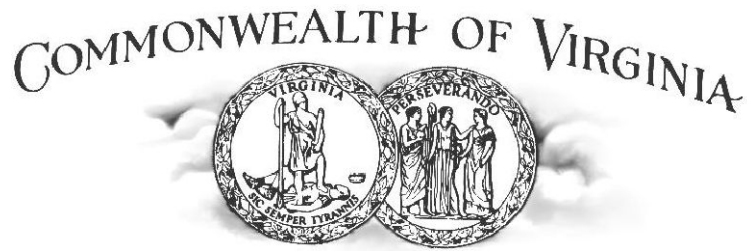


JEHMAL T. HUDSON
COMMISSIONER

SAMUEL T. TOWELL
COMMISSIONER

KELSEY A. BAGOT
COMMISSIONER



BERNARD LOGAN
CLERK OF THE COMMISSION
P.O. BOX 1197
RICHMOND, VIRGINIA 23218-1197

STATE CORPORATION COMMISSION

State Corporation Commission

RECEIVED

1/9/2026

Case No.: PUR-2025-00056

Sponsor: ("Loudoun County")

Exhibit No.: 29

Witness: Brain C. Conroy, P.E.

Bailiff: Kirsten S. Turney

Witness Direct Testimony Summary

Witness Name: Brian A. Conroy, P.E.

Title: Manager of Power System Studies, RLC Engineering PLLC

Summary:

Mr. Conroy provides an independent evaluation of the Company's Application, specifically the proposed 500 kV and 230 kV Golden-Mars lines in the vicinity of Rock Ridge High School, down to the proposed Mars Substation. Mr. Conroy assesses the Company's determination that no underground route through this area is feasible, provides his own assessment of that feasibility, and proposes additional hybrid alternatives—on top of those identified by the Company in its Underground Feasibility Study—in the County's Underground Hybrid Proposal. Mr. Conroy's testimony includes an exhibit showing photo renderings of strategic viewsheds along proposed Golden-Mars Routes 3 and 4, depicting the adverse impacts to scenic and cultural assets that would occur if these routes were constructed overhead.

Mr. Conroy testifies that hybrid alternatives—those identified by Dominion and those identified by the County—mitigate the negative impacts to facilities and communities along the proposed overhead routes and are feasible. After reviewing the Company's Underground Feasibility Study, Mr. Conroy identified and reviewed three additional underground hybrid variants (Options A, B, and C). Mr. Conroy describes these options and introduces the County's Underground Hybrid Proposal as Exhibit BC-3.

Mr. Conroy then addresses the constraints identified by Dominion from the Underground Feasibility Study for the UG routes most similar to the three variants in the County's Underground Hybrid Proposal. He explains how these identified constraints are or can be addressed for each of the three Options in the Underground Hybrid Proposal. Mr. Conroy also explains how micrositing and other routing adjustments can and often are made at the detailed design phase. He provides several examples of such adjustments made by RLC in developing the County's proposal.

Mr. Conroy testifies that the Company considered but did not fully vet the underground alternatives in the Underground Feasibility Study, and that its engineering approach—only proposing underground alternatives where no overhead option exists—essentially forecloses the possibility of underground placement of high-voltage lines. Mr. Conroy confirms that his analysis shows that a hybrid alternative is feasible in the relevant area, and that it would best minimize adverse impacts to residents, the schools, and viewsheds.

Finally, Mr. Conroy concludes by testifying that underground placement will have the same performance characteristics as overhead, that there will be no drop-off in performance, and that underground placement provides certain redundancy and resiliency advantages when compared to overhead alternatives.

**DIRECT TESTIMONY
OF
BRIAN CONROY, P.E.**

**ON BEHALF OF
LOUDOUN COUNTY, VIRGINIA
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2025-00056
(500 kV and 230 kV Golden-Mars Lines)**

**Q1. PLEASE STATE YOUR NAME, OCCUPATION, WHERE YOU WORK, AND
YOUR WORK ADDRESS.**

A. Brian A. Conroy, P.E.
Manager of Power System Studies
RLC Engineering, PLLC
176 Gannett Drive
South Portland, Maine 04106

Q2. WHAT IS YOUR EDUCATION AND PROFESSIONAL EXPERIENCE?

A. I graduated from the University of Maine in 1986 with BS in electrical engineering. I subsequently earned an MBA degree from Thomas College in 1992. From 1986 to 2019, I worked at Central Maine Power Company, along with its affiliates NYSEG, RG&E, and UI. My responsibilities have included metering, distribution automation, distribution engineering and planning, smart grid planning, and directing the electric system engineering functions (transmission, substation, protection, distribution, technical metering, and meter labs) across all the Avangrid electric operating companies before becoming a consultant. Since 2019, I have worked at RLC Engineering in the Power System Studies group. I manage a group of 32 engineers in the Transmission and Distribution Planning groups. I am a registered Professional Engineer in the States of Maine and New York. My most recent resume is attached to this testimony as **Exhibit BC-1**.

Q3. WHAT IS YOUR PROFESSIONAL EXPERIENCE AS IT RELATES TO ELECTRICAL POWER SYSTEM STUDIES, AND ELECTRICAL POWER SYSTEM ECONOMIC ANALYSIS?

A. As a Distribution Engineer, I performed distribution analyses, studies, protection coordination, and distribution system designs. As a Control Center Manager, I participated in operational studies associated with new or upgraded high voltage lines and substations, and was NERC certified as a Reliability Coordinator. I have represented my company and affiliates at the NPCC Reliability Coordinating Committee, the New York Joint Utilities Steering Committee, and EPRI. I have also participated in regulatory proceedings in Maine, New York, and Connecticut.

As a Principal Power System Engineer at RLC Engineering, I performed distribution system impact studies. As Manager of Power System Studies at RLC Engineering, I oversee and participate in the transmission and distribution studies performed for our utility and ISO/RTO clients. These studies may include estimating, forecasting, production modeling, and other economic analyses.

Q4. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. My testimony will provide an independent evaluation of Dominion Virginia Power's siting and transmission proposal to the Virginia State Corporation Commission, and specifically, the proposed 500 and 230 kV Golden-Mars lines in the vicinity of Rock Ridge High School and the proposed Mars Substation. My testimony will discuss hybrid alternatives involving underground options in an area which includes:

Rock Ridge High School

Rosa Lee Carter Elementary School

Loudoun Valley Estates

Some of the impacts of the proposed overhead lines in this community are illustrated in **Exhibit BC-2**. The renderings in Exhibit BC-2 were prepared under my direction. I directed J2, a civil engineering firm, to visit the sites and take the necessary photos to be able to provide a comparison between Dominion suggested overhead Golden-Mars Routes 3 and 4 versus Option B in the County's Underground Hybrid Proposal. The pictures have been taken in strategic locations along the proposed alignment, giving priority to specific areas such as a view from the high school entrance. J2's landscape architect visited the site on September 24, 2025, to provide the photos and renderings, and took the photos on that date.

Q5. HAVE YOU REVIEWED AND ANALYZED THE COMPANY'S APPLICATION FOR PROPOSED TRANSMISSION LINES SUBMITTED IN CASE NO. PUR-2025-00056 (THE "GOLDEN-MARS APPLICATION")?

A. Yes. I have reviewed the application.

Q6. ON BEHALF OF LOUDOUN COUNTY, DID YOU CONDUCT A REVIEW OF ALTERNATIVE SOLUTIONS, INCLUDING AN UNDERGROUND OPTION FOR PART OF THE ROUTE, RUNNING MOSTLY ALONG ROUTE 7?

A. Yes, we did.

Q7. PLEASE EXPLAIN THE SCOPE OF THE REVIEW AND THE PROCESSES UTILIZED TO UNDERTAKE IT.

A. To become familiar with the proposed project, and assess the alternatives, RLC began with a document review, including:

Volume 1 of 5 (Testimony, Application, Appendices)

After reviewing the application, testimony, and underground feasibility study, RLC investigated hybrid underground alternatives for these lines.

Q8. WHAT WERE THE CONCLUSIONS OF YOUR REVIEW?

A. We concluded that these hybrid alternatives mitigated negative impacts to facilities in this vicinity and that routing these lines underground in this area was feasible.

Q9. DID YOU SUCCEED IN DEVELOPING A FEASIBLE UNDERGROUND HYBRID PROJECT PROPOSAL TO UNDERGROUND PART OF THE TRANSMISSION LINE PROPOSED IN THE GOLDEN-MARS APPLICATION?

A. Yes, we did.

Q10. CAN YOU BRIEFLY DESCRIBE THE NATURE OF THE UNDERGROUND HYBRID PROJECT PROPOSAL?

A. Yes. The underground hybrid project proposal is attached to this testimony as **Exhibit BC-3**. This proposal reviews three options for an underground hybrid project.

Option A:

This underground segment would follow Dominion's proposed overhead line route from the Golden Substation to the Northwoods Property (Nearby Dominion proposed Transition Stations #2 and #4). An alternative transition station is proposed at the nearby Amazon Data Services site to avoid the flood plain issue associated with the Company's proposed locations. A proposed underground route, generally following a route similar to Dominion's proposed Underground Route #5, follows Loudoun Reserve Drive and the western and southern edges of Loudoun Valley Estates (while staying outside the Broad Run flood plain). At this point, it deviates from the Dominion

route and crosses Old Ox Road near Beaver Meadow Road, parallels Old Ox Road to Carter School Road, and follows parallel to Carter School Road to the planned Mars Substation. See Figure 1 - Proposed Transmission Line Routing Option A, in **Exhibit BC-3**.

Option B:

This underground section would begin at the same transition station as proposed in Option A, following the same route (similar to Dominion's proposed Underground Route R4), except terminating in a proposed transition station in the southwest corner of the Loudoun Valley Estates property (essentially, the proposed Dominion Transition Station #7). From there, the lines would continue overhead, cross Old Ox Road, parallel Old Ox Road to Carter School Road, and follow Carter School Road to the planned Mars Substation. See Figure 2 - Proposed Transmission Line Routing Option B, in **Exhibit BC-3**.

Option C:

This underground section would begin at the same transition station as proposed in Option A, follow Old Ox Road to Carter School Road, and follow Carter School Road to the planned Mars Substation (most like Dominion proposed Underground Route 6). See Figure 3 - Proposed Transmission Line Routing Option C, in **Exhibit BC-3**.

Q11. WHAT WERE THE COMPANY'S COMMENTS AND CONCERNS REGARDING THEIR SIMILAR UNDERGROUND ROUTES?

A. In their underground feasibility study, Dominion's comments and concerns regarding their proposed routes most like these options were:

- 124 Option A (most similar to Dominion Underground Route 5)¹:
- 125 Route outside the public ROW
- 126 Easements required from multiple entities:
- 127 o Loudoun County Board of Supervisors
- 128 o LVE III Homeowners' Association
- 129 o Loudoun County Public Schools
- 130 o Amazon Data Services
- 131 o Microsoft Corporation
- 132 o 7 LLCs
- 133 Parallels Broad Run Creek with approximately 30% of the route within a flood plain
- 134 230 kV and 500 kV share a common ROW
- 135 Utility congestion along Old Ox Road
- 136 VDOT will not allow open-cut trenching across Old Ox Road
- 137 Option B: (most like Dominion Underground Route R4)²:
- 138 Encroaching over High School access road
- 139 Crossing through OH transmission corridor
- 140 Needed HDD to cross below stream
- 141 Distance between splice vaults
- 142 Option C: (most like Dominion Underground Route 6)³:
- 143 Utility congestion along Old Ox Road and Ladbrook Drive
- 144 Depth of diabase rock

¹ See Volume 4, Environmental Routing Study, Section 4.1.5, Pages 4-34 and 4-35.

² See Volume 4, Environmental Routing Study, Section 4.1.11.6, Page 4-91.

³ See Volume 4, Environmental Routing Study, Section 4.1.6.6, Page 4-42.

145 Construction work area availability

146 VDOT limitations on Old Ox Road

147 Traffic control on Old Ox Road

148 Encroachments onto private property

149 Water drainage ditches near alignment

150 Land rights across the NOAA parcel

151 **Q12. DID YOU ADDRESS THESE CONCERNS WITH YOUR PROPOSAL OPTIONS?**

152 **IF SO, PLEASE DESCRIBE THEM, AND EXPLAIN HOW THEY WERE**

153 **TARGETED TO ADDRESS THE COMPANY’S CONCERNS, REGARDING**

154 **FEASIBILITY, OR OTHERWISE.**

155 A. Yes, we did. Please see the table below for responses to the Dominion concerns raised for

156 their similar routes:

Concern	Response
Option A	
Route outside the public ROW	This is not a feasibility issue.
Easements required from multiple entities:	The proposed underground route requires easements from: Amazon Data Services, Loudoun County School Board, Loudoun Valley Estates III, and Digital Carver Dulles
Parallels Broad Run Creek with approximately 30% in flood plain	The proposed route is outside the flood plain.
230 kV and 500 kV share a common ROW	This is not a feasibility issue. The Dominion OH proposal contains 100% shared ROW.
Utility congestion along Old Ox Road	Utility conflicts are commonplace and expected when planning new lines.
VDOT will not allow open-cut trenching across Old Ox Road	VDOT <u>Utility Manual of Instructions</u> in Appendix 8 states, “The Department encourages trenchless construction for transportation improvements, whereby it is imperative or necessary to limit the

Concern	Response
	impacts to the traveling public, while avoiding lane shutdowns and/or detouring.”
Option B	
Encroaching over High School access road	Micrositing option avoids blocking off bus entry to the High School.
Crossing through OH transmission corridor	Micrositing will avoid conflict with transmission structures and foundations.
Needed HDD to cross below stream	Option B avoids this stream crossing.
Distance between splice vaults	Splice vault distances limited to 2,600' maximum.
Option C	
Utility congestion along Old Ox Road	Utility conflicts are commonplace and expected when planning new lines. It is likely that with the footprint of the proposed duct bank, some level of utility relocation will be required to install the duct banks. ⁴
Depth of diabase rock	Available geotechnical boring survey results near Amazon Data Services, Rock Ridge High School, Dulles Trade Center II, and Prologis indicate depth of 2 to 13.7 feet. Fourteen of forty-two bores (33%) indicated refusal or boring terminated at depths of less than 7 feet. A detailed site-specific geotechnical investigation along the proposed route must be performed to further define the diabase rock depth variation along the route, as well as other soil layer types, thicknesses and mechanical properties. ⁵
Construction work area availability	Vaults will be staggered, placed in phases, and not be placed at intersections.
VDOT limitations on Old Ox Road	VDOT <u>Utility Manual of Instructions</u> in Appendix 8 states, “The Department encourages trenchless construction for transportation improvements, whereby it is imperative or necessary to limit the impacts to the traveling public, while avoiding lane shutdowns and/or detouring.”
Traffic control on Old Ox Road	[T]he duct bank installation can be completed in phases where a couple of lanes can remain open for traffic flow during construction. The alignment has been adjusted so the duct bank trench does not require digging into the asphalt on Route 606. Excavation is only expected on the road shoulder, and no trenching is expected within the ongoing traffic lanes.

⁴ Excerpt from Underground Feasibility Study, Section 4.1.6.1, Page 4-37.

⁵ Excerpts from Underground Feasibility Study, Section 4.1.1.6, Page 4-18.

Concern	Response
	Only up to a single lane of traffic would be impacted on the Route 606 corridor ⁶
Water drainage ditches near alignment	Ditch on opposite side from plan. Horseshoe Pond and dam not in proposed route.
Encroachments onto private property	[See easements response below]
Easements	The proposed underground route requires easements from: Amazon Data Services, Loudoun Valley Estates III, and Digital Carver Dulles

Q13. DID YOUR REVISIONS ADDRESS ALL OF DOMINION'S STATED CONCERNS AS YOU UNDERSTOOD THEM?

A. They addressed as many of the concerns as possible with a conceptual design. Geological and environmental details will be assessed in detailed design as is the case in all transmission line applications. These, regulatory and environmental permitting risks, and other risks are factored into the conceptual estimate.

Q14. BASED ON YOUR ANALYSIS, WHAT IS YOUR CONCLUSION REGARDING DOMINION'S PROPOSED ROUTE IN THE GOLDEN-MARS APPLICATION, SPECIFICALLY ITS PROPOSAL TO PLACE THE ENTIRE ROUTE OVERHEAD, INCLUDING THAT PORTION OF THE ROUTE THAT RUNS ALONG OR NEAR THE UNDERGROUND PROPOSAL?

A. My conclusion regarding Dominion's proposed route is that they considered but did not fully vet the alternatives of placing portions of the line underground as feasible alternatives to minimize the negative impact to adjacent facilities and uses.

⁶ Excerpts from Underground Feasibility Study, Section 4.1.1.3 and 4.1.1.4, Pages 4-12 through 4-14.

Q15. WHAT IS THE BASIS FOR YOUR ASSESSMENT?

A. This assessment is based upon the negative impacts to the area in question, including:

Rock Ridge High School

Rosa Lee Carter Elementary School

Loudoun Valley Estates

Please see the photo renditions in **Exhibit BC-2** to compare the impact of the overhead lines in this vicinity.

Q16. IN THE UNDERGROUND FEASIBILITY STUDY FILED AS VOLUME 4 OF DOMINION'S GOLDEN-MARS APPLICATION, DOMINION PROVIDES ANALYSIS SUPPORTING ITS DETERMINATION THAT UNDERGROUNDING ALL OR PART OF THE ROUTE IS UNFEASIBLE. WHAT IS YOUR OPINION OF THAT ANALYSIS?

A. I disagree based on the in the responses above to the route concerns raised by Dominion. In summary, our analysis shows a hybrid alternative is feasible and preferred to minimize the negative impacts to these adjacent facilities.

Q17. WHAT ARE THE KEY PERFORMANCE CHARACTERISTICS OF THE UNDERGROUND PROPOSAL? IN TERMS OF RELIABILITY, REDUNDANCY, AND OTHER KEY PERFORMANCE CHARACTERISTICS?

A. For a fault on an underground cable, with the ability to isolate individual cables, 75% of the line flow can be maintained until the repair is complete on a faulted cable (assuming 4 cables per phase with separate disconnects). With an overhead line, no flow is available until the repair is completed. This represents an increase in resiliency/redundancy. Also,

with fault detection technology, the location of a fault can be identified between the nearest vaults/splices to facilitate repairs.

Also, underground lines provide increased reliability from weather-related phenomena, such as high winds and lightning

Further, decreased interruption durations are observed with underground lines. Researchers at Stanford found that a 10% increase in a system's underground line miles was correlated with a 14% reduction in annual interruption durations across the U.S.⁷

Q18. HOW DO THE PERFORMANCE CHARACTERISTICS OF THE UNDERGROUND PROPOSAL COMPARE TO THE PERFORMANCE CHARACTERISTICS FOR THE COMPANY'S PROPOSED OVERHEAD TRANSMISSION LINE IN THE GOLDEN-MARS APPLICATION?

A. The 'all lines in' rating of the proposed underground lines will match the rating of the overhead lines (4,000 A at 230 kV and 5,000 A at 500 kV). However, when the overhead line has a fault, the entire line is lost, and alternate paths must carry the full flows of the line until it is repaired and put back into service. Whereas, when an underground cable has a fault, it can be isolated, and the remaining cables carry 75% of the rated load (in the case of 4 cables per phase) until it is repaired. This provides a resiliency/redundancy benefit for the underground alternative.

Q19. WHAT ARE THE CRITICAL ROUTING AND LOCATION DECISIONS THAT HAD TO BE MADE IN DEVELOPING THE UNDERGROUND PROPOSAL AND CAN YOU EXPLAIN THOSE?

⁷ Lawrence Berkeley National Laboratory. 2024. "Undergrounding Transmission and Distribution Lines." Report. *Resilience Investment Guide*. https://www.energy.gov/sites/default/files/2024-11/111524_Undergrounding_Transmission_and_Distribution_Lines.pdf.

215 A. Critical routing and location decisions made in developing the underground hybrid
216 proposal include transition station locations, required right-of-way width, splice vault
217 spacing, current and proposed developments, existing uses, and existing easements.

218 Transition stations had to be located where there is accommodating space;
219 the route had to be located where there is accommodating right-of-way width;
220 the splice vaults (with their expanded right-of-way requirement) had to be located
221 where there is accommodating width, yet spaced close enough together for
222 acceptable cable pulling and reel size; and
223 the route had to accommodate both existing and planned developments.

224 **Q20. HOW DID THESE CRITICAL ROUTING AND LOCATION DECISIONS IMPACT**
225 **YOUR PROPOSED UNDERGROUND HYBRID OPTIONS?**

226 A. An alternative transition station is proposed at the Amazon Data Services site, rather than
227 Transition Station 2 or Transition Station 4 from the Underground Feasibility Study, to
228 avoid the flood plain concern associated with the Company's proposed locations⁸, and
229 because construction has not begun on Amazon's Building B, which is the building
230 impacted by the transition yard in the County's proposal. Further, the proposed
231 Transition Station 4 contains a "large stormwater pond" listed as a "main constructability
232 stressor."⁹ However, the County would support modifications of the flood plain and/or
233 wetlands to avoid conflict with proposed transition stations if that could avoid impacts to
234 planned development.

⁸ Figures 5-10 and 5-13 of Volume 4 illustrate the flood plain overlap with these sites.

⁹ Underground Feasibility Study, Section 5.2.4.2, Page 5-16.

Further, the County's proposed transition stations and underground route were elected to avoid the trenchless crossing R4-TC1¹⁰, and to avoid the Broad Run Creek flood plain completely.

Q21. HOW CAN CRITICAL ROUTING AND LOCATION DECISIONS BE FURTHER OPTIMIZED?

A. Further adjustments can be made to transition stations, routes, vault locations, etc., to avoid discovered or unforeseen conflicts. These more detailed adjustments are typically made during the detailed design phase but may occur at any time during the planning process. Examples are indicated in proposed underground Option B, labelled as Figure 2 below. The magenta route along Loudoun Reserve Drive indicates an option that avoids conflicts with a pump house and several utility services. This route also avoids conflicts with access to school parking lots. Toward the top of Figure 2 is another alignment option shown in magenta. This option positions the underground line further away from the Loudoun Valley Estates III homes yet remains outside the Broad Run Creek flood plain.

¹⁰ Underground Feasibility Study, Section E.6.1.1, Pages E.6-1 and E.6-2.

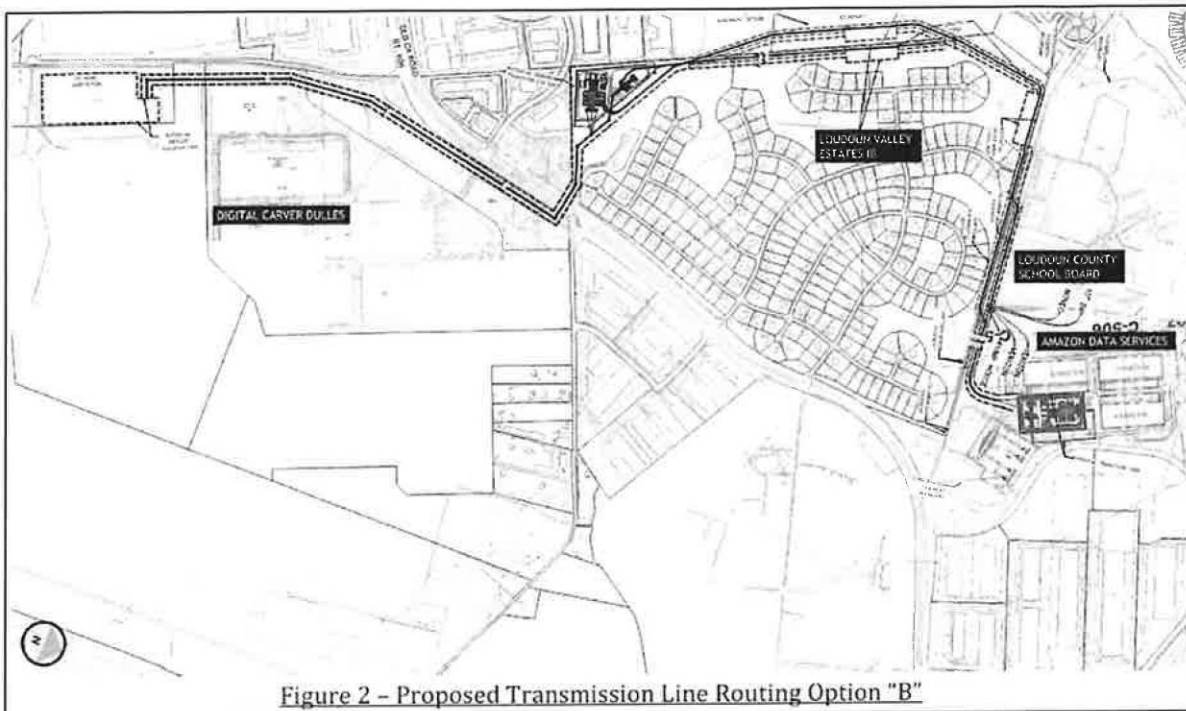


Figure 2 – Proposed Transmission Line Routing Option "B"

Another example of further optimization is the layout for the transition station to be sited within the planned Mars Substation. Per Dominion response to Loudoun County, First Set, Question No. 3, the Company determined that there was sufficient land area to expand the Mars Substation to accommodate the facilities for a transition station. The response and attachment to that response, showing the general arrangement plan for the Mars substation which incorporates the transition station equipment, is attached as **Exhibit BC-4**.

Further refinements and micrositing can be achieved as conflicts and challenges are discovered during the project planning process.

Q20. WHAT ARE YOUR OVERALL CONCLUSIONS ABOUT THE FEASIBILITY AND PROSPECTIVE PERFORMANCE OF THE UNDERGROUND PROPOSAL?

A. Underground hybrid options are feasible, perform better than their overhead alternative, and reasonably minimize adverse impacts to the surrounding area.

262 **Q21. IN YOUR OPINION, WILL THERE BE ANY MATERIAL PERFORMANCE**
263 **DROPOFF IF THE COMMISSION ORDERS DOMINION TO UNDERGROUND**
264 **THE PORTION OF THE ROUTE DESIGNATED BY THE UNDERGROUND**
265 **PROPOSAL?**

266 A. No, there will not be any material performance drop-off with an underground hybrid
267 alternative.

268 **Q22. ARE THERE ANY OTHER ADVANTAGES EXCLUSIVE TO THE**
269 **UNDERGROUND PROPOSAL?**

270 A. The surrounding community and residents will enjoy the benefits of the reduced negative
271 impacts of the underground segment for the life of the project.

272 **Q23. WHAT ARE YOUR OVERALL CONCLUSIONS REGARDING DOMINION'S**
273 **GOLDEN-MARS APPLICATION?**

274 A. My overall conclusions are as follows:

275 Dominion has identified and evaluated multiple overhead and underground routes for
276 its planned 230/500 kV Golden-Mars line.

277 Dominion's evaluation of the underground alternatives in the Underground Feasibility
278 Study identified challenges with each route, but those challenges did not rise to the
279 level of making the options infeasible.

280 The hybrid Golden-Mars options presented above, would minimize impacts to the
281 communities along the route.

282 A hybrid alternative is feasible.

283 **Q24. IS THERE ANYTHING ELSE YOU WOULD LIKE TO ADD TO YOUR**
284 **TESTIMONY?**

285 A. Not at this time.

286 **Attachments:**

287 **1) Exhibit BC-1 – Resume**

288 **2) Exhibit BC-2 – Photographs Showing Impacts of Overhead Lines**

289 **3) Exhibit BC-3 – Transmission Line Summary Estimate and Underground Hybrid**

290 **Proposal (October 2025)**

291 **4) Exhibit BC-4 – Company Response to County Set 01-03 and Attachment**

BRIAN A. CONROY, P.E.

EDUCATION & TRAINING

Masters Degree in Business Administration
Thomas College; Waterville, Maine
June 1992

Bachelor of Science in Electrical Engineering
University of Maine; Orono, Maine
May 1986
Graduated with High Distinction

Registered Professional Engineer

- State of Maine
- State of New York

PROFESSIONAL EXPERIENCE

Manager of Power System Studies, RLC Engineering; South Portland, Maine. Leading a high performance Distribution and Transmission Planning groups in steady-state, dynamic, and EMT system studies, including DER interconnection, reliability/resiliency, protection, scripting and modeling, arc hazard analyses, etc. (7/2019 - present)

Director - Network Projects & Initiatives, AVANGRID; Portland, Maine. Responsible for delivering an integrated Energy Management, Distribution Management, Geographic Information, and Outage Management System for the AVANGRID network companies, and continuing to plan and develop the smart grid technology platform required to operate the electric utility of the future. (4/2014 - 7/2019)

Director - Electric Systems Engineering, Iberdrola USA; Augusta, Maine. Responsible for transmission, substation, protection, and distribution engineering functions across the Iberdrola USA operating companies [Rochester Gas & Electric, New York State Electric & Gas, and Central Maine Power Company]. (1/2010 - 3/2014)

Manager - Dispatch & Energy Control Center, Central Maine Power Company; Augusta, Maine. Manager responsible for Maine Local Control Center which oversees the operations of the 345 kV and 115 kV transmission systems in Maine, along with the 35 kV sub-transmission system for Central Maine Power Company. NERC Certified System Operator - Reliability (7/2006 - 12/2009)

Lead Electrical Engineer, Distribution Engineering Department, Central Maine Power Company; Augusta, Maine. Electrical engineer responsible for the planning, design, construction, operation and maintenance of the distribution system, including underground secondary network system. (7/1995 - 6/2006)

Engineer, Load Management Operations Department, Central Maine Power Company; Augusta, Maine. Project engineer responsible for specification, bid review, technical design review, and acceptance testing of real-time computer system. Also responsible for the design and installation of substation, communications (telecommunications and

power line carrier), and metering equipment for Load Management System. (12/1988 - 7/1995)

Engineer, Meter Operations Department, Central Maine Power Company; Augusta, Maine. Designed metering installations, equipment specifications, and construction standards. (6/1986 - 12/1988)

PAPERS



PCGBTSUSD.pdf



MPAPSTSUSD.pdf

PUBLICATIONS

"Flexibility Is Key in New York: New Tools and Operational Solutions for Managing Distributed Energy Resources (Currie, et al., May/June 2017)" IEEE Power and Energy Magazine, May/June 2017, pp 20-29. <http://ieeexplore.ieee.org/document/7900480/>

VOLUNTEER EXPERIENCE

Maine Engineering Promotional Council Board - Organized the annual National Engineers Week Banquet and EXPO. 2020 President. www.engineeringme.com (2014 - present)



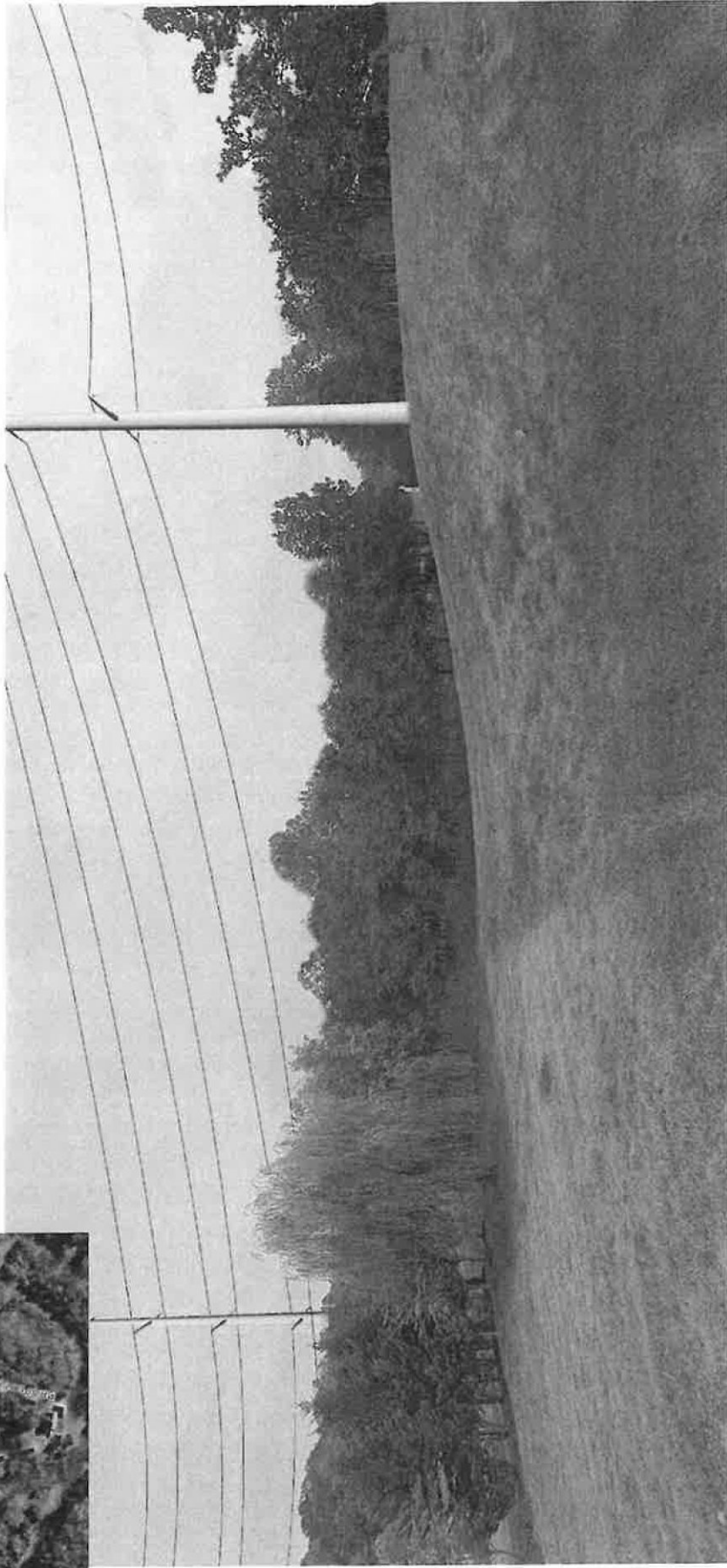
**EXHIBIT
BC-2**



GOLDEN TO MARS - ILLUSTRATIVE RENDERINGS
Loudoun, Virginia

EXISTING
22819 OATLANDS GROVE- SOUTH

10.07.2005



GOLDEN TO MARS - ILLUSTRATIVE RENDERINGS

Loudoun, Virginia

PROPOSED
22819 OATLANDS GROVE- SOUTH

10/07/2025



GOLDEN TO MARS - ILLUSTRATIVE RENDERINGS

Loudoun, Virginia

EXISTING
22819 OATLANDS GROVE- NORTH

10/17/2024

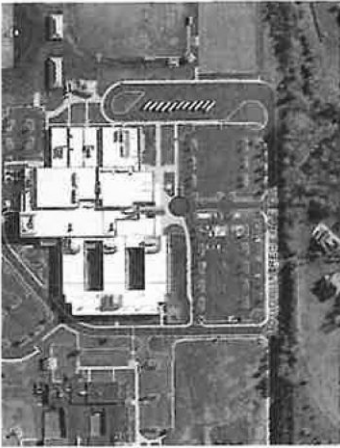


GOLDEN TO MARS - ILLUSTRATIVE RENDERINGS

Loudoun, Virginia

PROPOSED
22819 OATLANDS GROVE- NORTH

10.07.2025



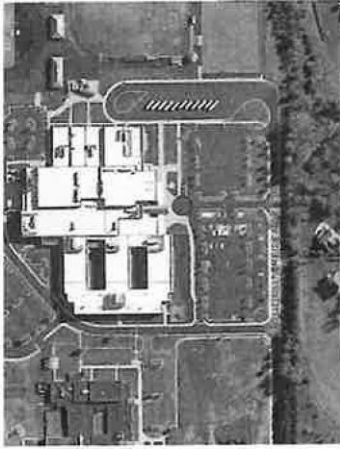
IMAGES BY DOMINION ENERGY

GOLDEN TO MARS - ILLUSTRATIVE RENDERINGS

Loudoun, Virginia

EXISTING - DOMINION
ROCK RIDGE HIGH SCHOOL - SOUTH

10/10/2005



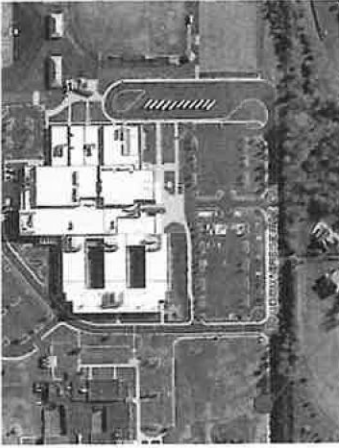
IMAGES BY DOMINION ENERGY

GOLDEN TO MARS - ILLUSTRATIVE RENDERINGS

Loudoun, Virginia

PROPOSED - DOMINION
ROCK RIDGE HIGH SCHOOL - SOUTH

10/07/2025

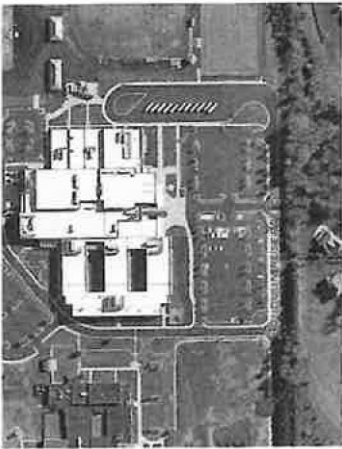


GOLDEN TO MARS - ILLUSTRATIVE RENDERINGS

Loudoun, Virginia

EXISTING
ROCK RIDGE HIGH SCHOOL - EAST

10.07.2005



GOLDEN TO MARS - ILLUSTRATIVE RENDERINGS

Loudoun, Virginia

PROPOSED
ROCK RIDGE HIGH SCHOOL - EAST

10/07/2025



GOLDEN TO MARS - ILLUSTRATIVE RENDERINGS
Loudoun, Virginia

EXISTING
43495 OGDEN PL

10/07/2025



GOLDEN TO MARS - ILLUSTRATIVE RENDERINGS

Loudoun, Virginia

PROPOSED
43495 OGDEN PL

10/07/2025



GOLDEN TO MARS - ILLUSTRATIVE RENDERINGS

Loudoun, Virginia

EXISTING
23241 MEADOWVALE GLEN CT

10/07/2025



GOLDEN TO MARS - ILLUSTRATIVE RENDERINGS

Loudoun, Virginia

PROPOSED
23241 MEADOWVALE GLEN CT

10/07/2025



GOLDEN TO MARS - ILLUSTRATIVE RENDERINGS

Loudoun, Virginia

MEADOWVALE GLEN CT. AND STUKELY DR

10.07.2005



GOLDEN TO MARS - ILLUSTRATIVE RENDERINGS

Loudoun, Virginia

PROPOSED
MEADOWVALE GLEN CT. AND STUKELY DR.

10/16/2022



**EXHIBIT
BC-3**

**ROUTING REPORT
OCTOBER 21, 2025**

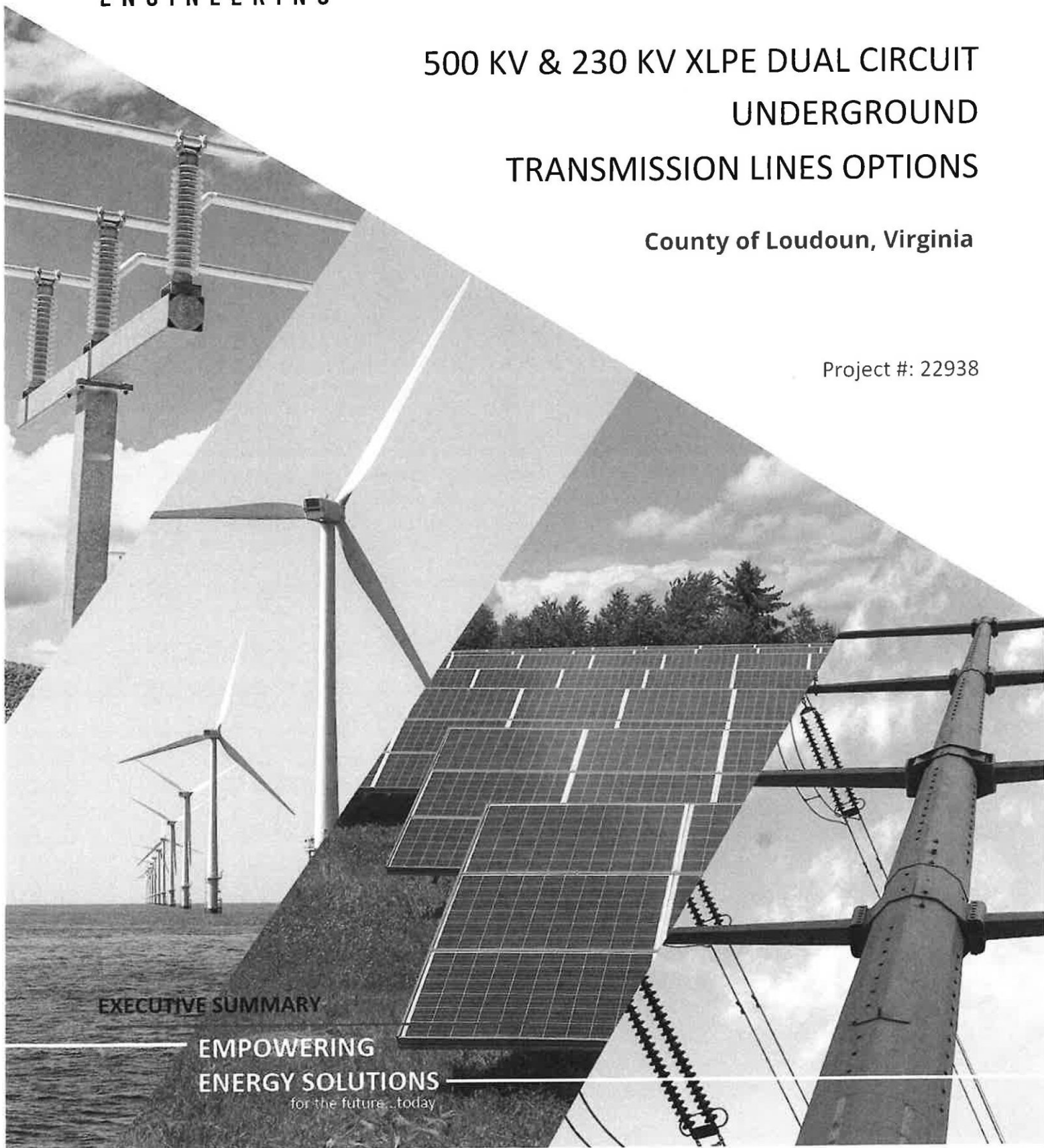
500 KV & 230 KV XLPE DUAL CIRCUIT UNDERGROUND TRANSMISSION LINES OPTIONS

County of Loudoun, Virginia

Project #: 22938

EXECUTIVE SUMMARY

**EMPOWERING
ENERGY SOLUTIONS**
for the future...today



1. Background

RLC Engineering, LLC (RLC) has prepared this report for Loudoun County, Virginia to develop a high-level feasibility analysis for a proposed 500 kV and 230 kV Dual Circuit XLPE Underground Transmission Line Installation (Project) located in Loudoun County, VA. The Project will require two (2) underground transmission lines in duct banks, lengths for the underground portion of two (2) transmission lines vary depending on the option. These underground transmission lines will be a section of a larger 500 kV/230 kV overhead transmission line, which will run approximately 8 miles from the proposed Golden Substation to the proposed Mars Substation. The underground transmission lines will be installed by and constructed to Dominion Energy specifications and approvals. Three different layouts for this section of underground line will be analyzed. The three layouts will have differing lengths of underground versus overhead line as well as differing locations for the transition yards that will be required at both ends of the underground line to convert the lines back to overhead.

The proposed underground routing options for the Project have been established and provided to RLC by the client. Please see Figure 1, Figure 2 and Figure 3 below for plan views drafts of the route options. The three different options will be referred to as options "A", "B" and "C". Based on the limited amount of project information available, RLC has made a number of assumptions in order to compile the required information for this feasibility analysis for the underground transmission line installation. These assumptions are listed in this report below. The proposed layout and assumptions address many of the concerns with constructing the underground versus overhead lines. Further details will be needed for the detailed design.

2. UNDERGROUND TRANSMISSION LINE PROJECT DESCRIPTION

2.1. General Underground Transmission Line Information

Dominion has proposed constructing a 500 kV and 230 kV overhead transmission lines between the future Mars Substation and the existing Golden Substation. This new line and structures will run above the tree line and will be visible at great distances. In an effort to reduce the visual impact and effect on nearby property values, RLC is proposing part of the line be run underground. The underground route options consist of a section of new underground transmission lines starting at the proposed transition substation along Ladbrook Drive in the vicinity of the future Amazon data centers. The underground lines, depending upon the route, have different options for termination locations. Each of the transition substations or yards will be between 7-8 acres in size. Each of the yards will require two (2) take-off structures; one (1) for the 500 kV conductors, and one (1) for the 230 kV conductors. Both transmission lines will be run in one (1) common trench in separate concrete encased duct banks, with a series of splice vaults to accommodate the proposed routing and conductor splicing. The location of the transition yards and vaults, and distance between them, was estimated using the map provided and Google Earth imagery as well as estimated cable lengths. Vaults will be located a maximum of 2600' apart. No right-of-way (ROW) reviews, environmental permitting or inspections were completed on this project routing, which could impact the final locations of the structures and vaults.

2.2. Underground Transmission Line Description

Option A: The proposed transition yard and underground line routing is shown as a red line in Figure 1. This plan proposes routing the overhead lines along the Northwoods properties to reduce the visual impact to Rock Ridge High School. The overhead line will terminate at this proposed transition yard and convert to underground construction. This will impact the planned Amazon data centers on that property, most notably the southeasternmost building. The line will then run underground south until it reaches the Loudoun Valley Estates boundary; it will then wrap around the Estates and head south again until it reaches Route 606 (Old Ox Road), which it will cross underneath. It will follow Route 606 and then Carters School Road until it terminates at the second proposed transition yard, outside Mars Substation.

Overview:

- Length: 14,500'
- Number of splice locations:
 - 4x 500 kV splice locations
 - 4x 230 kV splice locations

Benefits

- Reduced visual impact on Rock Ridge High School and Loudoun Valley Estates
- Increased reliability from weather related phenomena such as high winds and
- Decreased interruption durations: Researchers at Stanford found that a 10% increase in a system's underground line miles was correlated with a 14% reduction in annual interruption durations across the U.S. [1].

Impacts:

- Underground construction is more expensive than overhead construction
- A portion of the route has diabase rock below grade that will require excavation. Based on available geotechnical explorations, the depth of rock will only impact the installation of the duct bank for limited areas. See Appendix A; Geotech Boring Exhibit.
- Open trenching of roadway will be required to cross under Route 606.
- Mars Substation will need to be expanded to transition the underground cable. A transition yard will need to be installed on the Northwoods Property.
- There will be impact to the data centers at Northwood Property.

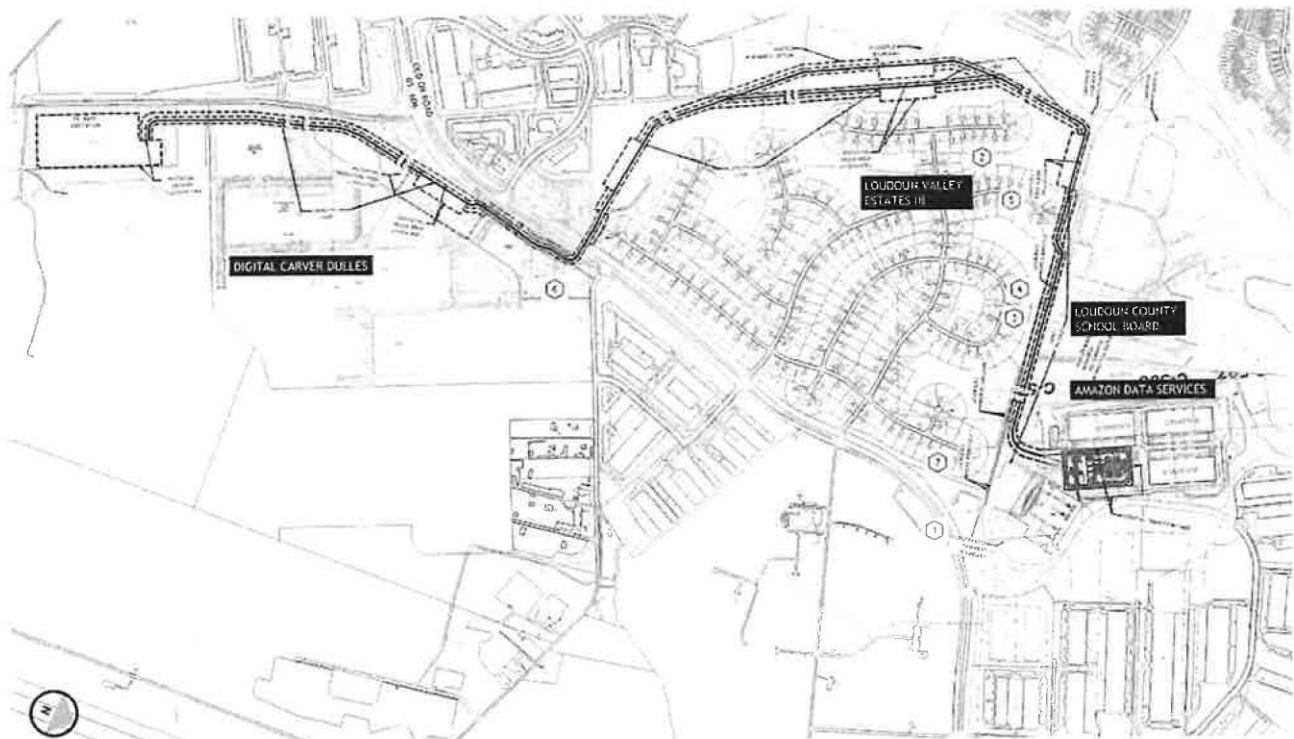


Figure 1 – Proposed Transmission Line Routing Option "A"

Option B: The proposed transition yards and underground line routing are shown in red in Figure 2 below. This plan again proposes routing the overhead lines along the Northwoods properties to reduce the visual impact to Rock Ridge High School. The overhead line will terminate at this proposed transition yard and convert to underground construction. As in Option A, this will impact the planned data centers on that property, most notably the southeasternmost building. The line will then run as underground south until it reaches the Loudoun Valley Estates boundary; it will then wrap around the Estates and head south until it reaches the triangular parcel of land between Route 606 (Old Ox Road), Overland Drive, and the Loudoun Valley Estates. This will be the location of the second transition yard. From here, the lines will transition back to overhead construction, continue south along Route 606, and follow Carters School Road into Mars Substation.

Overview:

- Length: 6,970'
- Number of splice locations:
 - 2x 500 kV splice locations
 - 2x 230 kV splice locations

Benefits

- Reduces visual impact on Rock Ridge High School and Loudoun Valley Estates
- Simplifies crossing existing transmission line along Route 606 by using overhead transmission instead of underground
- Increased reliability from weather-related phenomena, such as high winds and lightning
- Decreased interruption durations: Researchers at Stanford found that a 10% increase in a system's underground line miles was correlated with a 14% reduction in annual interruption durations across the U.S. [1].

Impacts:

- Underground construction is more expensive than overhead construction
- A portion of the route has diabase rock below grade that will require excavation. Based on available geotechnical explorations, the depth of rock will only impact the installation of the duct bank for limited areas. See Appendix A; Geotech Boring Exhibit.
- Two transition yards will need to be installed, one on the Northwoods Property and one in the triangle-shaped wooded parcel of land between Loudoun Valley Estates and Overland Drive.
- There will be impact to the data centers at Northwood Property.

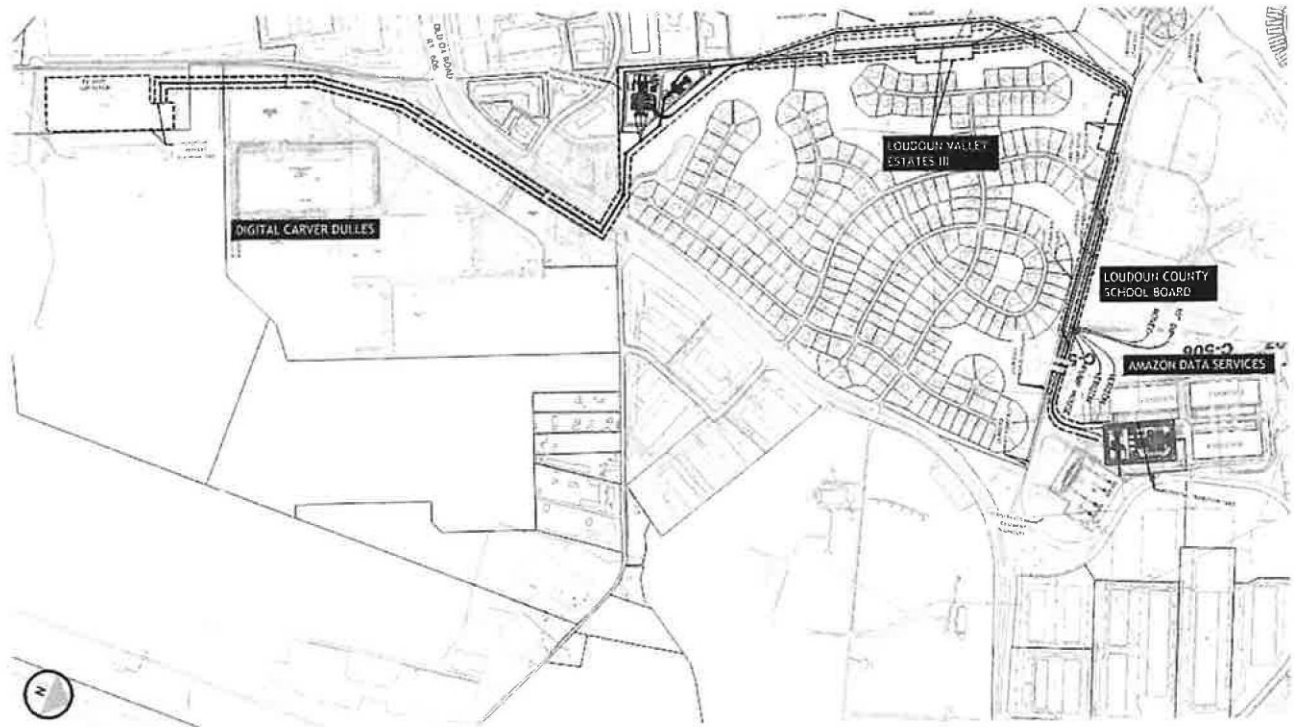


Figure 2 – Proposed Transmission Line Routing Option "B"

Option C: The proposed transition yard and underground line routing is shown in red and orange in Figure 3. This plan proposes routing the overhead lines along the Northwoods properties to reduce the visual impact to Rock Ridge High School. The overhead line will terminate at this proposed transition yard and convert to underground construction. As in Options A and B, this will impact the planned Amazon data centers on that property, most notably the southeasternmost building. The underground line will then run underground to Route 606 (Old Ox Road) and will follow it to Carters School Road, and then along Carters School Road to connect with the transition yard at Mars Substation. At some point along the route, the line will need to cross under Route 606. The best opportunity for this would be at the retention pond access road across from Beaver Meadow. This is the place on the north side of Route 606 with the most room to set up a drilling rig. The locations of the splice vaults along Route 606 will need to be determined during detailed design.

Overview:

- Length: 10,017'
- Number of splice locations:
 - 3x 500 kV splice locations
 - 3x 230 kV splice locations

Benefits:

- Reduced visual impact on Rock Ridge High School and Loudoun Valley Estates
- Increased reliability from weather-related phenomena, such as high winds and lightning
- Decreased interruption durations: Researchers at Stanford found that a 10% increase in a system's underground line miles was correlated with a 14% reduction in annual interruption durations across the U.S. [1].

Impacts:

- Underground construction is more expensive than overhead construction
- A portion of the route has diabase rock below grade that will require excavation. Based on available geotechnical explorations, the depth of rock will only impact the installation of the duct bank for limited areas. See Appendix A; Geotech Boring Exhibit.
- Open trenching of roadway will be required to cross under Route 606.
- Mars Substation will need to be expanded to transition the underground cables. Another transition yard will need to be installed on the Northwoods Property.
- There will be impact to the data centers at Northwood Property.
- Multiple driveways along Route 606 will need to be trenching to set the duct bank.

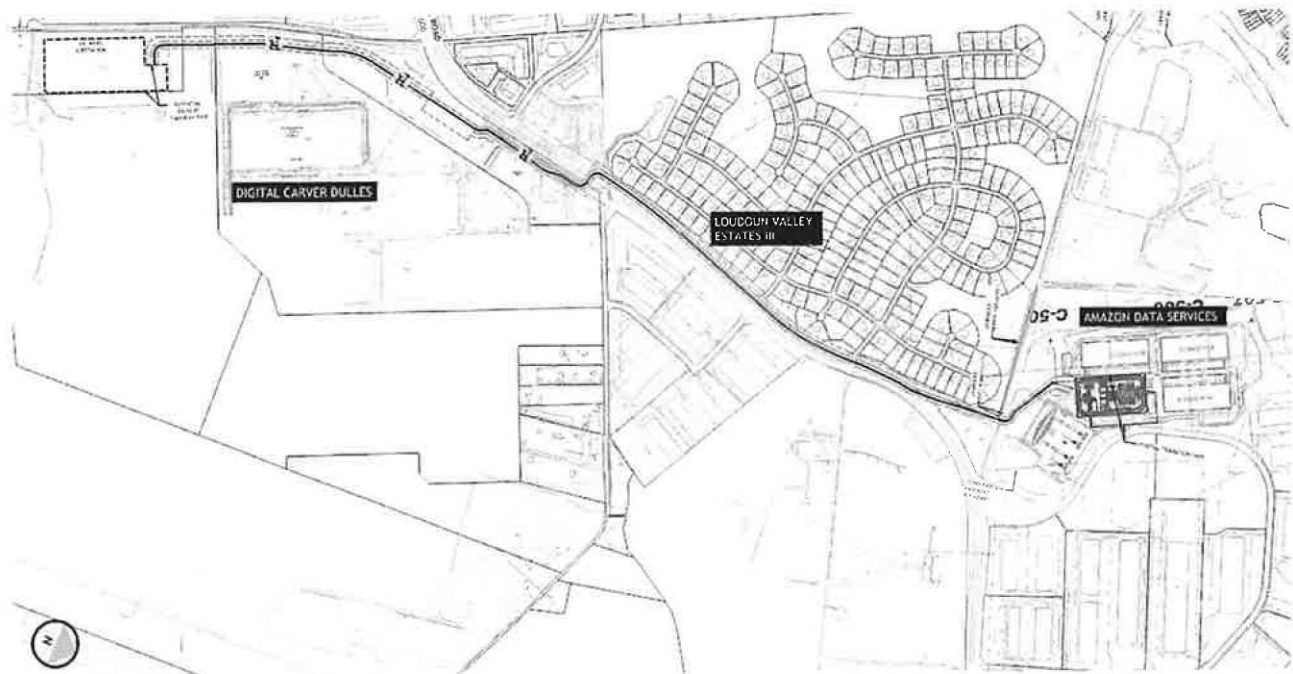


Figure 3 – Proposed Transmission Line Routing Option "C"

2.3. Underground Transmission Line Scope of Work

The following is an estimated list of major equipment that will be included in the construction of the proposed underground portion of project: (see Figure 4 for a typical duct bank configuration, see Figure 5 and 6 for example sketches of the transition yards and transmission duct bank routing) Each underground section will require two transition yards with the major equipment being the same for all options.

Option A:

- **Two (2) - Seven-acre transition yards (one at either end of the underground transmission lines routing)**
 - o Two (2) 500 kV take-off structures
 - (19) Concrete Foundations
 - Structure Steel and associated bus work

- (75) Insulators
 - (15) 500 kV Underground Cable Terminations (5 per phase)
- Two (2) 230 kV take-off structures (H-Frame)
 - (20) Concrete Foundations
 - Structural steel and associated bus work
 - (36) Insulators
 - (12) 230 kV Underground Cable Terminations (4 per phase)
- 2,200' perimeter, 8' high chain-link security fencing, with access gates
- Allowance for additional transition yard equipment
- 500,000 sq/ft transition yard site work and finish materials
- 400' of access road
- Site Lighting
- Ground Grid
- Storm Water Drainage
- **500 kV Underground Transmission Line**
 - 229,000' of 5000 kcmil XLPE conductors (5 per phase - 15 total)
 - 15,250' of 500 kcmil grounding conductor
 - (12) - 8'x15'x40' splice vaults located along proposed routing
 - 8'x15'x40' concrete vaults
 - Cable supports, splicing, grounding
 - Excavation and grading work
- **230 kV Underground Transmission Line**
 - 183,000' of 5000 kcmil XLPE conductors (4 per phase - 12 total)
 - 15,250' of #5000 kcmil grounding conductor
 - (12) - 8'x10'x26' splice vaults located along proposed routing
 - 8'x10'x26' concrete vaults
 - Cable supports, splicing, grounding
 - Excavation and grading work
- **Dual Duct Banks (4x4 concrete encased duct bank, 8'W x8' deep for 230 kV, 4x5 concrete encased duct bank 18'W x 8' deep for 500 kV)**
 - 305,000' of 8" PVC conduit (for 500 kV line: 14,523' + 5% x 20)
 - 244,000' of 8" PVC conduit (for 230 kV line: 14,523' + 5% x 16)
 - 137,242' of 3" PVC conduit (for grounding: 14,523' + 5% x 9)
 - 30500' of 3" PVC conduit (for communications: 14,523' + 5% x 2)

Option B:

- **Two (2) - Seven-acre transition yards (one at either end of the underground transmission lines routing)**
 - Two (2) 500 kV take-off structures
 - (19) Concrete Foundations
 - Structure Steel and associated bus work
 - (75) Insulators
 - (15) 500 kV Underground Cable Terminations (5 per phase)
 - Two (2) 230 kV take-off structures (H-Frame)

- (20) Concrete Foundations
 - Structural steel and associated bus work
 - (36) Insulators
 - (12) 230 kV Underground Cable Terminations (4 per phase)
- 2,200' perimeter, 8' high chain-link security fencing, with access gates
- Allowance for additional transition yard equipment
- 500,000 sq/ft transition yard site work and finish materials
- 400' of access road
- Site Lighting
- Ground Grid
- Storm Water Drainage
- **500 kV Underground Transmission Line**
 - 110,000' of 5000kcmil XLPE conductors (5 per phase - 15 total)
 - 7300' #500kcmil grounding conductor
 - (6) - 8'x15'x40' splice vaults located along proposed routing
 - 8'x15'x40' concrete vaults
 - Cable supports, splicing, grounding
 - Excavation and grading work
- **230 kV Underground Transmission Line**
 - 87,800' of 5000kcmil XLPE conductors (4 per phase - 12 total)
 - 7300' of #500kcmil grounding conductor
 - (6) - 8'x10'x26' splice vaults located along proposed routing
 - 8'x10'x26' concrete vaults
 - Cable supports, splicing, grounding
 - Excavation and grading work
- **Dual Duct Banks (4x4 concrete encased duct bank, 8'W x8' deep for 230 kV, 4x5 concrete encased duct bank 18'W x 8' deep for 500 kV)**
 - 146,400' of 8" PVC conduit (for 500 kV line: 6,970' + 5% x 20)
 - 117,000' of 8" PVC conduit (for 230 kV line: 6,970' + 5% x 16)
 - 65,900' of 3" PVC conduit (for grounding: 6,970' + 5% x 9)
 - 14,600' of 3" PVC conduit (for communications: 6,970' + 5% x 2)

Option C:

- **Two (2) - Seven-acre transition yards (one at either end of the underground transmission lines routing)**
 - Two (2) 500 kV take-off structures
 - (19) Concrete Foundations
 - Structure Steel and associated bus work
 - (75) Insulators
 - (15) 500 kV Underground Cable Terminations (5 per phase)
 - Two (2) 230 kV take-off structures (H-Frame)
 - (20) Concrete Foundations
 - Structural steel and associated bus work

- (36) Insulators
 - (12) 230 kV Underground Cable Terminations (4 per phase)
- 2,200' perimeter, 8' high chain-link security fencing, with access gates
- Allowance for additional transition yard equipment
- 500,000 sq/ft transition yard site work and finish materials
- 400' of access road
- Site Lighting
- Ground Grid
- Storm Water Drainage
- **500 kV Underground Transmission Line**
 - 157,500' of 5000kcmil XLPE conductors (5 per phase - 15 total)
 - 10,500' #500kcmil grounding conductor
 - (9) - 8'x15'x40' splice vaults located along proposed routing
 - 8'x15'x40' concrete vaults
 - Cable supports, splicing, grounding
 - Excavation and grading work
- **230 kV Underground Transmission Line**
 - 126,000' of 5000kcmil XLPE conductors (4 per phase - 12 total)
 - 10,500' of #500kcmil grounding conductor
 - (9) - 8'x10'x26' splice vaults located along proposed routing
 - 8'x10'x26' concrete vaults
 - Cable supports, splicing, grounding
 - Excavation and grading work
- **Dual Duct Banks (4x4 concrete encased duct bank, 8'W x8' deep for 230 kV, 4x5 concrete encased duct bank 18'W x 8' deep for 500 kV)**
 - 210,000' of 8" PVC conduit (for 500 kV line: 10,000' + 5% x 20)
 - 168,000' of 8" PVC conduit (for 230 kV line: 10,000' + 5% x 16)
 - 94,500' of 3" PVC conduit (for grounding: 10,000' + 5% x9)
 - 21,000' of 3" PVC conduit (for communications: 10,000' + 5% x2)

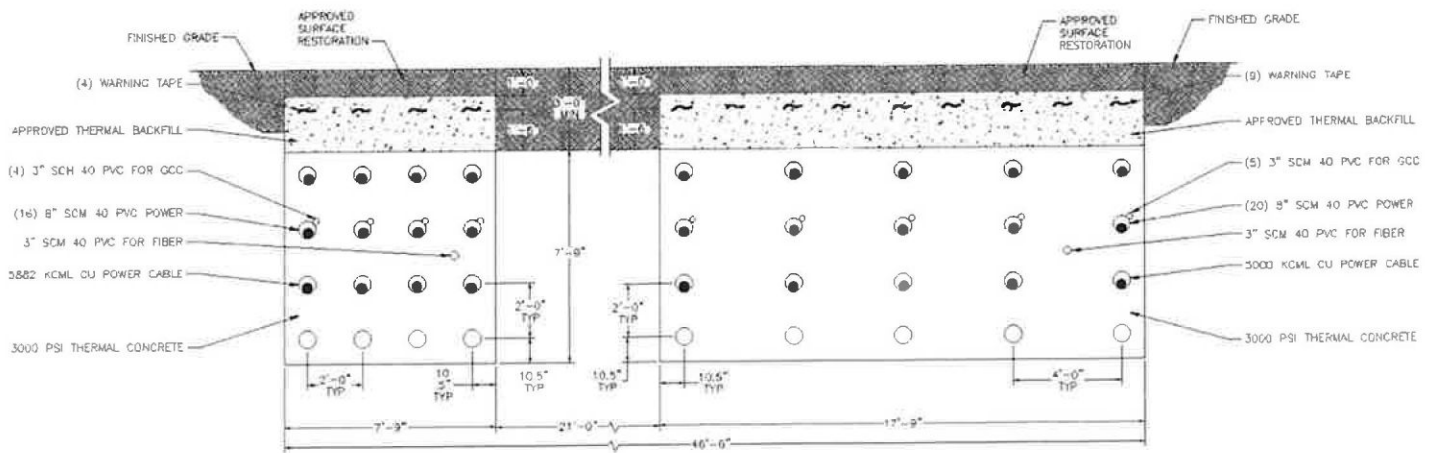


Figure 4 - Example Concrete Duct Bank Arrangement

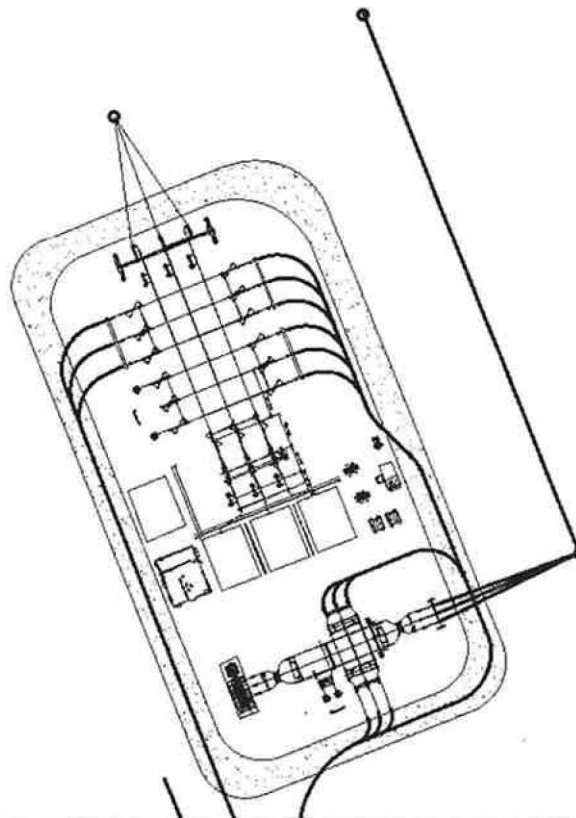


Figure 5 - Example Transition Yard Options A, B, and C

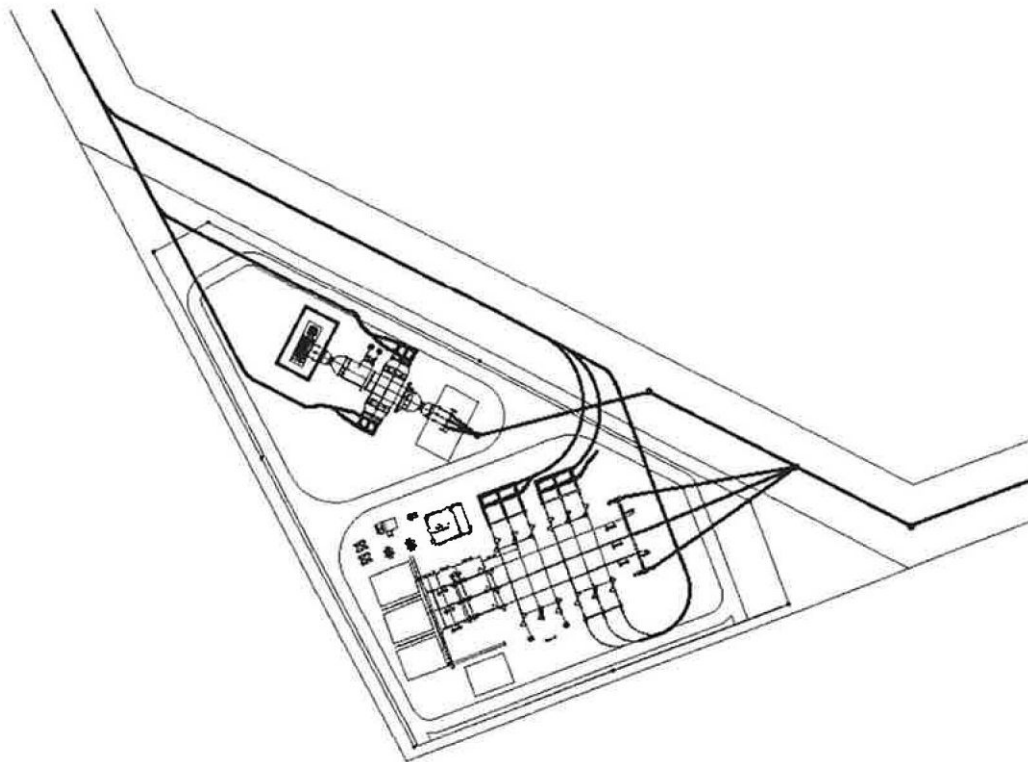


Figure 6 – Example Transition Yard Option B

2.4. Assumptions and Clarifications

RLC made the following assumptions and clarifications while developing this analysis and cost estimate:

- Conductor sizing/quantity are based on Dominion's preliminary analysis [2], the exact quantities will need to be established during the conductor design.
- Assumed all ROW and real estate rights can be obtained and allow for transmission lines installation.
- Assumed all Regulatory approvals can be obtained.
- Proposing 60' ROW for 500 kV & 230 kV UG duct banks with 115' ROW at splice vault locations.
- Cable manufacturer can produce a 500 kV XLPE cable to meet specifications.
- Concrete vaults for conductor splicing will be installed in a staggered manor to reduce overall width of ROW required for the transmission line routing .
- Disposal of contaminate soils not included for any excavations
- Limited environmental permitting is included in the estimate
- Locations for splice vaults based on review of google earth; final locations will need to be coordinated with cable manufactures and existing site conditions.
- A high-level investigation reveals some existing utilities. Subsequent inspection will be required. Relocation of existing utilities has not been included in this estimate.

2.5. Underground Transmission Line Cost Estimating

The costs identified in this study, for the underground portion of the hybrid routing, are estimated costs for

the design, procurement, construction, and commissioning of a 500 kV and 230 kV dual circuit underground transmission line. This is a conceptual grade estimate that will be refined as the project progresses through the design process. The estimates have a built in margin of +200%, -50%. This margin is based on the limited design information currently available for the project. The quantities and costs included in the estimate were established based on standard electric underground transmission design criteria and installation practices for XLPE conductors. This estimate includes risks and escalation associated with the procurement of a custom 500 kV XLPE cable as well as the required splicing vaults and termination structures. The final conductor design could have major impacts to the project design and the routing of the underground transmission line. The cost for the 500 kV and 230 kV cables in this estimate were obtained from a distributor and cable manufacturer based on basic design information.

RLC Engineering has provided a high-level cost estimate for the underground transmission line portion of each of the three route options, as well as the cost to build two transition yards. The cost estimate summary in Table 1 below gives a project cost for the underground dual circuit transmission line portion of the Golden to Mars line. It does not include any overhead transmission costs. Table 2 gives the cost savings of the displaced sections of overhead line. These estimates were generated off a flat \$18.2 million/mile cost, this is based off the past Aspen to Golden cost estimates for overhead DCT.

Table 1: Underground Cost Estimate Summary

Option	Cost (million)	Description
A	\$471	Cost for 2.75 miles of UG construction and 2X transition yards
B	\$354	Cost for 1.32 miles of UG construction and 2X transition yards
C	\$418	Cost of 1.9 miles of UG construction and 2X transition yards

Table 2: Reduction in Overhead Line Cost

Option	Savings (million)	Description
A	\$50	Savings from displacing 2.75 miles of overhead
B	\$24	Savings from displacing 1.32 miles of overhead
C	\$35	Savings from displacing 1.9 miles of overhead

3. REFERENCES

- [1] Lawrence Berkeley National Laboratory. 2024. "Undergrounding Transmission and Distribution Lines." Report. *Resilience Investment Guide*. https://www.energy.gov/sites/default/files/2024-11/111524_Undergrounding_Transmission_and_Distribution_Lines.pdf.
- [2] Burns & McDonnell Engineering Company, 2025, Dominion Golden to Mars - 230-kV and 500-kV Underground Feasibility Study.

Appendix A - Geotech Boring Exhibit

Virginia Electric and Power Company
Case No. PUR-2025-00056
Loudoun County
First Set

The following response to Question No. 1 of the First Set of Interrogatories and Requests for Production of Documents propounded by Loudoun County received on July 22, 2025, was prepared by or under the supervision of:

David J. DePippo
Managing Counsel
Dominion Energy Services, Inc.

Question No. 1

The County adopts as its own all the interrogatories, requests for production of documents, and other requests for data or information of all other parties, and of Commission Staff, whether written or oral, formal or informal, in these matters. Therefore, please provide the initial and revised Company responses to all formal or informal interrogatories, requests for production of documents, and requests for information and/or data propounded by any party to this proceeding, including the Commission Staff, when that response is provided to the requesting party or Commission Staff.

Response:

Copies of responses to all formal and informal interrogatories, requests for production of documents, and other requests for data made by a party to Virginia Electric and Power Company (the "Company") pursuant to 5 VAC 5-20-260 in this proceeding will be provided or otherwise made available to Loudoun County, Virginia ("Loudoun County"), except where the Company withholds such responses on the basis of privilege or other reasonable objections. Where the Company considers information contained in such responses to be confidential or extraordinarily sensitive, such responses may be provided to Loudoun County pursuant to the protections set forth in 5 VAC 5-20-170, and subject to the June 4, 2025 Protective Ruling, any subsequent protective order or ruling that may be issued for confidential information in this proceeding, and the Agreements to Adhere executed pursuant to such orders or rulings. Third-party proprietary information will be provided subject to any restrictions on use and/or disclosure imposed by the owner of the proprietary information.

On a continuing basis, for the period of this proceeding, the Company will provide copies of all responses provided to any party intervening in this docket by posting copies to an electronic discovery site ("eRoom") established in this case, Case No. PUR-2025-00056.

Virginia Electric and Power Company
Case No. PUR-2025-00056
Loudoun County
First Set

As it pertains to underground engineering, the following response to Question No. 2 of the First Set of Interrogatories and Requests for Production of Documents propounded by Loudoun County received on July 22, 2025, was prepared by or under the supervision of:

Corey D. Anderson
Underground Transmission Engineer
Dominion Energy Technical Solutions, Inc.

As it pertains to legal matters, the following response to Question No. 2 of the First Set of Interrogatories and Requests for Production of Documents propounded by Loudoun County received on July 22, 2025, was prepared by or under the supervision of:

David J. DePippo
Managing Counsel
Dominion Energy Services, Inc.

Question No. 2

Please see Section 5.3.1. Land Acquisition of the Burns and McDonnell Underground Feasibility Study, included in the Application as Appendix C of the Environmental Routing Study, which states that the possibility of expanding Mars Substation as part of any underground route is “constrained by planned transmission lines, existing ponds, and MWAA property.”

Identify and describe in detail the location of the “planned transmission lines” which, in the Company’s opinion, so constrain the expansion of Mars Substation. Please provide all documents relied upon in forming your answer or supporting your answer.

Response:

The Company objects to this request as overly broad, unduly burdensome, and potentially voluminous to the extent it seeks “all documents” forming or supporting the Company’s response. Notwithstanding and subject to this objection, the Company provides the following response.

In preparing this response and upon further review, the Company determined there is sufficient land area to expand the Mars Substation to the south, and therefore, the “planned transmission lines” referenced in Section 5.3.1. Land Acquisition, which included the Golden-Mars Lines, the Mars-Wishing Star Lines, and the Sojourner Loop, are not constraints to expansion of the Mars Substation. See the Company’s response to Loudoun County Set 01-03. That said, as noted in Section 8.1. Feasibility Summary, based on the number and complexity of the identified

constructability constraints, which are enumerated and described in the Underground Feasibility Study, none of the studied underground routes are considered constructable options for the Project.

The Company will file a correction to Section 5.3.1. Land Acquisition of the Underground Feasibility Study, which will reflect the following:

ERM's review found that while Dominion has obtained the Mars Substation land, additional space would be needed to accommodate transition station equipment beyond the existing footprint. ~~This expansion is constrained by planned transmission lines, existing ponds, and MWAA property to the south. Consequently, sufficient space for transition station equipment may not be available or obtainable.~~

The Company relied upon Attachment Loudoun County Set 01-03 (KJ) in preparing this response.

Virginia Electric and Power Company
Case No. PUR-2025-00056
Loudoun County
First Set

As it pertains to substation engineering, the following response to Question No. 3 of the First Set of Interrogatories and Requests for Production of Documents propounded by Loudoun County received on July 22, 2025, was prepared by or under the supervision of:

Kamlesh A. Joshi
Senior Electrical Engineer – Transmission and Distribution Services Department
Burns & McDonnell

As it pertains to underground engineering, the following response to Question No. 3 of the First Set of Interrogatories and Requests for Production of Documents propounded by Loudoun County received on July 22, 2025, was prepared by or under the supervision of:

Corey D. Anderson
Underground Transmission Engineer
Dominion Energy Technical Solutions, Inc.

As it pertains to legal matters, the following response to Question No. 3 of the First Set of Interrogatories and Requests for Production of Documents propounded by Loudoun County received on July 22, 2025, was prepared by or under the supervision of:

David J. DePippo
Managing Counsel
Dominion Energy Services, Inc.

Question No. 3

What are the size and dimensions—i.e., height, depth, land area—of the expansion needed at Mars Substation to terminate the 500 kV and 230 kV circuits with underground cables rather than overhead conductor? Please provide all documents relied upon in forming your answer or supporting your answer.

Response:

The Company objects to this request as overly broad, unduly burdensome, and potentially voluminous to the extent it seeks “all documents” forming or supporting the Company’s response. The Company further objects to this request as requiring original work. Notwithstanding and subject to these objections, the Company provides the following response.

The additional land area required to terminate a 500 kV and 230 kV underground route at the Mars Substation is approximately 200 feet by 230 feet, the maximum height would be approximately 50 feet, and the depth would be approximately 8 feet to the top of the duct bank.

The Company relied upon Attachment Loudoun County Set 01-03 (KJ) in preparing this response.

Virginia Electric and Power Company
Case No. PUR-2025-00056
Loudoun County
First Set

As it pertains to real estate, the following response to Question No. 4 of the First Set of Interrogatories and Requests for Production of Documents propounded by Loudoun County received on July 22, 2025, was prepared by or under the supervision of:

Cheryl L. Taylor
Real Estate Specialist
Dominion Energy Virginia

As it pertains to underground engineering, the following response to Question No. 4 of the First Set of Interrogatories and Requests for Production of Documents propounded by Loudoun County received on July 22, 2025, was prepared by or under the supervision of:

Corey D. Anderson
Underground Transmission Engineer
Dominion Energy Technical Solutions, Inc.

Question No. 4

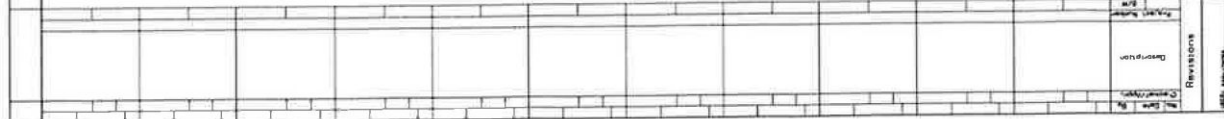
Describe in detail and produce all communications between the Company or a representative of the Company and the owners (the "Owners") of the following parcels (the "Parcels") in the County—or between the Company and the agents/representatives of the Owners—regarding underground placement of all or part of the Golden-Mars line or the potential placement of a transition station on one or more of the Parcels:

- a. Parcel Identification Number (PIN) 093365404001, located at 43695 Efficiency Drive, Sterling, Virginia 20166, owned by Digital Carver Dulles 5 LLC.
- b. PIN 123287817000, located at 23540 Pebble Run Place, Sterling, Virginia 20166, owned by Microsoft Corporation.
- c. PIN 122207249000, located at 43750 Light Speed Plaza, Dulles, Virginia 20166, owned by Amazon Data Services Inc.

Response:

(a)-(c) With regard to the potential placement of a transition station, on December 3, 2024, the Company contacted Microsoft Corporation via email to inquire whether it would entertain a sale of the parcel identified as PIN 123287817000. The Company did not have any further communications with Microsoft regarding the sale of that parcel after receipt of the December 4,

2024, response. See Attachment Loudoun County Set 01-04 (CT). Note that personal identifying contact information has been redacted.



230KV LINE NO. 2291
TO WISHING STAR

PRELIMINARY
PLAN FOR CONSTRUCTION

 Dominion Energy		GENERAL ARRANGEMENT MARS SUBSTATION LOUDOUN COUNTY, VIRGINIA		SHEET NO. OF 1
PROJECT NO. 10-10-12	DATE 10-10-12	REVISION NO. 1	REVISION 1	PROJECT NO. 10-10-12
DRAWING NO. 10-10-12	DATE 10-10-12	REVISION NO. 1	REVISION 1	PROJECT NO. 10-10-12
DRAWING NO. 10-10-12	DATE 10-10-12	REVISION NO. 1	REVISION 1	PROJECT NO. 10-10-12

Respectfully submitted,

LOUDOUN COUNTY, VIRGINIA

By Counsel

/s/ Adam B. Winston

Andrew R. McRoberts, Esquire (VSB No. 31882)

Adam B. Winston, Esquire (VSB No. 97293)

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