.4
Substation Total Calculation for 300MW NERC Limit			0	0	0	0	0	0	0	0	81.7	111.1	121	121	121	121	121
Transformer	Nameplate	NOL															
TX #1	112	120	0	0	0	0	0	0	0	0	38	45.5	45.5	45.5	45.5	45.5	45.5
TX #2	84	90	0	0	0	0	0	0	0	0	11	26	36.45	36.45	36.45	36.45	36.45
TX #3	112	120	0	0	0	0	0	0	0	0	37	45.45	45.45	45.45	45.45	45.45	45.45
TX #4	84	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX #5	112	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table I.C.1.d																	
Poland Rd Load Area			(Load and Ratings in MVA)														
Poland Rd Substation (Loads contain existing project loads and customer bridging Load until Takeoff is Energized)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total			54.1	89.8	158.9	219.9	208.9	288.26	299.2	299.2	266.2	266.2	266.2	266.2	266.2	266.2	266.2
Substation Total Calculation for 300MW NERC Limit			51.4	85.3	151	208.9	198.5	273.8	284.2	284.2	252.9	252.9	252.9	252.9	252.9	252.9	252.9
Transformer	Nameplate	NOL															
TX #3	84	90	46.6	77.1	41.8	73.7	62.9	63.3	72.7	72.7	72.7	72.7	72.7	72.7	72.7	72.7	72.7
TX #2	84	90	0	0	63.4	58.5	59.5	77.96	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5
TX #1	84	90	7.5	12.7	53.7	87.7	86.5	87	87	87	87	87	87	87	87	87	87
TX #6	84	90	0	0	0	0	0	60	60	60	27	27	27	27	27	27	27
Takeoff Substation (Loads contain new Customer Load)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total			0	0	0	0	0	0	0	0	86	116.95	127.4	127.4	127.4	127.4	127.4
Substation Total Calculation for 300MW NERC Limit			0	0	0	0	0	0	0	0	81.7	111.1	121	121	121	121	121
Transformer	Nameplate	NOL															
TX #1	112	120	0	0	0	0	0	0	0	0	38	45.5	45.5	45.5	45.5	45.5	45.5
TX #2	84	90	0	0	0	0	0	0	0	0	11	26	36.45	36.45	36.45	36.45	36.45
TX #3	112	120	0	0	0	0	0	0	0	0	37	45.45	45.45	45.45	45.45	45.45	45.45
TX #4	84	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX #5	112	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table I.C.2.a																	
Walney Load Area			(Load and Ratings in MVA)														
Walney Substation (Loads contain existing project loads loads only)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total			84.3	85.4	113.1	100	109.3	135.63	140.63	165.13	105.13	105.13	105.13	105.13	105.13	105.13	105.13
Substation Total Calculation for 250MW Facility Interconnection Limit			80.1	81.1	107.4	95	103.8	128.8	133.6	156.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
Transformer	Nameplate	NOL															
TX #1	75	80	37.1	36	36.1	45.7	47.3	49.23	49.23	49.23	49.23	49.23	49.23	49.23	49.23	49.23	49.23
TX #2	75	80	47.2	49.4	77	48	52.8	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9
TX #3	84	90	0	0	0	6.3	9.2	40.5	45.5	70	10	10	10	10	10	10	10

Table I.C.2.b																	
Walney Load Area			(Load and Ratings in MVA)														
Walney Substation (Loads contain existing project loads and new Customer Load, no Takeoff)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total (250MW Facility Interconnection Limit)			84.3	85.4	113.1	100	109.3	167.63	193.7	221.3	221.3	221.3	221.3	221.3	221.3	221.3	221.3
Substation Total Calculation for 300MW NERC Limit			80.1	81.1	107.4	95	103.8	159.2	184	210.2	210.2	210.2	210.2	210.2	210.2	210.2	210.2
Transformer	Nameplate	NOL															
TX #1	75	80	37.1	36	36.1	45.7	47.3	67.23	76.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3
TX #2	75	80	47.2	49.4	77	48	52.8	59.9	71.9	75	75	75	75	75	75	75	75
TX #3	84	90	0	0	0	6.3	9.2	40.5	45.5	70	70	70	70	70	70	70	70

Table I.C.2c																	
Walney Load Area			(Load and Ratings in MVA)														
Walney Substation (Loads contain existing project loads and new Customer Load until Takeoff is energized)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total (250MW Facility Interconnection Limit)			84.3	85.4	113.1	100	109.3	167.63	193.7	221.3	221.3	105.13	105.13	105.13	105.13	105.13	105.13
Substation Total Calculation for 300MW NERC Limit			80.1	81.1	107.4	95	103.8	159.2	184	210.2	210.2	99.9	99.9	99.9	99.9	99.9	99.9
Transformer	Nameplate	NOL															
TX #1	75	80	37.1	36	36.1	45.7	47.3	67.23	76.3	76.3	76.3	49.23	49.23	49.23	49.23	49.23	49.23
TX #2	75	80	47.2	49.4	77	48	52.8	59.9	71.9	75	75	45.9	45.9	45.9	45.9	45.9	45.9
TX #3	84	90	0	0	0	6.3	9.2	40.5	45.5	70	70	10	10	10	10	10	10
Takeoff Substation (Loads contain new Customer Load)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total			0	0	0	0	0	0	0	0	86	116.95	127.4	127.4	127.4	127.4	127.4
Substation Total Calculation for 300MW NERC Limit			0	0	0	0	0	0	0	0	81.7	111.1	121	121	121	121	121
Transformer	Nameplate	NOL															
TX #1	112	120	0	0	0	0	0	0	0	0	38	45.5	45.5	45.5	45.5	45.5	45.5
TX #2	84	90	0	0	0	0	0	0	0	0	11	26	36.45	36.45	36.45	36.45	36.45
TX #3	112	120	0	0	0	0	0	0	0	0	37	45.45	45.45	45.45	45.45	45.45	45.45
TX #4	84	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX #5	112	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table I.C.2.d																	
Walney Load Area			(Load and Ratings in MVA)														
Walney Substation (Loads contain existing project loads and Customer bridging Load until Takeoff is energized)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total (250MW Facility Interconnection Limit)			84.3	85.4	113.1	100	109.3	135.63	140.63	165.13	105.13	105.13	105.13	105.13	105.13	105.13	105.13
Substation Total Calculation for 300MW NERC Limit			80.1	81.1	107.4	95	103.8	128.8	133.6	156.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
Transformer	Nameplate	NOL															
TX #1	75	80	37.1	36	36.1	45.7	47.3	49.23	49.23	49.23	49.23	49.23	49.23	49.23	49.23	49.23	49.23
TX #2	75	80	47.2	49.4	77	48	52.8	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9
TX #3	84	90	0	0	0	6.3	9.2	40.5	45.5	70	10	10	10	10	10	10	10
Takeoff Substation (Loads contain new Customer Load)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total			0	0	0	0	0	0	0	0	86	116.95	127.4	127.4	127.4	127.4	127.4
Substation Total Calculation for 300MW NERC Limit			0	0	0	0	0	0	0	0	81.7	111.1	121	121	121	121	121
Transformer	Nameplate	NOL															
TX #1	112	120	0	0	0	0	0	0	0	0	38	45.5	45.5	45.5	45.5	45.5	45.5
TX #2	84	90	0	0	0	0	0	0	0	0	11	26	36.45	36.45	36.45	36.45	36.45
TX #3	112	120	0	0	0	0	0	0	0	0	37	45.45	45.45	45.45	45.45	45.45	45.45
TX #4	84	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX #5	112	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table I.C.3.a																	
Aviator Load Area			(Load and Ratings in MVA)														
Future Aviator Sub (Loads contain with existing project load only)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total			0	0	0	0	0	54.45	270.45	270.45	270.45	270.45	270.45	270.45	270.45	270.45	270.45
Substation Total Calculation for 300MW			0	0	0	0	0	51.7	256.9	256.9	256.9	256.9	256.9	256.9	256.9	256.9	256.9
Transformer	Nameplate	NOL															
TX #1	112	120	0	0	0	0	0	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45
TX #2	112	120	0	0	0	0	0	0	54	54	54	54	54	54	54	54	54
TX #3	112	120	0	0	0	0	0	0	54	54	54	54	54	54	54	54	54
TX #4	112	120	0	0	0	0	0	0	54	54	54	54	54	54	54	54	54
TX #5	112	120	0	0	0	0	0	0	54	54	54	54	54	54	54	54	54

Table I.C.3.b																	
Aviator Load Area			(Load and Ratings in MVA)														
Future Aviator Sub (Loads contain with existing project and new customer load, no Takeoff)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total			0	0	0	0	0	99.45	336.9	382.9	397.35	397.35	397.35	397.35	397.35	397.35	397.35
Substation Total Calculation for 300MW NERC Limit			0	0	0	0	0	94.5	320.1	363.8	377.5	377.5	377.5	377.5	377.5	377.5	377.5
Transformer	Nameplate	NOL															
TX #1	112	120	0	0	0	0	0	99.45	99.45	99.45	99.45	99.45	99.45	99.45	99.45	99.45	99.45
TX #2	112	120	0	0	0	0	0	0	75.45	99.45	99.45	99.45	99.45	99.45	99.45	99.45	99.45
TX #3	112	120	0	0	0	0	0	0	54	76	90.45	90.45	90.45	90.45	90.45	90.45	90.45
TX #4	112	120	0	0	0	0	0	0	54	54	54	54	54	54	54	54	54
TX #5	112	120	0	0	0	0	0	0	54	54	54	54	54	54	54	54	54

Table I.C.3.c																	
Aviator Load Area			(Load and Ratings in MVA)														
Future Aviator Sub (Loads contain with existing project and new customer load until Takeoff is energized)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total			0	0	0	0	0	99.45	336.9	382.9	397.35	270.45	270.45	270.45	270.45	270.45	270.45
Substation Total Calculation for 300MW NERC Limit			0	0	0	0	0	94.5	320.1	363.8	377.5	256.9	256.9	256.9	256.9	256.9	256.9
Transformer	Nameplate	NOL															
TX #1	112	120	0	0	0	0	0	99.45	99.45	99.45	99.45	54.45	54.45	54.45	54.45	54.45	54.45
TX #2	112	120	0	0	0	0	0	0	75.45	99.45	99.45	54	54	54	54	54	54
TX #3	112	120	0	0	0	0	0	0	54	76	90.45	54	54	54	54	54	54
TX #4	112	120	0	0	0	0	0	0	54	54	54	54	54	54	54	54	54
TX #5	112	120	0	0	0	0	0	0	54	54	54	54	54	54	54	54	54
Takeoff Substation (Loads contain new Customer Load)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total			0	0	0	0	0	0	0	0	86	116.95	127.4	127.4	127.4	127.4	127.4
Substation Total Calculation for 300MW NERC Limit			0	0	0	0	0	0	0	0	81.7	111.1	121	121	121	121	121
Transformer	Nameplate	NOL															
TX #1	112	120	0	0	0	0	0	0	0	0	38	45.5	45.5	45.5	45.5	45.5	45.5
TX #2	84	90	0	0	0	0	0	0	0	0	11	26	36.45	36.45	36.45	36.45	36.45
TX #3	112	120	0	0	0	0	0	0	0	0	37	45.45	45.45	45.45	45.45	45.45	45.45
TX #4	84	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX #5	112	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table I.C.3d																	
Aviator Load Area			(Load and Ratings in MVA)														
Future Aviator Sub (Loads contain with existing project and customer bridging load until Takeoff is energized)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total			0	0	0	0	0	54.45	270.45	270.45	270.45	270.45	270.45	270.45	270.45	270.45	270.45
Substation Total Calculation for 300MW NERC Limit			0	0	0	0	0	51.7	256.9	256.9	256.9	256.9	256.9	256.9	256.9	256.9	256.9
Transformer	Nameplate	NOL															
TX #1	112	120	0	0	0	0	0	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45	54.45
TX #2	112	120	0	0	0	0	0	0	54	54	54	54	54	54	54	54	54
TX #3	112	120	0	0	0	0	0	0	54	54	54	54	54	54	54	54	54
TX #4	112	120	0	0	0	0	0	0	54	54	54	54	54	54	54	54	54
TX #5	112	120	0	0	0	0	0	0	54	54	54	54	54	54	54	54	54
Takeoff Substation (Loads contain new Customer Load)																	
			2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Actual Peak Loading (MVA)	2023 Actual Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)	2031 Projected Peak Loading (MVA)	2032 Projected Peak Loading (MVA)	2033 Projected Peak Loading (MVA)
Substation Total			0	0	0	0	0	0	0	0	86	116.95	127.4	127.4	127.4	127.4	127.4
Substation Total Calculation for 300MW NERC Limit			0	0	0	0	0	0	0	0	81.7	111.1	121	121	121	121	121
Transformer	Nameplate	NOL															
TX #1	112	120	0	0	0	0	0	0	0	0	38	45.5	45.5	45.5	45.5	45.5	45.5
TX #2	84	90	0	0	0	0	0	0	0	0	11	26	36.45	36.45	36.45	36.45	36.45
TX #3	112	120	0	0	0	0	0	0	0	0	37	45.45	45.45	45.45	45.45	45.45	45.45
TX #4	84	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX #5	112	120	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: There are no feasible distribution or transmission electrical alternatives to the Project, and no alternatives were submitted to PJM. See Sections I.A and I.C.

Pursuant to the Commission's November 26, 2013, Order entered in Case No. PUE-2012-00029,[27] and its November 1, 2018, Final Order entered in Case No. PUR-2018-00075,[28] 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 and PJM have identified a need for the Project based on the need to address identified violations of NERC Reliability Standards and to provide requested service, thereby enabling the Company to maintain the overall long-term reliability of its transmission system.[29] Notwithstanding, when performing an analysis based on PJM's 50/50 load forecast, there is no adjustment in load for DR programs 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 previously into PJM's capacity 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 eliminate the need for the Project. As discussed in Sections I.A and I.C, the need for the proposed Project is not load driven; rather, it is based on the need to address identified violations of NERC Reliability Standards and the Company's obligation to interconnect the Customer's new data center development, consistent with the Company's FIR and mandatory NERC Reliability Standards.

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[27] *Application of Virginia Electric and Power Company d/b/a Dominion Virginia Power for approval and certification of electric facilities: Surry-Skiffes Creek 500 kV Transmission Line, Skiffes Creek-Whealton 230 kV Transmission Line, and Skiffes Creek 500 kV-230 kV-115 kV Switching Station*, Case No. PUR-2012-00029, Final Order (Nov. 26, 2023).

[28] *Application of Virginia Electric and Power Company for approval and certification of electric transmission facilities under Va. Code § 56-46.1 and the Utility Facilities Act, Va. Code § 56-265.1 et seq.*, Case No. PUR-2018-00075, Final Order (Nov. 1, 2018).

[29] 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.

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: **Takeoff Loop and Substation**

For this component of the Project, the Company plans to transfer two spans of fiber from existing Structure #2008/66 / #2285/66 to the proposed tap structure (Structure #2008/67 / #2285/67) and from existing Structure #2008/67 / #2285/67 to the proposed tap structure (Structure #2356/66 / #2357/66).

Sully-Takeoff Partial Reconductor/Rebuild

For the Sully-Takeoff Partial Reconductor, the Company proposes to remove approximately 1.9 miles of existing 1590 kcmil 45/7 ACSR type conductor with a normal rating of 125°C and an emergency rating of 824/824 MVA summer and 944/944 MVA winter, and 1534 ACAR 42 EC/19 type conductor with a normal rating of 90°C and an emergency rating of 583/583 MVA summer and 741/741 MVA winter. The Company plans to replace the conductor with three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS with a normal rating of 250°C and an emergency rating of 786/786 MVA summer and 824/824 MVA winter. The existing 1.9-mile segment of Line #2357 being reconductored is between the Sully-Takeoff Cut-in and the Sully Substation. No shield wire replacements are included within this scope of work.

For the Sully-Takeoff Partial Rebuild, the Company proposes to remove five existing painted steel double circuit monopole structures supporting Line #2357 and Line #2107 (existing Structures #265/98 / #2107/72, #265/99 / #2107/71, #265/102 / #2107/68, #265/104 / #2107/66, and #265/107 / #2107/63) located within an existing 0.9-mile segment of the Sully-Takeoff Line #2357 between Structure #265/98 / #2107/72 and Sully Substation and replace them with five double circuit dulled galvanized steel monopole structures.

The Company plans to transfer the existing Line #2107 conductor to the five rebuilt structures until such time as it is uprated. The existing conductor consists of 1534 ACAR 42 EC/19 type conductor with a normal rating of 90°C and an emergency rating of 583/583 MVA summer and 741/741 MVA winter.

See also Section II.C.

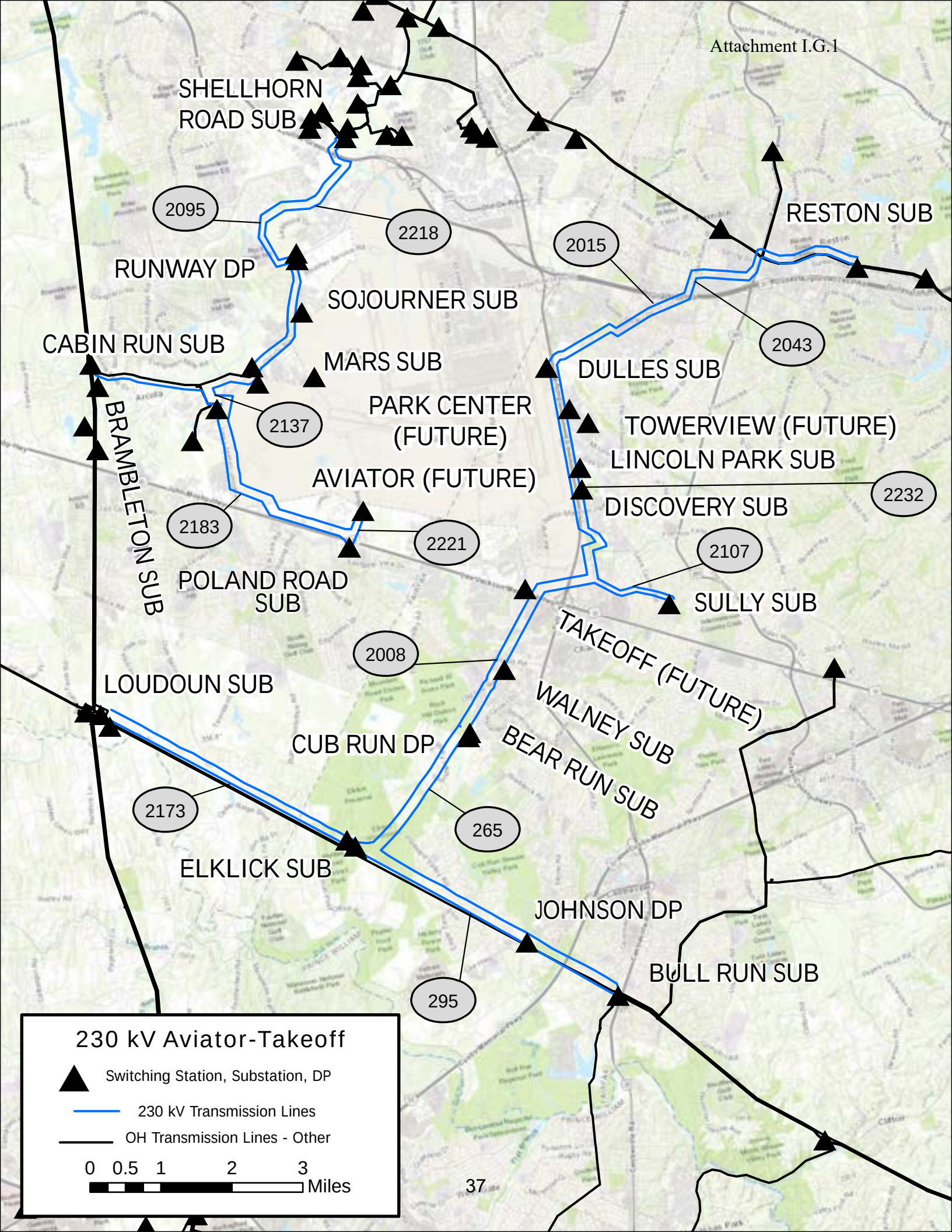
Aviator-Takeoff Lines

No transmission facilities will be removed or replaced or taken out of service related to construction of the proposed Aviator-Takeoff Lines. See also Section II.C.

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.


SHELLHORN ROAD SUB
2095
2218
RUNWAY DP
SOJOURNER SUB
CABIN RUN SUB
MARS SUB
2137
BRAMBLETON SUB
PARK CENTER (FUTURE)
AVIATOR (FUTURE)
2183
2221
POLAND ROAD SUB
RESTON SUB
2015
2043
DULLES SUB
TOWERVIEW (FUTURE)
LINCOLN PARK SUB
2232
DISCOVERY SUB
2107
SULLY SUB
TAKEOFF (FUTURE)
2008
LOUDOUN SUB
WALNEY SUB
BEAR RUN SUB
CUB RUN DP
2173
265
ELKLICK SUB
JOHNSON DP
BULL RUN SUB
295
230 kV Aviator-Takeoff
Switching Station, Substation, DP
230 kV Transmission Lines
OH Transmission Lines - Other
0 0.5 1 2 3
Miles

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 August 1, 2027.

The Company estimates it will take approximately 30 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 February 17, 2025. Should the Commission issue a final order by February 17, 2025, the Company estimates that construction should begin around January 2026, and be completed by August 1, 2027. This schedule is contingent upon obtaining the necessary permits and outages, the latter of which may be particularly challenging due to the amount of new load growth, rebuilds, and new builds scheduled to occur in this load area. 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, as well as the ability to schedule outages, and unpredictable delays due to labor shortages, or materials/supply issues. This schedule is also contingent upon the Company's ability to negotiate for easements with property owners along the approved routes without the need for additional litigation.

In addition, the Company is actively monitoring the regulatory changes and requirements associated with the NLEB and how they could potentially impact construction timing associated with time of year restrictions TOYRs. The USFWS previously indicated that it planned to issue final NLEB guidance to replace the interim guidance by April 1, 2024; however, the interim guidance has been extended by USFWS until late summer 2024. The Company actively is tracking updates from the USFWS with respect to the final guidance. Once issued, the Company plans to review and follow the final guidance to the extent it applies to the Company's projects. Until the final guidance is issued, the Company will continue following the interim guidance. For projects that may require additional coordination, the Company will coordinate with the USFWS.

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

Any adjustments to this Project schedule resulting from these or similar challenges could necessitate a minimum of a six- to twelve-month delay in the targeted in-service date. Accordingly, for purposes of judicial economy, the Company requests that the Commission issue a final order approving both a desired in-service target

date (*i.e.*, August 1, 2027) and an authorization sunset date (*i.e.*, August 1, 2028) for energization of the Project.

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 as proposed is approximately $168.3 million,[30] which includes approximately $93.1 million for transmission-related work[31] and approximately $75.2 million for substation-related work (2024 dollars).

The following is a breakdown of approximate costs.

Transmission-Related Costs

Takeoff Loop Proposed Route: $18.8 million
Takeoff Loop Alternative Route 2: $10.5 million

Sully-Takeoff Partial Reconductor/Rebuild: $4.7 million

Aviator-Takeoff Proposed Route 1: $69.6 million
Aviator-Takeoff Alternative Route 2: $58.8 million
Aviator-Takeoff Alternative Route 3: $54.7 million

Substation-Related Costs

Takeoff Substation: $72.7 million

Aviator Substation: $2.5 million

See Section II.C for costs associated with minor substation work at the Company's future Bear Run Substation, and the Company's existing Lincoln Park, Sully, and Loudoun Substations, which are not included in the total Project costs but are provided for informational purposes.

[30] *See supra*, n. 11.

[31] The conceptual transmission-related estimates for the Takeoff Loop Proposed Route (Route 1) and the Aviator-Takeoff Proposed Route (Route 1) include placeholders for MWAA negotiations that will continue through the proceeding. These estimates were developed using the same methodology used to develop the conceptual transmission-related cost estimates for Takeoff Loop Alternative Route 2 and Aviator-Takeoff Alternative Routes 2 and 3.

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: As discussed in Section I.A, the Company presented need and solution slides to PJM in 2020 for the future Aviator Substation (Supplemental Project DOM-2020-0003), which was needed to accommodate a new data center development in Loudoun County, Virginia, with a total load exceeding 100 MW. See Attachment I.J.1 and Attachment I.J.2. That project was classified as a supplemental project (Supplemental Project DOM-2020-0003), assigned Supplemental Project No. s2324, and accepted into the 2020 Local Plan. The Aviator Substation was approved by Final Order of the Commission on November 28, 2022, in Case No. PUR-2022-00012, with an in-service date of September 30, 2024

During the 2020 DNH analysis of Supplemental Project DOM-2020-0003 (*i.e.*, the future Aviator Substation), PJM identified a 300 MW N-1-1 load drop violation for the loss of Shellhorn-Sojourner Line #2218 and Evergreen Mills-Poland Road Line #2183. See Attachment I.J.3. As part of the same DNH analysis, PJM identified thermal violations requiring the reconductor of existing Lines #2008 and #265, which will increase the line capacity from the existing 583 MVA to 1,573 MVA. See Attachment I.J.3. The proposed Project—including the Takeoff Loop and Substation, the Sully-Takeoff Partial Reconductor/Rebuild, and the Aviator-Takeoff Lines—resolves the potential NERC reliability and thermal violations by providing a network connection to the Takeoff Substation that increases reliability.

Accordingly, the proposed Project is classified as a supplemental project initiated by the TO in order to mitigate a NERC reliability violation identified during the DNH analysis of the project solutions presented at the February 9, 2021 TEAC Meeting for Supplemental Project DOM-2020-0003 (Aviator Substation), and to maintain reliable service for overall growth in the Project Area. See Attachment I.J.3. See also Section I.A as to a second 300 MW N-1-1 load drop violation expected to occur within the Project area surrounding existing Bull Run-Sully Line #265 identified by the Company's Transmission Planning group, consistent with prudent planning.

As also discussed in Section I.A, in order to connect the Customer's new data center load in Fairfax County, Virginia, the Company submitted additional transformers to the design of the Takeoff Substation to PJM in 2021. The additions to the design of the Takeoff Substation have been designated as a supplemental project in the PJM RTEP process and have been assigned Dominion Need Number DOM-2021-0003. See Attachment I.J.4 for the need slide that was presented at PJM's April 6, 2021 TEAC Meeting, and Attachment I.J.5 for the solution slide that was presented at PJM's May 11, 2021 TEAC Meeting. As this is a supplemental project, the Company anticipates that it will be included in the RTEP. While the Company has

not received a Supplement ID#, this component of the Project as originally submitted to PJM in 2021 was included in the 2025 RTEP model.

Subsequently, the Company presented a change to Supplemental Project No. s2324 to PJM at the June 8, 2021 TEAC Meeting, to address some minor changes to the Project scope, as reflected in this Appendix. See Attachment I.J.6. As this is a supplemental project, the Company anticipates that these minor revisions to the Project scope will have no impact, and that the Project, as proposed herein, will be incorporated into the 2023 PJM RTEP/2023 Local Plan and included in the 2025 RTEP.

The Project will be 100% cost allocated to DOM Zone.

Dominion Supplemental Projects

Transmission Expansion Advisory Committee
March 10, 2020

Attachment I.J.1

Needs

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-2020-0003

Process Stage: Need Meeting 03/10/2020

Project Driver: Customer Service

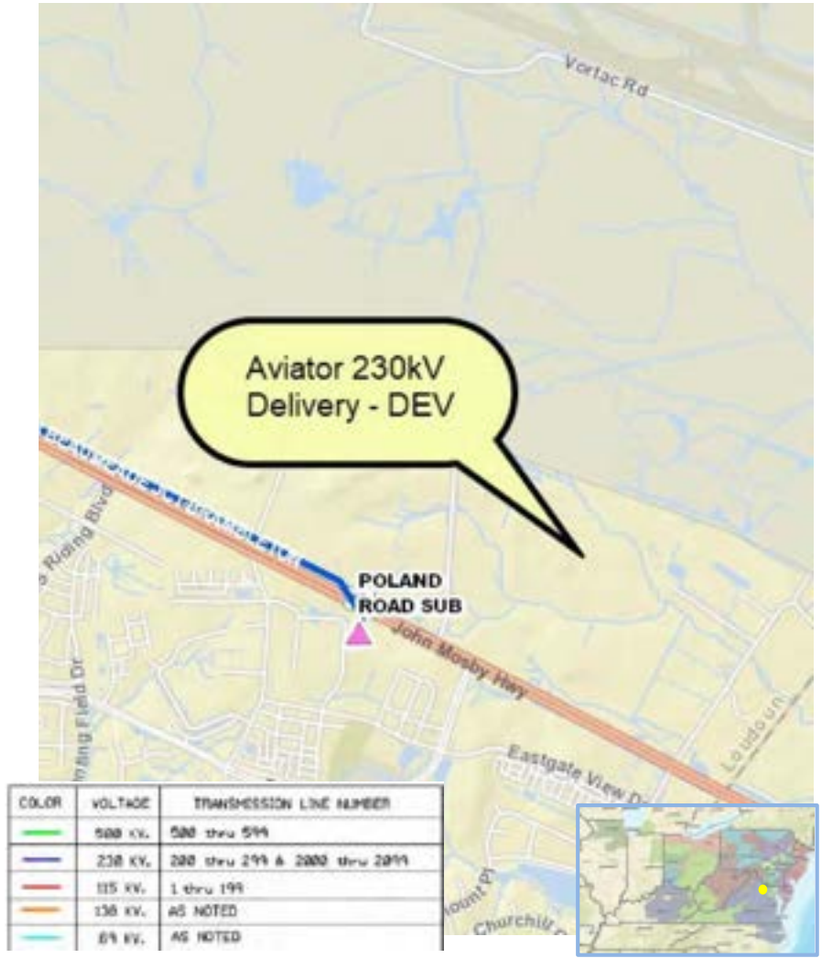
Specific Assumption References:

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 (Aviator) to accommodate a new datacenter campus in Loudoun County with a total load in excess of 100MW. Requested in-service date is 6/01/2023.

Initial In-Service Load	Projected 2025 Load
Summer: 27.0 MW	Summer: 116.0 MW



Dominion Supplemental Projects

Transmission Expansion Advisory Committee
May 12, 2020

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

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Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2020-0003

Process Stage: Solutions Meeting 05/12/2020

Previously Presented: Need Meeting 04/14/2020

Project Driver: Customer Service

Specific Assumption References:

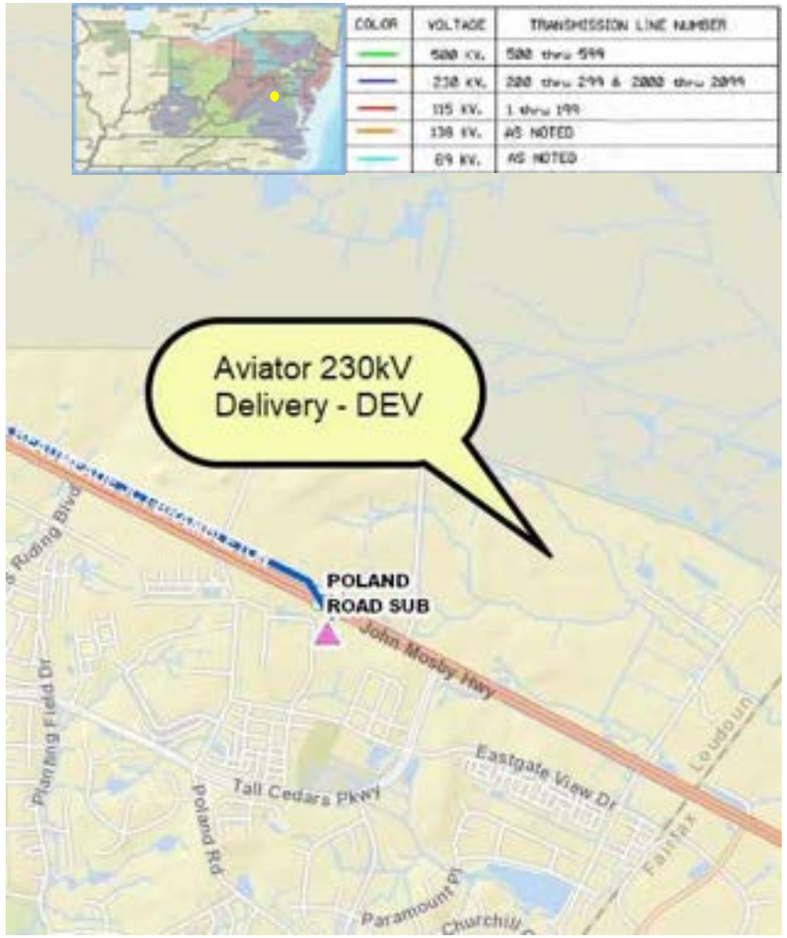
Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria.

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Problem Statement:

DEV Distribution has submitted a DP Request for a new substation (Aviator) to accommodate a new datacenter campus in Loudoun County with a total load in excess of 100MW. Requested in-service date is 6/01/2023.

Initial In-Service Load	Projected 2025 Load
Summer: 27.0 MW	Summer: 116.0 MW



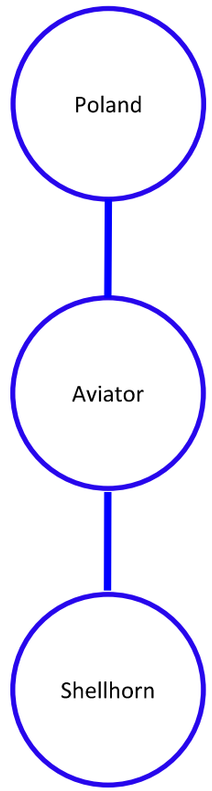
Dominion Transmission Zone: Supplemental Aviator 230kV Delivery - DEV

Need Number: DOM-2020-0003

Process Stage: Solutions Meeting 05/12/2020

Proposed Solution:

Interconnect the new substation by cutting and extending Line #2137 (Poland-Shellhorn) approximately 0.5 miles to the proposed Aviator Substation. Terminate both ends into a four-breaker ring arrangement to create an Aviator-Poland line and an Aviator-Shellhorn line. Dominion's standard high ampacity conductor (bundled 768 ACSS; normal summer rating = 1572 MVA) will be used for the line extension.



Estimated Project Cost: $22.0 M

49

Alternatives Considered:

No feasible alternatives

Projected In-service Date: 06/01/2023

Project Status: Engineering

Model: 2025 RTEP

Dominion Supplemental Projects

Transmission Expansion Advisory Committee
February 9, 2021

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 Do No Harm Analysis

Need Number: DOM-2020-0003 DNH

Meeting Date: 02/09/2021

Process Stage: Solution Meeting 02/09/2021

Supplemental Project Driver: Do No Harm Analysis

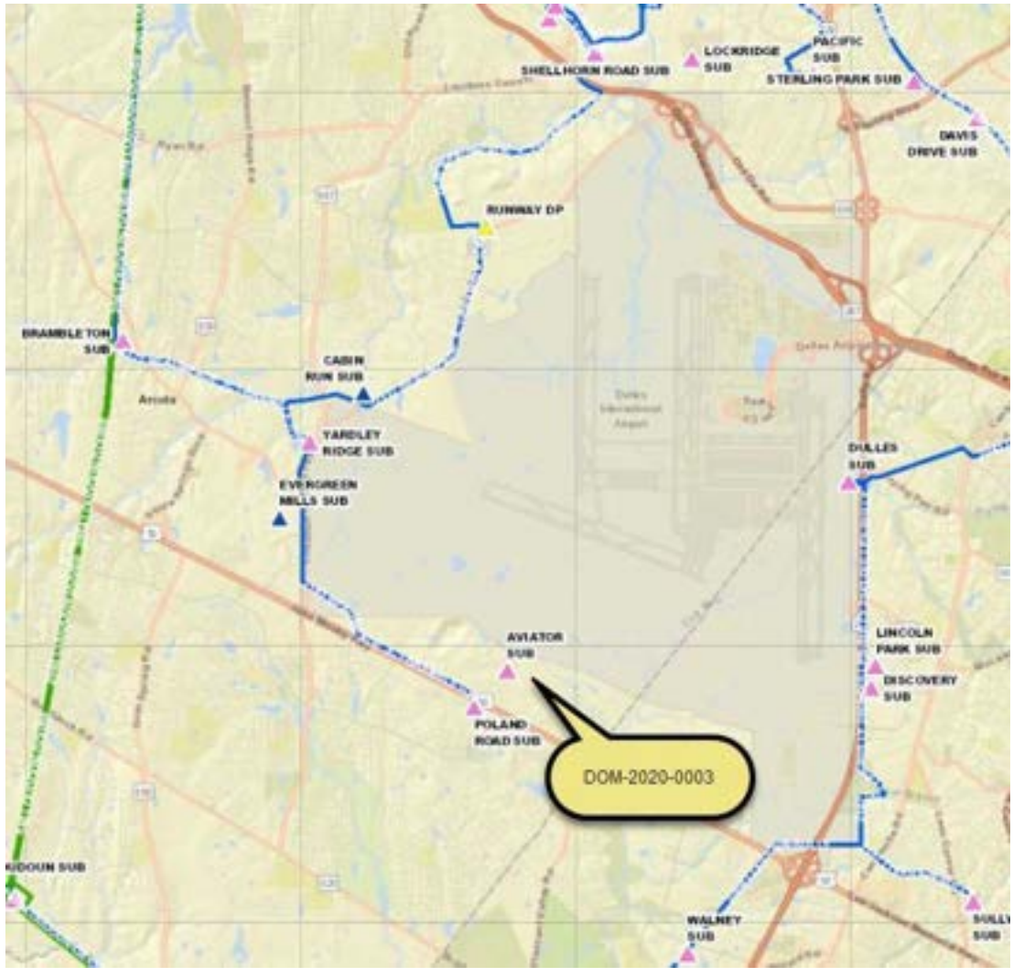
Specific Assumption Reference:

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

Problem Statement:

PJM has identified a 300MW N-1-1 Load Drop violation for the loss of Line #9192 (Shellhorn to Sojourner) and Line #2183 (Evergreen Mills to Poland Road) during the 2020 Do-No-Harm analysis.

The violation was caused by Supplemental Project DOM-2020-0003 in the Dominion Zone.



Dominion Transmission Zone: Supplemental Do No Harm Analysis

Need Number: DOM-2020-0003 DNH

Meeting Date: 02/09/2021

Process Stage: Solution Meeting 02/09/2021

Proposed Solution :

- Build a new substation (Takeoff) by cutting Line #2008 (Lincoln Park-Loudoun) and Line #265 (Bull Run-Sully). Terminate all lines in a 230kV breaker-and-a-half arrangement at Takeoff Substation.
- Extend a new 230kV double-circuit line approx. 3 miles from Aviator to Takeoff.
- Reconductor three 230kV lines using standard high-capacity conductors.
  - Line segment between Loudoun and Takeoff (approx. 2.21 miles),
  - Line segment between Lincoln Park and Takeoff (approx. 2.63 miles), and
  - Line segment between Sully and Takeoff (approx. 1.16 miles).
- Replace one 230kV breaker at Brambleton (SC102) and three 69kV breakers at Davis Substation (178T186, 18622, T342) with higher interrupting capabilities.

53

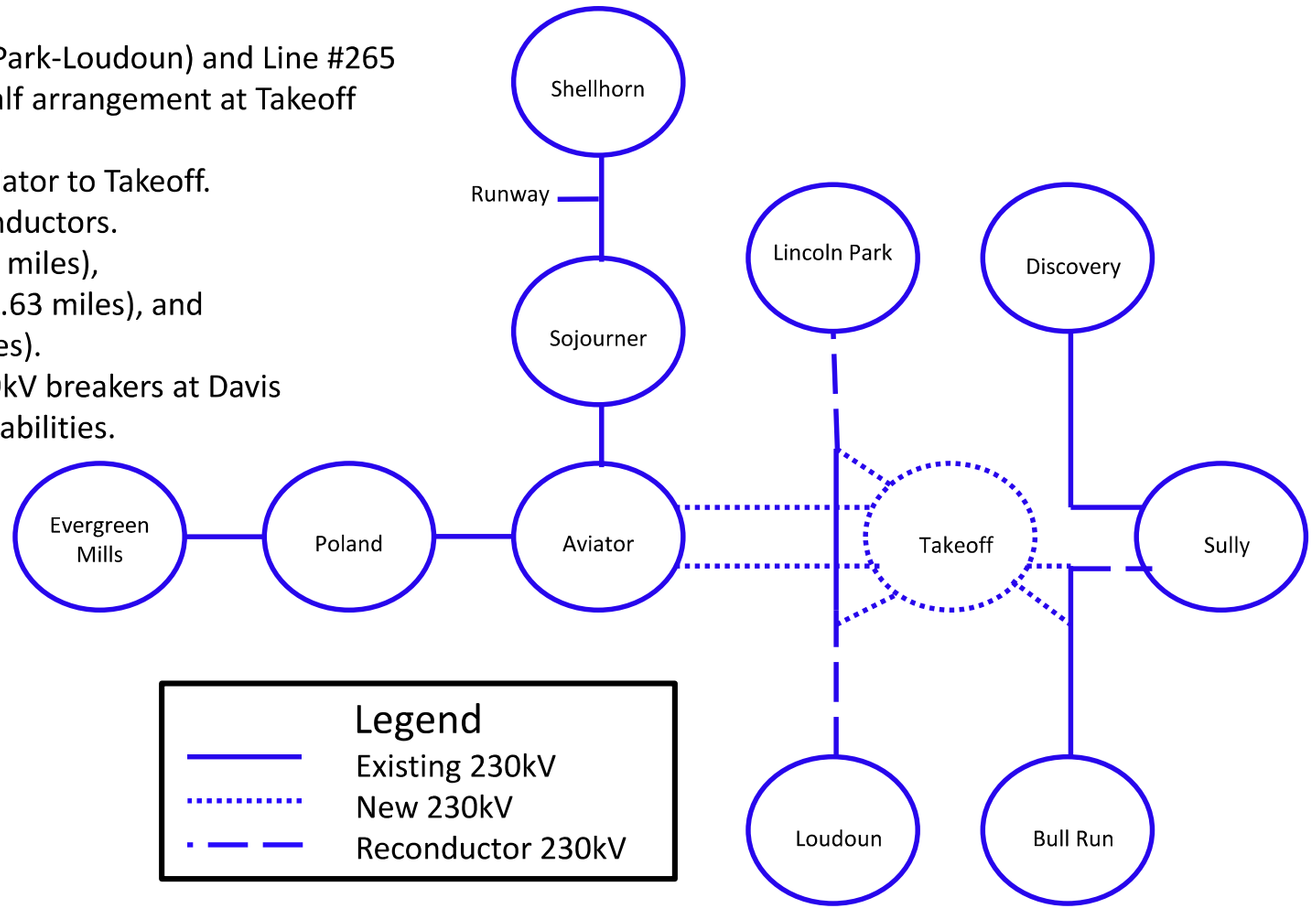
TO Alternatives Considered :

No feasible alternatives

Estimated Cost:	$74.9M (Total)
• Transmission Line	$36M
• Substation	$28M
• Reconductor	$ 9M
• Breakers (Brambleton)	$0.7M
• Breakers (Pentagon)	$1.2M

Projected In-service Date: 12/31/2025

Project Status: Conceptual



Dominion Supplemental Projects

Transmission Expansion Advisory Committee
April 6, 2021

Needs

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

55

Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2021-0003

Process Stage: Need Meeting 04/06/2021

Project Driver: Customer Service

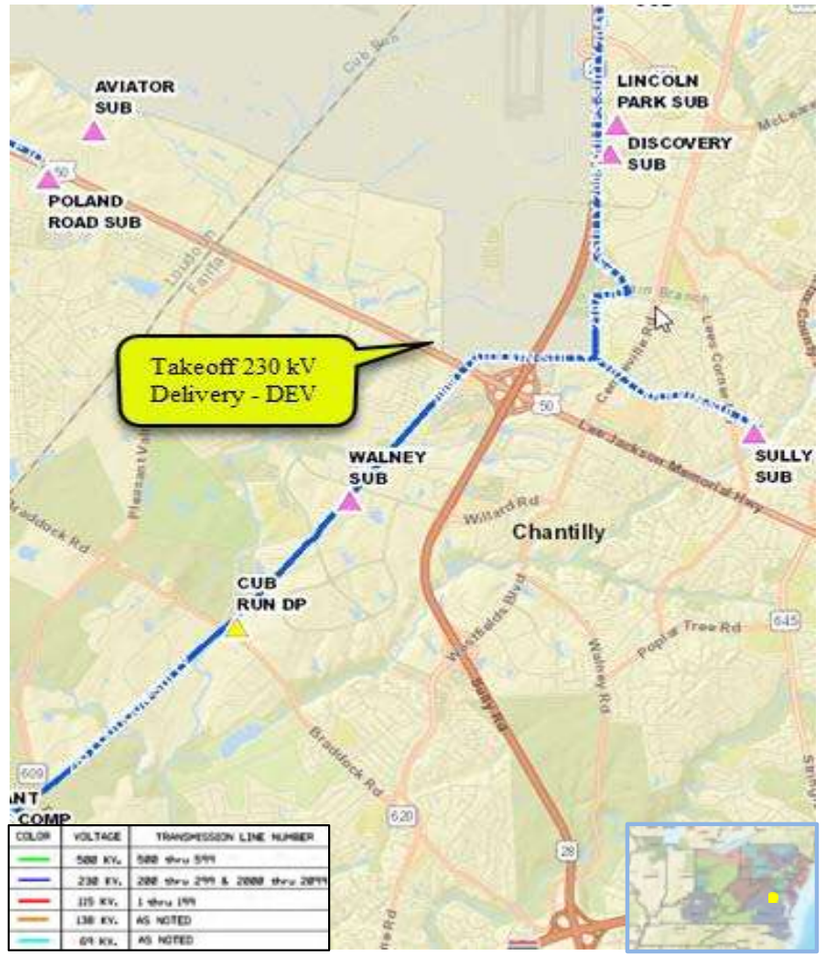
Specific Assumption References:

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 to add transformers at Takeoff Substation to support a new datacenter campus in Fairfax County with a total load in excess of 100 MW. The new station will also support existing load in the immediate area. Requested in-service date is 06/15/2024.

Initial In-Service Load	Projected 2026 Load
Summer: 86.0 MW	Summer: 143.2 MW



Dominion Supplemental Projects

Transmission Expansion Advisory Committee
May 11, 2021

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-2021-0003

Process Stage: Solutions Meeting 05/11/2021

Previously Presented: Need Meeting 04/06/2021

Project Driver: Customer Service

Specific Assumption References:

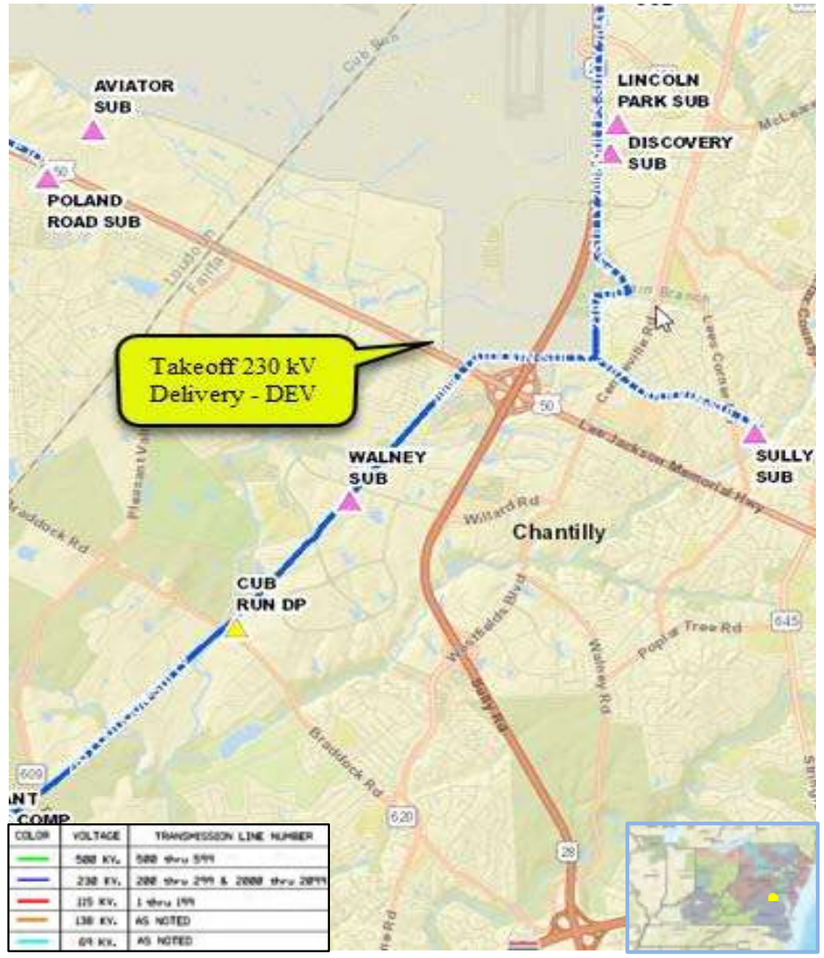
Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria.

59

Problem Statement:

DEV Distribution has submitted a DP Request to add transformers at Takeoff Substation to support a new datacenter campus in Fairfax County with a total load in excess of 100 MW. The new station will also support existing load in the immediate area. Requested in-service date is 06/15/2024.

Initial In-Service Load	Projected 2026 Load
Summer: 86.0 MW	Summer: 143.2 MW



Dominion Transmission Zone: Supplemental Takeoff 230kV Delivery- Add Two TX's - DEV

Need Number: DOM-2021-0003

Process Stage: Solutions Meeting 05/11/2021

Proposed Solution:

Install two 1200 Amp, 63kAIC circuit switchers and associated equipment (bus, switches, relaying, etc.) to feed the new transformers at Takeoff. .

Estimated Project Cost: $1.0 M

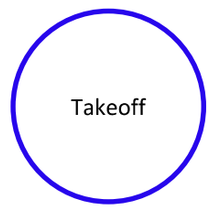
Alternatives Considered:

No feasible alternatives

Projected In-service Date: 06/15/2024

Project Status: Engineering

Model: 2025 RTEP



Dominion Supplemental Projects

Transmission Expansion Advisory Committee
June 8, 2021

Changes to Existing Supplemental Projects

62

Dominion Transmission Zone: Supplemental Do No Harm Analysis

Supplemental Project: s2324.2-s2324.8 (Need-2020-0003 DNH, posted to the 2020 Dominion Local Plan)

Original Scope:

- Build a new substation (Takeoff) by cutting Line #2008 (Lincoln Park-Loudoun) and Line #265 (Bull Run-Sully). Terminate all lines in a 230kV breaker-and-a-half arrangement at Takeoff Substation. **(s2324.2)**
- Extend a new 230kV double-circuit line approx. 3 miles from Aviator to Takeoff. **(s2324.3)**
- Reconductor three 230kV lines using a standard high-capacity conductor.
  - Line segment between Loudoun and Takeoff (approx. 2.21 miles), **(s2324.4)**
  - Line segment between Lincoln Park and Takeoff (approx. 2.63 miles), **(s2324.5)** and
  - Line segment between Sully and Takeoff (approx. 1.16 miles). **(s2324.6)**
- Replace one 230kV breaker at Brambleton (SC102) **(s2324.7)** and three 69kV breakers at Davis Substation (178T186, 18622, T342) **(s2324.8)** with higher interrupting capabilities.

New Scope:

- Build a new substation (Takeoff) by cutting Line #2008 (Lincoln Park-Loudoun) and Line #265 (Bull Run-Sully). Terminate all lines in a 230kV breaker-and-a-half arrangement at Takeoff Substation. **(s2324.2)**
- Extend a new 230kV double-circuit line approx. 3 miles from Aviator to Takeoff. **(s2324.3)**
- Reconductor three 230kV lines using a standard high-capacity conductor.
  - Line segment between Loudoun and Takeoff (approx. 2.21 miles), **(s2324.4)**
  - Line segment between Lincoln Park and Takeoff (approx. 2.63 miles), **(s2324.5)** and
  - Line segment between Sully and Takeoff (approx. 1.16 miles). **(s2324.6)**
- Replace ~~one~~ four 230kV breaker at Brambleton (SC102, H302, H402, 218302) **(s2324.7)** and three 69kV breakers at Davis Substation (178T186, 18622, T342) **(s2324.8)** with higher interrupting capabilities.

Estimated Cost: ~~$74.9M~~ $76.7M (Total)
Projected IS Date: 12/31/2025

Reason for the scope change: Short circuit case updates and reevaluation of previous results.



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.

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 proposed Takeoff Substation will serve the Aviator Load Area described in Section I.C and generally depicted in Attachment I.A.1. The Project will also be used to support future load 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 Project are provided below. See Section II.A.9 for an explanation of the Company's route selection process, as well as the Environmental Routing Study referenced therein, and Attachment I.A.1 for an overview map of the Proposed and Alternative Routes for the Project.

Takeoff Loop and Substation

The approximate lengths of the Proposed and Alternative Routes for the Takeoff Loop are as follows:

Takeoff Loop Proposed Route (Route 1): 0.3 mile
Takeoff Loop Alternative Route 2: 0.3 mile

Sully-Takeoff Partial Reconductor/Rebuild

For the Sully-Takeoff Partial Reconductor/Rebuild, the total length of the existing right-of-way to be used for this component is approximately 1.9 miles.[32] Because it will be entirely within existing right-of-way, there are no alternative routes proposed.

Aviator-Takeoff Lines

The approximate lengths of the Proposed and Alternative Routes for the Aviator-Takeoff Lines are as follows:

Aviator-Takeoff Proposed Route (Route 1): 3.2 miles
Aviator-Takeoff Alternative Route 2: 3.3 miles
Aviator-Takeoff Alternative Route 3: 3.1 miles

[32] The entire length of future Sully-Takeoff Line #2357 is approximately 2.2 miles; however, the new 0.3-mile portion of the line proposed as part of the Takeoff Loop is not included for purposes of the Sully-Takeoff Partial Reconductor/Rebuild. *See supra*, n. 9.

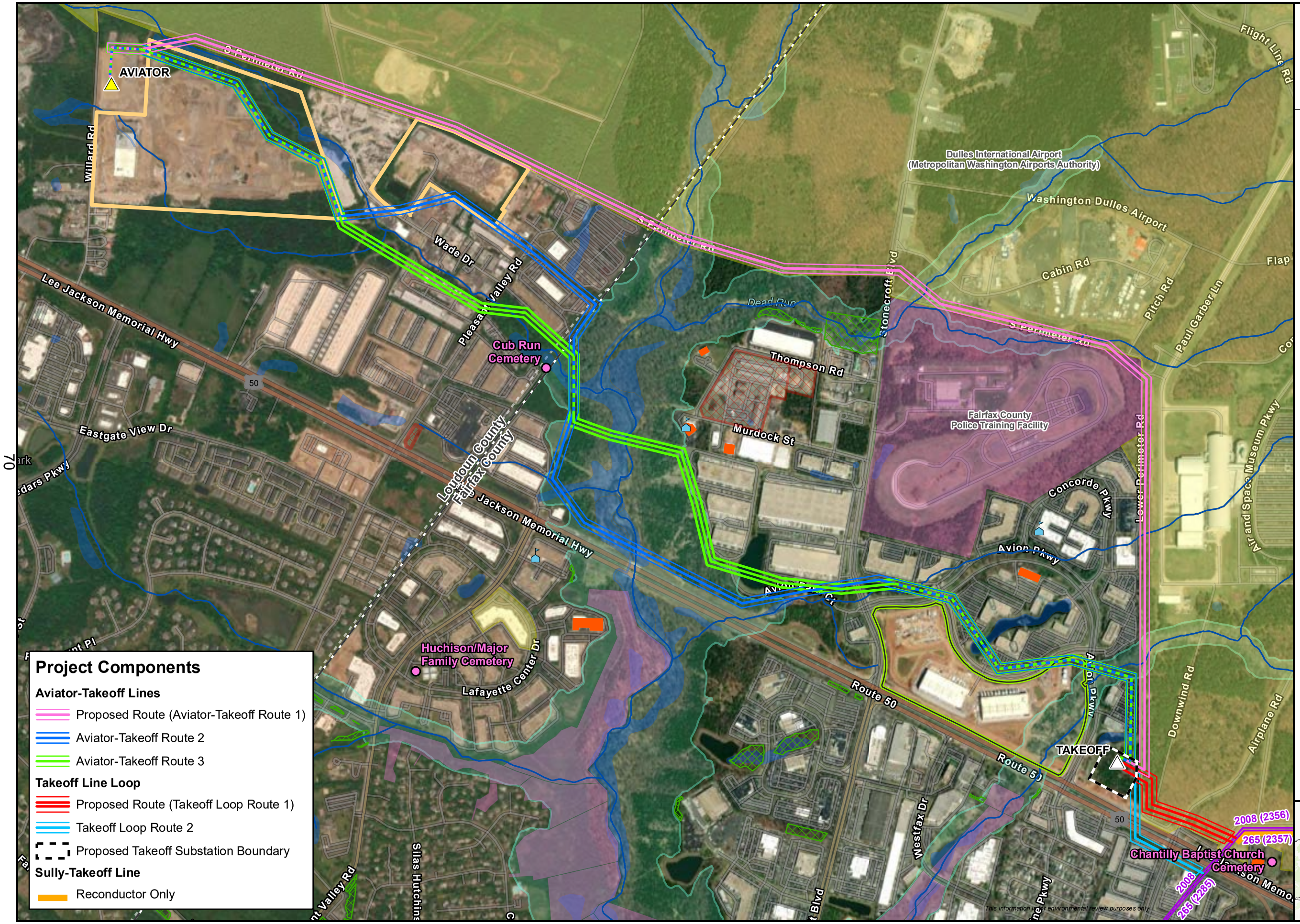
II. DESCRIPTION OF THE PROPOSED PROJECT

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 for the Project as proposed. No portion of the right-of-way is proposed to be quitclaimed or relinquished.

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



Project Components

Aviator-Takeoff Lines

- Proposed Route (Aviator-Takeoff Route 1)
- Aviator-Takeoff Route 2
- Aviator-Takeoff Route 3

Takeoff Line Loop

- Proposed Route (Takeoff Loop Route 1)
- Takeoff Loop Route 2
- Proposed Takeoff Substation Boundary

Sully-Takeoff Line

- Reconductor Only

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Attachment II.A.2
Project Overview and Constraints

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Fairfax and Loudoun Counties, Virginia

- Future Substation
- Proposed Substation
- Existing Dominion Transmission Line Labeled with Current (Future) Number
- School
- Cemetery
- Place of Worship
- Customer Data Center
- Planned Data Center Campus
- County Boundary
- Fairfax Conservation Easement
- Resource Protection Area
- NHD Stream
- NWI Wetland

Public Lands

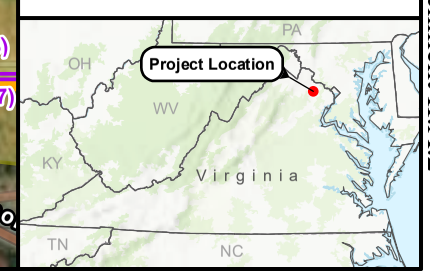
- County
- State
- Federal

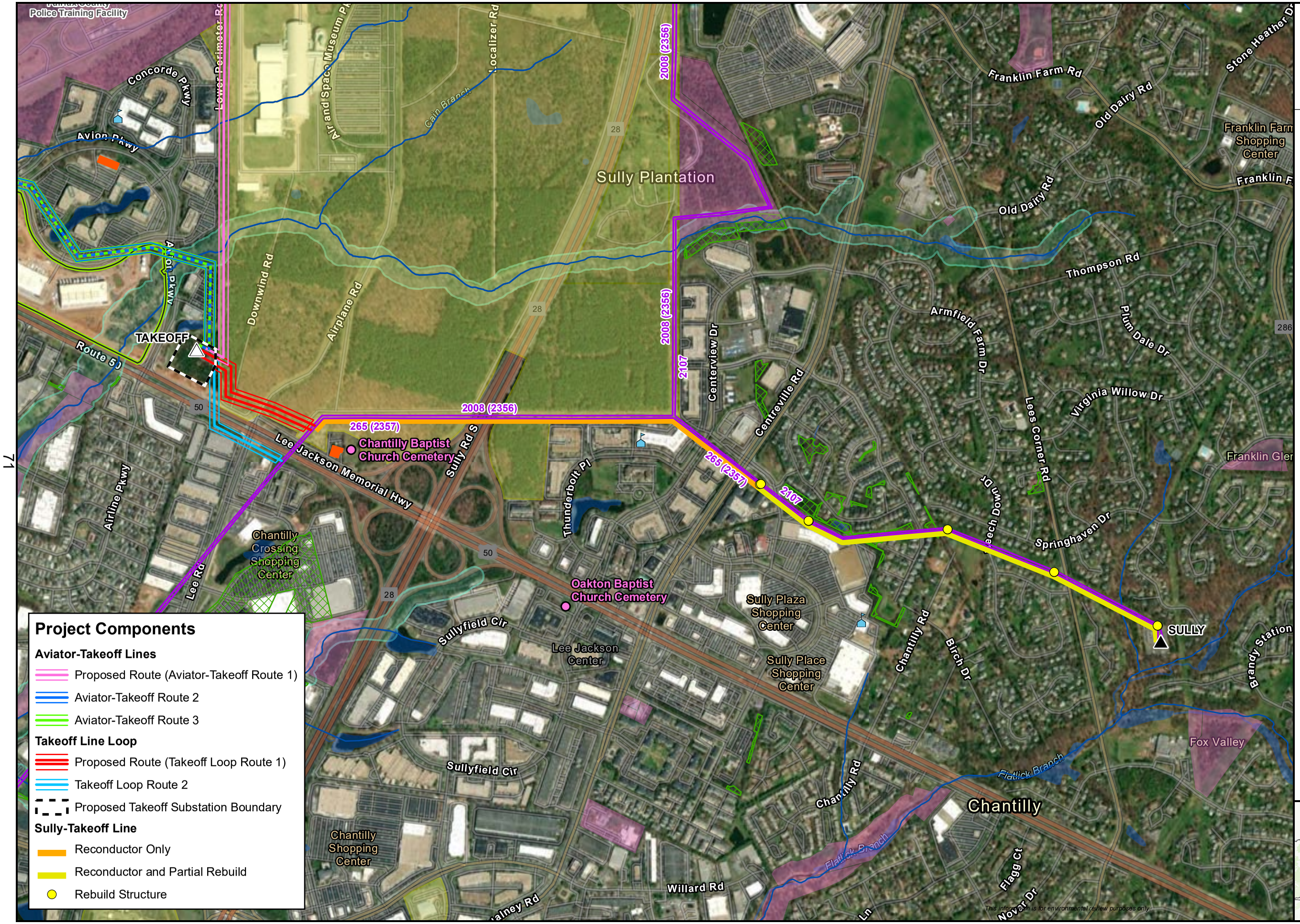
0 500 1,000
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Project Components

Aviator-Takeoff Lines

- Proposed Route (Aviator-Takeoff Route 1)
- Aviator-Takeoff Route 2
- Aviator-Takeoff Route 3

Takeoff Line Loop

- Proposed Route (Takeoff Loop Route 1)
- Takeoff Loop Route 2
- Proposed Takeoff Substation Boundary

Sully-Takeoff Line

- Reconductor Only
- Reconductor and Partial Rebuild
- Rebuild Structure

Dominion Energy®

Attachment II.A.2
Project Overview and Constraints

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Fairfax and Loudoun Counties, Virginia

- Existing Substation
- Proposed Substation
- Existing Dominion Transmission Line Labeled with Current (Future) Number
- School
- Cemetery
- Place of Worship
- Customer Data Center
- Fairfax Conservation Easement
- Resource Protection Area
- NHD Stream
- NWI Wetland

Public Lands

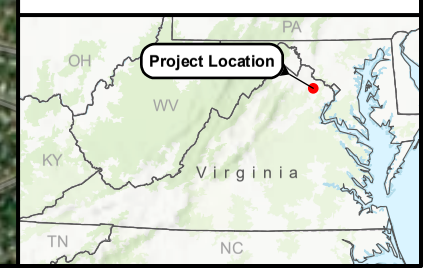
- County
- State
- Federal

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ERM



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 for the existing transmission line rights-of-way and Attachment II.B.3.h for the proposed transmission line right-of-way in the Project area.

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: **Takeoff Loop**

There is no existing 160-foot-wide right-of-way that serves the proposed Takeoff Substation from the cut-in locations on the existing Lincoln Park-Loudoun Line #2008 and existing Bull Run-Sully Line #265 to the proposed Takeoff Substation.

Sully-Takeoff Partial Reconductor/Rebuild

Not applicable. The entire 1.9-mile section of Sully-Takeoff Partial Reconductor/Rebuild proposed for reconductor and rebuild is located within an existing variable 100- to 120-foot-wide right-of-way transmission corridor that contains existing Line #265, existing Line #2008, and existing Line #2107.

Aviator-Takeoff Lines

There is no existing right-of-way that interconnects the future Aviator Substation to the proposed Takeoff Substation.

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 the following for right-of-way cross sections showing typical transmission line structure placements for the Project as proposed. For additional information on the structures, see Section II.B.3.

Takeoff Loop

See Attachments II.A.5.a-b.

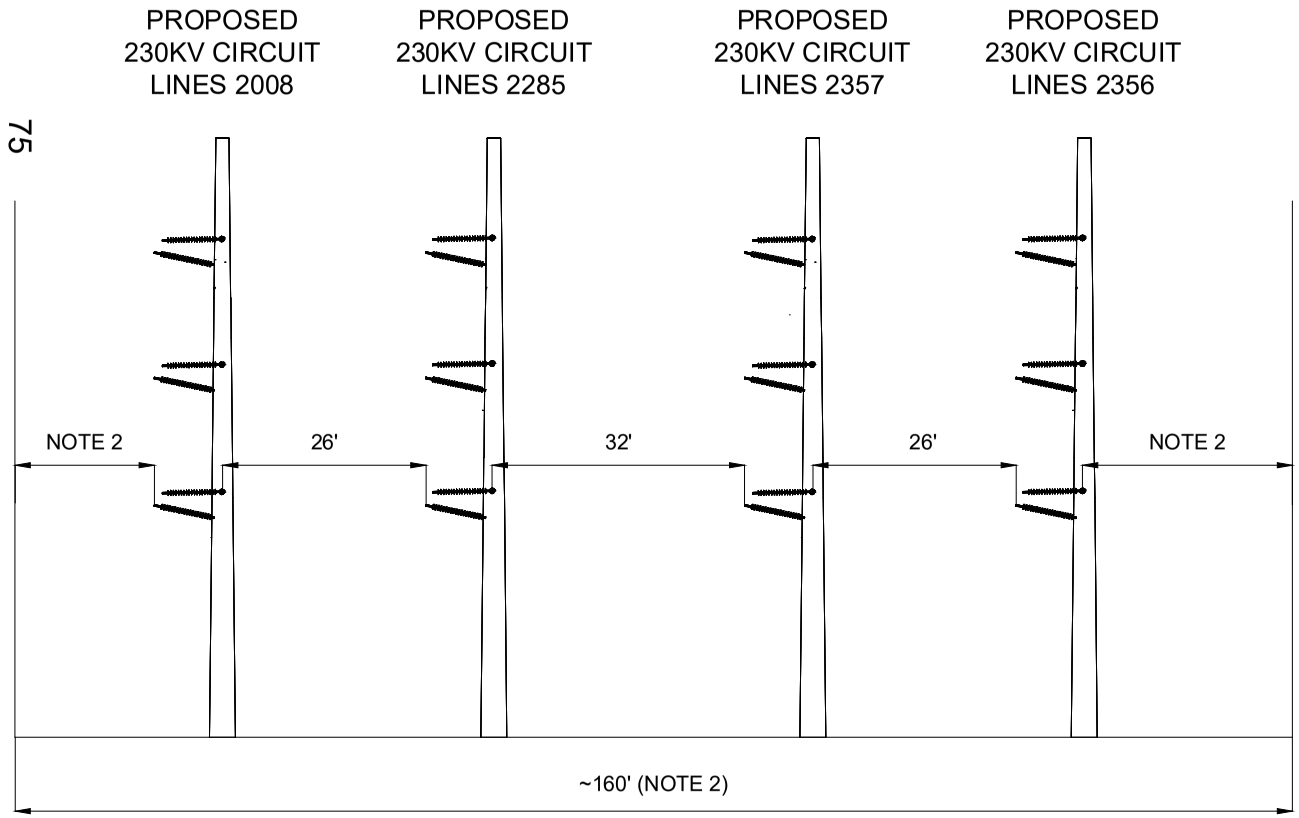
Sully-Takeoff Partial Reconductor/Rebuild

See Attachments II.A.5.c-f for existing and proposed right-of-way cross sections. Note that the structure in the cross sections provided in Attachment II.A.5.c (existing) and Attachment II.A.5.d (proposed) is not being replaced as part of the Sully-Takeoff Partial Rebuild (*i.e.*, it is being reconductored only). These cross sections, which are within the existing 100-foot-wide right-of-way, are being provided for purposes of calculating electromagnetic fields ("EMF") in Section IV.A.

Aviator-Takeoff Lines

See Attachments II.A.5.g-i.

TAKEOFF LOOP



NOTE:

1. INFORMATION CONTAINED ON DRAWING IS CONSIDERED PRELIMINARY IN NATURE AND SUBJECT TO CHANGE BASED ON FINAL DESIGN
2. DISTANCE FROM EDGE OF ROW TO ENERGIZED CONDUCTOR IS DEPENDANT ON LINE ANGLE.

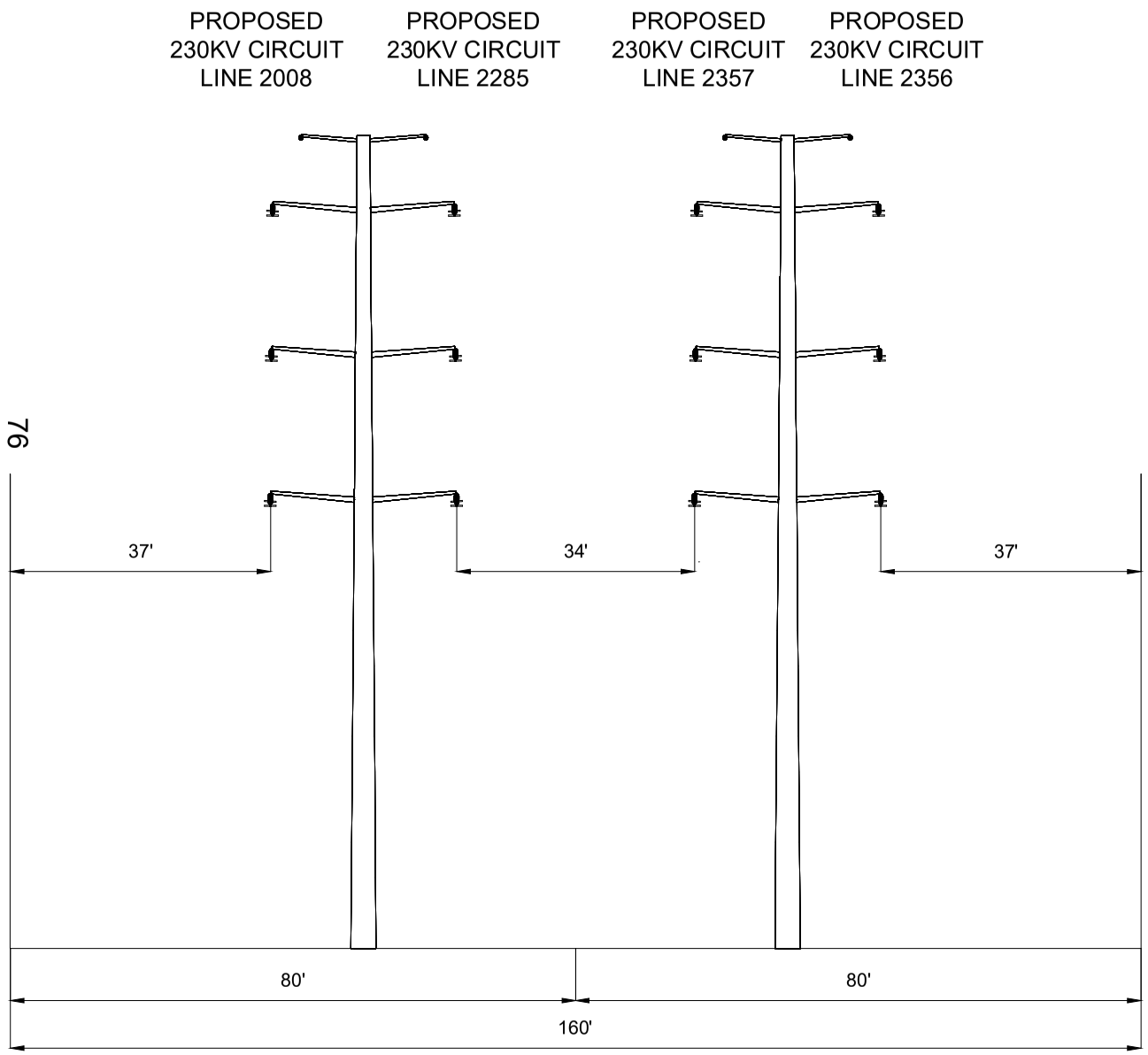
Dominion Energy
5000 Dominion Blvd
Glen Allen, VA 23060

TYPICAL PROPOSED RIGHT OF WAY FOR DEADEND 2-POLE STRUCTURES LOOKING TOWARDS TAKEOFF SUBSTATION

	ORIG.	REV.	REV.	DRAWING NO.
DRAWN	CBW			ATTACHMENT II.A.5.a
CHECKED	KJS			
APPROVED	CBA			
DATE	5/18/24			

Attachment II.A.5.a

TAKEOFF LOOP



NOTE:

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

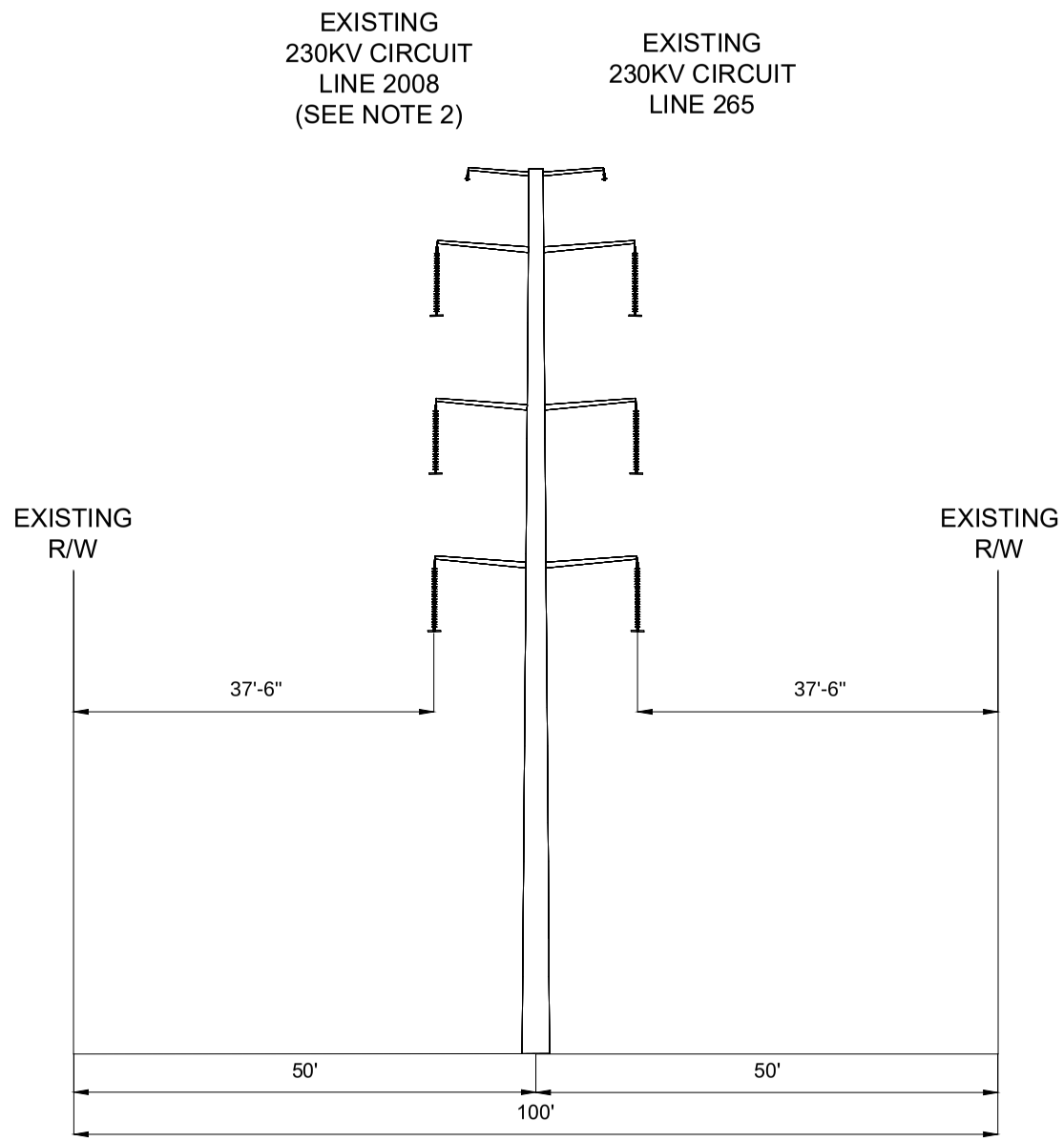
Dominion Energy
5000 Dominion Blvd
Glen Allen, VA 23060

TYPICAL PROPOSED RIGHT OF WAY FOR DEADEND MONOPOLE STRUCTURE LOOKING TOWARDS TAKEOFF SUBSTATION

	ORIG.	REV.	REV.	DRAWING NO.
DRAWN	CBW			ATTACHMENT II.A.5.b
CHECKED	KJS			
APPROVED	CBA			
DATE	5/18/24			

Attachment II.A.5.b

SULLY-TAKEOFF PARTIAL RECONDUCTOR/REBUILD



77

NOTE:

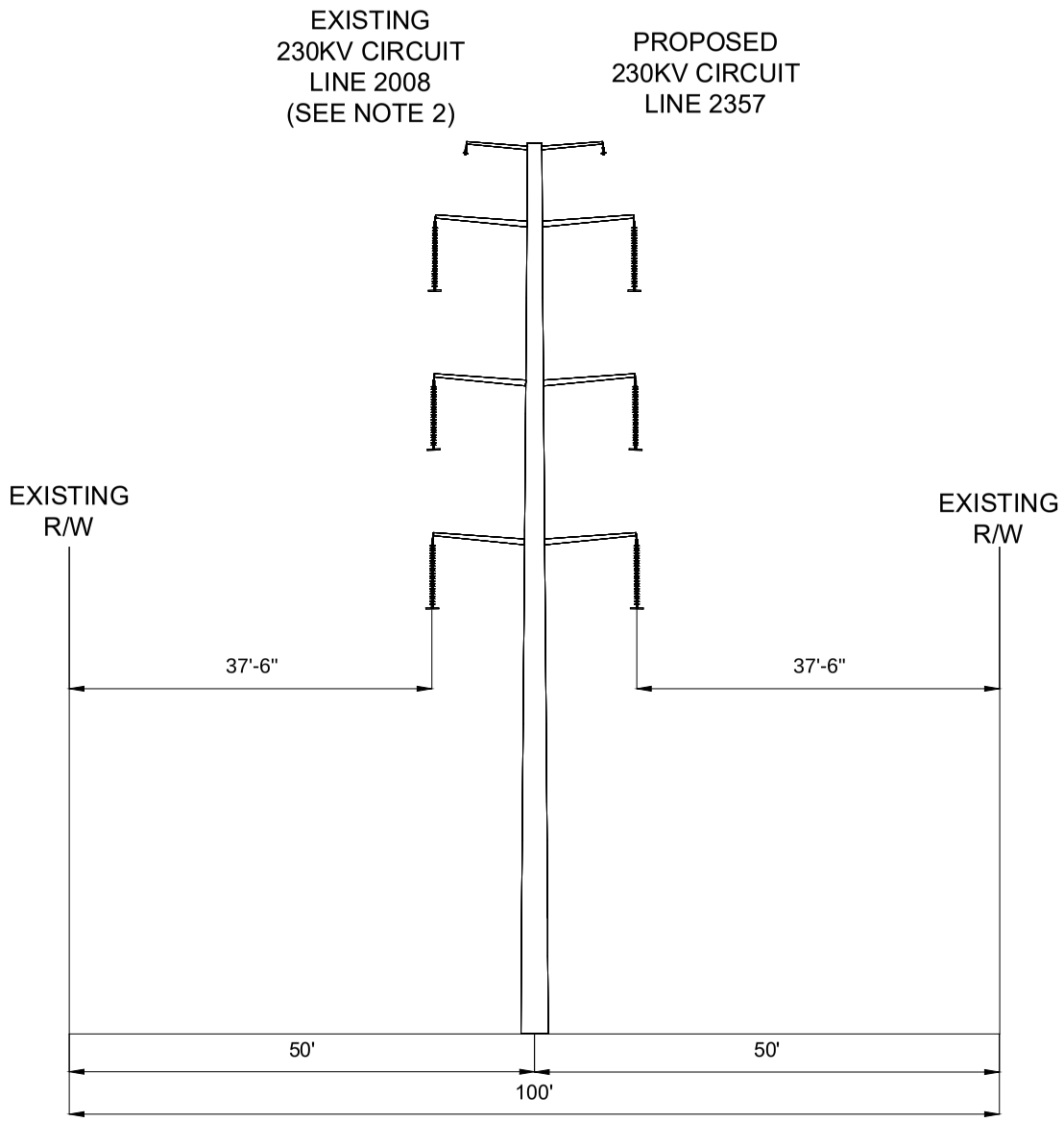
1. INFORMATION CONTAINED ON DRAWING IS CONSIDERED PRELIMINARY IN NATURE AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.
2. IT IS ASSUMED FOR EXISTING LINE 2008 THAT PROJECT 992872 HAS NOT OCCURRED.

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5000 Dominion Blvd
Glen Allen, VA 23060

TYPICAL EXISTING RIGHT OF WAY FOR SUSPENSION STRUCTURE LOOKING TOWARDS SULLY SUBSTATION

	ORIG.	REV.	REV.	DRAWING NO.
DRAWN	CBW			ATTACHMENT II.A.5.c
CHECKED	KJS			
APPROVED	CBA			
DATE	6/19/24			

SULLY-TAKEOFF PARTIAL RECONDUCTOR/REBUILD



NOTE:

1. INFORMATION CONTAINED ON DRAWING IS CONSIDERED PRELIMINARY IN NATURE AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.
2. IT IS ASSUMED FOR EXISTING LINE 2008 THAT PROJECT 992872 HAS OCCURRED.

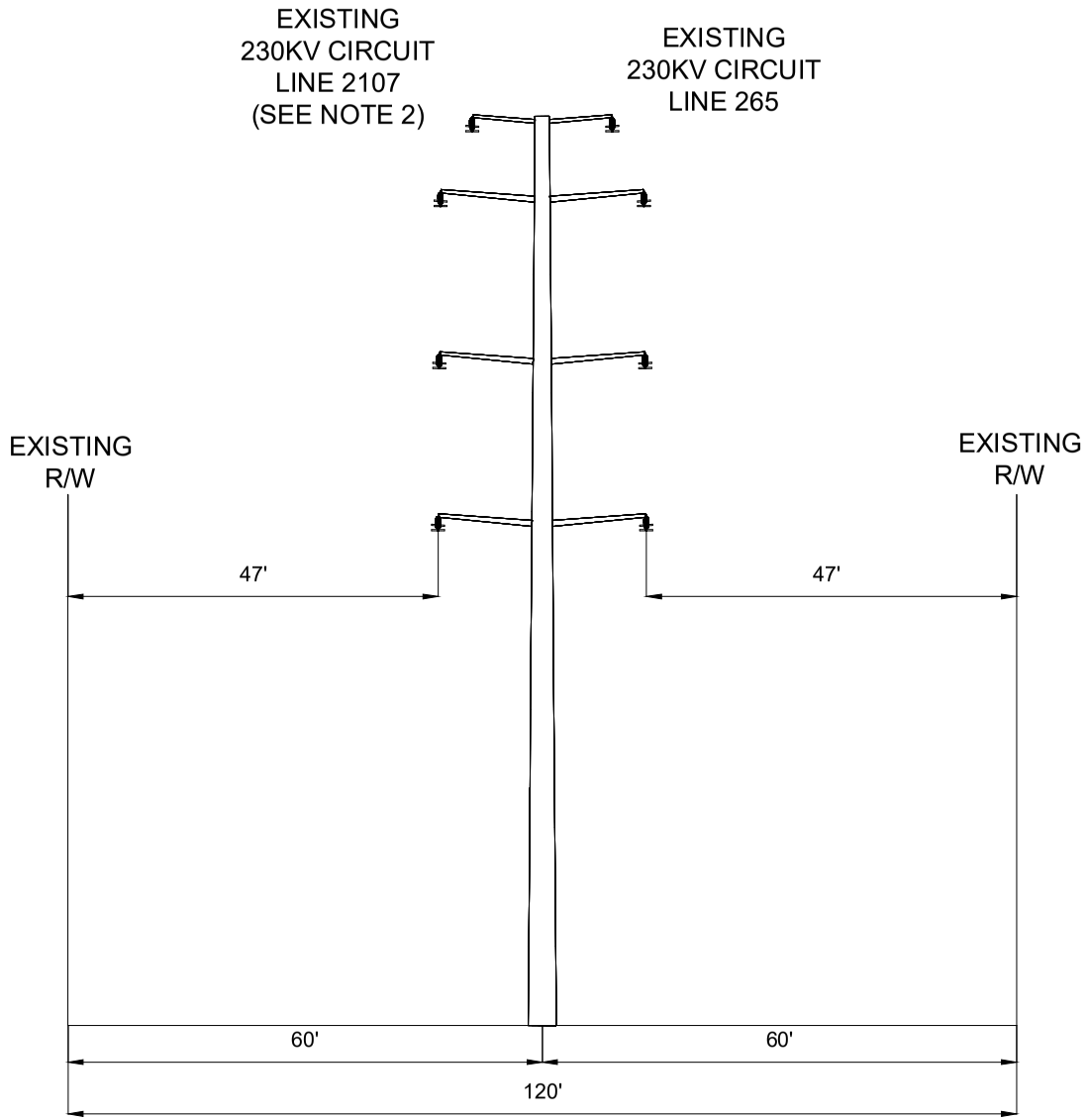
Dominion Energy
5000 Dominion Blvd
Glen Allen, VA 23060

TYPICAL PROPOSED RIGHT OF WAY FOR SUSPENSION STRUCTURE LOOKING TOWARDS SULLY SUBSTATION

	ORIG.	REV.	REV.	DRAWING NO.
DRAWN	CBW			ATTACHMENT II.A.5.d
CHECKED	KJS			
APPROVED	CBA			
DATE	6/19/24			

Attachment II.A.5.d

SULLY-TAKEOFF PARTIAL RECONDUCTOR/REBUILD



NOTE:

1. INFORMATION CONTAINED ON DRAWING IS CONSIDERED PRELIMINARY IN NATURE AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.
2. IT IS ASSUMED FOR EXISTING LINE 2107 THAT PROJECT 993076 HAS NOT OCCURRED.

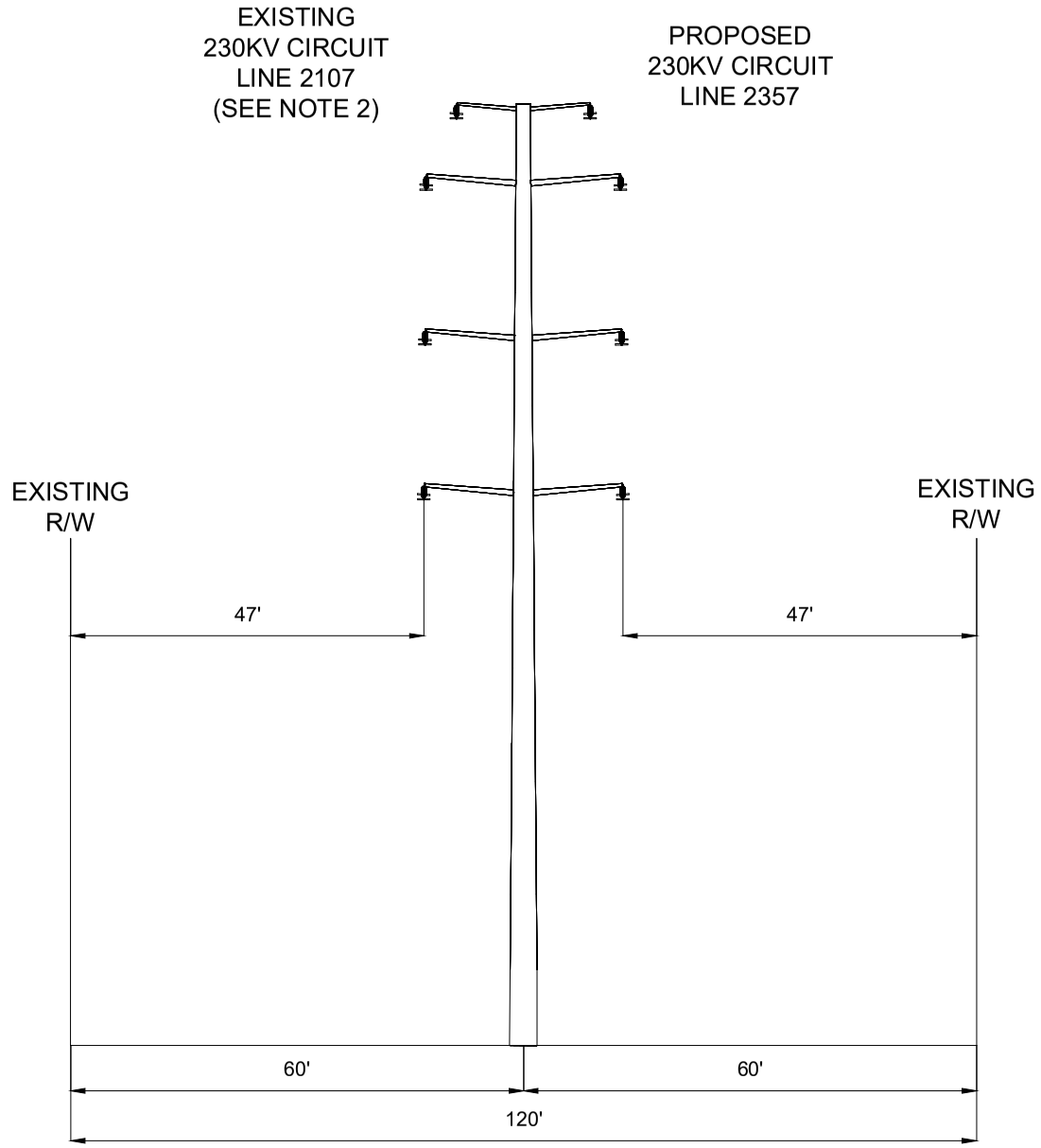
Dominion Energy
5000 Dominion Blvd
Glen Allen, VA 23060

TYPICAL EXISTING RIGHT OF WAY FOR DEADEND STRUCTURES LOOKING TOWARDS SULLY SUBSTATION

	ORIG.	REV.	REV.	DRAWING NO.
DRAWN	CBW			ATTACHMENT II.A.5.e
CHECKED	KJS			
APPROVED	CBA			
DATE	6/19/24			

Attachment II.A.5.e

SULLY-TAKEOFF PARTIAL RECONDUCTOR/REBUILD



NOTE:

1. INFORMATION CONTAINED ON DRAWING IS CONSIDERED PRELIMINARY IN NATURE AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.
2. IT IS ASSUMED FOR EXISTING LINE 2107 THAT PROJECT 993076 HAS OCCURRED.

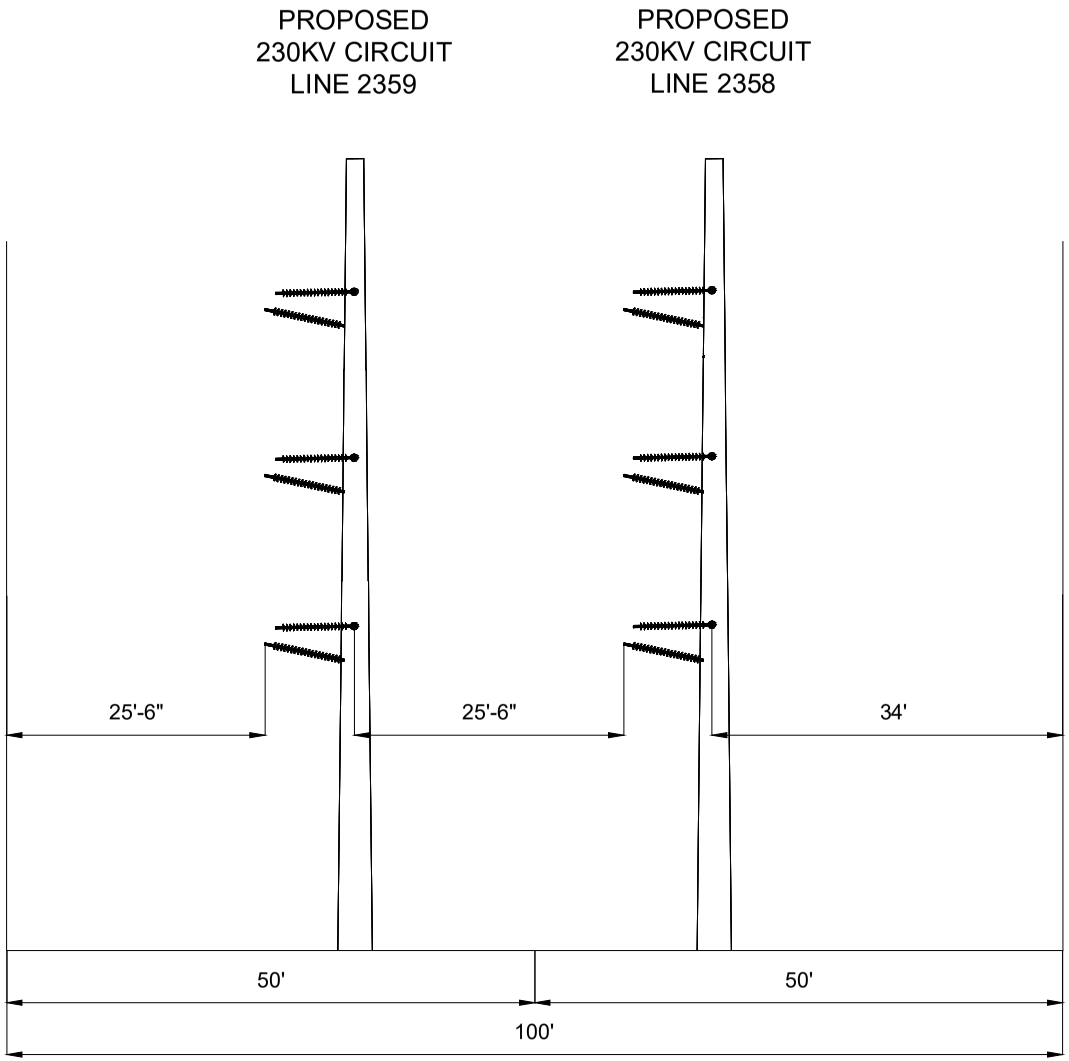
Dominion Energy
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Glen Allen, VA 23060

TYPICAL PROPOSED RIGHT OF WAY FOR DEADEND STRUCTURES LOOKING TOWARDS SULLY SUBSTATION

	ORIG.	REV.	REV.	DRAWING NO.
DRAWN	CBW			ATTACHMENT II.A.5.f
CHECKED	KJS			
APPROVED	CBA			
DATE	6/19/24			

Attachment II.A.5.f

AVIATOR - TAKEOFF LINES



NOTE:

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

Dominion Energy
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Glen Allen, VA 23060

TYPICAL PROPOSED RIGHT OF WAY FOR DEADEND 2-POLE STRUCTURES LOOKING TOWARDS AVIATOR SUBSTATION

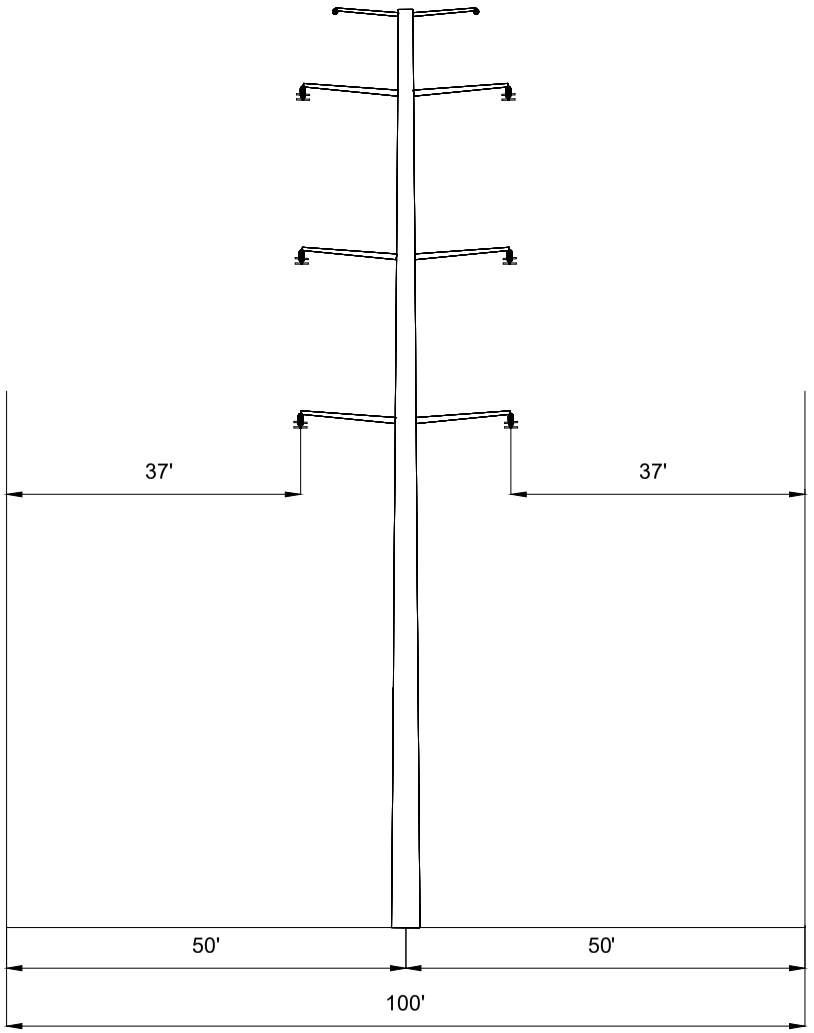
	ORIG.	REV.	REV.	DRAWING NO.
DRAWN	CBW			ATTACHMENT II.A.5.g
CHECKED	KJS			
APPROVED	CBA			
DATE	6/19/24			

Attachment II.A.5.g

AVIATOR - TAKEOFF LINES

PROPOSED
230KV CIRCUIT
LINE 2359

PROPOSED
230KV CIRCUIT
LINE 2358



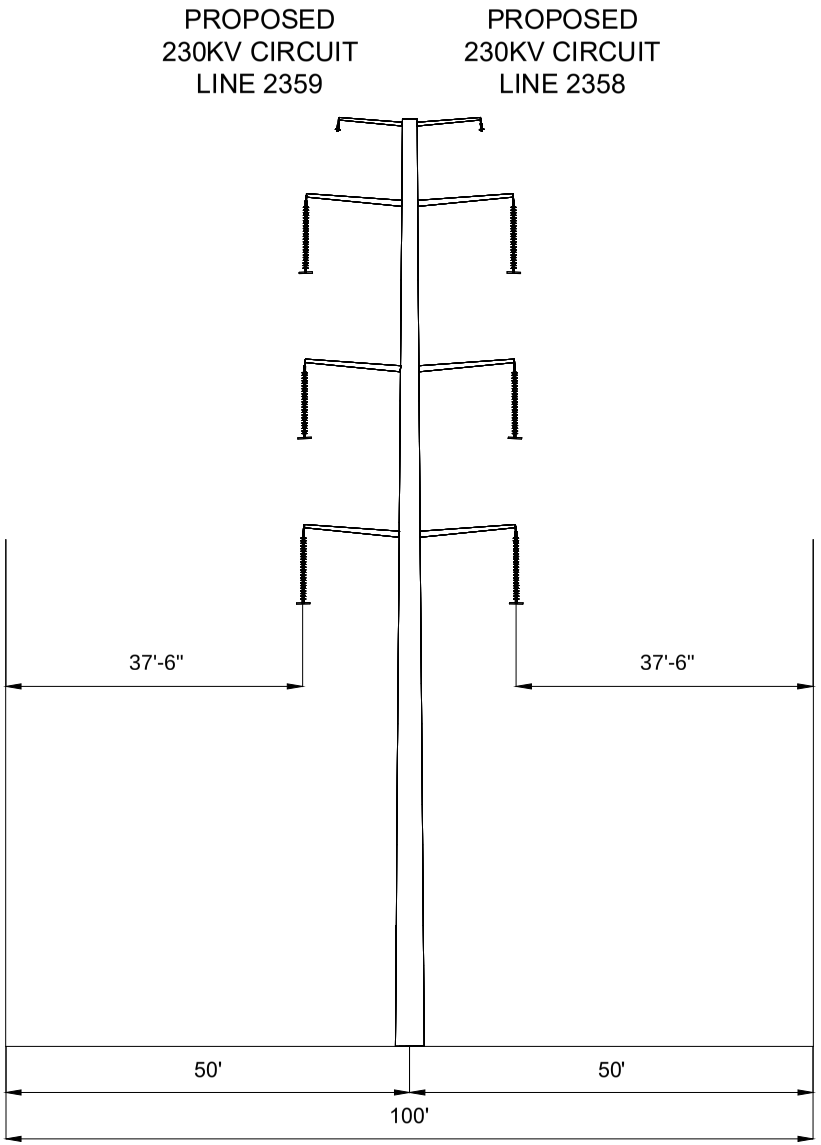
NOTE:
1. INFORMATION CONTAINED ON DRAWING IS CONSIDERED PRELIMINARY IN NATURE AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.

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Glen Allen, VA 23060

TYPICAL PROPOSED RIGHT OF WAY FOR DEADEND MONOPOLE STRUCTURES LOOKING TOWARDS AVIATOR SUBSTATION

	ORIG.	REV.	REV.	DRAWING NO.
DRAWN	CBW			ATTACHMENT II.A.5.h
CHECKED	KJS			
APPROVED	CBA			
DATE	5/18/24			

AVIATOR - TAKEOFF LINES



NOTE:

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

Dominion Energy
5000 Dominion Blvd
Glen Allen, VA 23060

TYPICAL PROPOSED RIGHT OF WAY FOR SUSPENSION MONOPOLE STRUCTURES LOOKING TOWARDS AVIATOR SUBSTATION

	ORIG.	REV.	REV.	DRAWING NO.
DRAWN	CBW			ATTACHMENT II.A.5.i
CHECKED	KJS			
APPROVED	CBA			
DATE	6/19/24			

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: See Attachment II.A.6 and the discussion below.

Takeoff Loop

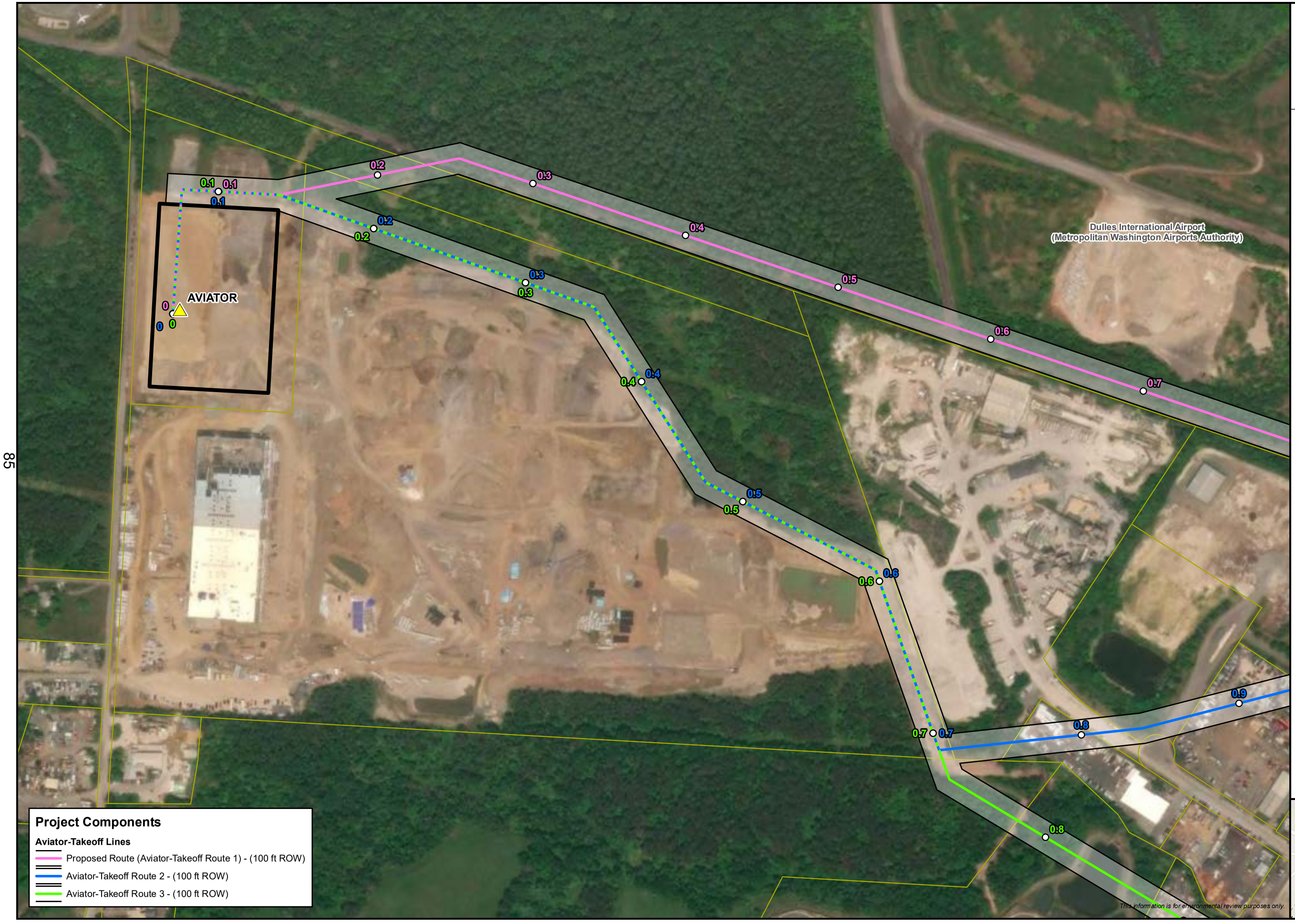
As discussed in Section II.A.4, there is no existing right-of-way that serves the proposed Takeoff Substation from the cut-in locations on existing Line #2008 and Line #265. Therefore, the entire right-of-way of the Takeoff Loop Proposed Route will require easements for a new-build transmission line, except where the route for the Takeoff Loop is within the Company's existing Line #2008 and Line #265 right-of-way at the cut-in locations or located on the Company's to-be-owned Takeoff Substation property. The entire approximately 0.3-mile Takeoff Loop Proposed Route is located on property owned by MWAA except for approximately 0.04 mile that is on the Takeoff Substation parcel. See Section II.A.9 regarding ongoing coordination with MWAA and pending completion of other necessary items such as license agreements and National Environmental Policy Act ("NEPA") review. No other utility easements were identified along the Takeoff Loop Proposed Route.

Sully-Takeoff Partial Reconductor/Rebuild

The Company acquired property rights for the existing transmission right-of-way corridor containing existing Bull Run-Sully Line #265, existing Lincoln Park-Loudoun Line #2008, and existing Discovery-Sully Line #2107 in the 1960s. While existing conservation easements were identified that overlap with the Company's existing transmission right-of-way corridor containing existing Line #265, none of the five rebuilt structures will be placed in any of these conservation easements. No additional easements will be required for the Sully-Takeoff Partial Reconductor/Rebuild.

Aviator-Takeoff Lines

As discussed in Section II.A.4, there is no existing right-of-way that interconnects the proposed Takeoff Substation to the future Aviator Substation. Therefore, the entire right-of-way of the Aviator-Takeoff Proposed Route (Route 1) will require easements for new-build transmission lines except where the route is located on Company-owned or to-be-owned property at the proposed Takeoff Substation or future Aviator Substation. Approximately 2.9 miles of the 3.2-mile Aviator-Takeoff Proposed Route is located on MWAA-owned property. See Section II.A.9 regarding ongoing coordination with MWAA and pending completion of other necessary items such as license agreements and NEPA review.



Project Components

Aviator-Takeoff Lines

- Proposed Route (Aviator-Takeoff Route 1) - (100 ft ROW)
- Aviator-Takeoff Route 2 - (100 ft ROW)
- Aviator-Takeoff Route 3 - (100 ft ROW)

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Attachment II.A.6

Right-of-Way Subject to New and Existing Easements

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation

Fairfax and Loudoun Counties, Virginia

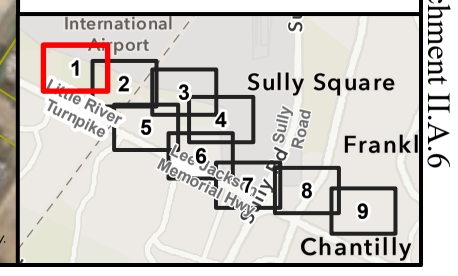
- Milepost
- Future Substation
- Aviator Substation Boundary
- Existing Dominion Transmission Line Labeled with Current (Future) Number
- New Company Easement
- Parcel Boundary

0 150 300
Feet

1:3,600

ERM

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86

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Attachment II.A.6
Right-of-Way Subject to New and Existing Easements

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Fairfax and Loudoun Counties, Virginia

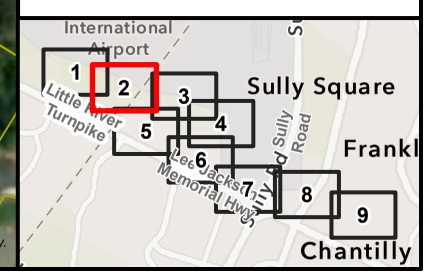
- Milepost
- Existing Dominion Transmission Line Labeled with Current (Future) Number
- New Company Easement
- Parcel Boundary
- County Boundary

0 150 300
Feet

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Attachment II.A.6
Right-of-Way Subject to New and Existing Easements

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Fairfax and Loudoun Counties, Virginia

1.5
1.6
1.7
1.8
1.9
2
2.1
2.2

○ Milepost
Existing Dominion Transmission Line Labeled with Current (Future) Number
New Company Easement
Parcel Boundary
County Boundary

0 150 300
Feet

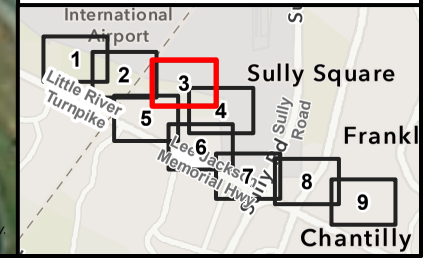
1:3,600

Project Components
Aviator-Takeoff Lines
Proposed Route (Aviator-Takeoff Route 1) - (100 ft ROW)

This information is for environmental review purposes only.

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Attachment II.A.6
Right-of-Way Subject to New and Existing Easements

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Fairfax and Loudoun Counties, Virginia

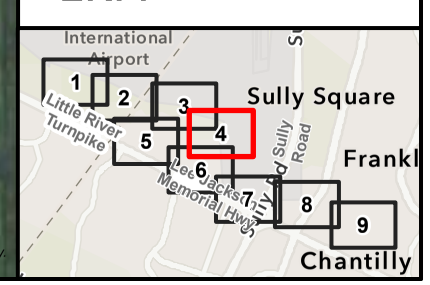
- Milepost
- Existing Dominion Transmission Line Labeled with Current (Future) Number
- New Company Easement
- Parcel Boundary

0 150 300
Feet

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Loudoun County
Fairfax County

1.3
1.5
1.4
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1.7
1.7
1.8
1.8
1.9
1.9
2
2
2.1
2.1
2.2
2.2
2.3
2.4

Lee Jackson Memorial Hwy

Project Components

- Aviator-Takeoff Route 2 - (100 ft ROW)
- Aviator-Takeoff Route 3 - (100 ft ROW)

This information is for environmental review purposes only.

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Attachment II.A.6
Right-of-Way Subject to New and Existing Easements

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Fairfax and Loudoun Counties, Virginia

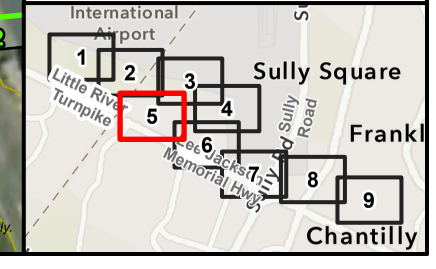
- ○ Milepost
- Existing Dominion Transmission Line Labeled with Current (Future) Number
- New Company Easement
- Parcel Boundary
- County Boundary

0 150 300
Feet

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ERM

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Project Components

Aviator-Takeoff Lines

- Proposed Route (Aviator-Takeoff Route 1) - (100 ft ROW)
- Aviator-Takeoff Route 2 - (100 ft ROW)
- Aviator-Takeoff Route 3 - (100 ft ROW)

Takeoff Line Loop

- Proposed Route (Takeoff Loop Route 1) - (160 ft ROW)
- Takeoff Loop Route 2 - (100 ft ROW)
- Proposed Takeoff Substation Boundary

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Attachment II.A.6

Right-of-Way Subject to New and Existing Easements

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation

Fairfax and Loudoun Counties, Virginia

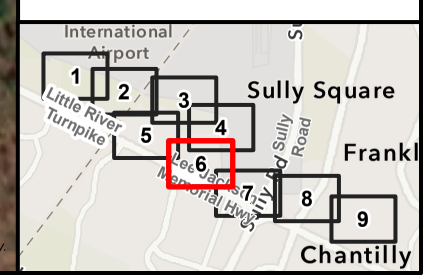
- Milepost
- Proposed Substation
- Existing Dominion Transmission Line Labeled with Current (Future) Number
- New Company Easement
- Parcel Boundary

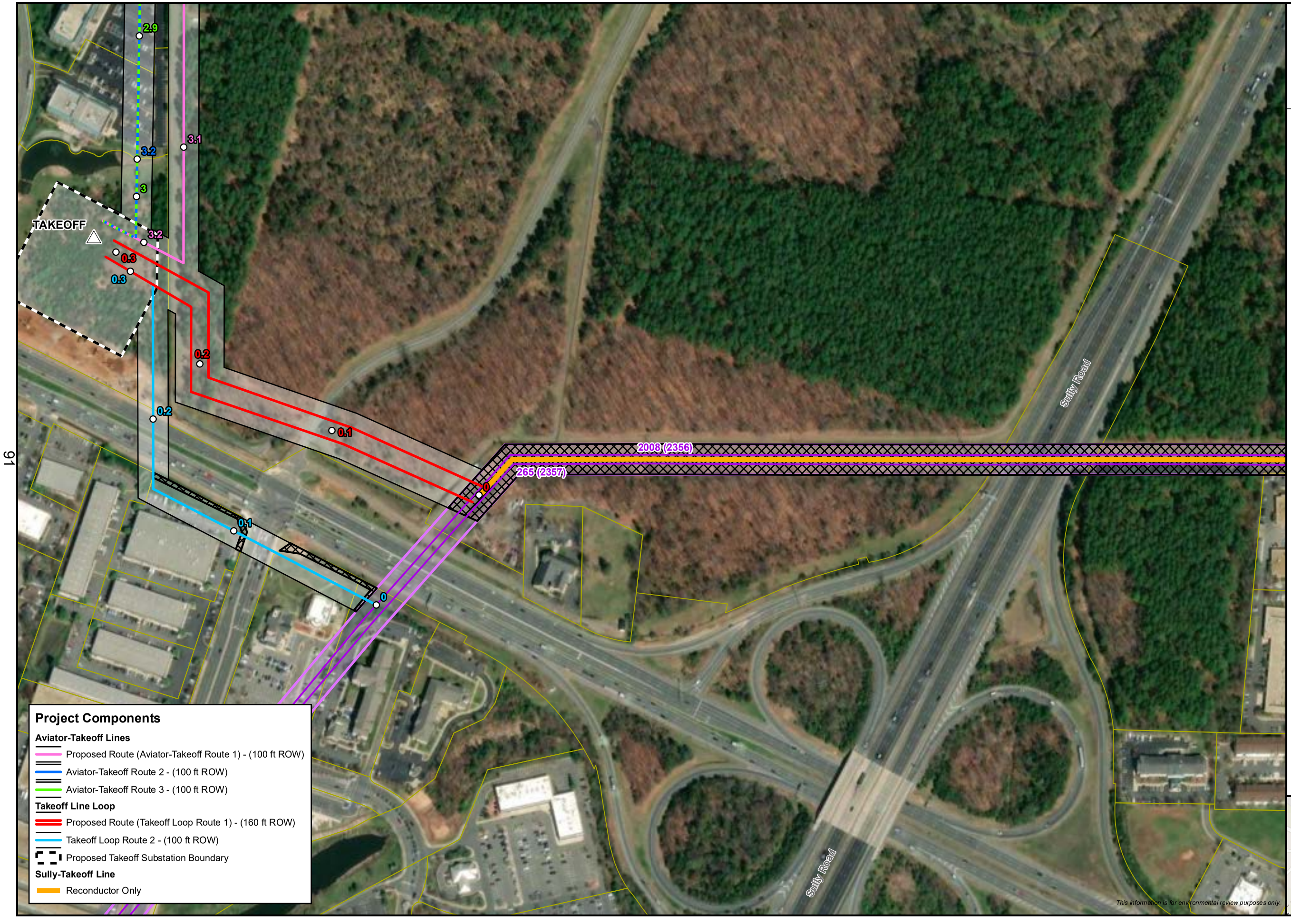
0 150 300
Feet

1:3,600

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Attachment II.A.6
Right-of-Way Subject to New and Existing Easements

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Fairfax and Loudoun Counties, Virginia

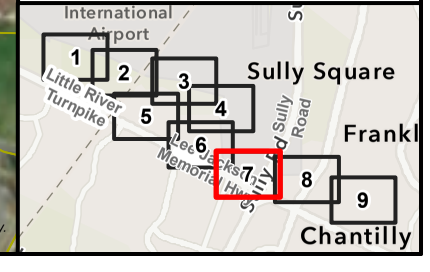
- Milepost
- Proposed Substation
- Existing Dominion Transmission Line Labeled with Current (Future) Number
- Existing Dominion Right of Way
- New Company Easement
- Existing Company Easement Crossed
- Parcel Boundary

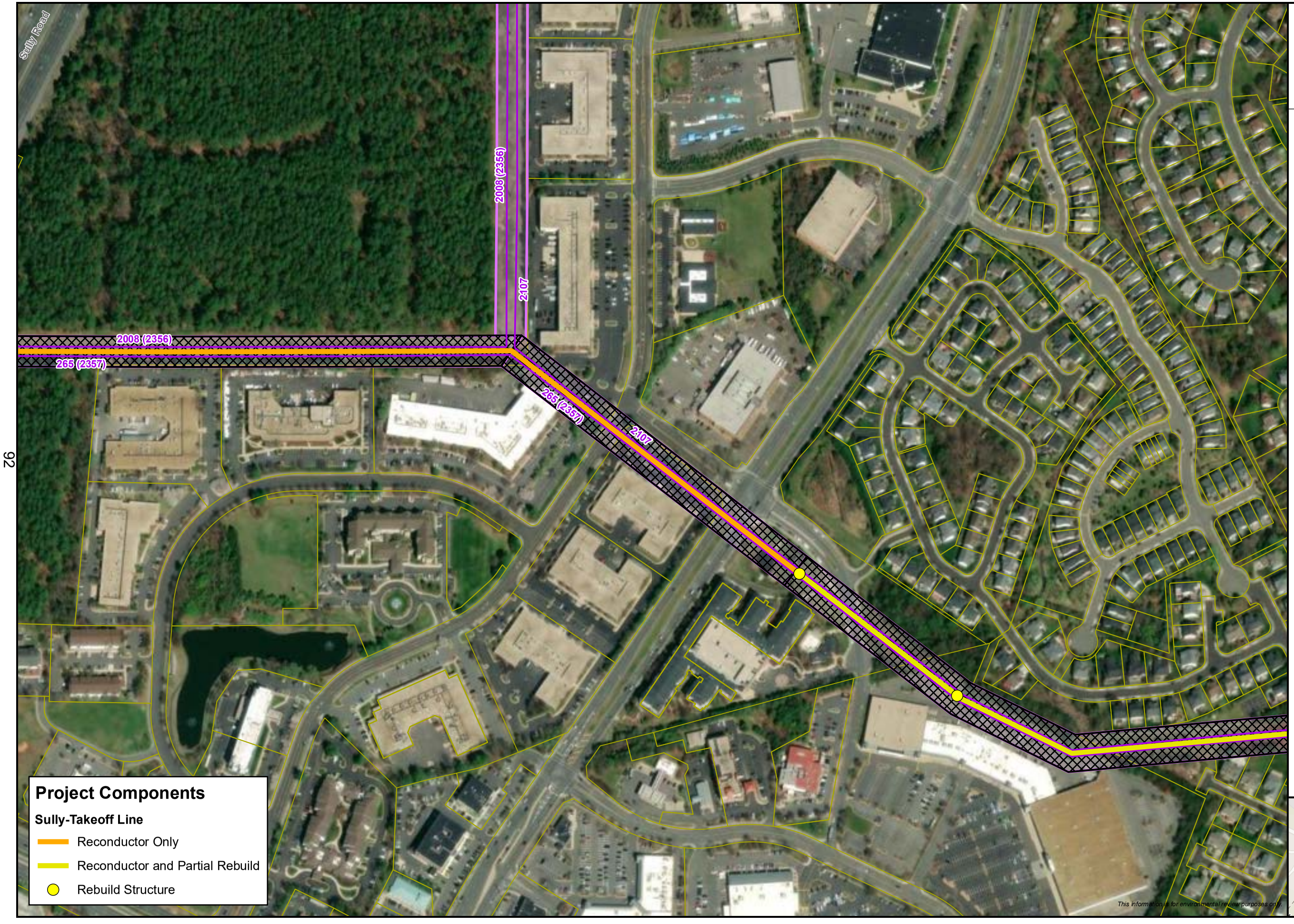
0 150 300
Feet

1:3,600

ERM

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92

Project Components

Sully-Takeoff Line

- Reconductor Only
- Reconductor and Partial Rebuild
- Rebuild Structure

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Attachment II.A.6
Right-of-Way Subject to New and Existing Easements

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Fairfax and Loudoun Counties, Virginia

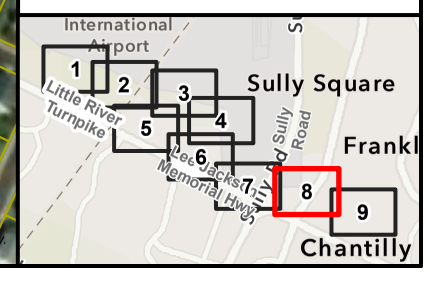
- Existing Dominion Transmission Line Labeled with Current (Future) Number
- Existing Dominion Right of Way
- Existing Company Easement Crossed
- Parcel Boundary

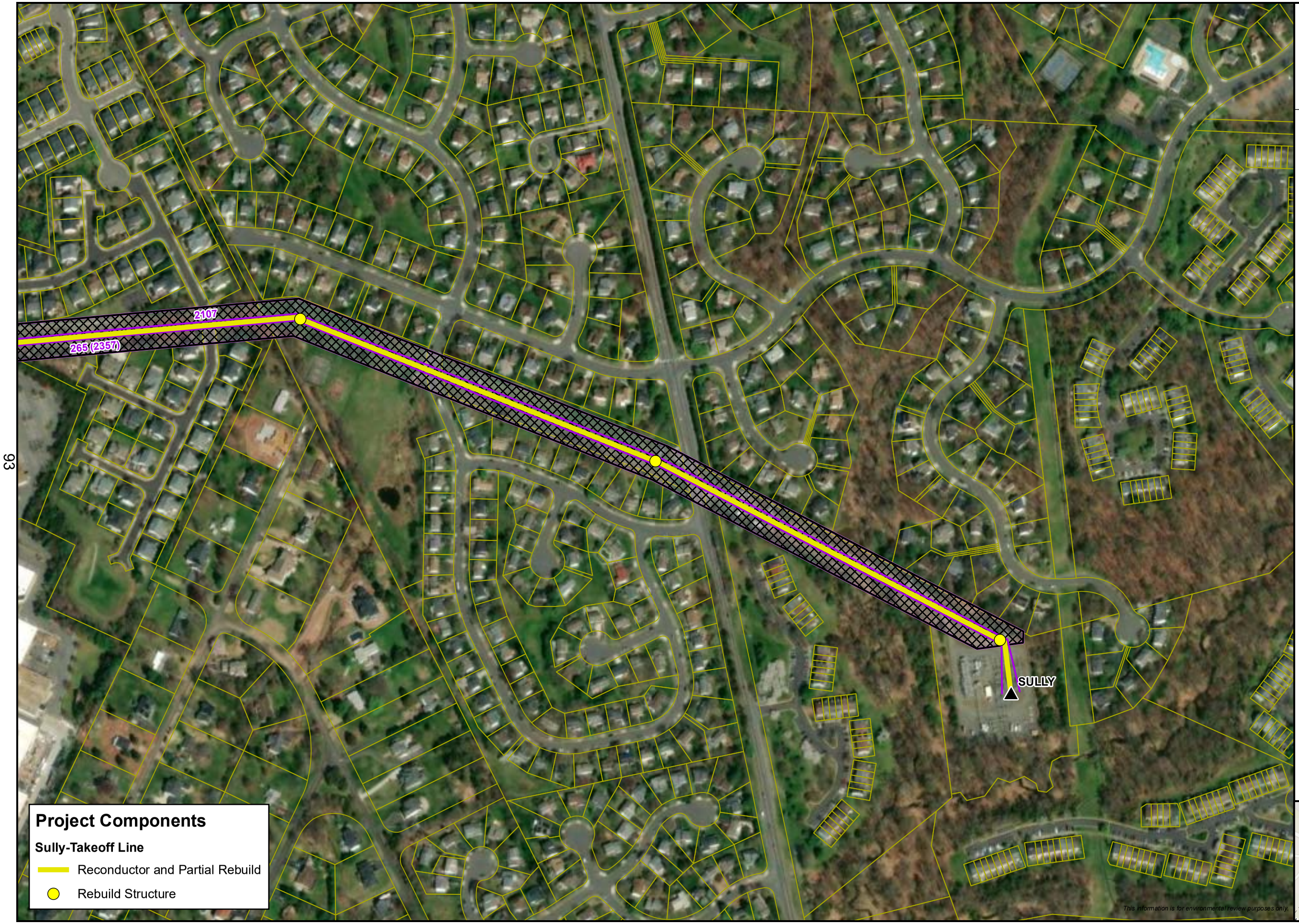
0 150 300
Feet

1:3,600

ERM

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Attachment II.A.6
Right-of-Way Subject to New and Existing Easements

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Fairfax and Loudoun Counties, Virginia

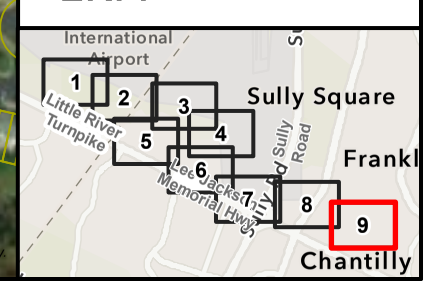
- Existing Substation
- Existing Dominion Transmission Line Labeled with Current (Future) Number
- Existing Dominion Right of Way
- Existing Company Easement Crossed
- Parcel Boundary

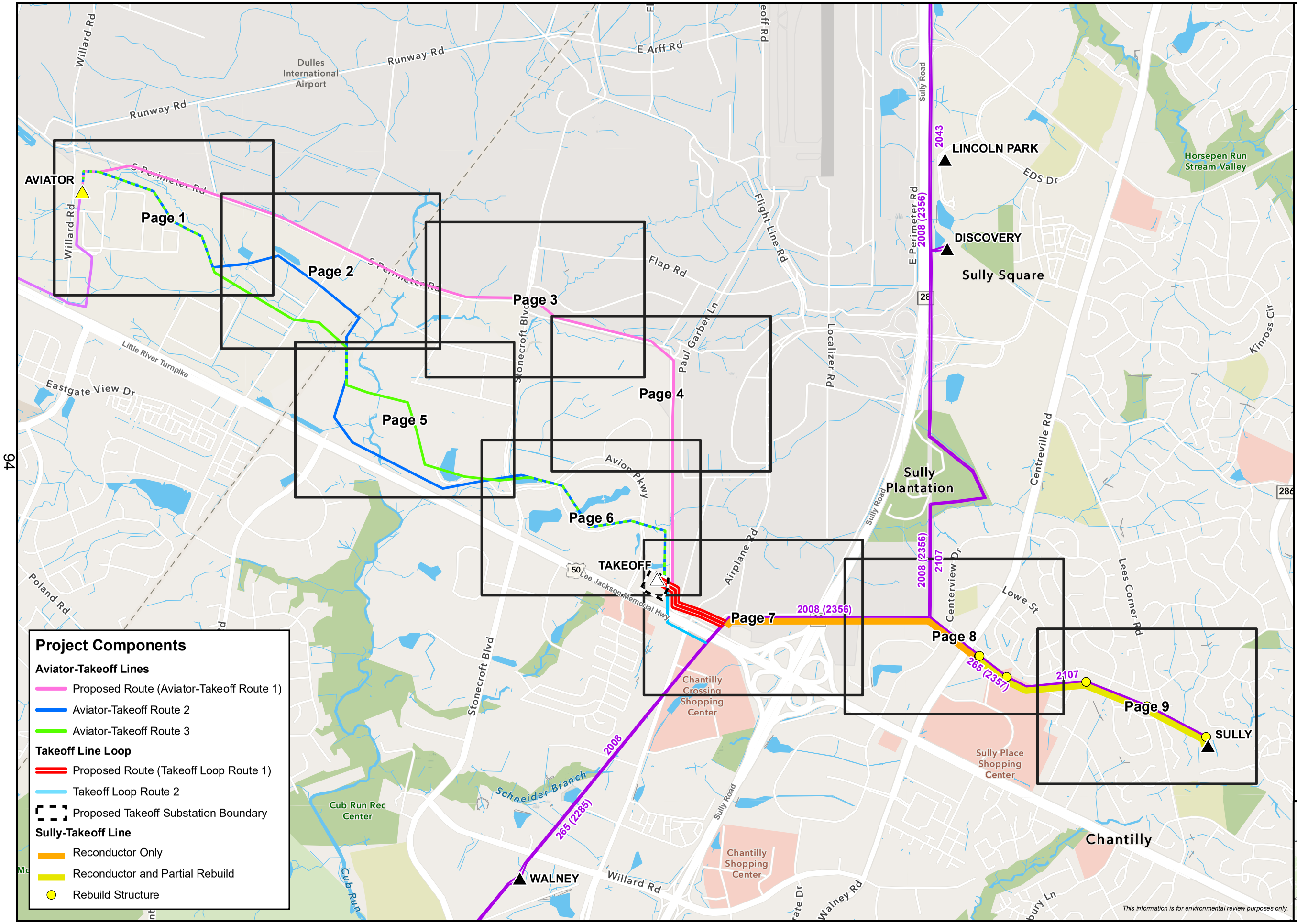
0 150 300
Feet

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Project Components

Aviator-Takeoff Lines
- Proposed Route (Aviator-Takeoff Route 1)
- Aviator-Takeoff Route 2
- Aviator-Takeoff Route 3

Takeoff Line Loop
- Proposed Route (Takeoff Loop Route 1)
- Takeoff Loop Route 2
- Proposed Takeoff Substation Boundary

Sully-Takeoff Line
- Reconductor Only
- Reconductor and Partial Rebuild
- Rebuild Structure

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Attachment II.A.6 Index

Right of Way Subject to New and Existing Easements Index Page

Takeoff 230 kV Line Loop and Takeoff Substation, 230 kV Aviator-Takeoff Lines, and Partial Reconductor and Rebuild of Proposed Sully-Takeoff Line Project

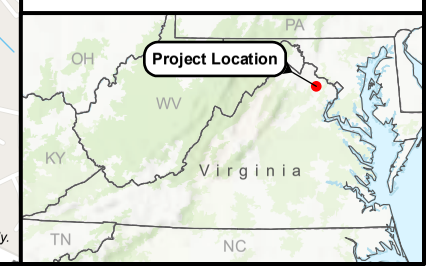
Fairfax and Loudoun Counties, Virginia

- Existing Substation
- Future Substation
- Proposed Substation
- Future Dominion Transmission Line
- Existing Dominion Transmission Line Labeled with Current (Future) Number
- Viewframe

0 875 1,750
Feet

1:21,000

ERM



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 proposed rights-of-way for the Takeoff Loop Proposed Route (approximately 0.3 mile at 160 feet wide) and the Aviator-Takeoff Proposed Route (approximately 3.2 miles at 100 feet wide) will require clearing for the majority of both routes. The Sully-Takeoff Partial Rebuild Segment of the Reconductor/Rebuild Proposed Route utilizes existing right-of-way (approximately 0.9 mile at 120 feet); therefore, additional clearing is not anticipated, as the area is currently and will continue to be maintained for operation of the existing transmission facilities.

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 where applicable 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.

These rights-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 in order to patrol and make emergency repairs. Periodic maintenance to control woody growth will consist of hand cutting, machine mowing and herbicide application.

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: This Project involves both new transmission lines in new right-of-way (*i.e.*, the Takeoff Loop and Aviator-Takeoff Lines) and a partial reconductor/rebuild within existing right-of-way (*i.e.*, Sully-Takeoff Partial Reconductor/Rebuild). The route selection process for each is outlined below, followed by the identified route options.

The Company's route selection for a new transmission line 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 suitable for a transmission line can be identified.

For rebuild projects, the Company's route selection begins with a review of existing rights-of-way. This approach generally minimizes impacts on the natural and human environments. This approach is also consistent with Attachment 1 to these Guidelines, which provides a tool routinely used by the Company in routing its transmission line projects. Specifically, this approach is consistent with Guideline #1, which states that existing rights-of-way should be given priority when adding new transmission facilities, and Va. Code §§ 56-46.1 and 56-259, which promote the use of existing rights-of-way for new transmission facilities.

For both the new build and rebuild portions of the 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.[33]

The study area encompasses an area containing the Project origin and termination points, and is bounded approximately by the following features:

- Dulles Airport on the north;
- Sully Road (Route 28) on the east;
- Route 50 (Lee Jackson Memorial Highway in Fairfax County and Little River Turnpike in Loudoun County) on the south; and
- Willard Road on the west.

For the new build portions of the Project (*i.e.*, the Takeoff Loop and the Aviator-Takeoff Lines), the Company considered the facilities required to construct and operate the new infrastructure, the length of new rights-of-way that would be required for the Project, the amount of existing development in the area, the potential for environmental impacts and impacts on communities, and cost.

As discussed in more detail below and in the Environmental Routing Study, for the Takeoff Loop, the Company identified two viable overhead route alternatives for the lines between the cut-in locations along the Company's existing Lincoln Park-Loudoun Line #2008 and Bull Run-Sully Line #265 and the proposed Takeoff Substation. The Company selected the Takeoff Loop Proposed Route because it avoids crossing Route 50, minimizes impacts to existing commercial buildings and private landowners, and, importantly, allows for a more robust electrical solution by having sufficient new right-of-way space to connect the proposed Takeoff Substation to both existing Lines #2008 and #265.

For the Aviator-Takeoff Lines, the Company identified three viable overhead route alternatives between the future Aviator Substation and the proposed Takeoff Substation. Ultimately, the Company selected Route 1 as the Proposed Route, and Alternative Routes 2 and 3 as viable alternatives. While all three route alternatives are similar in length, Route 1 was selected as the Proposed Route because it maximizes collocation with existing infrastructure, minimizes impacts to buildings, commercial areas, and other private landowners, and minimizes fragmentation and impacts to the Cub Run Resource Protection Area ("RPA"). Three additional route alternatives were evaluated but rejected from further consideration after the Company received input from Fairfax County staff. Specifically, two of the rejected routes would require crossing Fairfax County-owned land, and Fairfax County did not support the two route crossing locations. The third rejected route would involve crossing the Cub Run RPA in an area without collocating with existing infrastructure, which would be the only route considered to cause this increased impact and fragmentation and was rejected for this additional reason. Additional discussion of these rejected route alternatives are included in Section 4

[33] No alternative routes were reviewed for the Sully-Takeoff Partial Reconductor/Rebuild as the Reconductor/Rebuild Proposed Route is entirely within existing Company right-of-way. No impacts are anticipated from the 1.0-mile Sully-Takeoff Partial Reconductor/Rebuild reconductor-only segment. An assessment of impacts from the 0.9-mile Sully-Takeoff Partial Rebuild Segment is included in Section 6 of the Environmental Routing Study.

of the Environmental Routing Study.

For the rebuild portion of the Project (*i.e.*, within the Sully-Takeoff Partial Reconductor/Rebuild), the 1.9-mile Reconductor/Rebuild Proposed Route is entirely within the existing right-of-way. See Sections II.A.4 and II.A.6. Given the availability of existing right-of-way and/or easements and the statutory preference given to the use of existing rights-of-way, and because additional costs and environmental impacts would be associated the acquisition of and construction on entirely new right-of-way, the Company did not consider any alternate routes requiring new right-of-way for the Sully-Takeoff Partial Reconductor/Rebuild.

The estimated conceptual costs of the Project's Proposed and Alternative Routes are provided in Section I.I.

PROPOSED AND ALTERNATIVE ROUTES

Takeoff Loop

Takeoff Loop Proposed Route (Route 1)

The Takeoff Loop Proposed Route would involve constructing two new overhead double circuit 230 kV transmission lines primarily supported by double circuit monopole structures in a new 160-foot-wide[34] right-of-way beginning at the Company's existing 230 kV Lincoln Park-Loudoun Line #2008 and Bull Run-Sully Line #265, and extending approximately 0.3 mile northwest to the Company's proposed Takeoff Substation.

There is sufficient right-of-way space for two new double circuit 230 kV transmission lines that make up the Takeoff Loop Proposed Route.

The Takeoff Loop Proposed Route (Route 1) originates at cut-in locations on the Company's existing 230 kV Lincoln Park-Loudoun Line #2008 (between Structures #2008/66 and #2008/67) and Bull Run-Sully Line #265 (between Structures #265/88 and #265/89). From the cut-in locations, the route crosses Lower Perimeter Road and heads northwest through MWAA property along the north side of Lower Perimeter Road for about 0.1 mile. It then crosses Airplane Road and Downwind Road as it continues to collocate with Lower Perimeter Road for approximately 0.1 mile. Continuing through MWAA property, the Takeoff Loop Proposed Route turns north and then northwest for about 0.1 mile, where it terminates at the proposed Takeoff Substation. In total, the Takeoff Loop Proposed Route measures approximately 0.3 mile in length.

The Takeoff Loop Proposed Route crosses two parcels affecting approximately 9.1 acres of land, which includes approximately 4.1 acres for the proposed Takeoff Substation footprint. The Takeoff Loop Proposed Route crosses one private parcel (where the proposed Takeoff Substation will be located) and one public parcel (the

[34] *See* n. 5*, supra.*

MWAA-owned Dulles Airport). The Company has coordinated with MWAA regarding the potential location of this new transmission line on MWAA property since 2020. In December 2023, the Company met virtually with MWAA regarding specific crossings for the Takeoff Loop Proposed Route, and on January 31, 2024, the Company received a letter from MWAA stating that the Takeoff Loop Proposed Route may be considered as a feasible option. See Attachment II.A.9.a. Additional coordination with MWAA, including an email to the Company dated April 11, 2024, confirmed that MWAA agrees with the specific route location of the Takeoff Loop Proposed Route, pending completion of other necessary items such as license agreements and NEPA review. See Attachment II.A.9.b.

Land along the right-of-way consists of 3.9 acres of forested land, 0.4 acre of developed land, and 4.7 acres of open space, with no open water or agricultural land. Of the 3.9 acres of forested land, 1.7 acres is classified as having a Forest Conservation Value ("FCV") of Average, while no High, Very High, or Outstanding classified land is crossed. No agricultural areas are crossed by the Takeoff Loop Proposed Route, although 1.0 acre of soil classified as prime farmland is within the right-of-way. Based on ERM's desktop wetland and waterbody analysis, no wetlands or waterbodies are within the Takeoff Loop Proposed Route right-of-way.

The existing zoning along the Takeoff Loop Proposed Route includes 53% (4.8 acres) zoned as residential and 47% (4.3 acres) zoned as industrial, with the entire residential zoned area crossed by the Takeoff Loop Proposed Route located on MWAA property. The proposed Takeoff Substation is entirely within an industrial zoned area. The Takeoff Loop Proposed Route is collocated with Lower Perimeter Road (directly north of Route 50) for 0.2 mile (66%) of its total length. Zero residential dwellings were identified within the right-of-way or within 500 feet of the centerline of the Takeoff Loop Proposed Route. One outbuilding (an existing guard shack) is within the Takeoff Loop Proposed Route and will require relocation prior to construction. Per an April 11, 2024, email with MWAA, however, the location of the Takeoff Loop Proposed Route, which follows the southern MWAA property boundary and requires relocation of this guard shack, is preferred to moving the route further north on the MWAA parcel and avoiding the guard shack. See Attachment II.A.9.b. The Takeoff Loop Proposed Route does not cross any conservation easements. The Takeoff Loop Proposed Route is anticipated to have a moderate impact on visual resources and no impact on aboveground historic resources. See Section 5 of the Environmental Routing Study.

While the Takeoff Loop Proposed Route has a larger right-of-way and crosses more forested land than Takeoff Loop Alternative Route 2, it allows for a more robust electrical solution than the alternative route, as previously described. See Section I.A. In addition, the Takeoff Loop Proposed Route crosses fewer landowners, avoids crossing Route 50, has the same amount of collocation as the alternative route, and avoids all wetlands and waterbodies. For all these reasons, Takeoff Loop Route 1 was selected as the Proposed Route.

Takeoff Loop Alternative Route 2

Takeoff Loop Alternative Route 2 would involve constructing one new overhead double circuit 230 kV transmission line primarily supported by double circuit monopole structures in a new 100-foot-wide[35] right-of-way beginning at the Company's existing 230 kV Lincoln Park-Loudoun Line #2008 and extending approximately 0.3 mile northwest to the Company's proposed Takeoff Substation.

Takeoff Loop Alternative Route 2 does not have sufficient space for a new 160-foot-wide right-of-way due to the location of Route 50 and existing commercial buildings and, therefore, only one double circuit 230 kV transmission line can be constructed for Takeoff Loop Alternative Route 2. In contrast, the Takeoff Loop Proposed Route has sufficient right-of-way space for two double circuit 230 kV transmission lines, and, therefore, Takeoff Loop Alternative Route 2 is not as robust of an electrical solution as the Takeoff Loop Proposed Route. See Section I.A.

Takeoff Loop Alternative Route 2 originates at a cut-in location on the Company's existing Lincoln Park-Loudoun Line #2008 between Structures #2008/65 and #2008/66. From the cut-in location, the route heads northwest for about 0.2 mile as it collocates along the south side of Route 50, crossing Lee Road and developed commercial and industrial parcels. The route then turns north, crosses Route 50, and continues for about 0.1 mile through forested land along, but outside of, the western boundary of MWAA property, where it terminates at the proposed Takeoff Substation. In total, Takeoff Loop Alternative Route 2 measures approximately 0.3 mile in length.

Takeoff Loop Alternative Route 2 crosses five parcels affecting approximately 7.4 acres of land, which includes approximately 4.1 acres of the proposed Takeoff Substation footprint. Takeoff Loop Alternative Route 2 crosses only private parcels and does not cross MWAA-owned land. Land along the right-of-way consists of 0.8 acre of forested land, 1.0 acre of developed land, and 5.6 acres of open space, with no open water or agricultural land. No forested land crossed is classified as having a FCV. No agricultural areas are crossed by Takeoff Loop Alternative Route 2 and no soil classified as prime farmland is within the right-of-way. Based on ERM's desktop wetland and waterbody analysis, no wetlands or waterbodies are within the Takeoff Loop Alternative Route 2 right-of-way.

The existing zoning along Takeoff Loop Alternative Route 2 includes 92% (6.7 acres) zoned as commercial or industrial and 9% (0.7 acre) zoned as residential, although the entire residential zoned area crossed is located on public road rights-of-way. The proposed Takeoff Substation is entirely within an industrial zoned area. Takeoff Loop Alternative Route 2 is collocated with Route 50 for 0.2 mile (66%) of its total length. Zero residential dwellings were identified within the right-of-way or within 250 feet of the centerline, and two dwellings were identified within 500 feet of the centerline of Takeoff Loop Alternative Route 2. No non-residential buildings are located within the right-of-way, although one commercial

[35] *See supra,* n. 5.

building located south of Route 50 and west of Lee Road is directly adjacent to the Takeoff Loop Alternative Route 2 right-of-way. Takeoff Loop Alternative Route 2 does not cross any conservation easements. Similar to the Takeoff Loop Proposed Route, Takeoff Loop Alternative Route 2 is anticipated to have a moderate impact on visual resources and no impact on aboveground historic resources. See Section 5 of the Environmental Routing Study.

While Takeoff Loop Alternative Route 2 is the most direct route that does not cross MWAA-owned property or directly impact existing buildings, it was not selected as the preferred route because it does not provide an equivalent electrical solution to the Proposed Route, providing only a connection to the existing Line #2008 but not the existing Line #265.[36] As the Company continues coordination with MWAA regarding an agreement for the Proposed Route to cross MWAA-owned property, it is also submitting Takeoff Loop Alternative Route 2 for notice.

Sully-Takeoff Partial Reconductor/Rebuild

Reconductor/Rebuild Proposed Route

The Reconductor/Rebuild Proposed Route is approximately 1.9 miles long, including approximately 1.0 mile of reconductor only and 0.9 mile of reconductor and partial rebuild, which will entail replacement of five existing structures. The Reconductor/Rebuild Proposed Route begins at the existing Sully Substation located in Chantilly, Virginia, east of Lees Corner Road and north of Fatlick Branch and heads northeast along an existing transmission line right-of-way, crossing Centreville Road, then continues along the Dulles Airport property, crosses Route 28, and terminates at the cut-in location between Structures #2008/66 / #265/88 and #2008/67 / #265/89, north of Route 50 and east of Airplane Road.

No alternative routes were reviewed for the Sully-Takeoff Partial Reconductor/Rebuild as the Reconductor/Rebuild Proposed Route is entirely within existing Company right-of-way. No impacts are anticipated from the 1.0-mile Sully-Takeoff Partial Reconductor/Rebuild reconductor-only segment. An assessment of impacts from the 0.9-mile Sully-Takeoff Partial Rebuild Segment is included in Section 6 of the Environmental Routing Study.

Aviator-Takeoff Lines

Aviator-Takeoff Proposed Route (Route 1)

The Aviator-Takeoff Proposed Route (Route 1) would involve constructing a new overhead 230 kV double circuit transmission line primarily supported by double circuit monopole structures in a new 100-foot-wide right-of-way beginning at the Company's future Aviator Substation and extending approximately 3.2 miles east to the Company's proposed Takeoff Substation.

[36] *See supra*, n. 5.

Aviator-Takeoff Proposed Route (Route 1) originates at the future Aviator Substation, approximately 0.1 mile south of the intersection of South Perimeter Road and Willard Road in Loudoun County. From there, the route heads north for about 0.1 mile before turning east for approximately 0.2 mile. It then turns to the southeast as it enters MWAA property, collocates with South Perimeter Road, and continues east along the southern boundary of the parcel through forested land for about 1.3 miles. The route next continues generally east for approximately 0.7 mile along MWAA property, then crosses through a forested area on the Fairfax County Police Training Facility for about 0.1 mile. It next turns and heads south for approximately 0.8 mile as it enters a primarily forested area on MWAA property between the National Air and Space Museum Udvar-Hazy Center to the east and commercial and industrial developments to the west. The Aviator-Takeoff Proposed Route then turns northeast for about 0.1 mile before terminating at the proposed Takeoff Substation. In total, the Aviator-Takeoff Proposed Route measures approximately 3.2 miles in length.

The Aviator-Takeoff Proposed Route crosses seven parcels affecting approximately 37.8 acres of land. The Aviator-Takeoff Proposed Route crosses four private parcels and three public parcels, including two MWAA-owned Dulles Airport parcels for approximately 2.9 miles and one Fairfax County-owned Police Training Facility parcel for approximately 0.1 mile. The Company is coordinating with MWAA regarding the Aviator-Takeoff Lines crossings over MWAA property, and in a letter dated January 31, 2024, MWAA indicated that the crossings "may be feasible" and it "will continue to coordinate with [the Company] to support the proposed alignments provided no critical and unresolvable issues are identified." See Attachment II.A.9.a.[37] Additionally, in an email from MWAA to the Company on April 11, 2024, MWAA indicated support for the specific location of the Aviator-Takeoff Proposed Route, pending appropriate coordination and completion of any other approvals necessary such as licensing agreements and NEPA. See Attachment II.A.9.b. Finally, the Company obtained a letter of support from Fairfax County, regarding the crossing over its property. See Attachment II.A.9.c.

Zero cemeteries, schools, and places of worship were identified within 500 feet of

[37] Note that Attachment II.A.9.a includes information regarding three additional route options for the Aviator-Takeoff Lines, referred to as Routes 2, 3, and 5. These three additional route options also appear on an overview map shared in discussions with MWAA in January 2024. While the Company initially considered these three additional route options, which were different combinations of the Aviator-Takeoff Alternative Routes 2 and 3 included in this filing, they were subsequently removed from further consideration to minimize redundant analysis of the potential impacts of the Aviator-Takeoff Lines from these different combinations of the Aviator-Takeoff Alternative Routes 2 and 3. Also note that Routes 1, 4, and 6 as shown on the map in Attachment II.A.9.a were renumbered prior to preparation of this filing so that previous Route 6 is the current Aviator-Takeoff Proposed Route (Route 1), previous Route 1 is the current Aviator-Takeoff Alternative Route 2, and previous Route 4 is the current Aviator-Takeoff Alternative Route 3. Three additional Aviator-Takeoff routes (Routes A, B, and C) were shown to the public during the October 2023 community meeting and were reflected on the Project website prior to November 2023. *See infra,* n. 40. These three routes (A, B, and C) were not included in correspondence to MWAA (*see* Attachment II.A.9.a) because they were rejected from further consideration following discussions with Fairfax County in October and November 2023. These three routes (A, B, and C) do not correspond with any of the route alternatives discussed with MWAA or included in this filing. *See* Section 4.6 of the Environmental Routing Study for additional information on the route analysis and conclusions pertaining to the rejected routes of Aviator-Takeoff Rejected Routes A, B, and C.

the Aviator-Takeoff Proposed Route. Land along the right-of-way consists of 21.8 acres of forested land, 6.0 acres of developed land, and 10.0 acres of open space, with no open water or agricultural land. Of the 21.8 acres of forested land, 18.7 acres is classified as having a FCV of Average, while no High, Very High, or Outstanding classified land is crossed. Additionally, no Virginia Department of Conservation and Recreation ("DCR") Ecological Cores ranked as High, Very High, or Outstanding are crossed by the Aviator-Takeoff Proposed Route. No agricultural areas are crossed by the Aviator-Takeoff Proposed Route, although 6.2 acres of soil classified as prime farmland is within the right-of-way.

Based on ERM's desktop wetland and waterbody analysis, 5.0 acres of wetlands, including 4.3 acres of forested wetlands, and nine waterbodies are within the Aviator-Takeoff Proposed Route right-of-way. The Aviator-Takeoff Proposed Route also crosses 3.7 acres (0.3 mile) of the Cub Run RPA within Fairfax County, although 83% (approximately 0.3 mile) of this crossing is collocated with South Perimeter Road to minimize fragmentation to this resource. The Aviator-Takeoff Proposed Route also crosses 0.8 acre of River and Stream Corridor Resources ("RSCR") within Loudoun County. This is a total of 4.5 acres of protected riparian stream corridors.

The existing zoning along the Aviator-Takeoff Proposed Route includes 56% (22.1 acres) zoned as residential and 44% (15.7 acres) zoned as industrial, although the entire residential zoned area crossed is located on MWAA property. The Aviator-Takeoff Proposed Route is collocated with South Perimeter Road and Lower Perimeter Road for approximately 2.7 miles (84%) of its total length. Zero residential dwellings were identified within the right-of-way or within 500 feet of the centerline of the Aviator-Takeoff Proposed Route. One commercial building, a mobile office trailer on MWAA property, is within the Aviator-Takeoff Proposed Route right-of-way and will require relocation prior to construction. Per an April 11, 2024, email from MWAA, the location of the Aviator-Takeoff Proposed Route, which follows the southern MWAA property boundary, is preferred to moving the route further north on the MWAA parcel. See Attachment II.A.9.b. The Aviator-Takeoff Proposed Route does not cross any conservation easements. The Aviator-Takeoff Proposed Route is anticipated to have a moderate impact on visual resources and no impact on aboveground historic resources. See Section 5 of the Environmental Routing Study.

While the Aviator-Takeoff Proposed Route has more forested impacts than the alternative routes, it is similar in overall length, reduces impacts to private landowners, avoids residential dwellings, reduces impacts to the Cub Run RPA and RSCR, does not have any cemeteries, schools, or places of worship within 500 feet of the centerline, and maximizes collocation with existing infrastructure. For all these reasons, Aviator-Takeoff Route 1 was selected as the Proposed Route.

Aviator-Takeoff Alternative Route 2

Aviator-Takeoff Alternative Route 2 would involve constructing a new overhead 230 kV double circuit transmission line primarily supported by double circuit

monopole structures in a new 100-foot-wide right-of-way beginning at the Company's future Aviator Substation and extending approximately 3.3 miles east to the Company's proposed Takeoff Substation.

Aviator-Takeoff Alternative Route 2 originates at the future Aviator Substation, approximately 0.1 mile south of the intersection of South Perimeter Road and Willard Road. From the future Aviator Substation, Aviator-Takeoff Alternative Route 2 heads initially north for about 0.1 mile before turning generally southeast within a parcel cleared for a future data center, then follows the southern boundary of a forested area for approximately 0.6 mile. The route next heads east and southeast for about 0.6 mile, crossing industrial parcels and surface parking/storage lots, a portion of a proposed data center development, and Pleasant Valley Road, then continues along forested land and a parking lot, where the route enters Fairfax County. It then continues south for about 0.5 mile along the western boundary of the Cub Run RPA, adjacent to existing and proposed industrial developments. Aviator-Takeoff Alternative Route 2 next heads southeast, collocating with an existing water mainline for approximately 0.4 mile through the Cub Run RPA and across Cub Run. From there, the route continues east for approximately 0.4 mile, crossing forested land, Avion Park Court, Stonecroft Boulevard, and a pond. It then continues southeast for approximately 0.5 mile, following Virginia Mallory Drive and crossing Avion Parkway and a forested area. The route next turns south for approximately 0.2 mile before terminating at the proposed Takeoff Substation. In total, Aviator-Takeoff Alternative Route 2 measures approximately 3.3 miles in length.

Aviator-Takeoff Alternative Route 2 crosses 33 parcels affecting approximately 38.5 acres of land. The route does not cross public parcels. One cemetery, two schools (both for-profit schools in commercial buildings), and zero places of worship were identified within 500 feet of Aviator-Takeoff Alternative Route 2 centerline. Land along the right-of-way consists of 17.8 acres of forested land, 11.9 acres of developed land, 8.1 acres of open space, and 0.7 acre of open water, with no agricultural land. Of the 17.8 acres of forested land, 9.7 acres is classified as having a FCV of Average, while no High, Very High, or Outstanding classified land is crossed. Additionally, no DCR Ecological Cores ranked as High, Very High, or Outstanding are crossed by the Alternative Route 2. No agricultural areas are crossed by the Alternative Route 2, although 5.1 acres of soil classified as prime farmland are within the right-of-way.

Based on ERM's desktop wetland and waterbody analysis, 6.5 acres of wetlands, including 3.7 acres of forested wetlands, and 15 waterbodies are within the Aviator-Takeoff Alternative Route 2 right-of-way. Aviator-Takeoff Alternative Route 2 also crosses 11.1 acres (0.9 mile) of the Cub Run RPA within Fairfax County, although 51% (approximately 0.5 mile) of this RPA crossing is collocated with existing buried utilities along Route 50 to minimize fragmentation to this resource. Aviator-Takeoff Alternative Route 2 also crosses 1.4 acres of RSCR within Loudoun County. This is a total of 12.5 acres of protected riparian stream corridors.

The existing zoning along Aviator-Takeoff Alternative Route 2 is entirely (100%)

within zoned commercial, industrial, and mineral resource areas. The route is collocated with existing roads and utilities for approximately 1.2 miles (36%) of its total length. Zero residential dwellings were identified within the right-of-way or within 500 feet of the centerline of Aviator-Takeoff Alternative Route 2. One commercial outbuilding, an arch-shaped storage outbuilding/shed, is within the route right-of-way and will require relocation prior to construction. Aviator-Takeoff Alternative Route 2 does not cross any conservation easements. Similar to the Aviator-Takeoff Proposed Route, Aviator-Takeoff Alternative Route 2 is anticipated to have a moderate impact on visual resources and no impact on aboveground historic resources. See Section 5 of the Environmental Routing Study.

While Aviator-Takeoff Alternative Route 2 avoids public land and therefore does not require coordination with MWAA or Fairfax County to be constructed, it is longer, has greater impacts to the Cub Run RPA and RSCR in Loudoun County, has less total collocation, is more impactful to cemeteries and places of worship, and crosses 26 more parcels when compared to the Proposed Route. For all these reasons, Aviator-Takeoff Alternative Route 2 was not selected as the preferred route. See Section 5 of the Environmental Routing Study for additional discussion and analysis.

Aviator-Takeoff Alternative Route 3

Aviator-Takeoff Alternative Route 3 would involve constructing a new overhead 230 kV double circuit transmission line primarily supported by double circuit monopole structures in a new 100-foot-wide right-of-way beginning at the Company's future Aviator Substation and extending approximately 3.1 miles east to the Company's proposed Takeoff Substation.

Aviator-Takeoff Alternative Route 3 originates at the future Aviator Substation, approximately 0.1 mile south of the intersection of South Perimeter Road and Willard Road in Loudoun County. From the future Aviator Substation, Aviator-Takeoff Alternative Route 3 heads north for about 0.1 mile before turning generally southeast for approximately 0.6 mile along the northern boundary of an area recently cleared for a future data center. The route then continues southeast for about 0.6 mile, crossing a pond and passing through both industrial parcels and forested land. Aviator-Takeoff Alternative Route 3 then exits Loudoun County and enters Fairfax County and the Cub Run RPA. From there, it continues south for approximately 0.2 mile along the western boundary of the RPA, then heads east across the RPA for about 0.2 mile along an existing 15-foot-wide buried utility (waterline) easement. The route then heads south for approximately 0.2 mile along the eastern boundary of the RPA, before continuing east for about 0.5 mile crossing two ponds, forested land, Avion Park Court, and Stonecroft Boulevard. Aviator-Takeoff Alternative Route 3 then continues southeast for approximately 0.5 mile, following Virginia Mallory Drive, and crossing Avion Parkway and a forested area. It then turns south for approximately 0.2 mile before entering and terminating at the proposed Takeoff Substation. In total, Aviator-Takeoff Alternative Route 3 measures approximately 3.1 miles in length.

Aviator-Takeoff Alternative Route 3 follows a common alignment with Alternative Route 2 for about 0.7 mile from the future Aviator Substation around the planned data center development, for about 0.2 mile within the Cub Run RPA, and again for about 0.8 mile from Virginia Mallory Drive to the proposed Takeoff Substation.

Aviator-Takeoff Alternative Route 3 crosses 24 parcels affecting approximately 35.8 acres of land. The route does not cross public parcels. One cemetery, one school, and two places of worship were identified within 500 feet of Aviator-Takeoff Alternative Route 3. Land along the right-of-way consists of 15.3 acres of forested land, 10.9 acres of developed land, 8.0 acres of open space, 1.5 acres of open water, and no agricultural land. Of the 15.3 acres of forested land, 11.0 acres is classified as having a FCV of Average, while no High, Very High, or Outstanding classified land is crossed. Additionally, no DCR Ecological Cores ranked as High, Very High, or Outstanding are crossed by the route. No agricultural areas are crossed by Aviator-Takeoff Alternative Route 3, although 7.3 acres of soil classified as prime farmland is within the right-of-way.

Based on ERM's desktop wetland and waterbody analysis, 6.7 acres of wetlands, including 3.6 acres of forested wetlands, and 14 waterbodies are within the Aviator-Takeoff Alternative Route 3 right-of-way. The route also crosses 8.1 acres (0.7 mile) of the Cub Run RPA, although 65% (approximately 0.4 mile) of this RPA crossing is collocated with existing buried utilities within an approximately 15-foot-wide cleared easement, to minimize fragmentation to this resource. Aviator-Takeoff Alternative Route 3 also crosses 4.0 acres of RSCR in Loudoun County. This is a total of 12.1 acres of protected riparian stream corridors.

The existing zoning along Aviator-Takeoff Alternative Route 3 is entirely (100%) within zoned commercial, industrial, and mineral resource areas. The route is collocated with existing roads and utilities for approximately 1.2 miles (39%) of its total length. Zero residential dwellings were identified within the right-of-way or within 500 feet of the centerline of Aviator-Takeoff Alternative Route 3. One commercial building, a storage building, is within the route right-of-way and will require relocation prior to construction. Aviator-Takeoff Alternative Route 3 does not cross any conservation easements. Similar to the Aviator-Takeoff Proposed Route and Alternative Route 2, Aviator-Takeoff Alternative Route 3 is anticipated to have a moderate impact on visual resources and no impact on aboveground historic resources. See Section 5 of the Environmental Routing Study.

While Aviator-Takeoff Alternative Route 3 is slightly shorter and avoids public land and therefore does not require coordination with MWAA or Fairfax County to be constructed, it has greater impacts to the Cub Run RPA and RSCR in Loudoun County; has less total collocation; is more impactful to cemeteries, places of worship, and schools; and crosses 17 more parcels when compared to the Proposed Route. For all these reasons, Aviator-Takeoff Alternative Route 3 was not selected as the preferred route. See Section 5 of the Environmental Routing Study for additional discussion and analysis.

Summary of Routes

For all the reasons stated above and in the Routing Study, ERM and the Company support the Takeoff Loop Proposed Route (Route 1), the Reconductor/Rebuild Proposed Route, and the Aviator-Takeoff Proposed Route (Route 1) as the Project routes that avoid or reasonably minimize adverse impact to the greatest extent reasonably practicable on the scenic assets, historic and cultural resources, and environment of the area concerned.

Metropolitan Washington
Airports Authority
1 Aviation Circle
Washington, DC 20001-6000

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Yolanda Green
External Affairs
Dominion Energy
3072 Centreville Road
Herndon, VA 20171

January 31, 2024

Dear Ms. Green,

This letter is submitted to be included with a package to the State Corporation Commission as Dominion Energy contemplates overhead electric transmission routes to connect Aviator and Takeoff substations (Parallel Alignment), as well as to connect Takeoff Substation to existing transmission lines along Route 28 (Takeoff Cut-In). Dominion Energy has approached the Metropolitan Washington Airports Authority (Airports Authority) to discuss preliminary routes that would require the use of Airports Authority land. Dominion Energy has represented that the Takeoff Cut-In, a 0.3-mile segment located along the north side of Virginia SR 50 near Lee Road, is critical to the project and to reliable service to customers in the area. Dominion Energy has further represented that the Parallel Alignment, approximately 3.3 miles generally tracking South Perimeter Road, is less critical to reliable service but presents routing advantages compared to other overhead alternatives by paralleling the existing transportation corridor. A map provided by Dominion Energy showing preliminary routing for the Takeoff Cut-In and Parallel Alignment is attached to this letter.

Based on the information provided by Dominion Energy, which includes preliminary structure heights, the Takeoff Cut-In or Parallel Alignment may be feasible. The Airports Authority will continue to coordinate with Dominion Energy to support the proposed alignments provided no critical and unresolvable issues are identified. Unresolvable issues would include, among other things, risk to aviation safety and impact to the Airports Authority's current or planned aviation operations and property development. Alternatives to overhead transmission lines may be considered.

Consistent with Airports Authority's policy and in addition to the Airports Authority's review described above, easement(s) for the proposed electric transmission segments require Airports Authority Board approval and fair market value consideration (appraisal required), as well as Federal Aviation Administration, and Department of Transportation Secretary approval.

Should you have any questions please feel free to contact me at 703-309-0567 or andrew.hascall@mwaa.com

Sincerely,

Andrew Hascall, PE
Vice President—Office of Engineering

Not for Public Release – Confidential – Preliminary Information for Review Purposes Only

Overview Map with MWAA Options

Aviator to Takeoff Project

Dominion Energy
Loudoun and Fairfax Counties
Virginia

Dulles International Airport
(Metropolitan Washington Airports Authority)

PROPOSED RUNWAY

Aviator

Willard Rd

Wade Dr

Pleasant Valley Rd

John Mosby Hwy

50

Eastgate View Dr

Pleasant Valley

Loudoun County
Fairfax County

Dead Run

Thompson Rd

Murdock St

Stonecroft Blvd

Fairfax County
Police Training Facility

Cabin Rd

Concorde Pkwy

Avion Pkwy

Parallel Alignment

609

Lee Jackson Memorial Hwy

Lafayette Center Dr

Takeoff

Takeoff Cut-in

Airplane Rd

Silas Hutchison Valley Rd

Takeoff Routes

Centerline and Rights of Way

- Route 1 (0.33 Miles - 100 ft ROW)
- Route 2 (0.32 Miles - 160 ft ROW)

Aviator to Takeoff Routes

Centerline and Rights of Way

- Route 1 (3.25 Miles - 100 ft ROW)
- Route 2 (3.10 Miles - 100 ft ROW)
- Route 3 (3.18 Miles - 100 ft ROW)
- Route 4 (3.03 Miles - 100 ft ROW)
- Route 5 (3.09 Miles - 100 ft ROW)
- Route 6 (3.23 Miles - 100 ft ROW)

- Proposed Substation
- Existing Dominion Transmission Line
- MWAA Property
- Fairfax County Owned Parcel
- County Boundary
- NHD Stream
- NWI Wetland

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ERM

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Loudoun
Fairfax

This information is for environmental review purposes only

FILE: M:\US\Projects\D-F\Dominion\Aviator_ArcGIS\2023\12\Figures_DOM_AVR_TO_Figures_202312.aprx | REVISED: 12/22/2023 | SCALE: 1:12,000 when printed at 11x17 | DRAWN BY: 0239

From: Hascall, Andrew
To: Yolanda C Green (Services - 6)
Cc: Robert E Richardson (DEV Trans Distribution - 1); Greg.R.Baka@dominionenergy.com; Jared Brandell-Douglas
Subject: RE: Dominion Energy"s Aviator-Takeoff Project -- Routing Concurrence Request via 3/21/2024 Meeting
Date: Thursday, April 11, 2024 6:10:20 PM

You don't often get email from andrew.hascall@mwaa.com. Learn why this is important

EXTERNAL MESSAGE

Yolanda,

Thanks for the email. I agree the routings you have proposed below are preferred—specifically the Aviator to Takeoff 100' ROW on southern boundary and Takeoff to Transmission as 160' ROW which would likely encumber the guard shack. Please understand, as always, these routes are subject still subject to the approval process we've laid out previously. A preliminary look at NEPA planning makes me think this will likely require an Environmental Assessment.

I think it may be premature to engage Loudoun County at this point. I have a question with your ROW experts. If you have underground transmission lines, can the road ROW and transmission ROW overlap at all, or can it be tightened up?

Thanks,
Drew

Drew Hascall, PE
Vice President—Office of Engineering
Engineering Support & Dulles Corridor Metrorail Project

O: 703-417-0567
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andrew.hascall@mwaa.com

From: yolanda.c.green@dominionenergy.com <yolanda.c.green@dominionenergy.com>
Sent: Tuesday, April 9, 2024 1:39 PM
To: Hascall, Andrew <Andrew.Hascall@MWAA.com>
Cc: Robert.E.Richardson@dominionenergy.com; Greg.R.Baka@dominionenergy.com; jared.brandell-douglas@erm.com
Subject: Re: Dominion Energy's Aviator-Takeoff Project -- Routing Concurrence Request via 3/21/2024 Meeting

CAUTION: This email originated from outside of Airports Authority. Do not click links or open attachments unless you recognize the sender and have verified the authenticity of the message.

Hello Drew. Hope you are well. What a beautiful day.

I sent a voicemail last week and just wanted to check in to ask if you need additional information and if not how are we moving forward? Please let us know how to proceed. Thank you.

Get Outlook for iOS

From: Yolanda C Green (Services - 6) <yolanda.c.green@dominionenergy.com>
Sent: Tuesday, March 26, 2024 1:38:40 PM
To: Hascall, Andrew <Andrew.Hascall@MWAA.com>
Cc: Robert E Richardson (DEV Trans Distribution - 1) <Robert.E.Richardson@dominionenergy.com>; Greg R Baka (DEV Trans Distribution - 1) <Greg.R.Baka@dominionenergy.com>; Jared Brandell-Douglas <jared.brandell-douglas@erm.com>
Subject: Dominion Energy's Aviator-Takeoff Project -- Routing Concurrence Request via 3/21/2024 Meeting

Drew,

Thank you for meeting with our routing team last week to discuss details for the Aviator-Takeoff and Takeoff Cut-In Transmission Lines. Attached are two PDF maps as requested. The first map contains two pages which show the estimated FAA maximum structure heights for the 100' wide Aviator-Takeoff South Option (along parcel boundary) and North Option (north of the conceptual Tall Cedars Parkway extension), and the second map shows the Takeoff Cut-In Line within a new 160' right-of-way to accommodate two double circuit 230 kV transmission lines north of Route 50. Dominion is in the process of finalizing the alignments of the transmission lines for inclusion in its application for approval of the project with the State Corporation Commission of Virginia (SCC) in the coming months. Therefore, we are seeking your confirmation regarding the portions of the alignments of the Aviator-Takeoff and Takeoff Cut-In Transmission Lines which cross MWAA property.

Aviator-Takeoff 230kV Transmission Line
For the Aviator-Takeoff Line, it is our understanding it would be preferable to locate our proposed transmission line along the MWAA parcel boundary rather than siting the line along the north side of the potential Tall Cedars Parkway extension, as this allows our transmission structures to be located as far as possible from runways for safety purposes. We understand that locating the proposed transmission line along the parcel boundary would not interfere with the development of the potential Tall Cedars Parkway extension in this area, because as we discussed, there is land immediately adjacent and north of the proposed transmission line where the future Tall Cedars Parkway extension could be built. The northern edge of our 100' Transmission line right-of-way would run parallel to the southern edge of the potential road extension right-of-way. Dominion will coordinate closely with the agencies developing the road extension (Loudoun DTCI and Fairfax DOT) and with MWAA to ensure that there are no conflicts between the transmission line and road extension project.

Takeoff 230kV Cut-In Line
Regarding the Takeoff Cut-In, the preferred alignment would follow the parcel boundary north of Route 50 which requires the relocation of the existing guard station at Dominion's expense.

NEPA Coordination
We also understand that additional coordination regarding a NEPA review is needed for these projects, and we welcome the opportunity to discuss this with your NEPA coordinator. If you prefer, we can reach out directly to your NEPA coordinator or coordinate through you. As a reference, the Aviator-Takeoff Lines and Takeoff Cut-In would have approximately 34.8 acres (of which 20.5 acres is forested) and 4.8 acres (of which 3.2 acres is forested) of right-of-way on MWAA property, respectively.

Routing Concurrence Request
Based on our discussion, and with respect to our filing of the projects with the SCC, would you please respond to this email indicating your awareness and support from MWAA of our plans to move forward with:

1. the Aviator-Takeoff South Option (the option along the parcel boundary) – see 1st attachment; and
2. the Takeoff Cut-In alignment located along the MWAA parcel boundaries – see 2nd attachment.

Tall Cedars Parkway Coordination
Finally, we would like to keep Loudoun DTCI aware of our planned alignment, as Loudoun County has specifically asked about the transmission line impacts to the potential Tall Cedars Parkway extension (Fairfax DOT and Fairfax County have not indicated any concerns regarding this potential roadway). Please let us know if you would like us to participate in a call together with you and Loudoun DTCI to discuss the location of our transmission line and the Tall Cedars Parkway extension, or if you would like to have that conversation with DTCI without us.

Drew, please let us know if you have any questions or concerns and again thank you for your partnership.

CONFIDENTIALITY NOTICE: This electronic message contains information which may be legally confidential and or privileged and does not in any case represent a firm ENERGY COMMODITY bid or offer relating thereto which binds the sender without an additional express written confirmation to that effect. The information is intended solely for the individual or entity named above and access by anyone else is unauthorized. If you are not the intended recipient, any disclosure, copying, distribution, or use of the contents of this information is prohibited and may be unlawful. If you have received this electronic transmission in error, please reply immediately to the sender that you have received the

message in error, and delete it. Thank you.

Not for Public Release – Confidential – Preliminary Information for Review Purposes Only

Maximum Structure Heights Along Route 6 - South Option

Aviator to Takeoff 230 kV Line, Takeoff 230 kV Line, and Takeoff Substation Project

Loudoun and Fairfax Counties
Virginia, USA

Aviator
Takeoff
Proposed 5th Runway
Loudoun County
Fairfax County
Dulles International Airport (Metropolitan Washington Airports Authority)
Washington Dulles Airport
Flight Line Rd
Willard Rd
Wade Dr
Pleasant Valley Rd
Little River Tpke
Dead Run
Thompson Rd
Stonecroft Blvd
Cabin Rd
Pitch Rd
Paul Garber Ln
Flap Rd
S Perimeter Rd
Lower Perimeter Rd
Eastgate View Dr
Murdock St
Fairfax County Police Training Facility
Concorde Pkwy
Smithsonian National Air and Space Museum
Avion Pkwy
Avion Park Ct
Route 50
Lafayette Center Dr
Downwind Rd
Airplane Rd
Westfax Dr
146 148 148 147 151 149 151 155 160 160 170 190 167 178 183 182 178 176 176 168 141 125 154 135 123 116 134 172 177 185 181 182 188 176 184 177 179 178 174 170 165

Estimated maximum structure heights are modeled using publicly available data. Heights should be considered approximate until site grading and civil survey have been completed. In addition, it will be necessary to consult with Dulles Airport before completing the final structure design for the project.

Estimated maximum allowable height per FAA standards
Proposed Substation
Aviator to Takeoff Route 6 - South Option
Takeoff Route 2
Existing Dominion Transmission Line
Proposed 5th Runway
5th Runway Estimated Approach Surface
Parcel Boundary
Fairfax County Resource Protection Area
NHD Stream

0 500 1,000
Feet

1:12,000

ERM

N W E S

This information is for environmental review purposes only.

FILE: M:\US\Projects\D-F\Dominion\Aviator_ArcGIS\2024\03\Structure_Heights_DOM_AVR_TO_Max_Structure_Heights.aprx | REVISED: 03/26/2024 | SCALE: 1:12,000 when printed at 11x17 DRAWN BY: 0239

Not for Public Release – Confidential – Preliminary Information for Review Purposes Only

Maximum Structure Heights along Route 6 - North Option (Tall Cedars)

Aviator to Takeoff 230 kV Line, Takeoff 230 kV Line, and Takeoff Substation Project

Loudoun and Fairfax Counties
Virginia, USA

Dominion Energy®

- Estimated maximum allowable height per FAA standards
- Proposed Substation
- Aviator to Takeoff Route 6 - North Option (Tall Cedars)
- Takeoff Route 2
- Existing Dominion Transmission Line
- Proposed 5th Runway
- 5th Runway Estimated Approach Surface
- Proposed Tall Cedars Parkway Extension
- Parcel Boundary
- Fairfax County Resource Protection Area
- NHD Stream

0 500 1,000
Feet

1:12,000

ERM

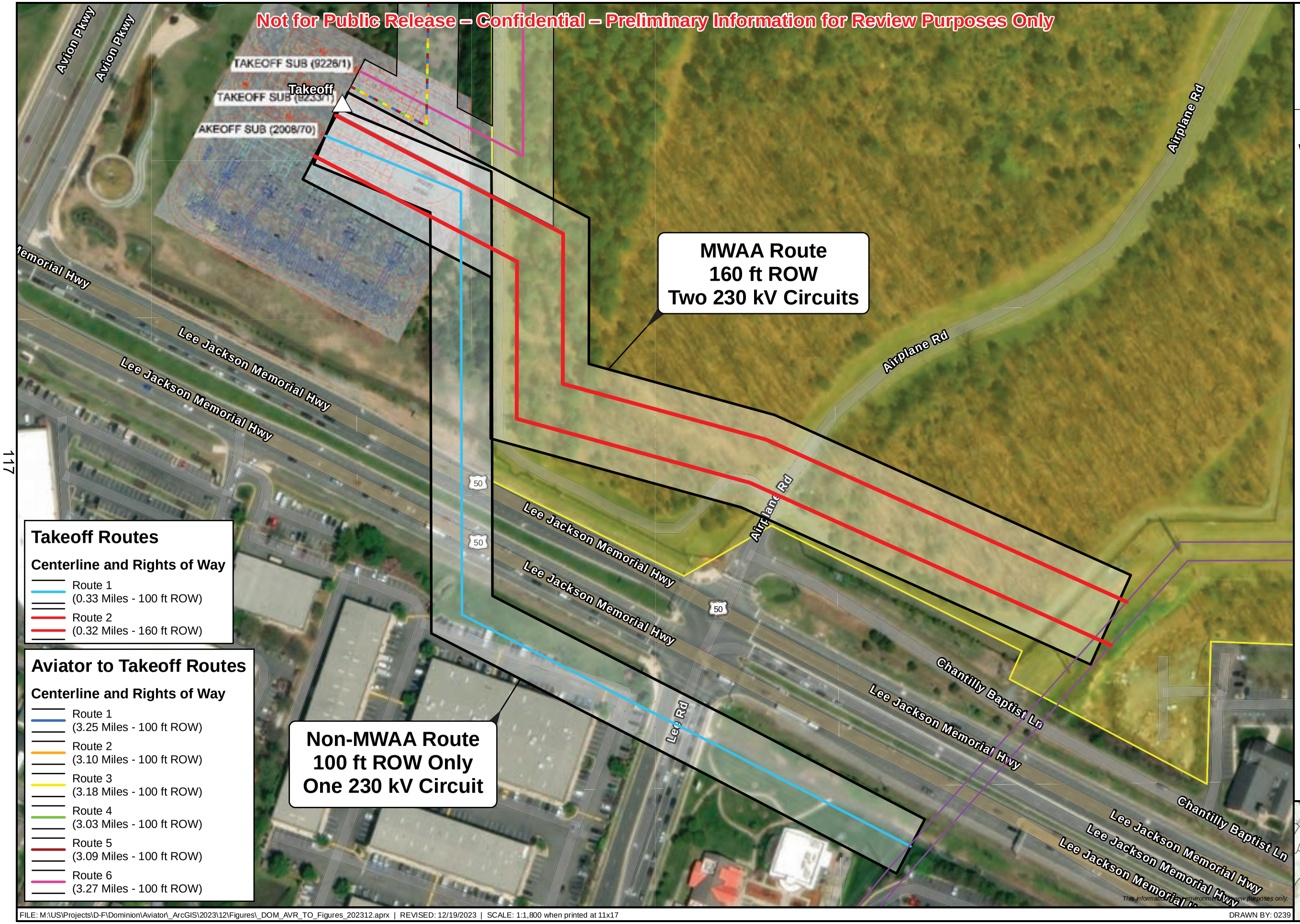
N W E S

Estimated maximum structure heights are modeled using publicly available data. Heights should be considered approximate until site grading and civil survey have been completed. In addition, it will be necessary to consult with Dulles Airport before completing the final structure design for the project.

This information is for environmental review purposes only.

FILE: M:\US\Projects\D-F\Dominion\Aviator_ArcGIS\2024\03\Structure_Heights_DOM_AVR_TO_Max_Structure_Heights.aprx | REVISED: 03/22/2024 | SCALE: 1:12,000 when printed at 11x17 DRAWN BY: 0239

Not for Public Release – Confidential – Preliminary Information for Review Purposes Only



Takeoff Routes

Centerline and Rights of Way

- Route 1 (0.33 Miles - 100 ft ROW)
- Route 2 (0.32 Miles - 160 ft ROW)

Aviator to Takeoff Routes

Centerline and Rights of Way

- Route 1 (3.25 Miles - 100 ft ROW)
- Route 2 (3.10 Miles - 100 ft ROW)
- Route 3 (3.18 Miles - 100 ft ROW)
- Route 4 (3.03 Miles - 100 ft ROW)
- Route 5 (3.09 Miles - 100 ft ROW)
- Route 6 (3.27 Miles - 100 ft ROW)

Dominion Energy®

Overview Map with MWAA Options

Aviator to Takeoff Project
Dominion Energy
Loudoun and Fairfax Counties
Virginia

- Proposed Substation
- Existing Dominion Transmission Line
- MWAA Property
- NWI Wetland

0 75 150
Feet

1:1,800

ERM

N
W E
S



This information is for environmental review purposes only.

FILE: M:\US\Projects\D-F\Dominion\Aviator_ArcGIS\2023\12\Figures_DOM_AVR_TO_Figures_202312.aprx | REVISED: 12/19/2023 | SCALE: 1:1,800 when printed at 11x17 DRAWN BY: 0239

County of Fairfax, Virginia

To protect and enrich the quality of life for the people, neighborhoods and diverse communities of Fairfax County

April 17, 2024

Stefan Haas
Project Manager
Dominion Energy Virginia
5000 Dominion Blvd.
Glen Allen, Virginia 23060

Re: Fairfax County Support for Proposed Route for the Aviator -Takeoff 230 kV Project

Dear Stefan,

I am writing on behalf of Fairfax County as the Fairfax County Executive to express the county's willingness to coordinate with Dominion regarding crossing the northeastern corner of the Fairfax County Police Training Facility parcel.

This crossing of Fairfax-owned land was requested by the Metro Washington Airport Authority (MWAA) to avoid placing a transmission line structure in a location with a FAA maximum allowable height of approximately 107 feet. I understand the final length and area of the crossing and right-of-way on Fairfax-owned land would be subject to final engineering design, the crossing would be approximately 385 feet long within a 100-feet-wide right-of-way and would entail approximately 0.9 acre on land owned by Fairfax County.

I recognize the need for this necessary infrastructure and as a county we are especially pleased with Dominion's commitment to solicit and collect feedback and implement changes based on that input.

We look forward to continued collaboration as Dominion works to make the Aviator -Takeoff 230 kV Project a reality. Fairfax County is in full support of these projects as long as all transmission lines do not cross route 50.

Sincerely,

Bryan J. Hill
County Executive

Office of the County Executive
12000 Government Center Parkway, Suite 552
Fairfax, VA 22035-0066
703-324-2531, TTY 711, Fax 703-324-3956
www.fairfaxcounty.gov

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 Project in a manner that minimizes outage times. Assuming the Commission issues a final order by February 17, 2025, and construction commences around January 2026, the Company anticipates that all construction will be complete and the Project will be energized by August 1, 2027.

The Company intends to complete this work during requested outage windows, as described below. However, as with all outage scheduling, these timeframes may change depending on whether PJM approves the outages and other relevant considerations allow for it. It is customary for PJM to hold requests for outages and approve only shortly before the outages are expected to occur and, therefore, the requested outages are subject to change. Therefore, the Company will not have clarity on whether this work will be done as requested until very close in time to the requested outages. If PJM approves different outage dates, the Company will continue to diligently pursue timely completion of this work.

Takeoff Loop and Substation

The cut-in of existing Lincoln Park-Loudoun Line #2008 and existing Bull Run-Sully Line #265, which is required to connect existing transmission lines to the proposed Takeoff Substation, is planned to be completed between fall 2026 and spring 2027. Outages will be required to install structures in the existing Line #2008/#265 corridor and tie-in the new transmission lines between Takeoff Substation and existing Lines #2008 and #265. Installation of the structures from the proposed Takeoff Substation to the cut-in locations will not require outages on any existing transmission lines. Proposed structures within the existing right-of-way will be installed prior to the cut-in to minimize the outage duration on the existing lines. Any outages required will likely occur during fall 2026 to spring 2027 and be limited to two weeks at a time. The outages required to cut-in existing Line #265 may utilize the fall 2026 outages scheduled for Line #265 on the Sully-Takeoff Partial Reconductor/Rebuild described below. The outages on Line #2008 will be scheduled in spring 2027 so as not to overlap with the existing Line #265 outage.

Sully-Takeoff Partial Reconductor/Rebuild

The Company's plans will not interrupt service to customers during construction of the Sully-Takeoff Partial Reconductor/Rebuild. An outage on existing Line #265 will be required to reconductor the line. The outage on existing Line #265 is expected to have a maximum duration of three months. Multiple outages on

existing Line #2107 coinciding with the Line #265 outage will be required to replace five monopole structures along the corridor. It is expected that outages will be a maximum of 10 days. No outages will be required on existing Line #2008. Any required outages to either existing Line #265 or Line #2107 would be anticipated to occur in fall 2026.

Aviator-Takeoff Lines

The proposed Aviator-Takeoff Lines do not require an outage on any existing transmission lines. A short outage at the Aviator Substation may be required to connect the proposed Aviator-Takeoff Lines into the Aviator Substation. Any outages that are required will likely take place in fall 2026 and be limited to a two-week duration. Since Takeoff Substation will be under construction at a similar time during the Aviator-Takeoff Lines construction, no outages at Takeoff Substation are anticipated. The construction of the Aviator-Takeoff Lines is expected to take 12 months.

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[38] provides a tool routinely used by the Company in routing its transmission line projects.

Takeoff Loop and Substation

The Company utilized Guideline #1 by minimizing conflict between existing rights-of-way and present and prospective uses of the land on which the proposed Project is to be located (to the extent permitted by the property interest involved, rights-of-way should be selected with the purpose of minimizing conflict between the rights-of-way and present and prospective uses of the land on which they are to be located. To this end, existing rights of way should be given priority as the locations for additions to existing transmission facilities, and the joint use of existing rights-of-way by different kinds of utility services should be considered.). The Takeoff Loop Proposed Route collocates with Lower Perimeter Road and Route 50 on MWAA property. The Company reviewed the route with MWAA staff on March 21, 2024, and received an email on April 11, 2024, indicating that the Takeoff Loop Proposed Route will not conflict with planned land use. See Attachment II.A.9.b.

The Takeoff Loop and Substation 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). The closest NRHP site, Sully Plantation, is located approximately 0.7-mile northeast of Takeoff Substation parcel boundary and would not be impacted. As there would be no direct impacts to the Sully Plantation, nor would there be visual impacts as the Takeoff Loop and Substation would not be visible from the site. All other NRHP sites in the area are beyond 1.0 mile from the rights-of-way of the Takeoff Loop and Takeoff Substation. A Stage I Pre-Application Analysis prepared by Dutton+Associates on behalf of the Company, which is included with the Environmental Routing Study as Appendix F, was submitted to the Virginia Department of Historic Resources ("VDHR") on July 16, 2024.

The Company communicated with local, state, and federal agencies and relevant private organizations prior to filing this Application consistent with Guideline #4 (where government land is involved the applicant should contact the agencies early in the planning process). In particular, the Company consulted with MWAA and

[38] *See* Guideline #1 in Attachment 1 of the *Guidelines for Transmission Line Applications Filed Under Title 56 of the Code of Virginia*, which is available at https://scc.virginia.gov/getattachment/921b6b42-4e06-4ab5-b296-e73fdcd60cac/Trans.pdf.

Fairfax County as to the Takeoff Loop and Substation. See Sections III.B and III.J of this Appendix.

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).

The Company also utilizes recommended guidelines in clearing right-of-way, constructing facilities, and maintaining rights-of-way after construction. Moreover, secondary uses of right-of-way that are consistent with the safe maintenance and operation of facilities are permitted.

Sully-Takeoff Partial Reconductor/Rebuild

The Company utilized Guideline #1 (existing rights-of-way should be given priority when additional facilities) by siting the Sully-Takeoff Partial Reconductor/Rebuild within the existing transmission corridor.

By utilizing the existing transmission corridor, the Sully-Takeoff Partial Reconductor/Rebuild will minimize impact to any site listed on the NRHP. Thus, it is consistent with Guideline #2 (where practical, rights-of-way should avoid sites listed on the NRHP). In any event, the Company will coordinate with VDHR regarding its plans prior to engineering and construction of the Sully-Takeoff Partial Reconductor/Rebuild to avoid or minimize impacts. A Stage I Pre-Application Analysis prepared by Dutton+Associates on behalf of the Company, which is included with the Environmental Routing Study as Appendix F, was submitted to the VDHR on July 16, 2024.

The Company has communicated with local, state, and federal agencies prior to filing this Application, consistent with Guideline #4 (where government land is involved the applicant should contact the agencies early in the planning process). In particular, the Company consulted with Fairfax County as to the Sully-Takeoff Partial Reconductor/Rebuild. See Sections III.B and III.J of this Appendix.

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).

The Company also utilizes recommended guidelines in clearing right-of-way, constructing facilities, and maintaining rights-of-way after construction. Moreover, secondary uses of right-of-way that are consistent with the safe maintenance and operation of facilities are permitted.

Aviator-Takeoff Lines

The Company utilized Guideline #1 by minimizing conflict between existing rights-of-way and present and prospective uses of the land on which the proposed Project is to be located (to the extent permitted by the property interest involved,

rights-of-way should be selected with the purpose of minimizing conflict between the rights-of-way and present and prospective uses of the land on which they are to be located. To this end, existing rights of way should be given priority as the locations for additions to existing transmission facilities, and the joint use of existing rights-of-way by different kinds of utility services should be considered.). The Aviator-Takeoff Proposed Route collocates with the perimeter road on MWAA property, avoiding multiple parcels that are zoned for commercial and industrial uses that may have future planned developments. While there is a planned future road extension within Loudoun County that is initially outlined for a similar location as the Aviator-Takeoff Proposed Route, MWAA indicated to the Company that the location of the Proposed Route along the MWAA property boundary is preferred to having the Proposed Route located north of the planned future road development. See Attachment II.A.9.b.

The Aviator-Takeoff Lines will have no impact to any site listed on the NRHP. Thus, it is consistent with Guideline #2 (where practical, rights of-way should avoid sites listed on the NRHP). The closest NRHP site, Sully Plantation, is located approximately 0.7 mile northeast from the Proposed Route. All other NRHP sites in the area are beyond 1.0 mile from the rights-of-way of the Proposed Route, Aviator Substation, and Takeoff Substation. A Stage I Pre-Application Analysis prepared by Dutton+Associates on behalf of the Company, which is included with the Environmental Routing Study as Appendix F, was submitted to the VDHR on July 16, 2024.

The Company communicated with local, state, and federal agencies and relevant private organizations prior to filing this Application consistent with Guideline #4 (where government land is involved the applicant should contact the agencies early in the planning process). In particular, the Company consulted with MWAA, Fairfax County, and Loudoun County as to the Aviator-Takeoff Lines. See Sections III.B and III.J of this Appendix.

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).

The Company also utilizes recommended guidelines in clearing right-of-way, constructing facilities, and maintaining rights-of-way after construction. Moreover, secondary uses of right-of-way that are consistent with the safe maintenance and operation of facilities are permitted.

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. **Takeoff Loop and Substation**

The Takeoff Loop Proposed Route (Route 1) crosses Fairfax County for a total of approximately 0.3 mile. The Takeoff Loop and Substation are located entirely within Dominion Energy Virginia's service territory.

Sully-Takeoff Partial Reconductor/Rebuild

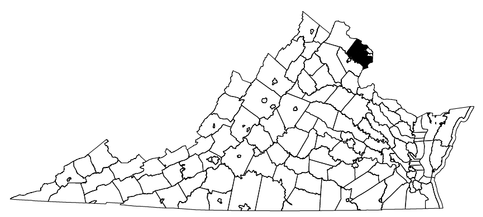
The proposed Reconductor/Rebuild Proposed Route crosses Fairfax County for a total of approximately 1.9 miles and is located entirely within Dominion Energy Virginia's service territory.

Aviator-Takeoff Lines

The Aviator-Takeoff Proposed Route (Route 1) crosses Loudoun County for a total of approximately 1.3 miles and crosses Fairfax County for a total of approximately 1.9 miles. Approximately 0.6 mile of the Aviator-Takeoff Proposed Route is located within Dominion Energy Virginia's service territory. Approximately 2.6 miles of the Aviator-Takeoff Proposed Route are in NOVEC's service territory. NOVEC has confirmed that it does not object to the construction of the Project.

b. Electronic copies of the VDOT "General Highway Map" for Fairfax and Loudoun Counties are marked as required and submitted with the Application. Reduced copies of the maps are provided as Attachment

II.A.12.b.i (Fairfax County) and Attachment II.A.12.b.ii (Loudoun County).



MAP DATE: 4/17/2024

Fairfax County, City of Fairfax, City of Falls Church, City of Alexandria, and City of Arlington 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 December 4, 2023. Other Company facilities previously authorized by the SCC may be depicted on prior SCC approved county maps.

Stream data from Esri. Road data from Esri and VDOT. Transmission line and electric service territory data from Department of Homeland Infrastructure. Rail data from VGIN.

126

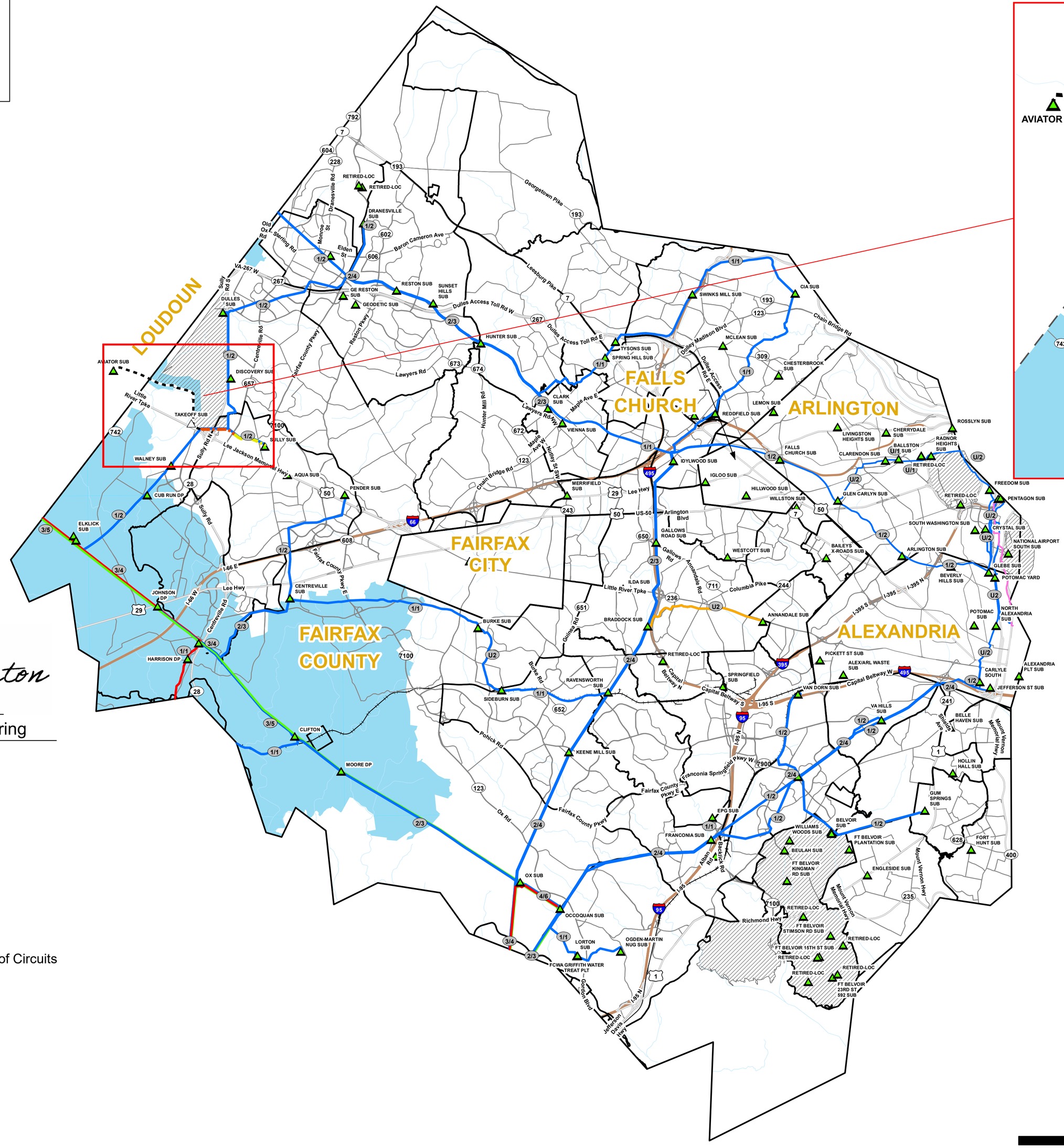
N W E S

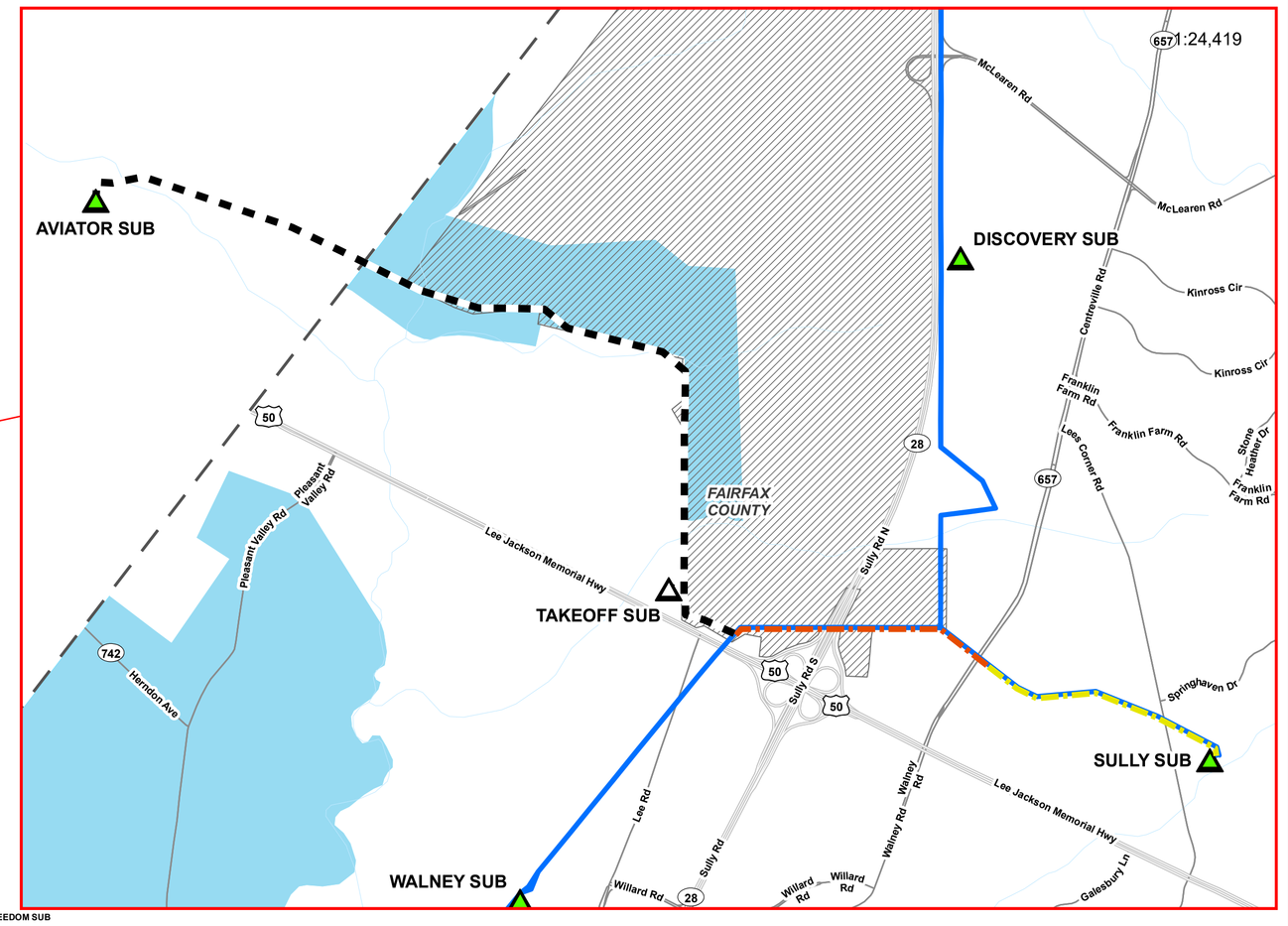
NORTHERN VIRGINIA ELECTRIC COOPERATIVE IS NOT OPPOSED TO SUCH CONSTRUCTION IN ITS SERVICE TERRITORY.

SIGNATURE Arnold Singleton

NAME (PRINT) Arnold Singleton

DATE 6/20/2024 TITLE VP Engineering





Legend

- Proposed Project
- Reconductor Only
- Reconductor and Partial Rebuild
- 1/1 Number of Lines of Structures/Number of Circuits
- Proposed Substation
- Existing Substation
- Existing 115 kV Line
- Existing 138 kV Line
- Existing 230 kV Line
- Existing 500 kV Line

Provider Service Territory

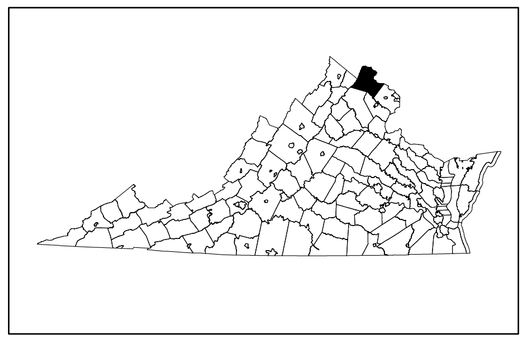
- Northern Virginia Electric Cooperative
- VEPCO

0 1.5 3 4.5 6 Miles

*Road data obtained from VDOT and Esri, current as of August 2022.

Fairfax County, City of Fairfax, City of Falls Church, City of Alexandria, and City of Arlington

Attachment II.A.12.b.i



MAP DATE: 6/17/2024

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 _____. 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.

NORTHERN VIRGINIA ELECTRIC COOPERATIVE IS NOT OPPOSED TO SUCH CONSTRUCTION IN ITS SERVICE TERRITORY.

SIGNATURE *Arnold Singleton*

DATE 6/20/2024 TITLE VP Engineering

Legend

- Proposed Project
- 500kV Under Consideration by SCC
- 230kV Under Consideration by SCC
- 1/1 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

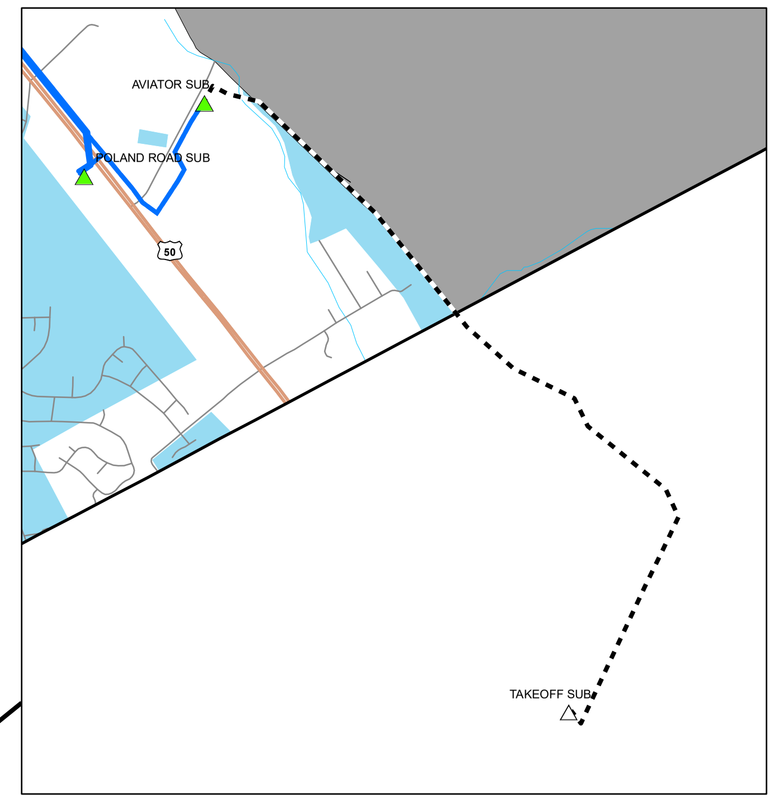
Clarke County

Fauquier County

Prince William County

Fairfax County

HAMILTON SUB
BREEZY KNOLL SUB
DRY MILL SOUTH SUB
GOOSE CREEK SUB
ALTAIR SWITCHING STATION
PLEASANT VIEW SUB
APOLLO SUB
LUNAR SUB
STARLIGHT SUB
STONEWATER SUB
BELMONT SUB
SW COLIN CREEK SUB
ASHBURN SUB
BEAUMEADE SUB
DTC SHUNT
WAXPOOL SUB
FARMWELL SUB
BECO SUB
CUMULUS SUB
ROUNDTABLE SUB
NIMBUS SUB
ENTERPRISE SUB
SHELLHORN ROAD SUB
GUTTERMIST SUB
LOGAN RIDGE SUB
PACIFIC SUB
GLOBAL PLAZA SUB
STERLING PARK SUB
DAVIS DRIVE SUB
BRAMBLETON SUB
NEW ROAD SUB
CABIN RUN SUB
EVERGREEN MILLS SUB
YARDLEY RIDGE SUB
MARS SUB
MIDDLEBURG SUB
LOUDOUN SUB
MOSBY SUB
POLAND ROAD SUB
AVIATOR SUB
TAKEOFF SUB
WASHINGTON-DULLES INTL AIRPORT



2 1 0 2 4 6 Miles

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

Loudoun

127

Attachment II.A.1.2.b.ii

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: **Takeoff Loop and Substation**

The proposed Takeoff Loop will be designed and operated at 230 kV with no anticipated voltage upgrade and will have a transfer capability of 1,573 MVA per circuit.

Sully-Takeoff Partial Reconductor/Rebuild

Approximately 1.9 mile of Line #2357, which is proposed for partial reconductor and rebuild, will be designed and operated at 230 kV with no anticipated upgrades and will have a transfer capability of 1,573 MVA.

Aviator-Takeoff Lines

The proposed Aviator-Takeoff Lines will be designed and operated at 230 kV with no anticipated voltage upgrade and will have a transfer capability of 1,573 MVA per circuit.

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: **Takeoff Loop and Substation**

The proposed double circuit 230 kV lines will include three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS type conductors and new optical ground wire for shielding, arranged as shown in Attachments II.B.3.a-b. Within the proposed Takeoff Substation, 7#7 Alumoweld shield wire will be used to provide additional lightning protection for the substation equipment. The twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS conductors are a Company standard for new 230 kV construction.

Sully-Takeoff Partial Reconductor/Rebuild

For the Sully-Takeoff Partial Reconductor/Rebuild, approximately 1.9 mile will be uprated to three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS type conductor arranged as shown in Attachments II.B.3.c-d. The twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS conductors are a Company standard for new 230 kV construction.

Aviator-Takeoff Lines

The proposed double circuit 230 kV lines will include three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS type conductor and new DNO-11410 shield wire over each circuit, arranged as shown in Attachments II.B.3.e-g. Within the proposed Takeoff Substation and the future Aviator Substation, 7#7 Alumoweld shield wire will be used to provide additional lightning protection for the substation equipment. The twin-bundled 768.2 kcmil 20/7 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: For subparts (b)-(j), the descriptions and diagrams of the supporting structures for the Project as proposed are provided as Attachments II.B.3.a-g as discussed below. For subpart (a), Attachment II.B.3.h provides approximate mapping of the structures for the Project as proposed, which is subject to change during final engineering.

Takeoff Loop Proposed Route (Route 1)

See Attachments II.B.3.a-b.

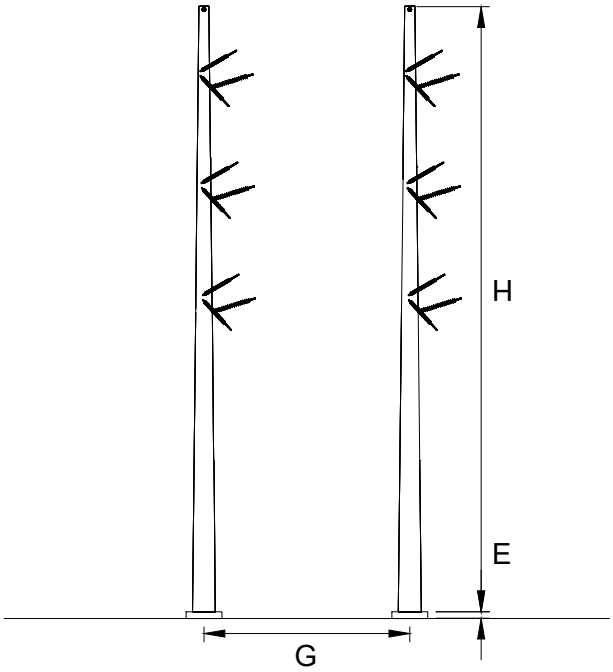
Sully-Takeoff Partial Reconductor/Rebuild Proposed Route

See Attachments II.B.3.c-d.

Aviator-Takeoff Proposed Route (Route 1)

See Attachments II.B.3.e-g.

TAKEOFF LOOP



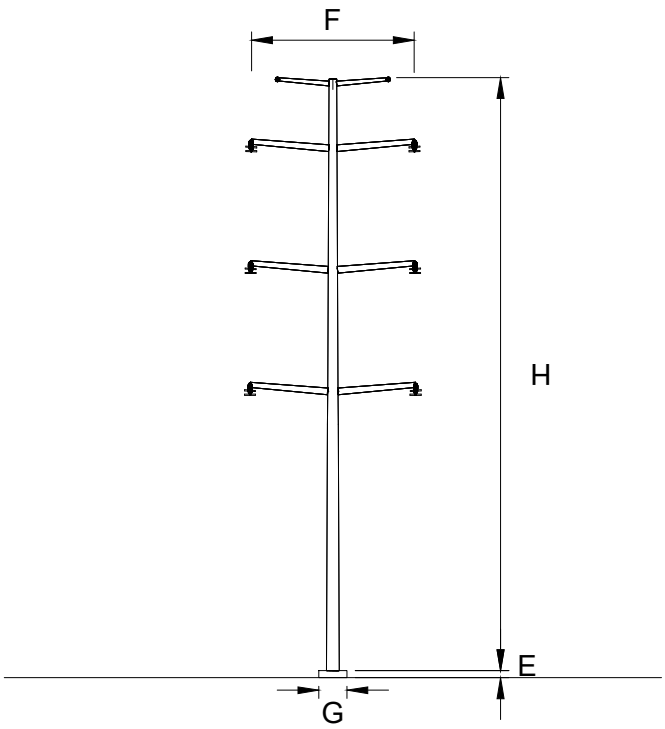
DOUBLE CIRCUIT DOUBLE DEADEND 2-POLE STRUCTURE

B. RATIONALE FOR STRUCTURE TYPE:	STRUCTURES ARE TO ACCOMMODATE LINE 2008, 2285, 2356, AND 2357
C. LENGTH OF R/W (STRUCTURE QUANTITY):	0.61 MILES (6 STRUCTURES)
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	FINISH DETERMINED BASED OFF EXISTING STRUCTURES IN THE AREA
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	N/A
G. AVERAGE WIDTH AT BASE:	34'
H. MINIMUM STRUCTURE HEIGHT:	100'
MAXIMUM STRUCTURE HEIGHT:	105'
AVERAGE STRUCTURE HEIGHT:	101'
I. AVERAGE SPAN LENGTH:	330'
J. MINIMUM CONDUCTOR-TO-GROUND:	36.4' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES
1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. INDIVIDUAL POLE HEIGHTS ABOVE GROUND MAY VARY SUBJECT TO FINAL LOCATION AND TERRAIN
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

Electric Transmission	TAKEOFF LOOP STRUCTURES 2008/67 (2285/89), 2008/69 (2285/91), 2008/70 (2285/92), 2356/63 (2357/85), 2356/64 (2357/86), AND 2356/66 (2357/88)	DRAWING NO. Attachment II.B.3.a
Dominion Energy 5000 Dominion Blvd Glen Allen, VA 23060		DRAWN CBW

TAKEOFF LOOP



DOUBLE CIRCUIT DOUBLE DEADEND MONOPOLE STRUCTURE

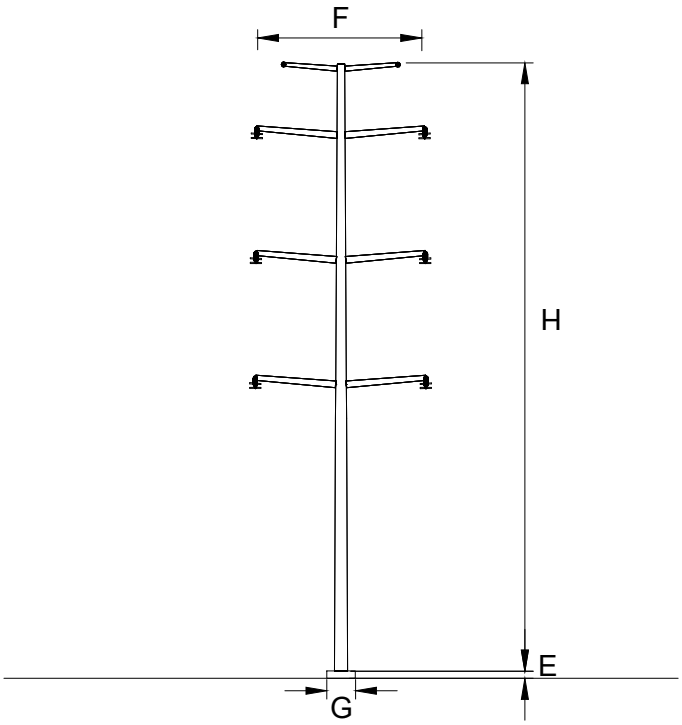
B. RATIONALE FOR STRUCTURE TYPE:	STRUCTURES ARE TO ACCOMMODATE LINE 2008, 2285, 2356, AND 2357
C. LENGTH OF R/W (STRUCTURE QUANTITY):	0.61 MILES (2 STRUCTURES)
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	FINISH DETERMINED BASED OFF EXISTING STRUCTURES IN THE AREA
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	26'
G. AVERAGE WIDTH AT BASE:	6' - 8' DIAMETER FOUNDATION (SEE NOTE 1)
H. MINIMUM STRUCTURE HEIGHT:	105'
MAXIMUM STRUCTURE HEIGHT:	110'
AVERAGE STRUCTURE HEIGHT:	108'
I. AVERAGE SPAN LENGTH:	507'
J. MINIMUM CONDUCTOR-TO-GROUND:	36.4' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES

1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. INDIVIDUAL POLE HEIGHTS ABOVE GROUND MAY VARY SUBJECT TO FINAL LOCATION AND TERRAIN
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

Electric Transmission	TAKEOFF LOOP 2008/28 (2285/90) AND 2356/65 (2357/87)	DRAWING NO. Attachment II.B.3.b
Dominion Energy 5000 Dominion Blvd Glen Allen, VA 23060		DRAWN CBW

SULLY-TAKEOFF PARTIAL RECONDUCTOR/REBUILD



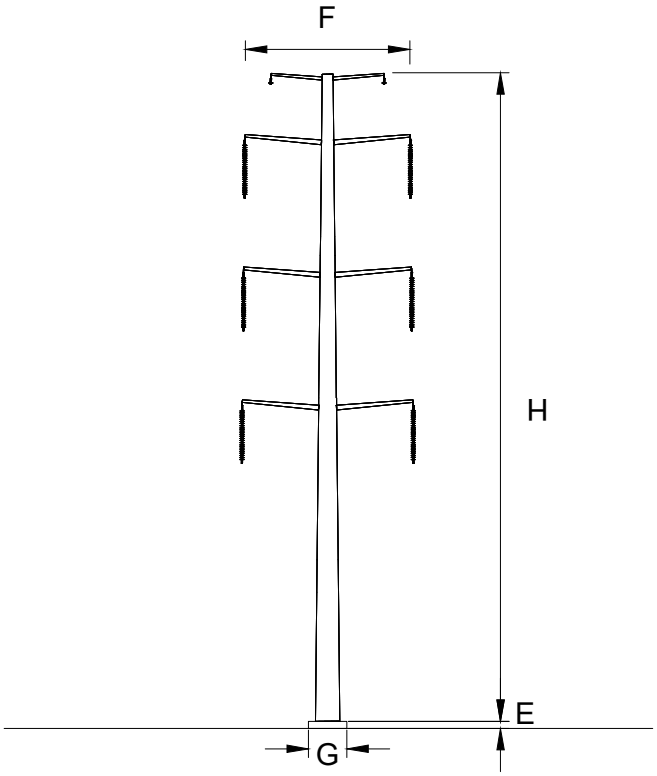
DOUBLE CIRCUIT DOUBLE DEADEND MONOPOLE STRUCTURES

B. RATIONALE FOR STRUCTURE TYPE:	STRUCTURES ARE TO ACCOMMODATE LINE 2107 AND 2357
C. LENGTH OF R/W (STRUCTURE QUANTITY):	0.93 MILES (4 STRUCTURES)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	FINISH DETERMINED BASED OFF EXISTING STRUCTURES IN THE AREA
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	26'
G. AVERAGE WIDTH AT BASE:	6' - 8' DIAMETER FOUNDATION (SEE NOTE 1)
H. MINIMUM STRUCTURE HEIGHT:	110'
MAXIMUM STRUCTURE HEIGHT:	130'
AVERAGE STRUCTURE HEIGHT:	120'
I. AVERAGE SPAN LENGTH:	465'
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES
1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. INDIVIDUAL POLE HEIGHTS ABOVE GROUND MAY VARY SUBJECT TO FINAL LOCATION AND TERRAIN
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

Electric Transmission	LINE 2357 PARTIAL REBUILD STRUCTURES 2357/99 (2107/71), 2357/102 (2107/68), 2357/104 (2107/66), AND 2357/107 (2107/63)	DRAWING NO. Attachment II.B.3.c
Dominion Energy 5000 Dominion Blvd Glen Allen, VA 23060		DRAWN CBW

SULLY-TAKEOFF PARTIAL RECONDUCTOR/REBUILD



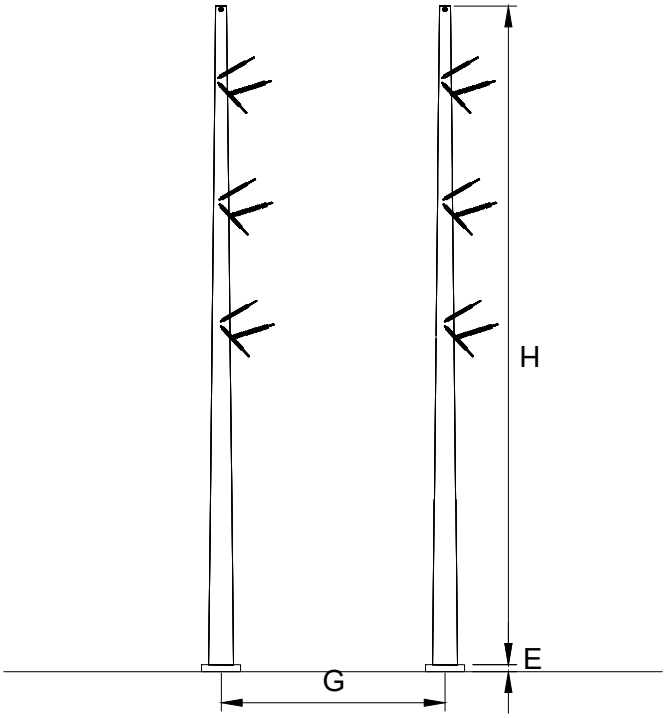
DOUBLE CIRCUIT SUSPENSION MONOPOLE STRUCTURE

B. RATIONALE FOR STRUCTURE TYPE:	STRUCTURES ARE TO ACCOMMODATE LINE 2107 AND 2357
C. LENGTH OF R/W (STRUCTURE QUANTITY):	0.93 MILES (1 STRUCTURE)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	FINISH DETERMINED BASED OFF EXISTING STRUCTURES IN THE AREA
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	25.0'
G. AVERAGE WIDTH AT BASE:	6' DIAMETER FOUNDATION (SEE NOTE 1)
H. MINIMUM STRUCTURE HEIGHT:	105'
MAXIMUM STRUCTURE HEIGHT:	105'
AVERAGE STRUCTURE HEIGHT:	105'
I. AVERAGE SPAN LENGTH:	635'
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES
1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. INDIVIDUAL POLE HEIGHTS ABOVE GROUND MAY VARY SUBJECT TO FINAL LOCATION AND TERRAIN
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

Electric Transmission	LINE 2357 PARTIAL REBUILD STRUCTURES 2357/98 (2107/72)	DRAWING NO. Attachment II.B.3.d
Dominion Energy 5000 Dominion Blvd Glen Allen, VA 23060		DRAWN CBW

AVIATOR-TAKEOFF LINES



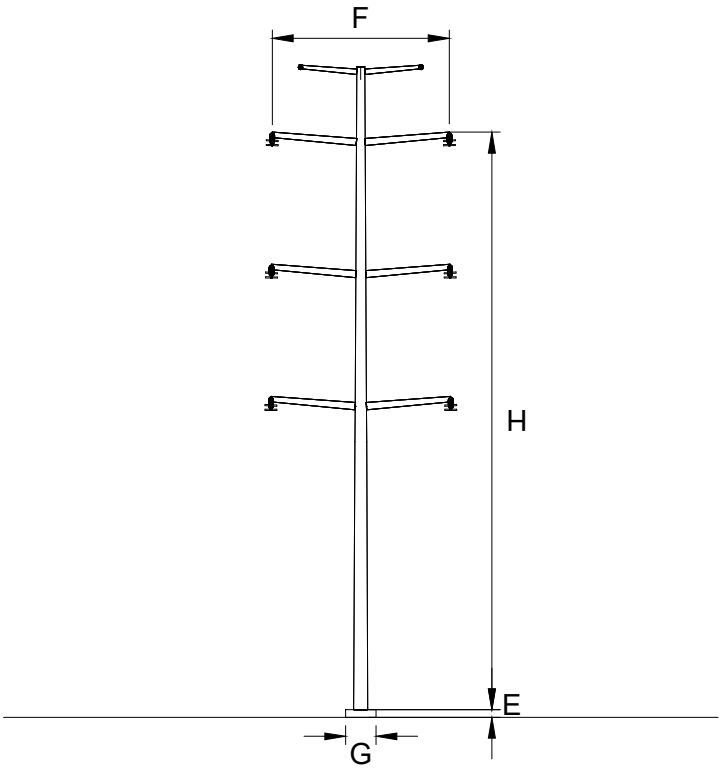
DOUBLE CIRCUIT DOUBLE DEADEND 2-POLE STRUCTURES

B. RATIONALE FOR STRUCTURE TYPE:	STRUCTURES ARE TO ACCOMMODATE LINE 2358 AND 2359
C. LENGTH OF R/W (STRUCTURE QUANTITY):	3.23 MILES (5 STRUCTURES)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	FINISH DETERMINED BY SOLICITING FEEDBACK FROM LAND OWNERS
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	N/A
G. AVERAGE WIDTH AT BASE:	35' SPACING
H. MINIMUM STRUCTURE HEIGHT:	100'
MAXIMUM STRUCTURE HEIGHT:	130'
AVERAGE STRUCTURE HEIGHT:	107'
I. AVERAGE SPAN LENGTH:	645'
J. MINIMUM CONDUCTOR-TO-GROUND:	26.4' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES
1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. INDIVIDUAL POLE HEIGHTS ABOVE GROUND MAY VARY SUBJECT TO FINAL LOCATION AND TERRAIN
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

Electric Transmission	AVIATOR-TAKEOFF STRUCTURES 2358/2 (2359/2), 2358/7 (2359/7), 2358/12 (2359/12), 2358/22 (2359/22), AND 2358/24 (2359/24)	DRAWING NO. Attachment II.B.3.e
Dominion Energy 5000 DOMINION BLVD Glen Allen, VA 23060		DRAWN KEG

AVIATOR-TAKEOFF LINES



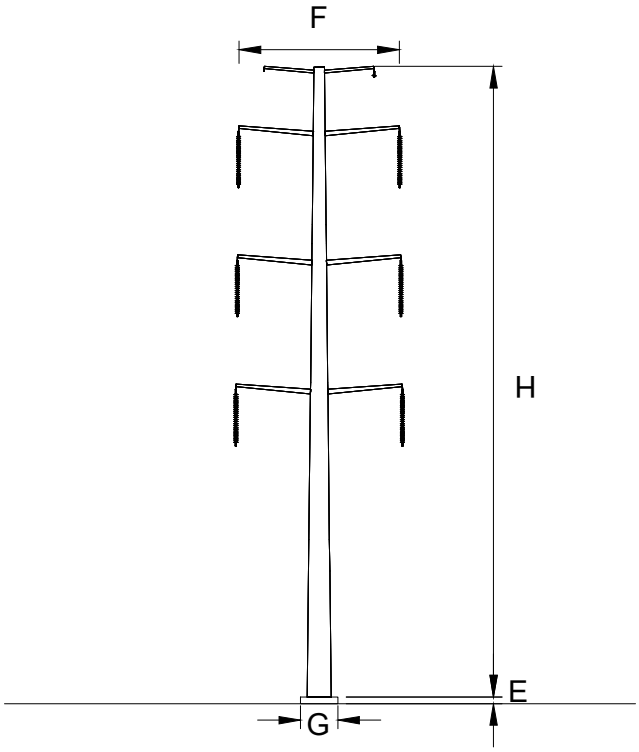
DOUBLE CIRCUIT DOUBLE DEADEND MONOPOLE STRUCTURES

B. RATIONALE FOR STRUCTURE TYPE:	STRUCTURES ARE TO ACCOMMODATE LINE 2358 AND 2359
C. LENGTH OF R/W (STRUCTURE QUANTITY):	3.23 MILES (6 STRUCTURES)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	FINISH DETERMINED BY SOLICITING FEEDBACK FROM LAND OWNERS
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	26'
G. AVERAGE WIDTH AT BASE:	6' - 8' DIAMETER FOUNDATION (SEE NOTE 1)
H. MINIMUM STRUCTURE HEIGHT:	95'
MAXIMUM STRUCTURE HEIGHT:	120'
AVERAGE STRUCTURE HEIGHT:	107'
I. AVERAGE SPAN LENGTH:	685'
J. MINIMUM CONDUCTOR-TO-GROUND:	26.4' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES
1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. INDIVIDUAL POLE HEIGHTS ABOVE GROUND MAY VARY SUBJECT TO FINAL LOCATION AND TERRAIN
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

Electric Transmission	AVIATOR-TAKEOFF STRUCTURES 2358/8 (2359/8), 2358/11 (2359/11), 2358/14 (2359/14), 2358/16 (2359/16), 2358/19 (2359/19), AND 2358/23 (2359/23)	DRAWING NO. Attachment II.B.3.f
Dominion Energy 5000 DOMINION BLVD Glen Allen, VA 23060		DRAWN KEG

AVIATOR-TAKEOFF LINES



DOUBLE CIRCUIT SUSPENSION MONOPOLE STRUCTURES

B. RATIONALE FOR STRUCTURE TYPE:	STRUCTURES ARE TO ACCOMMODATE LINE 2358 AND 2359
C. LENGTH OF R/W (STRUCTURE QUANTITY):	3.23 MILES (12 STRUCTURES)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	FINISH DETERMINED BY SOLICITING FEEDBACK FROM LAND OWNERS
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	26.0'
G. AVERAGE WIDTH AT BASE:	6'-8" DIAMETER FOUNDATION (SEE NOTE 1)
H. MINIMUM STRUCTURE HEIGHT:	100'
MAXIMUM STRUCTURE HEIGHT:	140'
AVERAGE STRUCTURE HEIGHT:	121'
I. AVERAGE SPAN LENGTH:	785'
J. MINIMUM CONDUCTOR-TO-GROUND:	26.4' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES
1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. INDIVIDUAL POLE HEIGHTS ABOVE GROUND MAY VARY SUBJECT TO FINAL LOCATION AND TERRAIN
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

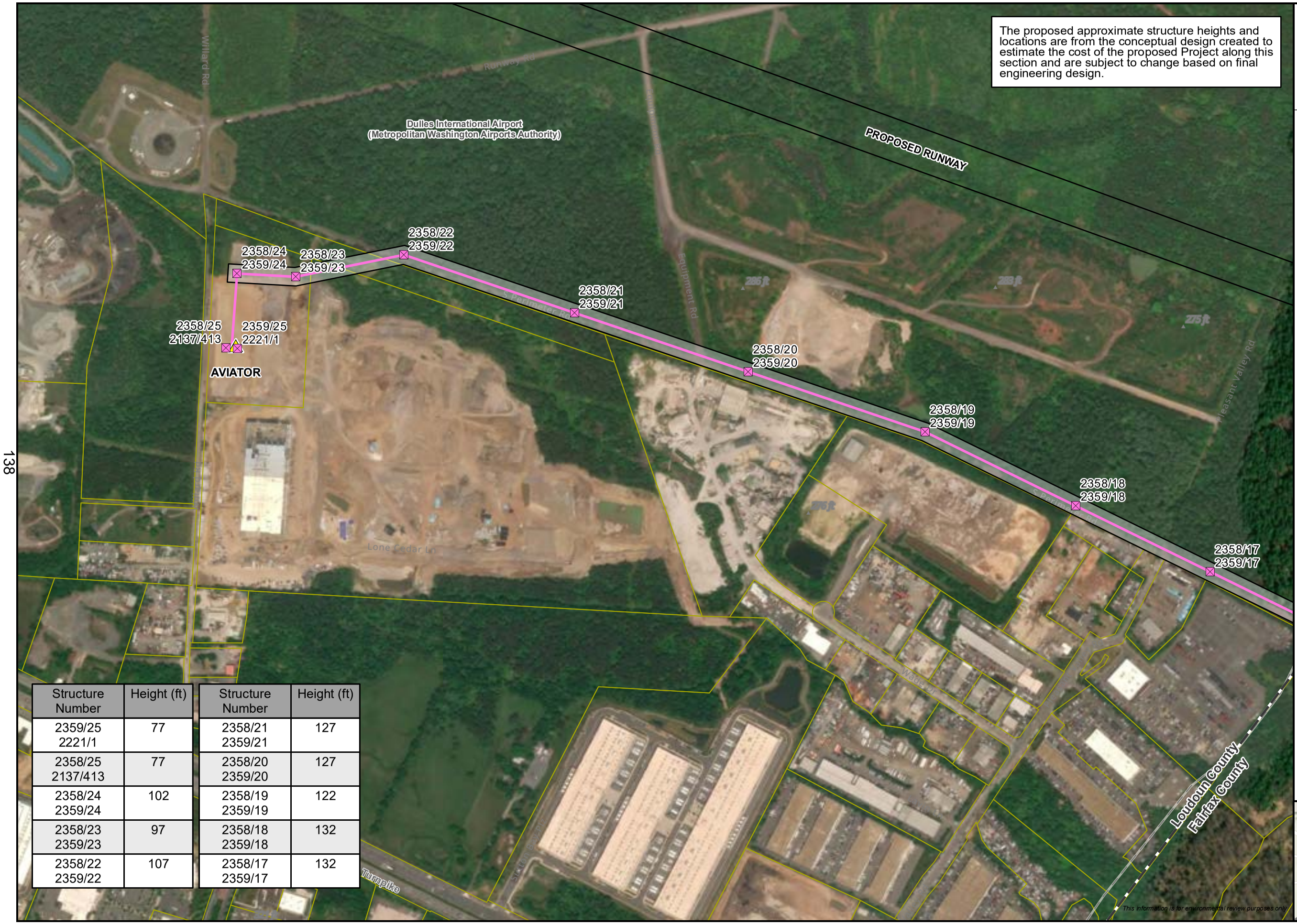
Electric Transmission	AVIATOR-TAKEOFF STRUCTURES 2358/3-6 (2359/3-6), 2358/10 (2359/10), 2358/13 (2359/13), 2358/15 (2359/15), 2358/17-18 (2359/17-18), AND 2358/20-21 (2359/20-21)	DRAWING NO. Attachment II.B.3.g
Dominion Energy 5000 DOMINION Road Glen Allen, VA 23060		DRAWN KEG

The proposed approximate structure heights and locations are from the conceptual design created to estimate the cost of the proposed Project along this section and are subject to change based on final engineering design.

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Attachment II.B.3.h
Structure Locations Along the Proposed Route

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Fairfax and Loudoun Counties, Virginia



Structure Number	Height (ft)	Structure Number	Height (ft)
2359/25 2221/1	77	2358/21 2359/21	127
2358/25 2137/413	77	2358/20 2359/20	127
2358/24 2359/24	102	2358/19 2359/19	122
2358/23 2359/23	97	2358/18 2359/18	132
2358/22 2359/22	107	2358/17 2359/17	132

- Aviator-Takeoff Route 1 Structure Location
- Future Substation
- County Boundary

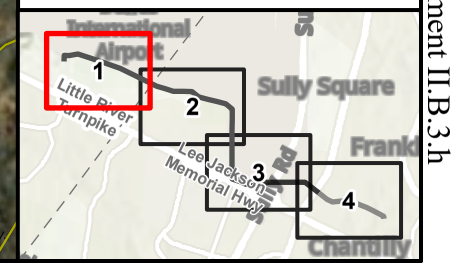
Aviator-Takeoff Lines

- Proposed Route (Aviator-Takeoff Route 1) - (100 ft ROW)

0 250 500
Feet

1:6,000

ERM



The proposed approximate structure heights and locations are from the conceptual design created to estimate the cost of the proposed Project along this section and are subject to change based on final engineering design.

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Attachment II.B.3.h
Structure Locations Along the Proposed Route

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Fairfax and Loudoun Counties, Virginia

Structure Number	Height (ft)
2358/17 2359/17	132
2358/16 2359/16	122
2358/15 2359/15	102
2358/14 2359/14	107
2358/13 2359/13	107

Structure Number	Height (ft)
2358/12 2359/12	102
2358/11 2359/11	107
2358/10 2359/10	117
2358/9 2359/9	102
2358/8 2359/8	97

Structure Number	Height (ft)
2358/7 2359/7	102
2358/6 2359/6	112
2358/5 2359/5	142
2358/4 2359/4	142

Aviator-Takeoff Route 1 Structure Location

County Boundary

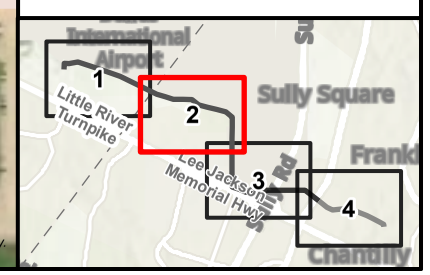
Aviator-Takeoff Lines

Proposed Route (Aviator-Takeoff Route 1) - (100 ft ROW)

0 250 500
Feet

1:6,000

ERM



This information is for environmental review purposes only.

The proposed approximate structure heights and locations are from the conceptual design created to estimate the cost of the proposed Project along this section and are subject to change based on final engineering design.

2358/4
2359/4
2358/3
2359/3
2358/1
2359/1
9233/62
9234/84
TAKEOFF
2358/2
2359/2
2008/71
265/93
9233/63
9234/85
2008/70
265/92
9233/64
9234/86
9233/65
9234/87
2008/69
265/91
2008/68
265/90
9233/66
9234/88
2008/67
265/89
2008 (2356)
265 (2357)
2008 (2356)
2107
265 (2357)
2107
Sully Road
Sully Road
Lee Jackson Memorial Hwy
Avion Pkwy
Virginia Wesleyan Dr
Sully Plantation
330 ft
312 ft

Structure Number	Height (ft)
2358/4 2359/4	142
2358/3 2359/3	132
2358/2 2359/2	132
2358/1 2359/1	97

Structure Number	Height (ft)
9233/66 9234/88	102
9233/65 9234/87	112
9233/64 9234/86	102
9233/63 9234/85	102
9233/62 9234/84	97

Structure Number	Height (ft)
2008/71 265/93	97
2008/70 265/92	102
2008/69 265/91	107
2008/68 265/90	107
2008/67 265/89	102

This information is for environmental review purposes only.

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Attachment II.B.3.h
Structure Locations Along the Proposed Route

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Fairfax and Loudoun Counties, Virginia

- Aviator-Takeoff Route 1 Structure Location
- Takeoff Loop Route 1 Structure Location
- Proposed Substation
- Existing Dominion Transmission Line Labeled with Current (Future) Number

Aviator-Takeoff Lines
- Proposed Route (Aviator-Takeoff Route 1) - (100 ft ROW)

Takeoff Line Loop
- Proposed Route (Takeoff Loop Route 1) - (160 ft ROW)
- Proposed Takeoff Substation Boundary

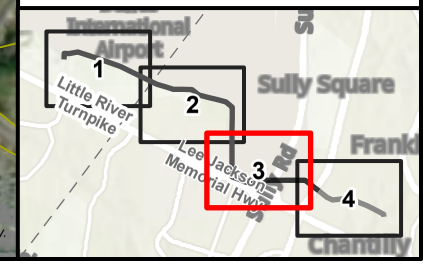
Sully-Takeoff Line
- Reconductor Only

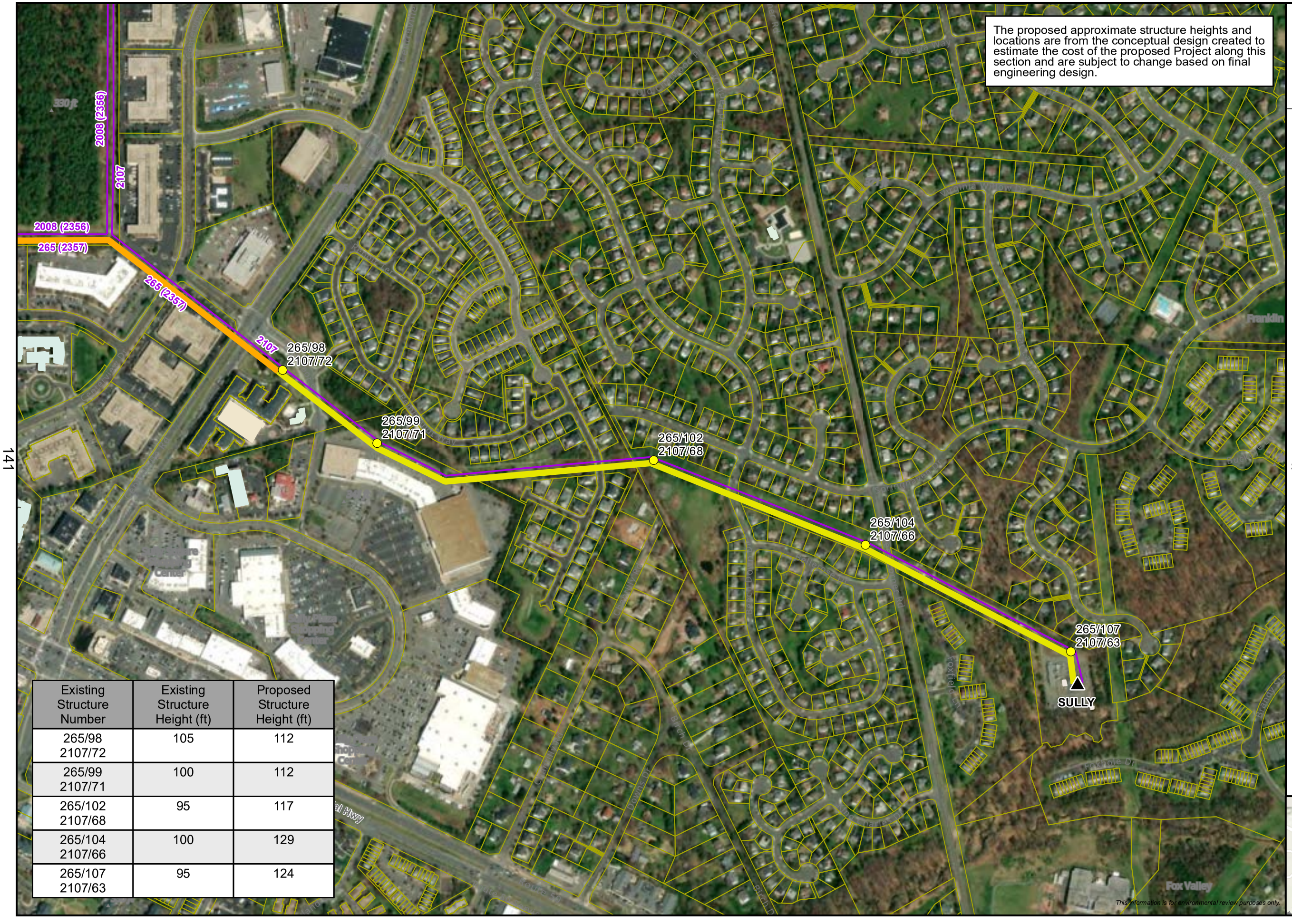
0 250 500
Feet

1:6,000

ERM

N W E S





Existing Structure Number	Existing Structure Height (ft)	Proposed Structure Height (ft)
265/98 2107/72	105	112
265/99 2107/71	100	112
265/102 2107/68	95	117
265/104 2107/66	100	129
265/107 2107/63	95	124

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Attachment II.B.3.h
Structure Locations Along the Proposed Route

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Fairfax and Loudoun Counties, Virginia

▲ Existing Substation

Existing Dominion Transmission Line Labeled with Current (Future) Number

Sully-Takeoff Line

Reconductor Only

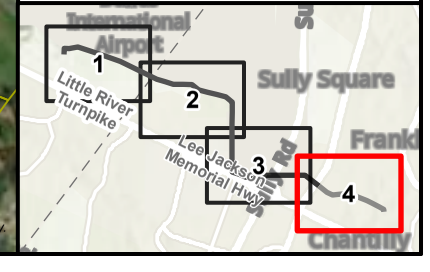
Reconductor and Partial Rebuild

Rebuild Structure

0 250 500
Feet

1:6,000

ERM



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: **Takeoff Loop and Substation**

The approximate structure heights along the Proposed and Alternative Routes for the Takeoff Loop 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.)
Takeoff Loop Proposed Route (Route 1)	100	110	103
Takeoff Loop Alternative Route 2	95	125	106

Sully-Takeoff Partial Reconductor/Rebuild

There are no route alternatives to the Sully-Takeoff Partial Reconductor/Rebuild. The approximate structure height of the structures along the Sully-Takeoff Partial Rebuild Segment (approximately 0.9 mile, between Structure #265/98 / #2107/72 and Structure #265/107 / #2107/63) of the Reconductor/Rebuild Proposed Route 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.)
Sully-Takeoff Partial Rebuild (0.9 mile)	90	130	108

Aviator-Takeoff Lines

The approximate structure heights along the Proposed and Alternative Routes for the Aviator-Takeoff Lines 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.)
Aviator-Takeoff Proposed Route (Route1)	95	140	114
Aviator-Takeoff Alternative Route 2	100	135	115
Aviator-Takeoff Alternative Route 3	100	140	114

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: This section is only applicable to the Sully-Takeoff Partial Reconductor/Rebuild.[39] See Attachment II.B.3.h for structure mapping and the existing and proposed structure heights along the 0.9-mile Sully-Takeoff Partial Rebuild Segment.

[39] *See supra*, n. 5.

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]** ***Photographs for typical existing facilities to be removed***

Takeoff Loop and Substation

Not applicable.

Sully-Takeoff Partial Reconductor/Rebuild

Representative photographs of the typical existing structures on Line #2357 (*i.e.*, supporting existing Bull Run-Sully Line #265) that are being removed as part of the 0.9-mile Sully-Takeoff Partial Rebuild are provided in Attachment II.B.6.a.i-ii.

Aviator-Takeoff Lines

Not applicable.

[b] ***Comparable photographs or representations for proposed structures***

Takeoff Loop and Substation

See Attachment II.B.6.b.i-ii for representative photographs of the proposed structures for the Takeoff Loop. Note that the proposed structures will be weathering steel.

Sully-Takeoff Partial Reconductor/Rebuild

See Attachment II.B.6.b.iii-iv for representative photographs of the proposed structures for the Sully-Takeoff Partial Reconductor/Rebuild.

Aviator-Takeoff Lines

See Attachment II.B.6.b.v-vii for representative photographs of the proposed structures for the Aviator-Takeoff Lines.

[c] ***Visual simulations from historic and other key locations***

Visual simulations showing the appearance of the proposed transmission structures at identified historic locations within 1.0 mile of the proposed centerlines of the

Project routes—including the Proposed and Alternative Routes for the Takeoff Loop, the Sully-Takeoff Partial Reconductor/Rebuild, and the Aviator-Takeoff Lines—are provided. See Attachment II.B.6.c for a map of the simulation locations, the existing views at the historic properties, and simulated proposed views. These simulations were created using Geographic Information Systems modeling to depict whether the proposed structures will be visible from the identified historic property. The historic properties evaluated are described below. See also the Stage I Pre-Application Analysis Report contained in Appendix F of the Environmental Routing Study.

Takeoff Loop and Substation

Historic Location	Viewpoint	Comments
Sully Plantation (VDHR ID# 029-0037)	3, 4, 5, 6, 7	The Takeoff Loop Proposed Route (Route 1) would have no impact on 029-0037.
	3, 4, 5, 6, 7	Takeoff Loop Alternative Route 2 would have no impact on 029-0037.

Sully-Takeoff Partial Reconductor/Rebuild

Historic Location	Viewpoint	Comments
Sully Plantation (VDHR ID# 029-0037)	8	The Sully-Takeoff Partial Rebuild Segment along the Reconductor/Rebuild Proposed Route would have no impact on 029-0037.

Aviator-Takeoff Lines

Historic Location	Viewpoint	Comments
Sully Plantation (VDHR ID# 029-0037)	3, 4, 5, 6, 7	The Aviator-Takeoff Proposed Route (Route 1) would have no impact on 029-0037.
	3, 4, 5, 6, 7	Aviator-Takeoff Alternative Route 2 would have no impact on 029-0037.
	3, 4, 5, 6, 7	Aviator-Takeoff Alternative Route 3 would have no impact on 029-0037.

See Attachment III.B.2 for visual simulations of key locations evaluated.



Photograph provided by Dominion Energy

SULLY-TAKEOFF PARTIAL RECONDUCTOR/REBUILD

Existing Structure Type:
230 kV Double Circuit Painted Steel
Double Deadend Monopole



Photograph provided by Dominion Energy

SULLY-TAKEOFF PARTIAL RECONDUCTOR/REBUILD

Existing Structure Type:
230 kV Double Circuit Painted Steel
Double Deadend Monopole



TAKEOFF LOOP

Photograph provided by Dominion Energy

Proposed Structure Type:
230kV Double Circuit Weathering Steel Double Deadend 2-Pole
***structure shown above shows dulled galvanized finish with the proposed finish being weathering steel**



Photograph provided by Dominion Energy

TAKEOFF LOOP

Proposed Structure Type:
230kV Double Circuit Weathering Steel Double Deadend Monopole

Dominion Energy®



Photograph provided by Dominion Energy

SULLY-TAKEOFF PARTIAL RECONDUCTOR/REBUILD

Dominion Energy®

Proposed Structure Type:
230kV Double Circuit Dulled Galvanized
Double Deadend Monopole



Photograph provided by Dominion Energy

SULLY-TAKEOFF PARTIAL RECONDUCTOR/REBUILD

Dominion Energy®

Proposed Structure Type:
230kV Double Circuit Dulled Galvanized Suspension Monopole



Photograph provided by Dominion Energy

AVIATOR-TAKEOFF LINES

Dominion Energy®

Proposed Structure Type:
230kV Double Circuit Dulled Galvanized
Double Deadend 2-Pole



Photograph provided by Dominion Energy

AVIATOR-TAKEOFF LINES

Proposed Structure Type:
230kV Double Circuit Dulled Galvanized Suspension Monopole



Photograph provided by Dominion Energy

AVIATOR-TAKEOFF LINES

Proposed Structure Type:
230kV Double Circuit Dulled Galvanized
Double Deadend Monopole

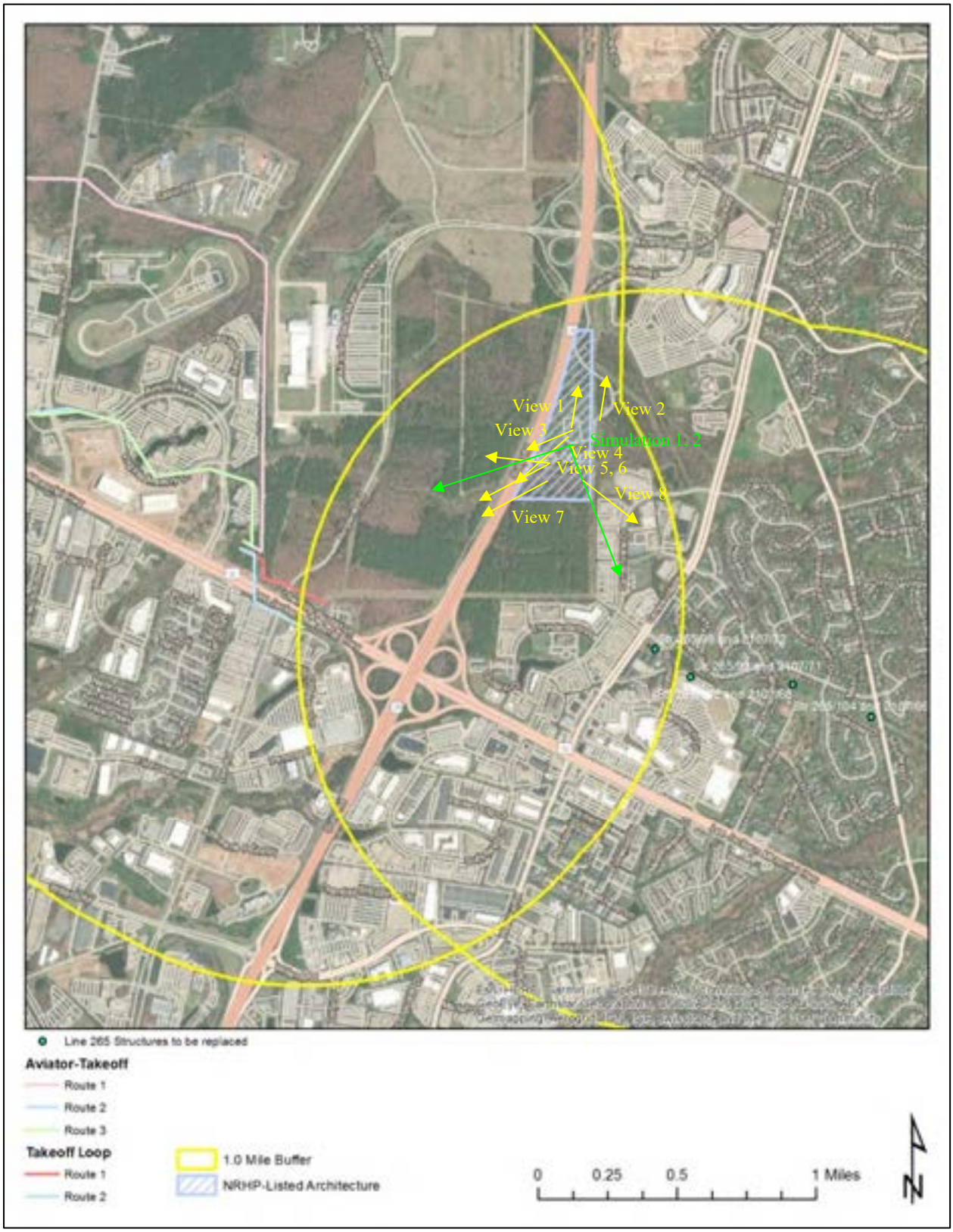


Figure 5-3: Sully Plantation with location and direction of representative photographs and views towards the projects depicted in yellow and photo simulations depicted in green.



Figure 5-4: Photo location 1- View of the front of Sully house from pedestrian walkway, facing north (revealing views of existing transmission line infrastructure along the edge of the property).



Figure 5-5: Photo location 2- View from Sully pedestrian walkway, facing north (revealing views of existing transmission line infrastructure along the edge of the property).

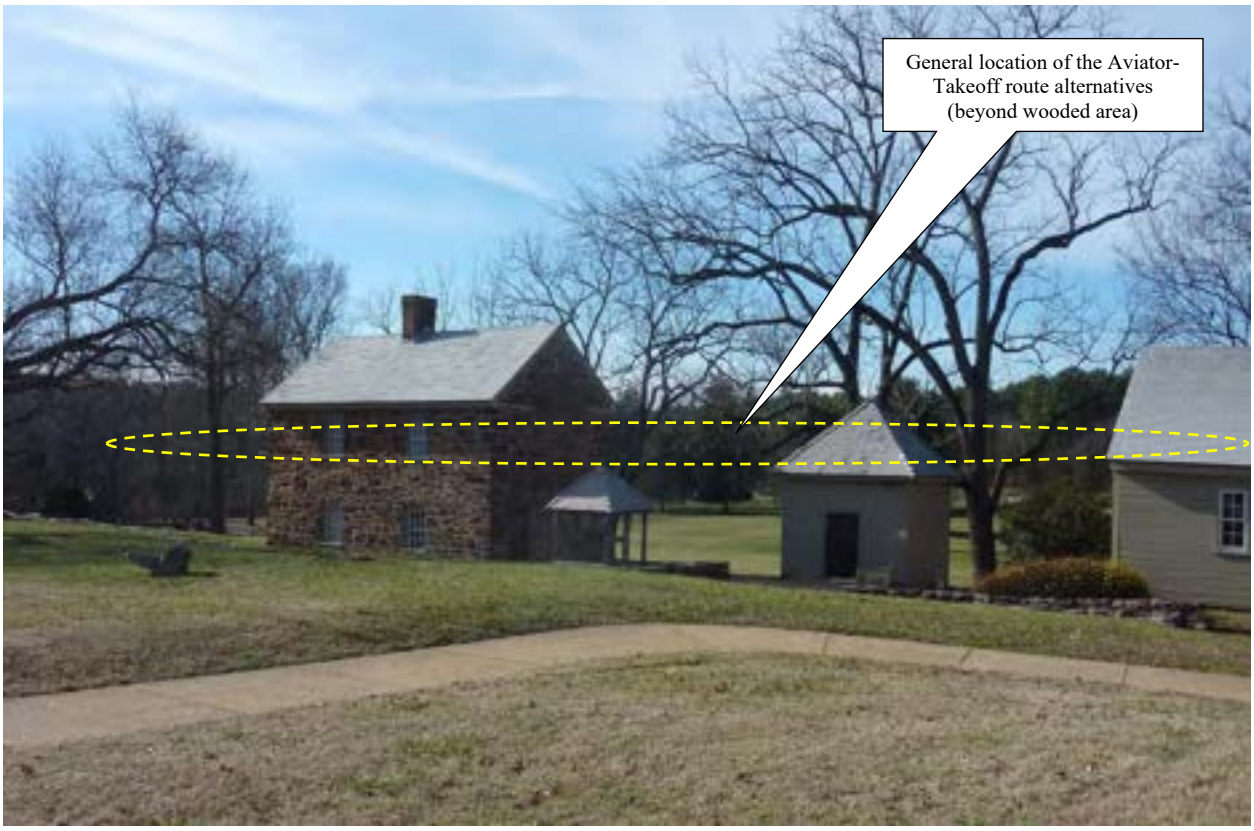


Figure 5-6: Photo location 3- View from main house towards the Aviator-Takeoff route alternatives, facing southwest (No expected visibility – all screened by intervening vegetation).

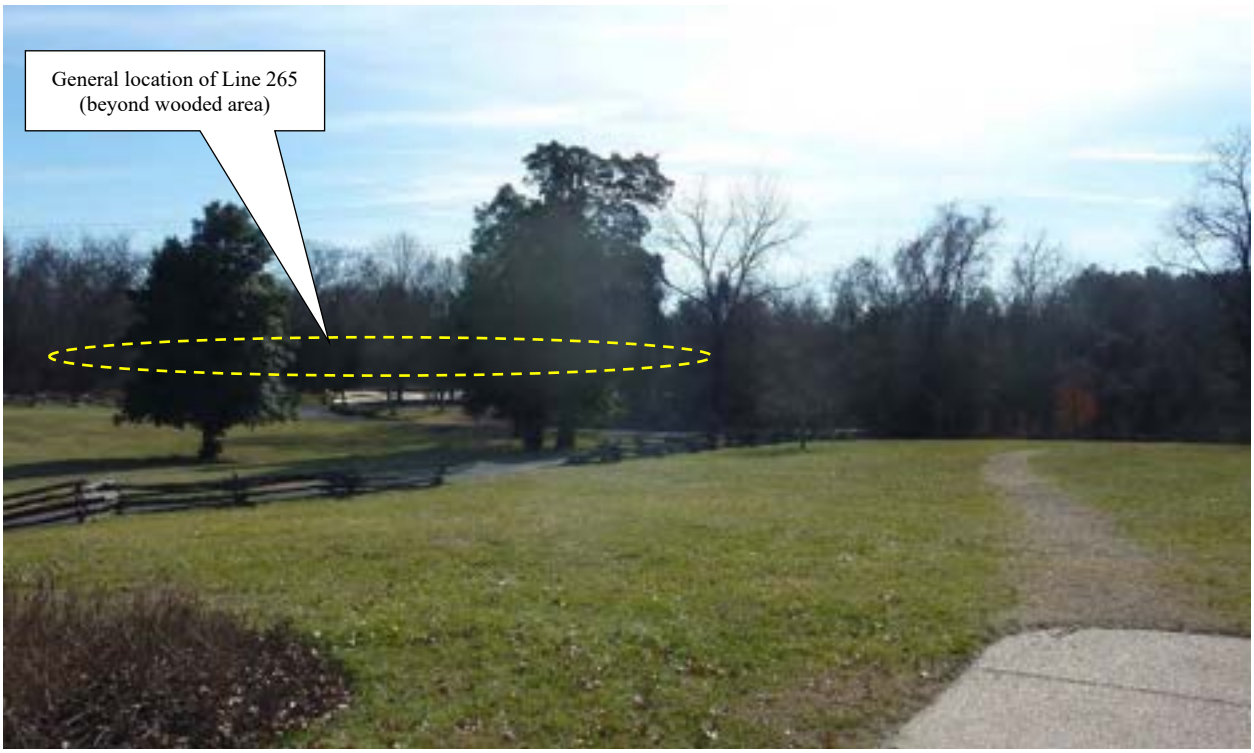


Figure 5-7: Photo location 4- View from main house towards the Line 265 partial rebuild, facing southeast (No expected visibility – screened by intervening vegetation).

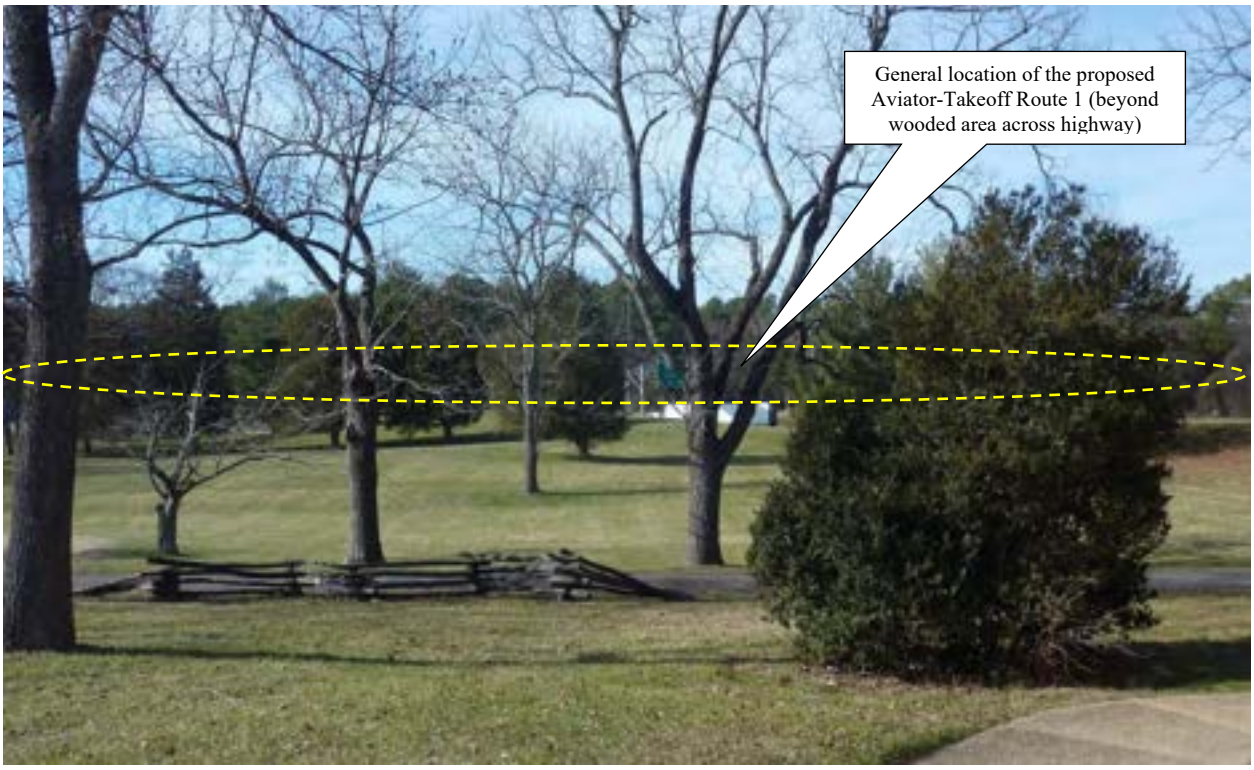


Figure 5-8: Photo location 5- View from former parking lot area towards proposed Aviator-Takeoff Route 1, facing southwest (No expected visibility – screened by intervening vegetation).

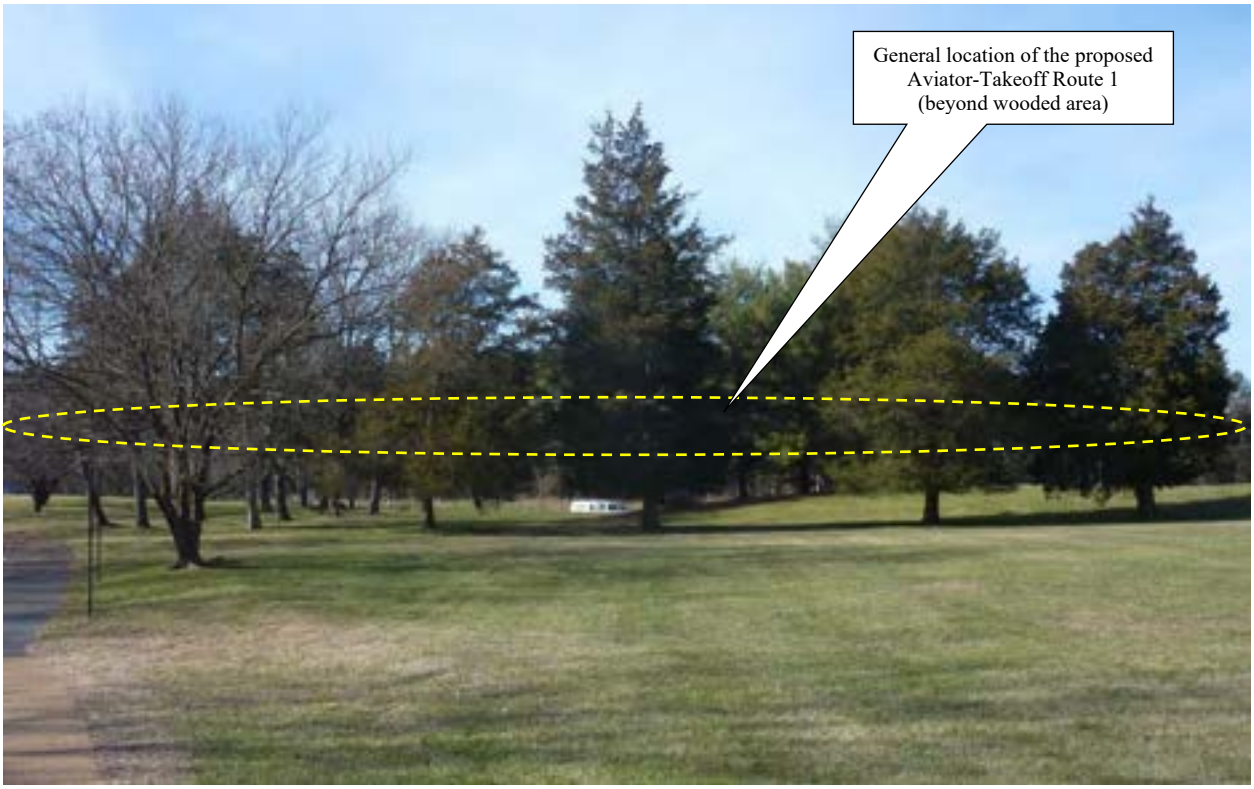


Figure 5-9: Photo location 6- View from former parking lot area towards proposed Aviator-Takeoff Route 1, facing west (No expected visibility – screened by intervening vegetation).

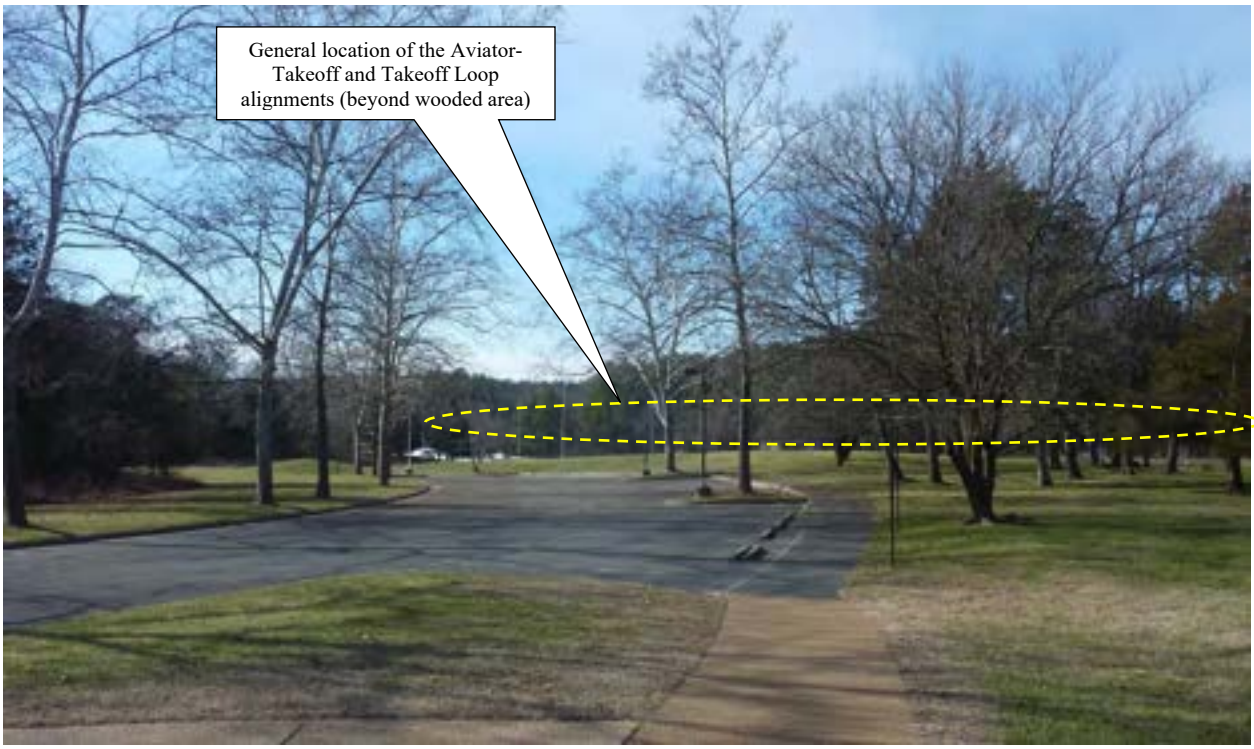


Figure 5-10: Photo location 7- View from former parking lot area towards Aviator-Takeoff and Takeoff Loop alignments, facing southwest (No expected visibility – all screened by intervening vegetation).



Figure 5-11: Photo location 8- View from main house towards the Line 265 partial rebuild, facing southeast (No expected visibility – screened by intervening vegetation).

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 Project requires construction of the proposed 230-34.5 kV Takeoff Substation in Fairfax County, Virginia, as well as minor substation-related work at the Company's future Aviator Substation in Loudoun County, Virginia. The costs associated with this work is provided in Section I.I.

Takeoff Substation

The Takeoff Substation will be constructed with three 112 MVA 230-34.5 kV transformers, two 84 MVA 230-34.5 kV transformers, and nine 230 kV breakers arranged in a breaker-and-a-half configuration. The total area of the Takeoff Substation is approximately 4.3 acres.

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

Aviator Substation

At the future Aviator Substation, the Project requires the installation of the two 230 kV Aviator-Takeoff Lines, as well as supporting 230 kV equipment to include breakers, switches, CCVTs, and arresters. Additionally, one structure replacement within Aviator Substation is required to remove a galvanized steel static monopole and the two spans of 7#7 Alumoweld shield wire connected to it, which will be replaced with two double circuit weathering steel monopole structures.

Other Minor Substation-Related Work

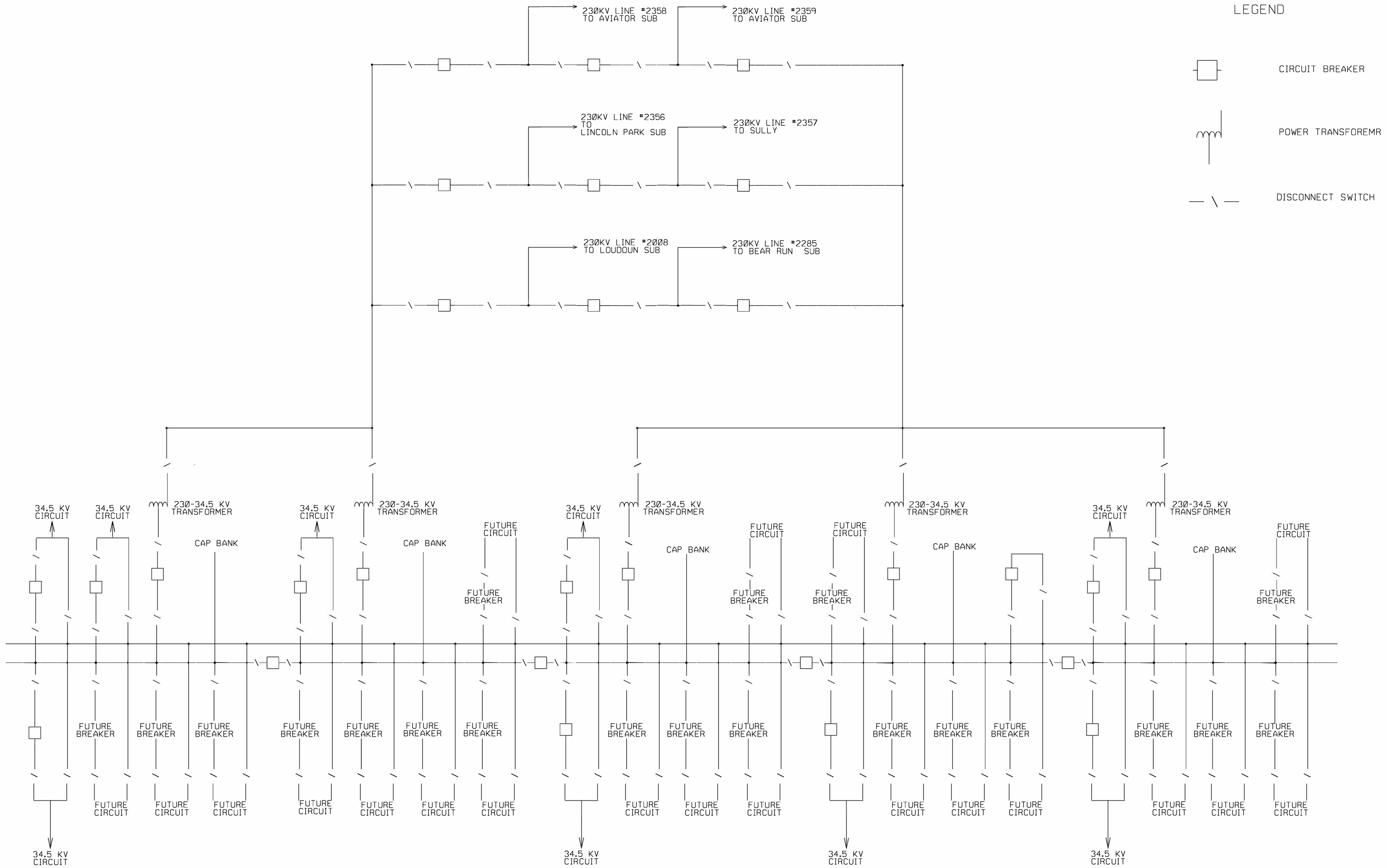
In addition to the substation-related work described above, the Company will perform additional minor work including relay resets and field support necessary to accommodate the Project at the Company's future Bear Run Substation, and existing Lincoln Park, Sully, and Loudoun Substations.

While this work is required in association with the Project, it is not a component of the Project as defined in Section I.A, and the costs associated with this minor substation-related work are not included in the total Project costs. The costs associated with this minor substation-related work are provided below, for reference purposes only.

Other Minor Substation-Related Costs
(approximate)

Substation	Total
Bear Run	$31,900
Lincoln Park	$72,885
Sully	$37,559
Loudoun	$31,850

ATTACHMENT II.C 1



LEGEND

- CIRCUIT BREAKER
- POWER TRANSFOREMR
- DISCONNECT SWITCH

PRELIMINARY
NOT FOR CONSTRUCTION

Revisions				
By	Date	Project No.	Network No.	BM No.	Description
Appr'vd					

#USERNAME#

(00)/(S) DEMARCATION INDICATOR - SEE SUB. OL. | (99)/(T) DEMARCATION INDICATOR - SEE TLIN. OL. | (98)/(D) DEMARCATION INDICATOR - SEE DIST. OL. | (97)/(C) DEMARCATION INDICATOR - SEE CUST. DOC.

Dominion Energy

One Line Diagram

Drawn By:ACK(BMC)	Date 06-24-24	Substation	TAKEOFF
Approval	Date	Drawing No.	

$$$$$$$$SYSTIME

Attachment II.C.2

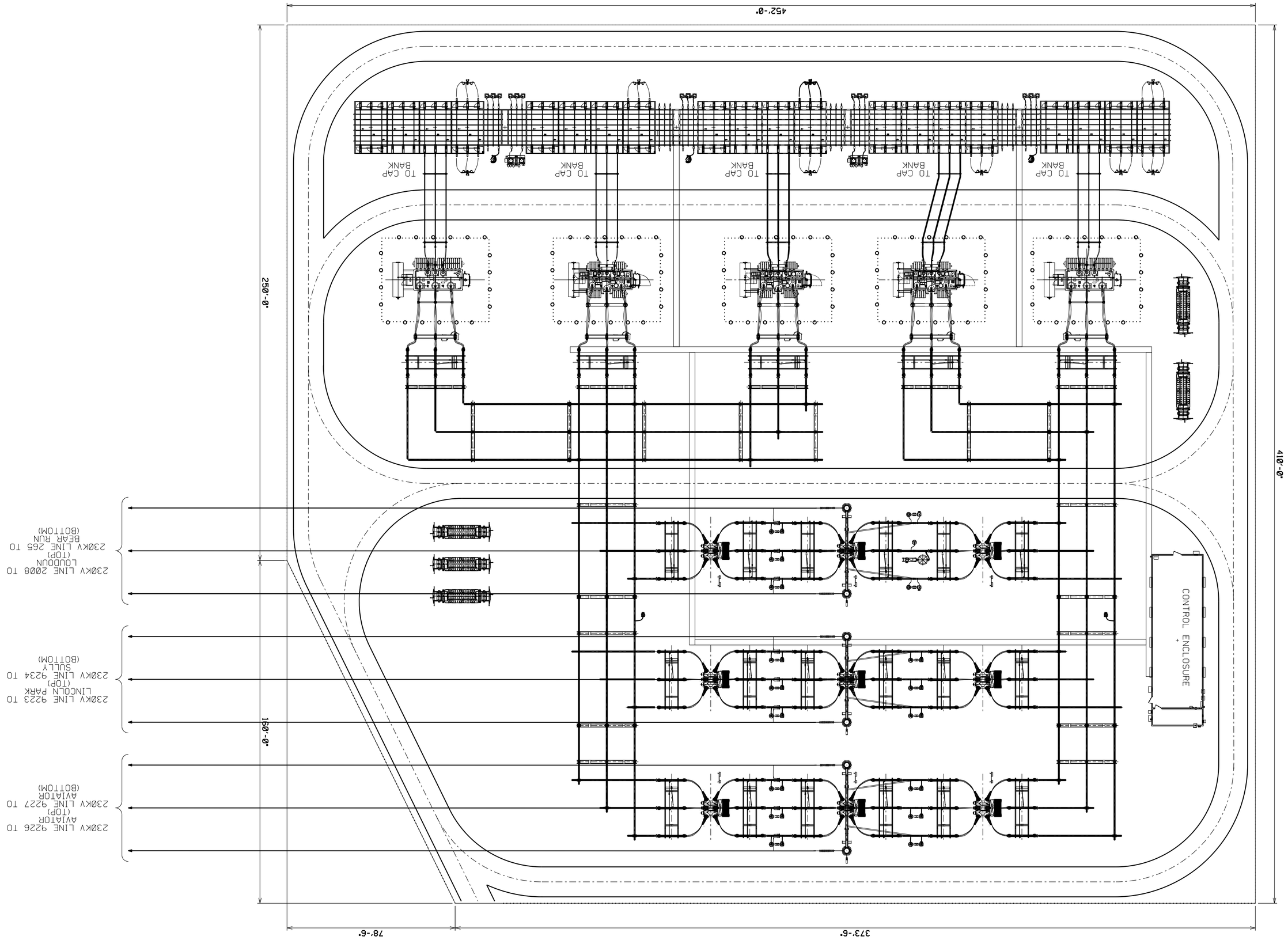
$FILENAME$
PLOTTED: $$$$$$$$$$$$$YTIME
$USERNAME$

PRELIMINARY NOT FOR CONSTRUCTION

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
$USERNAME$							

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

163



ATTACHMENT II.C 2

Cad File Name:	XXX		PLOTTED: $$$$$$$$$$$YTIME	Drawing No. XXXX-XXX
		XXX		
		B/M No.	Revisions	
Approvals			1"=30'	1 of 1
Approvals	XXX		Scale	
Designed by:	ACK(BMC)	06-24-24	99-2846/43-3302	
	Name	Date	Project No.	Sheet No.

Dominion Energy

GENERAL ARRANGEMENT PLAN
TAKEOFF SUBSTATION
FAIRFAX, VIRGINIA

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: **Takeoff Loop and Substation**

Takeoff Loop Proposed Route (Route 1)

The Takeoff Loop Proposed Route is approximately 0.3 mile in length and is located entirely within Fairfax County, extending northwest from a proposed cut-in locations on existing Lines #2008 and #265 to the proposed Takeoff Substation. The Takeoff Loop Proposed Route crosses mostly forested land on an undeveloped area on MWAA property, and an area of forested land that will be cleared for the proposed Takeoff Substation.

According to County parcel data, zoning data, and aerial photo analysis, there are zero dwellings located within 500 feet of the proposed centerline. There are five non-residential buildings (*e.g.*, commercial buildings) located within 500 feet of the proposed centerline of the Takeoff Loop Proposed Route. One existing building, an approximately 6-foot by 4-foot guard shack along Airplane Road, is within the right-of-way and will need to be relocated.

See Attachment III.A.1 and Section 2.L of the DEQ Supplement for the estimated amount of forestland and farmland within the right-of-way that the Proposed Route would impact. While prime farmland soils were identified within the right-of-way, no agricultural areas are within the right-of-way.

For additional description of the character of the area that will be traversed by the Takeoff Loop Proposed Route and the related impacts, see the DEQ Supplement, specifically as to land use (Section 2.K), wetlands (Section 2.D), forests (Section 2.L), agricultural lands (Section 2.L), historic resources (Section 2.I), and wildlife (Section 2.G).

Takeoff Loop Alternative Route 2

Takeoff Loop Alternative Route 2 is approximately 0.3 mile in length and is located entirely within Fairfax County, extending northwest from a proposed cut-in location on Line #2008 to the proposed Takeoff Substation. Takeoff Loop Alternative Route 2 crosses mostly developed commercial and industrial land, highway, and an area of forested land that will be cleared for the proposed Takeoff Substation.

According to County parcel data, zoning data, and aerial photo analysis, there are

two dwellings located within 500 feet of Takeoff Loop Alternative Route 2, and both are greater than 250 feet of the centerline. There are 12 non-residential buildings (*e.g.*, commercial buildings) located within 500 feet of the proposed centerline of Takeoff Loop Alternative Route 2. No building is within the right-of-way.

See Attachment III.A.1 and Section 2.L of the DEQ Supplement for the estimated amount of forestland within the right-of-way that Takeoff Loop Alternative Route 2 would impact. No farmland is located within the right-of-way.

For additional description of the character of the area that will be traversed by Takeoff Loop Alternative Route 2 and the related impacts, see the DEQ Supplement, specifically as to land use (Section 2.K), wetlands (Section 2.D), forests (Section 2.L), agricultural lands (Section 2.L), historic resources (Section 2.I), and wildlife (Section 2.G).

Takeoff Substation

The Takeoff Substation will require an additional approximately 4.3 acres and is located entirely within Fairfax County within forested land.

No dwellings are located within 500, 250, or 100 feet of the proposed footprint. There are five non-residential buildings located within 500 feet of the proposed footprint. One of these non-residential buildings is located within 250 feet of the proposed footprint.

Sully-Takeoff Partial Reconductor/Rebuild

Reconductor/Rebuild Proposed Route

The Reconductor/Rebuild Proposed Route is approximately 1.9 miles long, including 1.0 mile of reconductor only and 0.9 mile of reconductor and partial rebuild. Five existing structures within the 0.9-mile Sully-Takeoff Partial Rebuild Segment of existing 120-foot-wide right-of-way will be replaced. The Sully-Takeoff Partial Rebuild Segment is located entirely within maintained right-of-way crossing existing developed commercial and residential areas.

According to County parcel data, zoning data, and aerial photo analysis, there are 224 dwellings located within 500 feet of the proposed centerline of the 0.9-mile Sully-Takeoff Partial Rebuild Segment, although these dwellings are all within 500 feet of the existing Lines #265 and #2107. No dwellings are located within the existing right-of-way, although 41 are located within 60 feet of the existing right-of-way of the 0.9-mile Sully-Takeoff Partial Rebuild Segment. There are no non-residential buildings located within the existing right-of-way, and six commercial or non-residential buildings within 500 feet of the centerline of the 0.9-mile Sully-Takeoff Partial Rebuild Segment of the Reconductor/Rebuild Proposed Route.

As the entire Sully-Takeoff Partial Reconductor/Rebuild is within existing,

maintained, right-of-way, there will be no new impacts to forestland of farmland. See Attachment III.A.1 and Section 2.L of the DEQ Supplement for additional details about the Proposed Route.

For additional description of the character of the area that will be traversed by the 0.9-mile Sully-Takeoff Partial Rebuild Segment of the Reconductor/Rebuild Proposed Route and the related impacts, see the DEQ Supplement, specifically as to land use (Section 2.K), wetlands (Section 2.D), forests (Section 2.L), agricultural lands (Section 2.L), historic resources (Section 2.I), and wildlife (Section 2.G).

Aviator-Takeoff Lines

Aviator-Takeoff Proposed Route (Route 1)

The Aviator-Takeoff Proposed Route is approximately 3.2 miles in length and is located in both Loudoun and Fairfax Counties, extending southeast from the future Aviator Substation to the proposed Takeoff Substation. The Proposed Route crosses mostly forested and open space/developed land along an existing roadway on MWAA property. The entire Loudoun County portion of the right-of-way is zoned for industrial, while the entire Fairfax County portion of the right-of-way is zoned residential on MWAA property. However, this MWAA property is the Dulles Airport and will not be developed for residential uses. Therefore, the route does not cross any residential areas.

According to County parcel data, zoning data, and aerial photo analysis, there are no dwellings located within 500 feet of the proposed centerline of the Aviator-Takeoff Proposed Route. There are 20 commercial buildings within 500 feet of the centerline. One building, a mobile office trailer, is within the right-of-way of the Aviator-Takeoff Proposed Route.

See Attachment III.A.1 and Section 2.L of the DEQ Supplement for the estimated amount of forestland and farmland within the right-of-way that the Aviator-Takeoff Proposed Route would impact. While prime farmland soils were identified within the right-of-way, no agricultural areas are within the right-of-way.

For additional description of the character of the area that will be traversed by the Aviator-Takeoff Proposed Route and the related impacts, see the DEQ Supplement, specifically as to land use (Section 2.K), wetlands (Section 2.D), forests (Section 2.L), agricultural lands (Section 2.L), historic resources (Section 2.I), and wildlife (Section 2.G).

Aviator-Takeoff Alternative Route 2

Aviator-Takeoff Alternative Route 2 is approximately 3.3 miles in length and is located in both Loudoun and Fairfax Counties, extending southeast from the future Aviator Substation to the proposed Takeoff Substation. Aviator-Takeoff Alternative Route 2 crosses mostly industrial developed land and some forested areas through the Cub Run RPA. The route does not cross any residential areas.

According to County parcel data, zoning data, and aerial photo analysis, there are no dwellings located within 500 feet of the proposed centerline of Aviator-Takeoff Alternative Route 2. There are 61 commercial buildings located within 500 feet of the proposed centerline of Aviator-Takeoff Alternative Route 2. One outbuilding, a hoop storage building, is within the right-of-way of Aviator-Takeoff Alternative Route 2.

See Attachment III.A.1 and Section 2.L of the DEQ Supplement for the estimated amount of forestland and farmland within the right-of-way that Aviator-Takeoff Alternative Route 2 would impact. While prime farmland soils were identified within the right-of-way, no agricultural areas are within the right-of-way.

For additional description of the character of the area that will be traversed by Aviator-Takeoff Alternative Route 2 and the related impacts, see the DEQ Supplement, specifically as to land use (Section 2.K), wetlands (Section 2.D), forests (Section 2.L), agricultural lands (Section 2.L), historic resources (Section 2.I), and wildlife (Section 2.G).

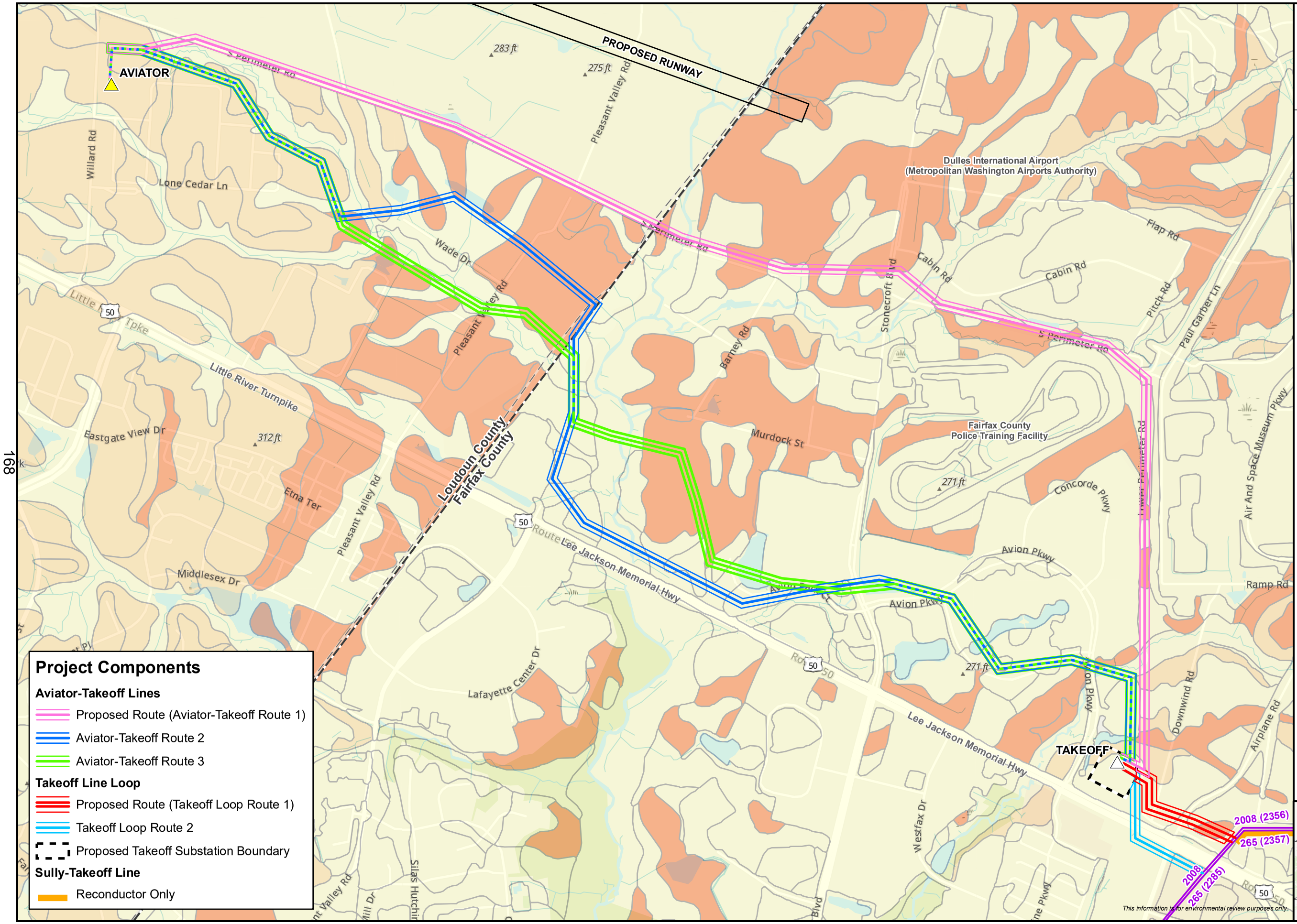
Aviator-Takeoff Alternative Route 3

Aviator-Takeoff Alternative Route 3 is approximately 3.1 miles in length and is located in both Loudoun and Fairfax Counties, extending southeast from the future Aviator Substation to the proposed Takeoff Substation. Aviator-Takeoff Alternative Route 3 crosses mostly industrial developed land and some forested areas through the Cub Run RPA. The route does not cross any residential areas.

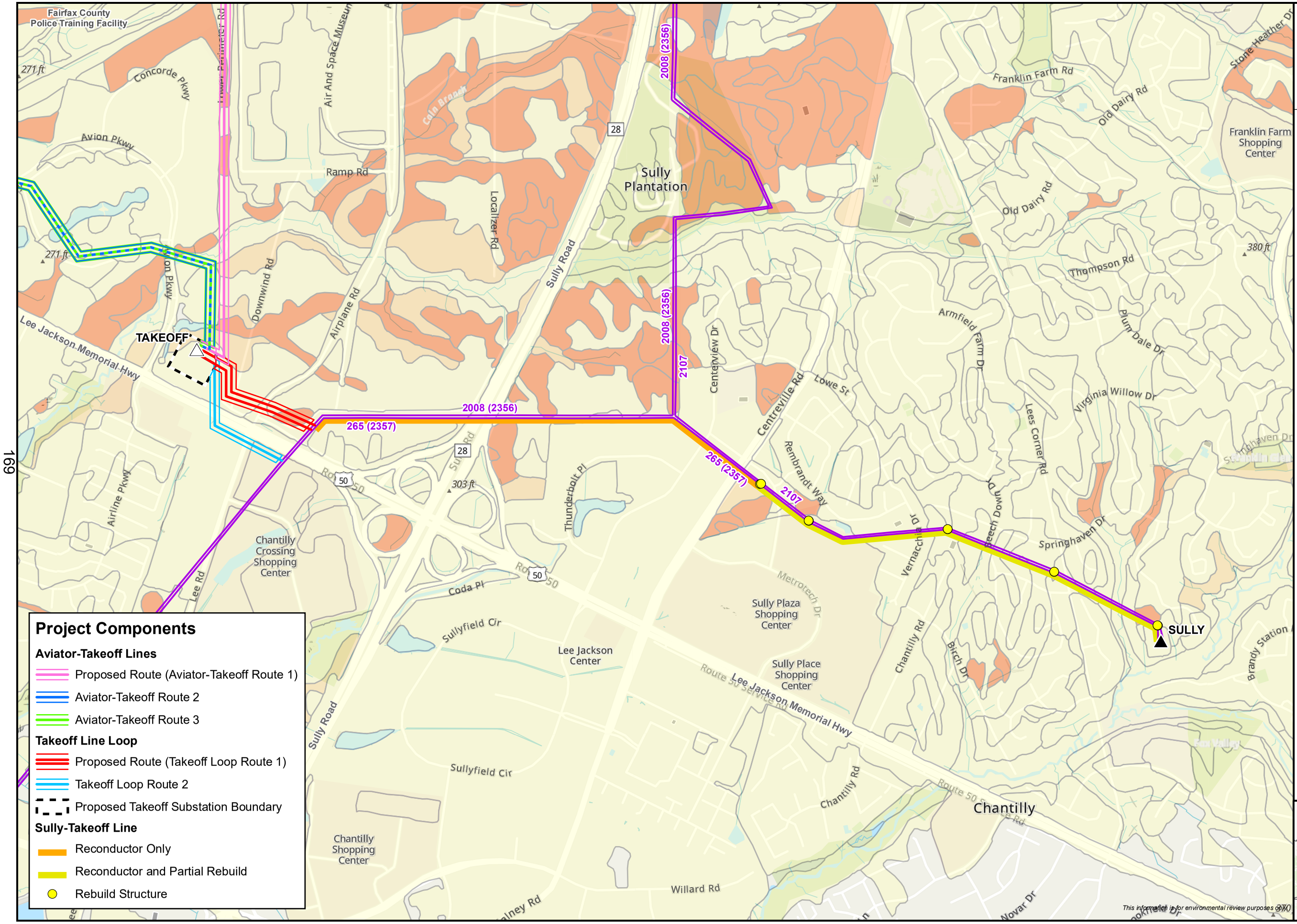
According to County parcel data, zoning data, and aerial photo analysis, there are no dwellings located within 500 feet of the proposed centerline of Aviator-Takeoff Alternative Route 3. There are 64 commercial buildings located within 500 feet of the proposed centerline of the route. One outbuilding, an accessory storage building, is within the Aviator-Takeoff Alternative Route 3 right-of-way.

See Attachment III.A.1 and Section 2.L of the DEQ Supplement for the estimated amount of forestland and farmland within the right-of-way that Aviator-Takeoff Alternative Route 3 would impact. While prime farmland soils were identified within the right-of-way, no agricultural areas are within the right-of-way.

For additional description of the character of the area that will be traversed by Aviator-Takeoff Alternative Route 3 and the related impacts, see the DEQ Supplement, specifically as to land use (Section 2.K), wetlands (Section 2.D), forests (Section 2.L), agricultural lands (Section 2.L), historic resources (Section 2.I), and wildlife (Section 2.G).



Attachment III.A.1



Project Components

Aviator-Takeoff Lines

- Proposed Route (Aviator-Takeoff Route 1)
- Aviator-Takeoff Route 2
- Aviator-Takeoff Route 3

Takeoff Line Loop

- Proposed Route (Takeoff Loop Route 1)
- Takeoff Loop Route 2
- Proposed Takeoff Substation Boundary

Sully-Takeoff Line

- Reconductor Only
- Reconductor and Partial Rebuild
- Rebuild Structure

Dominion Energy®

Attachment III.A.1
Prime Farmland and Farmland of Statewide Importance

230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation

Fairfax and Loudoun Counties, Virginia

- Existing Substation
- Proposed Substation
- Proposed Takeoff Substation Boundary
- Existing Dominion Transmission Line Labeled with Current (Future) Number

SSURGO Soils Farmland Class

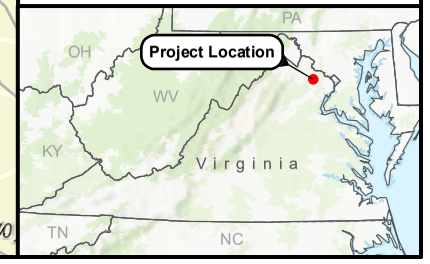
- All areas are prime farmland
- Prime farmland if drained
- Farmland of statewide importance
- Not prime farmland

0 500 1,000
Feet

1:12,000

ERM

N W E S



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: Stakeholder Engagement

At Dominion Energy Virginia, the Company believes stakeholder engagement is critical to the success of this Project. The data center industry has grown substantially in northern Virginia in recent years, and the Company has made significant investments in new infrastructure to meet the growing demand for electricity in a concentrated area. This Project is critical to the success of this industry in northern Virginia. Routing and siting this Project would not have been possible without important partnerships with substantial community involvement, including environmental organizations, elected officials, governmental bodies, community leaders and community members. Outreach about the Project to County leaders, the data center industry, and the creation of the Loudoun Reliability Engagement Group (or "LREG") engagement group that consisted of individuals with a variety of expertise and knowledge of the area, began in June 2022. Many of these stakeholders remain engaged and continue to represent their specialty as they participate in future electric transmission projects.

Feedback is critical as the Company considers all potential benefits and impacts of the Project—including connecting the future Aviator Substation to the proposed Takeoff Substation in both Loudoun and Fairfax Counties.

Dominion Energy Virginia has and will continue to engage with a broad range of stakeholders that have interests across both counties and the Project components.

Stakeholder engagement includes both a statewide and regional approach in the following segments: cultural and historic resource stewardship organizations; the business community and workforce organizations; the environmental community; and organizations that represent the needs of underrepresented communities. These organizations agreed to combine into the LREG. Since July 2022, the LREG group of more than 20 volunteers have met at least every other month to hear updates on electric transmission infrastructure projects impacting Loudoun County. The LREG has received updates on the Project beginning in November 2022 and provided input and feedback from their collective organizations related to routing, siting, environmental concerns as well as concerns about visual impacts to private property owners. Copies of presentations the Company made to the LREG group since first engaging on the Project are available on www.dominionenergy.com/NOVA. The Company remains committed to maintaining communications with this engagement group for other reliability projects proposed in Loudoun County.

The Company has also met with residents of nearby neighborhoods and churches and authorities representing MWAA.

In August 2022, the Company launched an internet website dedicated to a growing list of projects in the area: www.dominionenergy.com/NOVA. Specific details about the Takeoff Loop and Substation, the Sully-Takeoff Partial Reconductor/Rebuild, and Aviator-Takeoff Lines, were added in June 2023. The website includes a description of the proposed Project, an explanation of the need, routing options, GeoVoice (an interactive mapping tool), photo renderings and simulations, and information on the Commission review process. The Company also made the website available to the public in English and Spanish.

- In early October 2023, a save-the-date postcard was mailed to 586 nearby residents and business. The postcard included Project information and details regarding the in-person community meeting on October 25, 2023. The postcard is available on the Project website (www.dominionenergy.com/NOVA).[40]

- On October 25, 2023, the Project team hosted an in-person community meeting at Rajdhani Mandir in Chantilly, Virginia, to inform stakeholders about the proposed Project. There were 13 attendees.

- On May 17, 2024, a second save-the-date postcard was mailed to 586 nearby residents and businesses. The postcard included Project information and details regarding a second in-person community meeting on June 6, 2024. The postcard is available on the Project website (www.dominionenergy.com/NOVA). Project community meeting information was also available on https://engage.erm.com/novareliability/page/aviator. The digital advertising campaign promoting the June 2024 community meeting ran on Nextdoor, Facebook, and Instagram from May 23 through June 6, 2024. The Spanish campaign launched on May 24, 2024. Three print advertisements were published in the following Loudoun County publications: Loudoun Times Mirror, Loudoun Now, and Loudoun Local Living.

- On June 6, 2024, the Project team hosted a second in-person community meeting at Rajdhani Mandir in Chantilly, Virginia, to inform stakeholders about the proposed Project. There were seven attendees. The community meeting was conducted in an exhibition format, and the layout included

[40] At the time the save-the-date postcard was mailed in October 2023, the Company was considering one route for the Takeoff Loop and four routes (Routes A-D) for the Aviator-Takeoff Lines, as shown on the postcard map. Since October 2023, the Company has modified the routes for both the Takeoff Loop and the Aviator-Takeoff Lines, resulting in two route options for the Takeoff Loop and three route options for the Aviator-Takeoff Lines. Route A is no longer included in the Project and parts of Routes B, C, and D are incorporated into the current alignments of Aviator-Takeoff Alternative Routes 2 and 3. As a result, none of the Routes A-D as depicted on the October 2023 save-the-date postcard are included in their entireties as the Aviator-Takeoff Alternative Routes identified in this filing. *See also supra*, n. 37.

several project-specific stations, such as maps of the proposed electric transmission line routes, study areas, photo simulations, and related informational boards. A check-in table was placed at the main entrance, where Project team members greeted attendees and tracked attendance using Jambo, a stakeholder relationship management software. A feedback table was set up to collect comments from community meeting attendees via paper comment forms and a QR code directing users to the Loudoun County Transmission Projects GeoVoice webpage. One attendee of the June 6, 2024 meeting noted on the feedback form that "all of the visuals" related to engineering and design "were very helpful," and that she "enjoyed talking with [Company] representatives and" she was "happy to see [that the Company] gave thought to environmental impacts. See Attachment III.B.1.

- GeoVoice is an interactive mapping tool allowing users to digitally submit comments to the Project team. GeoVoice was first populated with Project routing options in September 2023, and was subsequently updated with typical proposed structure drawings and photo simulations, which are included as Attachment III.B.2. Users do not need to register before viewing the routing details. There have been three GeoVoice comments submitted for this Project since October 21, 2023.

- Environmental justice research indicated that a significant population of Spanish speakers reside in the Project area. Some printed materials, including comment forms and a Project fact sheet, were translated to accommodate attendees whose primary language was Spanish. Seven individuals attended the community meeting.

- From May 23, 2024, to June 6, 2024, the Company conducted a thorough digital advertising campaign designed to communicate all aspects of the Project. The goal was through social media platforms, display advertisements, videos and newspaper ads, to provide information about the many alternatives for meaningful involvement among all impacted communities. See Attachment III.B.3, which includes the advertisements and digital campaign results.

Environmental Justice

As set forth in Section 5.7 of the Routing Study, the Company researched the demographics of the surrounding communities using data from the U.S. Census Bureau's American Community Survey 5-Year Estimates (2018-2022). This review revealed that 13 Census Block Groups ("CBGs") are located within one mile of the Project as proposed. A review of census data for several demographic characteristics identified populations within the Project study area that meet the Virginia Environmental Justice Act ("VEJA") thresholds for Environmental Justice Communities ("EJ Communities") (Va. Code §§ 2.2-234, 2.2-235).

Of the 13 CBGs within one mile of the Takeoff Loop and Aviator-Takeoff Lines

routes, 11 CBGs contain populations of color, three CBGs contain low-income populations, and eight CBGs contain linguistically isolated populations (in two CBGs, more than 20% of households are "limited English speaking"). Of these 13 CBGs, four are crossed by the Takeoff Loop and Aviator-Takeoff Lines, two of which do not have permanent populations as they encompass the Dulles Airport. The other two contain populations of color and one of these also contains low-income and linguistically isolated populations. The Sully-Takeoff Partial Reconductor/Rebuild crosses two CBGs, both of which contain populations of color. See Sections 5.7 and 6.5 of the Environmental Routing Study for the results of the Company's EJ analysis.

As set forth above in this Section III.B, the Company has engaged extensively all communities within the Project study area, including people in the EJ Community CGBs discussed herein. This engagement has included accommodations for Spanish speakers at the community meetings, and translations of Project information into other languages. The Company believes that 1) its work has allowed for the fair treatment and meaningful involvement of all interested people, regardless of race, color, national origin, income, faith, or disability, and 2) the Proposed Route of the Project's Takeoff Loop, Sully-Takeoff Partial Rebuild, and Aviator-Takeoff Lines minimizes potential impacts to EJ Communities and other populations, and will not result in a disproportionate impact on EJ Communities.

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.4 for a copy of the Company's Environmental Justice Policy.



Dominion Energy subject matter experts are here to answer your questions. Please submit any additional questions or comments using this form for the project team to incorporate into our project planning.

Los expertos en la materia de Dominion Energy están aquí para responder a sus preguntas. Por favor, envíe sus preguntas o comentarios adicionales utilizando este formulario para que el equipo del proyecto los incorpore a nuestra planificación del proyecto.

Engineering & Design / *Ingeniería y diseño*
all of the visuals were very helpful!
Construction & Impact / *Construcción e impacto*
same as above
Additional comments or questions? Use reverse side. *¿Preguntas o comentarios adicionales? Por favor, utilice el reverso.*

If you would like your contact information for this project, please provide your preferred contact information below.

Si desea que su información de contacto se incluya en este proyecto, indique a continuación sus datos de contacto preferentes.

Name / *Nombre*		Preferred method of contact / *Método de contacto preferente*	
Property Address / *Dirección de la propiedad*		Phone/ *Teléfono*	
City, State, Zip Code / *Ciudad, estado, código postal*		Email Address / *Dirección de correo electrónico*	

Additional Comments
Comentarios adicionales

I enjoyed talking with your representatives and am happy to see you gave thought to environmental impacts.

Please leave your completed comment form at the sign-in table or mail to:

Powerline, Dominion Energy, P.O. Box 26666, Richmond, VA 23261

Email: powerline@dominionenergy.com

Por favor, deje su formulario de comentarios completo en la mesa de inscripción o bien envíelo por correo postal a:

Powerline, Dominion Energy, P.O. Box 26666, Richmond, VA 23261

Correo electrónico: powerline@dominionenergy.com

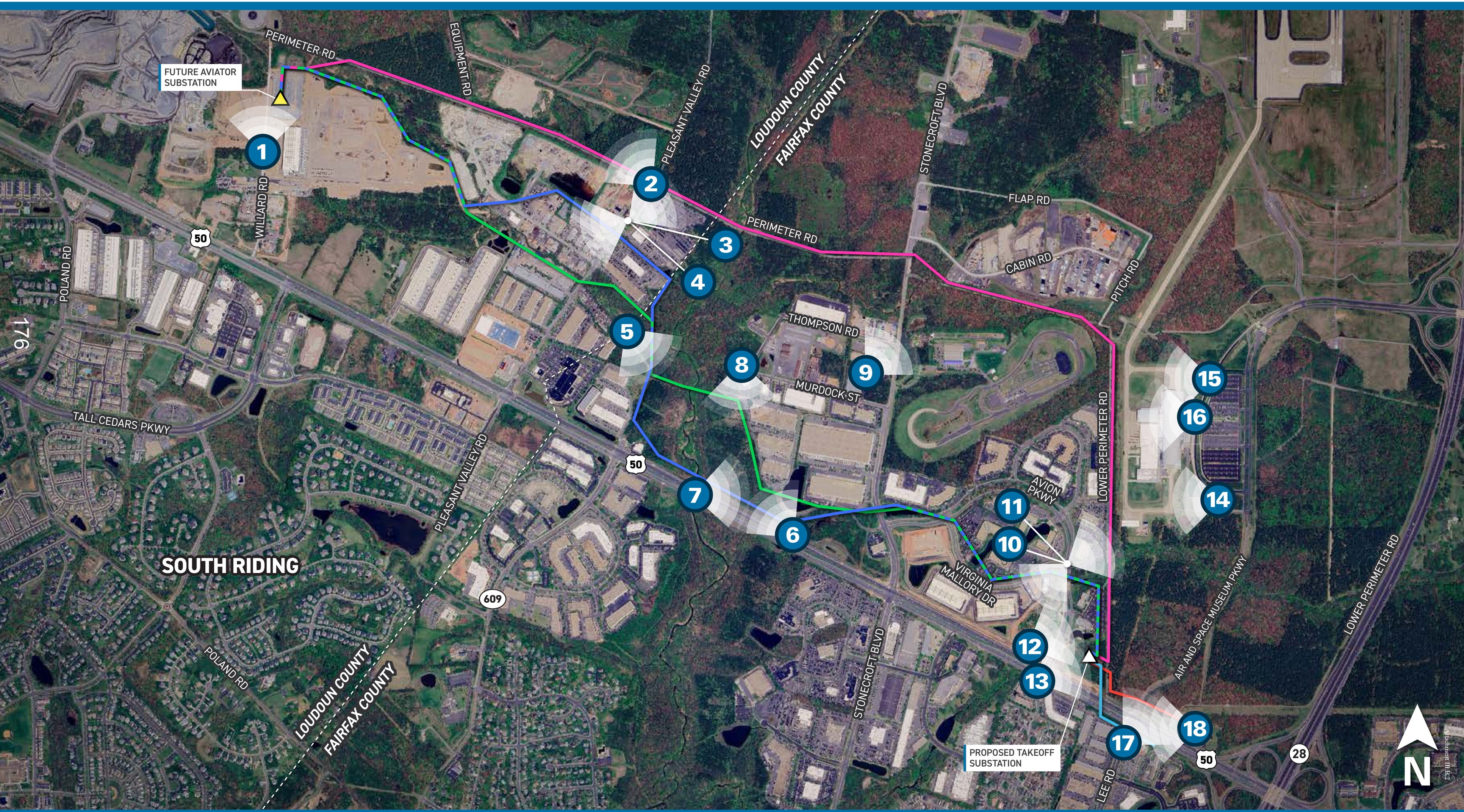
AVIATOR TO TAKEOFF

Transmission Line Project

Photo Location Map

- Viewpoint Location
- Aviator-Takeoff Route Alternative 1
- Aviator-Takeoff Route Alternative 2
- Aviator-Takeoff Route Alternative 3
- Takeoff Loop Route Alternative 1
- Takeoff Loop Route Alternative 2
- Proposed Substation
- Future Aviator Substation

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Attachment III.5.2

AVIATOR TO TAKEOFF

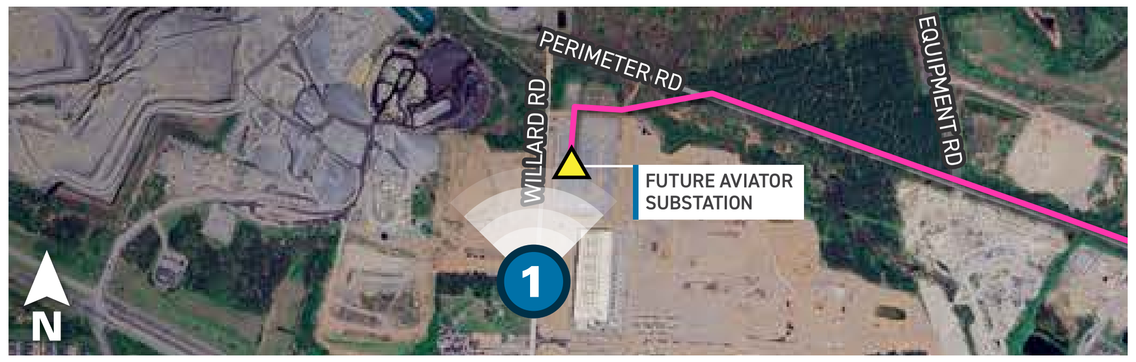
Transmission Line Project

Viewpoint 1

Date: 4/18/2023 **Time:** 3:48 pm **Viewing Direction:** North

1 Viewpoint Location — Aviator-Takeoff Route Alternative 1

△ Future Aviator Substation



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EXISTING CONDITIONS

PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 1**

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 1

Date: 4/18/2023 **Time:** 3:48 pm **Viewing Direction:** North

1 Viewpoint Location — Aviator-Takeoff Route Alternative 2

Aviator-Takeoff Route Alternative 3



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EXISTING CONDITIONS

PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 2** **Aviator-Takeoff Route Alternative 3**

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

AVIATOR TO TAKEOFF

Transmission Line Project

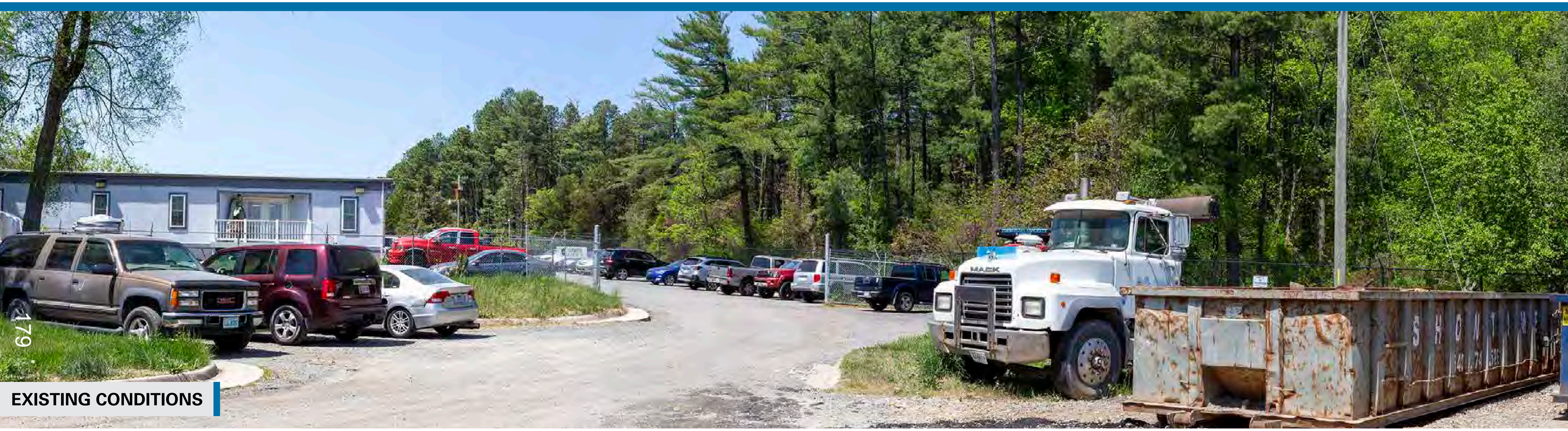
Viewpoint 2

Date: 4/20/2023 **Time:** 12:41 pm **Viewing Direction:** Northwest

2 Viewpoint Location — Aviator-Takeoff Route Alternative 1



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EXISTING CONDITIONS



PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 1**

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 3

Date: 4/20/2023 **Time:** 12:26 pm **Viewing Direction:** Southwest

3 Viewpoint Location — Aviator-Takeoff Route Alternative 2



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EXISTING CONDITIONS

PROPOSED CONDITIONS

Aviator-Takeoff Route Alternative 2

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

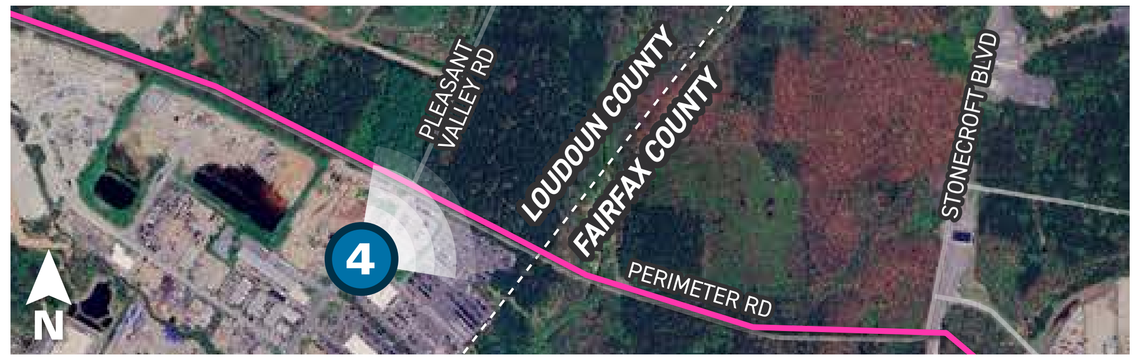
AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 4

Date: 4/20/2023 **Time:** 12:31 pm **Viewing Direction:** Northeast

4 Viewpoint Location — Aviator-Takeoff Route Alternative 1



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EXISTING CONDITIONS



PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 1**

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 5

Date: 1/29/2024 **Time:** 2:34 pm **Viewing Direction:** Southeast

5 Viewpoint Location — Aviator-Takeoff Route Alternative 1



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EXISTING CONDITIONS

PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 1** **OVERLAY**

Objects displayed in yellow will be fully or partially obscured by terrain and vegetation.

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 5

Date: 1/29/2024 **Time:** 2:34 pm **Viewing Direction:** Southeast

5 Viewpoint Location — Aviator-Takeoff Route Alternative 2



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EXISTING CONDITIONS

PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 2**

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 5

Date: 1/29/2024 **Time:** 2:34 pm **Viewing Direction:** Southeast

5 Viewpoint Location — Aviator-Takeoff Route Alternative 3



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EXISTING CONDITIONS

PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 3**

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 6

Date: 4/18/2023 **Time:** 3:34 pm **Viewing Direction:** Northwest

6 Viewpoint Location — Aviator-Takeoff Route Alternative 1



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EXISTING CONDITIONS

PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 1** **OVERLAY**

Objects displayed in yellow will be fully or partially obscured by terrain and vegetation.

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 6

Date: 4/18/2023 **Time:** 3:34 pm **Viewing Direction:** Northwest

6 Viewpoint Location — Aviator-Takeoff Route Alternative 2



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EXISTING CONDITIONS

PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 2**

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 6

Date: 4/18/2023 **Time:** 3:34 pm **Viewing Direction:** Northwest

6 Viewpoint Location — Aviator-Takeoff Route Alternative 3



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EXISTING CONDITIONS



PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 3**

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

AVIATOR TO TAKEOFF

Transmission Line Project

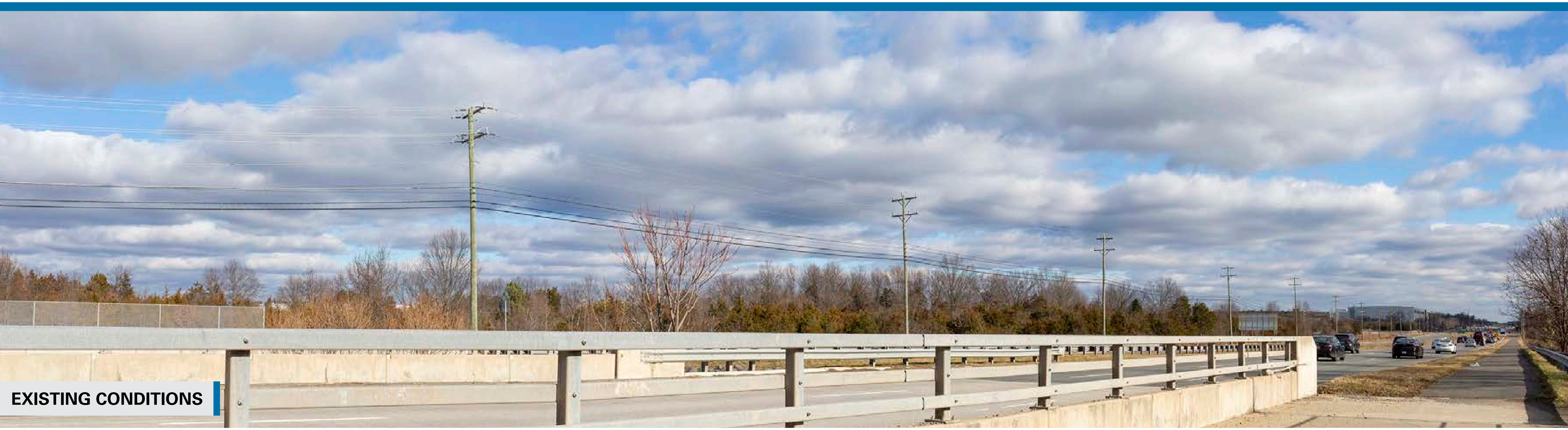
Viewpoint 7

Date: 1/29/2024 **Time:** 2:10 pm **Viewing Direction:** East

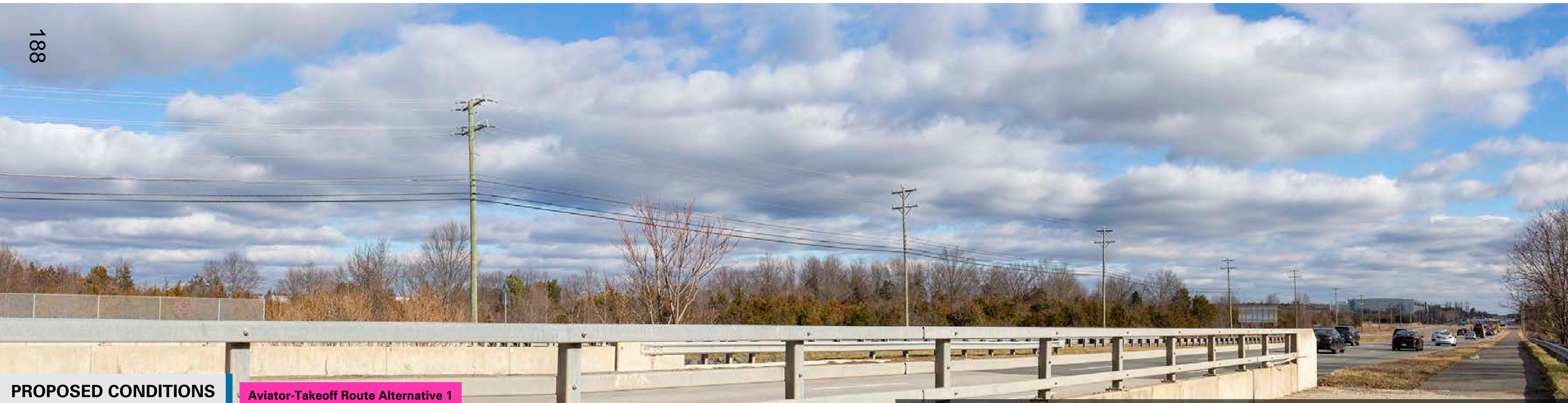
7 Viewpoint Location — Aviator-Takeoff Route Alternative 1



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EXISTING CONDITIONS



PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 1**

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

AVIATOR TO TAKEOFF

Transmission Line Project

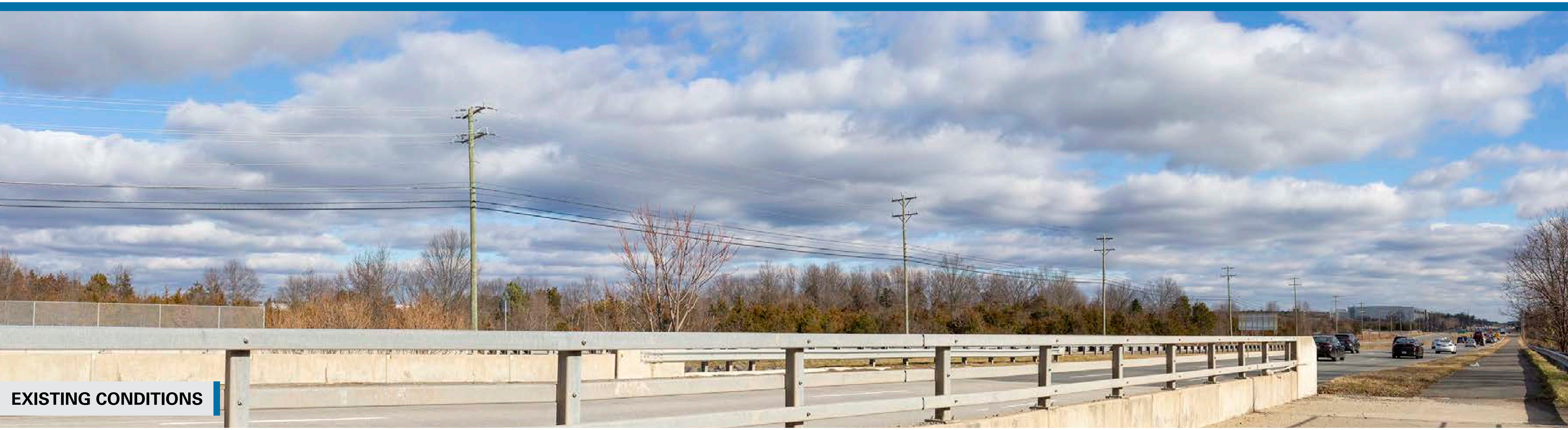
Viewpoint 7

Date: 1/29/2024 **Time:** 2:10 pm **Viewing Direction:** East

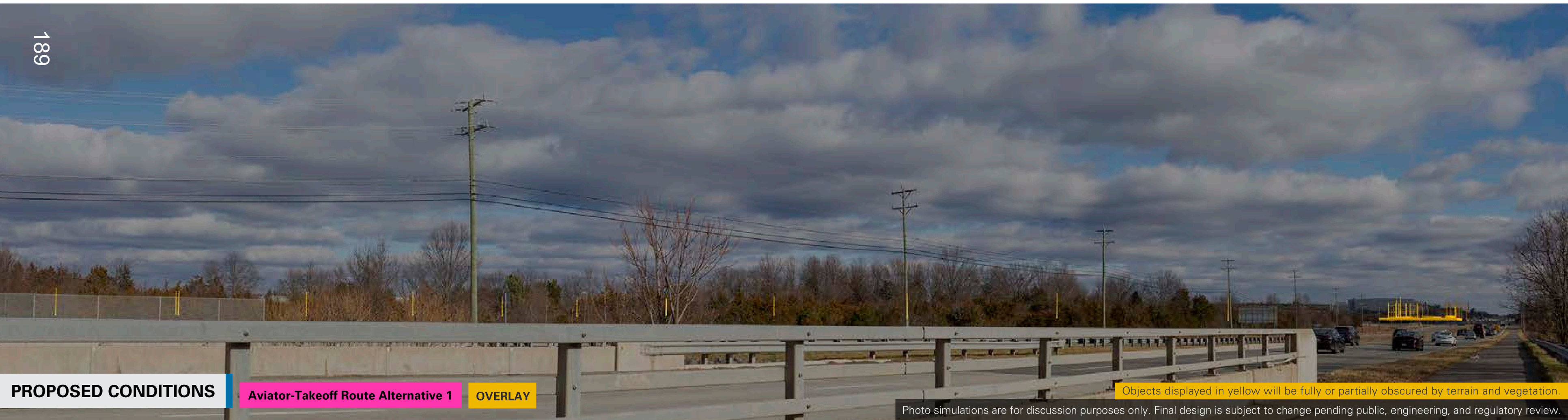
7 Viewpoint Location — Aviator-Takeoff Route Alternative 1



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EXISTING CONDITIONS



PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 1** **OVERLAY**

Objects displayed in yellow will be fully or partially obscured by terrain and vegetation.

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

AVIATOR TO TAKEOFF

Transmission Line Project

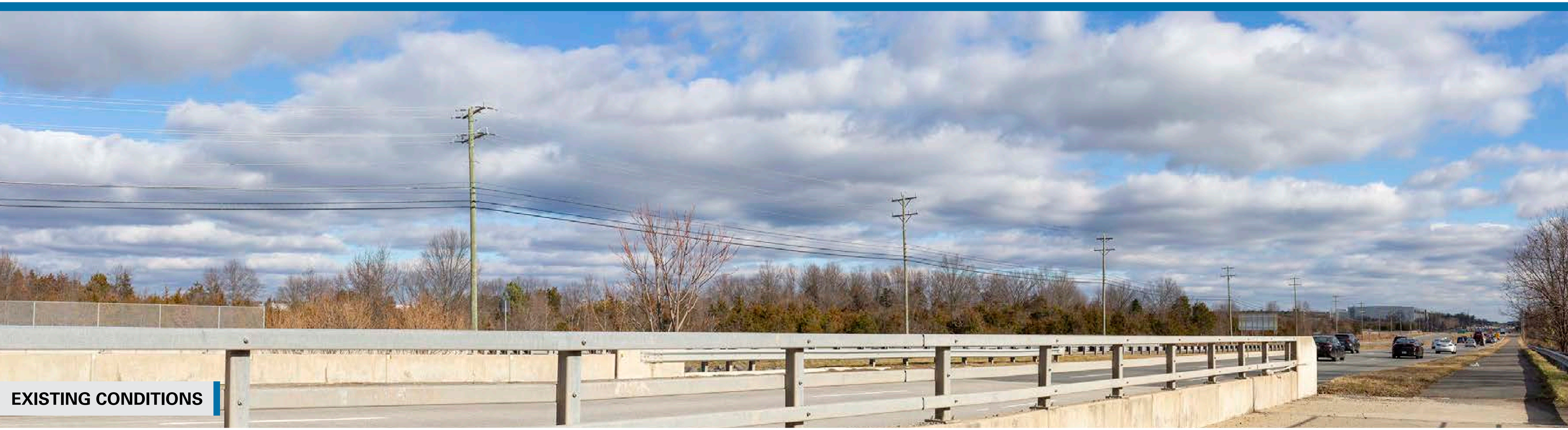
Viewpoint 7

Date: 1/29/2024 **Time:** 2:10 pm **Viewing Direction:** East

7 Viewpoint Location — Aviator-Takeoff Route Alternative 2

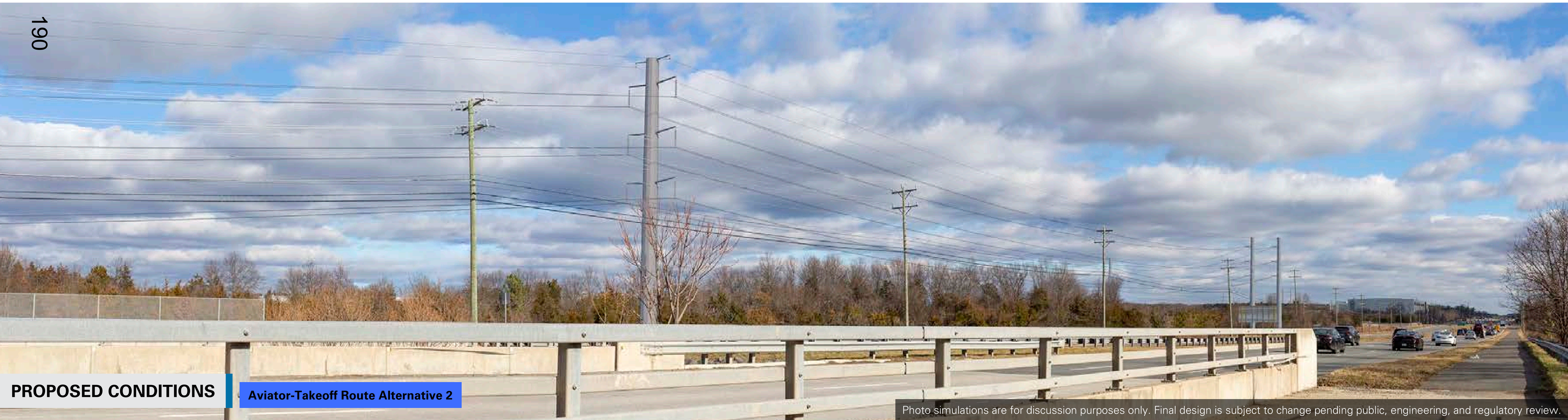


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EXISTING CONDITIONS

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PROPOSED CONDITIONS

Aviator-Takeoff Route Alternative 2

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

AVIATOR TO TAKEOFF

Transmission Line Project

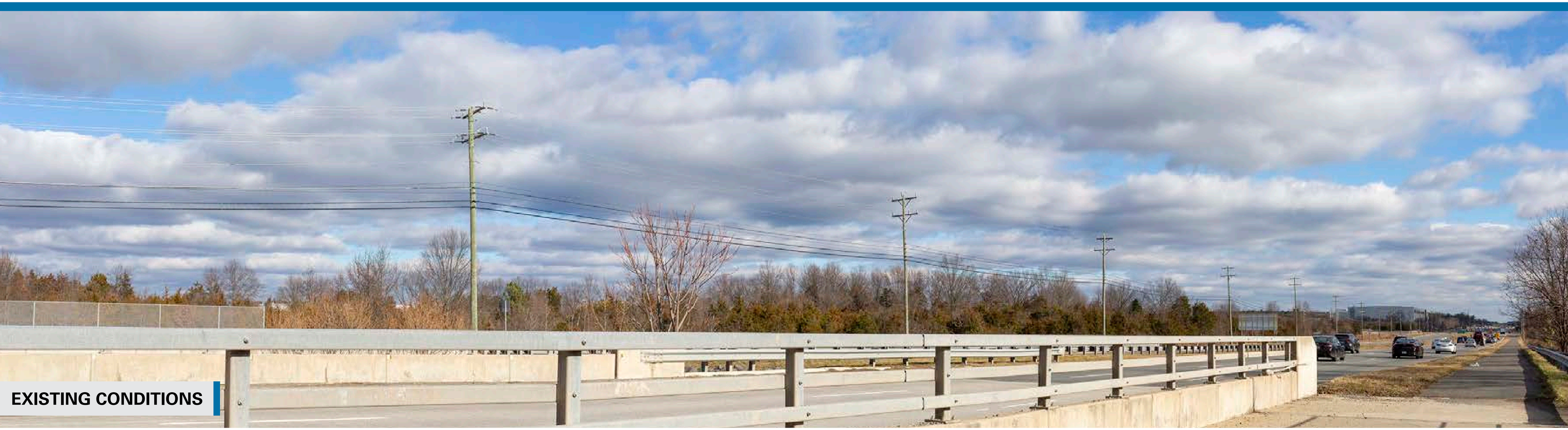
Viewpoint 7

Date: 1/29/2024 **Time:** 2:10 pm **Viewing Direction:** East

7 Viewpoint Location — Aviator-Takeoff Route Alternative 3

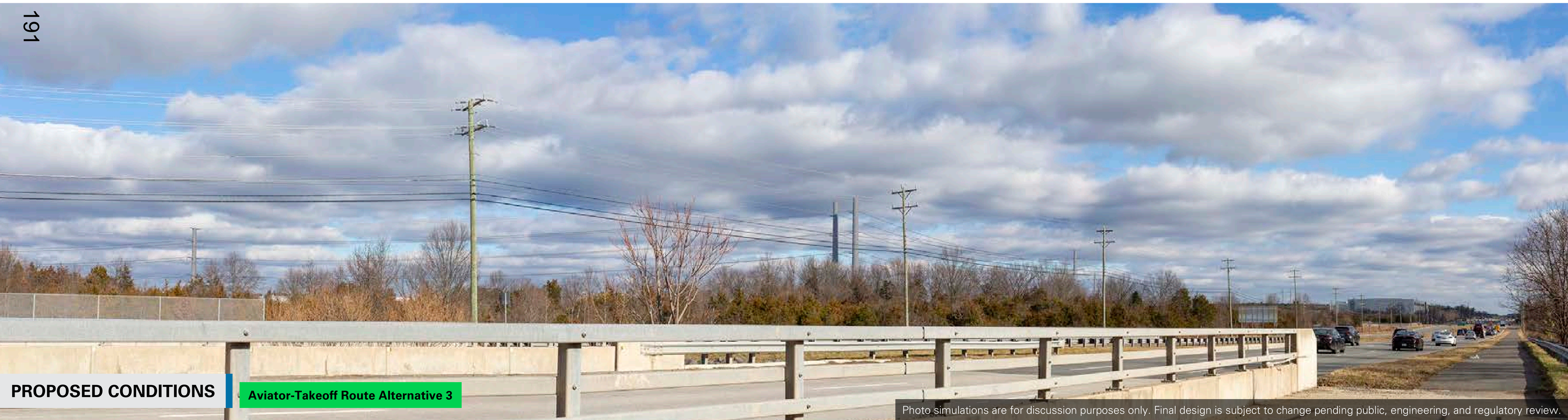


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EXISTING CONDITIONS

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PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 3**

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 8

Date: 4/20/2023 **Time:** 12:09 pm **Viewing Direction:** South

8 Viewpoint Location — Aviator-Takeoff Route Alternative 3



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EXISTING CONDITIONS

PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 3**

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 9

Date: 4/18/2023 **Time:** 3:25 pm **Viewing Direction:** Northeast

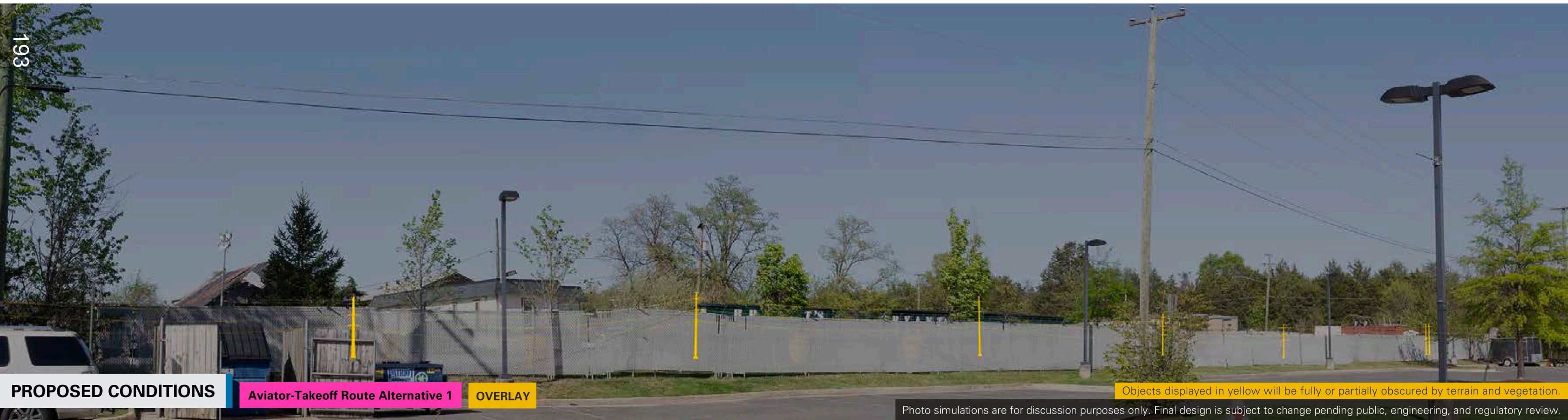
9 Viewpoint Location — Aviator-Takeoff Route Alternative 1



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EXISTING CONDITIONS



PROPOSED CONDITIONS

Aviator-Takeoff Route Alternative 1

OVERLAY

Objects displayed in yellow will be fully or partially obscured by terrain and vegetation.

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 10

Date: 4/18/2023 **Time:** 2:45 pm **Viewing Direction:** Southwest

10 Viewpoint Location — Aviator-Takeoff Route Alternative 2

Aviator-Takeoff Route Alternative 3



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EXISTING CONDITIONS

PROPOSED CONDITIONS Aviator-Takeoff Route Alternative 2 Aviator-Takeoff Route Alternative 3

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 11

Date: 4/18/2023 **Time:** 2:45 pm **Viewing Direction:** Northeast

11 Viewpoint Location — Aviator-Takeoff Route Alternative 1



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EXISTING CONDITIONS

PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 1**

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 12

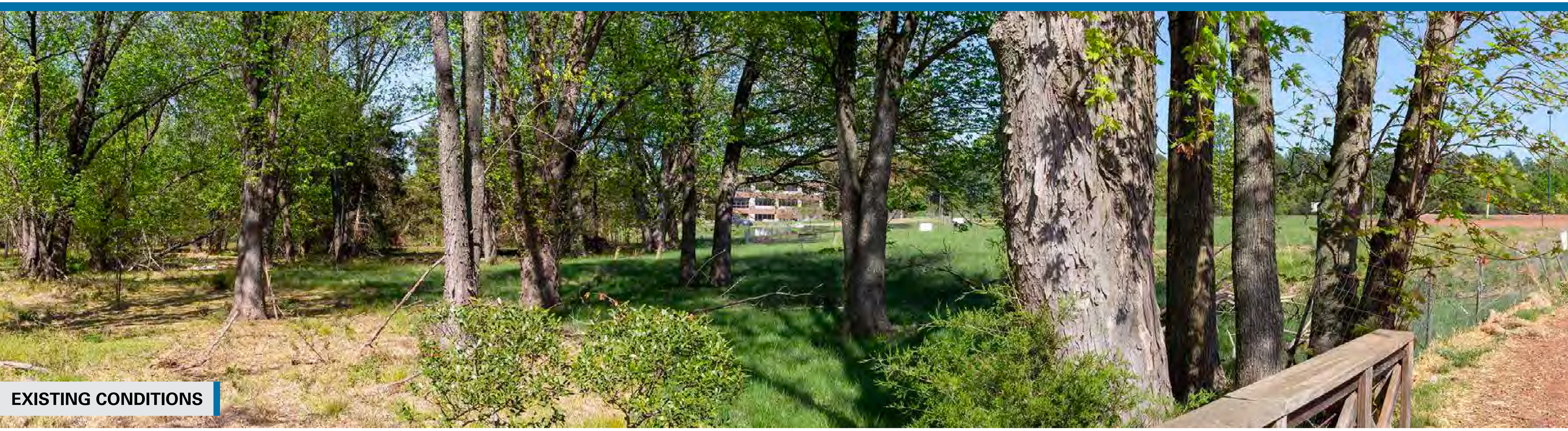
Date: 4/18/2023 **Time:** 3:13 pm **Viewing Direction:** Northeast

12 Viewpoint Location — Aviator-Takeoff Route Alternative 1

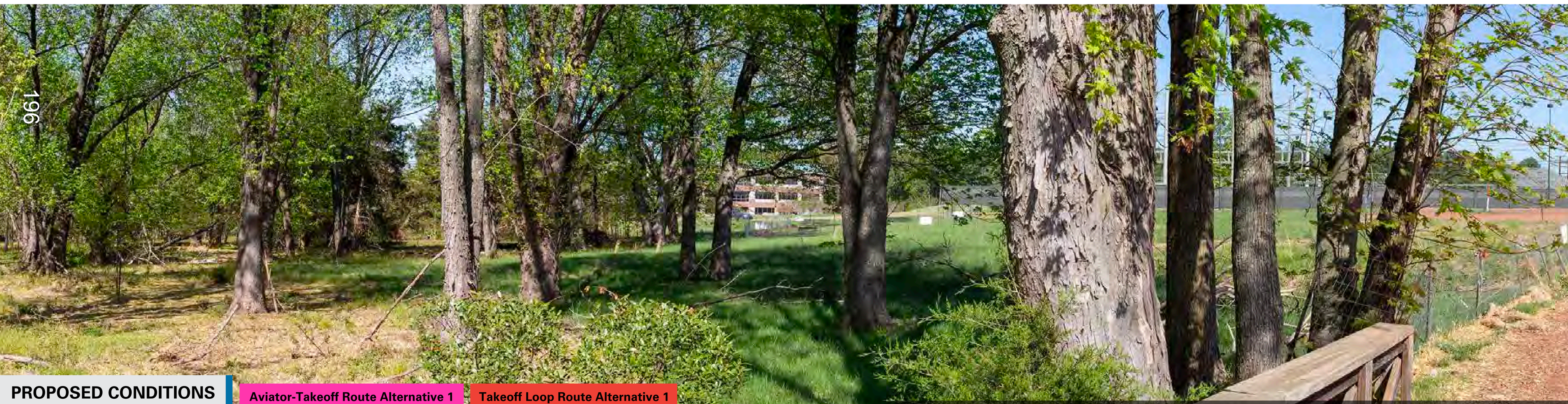
Takeoff Loop Route Alternative 1 △ Proposed Substation



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EXISTING CONDITIONS



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PROPOSED CONDITIONS

Aviator-Takeoff Route Alternative 1

Takeoff Loop Route Alternative 1

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 12

Date: 4/18/2023 **Time:** 3:13 pm **Viewing Direction:** Northeast

12 Viewpoint Location — Aviator-Takeoff Route Alternative 1

Takeoff Loop Route Alternative 1 △ Proposed Substation



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EXISTING CONDITIONS

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PROPOSED CONDITIONS Aviator-Takeoff Route Alternative 1 Takeoff Loop Route Alternative 1 OVERLAY

Objects displayed in yellow will be fully or partially obscured by terrain and vegetation.

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 12

Date: 4/18/2023 **Time:** 3:13 pm **Viewing Direction:** Northeast

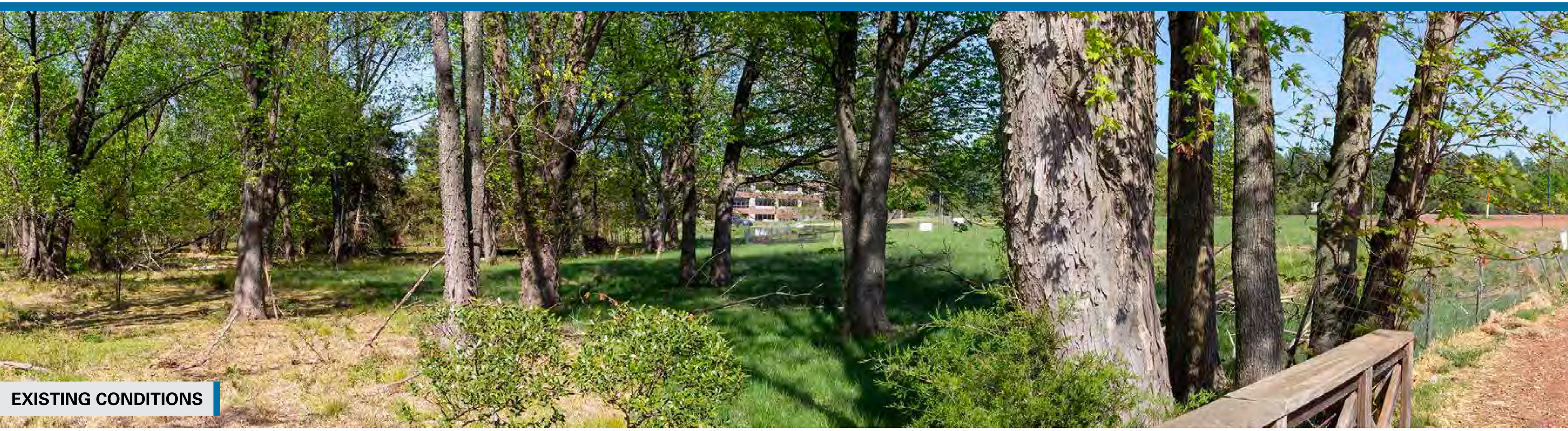
12 Viewpoint Location — Aviator-Takeoff Route Alternative 2

Aviator-Takeoff Route Alternative 3 △ Proposed Substation

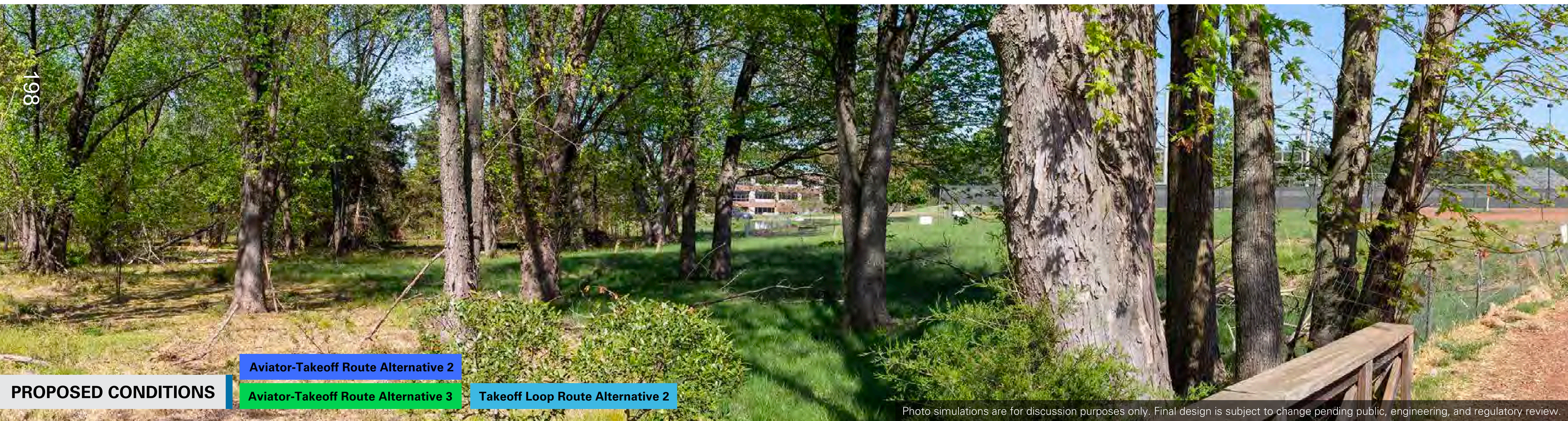
Takeoff Loop Route Alternative 2



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EXISTING CONDITIONS



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PROPOSED CONDITIONS

Aviator-Takeoff Route Alternative 2

Aviator-Takeoff Route Alternative 3

Takeoff Loop Route Alternative 2

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 12

Date: 4/18/2023 **Time:** 3:13 pm **Viewing Direction:** Northeast

12 Viewpoint Location — Aviator-Takeoff Route Alternative 2

Aviator-Takeoff Route Alternative 3 △ Proposed Substation

Takeoff Loop Route Alternative 2



Dominion Energy®

EXISTING CONDITIONS

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PROPOSED CONDITIONS

Aviator-Takeoff Route Alternative 2

Aviator-Takeoff Route Alternative 3

Takeoff Loop Route Alternative 2

OVERLAY

Objects displayed in yellow will be fully or partially obscured by terrain and vegetation.

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 13

Date: 4/18/2023 **Time:** 2:12 pm **Viewing Direction:** Northeast

13 Viewpoint Location — Aviator-Takeoff Route Alternative 1

Takeoff Loop Route Alternative 1 △ Proposed Substation



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EXISTING CONDITIONS



PROPOSED CONDITIONS Aviator-Takeoff Route Alternative 1 Takeoff Loop Route Alternative 1

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 13

Date: 4/18/2023 **Time:** 2:12 pm **Viewing Direction:** Northeast

13 Viewpoint Location — Aviator-Takeoff Route Alternative 2

Aviator-Takeoff Route Alternative 3 △ Proposed Substation

Takeoff Loop Route Alternative 2



Dominion Energy®



EXISTING CONDITIONS



PROPOSED CONDITIONS

Aviator-Takeoff Route Alternative 2

Aviator-Takeoff Route Alternative 3

Takeoff Loop Route Alternative 2

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 14

Date: 4/18/2023 **Time:** 12:17 pm **Viewing Direction:** West

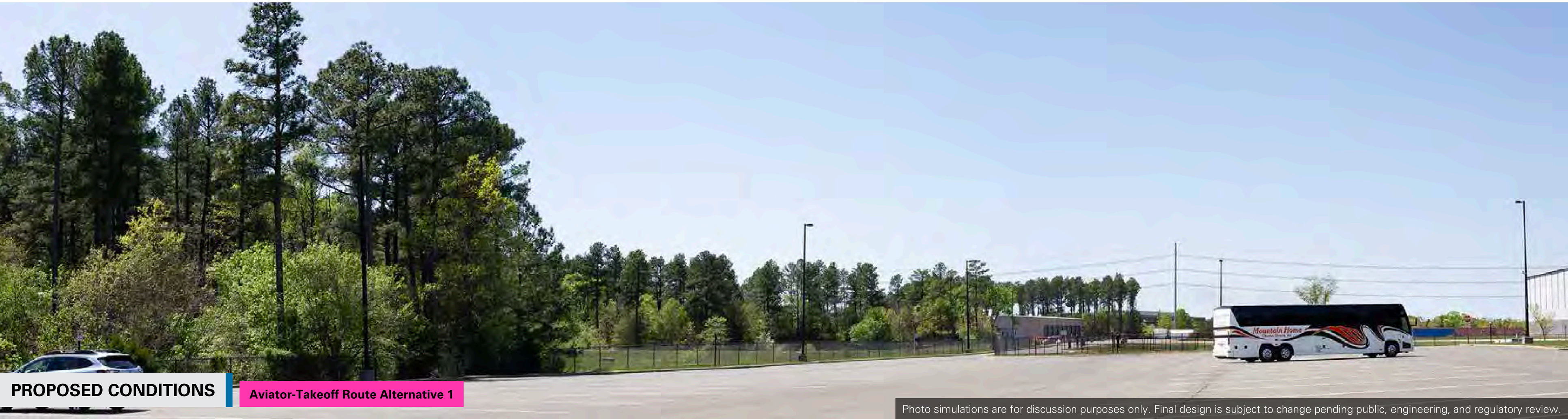
14 Viewpoint Location — Aviator-Takeoff Route Alternative 1



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EXISTING CONDITIONS



PROPOSED CONDITIONS

Aviator-Takeoff Route Alternative 1

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 14

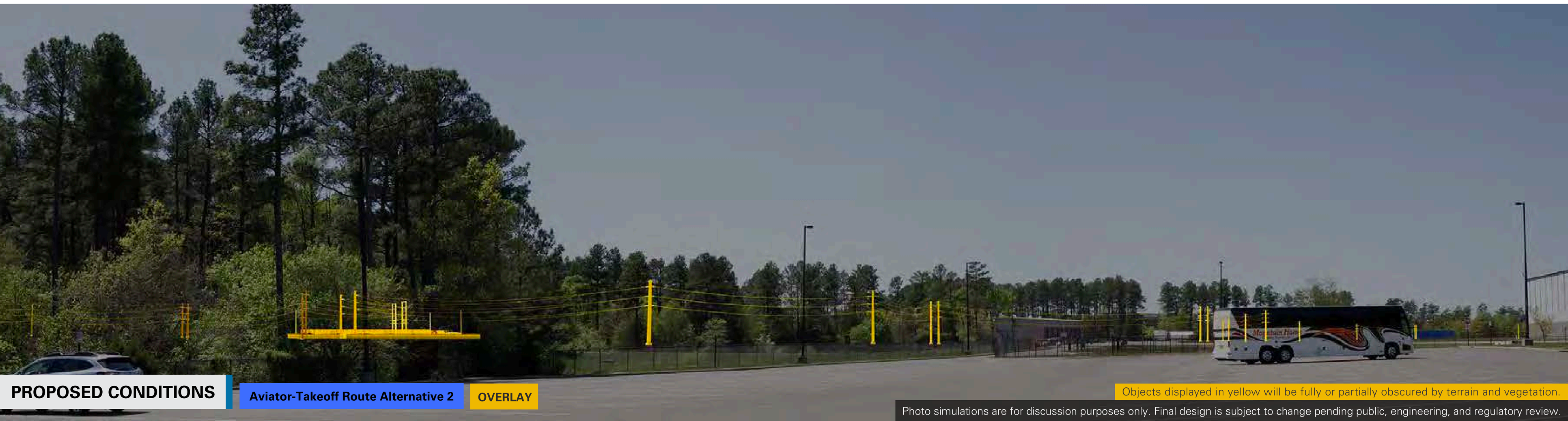
Date: 4/18/2023 **Time:** 12:17 pm **Viewing Direction:** West

14 Viewpoint Location — Aviator-Takeoff Route Alternative 2



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Objects displayed in yellow will be fully or partially obscured by terrain and vegetation.

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 14

Date: 4/18/2023 **Time:** 12:17 pm **Viewing Direction:** West

14 Viewpoint Location — Aviator-Takeoff Route Alternative 3



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204

EXISTING CONDITIONS

PROPOSED CONDITIONS

Aviator-Takeoff Route Alternative 3

OVERLAY

Objects displayed in yellow will be fully or partially obscured by terrain and vegetation.

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 15

Date: 4/18/2023 **Time:** 1:02 pm **Viewing Direction:** West

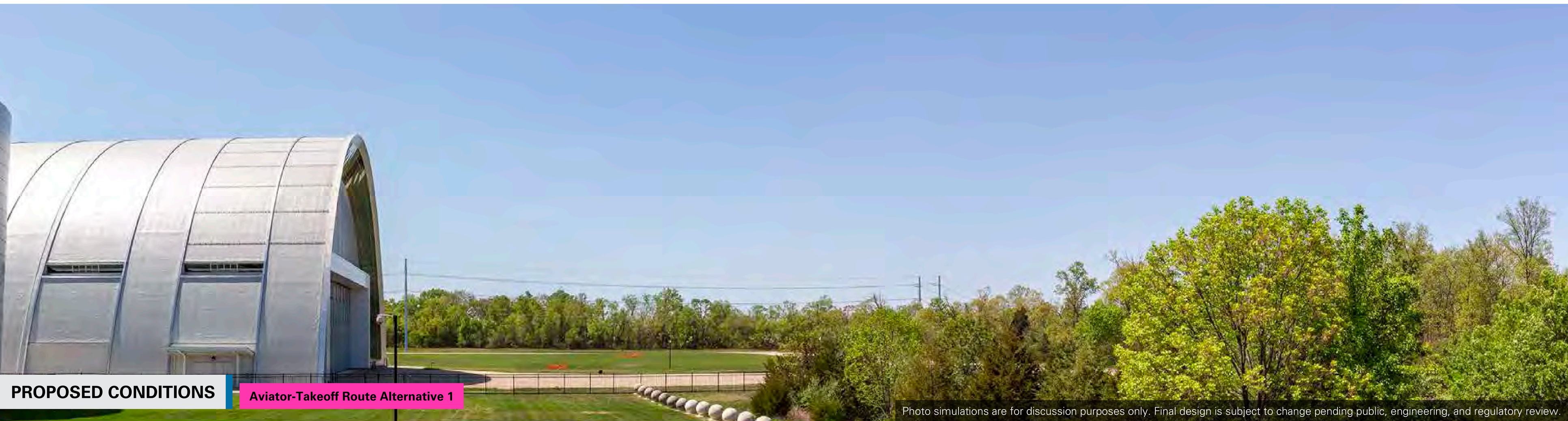
15 Viewpoint Location — Aviator-Takeoff Route Alternative 1



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EXISTING CONDITIONS



PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 1**

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 15

Date: 4/18/2023 **Time:** 1:02 pm **Viewing Direction:** West

15 Viewpoint Location — Aviator-Takeoff Route Alternative 2



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EXISTING CONDITIONS



PROPOSED CONDITIONS

Aviator-Takeoff Route Alternative 2

OVERLAY

Objects displayed in yellow will be fully or partially obscured by terrain and vegetation.

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 15

Date: 4/18/2023 **Time:** 1:02 pm **Viewing Direction:** West

15 Viewpoint Location — Aviator-Takeoff Route Alternative 3



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EXISTING CONDITIONS



PROPOSED CONDITIONS

Aviator-Takeoff Route Alternative 3

OVERLAY

Objects displayed in yellow will be fully or partially obscured by terrain and vegetation.

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

AVIATOR TO TAKEOFF

Transmission Line Project

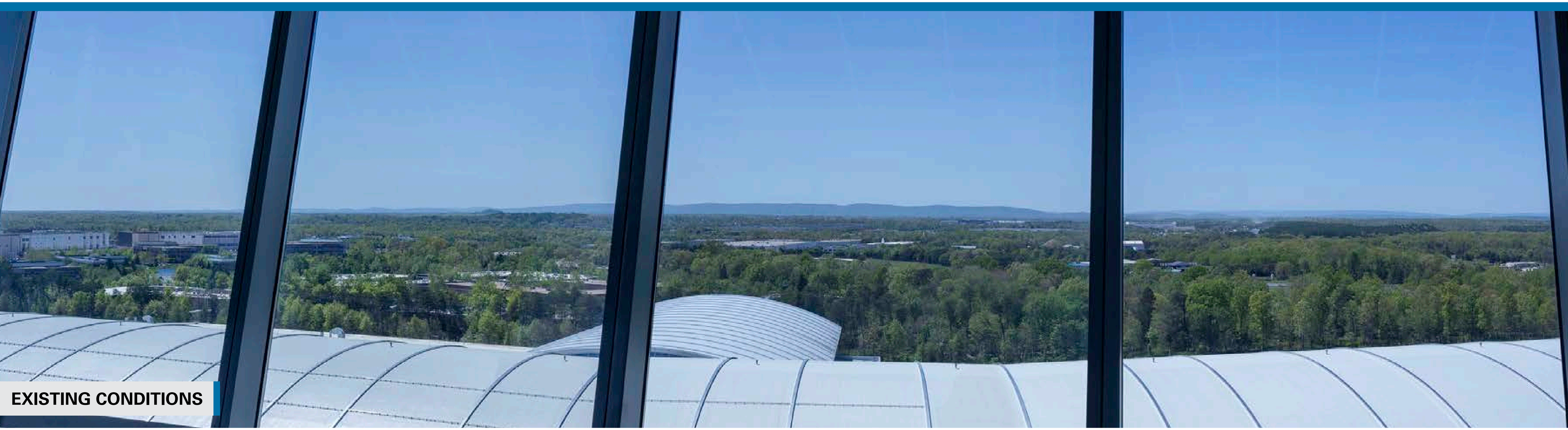
Viewpoint 16

Date: 4/18/2023 **Time:** 12:50 pm **Viewing Direction:** West

16 Viewpoint Location — Aviator-Takeoff Route Alternative 1



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EXISTING CONDITIONS



PROPOSED CONDITIONS

Aviator-Takeoff Route Alternative 1

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 16

Date: 4/18/2023 **Time:** 12:50 pm **Viewing Direction:** West

16 Viewpoint Location — Aviator-Takeoff Route Alternative 1



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EXISTING CONDITIONS

PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 1** **OVERLAY**

Objects displayed in yellow will be fully or partially obscured by terrain and vegetation.

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

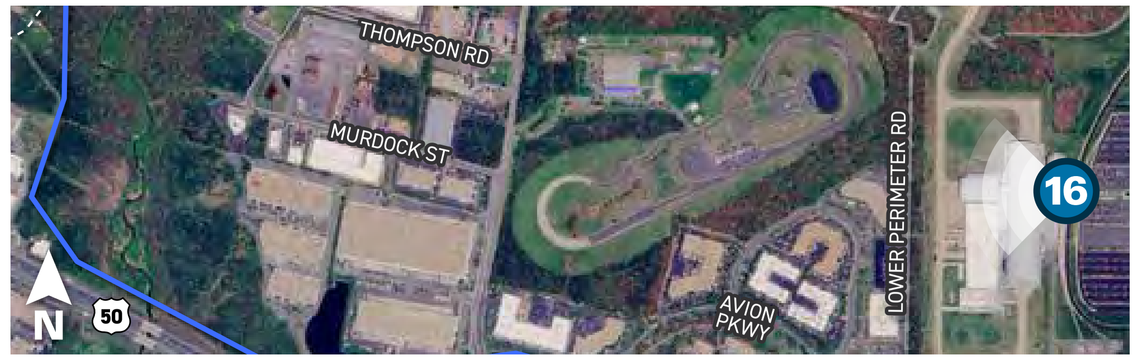
AVIATOR TO TAKEOFF

Transmission Line Project

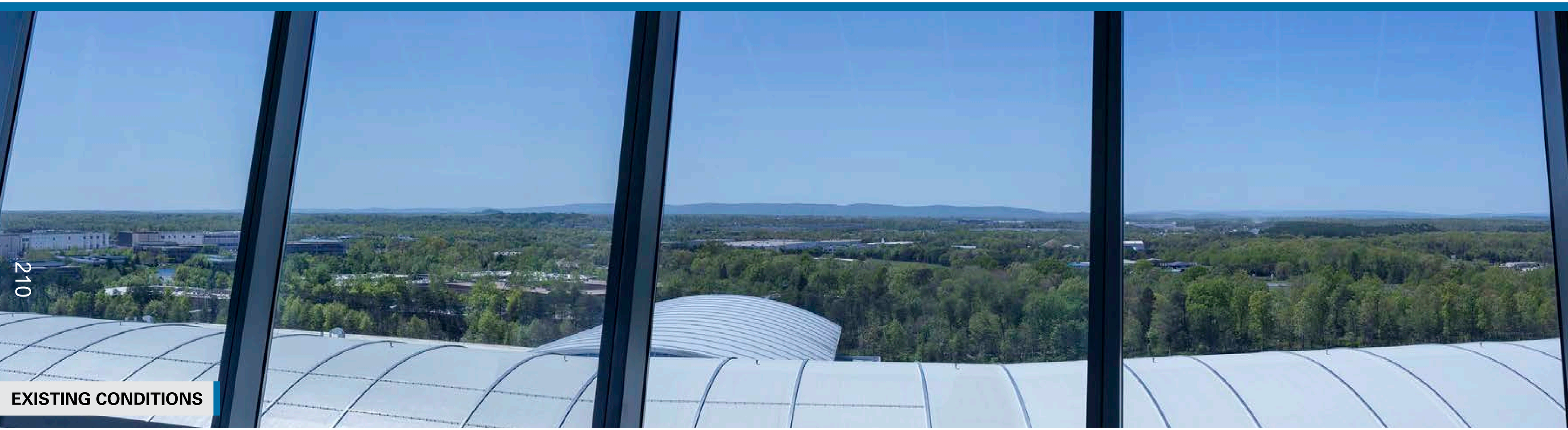
Viewpoint 16

Date: 4/18/2023 **Time:** 12:50 pm **Viewing Direction:** West

16 Viewpoint Location — Aviator-Takeoff Route Alternative 2

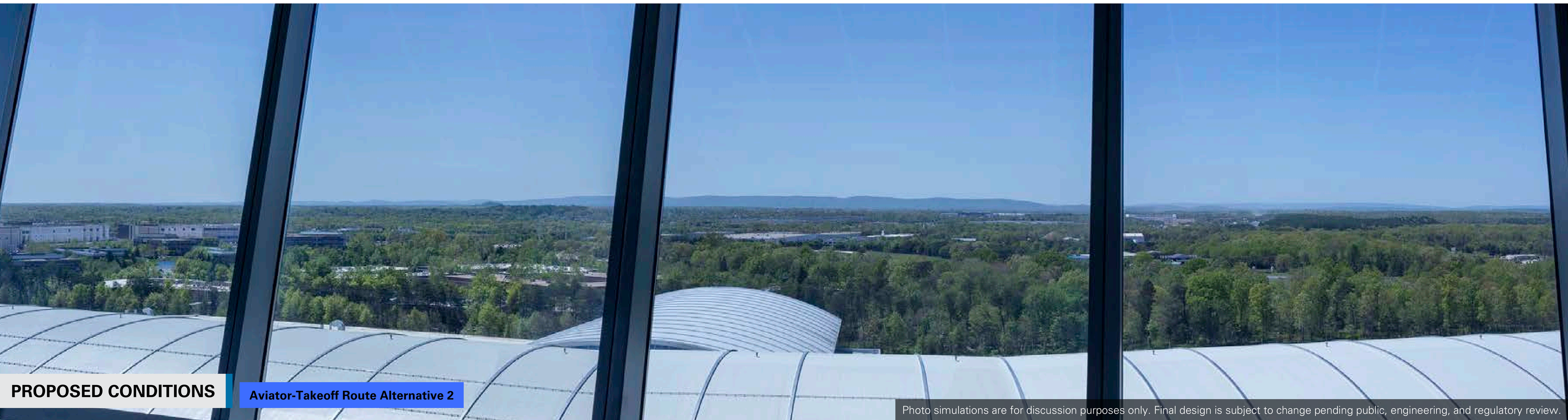


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EXISTING CONDITIONS



PROPOSED CONDITIONS

Aviator-Takeoff Route Alternative 2

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

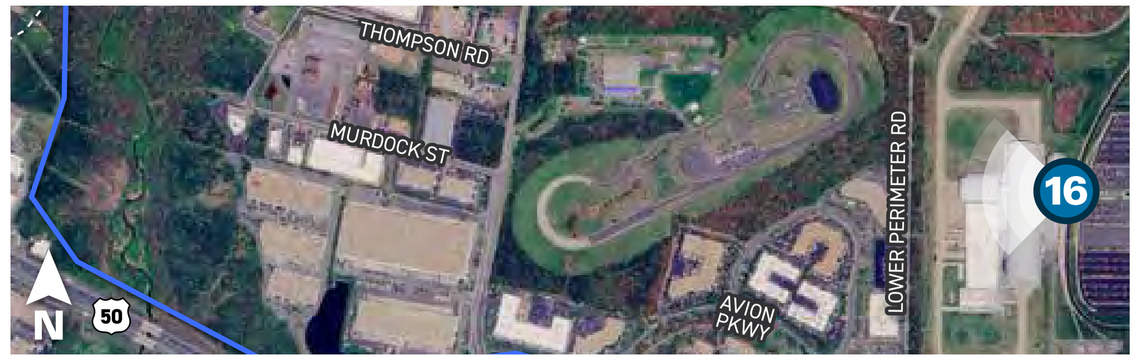
AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 16

Date: 4/18/2023 **Time:** 12:50 pm **Viewing Direction:** West

16 Viewpoint Location — Aviator-Takeoff Route Alternative 2



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EXISTING CONDITIONS

PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 2** **OVERLAY**

Objects displayed in yellow will be fully or partially obscured by terrain and vegetation.

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 16

Date: 4/18/2023 **Time:** 12:50 pm **Viewing Direction:** West

16 Viewpoint Location — Aviator-Takeoff Route Alternative 3



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EXISTING CONDITIONS

PROPOSED CONDITIONS

Aviator-Takeoff Route Alternative 3

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 16

Date: 4/18/2023 **Time:** 12:50 pm **Viewing Direction:** West

16 Viewpoint Location — Aviator-Takeoff Route Alternative 3



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EXISTING CONDITIONS

PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 3** **OVERLAY**

Objects displayed in yellow will be fully or partially obscured by terrain and vegetation.

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 17

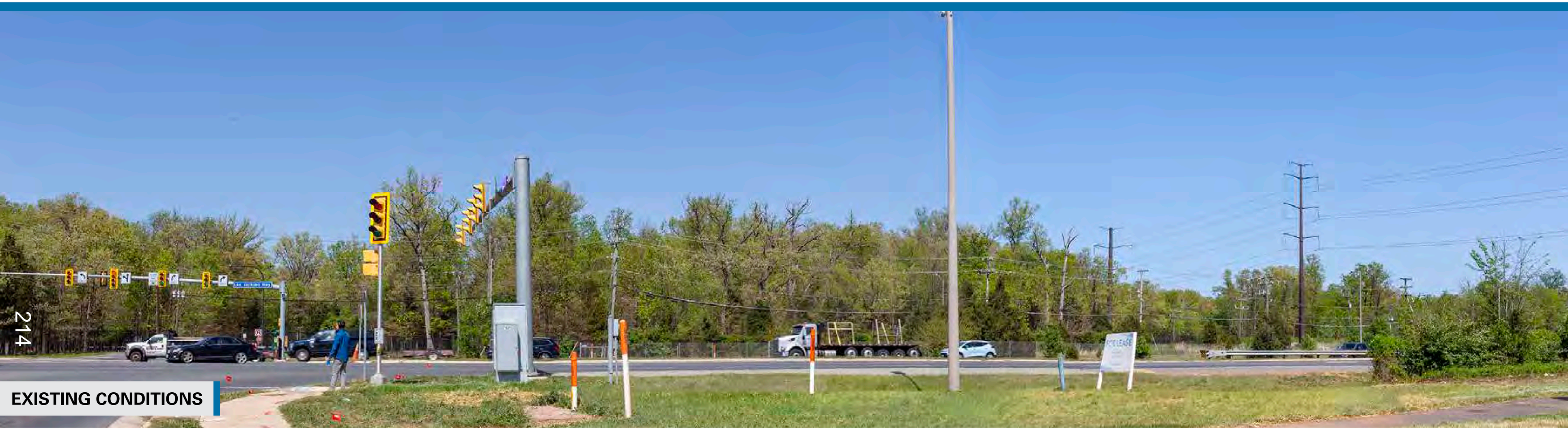
Date: 4/20/2023 **Time:** 1:55 pm **Viewing Direction:** Northeast

17 Viewpoint Location — Takeoff Loop Route Alternative 1

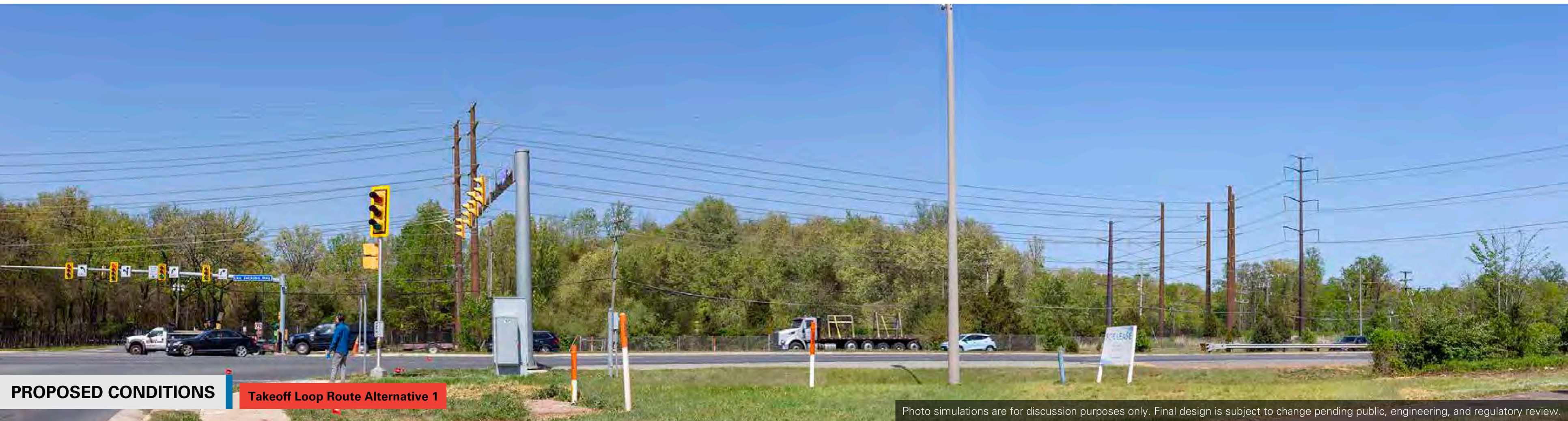
△ Proposed Substation



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EXISTING CONDITIONS



PROPOSED CONDITIONS **Takeoff Loop Route Alternative 1**

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 18

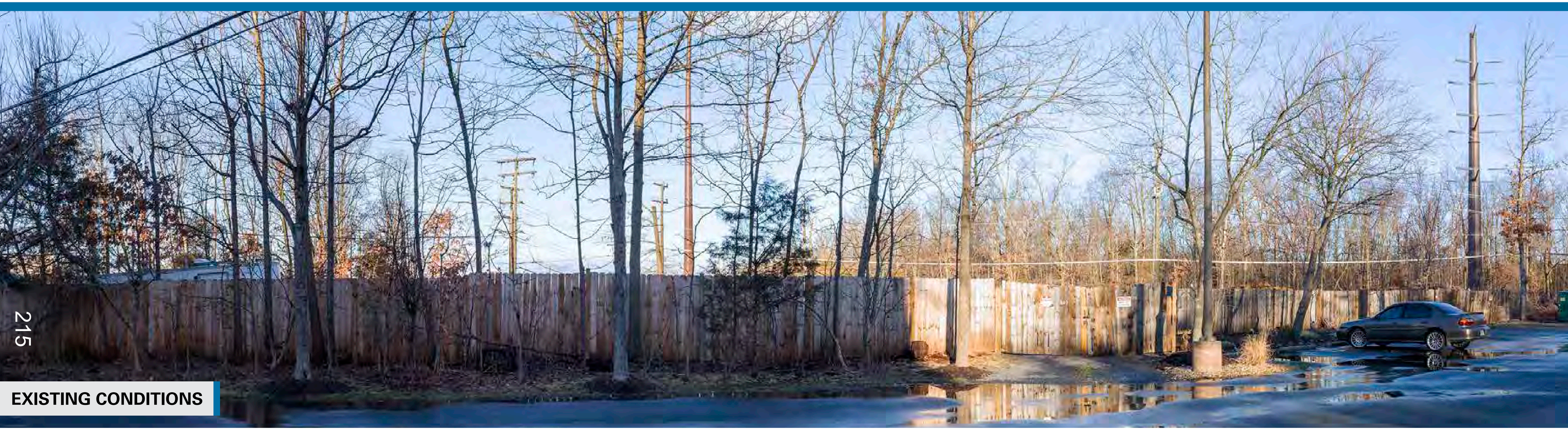
Date: 1/29/2023 **Time:** 8:16 am **Viewing Direction:** West

18 Viewpoint Location — Aviator-Takeoff Route Alternative 1

Takeoff Loop Route Alternative 1 — △ Proposed Substation

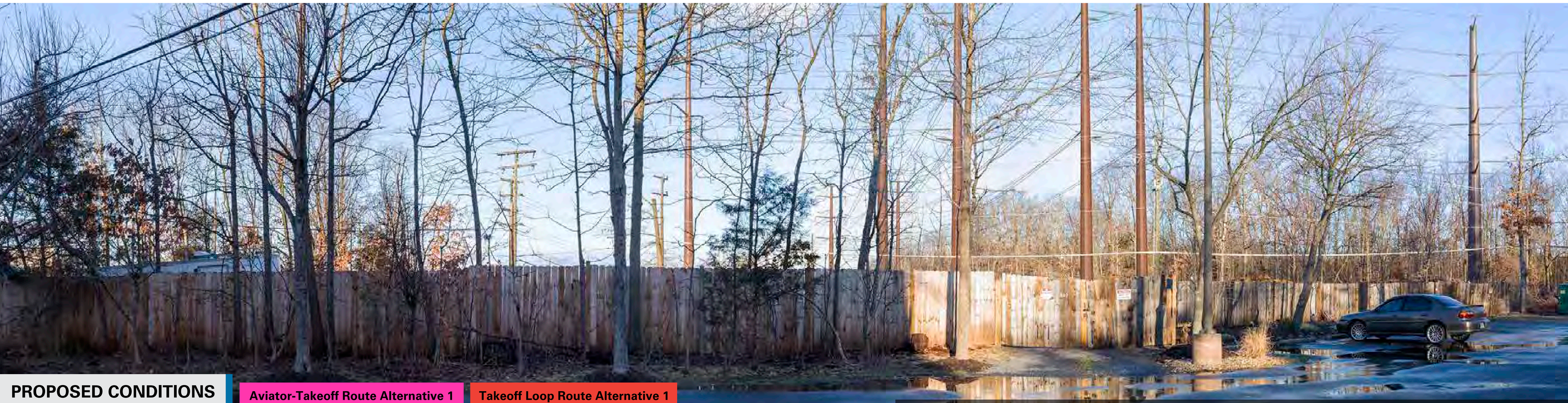


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EXISTING CONDITIONS



PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 1** **Takeoff Loop Route Alternative 1**

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

AVIATOR TO TAKEOFF

Transmission Line Project

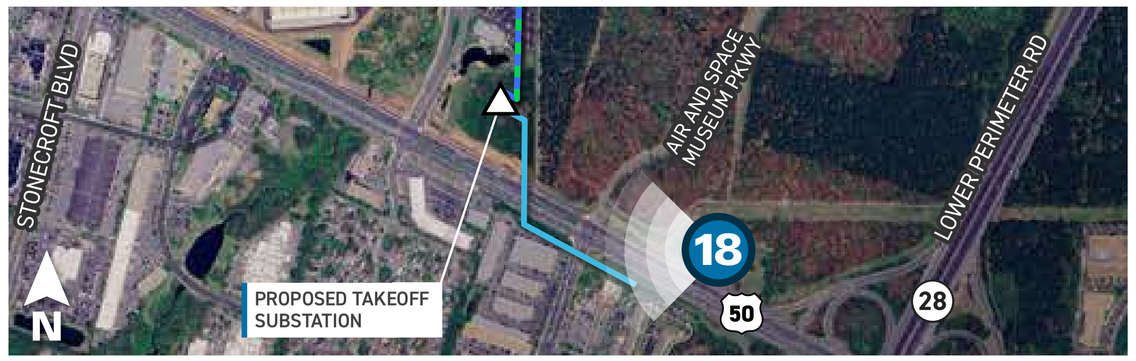
Viewpoint 18

Date: 1/29/2023 **Time:** 8:16 am **Viewing Direction:** West

18 Viewpoint Location — Aviator-Takeoff Route Alternative 2

Aviator-Takeoff Route Alternative 3 — △ Proposed Substation

Takeoff Loop Route Alternative 2



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EXISTING CONDITIONS

PROPOSED CONDITIONS

Aviator-Takeoff Route Alternative 2

Aviator-Takeoff Route Alternative 3

Takeoff Loop Route Alternative 2

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 19

Date: 4/9/2023 **Time:** 10:00 am **Viewing Direction:** Northeast

19 Viewpoint Location — Aviator-Takeoff Route Alternative 1



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PAUL GARBER LN

STONECROFT BLVD

FAIRFAX COUNTY POLICE DEPARTMENT
DRIVER TRAINING FACILITY

EXISTING CONDITIONS

Aviator-Takeoff Route Alternative 1

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 19

Date: 4/9/2023 **Time:** 10:00 am **Viewing Direction:** Northeast

19 Viewpoint Location — Aviator-Takeoff Route Alternative 1



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PAUL GARBER LN

STONCROFT BLVD

PROPOSED RIGHT-OF-WAY

FAIRFAX COUNTY POLICE DEPARTMENT
DRIVER TRAINING FACILITY

PROPOSED CONDITIONS **Aviator-Takeoff Route Alternative 1**

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 19

Date: 4/9/2023 **Time:** 10:00 am **Viewing Direction:** Northeast

19 Viewpoint Location — Aviator-Takeoff Route Alternative 1



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PAUL GARBER LN

FAIRFAX COUNTY POLICE DEPARTMENT
DRIVER TRAINING FACILITY

EXISTING CONDITIONS | **Route Alternative 1**

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

AVIATOR TO TAKEOFF

Transmission Line Project

Viewpoint 19

Date: 4/9/2023 **Time:** 10:00 am **Viewing Direction:** Northeast

19 Viewpoint Location — Aviator-Takeoff Route Alternative 1



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PROPOSED CONDITIONS **Route Alternative 1**

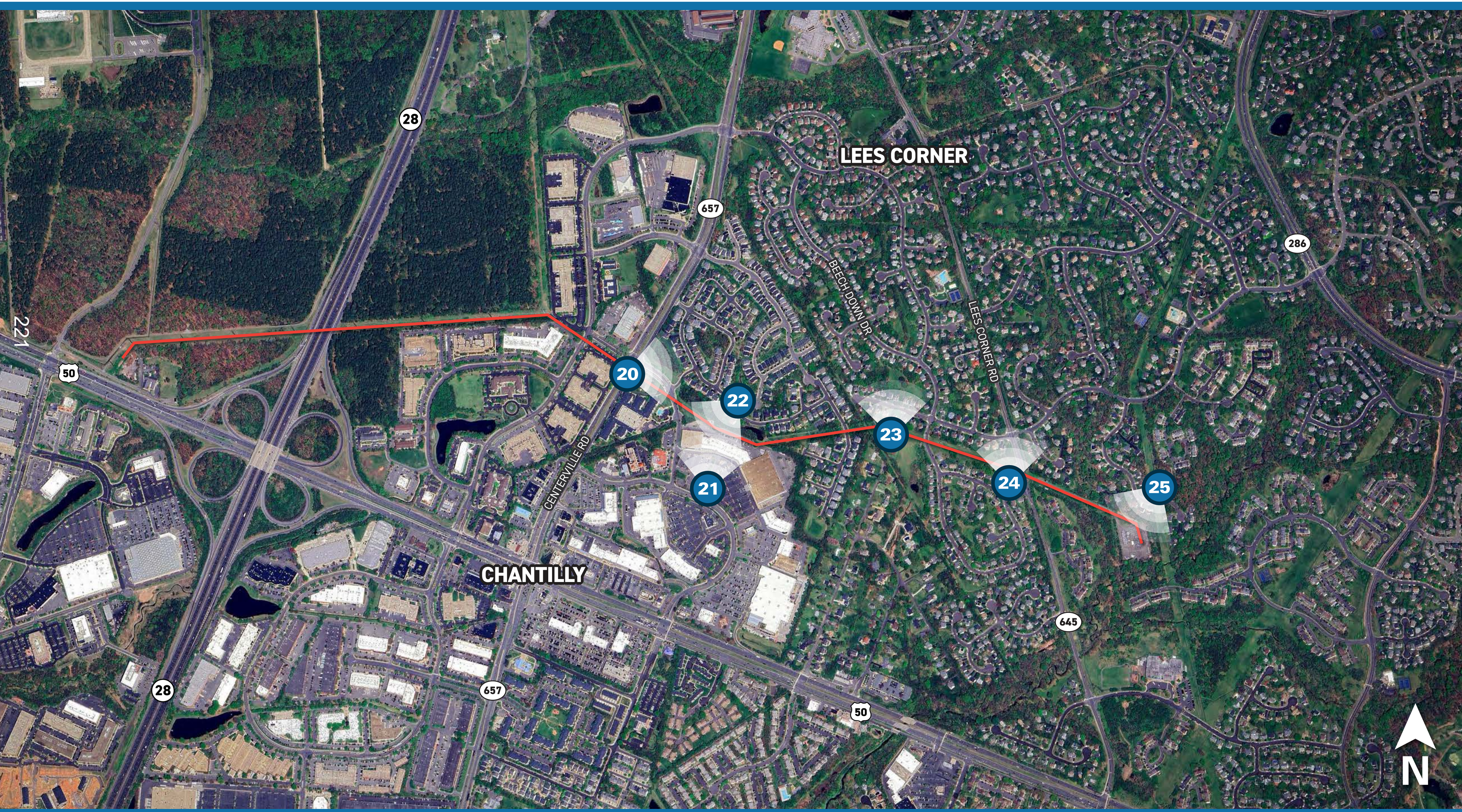
Rendered simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

SULLY TO TAKEOFF
Partial Rebuild Project

Photo Location Map

1 Viewpoint Location — Transmission Line

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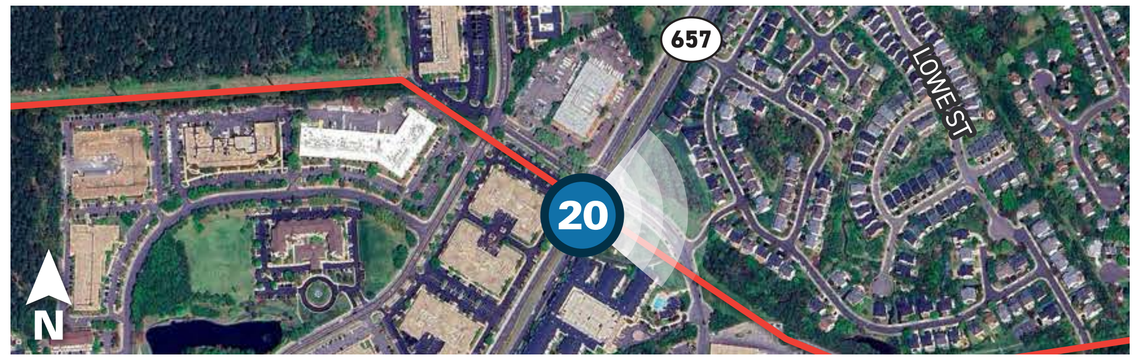


SULLY TO TAKEOFF
Partial Rebuild Project

Viewpoint 20

Date: 4/9/2023 **Time:** 10:48 am **Viewing Direction:** East

20 Viewpoint Location — Transmission Line



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EXISTING CONDITIONS

PROPOSED CONDITIONS

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

SULLY TO TAKEOFF
Partial Rebuild Project

Viewpoint 21

Date: 4/9/2023 **Time:** 9:41 am **Viewing Direction:** North

21 Viewpoint Location — Transmission Line



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EXISTING CONDITIONS



PROPOSED CONDITIONS

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

SULLY TO TAKEOFF
Partial Rebuild Project

Viewpoint 22

Date: 4/9/2023 **Time:** 11:06 am **Viewing Direction:** Southwest

22 Viewpoint Location — Transmission Line



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EXISTING CONDITIONS



PROPOSED CONDITIONS

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

SULLY TO TAKEOFF
Partial Rebuild Project

Viewpoint 23

Date: 4/9/2023 **Time:** 11:31 am **Viewing Direction:** North

23 Viewpoint Location — Transmission Line



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EXISTING CONDITIONS



PROPOSED CONDITIONS



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

SULLY TO TAKEOFF
Partial Rebuild Project

Viewpoint 24

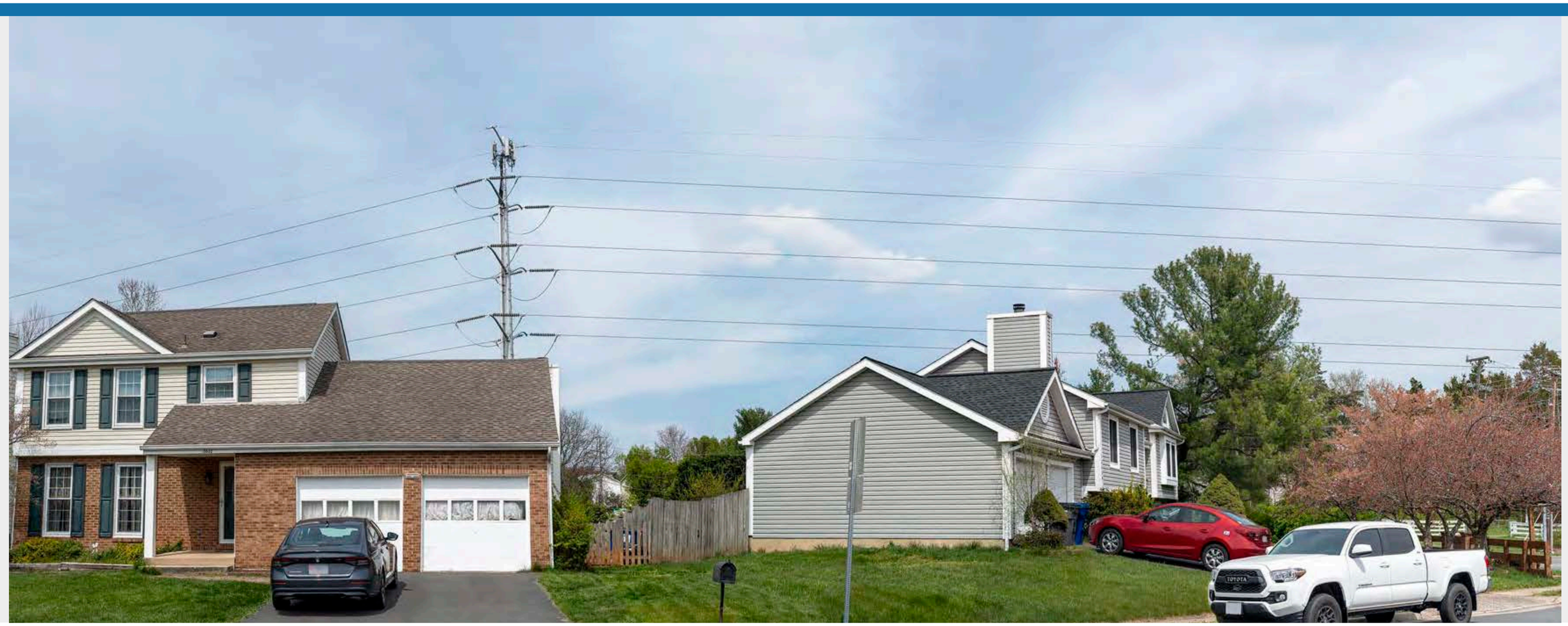
Date: 4/9/2023 **Time:** 11:59 am **Viewing Direction:** North

24 Viewpoint Location — Transmission Line



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EXISTING CONDITIONS



PROPOSED CONDITIONS

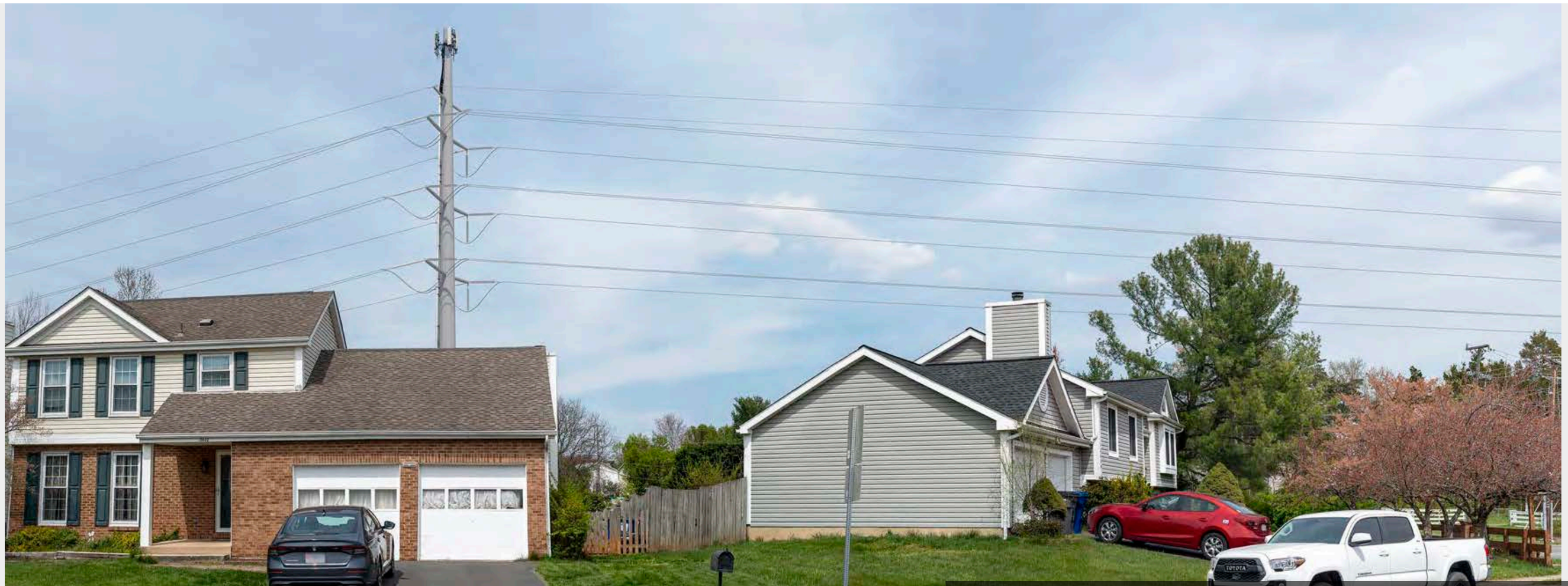


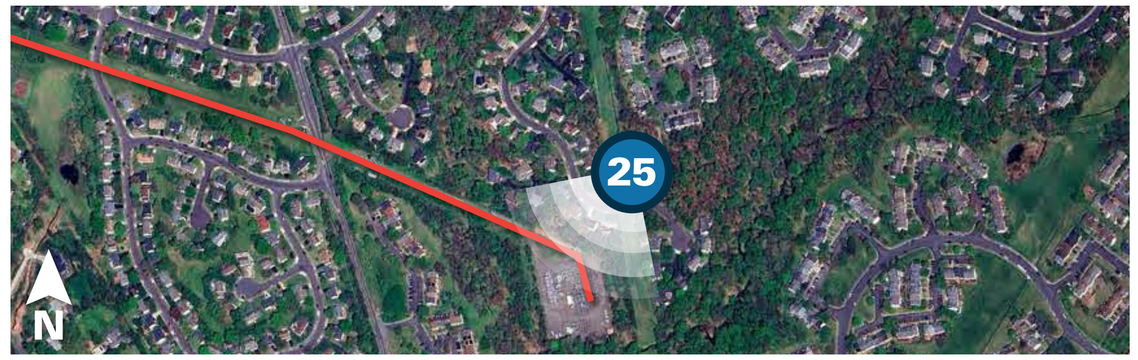
Photo simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

SULLY TO TAKEOFF
Partial Rebuild Project

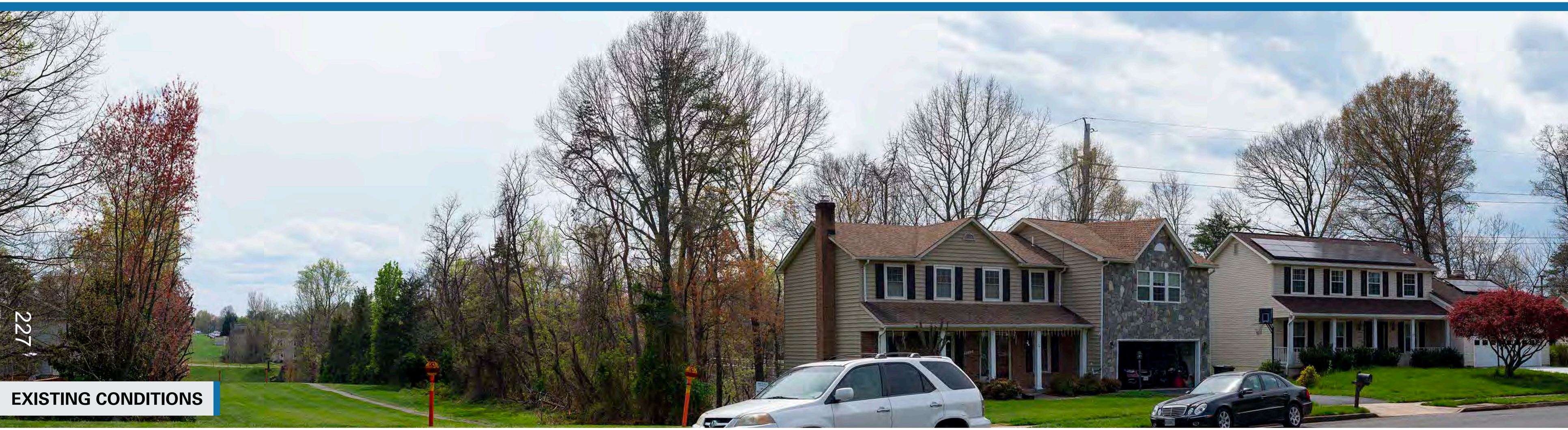
Viewpoint 25

Date: 4/9/2023 **Time:** 12:18 pm **Viewing Direction:** Southwest

25 Viewpoint Location — Transmission Line



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EXISTING CONDITIONS



PROPOSED CONDITIONS

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

DE Transmission

Aviator Takeoff

Report Date: May 23, 2024 – June 6, 2024

DET | Aviator Takeoff | 5/23/24 – 6/6/24 | Overall Report

The Aviator Takeoff campaign ran on Facebook, Google and Nextdoor through 6/6/24. These campaigns were targeted at customers over the age of 25 who resided in Loudoun and Fairfax Counties.

1,444,362 impressions
of ads were delivered to target audiences.

12,953 clicks
have taken audiences to the landing pages.

92,888 video views with an average 40.33% VCR.

0.90% CTR
Most CTRs near or above benchmarks.

69,653 ad engagements
such as reactions, likes, comments, shares and saves have been made on the ads.

Notable Creative

The Spanish DET Aviator Takeoff Pre-Event 300x600 Display ad had the highest CTR at 3.86%, which is 672% higher than the 0.50% Display benchmark.



Notable Insights

- Facebook ads had a CTR of 2.02% and 28,487 completed video views for a 43.81% VCR.
- Nextdoor ads performed well with a CTR of 0.40%, which is 167% above benchmark.
- Google Display ads performed well with a CTR of 0.68%, which is 36% above benchmark.
- Google Video ads had 8,976 completed video views for a 32.22% VCR, which is 115% above the 15% Google VCR benchmark.

Facebook CTR Benchmark: 0.90% | Twitter CTR Benchmark: 1.11% | Google Search CTR Benchmark: 3.17% | Google Display CTR Benchmark: 0.50% | Google Video Benchmark: 15%| Nextdoor CTR Benchmark: 0.15%

charles ryan associates

Dominion Energy

DET | Aviator Takeoff | 5/23/24 – 6/6/24 | English Pre-Event

The English Aviator Takeoff campaign ran on Facebook, Google and Nextdoor through 6/6/24. These campaigns were targeted at customers over the age of 25 who resided in Loudoun and Fairfax Counties.

1,093,957 impressions
of ads were delivered to target audiences.

8,899 clicks
have taken audiences to the landing pages.

64,084 video views with an average 39.68% VCR.

0.81% CTR
Most CTRs near or above benchmarks.

46,164 ad engagements
such as reactions, likes, comments, shares and saves have been made on the ads.

Notable Creative

The DET Aviator Takeoff Pre-Event 300x600 Display ad had the highest CTR at 2.83%, which is 466% higher than the 0.50% Display benchmark.



Notable Insights

- Facebook ads had a CTR of 2.31% and 18,720 completed video views for a 43.31% VCR.
- Nextdoor ads performed well with a CTR of 0.40%, which is 167% above benchmark.
- Google Display ads performed well with a CTR of 0.66%, which is 32% above benchmark.
- Google Video ads had 6,709 completed video views for a 32.16% VCR, which is 114% above the 15% Google VCR benchmark.

Facebook CTR Benchmark: 0.90% | Twitter CTR Benchmark: 1.11% | Google Search CTR Benchmark: 3.17% | Google Display CTR Benchmark: 0.50% | Google Video Benchmark: 15%| Nextdoor CTR Benchmark: 0.15%

charles ryan associates

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DET | Aviator Takeoff | 5/28/24 – 6/6/24 | Spanish Pre-Event

The Spanish Aviator Takeoff campaign ran on Facebook, Google and Nextdoor through 6/6/24. These campaigns were targeted at customers over the age of 25 who resided in Loudoun and Fairfax Counties.

350,405 impressions

of ads were delivered to target audiences.

4,054 clicks

have taken audiences to the landing pages.

28,804 video views with an average 41.78% VCR.

1.16% CTR

Most CTRs near or above benchmarks.

23,489 ad engagements

such as reactions, likes, comments, shares and saves have been made on the ads.

Notable Creative

The Spanish DET Aviator Takeoff Pre-Event 300x600 Display ad had the highest CTR at 3.86%, which is 672% higher than the 0.50% Display benchmark.



Notable Insights

- Facebook ads had a CTR of 1.65% and 9,767 completed video views for a 44.78% VCR.
- Google Display ads performed well with a CTR of 0.71%, which is 42% above benchmark.
- Google Video ads had 2,266 completed video views for a 32.40% VCR, which is 116% above the 15% Google VCR benchmark.

Facebook CTR Benchmark: 0.90% | Twitter CTR Benchmark: 1.11% | Google Search CTR Benchmark: 3.17% | Google Display CTR Benchmark: 0.50% | Google Video Benchmark: 15%| Nextdoor CTR Benchmark: 0.15%

Summary:

- The Spanish Aviator Takeoff Pre-Event 300x600 Display ad was the highest-performing ad with a CTR of 3.86%.
- The 300x600 Display ad sizes were the best-performing ads in both the English and Spanish campaigns.
- Females aged 65+ and males 25-44 were the top engagers within the English campaigns. Males 25-54 were the top engagers within the Spanish campaigns.
- Google Video was the top-performing platform for the campaign and ended the campaign with a VCR 115% over the 15% Google Video VCR benchmark.
- Video ads performed well in this campaign with 92,888 video views. There were 37,463 completed video views across the platforms for a total VCR of 40.33%.
- The energy industry information, power outage information, and energy consumption information were the top segments and had the highest CTRs on Google.

July 2, 2024

Platform Benchmarks:
Facebook CTR Benchmark: 0.90% | Twitter CTR Benchmark: 1.11% |
LinkedIn CTR Benchmark: 0.26%



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: **Takeoff Loop and Substation**

One existing building, a guard shack located at an entrance to the Dulles Airport along Airplane Road and owned by MWAA, is within the right-of-way and would have to be demolished or relocated to construct the Takeoff Loop Proposed Route. In an April 11, 2024 email, MWAA confirmed their preference that the Takeoff Loop Proposed Route (Route 1) remain in its location along the parcel boundary and the guard shack be relocated. See Attachment II.A.9.a.

No existing buildings are located within the Take Loop Alternative Route 2 right-of-way or the proposed Takeoff Substation footprint.

Sully-Takeoff Partial Reconductor/Rebuild

During the Company's review of the existing transmission line corridor, no unauthorized encroachments were identified within the right-of-way. No buildings will have to be demolished or relocated to construct the Sully-Takeoff Partial Reconductor/Rebuild.

Aviator-Takeoff Lines

For the Aviator-Takeoff Proposed Route (Route 1), one outbuilding, a mobile office trailer owned by MWAA, is located within the right-of-way which would require removal or relocation prior to construction.

For Alternative Route 2, one outbuilding, a hoop building storage shed, owned by Dulles South Properties, LLC, is located within the right-of-way, which would require removal or relocation prior to construction.

For Alternative Route 3, one outbuilding, a rectangular storage shed, owned by Lavin Investments, LLC, is located within the right-of-way, which would require removal or relocation prior to construction.

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: **Takeoff Loop and Substation**

Portions of the Takeoff Loop Proposed Route (Route 1) and Alternative Route 2 parallel existing physical facilities. No existing transmission line rights-of-way will be paralleled by the Takeoff Loop Proposed Route or Alternative Route 2, as described in Section II.A.4.

Route 50 is the existing physical facility that will be paralleled by the Takeoff Loop Proposed Route and proposed Takeoff Substation from the existing Line #2008 and Line #265 corridor heading approximately 0.2 mile (990 feet) to the west. Route 50 is a six-lane divided highway maintained by VDOT. Within the study area, the average daily traffic ("ADT") along Route 50 is approximately 60,000. The Route 50 right-of-way ranges between 160 and 300 feet wide where it is collocated with the Takeoff Loop Proposed Route.

Takeoff Loop Alternative Route 2 will parallel Route 50 from the existing Line #2008 corridor heading approximately 0.2 mile (830 feet) to the west. As mentioned above, Route 50 is a six-lane divided highway maintained by VDOT, with an ADT of approximately 60,000. The Route 50 right-of-way ranges between 160 and 300 feet wide where it is collocated with Takeoff Loop Alternative Route 2.

Sully-Takeoff Partial Reconductor/Rebuild

The entire 1.9-mile Sully-Takeoff Partial Reconductor/Rebuild is within an existing transmission line corridor that has been in use for at least 54 years. See Section II.A.4.

Aviator-Takeoff Lines

Portions of the Proposed and Alternative Routes for the Aviator-Takeoff Lines parallel existing physical facilities, as identified in Table 1 below. None of the route alternatives parallel existing transmission lines. See Section II.A.4.

Table 1. Existing Physical Facilities Paralleled by the Aviator-Takeoff Lines Proposed and Alternative Routes

Existing Facility Feature	Proposed Route (Route 1) (miles)	Alternative Route 2 (miles)	Alternative Route 3 (miles)
Roadway	2.7	0.5	0.4
Utility and Road	0.3	0.3	0.6
Utility	0.4	0.4	0.3
Total Collocation Length	**2.7**	**1.2**	**1.2**

As noted in Section II.A.4, the Aviator-Takeoff Proposed Route will collocate with approximately 2.7 miles of existing roadways on MWAA property—South Perimeter Road and Lower Perimeter Road—which are privately-owned roads within an approximately 40-foot-wide corridor along the southern boundary of the Dulles Airport.

Aviator-Takeoff Alternative Route 2 will have less than half the total collocation of the Proposed Route, with 1.2 miles of total collocation. Alternative Route 2 will parallel segments of Avion Parkway and parallel Virginia Mallory Drive for 0.1 mile, which is an approximately 0.4-mile-long four-lane divided local road within a commercial area, and with Avion Park Court for approximately 0.1 mile, which is an approximately 0.4-mile-long private two-lane road within a commercial area. The route will also parallel approximately 0.2 mile of additional unnamed private roads within a commercial area. Alternative Route 2 would parallel an existing 40-foot-wide waterline easement north of Route 50 for approximately 0.4 mile and will parallel existing buried water and sewer lines, which are typically 10 to 15 feet wide easements located along unnamed private roadways within developed commercial areas, and roadways for a total of 0.3 mile.

Aviator-Takeoff Alternative Route 3 will have less than half the total collocation of the Proposed Route, with 1.2 miles of total collocation. Alternative Route 3 will parallel Virginia Mallory Drive for 0.1 mile, an approximately 0.4-mile-long four-lane divided local road within a commercial area, and with Avion Park Court for approximately 0.2 mile, an approximately 0.4-mile-long private two-lane road within a commercial area, as well as an additional 0.1 mile parallel to unnamed private roads within a commercial area. Alternative Route 3 will parallel 0.6 mile of private roads with adjacent 10 to 15 feet buried utility easements. Alternative Route 3 will also parallel an existing 15-foot-wide waterline easement through a forested area across Cub Run.

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: **Loudoun County**

The Loudoun County 2019 General Plan[41] ("Loudoun General Plan") and the Loudoun County 2019 Countywide Transportation Plan ("Loudoun CTP")[42] were reviewed to evaluate the potential effect the Aviator-Takeoff Lines could have on future development within Loudoun County (the Takeoff Loop and Substation, and Sully-Takeoff Partial Rebuild are not located in Loudoun County and are therefore only discussed in relation to Fairfax County land use plans).

The Loudoun General Plan and Loudoun CTP do not address electric transmission lines within their land use policies and strategies explicitly; however, the Loudoun General Plan identifies data center development as a historic strength and future driver of economic growth to the County. The Loudoun General Plan recognizes that the area in proximity to the Aviator-Takeoff Proposed Route around the Route 50 corridor is expected to continue to be a key location for industrial/mineral extraction uses, data center development, and commercial sales and services. The Aviator-Takeoff Lines are located within several Loudoun County policy areas, Suburban and Town, including the Industrial/Mineral Extraction, Mixed-Use, and Airport place types, where light and general industry uses, large manufacturing and warehouse uses, and commercial/residential uses are encouraged. The Loudoun 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 and other land development near the Project.

No conflicting land uses were identified by Loudoun County Planning and Zoning staff. While several planned developments have been submitted to Loudoun County within the Aviator Load Area—including for data centers, flex-industrial warehouses, commercial spaces, and residential communities—the Aviator-Takeoff Proposed Route avoids impacts to these future developments by following the MWAA property parcel boundary and avoiding most privately-owned parcels. Where a direct parcel crossing was inevitable, the Company collaborated with landowners and property developers to route away from planned and existing structures.

The Aviator-Takeoff Proposed Route does pass through federal lands maintained by MWAA as associated with the Dulles Airport, which Loudoun County agencies and private landowners have acknowledged as the least impactful route to County-

[41] *See* General-Plan---Combined-with-small-maps-bookmarked (loudoun.gov).

[42] *See* https://www.loudoun.gov/DocumentCenter/View/152287/CTP---Combined-with-small-maps-bookmarked.

owned and privately-owned lands. MWAA has agreed in principle to allow transmission infrastructure on airport property and has further agreed to work with the Company on routing away from existing and planned structures. See Attachment II.A.9.a and Attachment II.A.9.b.

As identified on the Loudoun CTP, Loudoun County has plans for one future road project within the study area: the extension of Tall Cedars Parkway. The road would be extended north of Route 50, then head east towards the Fairfax County boundary, north of South Perimeter Road. While the road project is active/on-time, it is within the design phase, has not yet procured local funding for its construction, and the completion date is still to be determined. The Aviator-Takeoff Proposed and Alternative Routes each cross the proposed Tall Cedars Parkway extension once. While the Tall Cedars Parkway extension would be located generally parallel to the Aviator-Takeoff Proposed Route, MWAA indicated to the Company that the Aviator-Takeoff Proposed Route would not preclude the future development of the Tall Cedars Parkway extension.

There are no scenic rivers crossed by the Project; however, RSCRs do exist in the Project study area. Chapter 6.01 of the Loudoun County Zoning Ordinance requires a buffer on either side of a waterway's floodplain overlay district that restricts activities surrounding RSCRs. Aviator-Takeoff Proposed and Alternative Routes all cross over the RSCR that begins just north of the planned Aviator Substation and surrounds Sand Branch. An unnamed tributary of Sand Branch is also surrounded by this buffer north of Route 50. Although transmission lines are exempt from the activity restrictions within RSCRs, the Company will work to minimize impacts to the RSCR to the extent possible. The Aviator-Takeoff Proposed Route would cross the smallest RSCR area (0.8 acre), Aviator-Takeoff Alternative Route 2 would cross 1.4 acres, and Aviator-Takeoff Alternative Route 3 would impact the largest RSCR area (4.0 acres). Because the Takeoff Loop Routes are entirely within Fairfax County, they do not cross the Loudoun County RSCRs.

Fairfax County

The Fairfax County 2017 Comprehensive Plan[43] ("Fairfax Plan") and the 2020-2025 Fairfax County Transportation Priorities Plan[44] ("Fairfax TPP") were reviewed to evaluate the potential effects the Takeoff Loop and Substation, Sully-Takeoff Partial Rebuild, and Aviator-Takeoff Lines could have on future development.

The Fairfax Plan does not address the development of transmission lines or data centers in much detail; however, due to the rapid development of residences and commercial businesses within Fairfax County between the 1970s and the 1990s, the County has identified land scarcity as a significant historical and future concern. Land use mitigation objectives within the Fairfax Plan include creating

[43] *See* https://online.encodeplus.com/regs/fairfaxcounty-va-cp/page/policyplan.

[44] *See* https://www.fairfaxcounty.gov/transportation/TPP.

development patterns which cluster compatible, high-intensity land uses, promote functional efficiency, and attempt to preserve open spaces to protect natural resources. The Fairfax Plan recognizes that the area in proximity to the Proposed Route of the Takeoff Loop and Aviator-Takeoff Lines around the Route 50 corridor is expected to continue to be a key location for the preservation of open space, as well as for industrial, commercial, and public safety uses. Within Fairfax County, the Project is located in the Bull Run District, subdivided into the Upper Cub Run Community Planning Sector, where general and light industrial uses, commercial uses, and low-density residential uses are encouraged. The Fairfax Plan acknowledges that electrical demand in the County accelerates with development and, as the need for sites increases, so does the scarcity of land appropriate for electrical infrastructure. Demand is expected to continue to grow with new industrial and commercial development near the Project.

No conflicting land uses were identified by Fairfax County Department of Planning and Development or County Administration staff. While several planning developments have been submitted to Fairfax County within the Aviator Load Area, including for warehouses, data centers, office building, parking lots, and storage yards, the Proposed Route of the Takeoff Loop, Sully-Takeoff Partial Rebuild, and Aviator-Takeoff Lines avoids impacts to these future developments by passing along parcel boundaries or, as is the case for the Sully-Takeoff Partial Rebuild, is entirely within existing transmission line right-of-way. Where a direct parcel crossing is inevitable, the Company collaborated with landowners and property developers to route away from planned and existing structures.

The Proposed Route of the Takeoff Loop and Aviator-Takeoff Lines do pass through federal lands, maintained by MWAA as associated with the Dulles Airport, which Fairfax County agencies and private landowners have acknowledged as the least impactful route to County-owned and privately-owned lands. MWAA has agreed in principle to allow transmission infrastructure on airport property and has further agreed to work with the Company on routing away from existing and planned structures. See Attachment II.A.9.a and Attachment II.A.9.b.

As identified on the Fairfax TPP, Fairfax County has one plan for a future road project: widening Pleasant Valley Road to four lanes. While Tall Cedars Parkway extension is identified in the Loudoun County CTP, it should be noted that Fairfax County has no plans to create its own northern alternative to Route 50 or to continue the Tall Cedars Parkway extension within Fairfax County. The Proposed Route for the Takeoff Loop, Sully-Takeoff Partial Rebuild, Aviator-Takeoff Lines does not cross the proposed road project.

The Cub Run RPA is present within the Project study area in Fairfax County and is crossed by the three Aviator-Takeoff route alternatives. RPAs are not conservation easements, but they exist in Fairfax County to protect environmentally sensitive areas of land that surround waterbodies and waterways that drain into the Potomac River. The Aviator-Takeoff Proposed Route would impact the smallest RPA area (3.7 acres), Aviator-Takeoff Alternative Route 2 would impact the largest RPA area (11.1 acres), and Aviator-Takeoff Alternative Route 3 would impact 8.1 acres. The

Takeoff Loop routes and Sully-Takeoff Partial Rebuild do not cross the Cub Run RPA.

Company representatives met with Fairfax County staff on several occasions to discuss and coordinate on route development where the Aviator-Takeoff Proposed Route crosses County-owned land. As a result of the meetings, Fairfax County issued a letter on April 17, 2024, recognizing the need for the necessary infrastructure and the County's willingness to coordinate with the Company regarding the crossing of the County-owned land. See Attachment II.A.9.c. The Proposed Route of the Takeoff Loop and Sully-Takeoff Partial Rebuild do not cross Fairfax County-owned land.

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 Fairfax and Loudoun Counties 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: (1) One NRHP-listed property, Sully Plantation (029-0037), is located within one mile of the Proposed Route of the Takeoff Loop, Sully-Takeoff Partial Rebuild, and Aviator-Takeoff Lines, but would not be impacted by the Project. Section I of the DEQ Supplement provides additional discussion.

(2) One resource is listed, eligible, or potentially eligible for listing in the NRHP and is within one mile of the Proposed Route of the Takeoff Loop, Sully-Takeoff Partial Rebuild, and Aviator-Takeoff Lines. This information is provided in Table I-1 of the DEQ Supplement. Section I of the DEQ Supplement provides additional discussion.

(3) Not applicable.

(4) The known archaeological sites in the right-of-way for the Proposed and Alternative Routes of the Takeoff Loop and Substation, Sully-Takeoff Partial Rebuild, and Aviator-Takeoff Lines are listed below and summarized in Table I-6 of the DEQ Supplement. Of the twelve resources located within the Takeoff Loop, Sully-Takeoff Partial Rebuild, and Aviator-Takeoff Lines rights-of-way, three are not eligible and the remaining nine are unevaluated. None of the previously recorded archaeological sites are cemeteries. Two are artifact scatters, two are lithic scatter, one is associated with a temporary camp, one is associated with a historic farmstead, one is an unknown site type, two are associated with dwellings, and one is categorized as other. Section I of the DEQ Supplement provides additional discussion.

(5) Not applicable.

(6) Not applicable.

(7) Not applicable.

(8) Not applicable.

(9) There are two Fairfax County Conservation Easements in the Project study area but neither is crossed by the Project.

(10) Not applicable.

(11) Not applicable.

(12) Not applicable.

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 websites[45] to identify airports within 10.0 nautical miles of the proposed Project. Based on this review, the following FAA-restricted airports and heliports are located within 10.0 nautical miles of the Project:

Airport Name	Approximate Distance and Direction from Proposed Dominion Energy Virginia Facility (nautical miles)	Use
Washington Dulles International Airport	0.7 mile northeast of Aviator-Takeoff Proposed Route (Route 1) to nearest existing runway, 0.2 mile north to proposed runway	Public
Inova Fair Oaks Hospital Heliport	1.6 miles southeast of Sully-Takeoff Partial Rebuild Segment	Private
Stonesprings Heliport	2.7 miles northwest of Aviator-Takeoff Proposed Route (Route 1)	Private
Fairfax County Police Heliport	3.0 miles southeast of Sully-Takeoff Partial Rebuild Segment	Private
Reston Hospital Center Heliport	4.9 miles northeast of Aviator-Takeoff Proposed Route (Route 1)	Private
Crippen's Heliport	8.1 miles northeast of Aviator-Takeoff Proposed Route (Route 1)	Private
UVA Health/Prince William Medical Center	8.2 miles south of Takeoff Loop Alternative Route 2	Private
Building 250 Heliport	8.9 miles south of Takeoff Loop Alternative Route 2	Private
Inova Fairfax Hospital Heliport	8.9 miles southeast of Sully-Takeoff Partial Rebuild Segment	Private
Inova Loudoun Hospital Heliport	9.0 miles north of Aviator-Takeoff Proposed Route (Route 1)	Private
Goose Hunt Farm Airport	9.0 miles northwest of Aviator-Takeoff Proposed Route (Route 1)	Private
LM Building 110 Heliport	9.1 miles south of Takeoff Loop Alternative Route 2	Private
Leesburg Executive Airport	9.3 miles northwest of Aviator-Takeoff Proposed Route (Route 1)	Public
UVA Health/Haymarket Medical Center Heliport	9.7 miles southwest of Aviator-Takeoff Alternative Route 2	Private

[45] *See* https://oeaaa.faa.gov/oeaaa/external/portal.jsp and https://adip.faa.gov/agis/public/#/public.

The Company reviewed height limitations associated with FAA-defined civil airport imaginary surfaces for all runways associated with public or private registered airfields listed in the above table, to determine whether any of the structure heights associated with each specific structure location would penetrate the imaginary surfaces for any of the runways. The Company engaged ERM to conduct the review. ERM reviewed the height limitations associated with FAA-defined imaginary surfaces for all runways associated with the Dulles Airport and Leesburg Executive Airport, as the FAA only regulates potential obstructions for public use airports/heliports. Standard Geographic Information Systems tools, including ESRI's ArcMap 3D and Spatial Extension software were used to create and geo-reference the imaginary surfaces in space, and in relation to the locations and proposed heights of the transmission structures. Ground surface data for the study area was derived by using a USGS 10 Meter Digital Elevation Model.

Of the 14 airports/heliports listed above, it was determined that only the Dulles Airport is in close enough proximity to potentially impact navigable airspace. The Project would be located approximately 0.7 nautical mile southwest of the closest existing Dulles Airport facilities and 0.2 nautical mile south of the estimated location of the proposed future runway. The Takeoff Loop, Sully-Takeoff Partial Rebuild, and Aviator-Takeoff Lines Proposed and Alternative Routes are located directly south of all three north/south runways at the Dulles Airport, with all of the Takeoff Loop and Aviator-Takeoff Proposed and Alternative Routes and part of the Sully-Takeoff Partial Rebuild located below the horizontal surface, and only the Aviator-Takeoff Lines Proposed and Alternative Routes located below the approach surfaces of Runways 1L and 1C. The Takeoff Loop Proposed and Alternative Routes and the Sully-Takeoff Partial Rebuild structures are not located below any approach surfaces but are located below the transitional surfaces for Runways 1C and 1R.

Of the Aviator-Takeoff Lines, the Proposed Route is located closest to the north/south runways, at approximately 7,350 feet south of Runway 1L, 7,200 feet south of Runway 1C, and 4,100 feet southwest of Runway 1R. The Aviator-Takeoff Proposed Route is also located approximately 5,300 feet south of and parallel to the existing east/west Runway 12/30 and 950 feet south of the estimated location of the proposed fifth runway. The surveyed elevation of the Dulles Airport is 312.3 feet above mean sea level ("AMSL"), while elevations in the project area are estimated to range from approximately 315 feet AMSL near the future Aviator Substation, to a low of 240 feet AMSL at the crossing of Cub Run, and then rise to approximately 285 feet AMSL near the proposed Takeoff Substation, while elevations near the Sully-Takeoff Partial Rebuild structures range from approximately 310 to 335 feet AMSL.

Given the distance from the end of the runways and the ground elevations along the route alternatives, either the horizontal or the approach surfaces for the runways would be the most limiting surface along the route alternatives. Due to the proximity to these surfaces, ERM evaluated the estimated imaginary surface height of each proposed structure location for the Project's Proposed and Alternative

Routes. Based on this analysis, the Company's conceptual transmission line design engineers determined they can avoid penetrating any of these imaginary surfaces for all Proposed and Alternative Routes. Therefore, it was determined there would be no potential for penetration into any of the imaginary surfaces or terminal instrument procedures imaginary surfaces and thus there would be no impacts to navigable airspace from the proposed Project. See Section 5 of the Environmental Routing Study for additional information regarding the proposed structure heights and the estimated FAA maximum allowable height at each structure.

Based on the requirements stated in FAA Form 7460-1, Notice of Proposed Construction or Alteration, notice will need to be filed for the Project due to the proximity to Dulles Airport.

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. Perpendicular road crossings, which are preferred by VDOT, as well as Fairfax County Department of Transportation and Loudoun County Department of Transportation and Capital Infrastructure, will be utilized at other road crossings. Additionally, the use of the existing right-of-way minimizes or eliminates permanent incremental impacts at road crossings.

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

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

Response: The Company solicited feedback from Loudoun and Fairfax Counties regarding the proposed Project. Below is a list of coordination that has occurred with municipal, state, and federal agencies:

- Coordination with the U.S. Army Corps of Engineers, DEQ, and VDOT will take place as appropriate to obtain necessary approvals for the Project.
- A letter dated June 17, 2024, was submitted to Loudoun County to describe the Project and request comments. See Section V.D.
- A letter dated June 17, 2024, was submitted to Fairfax 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 June 17, 2024, 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 July 16, 2024. See Attachment 2.I.1 to the DEQ Supplement.
- In May 23, 2024, the Company solicited comments via letter from several federally recognized Native American tribes, including:

Chief Walt "Red Hawk" Brown	Cheroenhaka (Nottoway) Indian Tribe
Mary Frances Wilkerson	Cheroenhaka (Nottoway) Indian Tribe
Chief Stephen Adkins	Chickahominy Indian Tribe
Assistant Chief Reginald Stewart	Chickahominy Indian Tribe
Chief Gerald A Stewart	Chickahominy Indian Tribe Eastern Division
Jessica Phillips	Chickahominy Indian Tribe Eastern Division
Dana Adkins	Chickahominy Tribe
Chief Mark Custalow	Mattaponi Tribe
Chief Keith Anderson	Nansemond Indian Nation
Chief Lynette Allston	Nottoway Indian Tribe of Virginia
SUB: Ms. Beth Roach	Nottoway Indian Tribe of Virginia
Chief Robert Gray	Pamunkey Indian Tribe
Kendall Stevens	Pamunkey Indian Tribal Resource Office
Chief Charles (Bootsie) Bullock	Patawomeck Indian Tribe of Virginia
Chief G. Anne Richardson	Rappahannock Tribe

SUB: Assistant Chief	Rappahannock Tribe
Chief W. Frank Adams	Upper Mattaponi Indian Tribe
Leigh Mitchell	Upper Mattaponi Indian Tribe
Caitlin Rogers	Catawba Indian Nation

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
DominionEnergy.com

May 23, 2024

Aviator to Takeoff 230 kV Electric Transmission and Substation Rebuild Project

Dear _____,

Dominion Energy is dedicated to maintaining safe, reliable, and affordable electric service in the communities we serve. You are receiving this project announcement letter as part of our efforts to proactively communicate early with Tribal Nations who may have an interest in Loudoun and Fairfax counties in Virginia. With your unique perspective, you can help us better plan projects in their earliest stages. Please note, this letter is not a notification of formal government-to-government consultation from any state or federal agency. Dominion Energy has been, and continues to be, committed to creating and maintaining strong, open, supportive, and mutually beneficial relationships with Tribal Nations.

We are planning to build the Aviator to Takeoff 230 kilovolt (kV) Electric Transmission and Substation Project. This project will address increased load demand by expanding and upgrading the 230 kV transmission network around Chantilly, Virginia. This will improve the reliability of the electrical grid for all customers, enhance Dominion Energy's operational flexibility, and allow us to continue to comply with mandatory, federal standards.

This project is comprised of these components:

- Construct the new Takeoff Substation.
- Construct a new 0.3-mile long right of way corridor with two double-circuit 230 kV lines to connect Takeoff Substation to the electric grid.
- Construct a new 3.2-mile-long right of way corridor with one double-circuit 230 kV line to connect the newly constructed Aviator Substation to Takeoff Substation.
- Replace wires on approximately 2 miles of existing 230 kV electric transmission lines and replace five structures.

To minimize impacts on the community, we have refined the routing for this project. Multiple routes will be evaluated, and one proposed route with alternatives will be submitted to the Virginia State Corporation Commission (SCC) for final approval. Before we submit the application to the SCC, we are seeking your feedback. Providing your input now allows us to consider any concerns you may have as we work to meet the project's needs.

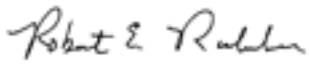
To learn more, consider joining us at our Community Meeting on **Thursday, June 6.**

Rajdhani Mandir
4525 Pleasant Valley Road
Chantilly, VA 20151

At the meeting, you will be able to speak to the project team and ask questions about the project. **There will not be a formal presentation**, so please feel free to stop by anytime between **5:30 p.m. and 7:30 p.m.** Your continued involvement, participation, and input are important in developing these projects. Please visit the project website at DominionEnergy.com/NOVA for an overview map, meeting updates, and other project materials.

Please feel free to notify other relevant organizations that may have an interest in the project area. For reference, other recipients of this letter include county and state historic, cultural, and scenic organizations, as well as Tribal Nations.

You may also contact Tribal Relations Manager Ken Custalow by sending an email to Ken.Custalow@dominionenergy.com.
Sincerely,



Robert Richardson
Communications Consultant
The Electric Transmission Project Team

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

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

Response: On May 23, 2024, 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. Thomas Gilmore	American Battlefield Trust
Mr. Jim Campi	American Battlefield Trust
Mr. Max Hokit	American Battlefield Trust
Mr. Steven Williams	Colonial National Historical Park
Ms. Eleanor Breen, PhD, RPA	Council of Virginia Archaeologists
Ms. Leighton Powell	Scenic Virginia
Ms. Elaine Chang	National Trust for Historic Preservation
Ms. Julie Bolthouse	Piedmont Environmental Council
Mr. John McCarthy	Piedmont Environmental Council
Dr. Cassandra Newby- Alexander, Dean	Norfolk State University
Mr. Roger Kirchen, Archaeologist	Virginia Department of Historic Resources
Ms. Adrienne Birge-Wilson	Virginia Department of Historic Resources
Mr. Dave Dutton	Dutton + Associates, LLC

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

May 23, 2024

Aviator to Takeoff 230 kV Electric Transmission and Substation Rebuild Project

Dear _____,

Dominion Energy is dedicated to maintaining safe, reliable, and affordable electric service in the communities we serve. As a valued stakeholder with a unique perspective, you can help us meet these objectives as we plan necessary electric infrastructure projects. We have an upcoming project in Loudoun and Fairfax counties, and we are reaching out to you as you may have an interest in this area.

We are planning to build the Aviator to Takeoff 230 kilovolt (kV) Electric Transmission and Substation Project. This project will address increased load demand by expanding and upgrading the 230 kV transmission network around Chantilly, Virginia. This will improve the reliability of the electrical grid for all customers, enhance Dominion Energy's operational flexibility, and allow us to continue to comply with mandatory federal standards.

This project is comprised of these components:

- Construct the new Takeoff Substation.
- Construct a new 0.3-mile long right of way corridor with two double-circuit 230 kV lines to connect Takeoff Substation to the electric grid.
- Construct a new 3.2-mile-long right of way corridor with one double-circuit 230 kV line to connect the newly constructed Aviator Substation to Takeoff Substation.
- Replace wires on approximately 2 miles of existing 230 kV electric transmission lines and replace five structures.

To minimize impacts on the community, we have refined the routing for this project. Multiple routes will be evaluated, and one proposed route with alternatives will be submitted to the Virginia State Corporation Commission (SCC) for final approval. Before we submit the application to the SCC, we would like your feedback. Providing your input now allows us to consider any concerns you may have as we work to meet the project's needs.

To learn more, consider joining us at our Community Meeting on **Thursday, June 6.**

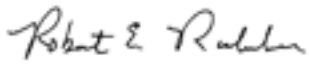
Rajdhani Mandir
4525 Pleasant Valley Road
Chantilly, VA 20151

At the meeting, you will be able to speak to the project team and ask questions about the project. **There will not be a formal presentation**, so please feel free to stop by anytime between **5:30 p.m. and 7:30 p.m.** Your continued involvement, participation, and input are important in developing these projects. Please visit the project website at DominionEnergy.com/NOVA for an overview map, meeting updates, and other project materials.

Please feel free to notify other relevant organizations that may have an interest in the project area. For reference, other recipients of this letter include county and state historic, cultural, and scenic organizations, as well as Tribal Nations.

If you have questions or would like to discuss the project, contact me by calling 804-248-1698 or please send me an email at Robert.E.Richardson@dominionenergy.com.

Sincerely,



Robert 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
Work within VDOT rights-of-way	Roadway Access Permit	Virginia Department of Transportation
Airspace obstruction evaluation	FAA 7460-1	Federal Aviation Administration/Metropolitan Washington Airports Authority
National Environmental Policy Act review	Environmental Assessment /Categorical Exclusion	Federal Aviation Administration/Metropolitan Washington Airports Authority

To permit the potential crossing of MWAA property through either an easement or license agreement between the Company and MWAA, review by the FAA and MWAA under the NEPA will be required. In preliminary discussions between the Company and MWAA regarding a NEPA review, MWAA indicated that if the Proposed Route of both the Takeoff Loop and Aviator-Takeoff Lines are reviewed, an Environmental Assessment will likely be required, rather than an Environmental Impact Statement or Categorical Exclusion. However, this determination of level of NEPA review will be confirmed through additional coordination with MWAA.

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 associated with high voltage power lines is best estimated by field levels 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 (2028) annual average and maximum (peak) loading conditions. The EMF values provided in this section were calculated based on the Company's proposed line characteristics of a typical span in both average and peak loading conditions.

Takeoff Loop and Substation

For the Takeoff Loop, EMF levels are provided for future (2028) annual average and maximum (peak) loading conditions.

Proposed Lines – Projected average loading in 2028

EMF levels were calculated for the proposed Takeoff Loop at the ***projected average*** load condition (1030 Amps for Line #2008, 545 Amps for Line #2285, 889 Amps for Line #2357, and 1379 Amps for Line #2356) and at operating voltages of 241.5 kV for each 230 kV circuit when supported on the proposed structures. See Attachment II.A.5.a and Attachment II.A.5.b.

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 Takeoff Loop at the projected average loading:

Proposed Lines - Projected *Average* Loading				
	Left Edge Looking towards Takeoff Substation		**Right Edge Looking towards Takeoff Substation**	
Attachment	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
II.A.5.a	1.410	129.620	1.408	167.384
II.A.5.b	0.523	112.074	0.518	138.200

Proposed Lines – Projected peak loading in 2028

EMF levels were calculated for the proposed Takeoff Loop at the ***projected peak*** load condition (1717 Amps for Line #2008, 908 Amps for Line #2285, 1482 Amps for Line #2357, and 2298 Amps for Line #2356) and at operating voltages of 241.5 kV for each 230 kV circuit when supported on the proposed structures. See Attachment II.A.5.a and Attachment II.A.5.b.

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 Takeoff Loop at the projected peak loading:

Proposed Lines - Projected *Peak* Loading				
	Left Edge Looking towards Takeoff Substation		**Right Edge Looking towards Takeoff Substation**	
Attachment	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
II.A.5.a	1.406	217.077	1.400	281.702
II.A.5.b	0.511	187.886	0.494	233.201

Sully-Takeoff Partial Reconductor/Rebuild

For Sully-Takeoff Partial Reconductor/Rebuild, EMF levels are provided for both historical (2023) and future (2028) annual average and maximum (peak) loading conditions.

Existing Lines – Historical Average Loading in 2023

EMF levels were calculated for the existing lines at the ***historical average*** load condition (712 Amps for Line #2008, 496 Amps for Line #265, and 354 Amps for Line #2107) and at operating voltages of 241.5 kV for each 230 kV circuit when supported on the existing structures. See Attachment II.A.5.c and Attachment II.A.5.e.

These field levels were calculated at mid-span where the conductors are closest to

the ground and the conductors are at a historical average load operating temperature.

EMF levels at the edge of the right-of-way for the existing lines at the historical average loading:

Existing Lines – Historical *Average* Loading

Attachment	Left Edge Looking towards Sully Substation		Right Edge Looking towards Sully Substation	
	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
II.A.5.c	0.373	63.372	0.375	56.447
II.A.5.e	0.065	31.420	0.064	34.648

Existing Lines – Historical Peak Loading in 2023

EMF levels were calculated for the existing lines at the ***historical peak*** load condition (1085 Amps for Line #2008, 785 Amps for Line #265, and 717 Amps for Line #2107) and at operating voltages of 241.5 kV for each 230 kV circuit when supported on the existing structures. See Attachment II.A.5.c and Attachment II.A.5.e.

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

EMF levels at the edge of the right-of-way for the existing lines at the historical peak loading:

Existing Lines – Historical *Peak* Loading

Attachment	Left Edge Looking towards Sully Substation		Right Edge Looking towards Sully Substation	
	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
II.A.5.c	0.366	98.05	0.370	88.139
II.A.5.e	0.062	57.695	0.062	59.267

Proposed Lines – Projected Average Loading in 2028

EMF levels were calculated for the proposed lines at the ***projected average*** load condition (1030 Amps for Line #2008, 889 Amps for Line #2357, and 633 Amps for Line #2107) and at operating voltages of 241.5 kV for each 230 kV circuit when supported on the proposed structures. See Attachment II.A.5.d and Attachment II.A.5.f.

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 right-of-way for the proposed lines at the projected average loading:

Proposed Lines – Projected *Average* Loading

Attachment	Left Edge Looking towards Sully Substation		Right Edge Looking towards Sully Substation	
	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
II.A.5.d	0.464	100.264	0.465	95.514
II.A.5.f	0.046	58.218	0.046	64.411

Proposed Lines – Projected Peak Loading in 2028

EMF levels were calculated for the proposed lines at the ***projected peak*** load condition (1717 Amps for Line #2008, 1482 Amps for Line #2357, and 1055 Amps for Line #2107) and at operating voltages of 241.5 kV for each 230 kV circuit when supported on the proposed structures. See Attachment II.A.5.d and Attachment II.A.5.f.

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 right-of-way for the proposed lines at the projected peak loading:

Proposed Lines – Projected *Peak* Loading

Attachment	Left Edge Looking towards Sully Substation		Right Edge Looking towards Sully Substation	
	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
II.A.5.d	0.456	167.844	0.458	159.726
II.A.5.f	0.045	97.168	0.044	107.624

Aviator-Takeoff Lines

For the Aviator-Takeoff Lines, EMF levels are provided for future (2028) annual average and maximum (peak) loading conditions.

Proposed Lines – Projected average loading in 2028

EMF levels were calculated for the proposed Aviator-Takeoff Lines at the ***projected average*** load condition (552 Amps for Line #2358 and 537 Amps for Line #2359) and at operating voltages of 241.5 kV for each 230 kV circuit when supported on

the proposed structures. See Attachment II.A.5.g, Attachment II.A.5.h, and Attachment II.A.5.i.

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 Aviator-Takeoff Lines at the projected average loading:

Proposed Lines - Projected *Average* Loading				
	Left Edge Looking towards Aviator Substation		**Right Edge Looking towards Aviator Substation**	
Attachment	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
II.A.5.g	0.867	52.742	0.866	53.349
II.A.5.h	0.670	50.593	0.670	51.026
II.A.5.i	0.771	52.854	0.771	53.290

Proposed Lines – Projected peak loading in 2028

EMF levels were calculated for the proposed Aviator-Takeoff Lines at the ***projected peak*** load condition (920 Amps for Line #2358 and 895 Amps for Line #2359) and at operating voltages of 241.5 kV for each 230 kV circuit when supported on the proposed structures. See Attachment II.A.5.g, Attachment II.A.5.h, and Attachment II.A.5.i.

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 Aviator-Takeoff Lines at the projected peak loading:

Proposed Lines - Projected *Peak* Loading				
	Left Edge Looking towards Aviator Substation		**Right Edge Looking towards Aviator Substation**	
Attachment	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
II.A.5.g	0.862	88.198	0.862	89.232
II.A.5.h	0.664	84.634	0.664	85.373
II.A.5.i	0.765	88.452	0.765	89.198

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 few decades are the foundation of the Company's opinion that no adverse health effects are anticipated to result from the operation of the proposed Project. Each of these panels has evaluated the scientific research related to health and extremely low frequency ("ELF") EMF, also referred to as power-frequency (50/60 Hertz ("Hz")) 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 on biological responses of high, short-term EMF exposure not typically found in people's day-to-day lives, while others evaluate the effects of common, low 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 100 epidemiologic studies of people in their natural environment and many more laboratory studies of animals (*in vivo*) and isolated cells and tissues (*in vitro*). Standard scientific procedures, such as weight-of-evidence methods, were used by the expert panels assembled by scientific agencies to identify, review, and summarize the results of this large and diverse research.

The reviews of ELF EMF-related biological and health research have been conducted by numerous scientific and health agencies, including, for example, the European Health Risk Assessment Network on Electromagnetic Fields Exposure ("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 Health, Environmental and Emerging Risks ("SCHEER") (formerly 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, 2022; ICES, 2019; SCHEER, 2023). 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 and 2023 reports by

SCENIHR and SCHEER, respectively, and annual reviews published by SSM (i.e., for the years 2015 through 2022). 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.

WHO has recommended that countries adopt recognized international standards published by ICNIRP and ICES. Typical levels of EMF from Dominion Energy Virginia's high voltage 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.

References

European Health Risk Assessment Network on Electromagnetic Fields Exposure (EFHRAN). Report on the Analysis of Risks Associated to Exposure to EMF: *In Vitro* and *In Vivo* (Animals) Studies. Milan, Italy: EFHRAN, 2010.

European Health Risk Assessment Network on Electromagnetic Fields Exposure (EFHRAN). Risk Analysis of Human Exposure to Electromagnetic Fields (Revised). Report D2 of the EFHRAN Project. Milan, Italy: EFHRAN, 2012.

International Commission on Non-ionizing Radiation Protection (ICNIRP). Guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz to 100 kHz). Health Phys 99: 818-36, 2010.

International Committee on Electromagnetic Safety (ICES). IEEE Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields 0 to 300 GHz. IEEE Std C95.1-2019. New York, NY: IEEE, 2019.

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Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR). Opinion on Potential Health Effects of Exposure to Electromagnetic Fields (EMF). Brussels, Belgium: European Commission, 2015.

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on EMF and Health Risk - Tenth report from SSM's Scientific Council on Electromagnetic Fields. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2015.

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Swedish Radiation Safety Authority (SSM). Research 2022:16. Recent Research on EMF and Health Risk – Sixteenth report from SSM's Scientific Council on Electromagnetic Fields, 2021. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2022.

World Health Organization (WHO). Environmental Health Criteria 238: Extremely Low Frequency (ELF) Fields. Geneva, Switzerland: World Health Organization, 2007.

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."[46]

The continuing scientific research on ELF 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:

- WHO, which published one of the most comprehensive and detailed reviews of the relevant scientific peer-reviewed literature in 2007;
- SCHEER (formerly SCENIHR), a committee of the European Commission, which published its assessments in 2009, 2015 and 2023;
- The SSM, which has published annual reviews of the relevant peer-reviewed scientific literature since 2003, with its most recent review published in 2022; 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

[46] *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). In their 2023 Preliminary Opinion providing an update on the potential health effects of exposure to electromagnetic fields in the 1 Hz to 100 kilohertz ("kHz") range, SCHEER concluded that "overall, there is weak evidence concerning the association of ELF-MF [magnetic field] exposure with childhood leukaemia" (SCHEER 2023, p. 2).

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 March 2024, provide additional evidence and contribute to clarification of previous findings. Overall, new research studies have not provided evidence to alter the previous conclusions of scientific and health organizations, including WHO and SCENIHR.

Epidemiologic studies of EMF and childhood leukemia published during the above referenced period 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 tumors, 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 and after) and reported no overall associations between exposure categories and childhood leukemia for the later periods (1980 and after), 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 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 Quebec. 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 exposure to high calculated magnetic fields (≥ 0.4 microtesla ["μT"]) (i.e., ≥ 4 milligauss ["mG"]). 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.

- Amoon et al. (2022) conducted a pooled analysis of four studies of residential exposure to magnetic fields and childhood leukemia published following a 2010 pooled analysis by Kheifets et al. (2010). The study by Amoon et al. (2022) compared the exposures of 24,994 children with leukemia to the exposures of 30,769 controls without leukemia in California, Denmark, Italy, and the United Kingdom. Exposure was assessed by measured or calculated magnetic fields at their residences. The exposure of these two groups to magnetic fields were found not to significantly differ. A decrease in the combined effect estimates in epidemiologic studies was observed over time, and the authors concluded that their findings, based on the most recent studies, were "not in line" with previous pooled analyses that reported an increased risk of childhood leukemia.

- Brabant et al. (2022) performed a literature review and meta-analysis of studies of childhood leukemia and magnetic-field exposure. The overall analysis included 21 epidemiologic studies published from 1979 to 2020. The authors reported a statistically significant association, which they noted was "mainly explained by the studies conducted before 2000." The authors reported a statistically significant association between childhood leukemia and measured or calculated magnetic-field exposures > 0.4 μT (4 mG); no statistically significant overall associations were reported between childhood leukemia and lower magnetic-field exposure (< 0.4 μT [4 mG]), residential distance from power lines, or wire coding configuration. An association between childhood

leukemia and electric blanket use was also reported. The overall results were likely influenced by the inclusion of a large number of earlier studies; 10 of the 21 studies in the main analysis were published prior to 2000. Studies published prior to 2000 included fewer studies deemed to be of higher study quality, as determined by the authors, compared to studies published after 2000.

- Nguyen et al. (2022) investigated whether potential pesticide exposure from living in close proximity to commercial plant nurseries confounds the association between magnetic-field exposure and childhood leukemia development reported within the California study population previously analyzed in Crespi et al. (2016) and Kheifets et al. (2017). The authors in Nguyen et al. (2022) noted that while the association between childhood leukemia and magnetic-field exposure was "slightly attenuated" after adjusting for nursery proximity or when restricting to subjects living > 300 meters from nurseries, their results "do not support plant nurseries as an explanation for observed childhood leukemia risks." The authors further noted that close residential proximity to nurseries may be an independent risk factor for childhood leukemia.

- Guo et al. (2023) reported conducting a systematic review and meta-analysis of studies published from 2015 to 2022 that evaluated associations between magnetic-field exposure and childhood leukemia development. Three meta-analyses were conducted to evaluate the relationship using different exposure metrics. In the first meta-analysis, magnetic-field levels ranging from 0.4 μT (4 mG) to 0.2 μT (2 mG) were associated with a statistically significant reduced risk of childhood leukemia development (i.e., a protective association). In the second meta-analysis, exposure was based on wiring configuration codes, and the reported pooled relative risk estimates demonstrated a statistically significant increased association with childhood leukemia. In the third meta-analysis, exposure was categorized into groupings of magnetic-field strength; no statistically significant associations with childhood leukemia were reported for any of the groupings, including for magnetic-field levels ≥ 0.4 μT (4 mG). There are significant limitations of this study that prevent meaningful interpretations of the results. Most of the analyses of magnetic fields did not state whether measurements and calculations were included, and the authors provided no description of the methods used for their analyses, no data tables to support their findings, and no references to the number and type of studies included. In fact, much of the article's introduction discusses ionized radiation. The authors also do not report relevant metrics for evaluating meta-analyses such as study heterogeneity.

- Malagoli et al. (2023) examined associations between exposure to magnetic fields from high voltage power lines (≥ 132 kV) and childhood leukemia development in a case-control study of children in Italy. The study included 182 cases diagnosed with childhood leukemia between 1998 and 2019 and 726 controls matched based on age, sex, and Italian province. The authors assessed magnetic-field exposure by calculating the distance from each participant's

residence to the nearest high voltage power line and classifying that distance into one of three exposed categories (participants living < 100 meters, 100 to < 200 meters, or 200 to < 400 meters from the power lines) or as unexposed (participants living ≥ 400 meters from the power lines). The authors reported a non-statistically significant association between childhood leukemia and a residence distance of <100 meters; no statistically significant associations were reported for any distance, including when stratifying by age (< 5 or ≥ 5 years) or when restricting to acute lymphoblastic leukemia (ALL).

- Nguyen et al. (2023) extended their previous investigation (Nguyen et al., 2022) into whether pesticide exposure was an independent risk factor or confounder for childhood leukemia in the presence of magnetic-field exposure from high voltage power lines by examining the potential impact of specific pesticide exposure factors (*e.g.*, intended use, chemical class, active ingredient). The authors found no statistically significant associations between distance to high voltage power lines or magnetic-field exposure and childhood leukemia, including when adjusting for pesticide exposures. Several of the examined pesticides were determined by the authors to be potential independent risk factors for childhood leukemia.

- Zagar et al. (2023) examined the relationship between magnetic fields and childhood cancers, including childhood leukemia, in Slovenia. Cancer cases, including 194 cases of leukemia, were identified from the Slovenian Cancer Registry; cases were then classified into one of five calculated magnetic-field exposure levels (ranging from < 0.1 μT [< 1 mG] to ≥ 0.4 μT [≥ 4 mG]) based on residential distance to high voltage (*e.g.*, 110-kV, 220-kV, and 400-kV) power lines. The authors reported that less than 1% of Slovenian children and adolescents lived in an area near high voltage power lines. No differences in the development of childhood cancers, including leukemia, brain tumors, or all cancers combined, were reported across the five exposure categories.

- Crespi et al. (2024) assessed the association between residential proximity to electricity transformers in multi-story residential buildings and childhood leukemia development in the International Transformer Exposure study. Participants were required to live in an apartment building that contained a built-in transformer; exposure was estimated using the participants' apartment location relative to the transformer and categorized as high exposure (located above or adjacent to the transformer), intermediate exposure (located on the same floor as apartments in the high exposure category), or unexposed (all other apartments). In the pooled analyses of five countries' data, a total of 74 cases and 20,443 controls were included; 18 of the 74 cases were identified in the intermediate or high exposure categories. No significant associations were reported between proximity to residential transformers and childhood leukemia. Sensitivity analyses performed using the data from one of the five countries (Finland) where a cohort study design was used, also reported no significant associations. The authors concluded that the evidence for an elevated risk of childhood leukemia from proximity to residential transformers was "weak."

- Duarte-Rodríguez et al. (2024) conducted a population-based case-control study to examine the geographical distribution of childhood ALL cases in Mexico City, Mexico. Cases and controls were geolocated using the most recent residential address, and a spatial scan statistic was used to detect spatial clusters of cancer cases. The authors identified eight spatial clusters of cases, representing nearly 40% of all cases included in the study (n=1,054 cases). The authors noted that six of the eight spatial clusters were located in proximity to high voltage power lines and high voltage electric installations (distances not specified), and that the remaining two clusters were located near former petrochemical industrial facility sites. Since the study did not directly assess magnetic-field exposure and made no conclusions about magnetic-field exposure and cancer development, this study adds little value to the existing literature regarding a potential association between exposure to ELF EMF and childhood leukemia development.

- Malavolti et al. (2024) examined the association between magnetic-field exposure from transformer stations and childhood leukemia in the same Italian study population as Malagoli et al. (2023). Magnetic-field exposure was estimated based on residential distance to the nearest transformer station, and participants were then categorized as exposed or unexposed using two different distance cut-points: residing within a radius of 15 or 25 meters from the transformer station (exposed); residing ≥ 15 meters or ≥ 25 meters from the transformer station (unexposed). No significant associations were reported for all leukemias, or ALL specifically, when either distance cut-point was used, and in fact no association at all (an odds ratio = 1.0) was observed when the more stringent cut-point of 15 meters was used. In sub-analyses that stratified by participant age (< 5 years vs. ≥ 5 years), no significant associations were reported for either age category.

Epidemiologic studies of EMF and neurodegenerative diseases published during the above referenced period 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 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[47] 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

[47] 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).

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 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.

- Grebeneva et al. (2021) evaluated disease rates among electric power company workers in the Republic of Kazakhstan. The authors included three groups of "exposed" workers who "were in contact with equipment generating [industrial frequency EMF]" (a total of 161 workers), as well as 114 controls "who were not associated with exposure to electromagnetic fields." Disease rates were assessed "based on analyzing the sick leaves of employees" from 2010 to 2014 and expressed as "incidence rate per 100 employees." The authors reported a higher "incidence rate" of "diseases of the nervous system" in two of the exposed categories compared to the non-exposed group. No meaningful conclusions from the study could be drawn, however, because no specific diagnoses within "diseases of the nervous system" were identified in the paper and no clear description was provided on how the authors defined and calculated "incidence rate" for the evaluated conditions. In addition, no measured or calculated magnetic-field levels were presented by the authors.

- Filippini et al. (2021) conducted a meta-analysis to assess the dose-response relationship between residential exposure to magnetic fields and ALS. The

authors identified six ALS epidemiologic studies, published between 2009 and 2020, that assessed exposure to residential magnetic fields by either distance from overhead power lines or magnetic-field modeling. They reported a decrease in risk of ALS in the highest exposure categories for both distance-based and modeling-based exposure estimates. The authors also reported that their dose-response analyses "showed little association between distance from power lines and ALS"; the data were too sparse to conduct a dose-response analysis for modeled magnetic-field estimates. The authors noted that their study was limited by small sample size, "imprecise" exposure categories, the potential for residual confounding, and by "some publication bias."

- Jalilian et al. (2021) conducted a meta-analysis of occupational exposure to ELF magnetic fields and electric shocks and development of ALS. The authors included 27 studies from Europe, the United States, and New Zealand that were published between 1983 and 2019. A weak, statistically significant association was reported between magnetic-field exposure and ALS, and no association was observed between electric shocks and ALS. Indications of publication bias and "moderate to high" heterogeneity were identified for the studies of magnetic-field exposure and ALS, and the authors noted that "the results should be interpreted with caution."

- Goutman et al. (2022) examined occupational exposures, including "electromagnetic radiation" exposure, and associations with ALS in a case-control study of Michigan workers across various industries. The study included 381 cases diagnosed with ALS, all patients at the University of Michigan's Pranger ALS clinic, and 272 controls recruited from an online database for the University of Michigan. Participants were enrolled from 2010 to 2020 and completed a written survey of their work history and occupational exposures to nine exposure categories, including electromagnetic fields, particulate matter (PM), and pesticides. Exposure to electromagnetic fields was ascertained with a binary question asking whether they were "[e]xposed to power lines, transformation [*sic*] stations or other EM [electromagnetic radiation]?" The analysis was adjusted for age, sex, and military service. No association was observed between electromagnetic field exposure and ALS, while exposure to PM, pesticides, and metals, among others, were determined by the authors to be "associated with an increased ALS risk in this cohort."

- Sorahan and Nichols (2022) investigated magnetic-field exposure and mortality from MND in a large cohort of employees of the former Central Electricity Generating Board of England and Wales. The study included nearly 38,000 employees first hired between 1942 and 1982 and still employed in 1987. Estimates of exposure magnitude, frequency, and duration were calculated using data from the power stations and the employees' job histories, and were described in detail in a previous publication (Renew et al., 2003). Mortality from MND in the total cohort was observed to be similar to national rates. No statistically significant dose-response trends were observed with lifetime, recent, or distant magnetic-field exposure; statistically significant associations

were observed for some categories of recent exposure, but not for the highest exposure category.

- Duan et al. (2023) conducted a meta-summary of ALS and exposure to magnetic fields, which was 1 of 22 non-genetic risk factors evaluated across 67 studies for its association with ALS. Six of the 67 studies examined magnetic-field exposure and associations with ALS; of the six studies identified, the authors included four case-control studies and one cohort study in their meta-analysis. Pooling results from these studies resulted in significant increased odds of ALS among individuals with higher (but undefined) exposure to magnetic fields. However, this pooled odds ratio for magnetic-field exposure (1.22) was below the minimum odds ratio threshold of 1.3 set by the authors as the criterion for defining an exposure as an ALS risk factor. In addition, the authors identified "substantial" heterogeneity between studies evaluating magnetic-field exposure and ALS.

- In a subsequent publication of the same study as Goutman et al. (2022), Goutman et al. (2023) assessed the potential for the same nine exposure categories, including "electromagnetic radiation" exposure, to be risk factors for ALS progression, including survival and onset segment (bulbar, cervical, lumbar). Electromagnetic field exposure was not significantly associated with ALS survival or with bulbar onset compared to lumbar, but was significantly associated with cervical onset compared to lumbar. It is worth noting that an association with cervical onset compared to lumbar was observed in the majority (7/9) of the exposure categories. The authors make no concluding statements on electromagnetic field exposure and ALS and instead emphasize that occupational pesticide exposure and working in military operations were significantly associated with worse ALS survival.

- Saucier et al. (2023) carried out three systematic reviews of studies that evaluated relationships between urbanization, air pollution, and water pollution, and ALS development. The authors identified five studies that assessed whether electromagnetic fields (of varying frequencies) and high voltage infrastructure were significant urbanization risk factors for ALS, but make no conclusion about magnetic-field exposure and ALS development based on these studies, therefore adding little value to the existing literature.

- Vasta et al. (2023) examined the relationship between residential distance to power lines and ALS development in a cohort study of 1,098 participants in Italy. The authors reported no differences in the age of ALS onset or ALS progression rate between low-exposed and high-exposed participants based on residential distance to power lines at the time of the participants' diagnosis. Similarly, no differences were observed when exposure was based on residential distance to repeater antennas.

- Vitturi et al. (2023) conducted a systematic review and meta-analysis of case-control studies examining potential occupational risk factors related to multiple

sclerosis, including solvents, mercury, pesticides, and low-frequency magnetic fields. The authors included 24 studies in their review, but only one of the included studies investigated exposure to magnetic fields (Pedersen et al., 2017, discussed above), thereby adding little new information to the existing body of research.

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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: The Project includes construction of two new double circuit 230 kV overhead transmission lines (the "Takeoff Loop") to a new proposed substation (the "Takeoff Substation") in Fairfax County, Virginia; the partial reconductor and rebuild of Sully-Takeoff Line #2357 (the "Sully-Takeoff Partial Reconductor/Rebuild") in Fairfax County, Virginia; and construction of a new double circuit 230 kV overhead transmission line (the "Aviator-Takeoff Lines") in Fairfax and Loudoun County, Virginia.

A map is provided in Attachment V.A showing the overhead Proposed and Alternative Routes for the Takeoff Loop, the Sully-Takeoff Partial Reconductor/Rebuild, and the Aviator-Takeoff Lines. The location of the proposed Takeoff Substation also is included.

A written description of the Project's Proposed and Alternative Routes are as follows:

TAKEOFF LOOP

Takeoff Loop Proposed Route (Route 1)

The Takeoff Loop Proposed Route is approximately 0.3 mile in length. The Takeoff Loop Proposed Route originates at cut-in locations on the Company's existing Lincoln Park-Loudoun Line #2008 and Bull Run-Sully Line #265 between Structures #2008/66 / #265/88 and #2008/67 / #265/89, north of Route 50 and east of Airplane Road. From the cut-in locations, the Proposed Route heads west collocated along Route 50, crosses Airplane Road, then turns north and terminates at the proposed Takeoff Substation, which is located north of Route 50 and east of Avion Parkway in Fairfax County.

The Takeoff Loop Proposed Route proposes construction of two new double circuit 230 kV overhead transmission lines, which primarily will be supported by double circuit weathering steel 2-pole structures. For the Takeoff Loop Proposed Route, the minimum structure height is 100 feet, the maximum structure height is 110 feet, and the average structure height is 103 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

Takeoff Loop Alternative Route 2

Takeoff Loop Alternative Route 2 is approximately 0.3 mile in length. Takeoff Loop Alternative Route 2 originates at a cut-in location on the Company's existing Lincoln Park-Loudoun Line #2008 between Structures #2008/65 and #2008/66, south of Route 50 and east of Lee Road. From the cut-in location, the route heads northwest collocated along the south side of Route 50 and crosses Lee Road, then turns north, crosses Route 50, and terminates at the proposed Takeoff Substation, which is located north of Route 50 and east of Avion Parkway in Fairfax County.

Takeoff Loop Alternative Route 2 proposes construction of one new double circuit 230 kV overhead transmission line, which primarily will be supported by double circuit weathering steel monopoles and 2-pole angle structures. For Takeoff Loop Alternative Route 2, the minimum structure height is 95 feet, the maximum structure height is 125 feet, and the average structure height is 106 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

SULLY-TAKEOFF PARTIAL RECONDUCTOR/REBUILD

Reconductor/Rebuild Proposed Route

The Reconductor/Rebuild Proposed Route is approximately 1.9 miles long, including approximately 1.0 mile of reconductor only and 0.9 mile of reconductor and partial rebuild, which will entail replacement of five existing structures. The Reconductor/Rebuild Proposed Route begins at the existing Sully Substation located in Chantilly, Virginia, east of Lees Corner Road and north of Fatlick Branch and heads northeast along an existing transmission line right-of-way, crossing Centreville Road, then continues along the Washington Dulles International Airport ("Dulles Airport") property, crosses Route 28, and terminates at the cut-in location between Structures #2008/66 / #265/88 and #2008/67 / #265/89, north of Route 50 and east of Airplane Road.

The Reconductor/Rebuild Proposed Route will replace approximately five existing double circuit painted monopole structures with five double circuit dulled galvanized steel monopole structures within an approximately 0.9-mile segment of existing right-of-way. For the 0.9-mile segment of the Reconductor/Rebuild Proposed Route, the minimum structure height is 90 feet, the maximum structure height is 130 feet, and the average structure height is 108 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

AVIATOR-TAKEOFF LINES

Aviator-Takeoff Proposed Route (Route 1)

The Aviator-Takeoff Proposed Route is approximately 3.2 miles in length. The Proposed Route originates at the future Aviator Substation, south of the intersection

of South Perimeter Road and Willard Road. From there, the Proposed Route briefly heads north and enters Dulles Airport property, then turns southeast and follows South Perimeter Road, exits Loudoun County and enters Fairfax County, then crosses Stonecroft Boulevard. Still on Dulles Airport property, the route continues southeast, then turns south along Lower Perimeter Road until it terminates at the proposed Takeoff Substation, north of Route 50 and east of Avion Parkway.

The Aviator-Takeoff Proposed Route primarily will be supported by double circuit dulled galvanized steel monopole structures. For the Proposed Route, the minimum structure height is 95 feet, the maximum structure height is 140 feet, and the average structure height is 114 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

Aviator-Takeoff Alternative Route 2

Aviator-Takeoff Alternative Route 2 is approximately 3.3 miles in length. Aviator-Takeoff Alternative Route 2 originates at the future Aviator Substation, south of the intersection of South Perimeter Road and Willard Road. From there, the route briefly heads north before turning southeast within a parcel cleared for a future data center. The route heads east and then southeast through a mix of industrial parcels and scattered forest. The route then exits Loudoun County and enters Fairfax County and the Cub Run Resource Protection Area ("RPA"). Alternative Route 2 turns south along developed areas west of Cub Run and then heads southeast as it collocates with Route 50 and an existing buried utility line, crosses Cub Run, and continues to collocate with Route 50. Aviator-Takeoff Alternative Route 2 continues east and crosses Avion Park Court and Stonecroft Boulevard, then follows Virginia Mallory Drive and crosses Avion Parkway. Aviator-Takeoff Alternative Route 2 then turns south and terminates at the proposed Takeoff Substation, north of Route 50 and east of Avion Parkway.

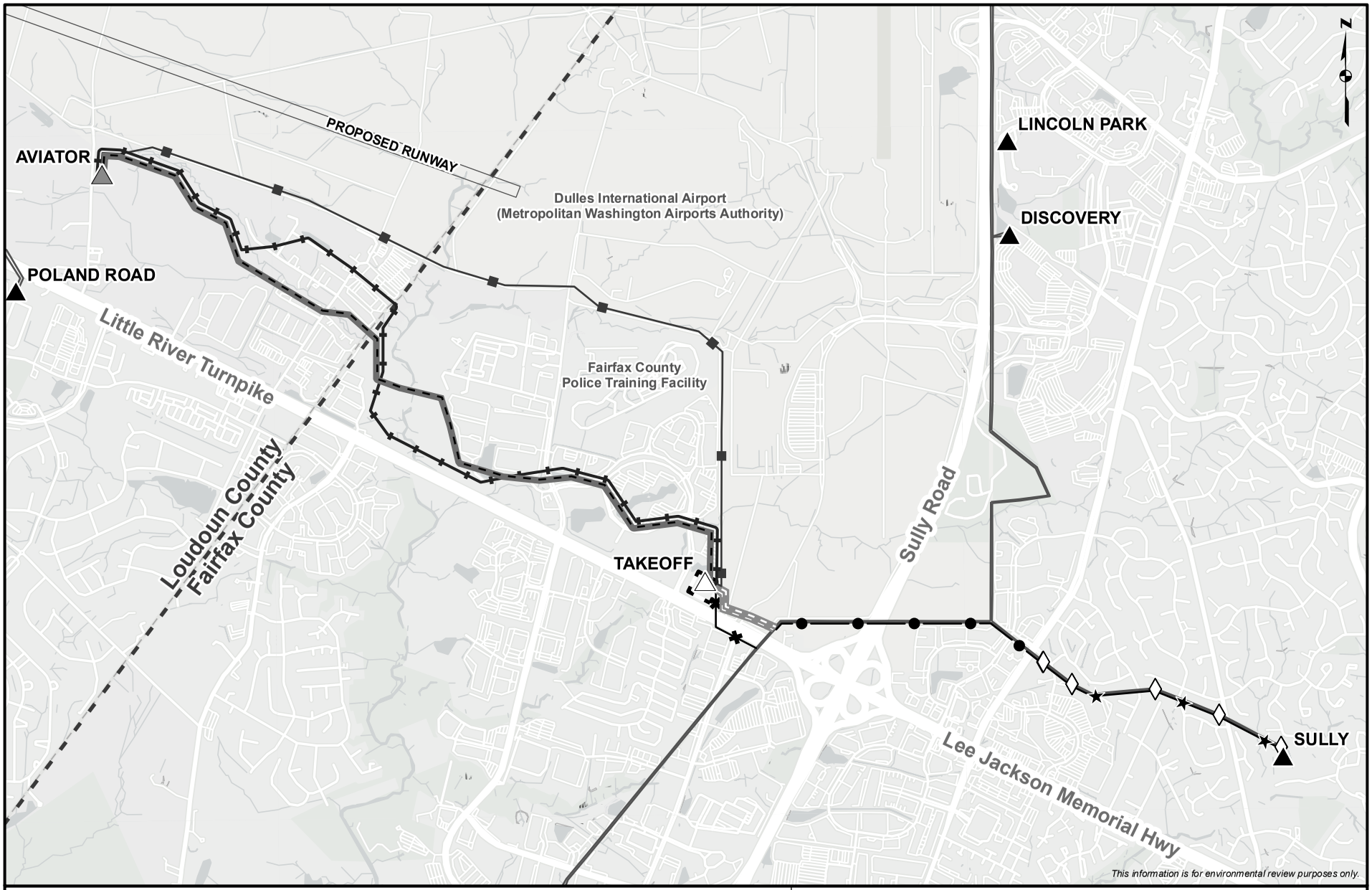
Aviator-Takeoff Alternative Route 2 primarily will be supported by double circuit dulled galvanized steel monopole structures. For Alternative Route 2, the minimum structure height is 100 feet, the maximum structure height is 135 feet, and the average structure height is 115 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

Aviator-Takeoff Alternative Route 3

Aviator-Takeoff Alternative Route 3 is approximately 3.1 miles in length. Aviator-Takeoff Alternative Route 3 originates at the future Aviator Substation, south of the intersection of South Perimeter Road and Willard Road. From there, Aviator-Takeoff Alternative Route 3 briefly heads north before turning southeast within a parcel cleared for a future data center. The route heads southeast along Sand Branch, crosses Pleasant Valley Road, and continues southeast before exiting Loudoun County and entering Fairfax County and the Cub Run RPA. Aviator-Takeoff Alternative Route 3 turns south briefly along the western boundary of the

Cub Run RPA and then bisects the Cub Run RPA as it heads southeast and collocates with an existing buried utility easement, crosses Cub Run, and then continues to collocate with a private road and water utility easement. Continuing east, Aviator-Takeoff Alternative Route 3 crosses Avion Park Court and Stonecroft Boulevard, then follows Virginia Mallory Drive and crosses Avion Parkway. Aviator-Takeoff Alternative Route 3 then turns south and terminates at the proposed Takeoff Substation, north of Route 50 and east of Avion Parkway.

Aviator-Takeoff Alternative Route 3 primarily will be supported by double circuit dulled galvanized steel monopole structures. For Alternative Route 3, the minimum structure height is 100 feet, the maximum structure height is 140 feet, and the average structure height is 114 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.



Attachment V.A
Notice Map
230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation

Fairfax and Loudoun Counties, Virginia

ERM

Dominion Energy

Attachment V.A

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: Shortly after filing, the Application will be made available electronically for public inspection at: www.dominionenergy.com/NOVA.

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
Virginia Department of Environmental Quality
Office of Environmental Impact Review
1111 East Main Street, Suite 1400
Richmond, Virginia 23219

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

Ms. Rene Hypes
Virginia Department of Conservation and Recreation
Division of Natural Heritage
600 East Main Street, 24th Floor
Richmond, Virginia 23219

Environmental Reviewer
Virginia Department of Conservation and Recreation
Planning & Recreation Bureau
600 East Main Street, 17th Floor
Richmond, Virginia 23219

Ms. Amy Martin
Virginia Department of Wildlife Resources
Wildlife Information and Environmental Services
7870 Villa Park, Suite 400
Henrico, Virginia 23228

Mr. Keith Tignor
Virginia Department of Agriculture and Consumer Services
Office of Plant Industry Services
102 Governor Street
Richmond, Virginia 23219

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

Scoping at VMRC
Virginia Marine Resources Commission
Habitat Management Division
Building 96, 380 Fenwick Road
Ft. Monroe, Virginia 23651

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

Ms. Regena Bronson
U.S. Army Corps of Engineers
Fredericksburg Field Office
1420 Central Park Boulevard
Fredericksburg, Virginia 22401

Ms. Arlene Fields Warren
Virginia Department of Health
Office of Drinking Water
109 Governor Street, 6th Floor
Richmond, Virginia 23219

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

Ms. Martha Little
Virginia Outdoors Foundation
P.O. Box 85073, PMB 38979
Richmond, Virginia 23285

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

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

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

Mr. Steven E. Welch
Assistant District Administrator
Director of Transportation & Land Use – Fairfax & Arlington Counties
Virginia Department of Transportation, Northern Virginia District Office
4975 Alliance Drive
Fairfax, Virginia 22030

Mr. Andrew Hascall
Vice President of Engineering Support
Metropolitan Washington Airports Authority
1 Aviation Circle
Washington, DC 20001-6000

Mr. Tim Hemstreet
County Administrator
Loudoun County
P.O. Box 7000
Leesburg, Virginia 20177-7000

Mr. Bryan Hill
County Executive
Fairfax County
12000 Government Center Pkwy
Fairfax, Virginia 22035

Supervisor Matt Letourneau
Loudoun County – Dulles District
P.O. Box 7000
Leesburg, Virginia 20177-7000

Supervisor Kathy Smith
Fairfax County – Sully District
4900 Stonecroft Blvd
Chantilly, Virginia 20151

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, letters dated June 17, 2024, were delivered to Bryan Hill, Executive of Fairfax County, and to Tim Hemstreet, Administrator of Loudoun County, where the Project is located. The letters stated the Company's intention to file this Application and invited the Counties to consult with the Company about the Project. These letters are included as Attachment V.D.1.

Dominion Energy Virginia
5000 Dominion Blvd, 3rd Floor, Glen Allen, Virginia 23060

June 17, 2024

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

RE: Dominion Energy Virginia's Proposed 230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation

Notice Pursuant to Va. Code § 15.2-2202 E

Dear Mr. Hemstreet:

In order to relieve identified violations of mandatory North American Electric Reliability Corporation Reliability Standards, to provide service requested by a data center customer, and to maintain the structural integrity and reliability of its transmission system, Dominion Energy Virginia (or the "Company") is proposing the following within Loudoun County and Fairfax County, Virginia:

1) Construct two new overhead double circuit 230 kilovolt ("kV") transmission lines ("Takeoff Loop") and a new 230-34.5 substation in Fairfax County ("Takeoff Substation");
2) Partially rebuild and reconductor an existing 230 kV overhead transmission line in Fairfax County ("Sully-Takeoff Partial Reconductor/Rebuild"); and
3) Construct a new overhead double circuit 230 kV transmission line in Loudoun County and Fairfax County (the "Aviator-Takeoff Lines").

Collectively, the Takeoff Loop and Takeoff Substation, the Sully-Takeoff Partial Reconductor/Rebuild, and the Aviator-Takeoff Lines are referred to as the "230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation" or the "Project."

The Company is preparing to file an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). Pursuant to § 15.2-2202 of the Code of Virginia, the Company is writing to notify Loudoun County of the proposed Project in advance of the CPCN filing and respectfully requests that you submit any comments or additional information you feel would have bearing on the Project within 30 days of the date of this letter.

Dominion Energy Virginia
5000 Dominion Blvd, 3rd Floor, Glen Allen, Virginia 23060

Enclosed is a Project Overview Map depicting the Project's alternative routes, as well as the general Project location. All final materials, including maps, will be available in the Company's CPCN filing to the Commission.

If you would like to receive a GIS shapefile of the alternative routes 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.

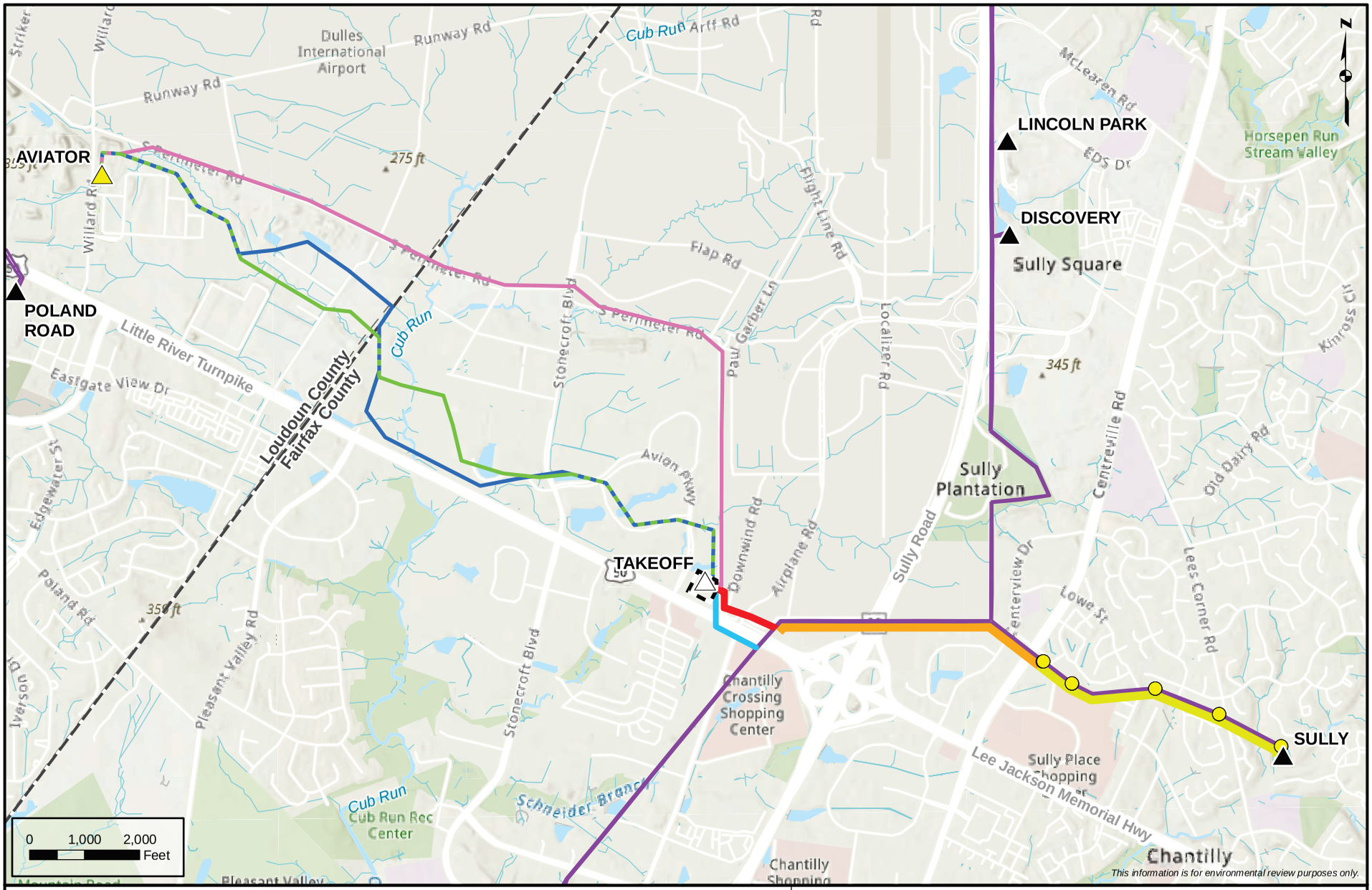
Dominion Energy Virginia appreciates your assistance with this Project review and looks forward to any additional information you may have to offer.

Sincerely,

Greg Baka

Greg Baka
Local Permitting Consultant

Attachment: Project Overview Map



Existing Substation
Future Substation
Proposed Substation
Existing Dominion Transmission Line

Aviator-Takeoff Lines
- Aviator-Takeoff Route 1
- Aviator-Takeoff Route 2
- Aviator-Takeoff Route 3

Takeoff Line Loop
- Takeoff Loop Route 1
- Takeoff Loop Route 2
- Proposed Takeoff Substation Boundary

Sully-Takeoff Line
- Reconductor Only
- Reconductor and Partial Rebuild
- Rebuild Structure

Project Overview Map
230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Fairfax and Loudoun Counties, Virginia

ERM

Dominion Energy

Dominion Energy Virginia
5000 Dominion Blvd, 3rd Floor, Glen Allen, Virginia 23060

June 17, 2024

Bryan Hill
Fairfax County Executive
12000 Government Center Pkwy
Fairfax, VA 22035

RE: Dominion Energy Virginia's Proposed 230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation;

Notice Pursuant to Va. Code § 15.2-2202 E

Dear Mr. Hill:

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1) Construct two new overhead double circuit 230 kilovolt ("kV") transmission lines ("Takeoff Loop") and a new 230-34.5 substation in Fairfax County ("Takeoff Substation");
2) Partially rebuild and reconductor an existing 230 kV overhead transmission line in Fairfax County ("Sully-Takeoff Partial Reconductor/Rebuild"); and
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Dominion Energy Virginia
5000 Dominion Blvd, 3rd Floor, Glen Allen, Virginia 23060

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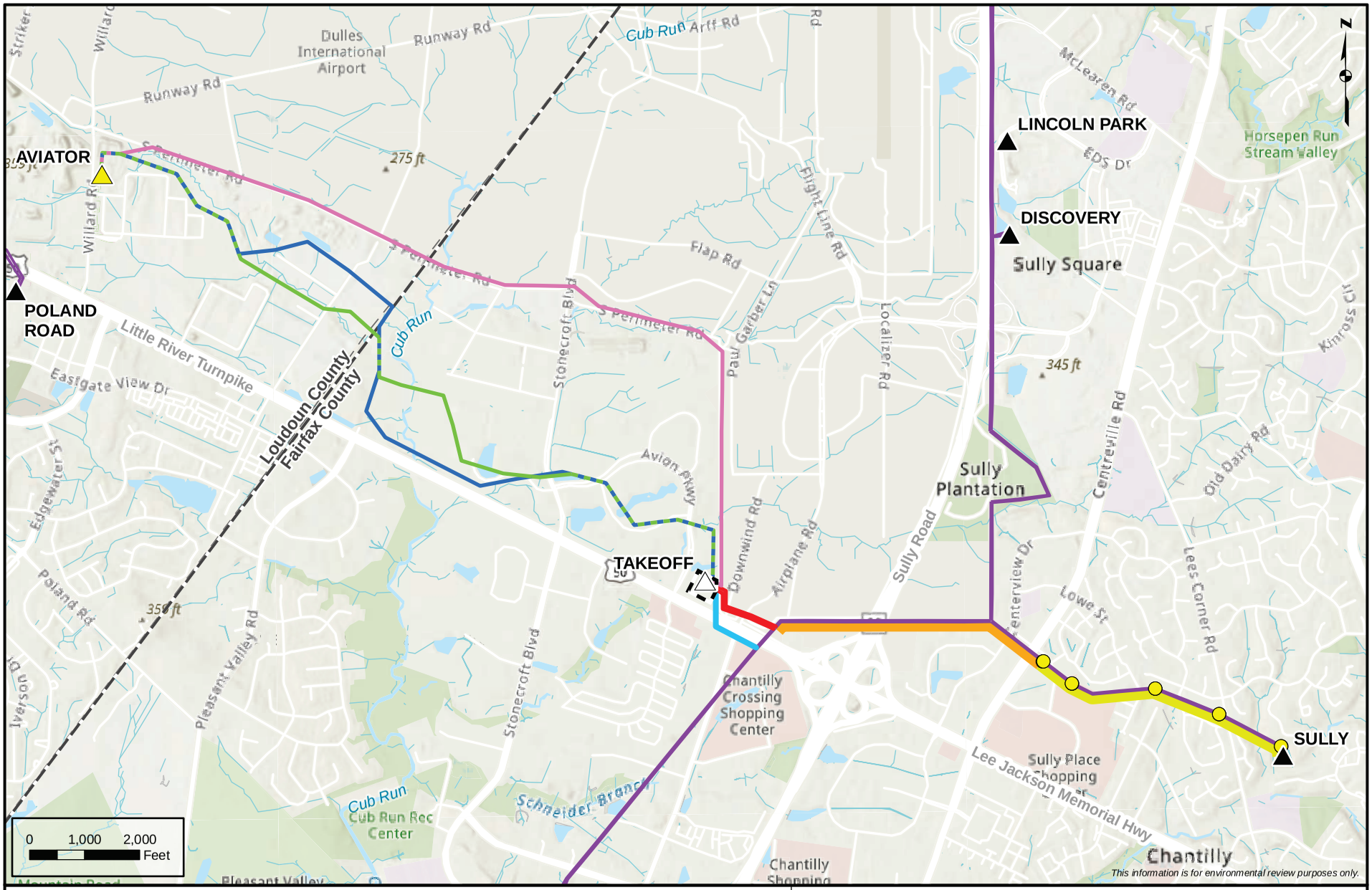
Dominion Energy Virginia appreciates your assistance with this Project review and looks forward to any additional information you may have to offer.

Sincerely,

Greg Baka

Greg Baka
Local Permitting Consultant

Attachment: Project Overview Map



Existing Substation
Future Substation
Proposed Substation
Existing Dominion Transmission Line

Aviator-Takeoff Lines
- Aviator-Takeoff Route 1
- Aviator-Takeoff Route 2
- Aviator-Takeoff Route 3

Takeoff Line Loop
- Takeoff Loop Route 1
- Takeoff Loop Route 2
- Proposed Takeoff Substation Boundary

Sully-Takeoff Line
- Reconductor Only
- Reconductor and Partial Rebuild
- Rebuild Structure

Project Overview Map
230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation
Fairfax and Loudoun Counties, Virginia

ERM

Dominion Energy

COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

APPLICATION OF	)	
	)	
VIRGINIA ELECTRIC AND POWER COMPANY	)	Case No. PUR-2024-00131
	)	
For approval and certification of electric transmission facilities: 230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation	)	

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

Kunal S. Amare

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

Brittany S. Rieckmann

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

Cale B. Armstrong

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

Brian L. Obermeier

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

Jared Brandell-Douglas

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

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Kunal S. Amare

Title: Consulting Engineer – Electric Transmission Planning

Summary:

Company Witness Kunal S. Amare sponsors those portions 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 Amare co-sponsors the following sections of the Appendix:

- Section I.A (co-sponsored with Company Witnesses Brittany S. Rieckmann, Cale B. Armstrong, Brian L. Obermeier, Greg R. Baka, and Jared Brandell-Douglas): This section details the primary justifications for the proposed project.
- Section I.B (co-sponsored with Company Witness Brittany S. Rieckmann): This section details the engineering justifications for the proposed project.
- Section I.C (co-sponsored with Company Witness Brittany S. Rieckmann): 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 Brittany S. Rieckmann): 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 Brittany S. Rieckmann): This section explains feasible project alternatives, when applicable.
- Section I.H (co-sponsored with Company Witnesses Brittany S. Rieckmann and Craig R. Hurd): This section provides the desired in-service date of the proposed project and the estimated construction time.
- Section I.L (co-sponsored with Company Witness Cale B. Armstrong): This section, when applicable, provides details on the deterioration of structures and associated equipment.
- Section I.N (co-sponsored with Company Witness Brittany S. Rieckmann): 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. Amare's background and qualifications is attached to his testimony as Appendix A.

DIRECT TESTIMONY
OF
KUNAL S. AMARE
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2024-00131

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

A. My name is Kunal S. Amare, and I am a Consulting Engineer in the Electric Transmission Planning Department for the Company. My business address is 5000 Dominion Boulevard, 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 relieve identified violations of mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, to provide service requested by a data center customer (the "Customer") of Dominion Energy Virginia, and to maintain the structural integrity and reliability of its transmission system, the Company proposes in the Counties of Fairfax and Loudoun County, Virginia, to:

- Construct two new overhead double circuit 230 kilovolt transmission lines by cutting the Company's existing 230 kV Lincoln Park-Loudoun Line #2008 and existing 230 kV Bull Run-Sully Line #265, which are collocated within an existing variable 100- to 120-foot-wide right-of-way. As proposed, existing Lincoln Park-Loudoun Line #2008 will be cut at a location between Structures #2008/66 and #2008/67, and existing Bull Run-Sully Line #265 will be cut at a

location between Structures #265/88 and #265/89. The two new double circuit lines will extend approximately 0.3 mile from the respective cut-in locations before terminating at a new proposed 230-34.5 kV substation located in Fairfax County, Virginia ("Takeoff Substation") on property to be owned by the Company (the "Takeoff Loop"). The cut-ins ultimately will result in (i) 230 kV Loudoun-Takeoff Line #2008, (ii) 230 kV Lincoln Park-Takeoff Line #2356, (iii) 230 kV Bear Run-Takeoff Line #2285 and (iv) 230 kV Sully-Takeoff Line #2357. At the cut-in between Structures #2008/66 and #2008/67, the Company will install two new monopole structures to provide a network connection to the Takeoff Substation. Similarly, at the cut-in between Structures #265/88 and #265/89, the Company will install two new monopole structures to provide a network connection to the Takeoff Substation. These network connections will allow the Takeoff Substation to connect to other existing substations for increased reliability. While the structures installed at the proposed cut-in locations are within the existing right-of-way, the proposed 0.3-mile Takeoff Loop will be constructed in a new 160-foot-wide right-of-way supported primarily by double circuit weathering steel 2-pole structures and utilizing three-phase twin-bundled 768.2 thousand circular mils ("kcmil") 20/7 Aluminum Conductor Steel Supported/Trapezoidal Wire/High Strength ("ACSS/TW/HS") type conductor with a summer transfer capability of 1,573 MVA, with one new Design Number ("DNO")-11410 shield wire over each circuit. Collectively, this proposed work is referred to as the "Takeoff Loop and Substation."

- Partially reconductor and rebuild Sully-Takeoff Line #2357 entirely within existing right-of-way in Fairfax County, Virginia ("Sully-Takeoff Partial Reconductor/Rebuild"). As discussed above, Sully-Takeoff Line #2357 will result from cutting existing Bull Run-Sully Line #265 between Structures #265/88 and #265/89 (the "Sully-Takeoff Cut-in") and extending 0.3 mile of new double circuit lines to the proposed Takeoff Substation. Accordingly, the resulting approximately 2.2-mile Sully-Takeoff Line #2357 will consist of the new 0.3-mile segment from the Takeoff Substation to the Sully-Takeoff Cut-in, and the existing 1.9-mile segment from the Sully Takeoff Cut-in to the Sully Substation. Hence, only a "partial" reconductor and rebuild of Sully-Takeoff Line #2357—namely, within the 1.9-mile existing segment—is required, as follows.

    - Sully-Takeoff Partial Reconductor: reconductor the existing 1.9-mile segment of Sully-Takeoff Line #2357 between the Sully-Takeoff Cut-in and the existing Sully Substation by uprating the existing conductors from three-phase 1590 kcmil 45/7 Aluminum Conductor Steel Reinforced ("ACSR") type conductor and 1534 Aluminum Conductor Alloy Reinforced ("ACAR") 42 EC/19 type conductor to three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS with a summer transfer capability of 1,573 MVA.

    - Sully-Takeoff Partial Rebuild: rebuild five of the existing painted steel double circuit monopole structures supporting Line #2357 (*i.e.*, supporting the existing Bull Run-Sully Line #265) and existing Discovery-Sully Line

#2107 (existing Structures #265/98 / #2107/72, #265/99 / #2107/71, #265/102 / #2107/68, #265/104 / #2107/66, and #265/107 / #2107/63) in order to maintain proper clearances. The five structures proposed for rebuild are located within an existing 0.9-mile segment between existing Structure #265/98 / #2107/72 and Sully Substation (the "Sully-Takeoff Partial Rebuild Segment"). The five removed structures will be replaced with five double circuit dulled galvanized steel monopole structures.

- Construct a new overhead double circuit 230 kV transmission line beginning at the Company's future Aviator Substation located in Loudoun County, Virginia, and extending approximately 3.2 miles to terminate at the Company's new proposed Takeoff Substation located in Fairfax County, Virginia, resulting in (i) 230 kV Aviator-Takeoff Line #2358, and (ii) 230 kV Aviator-Takeoff Line #2359 (the "Aviator-Takeoff Lines"). While the proposed Aviator-Takeoff Lines will commence and terminate on Company-owned or to-be-owned property (from Structure #2358/25 / #2359/25 at Aviator Substation to Structure #2358/1 / #2359/1 at Takeoff Substation), the proposed Aviator-Takeoff Lines will be constructed in new 100-foot-wide right-of-way supported primarily by double circuit dulled galvanized steel monopole structures and will utilize three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS type conductors with a summer transfer capability of 1,573 MVA, with one new DNO-11410 shield wire over each new circuit.

- Perform minor substation-related work at the Company's future Aviator Substation.

The Takeoff Loop and Substation, the Sully-Takeoff Partial Reconductor/Rebuild, the Aviator-Takeoff Lines, and minor substation-related work are collectively referred to as the "230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation" or the "Project."

The Project is necessary to relieve identified violations of NERC Reliability Standards in order to maintain and improve reliable electric service to customers in the load area extending generally southeast from the future Aviator Substation in Fairfax and Loudoun Counties (the "Aviator Load Area") and to ensure that Dominion Energy Virginia can provide service requested by its Customer in Fairfax County, Virginia.

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 sponsor 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 Brittany S. Rieckmann, Cale B. Armstrong, Brian L. Obermeier, Greg R. Baka, and Jared Brandell-Douglas; Sections I.B, I.C, I.D, I.E, and I.N with Company Witness Brittany S. Rieckmann; Section I.H with Company Witnesses Brittany S. Rieckmann and Greg R. Baka; and Section I.L with Company Witness Cale B. Armstrong.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
KUNAL S. AMARE

Kunal S. Amare received a Master of Science degree in Electrical Engineering from Virginia Polytechnic Institute and State University in 2016. He received a Bachelor of Technology degree in Electrical Engineering from the University of Mumbai in 2014. He has been licensed as a Professional Engineer in the State of Texas since 2019. He has been employed with the Company in the Transmission Planning team since June 2020. Prior to working with Dominion, Mr. Amare worked with Entergy Services LLC in the Transmission Planning Department from 2017-2020. Mr. Amare is skilled in Transmission Planning, Transient Stability Analysis, Renewable Energy Systems, and Electromagnetic Transient Analysis.

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

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Brittany S. Rieckmann

Title: Engineer III – Distribution Planning Team

Summary:

Company Witness Brittany S. Rieckmann 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 Kunal S. Amare, Cale B. Armstrong, Brian L. Obermeier, Greg R. Baka, and Jared Brandell-Douglas): This section details the primary justifications for the proposed project.

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

- Section I.C (co-sponsored with Company Witness Kunal S. Amare): 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 Kunal S. Amare): 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 Kunal S. Amare): This section explains feasible project alternatives, when applicable.

- Section I.H (co-sponsored with Company Witnesses Kunal S. Amare 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 Kunal S. Amare): 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 Ms. Rieckmann's background and qualifications is attached to her testimony as Appendix A.

DIRECT TESTIMONY
OF
BRITTANY S. RIECKMANN
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2024-00131

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 Brittany S. Rieckmann, and I am an Engineer III – Distribution Planning for the Company. My business address is 600 East 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 kilovolt ("kV").

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

A. In order to relieve identified violations of mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, to provide service requested by a data center customer (the "Customer") of Dominion Energy Virginia, and to maintain the structural integrity and reliability of its transmission system, the Company proposes in the Counties of Fairfax and Loudoun County, Virginia, to:

- Construct two new overhead double circuit 230 kilovolt transmission lines by cutting the Company's existing 230 kV Lincoln Park-Loudoun Line #2008 and existing 230 kV Bull Run-Sully Line #265, which are collocated within an existing variable 100- to 120-foot-wide right-of-way. As proposed, existing Lincoln Park-Loudoun Line #2008 will be cut at a location between Structures #2008/66 and #2008/67, and existing Bull Run-Sully Line #265 will be cut at a

location between Structures #265/88 and #265/89. The two new double circuit lines will extend approximately 0.3 mile from the respective cut-in locations before terminating at a new proposed 230-34.5 kV substation located in Fairfax County, Virginia ("Takeoff Substation") on property to be owned by the Company (the "Takeoff Loop"). The cut-ins ultimately will result in (i) 230 kV Loudoun-Takeoff Line #2008, (ii) 230 kV Lincoln Park-Takeoff Line #2356, (iii) 230 kV Bear Run-Takeoff Line #2285 and (iv) 230 kV Sully-Takeoff Line #2357. At the cut-in between Structures #2008/66 and #2008/67, the Company will install two new monopole structures to provide a network connection to the Takeoff Substation. Similarly, at the cut-in between Structures #265/88 and #265/89, the Company will install two new monopole structures to provide a network connection to the Takeoff Substation. These network connections will allow the Takeoff Substation to connect to other existing substations for increased reliability. While the structures installed at the proposed cut-in locations are within the existing right-of-way, the proposed 0.3-mile Takeoff Loop will be constructed in a new 160-foot-wide right-of-way supported primarily by double circuit weathering steel 2-pole structures and utilizing three-phase twin-bundled 768.2 thousand circular mils ("kcmil") 20/7 Aluminum Conductor Steel Supported/Trapezoidal Wire/High Strength ("ACSS/TW/HS") type conductor with a summer transfer capability of 1,573 MVA, with one new Design Number ("DNO")-11410 shield wire over each circuit. Collectively, this proposed work is referred to as the "Takeoff Loop and Substation."

- Partially reconductor and rebuild Sully-Takeoff Line #2357 entirely within existing right-of-way in Fairfax County, Virginia ("Sully-Takeoff Partial Reconductor/Rebuild"). As discussed above, Sully-Takeoff Line #2357 will result from cutting existing Bull Run-Sully Line #265 between Structures #265/88 and #265/89 (the "Sully-Takeoff Cut-in") and extending 0.3 mile of new double circuit lines to the proposed Takeoff Substation. Accordingly, the resulting approximately 2.2-mile Sully-Takeoff Line #2357 will consist of the new 0.3-mile segment from the Takeoff Substation to the Sully-Takeoff Cut-in, and the existing 1.9-mile segment from the Sully Takeoff Cut-in to the Sully Substation. Hence, only a "partial" reconductor and rebuild of Sully-Takeoff Line #2357—namely, within the 1.9-mile existing segment—is required, as follows.

    - Sully-Takeoff Partial Reconductor: reconductor the existing 1.9-mile segment of Sully-Takeoff Line #2357 between the Sully-Takeoff Cut-in and the existing Sully Substation by uprating the existing conductors from three-phase 1590 kcmil 45/7 Aluminum Conductor Steel Reinforced ("ACSR") type conductor and 1534 Aluminum Conductor Alloy Reinforced ("ACAR") 42 EC/19 type conductor to three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS with a summer transfer capability of 1,573 MVA.

    - Sully-Takeoff Partial Rebuild: rebuild five of the existing painted steel double circuit monopole structures supporting Line #2357 (*i.e.*, supporting the existing Bull Run-Sully Line #265) and existing Discovery-Sully Line

#2107 (existing Structures #265/98 / #2107/72, #265/99 / #2107/71, #265/102 / #2107/68, #265/104 / #2107/66, and #265/107 / #2107/63) in order to maintain proper clearances. The five structures proposed for rebuild are located within an existing 0.9-mile segment between existing Structure #265/98 / #2107/72 and Sully Substation (the "Sully-Takeoff Partial Rebuild Segment"). The five removed structures will be replaced with five double circuit dulled galvanized steel monopole structures.

- Construct a new overhead double circuit 230 kV transmission line beginning at the Company's future Aviator Substation located in Loudoun County, Virginia, and extending approximately 3.2 miles to terminate at the Company's new proposed Takeoff Substation located in Fairfax County, Virginia, resulting in (i) 230 kV Aviator-Takeoff Line #2358, and (ii) 230 kV Aviator-Takeoff Line #2359 (the "Aviator-Takeoff Lines"). While the proposed Aviator-Takeoff Lines will commence and terminate on Company-owned or to-be-owned property (from Structure #2358/25 / #2359/25 at Aviator Substation to Structure #2358/1 / #2359/1 at Takeoff Substation), the proposed Aviator-Takeoff Lines will be constructed in new 100-foot-wide right-of-way supported primarily by double circuit dulled galvanized steel monopole structures and will utilize three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS type conductors with a summer transfer capability of 1,573 MVA, with one new DNO-11410 shield wire over each new circuit.

- Perform minor substation-related work at the Company's future Aviator Substation.

The Takeoff Loop and Substation, the Sully-Takeoff Partial Reconductor/Rebuild, the Aviator-Takeoff Lines, and minor substation-related work are collectively referred to as the "230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation" or the "Project."

The Project is necessary to relieve identified violations of NERC Reliability Standards in order to maintain and improve reliable electric service to customers in the load area extending generally southeast from the future Aviator Substation in Fairfax and Loudoun Counties (the "Aviator Load Area") and to ensure that Dominion Energy Virginia can provide service requested by its Customer in Fairfax County, Virginia.

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 Kunal S. Amare, Cale B. Armstrong, Brian L. Obermeier, Greg R. Baka, and Jared Brandell-Douglas. Additionally, I co-sponsor Sections I.B, I.C, I.D, I.E, and I.N of the Appendix with Company Witness Kunal S. Amare; and Section I.H with Company Witnesses Kunal S. Amare and Greg R. Baka.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
BRITTANY S. RIECKMANN

Brittany S. Rieckmann is a 2018 graduate from James Madison University with a Bachelor of Science in Engineering and a 2022 graduate from George Mason University with a Master of Business Administration. She has been employed full time by the Company since 2018. Her experience with the Company includes gas transmission system planning and design (1 year), data center distribution design engineer (3 years), and most recently distribution planning. Prior to working full time for the Company, Ms. Rieckmann worked as an intern for the Company for two years.

Ms. Rieckmann has previously submitted pre-filed testimony to the State Corporation Commission of Virginia.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Cale B. Armstrong

Title: Senior Transmission Line Engineer – Overhead Transmission Group

Summary:

Company Witness Cale B. Armstrong 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 Armstrong co-sponsors the following sections of the Appendix:

- Section I.A (co-sponsored with Company Witnesses Kunal S. Amare, Brittany S. Rieckmann, Brian L. Obermeier, Greg R. Baka, and Jared Brandell-Douglas): This section details the primary justifications for the proposed project.
- Section I.I. (co-sponsored with Company Witness Brian L. Obermeier): This section provides the estimated total cost of the proposed project.
- Section I.L (co-sponsored with Company Witness Kunal S. Amare): 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 Jared Brandell-Douglas): 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 Jared Brandell-Douglas): This section provides the proposed route description and structure heights for notice purposes.

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

DIRECT TESTIMONY
OF
CALE B. ARMSTRONG
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2024-00131

Q. Please state your name, business address and position.

A. My name is Cale B. Armstrong, and I am a Senior Transmission Line Engineer in the Overhead Transmission Group at Burns & McDonnell providing testimony on behalf of Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company"). My business address is 9300 Ward Parkway, Kansas City, Missouri 64114. A statement of my qualifications and background is provided as Appendix A.

Q. Please describe your areas of responsibility with Burns & McDonnell.

A. I am responsible for the estimating, conceptual design, 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 relieve identified violations of mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, to provide service requested by a data center customer (the "Customer") of Dominion Energy Virginia, and to maintain the structural integrity and reliability of its transmission system, the Company proposes in the Counties of Fairfax and Loudoun County, Virginia, to:

- Construct two new overhead double circuit 230 kilovolt transmission lines by cutting the Company's existing 230 kV Lincoln Park-Loudoun Line #2008 and existing 230 kV Bull Run-Sully Line #265, which are collocated within an existing variable 100- to 120-foot-wide right-of-way. As proposed, existing Lincoln Park-Loudoun Line #2008 will be cut at a location between Structures #2008/66 and #2008/67, and existing Bull Run-Sully Line #265 will be cut at a

location between Structures #265/88 and #265/89. The two new double circuit lines will extend approximately 0.3 mile from the respective cut-in locations before terminating at a new proposed 230-34.5 kV substation located in Fairfax County, Virginia ("Takeoff Substation") on property to be owned by the Company (the "Takeoff Loop"). The cut-ins ultimately will result in (i) 230 kV Loudoun-Takeoff Line #2008, (ii) 230 kV Lincoln Park-Takeoff Line #2356, (iii) 230 kV Bear Run-Takeoff Line #2285 and (iv) 230 kV Sully-Takeoff Line #2357. At the cut-in between Structures #2008/66 and #2008/67, the Company will install two new monopole structures to provide a network connection to the Takeoff Substation. Similarly, at the cut-in between Structures #265/88 and #265/89, the Company will install two new monopole structures to provide a network connection to the Takeoff Substation. These network connections will allow the Takeoff Substation to connect to other existing substations for increased reliability. While the structures installed at the proposed cut-in locations are within the existing right-of-way, the proposed 0.3-mile Takeoff Loop will be constructed in a new 160-foot-wide right-of-way supported primarily by double circuit weathering steel 2-pole structures and utilizing three-phase twin-bundled 768.2 thousand circular mils ("kcmil") 20/7 Aluminum Conductor Steel Supported/Trapezoidal Wire/High Strength ("ACSS/TW/HS") type conductor with a summer transfer capability of 1,573 MVA, with one new Design Number ("DNO")-11410 shield wire over each circuit. Collectively, this proposed work is referred to as the "Takeoff Loop and Substation."

- Partially reconductor and rebuild Sully-Takeoff Line #2357 entirely within existing right-of-way in Fairfax County, Virginia ("Sully-Takeoff Partial Reconductor/Rebuild"). As discussed above, Sully-Takeoff Line #2357 will result from cutting existing Bull Run-Sully Line #265 between Structures #265/88 and #265/89 (the "Sully-Takeoff Cut-in") and extending 0.3 mile of new double circuit lines to the proposed Takeoff Substation. Accordingly, the resulting approximately 2.2-mile Sully-Takeoff Line #2357 will consist of the new 0.3-mile segment from the Takeoff Substation to the Sully-Takeoff Cut-in, and the existing 1.9-mile segment from the Sully Takeoff Cut-in to the Sully Substation. Hence, only a "partial" reconductor and rebuild of Sully-Takeoff Line #2357—namely, within the 1.9-mile existing segment—is required, as follows.

    - Sully-Takeoff Partial Reconductor: reconductor the existing 1.9-mile segment of Sully-Takeoff Line #2357 between the Sully-Takeoff Cut-in and the existing Sully Substation by uprating the existing conductors from three-phase 1590 kcmil 45/7 Aluminum Conductor Steel Reinforced ("ACSR") type conductor and 1534 Aluminum Conductor Alloy Reinforced ("ACAR") 42 EC/19 type conductor to three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS with a summer transfer capability of 1,573 MVA.

    - Sully-Takeoff Partial Rebuild: rebuild five of the existing painted steel double circuit monopole structures supporting Line #2357 (*i.e.*, supporting the existing Bull Run-Sully Line #265) and existing Discovery-Sully Line

#2107 (existing Structures #265/98 / #2107/72, #265/99 / #2107/71, #265/102 / #2107/68, #265/104 / #2107/66, and #265/107 / #2107/63) in order to maintain proper clearances. The five structures proposed for rebuild are located within an existing 0.9-mile segment between existing Structure #265/98 / #2107/72 and Sully Substation (the "Sully-Takeoff Partial Rebuild Segment"). The five removed structures will be replaced with five double circuit dulled galvanized steel monopole structures.

- Construct a new overhead double circuit 230 kV transmission line beginning at the Company's future Aviator Substation located in Loudoun County, Virginia, and extending approximately 3.2 miles to terminate at the Company's new proposed Takeoff Substation located in Fairfax County, Virginia, resulting in (i) 230 kV Aviator-Takeoff Line #2358, and (ii) 230 kV Aviator-Takeoff Line #2359 (the "Aviator-Takeoff Lines"). While the proposed Aviator-Takeoff Lines will commence and terminate on Company-owned or to-be-owned property (from Structure #2358/25 / #2359/25 at Aviator Substation to Structure #2358/1 / #2359/1 at Takeoff Substation), the proposed Aviator-Takeoff Lines will be constructed in new 100-foot-wide right-of-way supported primarily by double circuit dulled galvanized steel monopole structures and will utilize three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS type conductors with a summer transfer capability of 1,573 MVA, with one new DNO-11410 shield wire over each new circuit.

- Perform minor substation-related work at the Company's future Aviator Substation.

The Takeoff Loop and Substation, the Sully-Takeoff Partial Reconductor/Rebuild, the Aviator-Takeoff Lines, and minor substation-related work are collectively referred to as the "230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation" or the "Project."

The Project is necessary to relieve identified violations of NERC Reliability Standards in order to maintain and improve reliable electric service to customers in the load area extending generally southeast from the future Aviator Substation in Fairfax and Loudoun Counties (the "Aviator Load Area") and to ensure that Dominion Energy Virginia can provide service requested by its Customer in Fairfax County, Virginia.

The purpose of my testimony is to describe the design characteristics of the transmission facilities for the proposed Project and to discuss electric and magnetic field levels. I sponsor 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 Kunal S. Amare, Brittany S. Rieckmann, Brian L. Obermeier, Greg R. Baka, and Jared Brandell-Douglas; Section I.I with Company Witness Brian L. Obermeier; Section I.L with Company Witness Kunal S. Amare; Sections II.B.3 to II.B.5 with Company Witness Greg R. Baka; and Sections II.B.6 and V.A with Company Witnesses Greg R. Baka and Jared Brandell-Douglas.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS OF CALE B. ARMSTRONG

Cale B. Armstrong graduated from Kansas State University with a Bachelor of Science in Civil Engineering (2014) and a Master of Science in Civil Engineering (2016). He has approximately 8 years of experience working in the transmission line industry for Burns & McDonnell. Mr. Armstrong is a licensed engineer in the Commonwealth of Virginia.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Brian L. Obermeier

Title: Senior Electrical Engineer

Summary:

Company Witness Brian L. Obermeier 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 Kunal S. Amare, Brittany S. Rieckmann, Cale B. Armstrong, Greg R. Baka, and Jared Brandell-Douglas): This section details the primary justifications for the proposed project.

- Section I.I (co-sponsored with Company Witness Cale B. Armstrong): 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. Obermeier's background and qualifications is attached to his testimony as Appendix A.

DIRECT TESTIMONY
OF
BRIAN L. OBERMEIER
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2024-00131

Q. Please state your name, business address and position.

A. My name is Brian L. Obermeier, and I am a Senior Electrical Engineer in the Substation Department / Transmission & Distribution Group at Burns & McDonnell. My business address is 9400 Ward Parkway, Kansas City, Missouri 64114. A statement of my qualifications and background is provided as Appendix A.

Q. Please describe your areas of responsibility with Burns & McDonnell.

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 relieve identified violations of mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, to provide service requested by a data center customer (the "Customer") of Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company"), and to maintain the structural integrity and reliability of its transmission system, the Company proposes in the Counties of Fairfax and Loudoun County, Virginia, to:

- Construct two new overhead double circuit 230 kilovolt ("kV") transmission lines by cutting the Company's existing 230 kV Lincoln Park-Loudoun Line #2008 and existing 230 kV Bull Run-Sully Line #265, which are collocated within an existing variable 100- to 120-foot-wide right-of-way. As proposed, existing

Lincoln Park-Loudoun Line #2008 will be cut at a location between Structures #2008/66 and #2008/67, and existing Bull Run-Sully Line #265 will be cut at a location between Structures #265/88 and #265/89. The two new double circuit lines will extend approximately 0.3 mile from the respective cut-in locations before terminating at a new proposed 230-34.5 kV substation located in Fairfax County, Virginia ("Takeoff Substation") on property to be owned by the Company (the "Takeoff Loop"). The cut-ins ultimately will result in (i) 230 kV Loudoun-Takeoff Line #2008, (ii) 230 kV Lincoln Park-Takeoff Line #2356, (iii) 230 kV Bear Run-Takeoff Line #2285 and (iv) 230 kV Sully-Takeoff Line #2357. At the cut-in between Structures #2008/66 and #2008/67, the Company will install two new monopole structures to provide a network connection to the Takeoff Substation. Similarly, at the cut-in between Structures #265/88 and #265/89, the Company will install two new monopole structures to provide a network connection to the Takeoff Substation. These network connections will allow the Takeoff Substation to connect to other existing substations for increased reliability. While the structures installed at the proposed cut-in locations are within the existing right-of-way, the proposed 0.3-mile Takeoff Loop will be constructed in a new 160-foot-wide right-of-way supported primarily by double circuit weathering steel 2-pole structures and utilizing three-phase twin-bundled 768.2 thousand circular mils ("kcmil") 20/7 Aluminum Conductor Steel Supported/Trapezoidal Wire/High Strength ("ACSS/TW/HS") type conductor with a summer transfer capability of 1,573 MVA, with one new Design Number ("DNO")-11410 shield wire over each circuit. Collectively, this proposed work is referred to as the "Takeoff Loop and Substation."

- Partially reconductor and rebuild Sully-Takeoff Line #2357 entirely within existing right-of-way in Fairfax County, Virginia ("Sully-Takeoff Partial Reconductor/Rebuild"). As discussed above, Sully-Takeoff Line #2357 will result from cutting existing Bull Run-Sully Line #265 between Structures #265/88 and #265/89 (the "Sully-Takeoff Cut-in") and extending 0.3 mile of new double circuit lines to the proposed Takeoff Substation. Accordingly, the resulting approximately 2.2-mile Sully-Takeoff Line #2357 will consist of the new 0.3-mile segment from the Takeoff Substation to the Sully-Takeoff Cut-in, and the existing 1.9-mile segment from the Sully Takeoff Cut-in to the Sully Substation. Hence, only a "partial" reconductor and rebuild of Sully-Takeoff Line #2357—namely, within the 1.9-mile existing segment—is required, as follows.

    - Sully-Takeoff Partial Reconductor: reconductor the existing 1.9-mile segment of Sully-Takeoff Line #2357 between the Sully-Takeoff Cut-in and the existing Sully Substation by uprating the existing conductors from three-phase 1590 kcmil 45/7 Aluminum Conductor Steel Reinforced ("ACSR") type conductor and 1534 Aluminum Conductor Alloy Reinforced ("ACAR") 42 EC/19 type conductor to three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS with a summer transfer capability of 1,573 MVA.

- Sully-Takeoff Partial Rebuild: rebuild five of the existing painted steel double circuit monopole structures supporting Line #2357 (*i.e.*, supporting the existing Bull Run-Sully Line #265) and existing Discovery-Sully Line #2107 (existing Structures #265/98 / #2107/72, #265/99 / #2107/71, #265/102 / #2107/68, #265/104 / #2107/66, and #265/107 / #2107/63) in order to maintain proper clearances. The five structures proposed for rebuild are located within an existing 0.9-mile segment between existing Structure #265/98 / #2107/72 and Sully Substation (the "Sully-Takeoff Partial Rebuild Segment"). The five removed structures will be replaced with five double circuit dulled galvanized steel monopole structures.

- Construct a new overhead double circuit 230 kV transmission line beginning at the Company's future Aviator Substation located in Loudoun County, Virginia, and extending approximately 3.2 miles to terminate at the Company's new proposed Takeoff Substation located in Fairfax County, Virginia, resulting in (i) 230 kV Aviator-Takeoff Line #2358, and (ii) 230 kV Aviator-Takeoff Line #2359 (the "Aviator-Takeoff Lines"). While the proposed Aviator-Takeoff Lines will commence and terminate on Company-owned or to-be-owned property (from Structure #2358/25 / #2359/25 at Aviator Substation to Structure #2358/1 / #2359/1 at Takeoff Substation), the proposed Aviator-Takeoff Lines will be constructed in new 100-foot-wide right-of-way supported primarily by double circuit dulled galvanized steel monopole structures and will utilize three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS type conductors with a summer transfer capability of 1,573 MVA, with one new DNO-11410 shield wire over each new circuit.

- Perform minor substation-related work at the Company's future Aviator Substation.

The Takeoff Loop and Substation, the Sully-Takeoff Partial Reconductor/Rebuild, the Aviator-Takeoff Lines, and minor substation-related work are collectively referred to as the "230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation" or the "Project."

The Project is necessary to relieve identified violations of NERC Reliability Standards in order to maintain and improve reliable electric service to customers in the load area extending generally southeast from the future Aviator Substation in Fairfax and Loudoun Counties (the "Aviator Load Area") and to ensure that Dominion Energy Virginia can provide service requested by its Customer in Fairfax County, Virginia.

The purpose of my testimony is to describe the work to be performed as part of the Project. 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 Kunal S. Amare, Brittany S. Rieckmann, Cale B. Armstrong, Greg R. Baka, and Jared Brandell-Douglas; and Section I.I of the Appendix with Company Witness Cale B. Armstrong.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS OF BRIAN L. OBERMEIER

Brian L. Obermeier received a Bachelor of Science degree in Electrical Engineering from The University of Nebraska Lincoln in 2012. Mr. Obermeier also received a Masters of Science in Engineering Management from the University of Kansas in 2019. Mr. Obermeier has worked for Burns & McDonnell since 2013 and is currently a Senior Electrical Engineer providing support to the Dominion Energy Virginia Substation Conceptual Team. His responsibilities include the 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.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Greg R. Baka

Title: Siting and Permitting Specialist – Siting and Permitting Group

Summary:

Company Witness Greg R. Baka sponsors those portions 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 Kunal S. Amare, Brittany S. Rieckmann, Cale B. Armstrong, Greg R. Baka, and Jared Brandell-Douglas): This section details the primary justifications for the proposed project.
- Section I.H (co-sponsored with Company Witnesses Kunal S. Amare and Brittany S. Rieckmann): 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 Jared Brandell-Douglas): 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 Jared Brandell-Douglas): 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 Jared Brandell-Douglas): 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 Jared Brandell-Douglas): These sections provide detail regarding the right-of-way for the proposed project.
- Section II.A.9 (co-sponsored with Company Witness Roya P. Smith): This section describes the proposed route selection procedures and details alternative routes considered.
- Section II.A.11 (co-sponsored with Company Witness Jared Brandell-Douglas): 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 Cale B. Armstrong): These sections, when applicable, provide supporting structure details along the proposed and alternative routes.
- Section II.B.6 (co-sponsored with Company Witnesses Cale B. Armstrong and Jared Brandell-Douglas): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section III (co-sponsored with Company Witness Jared Brandell-Douglas): This section details the impact of the proposed project on scenic, environmental, and historic features.
- Section V.A (co-sponsored with Company Witnesses Cale B. Armstrong and Jared Brandell-Douglas): This section provides the proposed route description and structure heights for notice purposes.

Finally, Mr. Baka sponsors the DEQ Supplement filed with the Application.

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-2024-00131

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

A. My name is Gregory R. Baka, and I am an Electric Transmission Local Permitting Consultant for the Company. My business address is 5000 Dominion Boulevard, 3rd Floor, 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 relieve identified violations of mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, to provide service requested by a data center customer (the "Customer") of Dominion Energy Virginia, and to maintain the

structural integrity and reliability of its transmission system, the Company proposes in the Counties of Fairfax and Loudoun County, Virginia, to:

- Construct two new overhead double circuit 230 kilovolt ("kV") transmission lines by cutting the Company's existing 230 kV Lincoln Park-Loudoun Line #2008 and existing 230 kV Bull Run-Sully Line #265, which are collocated within an existing variable 100- to 120-foot-wide right-of-way. As proposed, existing Lincoln Park-Loudoun Line #2008 will be cut at a location between Structures #2008/66 and #2008/67, and existing Bull Run-Sully Line #265 will be cut at a location between Structures #265/88 and #265/89. The two new double circuit lines will extend approximately 0.3 mile from the respective cut-in locations before terminating at a new proposed 230-34.5 kV substation located in Fairfax County, Virginia ("Takeoff Substation") on property to be owned by the Company (the "Takeoff Loop"). The cut-ins ultimately will result in (i) 230 kV Loudoun-Takeoff Line #2008, (ii) 230 kV Lincoln Park-Takeoff Line #2356, (iii) 230 kV Bear Run-Takeoff Line #2285 and (iv) 230 kV Sully-Takeoff Line #2357. At the cut-in between Structures #2008/66 and #2008/67, the Company will install two new monopole structures to provide a network connection to the Takeoff Substation. Similarly, at the cut-in between Structures #265/88 and #265/89, the Company will install two new monopole structures to provide a network connection to the Takeoff Substation. These network connections will allow the Takeoff Substation to connect to other existing substations for increased reliability. While the structures installed at the proposed cut-in locations are within the existing right-of-way, the proposed 0.3-mile Takeoff Loop will be constructed in a new 160-foot-wide right-of-way supported primarily by double circuit weathering steel 2-pole structures and utilizing three-phase twin-bundled 768.2 thousand circular mils ("kcmil") 20/7 Aluminum Conductor Steel Supported/Trapezoidal Wire/High Strength ("ACSS/TW/HS") type conductor with a summer transfer capability of 1,573 MVA, with one new Design Number ("DNO")-11410 shield wire over each circuit. Collectively, this proposed work is referred to as the "Takeoff Loop and Substation."

- Partially reconductor and rebuild Sully-Takeoff Line #2357 entirely within existing right-of-way in Fairfax County, Virginia ("Sully-Takeoff Partial Reconductor/Rebuild"). As discussed above, Sully-Takeoff Line #2357 will result from cutting existing Bull Run-Sully Line #265 between Structures #265/88 and #265/89 (the "Sully-Takeoff Cut-in") and extending 0.3 mile of new double circuit lines to the proposed Takeoff Substation. Accordingly, the resulting approximately 2.2-mile Sully-Takeoff Line #2357 will consist of the new 0.3-mile segment from the Takeoff Substation to the Sully-Takeoff Cut-in, and the existing 1.9-mile segment from the Sully Takeoff Cut-in to the Sully Substation. Hence, only a "partial" reconductor and rebuild of Sully-Takeoff Line #2357—namely, within the 1.9-mile existing segment—is required, as follows.

    - Sully-Takeoff Partial Reconductor: reconductor the existing 1.9-mile segment of Sully-Takeoff Line #2357 between the Sully-Takeoff Cut-in

and the existing Sully Substation by uprating the existing conductors from three-phase 1590 kcmil 45/7 Aluminum Conductor Steel Reinforced ("ACSR") type conductor and 1534 Aluminum Conductor Alloy Reinforced ("ACAR") 42 EC/19 type conductor to three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS with a summer transfer capability of 1,573 MVA.

- Sully-Takeoff Partial Rebuild: rebuild five of the existing painted steel double circuit monopole structures supporting Line #2357 (*i.e.*, supporting the existing Bull Run-Sully Line #265) and existing Discovery-Sully Line #2107 (existing Structures #265/98 / #2107/72, #265/99 / #2107/71, #265/102 / #2107/68, #265/104 / #2107/66, and #265/107 / #2107/63) in order to maintain proper clearances. The five structures proposed for rebuild are located within an existing 0.9-mile segment between existing Structure #265/98 / #2107/72 and Sully Substation (the "Sully-Takeoff Partial Rebuild Segment"). The five removed structures will be replaced with five double circuit dulled galvanized steel monopole structures.

- Construct a new overhead double circuit 230 kV transmission line beginning at the Company's future Aviator Substation located in Loudoun County, Virginia, and extending approximately 3.2 miles to terminate at the Company's new proposed Takeoff Substation located in Fairfax County, Virginia, resulting in (i) 230 kV Aviator-Takeoff Line #2358, and (ii) 230 kV Aviator-Takeoff Line #2359 (the "Aviator-Takeoff Lines"). While the proposed Aviator-Takeoff Lines will commence and terminate on Company-owned or to-be-owned property (from Structure #2358/25 / #2359/25 at Aviator Substation to Structure #2358/1 / #2359/1 at Takeoff Substation), the proposed Aviator-Takeoff Lines will be constructed in new 100-foot-wide right-of-way supported primarily by double circuit dulled galvanized steel monopole structures and will utilize three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS type conductors with a summer transfer capability of 1,573 MVA, with one new DNO-11410 shield wire over each new circuit.

- Perform minor substation-related work at the Company's future Aviator Substation.

The Takeoff Loop and Substation, the Sully-Takeoff Partial Reconductor/Rebuild, the Aviator-Takeoff Lines, and minor substation-related work are collectively referred to as the "230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation" or the "Project."

The Project is necessary to relieve identified violations of NERC Reliability Standards in order to maintain and improve reliable electric service to customers in the load area extending generally southeast from the future Aviator Substation in Fairfax and Loudoun Counties (the "Aviator Load Area") and to ensure that Dominion Energy Virginia can provide service requested by its Customer in Fairfax County, Virginia.

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 Kunal S. Amare, Brittany S. Rieckmann, Cale B. Armstrong, Brian L. Obermeier, and Jared Brandell-Douglas; Section I.H with Company Witnesses Kunal S. Amare and Brittany S. Rieckmann; 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 Jared Brandell-Douglas; Sections II.B.3 to II.B.5 with Company Cale B. Armstrong; and Sections II.B.6 and V.A with Company Witnesses Cale B. Armstrong and Jared Brandell-Douglas. Finally, I co-sponsor the DEQ Supplement with Company Witness Jared Brandell-Douglas.

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

A. Yes. In accordance with Va. Code § 15.2-2202 E, letters dated June 17, 2024, were sent to Mr. Bryan Hill, Fairfax County Executive, and to Mr. Tim Hemstreet, Administrator of Loudoun County, where the Project is located. The letters stated the Company's intention to file this Application and invited the County to consult with the Company about the Project. A copy of the letters is included as Appendix 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: Jared Brandell-Douglas

Title: Managing Consultant, Environmental Resource Management

Summary:

Company Witness Jared Brandell-Douglas sponsors the Environmental Routing Study provided as part of the Company's Application.

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

- Section I.A (co-sponsored with Company Witnesses Kunal S. Amare, Brittany S. Rieckmann, Cale B. Armstrong, Brian L. Obermeier, 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 Cale B. Armstrong and Greg R. Baka): 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 Cale B. Armstrong and Greg R. Baka): This section provides the proposed route description and structure heights for notice purposes.

Finally, Mr. Brandell-Douglas co-sponsors the DEQ Supplement filed with this Application with Company Witness Greg R. Baka.

A statement of Mr. Brandell-Douglas background and qualifications is attached to his testimony as Appendix A.

DIRECT TESTIMONY
OF
JARED BRANDELL-DOUGLAS
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2024-00131

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

A. My name is Jared Brandell-Douglas. I am employed as a Managing Consultant with Environmental Resources 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, ERM served as routing consultant to Dominion Energy Virginia for many projects over the last 15 years, including:

- Cannon Branch-Cloverhill 230 kilovolt ("kV") transmission line project in the City of Manassas and Prince William County (Case No. PUE-2011-00011);
- Dahlgren 230 kV double circuit transmission line project in King George County (Case No. PUE-2011-00113);
- Surry-Skiffes Creek-Whealton 500 and 230 kV transmission lines (Case No. PUE-2012-00029);
- Remington CT-Warrenton 230 kV double circuit transmission line (Case No. PUE-2014-00025);
- Haymarket 230 kV Line and Substation Project (Case No. PUE-2015-00107);
- Remington-Gordonsville Electric Transmission Project (Case No. PUE-2015-00117);
- Norris Bridge (Case No. PUE-2016-00021);
- Idylwood-Tysons 230 kV single circuit underground transmission line, Tysons Substation rebuild, and related transmission facilities (Case No. PUR-2017-00143);
- Lockridge 230 kV Line Loop and Substation (Case No. PUR-2019-00215);
- Coastal Virginia Offshore Wind Commercial Project (Case No. PUR-2021-00142);
- DTC 230 kV Line Loop and DTC Substation (Case No. PUR-2021-00280);

- Aviator 230 kV Line Loop and Substation (Case. No. PUR-2022-00012);
- Nimbus Substation and 230 Farmwell-Nimbus Transmission Line (Case No. PUR-2022-00027);
- 500-230 kV Wishing Star Substation, 500 kV and 230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop (Case No. PUR-2022-00183);
- 500-230 kV Unity Switching Station, 230 kV Tunstall-Unity Lines #2259 and #2262, 230-36.5 kV Tunstall, Evans Creek, Raines Substations, and 230 kV Substation Interconnect Lines (Case No. PUR-2022-00167);
- Butler Farm to Clover 230 kV Line and Butler Farm to Finneywood 230 kV Line (Case No. PUR-2022-00175);
- 230 kV Altair Loop and Altair Switching Station (Case No. PUR-2022-00197);
- 230 kV Finneywood-Jeffress Lines and Jeffress Switching Station Conversion (Case No. PUR-2023-00088); and
- 230 kV White Oak Lines and White Oak Substation Expansion, in Case No. PUR-2023-00110.

Most recently, ERM served as the routing consultant for the Company's 230 kV Germanna Lines and Germanna Substation, in Case No. PUR-2023-00206; Daves Store 230 kV Line Extension, in Case No. PUR 2024-00021; the Aspen-Golden 500-230 kV Electric Transmission Project, in Case No. PUR-2024-00032; and the Apollo-Twin Creeks Electric Transmission Project, in Case No. PUR-2024-00044.

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 relieve identified violations of mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, to provide service requested by a data

center customer (the "Customer"), and to maintain the structural integrity and reliability of its transmission system, the Company proposes in the Counties of Fairfax and Loudoun County, Virginia, to:

- Construct two new overhead double circuit 230 kilovolt ("kV") transmission lines by cutting the Company's existing 230 kV Lincoln Park-Loudoun Line #2008 and existing 230 kV Bull Run-Sully Line #265, which are collocated within an existing variable 100- to 120-foot-wide right-of-way. As proposed, existing Lincoln Park-Loudoun Line #2008 will be cut at a location between Structures #2008/66 and #2008/67, and existing Bull Run-Sully Line #265 will be cut at a location between Structures #265/88 and #265/89. The two new double circuit lines will extend approximately 0.3 mile from the respective cut-in locations before terminating at a new proposed 230-34.5 kV substation located in Fairfax County, Virginia ("Takeoff Substation") on property to be owned by the Company (the "Takeoff Loop"). The cut-ins ultimately will result in (i) 230 kV Loudoun-Takeoff Line #2008, (ii) 230 kV Lincoln Park-Takeoff Line #2356, (iii) 230 kV Bear Run-Takeoff Line #2285 and (iv) 230 kV Sully-Takeoff Line #2357. At the cut-in between Structures #2008/66 and #2008/67, the Company will install two new monopole structures to provide a network connection to the Takeoff Substation. Similarly, at the cut-in between Structures #265/88 and #265/89, the Company will install two new monopole structures to provide a network connection to the Takeoff Substation. These network connections will allow the Takeoff Substation to connect to other existing substations for increased reliability. While the structures installed at the proposed cut-in locations are within the existing right-of-way, the proposed 0.3-mile Takeoff Loop will be constructed in a new 160-foot-wide right-of-way supported primarily by double circuit weathering steel 2-pole structures and utilizing three-phase twin-bundled 768.2 thousand circular mils ("kcmil") 20/7 Aluminum Conductor Steel Supported/Trapezoidal Wire/High Strength ("ACSS/TW/HS") type conductor with a summer transfer capability of 1,573 MVA, with one new Design Number ("DNO")-11410 shield wire over each circuit. Collectively, this proposed work is referred to as the "Takeoff Loop and Substation."

- Partially reconductor and rebuild Sully-Takeoff Line #2357 entirely within existing right-of-way in Fairfax County, Virginia ("Sully-Takeoff Partial Reconductor/Rebuild"). As discussed above, Sully-Takeoff Line #2357 will result from cutting existing Bull Run-Sully Line #265 between Structures #265/88 and #265/89 (the "Sully-Takeoff Cut-in") and extending 0.3 mile of new double circuit lines to the proposed Takeoff Substation. Accordingly, the resulting approximately 2.2-mile Sully-Takeoff Line #2357 will consist of the new 0.3-mile segment from the Takeoff Substation to the Sully-Takeoff Cut-in, and the existing 1.9-mile segment from the Sully Takeoff Cut-in to the Sully Substation. Hence, only a "partial" reconductor and rebuild of Sully-Takeoff Line #2357—namely, within the 1.9-mile existing segment—is required, as follows.

- Sully-Takeoff Partial Reconductor: reconductor the existing 1.9-mile segment of Sully-Takeoff Line #2357 between the Sully-Takeoff Cut-in and the existing Sully Substation by uprating the existing conductors from three-phase 1590 kcmil 45/7 Aluminum Conductor Steel Reinforced ("ACSR") type conductor and 1534 Aluminum Conductor Alloy Reinforced ("ACAR") 42 EC/19 type conductor to three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS with a summer transfer capability of 1,573 MVA.

- Sully-Takeoff Partial Rebuild: rebuild five of the existing painted steel double circuit monopole structures supporting Line #2357 (*i.e.*, supporting the existing Bull Run-Sully Line #265) and existing Discovery-Sully Line #2107 (existing Structures #265/98 / #2107/72, #265/99 / #2107/71, #265/102 / #2107/68, #265/104 / #2107/66, and #265/107 / #2107/63) in order to maintain proper clearances. The five structures proposed for rebuild are located within an existing 0.9-mile segment between existing Structure #265/98 / #2107/72 and Sully Substation (the "Sully-Takeoff Partial Rebuild Segment"). The five removed structures will be replaced with five double circuit dulled galvanized steel monopole structures.

- Construct a new overhead double circuit 230 kV transmission line beginning at the Company's future Aviator Substation located in Loudoun County, Virginia, and extending approximately 3.2 miles to terminate at the Company's new proposed Takeoff Substation located in Fairfax County, Virginia, resulting in (i) 230 kV Aviator-Takeoff Line #2358, and (ii) 230 kV Aviator-Takeoff Line #2359 (the "Aviator-Takeoff Lines"). While the proposed Aviator-Takeoff Lines will commence and terminate on Company-owned or to-be-owned property (from Structure #2358/25 / #2359/25 at Aviator Substation to Structure #2358/1 / #2359/1 at Takeoff Substation), the proposed Aviator-Takeoff Lines will be constructed in new 100-foot-wide right-of-way supported primarily by double circuit dulled galvanized steel monopole structures and will utilize three-phase twin-bundled 768.2 kcmil 20/7 ACSS/TW/HS type conductors with a summer transfer capability of 1,573 MVA, with one new DNO-11410 shield wire over each new circuit.

- Perform minor substation-related work at the Company's future Aviator Substation.

The Takeoff Loop and Substation, the Sully-Takeoff Partial Reconductor/Rebuild, the Aviator-Takeoff Lines, and minor substation-related work are collectively referred to as the "230 kV Rebuild, Reconductoring, and New Line Projects to Network Takeoff Substation" or the "Project."

The Project is necessary to relieve identified violations of NERC Reliability Standards in order to maintain and improve reliable electric service to customers in the load area extending generally southeast from the future Aviator Substation in Fairfax and Loudoun Counties (the "Aviator Load Area") and to ensure that Dominion Energy Virginia can provide service requested by its Customer in Fairfax County, Virginia.

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 Kunal S. Amare, Brittany S. Rieckmann, Cale B. Armstrong, Brian L. Obermeier, 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 R. Baka; and Sections II.B.6 and V.A with Company Witnesses Cale B. Armstrong 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 JARED BRANDELL-DOUGLAS

Jared Brandell-Douglas earned a Bachelor of Arts in Biology and Environmental Studies from St. Olaf College. He has approximately ten years of experience supporting land use permitting, zoning, and the siting and regulatory permitting of large-scale linear energy facilities, including electric transmission lines, throughout the eastern and midwestern United States. During this time, he was employed by various private- and publicly-owned consulting companies, including Natural Resource Group, LLC, Environmental Resources Management (ERM), Tetra Tech, Inc. and again most recently one and a half years with ERM, a privately-owned consulting company specializing in the siting, licensing and environmental construction compliance of large, multi-state energy transportation facilities.

Mr. Brandell-Douglas' professional experience related to electric transmission line projects includes the direct management of impact assessments and agency consultations associated with the routing and siting of multiple transmission line projects as well as the management of the routing of these facilities. His work on these projects included conducting studies to identify and delineate routing constraints and opportunities; identification and evaluation of route alternatives; public and stakeholder engagement; and analysis of route alternatives. Within the last several years, he has managed and supported the siting and evaluation of over 25 miles of 230 and 500 kV transmission line route alternatives in the Commonwealth for Virginia Electric and Power Company.