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November 21, 2022

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: Cirrus-Keyser 230 kV Loop and Related Projects
Case No. PUR-2022-00198

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, an electronic copy of the map of the Virginia Department of Transportation "General Highway Map" for Culpeper County, as well as the digital geographic information system ("GIS") map required by § 56-46.1 of the Code of Virginia, which is Attachment II.A.2 to the Appendix, were provided via an e-room to the Commission's Division of Public Utility Regulation on November 18, 2022.

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

Very truly yours,

Vishwa B. Link

Enclosures

cc: William H. Chambliss, Esq.
Mr. David Essah (without enclosures)

Mr. Neil Joshipura (without enclosures)
Mr. Michael A. Cizenski (without enclosures)
David J. DePippo, Esq.
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Briana M. Jackson, Esq.

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

Before the State Corporation Commission of Virginia

Cirrus-Keyser 230 kV Loop and Related Projects

Application No. 320

Case No. PUR-2022-00198

Filed: November 21, 2022

Volume 1 of 2

COMMONWEALTH OF VIRGINIA
BEFORE THE
STATE CORPORATION COMMISSION

APPLICATION OF

VIRGINIA ELECTRIC AND POIWER COMPANY

FOR APPROVAL AND CERTIFICATION
OF ELECTRIC TRANSMISSION FACILITIES

Cirrus – Keyser 230 kV Loop and Related Projects

Application No. 320

Case No. PUR-2022-00198

Filed: November 21, 2022

COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

APPLICATION OF VIRGINIA ELECTRIC AND POWER COMPANY For approval and certification of electric transmission facilities: Cirrus – Keyser 230 kV Loop and Related Projects	)))))))	Case No.: PUR-2022-00198

APPLICATION OF VIRGINIA ELECTRIC AND POWER COMPANY FOR APPROVAL AND CERTIFICATION OF ELECTRIC TRANSMISSION FACILITIES:
<u>CIRRUS – KEYSER 230 kV LOOP AND RELATED PROJECTS</u>

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 ("Commission") this application for approval and certification of electric transmission facilities ("Application"). In support, Dominion Energy Virginia respectfully states:

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

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

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

3. In this Application, in order to provide service to a Rappahannock Electric Cooperative ("REC") data center customer ("REC Customer"), to maintain reliable service for the overall growth in the area, and to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia proposes in Culpepper, Virginia, to:

(i) Construct a new, approximately 5.2-mile overhead 230 kV double circuit transmission line-loop. This 5.2 mile line-loop will be built entirely on the existing 100-foot-wide right-of-way and will result in three separate lines: (i) 230 kV Gordonsville-Cirrus Line #2199, (ii) 230 kV Cirrus-Keyser Line #2278, and (iii) 230 kV Keyser-Germanna Line #2276 (collectively, the "Cirrus-Keyser 230 kV Loop").

(ii) Remove a portion of one existing 115 kV double circuit transmission line (Line #2 and Line #70) located entirely within the existing right-of-way between existing Structures #2/1201-1253 and Structures #70/53-1 and install a new, overhead single circuit 115 kV line which will require an additional 25 feet of permanent right-of-way from the edge of the existing 100 feet of right-of-way for approximately 0.02-miles from proposed Structure #2/486A to proposed Structure #2/486B to connect Lines #2 and #70 at the Mountain Run Junction.[1]

(iii) Construct two overhead 230 kV transmission Lines, Line #2283 and Line #2284. Line #2283 will be 0.15 miles in length, and Line #2284 will be 0.10 miles in length. Both will be built in new right-of-way provided by the REC Customer and will run from the proposed Keyser Switching Station ("Keyser Station") to the existing REC Mountain Run Substation ("Mountain Run Substation" or "Mountain Run 1 and 2").[2]

(iv) Construct two overhead 230 kV transmission lines, Line #2288 and Line #2289, approximately 0.01-miles in length. Lines #2288 and #2289 will run from the proposed Cirrus Switching Station ("Cirrus Station") to the proposed REC

[1] This portion of the Project would qualify as an "ordinary extension[] or improvement[] in the usual course of business" pursuant to § 56-265.2 A 1 of the Code of Virginia. However, for the sake of completeness and because it helps resolves the reliability concerns, it has been included in this Project.
[2] See *supra* n. 1.

Mountain Run 3 Substation ("Mountain Run 3 Substation") and will not require any new right-of-way.[3]

(v) Build a new section of overhead 115 kV single circuit transmission line (Line #70), approximately 0.07-miles in length in new right-of-way provided by the REC Customer. This new section of Line #70 will run from the proposed Cirrus Station to existing Structure #70/1255.[4]

(vi) Construct two new 230 kV switching stations located along Frank Turnage Drive, the Cirrus Station and the Keyser Station, on land purchased by the Company from the REC Customer.

(vii) Update line protection settings at the Company's existing Remington, Germanna, Gordonsville and Oak Green Substations.

The Cirrus-Keyser 230 kV Loop, construction of Lines #2283, #2284, #2288, and #2289, additional line work, construction of the Cirrus and Keyser Stations and related substation work are collectively referred to as the "Project."

4. The REC Customer has requested retail electric service from Dominion Energy Virginia to support a new data center campus. The load area where this data center is being developed is currently served by the Mountain Run Substation. This substation has distribution limitations preventing it from serving the data center development. If the unserved load (61 MW by 2024; 320 MW by 2034) were connected to the Mountain Run Substation, the existing distribution substation equipment would overload. Connecting the REC Customer's requested load to Mountain Run Substation alone would result in (i) substation transformer thermal overloads, and (ii) violation of the Company's transmission planning criteria set forth in the Facilities Interconnection Requirement ("FIR") document. The Project includes the wreck and rebuild of Lines #2 and #70 and the construction of approximately 5.2 miles of a new, overhead 230 kV double circuit transmission line loop. The Company has proposed to extend the existing

[3] See *supra* n. 1.
[4] See *supra* n. 1.

right-of-way by 25 feet at the Mountain Run Junction, Structure #2199/100. Another new right-of-way on the REC Customer's property is also needed to connect the proposed Cirrus Station to the existing Line #70. Temporary right-of-way along the 5.2-mile corridor will also be needed during construction. No other alternative routes are proposed because any alternatives to the Project would require extensive acquisitions of new, permanent rights-of-way.

6. The proposed Cirrus Station will be constructed with an ultimate design of nine 230 kV circuit breakers, four 230 kV line terminals, two 230-34.65 kV, 168 MVA transformers, two 115 kV circuit breakers, one 115 kV line terminal and other associated equipment. It will be designed to accommodate future growth in the area with a build-out of three additional 230 kV circuit breakers, two additional 230 kV line terminals, and a 230 kV capacitor bank. The total area required to build the substation is approximately five acres.

7. The Proposed Keyser Station will be constructed with an ultimate design of six 230 kV circuit breakers, four 230 kV line terminals, and other associated equipment. It will be designed to accommodate future growth in the area with a build-out of four additional 230 kV circuit breakers, two additional 230 kV line terminals and two 230 kV capacitor banks. The total area required to build the station is approximately four acres.

8. The desired in-service target date for the proposed Project is December 30, 2025. The Company estimates it will take approximately 26 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 October 31, 2023. Should the Commission issue a final order by October 31, 2023, the Company estimates that construction should begin by November 1, 2024 and be completed by December 30, 2025. This schedule is contingent upon obtaining the

necessary permits and scheduling outages. Dates may be adjusted based on permitting delays or design modifications to comply with additional agency requirements identified during the permitting application process, as well as ability to schedule outages, or unpredictable delays due to labor shortages or materials/supply issues.

9. The estimated conceptual cost of the Project utilizing the Proposed Route is approximately $63.1 million, which includes approximately $26.3 million for transmission-related work and approximately $36.8 million for substation related work (in 2022 dollars).

10. The proposed Project will afford the best means of meeting the continuing need for reliable service while reasonably minimizing adverse impacts on the scenic, environmental, and historic features of the area.

11. 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.

12. 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.

13. 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.

14. In addition to the information provided in the Appendix and the DEQ Supplement, this Application is supported by the pre-filed direct testimony of Company Witnesses Mark R. Gill, Sherrill A. Crenshaw, Santosh Bhattarai, and Nancy Reid filed with this Application.

WHEREFORE, Dominion Energy Virginia respectfully requests that the Commission:

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

(b) approve the construction of the Project pursuant to § 56-46.1 of the Code of Virginia; 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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November 21, 2022

COMMONWEALTH OF VIRGINIA
BEFORE THE
STATE CORPORATION COMMISSION

APPLICATION OF

VIRGINIA ELECTRIC AND POWER COMPANY

FOR APPROVAL AND CERTIFICATION
OF ELECTRIC FACILITIES

Cirrus – Keyser 230 kV Loop and Related Projects
Application No. 320

Appendix

Containing Information in Response to
"Guidelines of Minimum Requirements for Transmission Line Application"

Case No. PUR-2022-00198

Filed: November 21, 2022

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EXECUTIVE SUMMARY

In order to provide service to a Rappahannock Electric Cooperative ("REC") data center customer ("REC Customer") to serve a new data center campus (the "Campus"), to maintain reliable service for the overall growth in the Project area, and to comply with mandatory Northern American Electric Reliability Corporation ("NERC") Reliability Standards, Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company") proposes in Culpeper County, Virginia to:

- Construct a new, approximately 5.2-mile overhead 230 kV double circuit transmission line-loop. This 5.2 mile line-loop will be built entirely on the existing 100-foot-wide right-of-way and will result in three separate lines: (i) 230 kV Gordonsville-Cirrus Line #2199, (ii) 230 kV Cirrus-Keyser Line #2278, and (iii) 230 kV Keyser-Germanna Line #2276 (collectively, the "Cirrus-Keyser 230 kV Loop").

- Remove a portion of one existing 115 kV double circuit transmission line (Line #2 and Line #70) located entirely within the existing right-of-way between existing Structures #2/1201-1253 and Structures #70/53-1 and install a new, overhead single circuit 115 kV line which will require an additional 25 feet of permanent right-of-way from the edge of the existing 100 feet of right-of-way for approximately 0.02-miles from proposed Structure #2/486A to proposed Structure #2/486B to connect Lines #2 and #70 at the Mountain Run Junction.[1]

- Construct two overhead 230 kV transmission Lines, Line #2283 and Line #2284. Line #2283 will be 0.15 miles in length, and Line #2284 will be 0.10 miles in length. Both will be built in new right-of-way provided by the REC Customer and will run from the proposed Keyser Switching Station ("Keyser Station") to the existing REC Mountain Run Substation ("Mountain Run Substation" or "Mountain Run 1 and 2").[2]

- Construct two overhead 230 kV transmission lines, Line #2288 and Line #2289, approximately 0.01-miles in length. Lines #2288 and #2289 will run from the proposed Cirrus Switching Station ("Cirrus Station") to the proposed REC Mountain Run 3 Substation ("Mountain Run 3 Substation") and will not require any new right-of-way.[3]

- Build a new section of overhead 115 kV single circuit transmission line (Line #70), approximately 0.07-miles in length in new right-of-way provided by the REC Customer. This new section of Line #70 will run from the proposed Cirrus Station to existing Structure #70/1255.[4]

[1]This portion of the Project would qualify as an "ordinary extension[] or improvement[] in the usual course of business" pursuant to § 56-265.2 A 1 of the Code of Virginia. However, for the sake of completeness and because it helps resolves the reliability concerns, it has been included in this Project.
[2] *See supra* n.1.
[3] *See supra* n.1.
[4] *See supra* n.1.

- Construct two new 230 kV switching stations located along Frank Turnage Drive, the Cirrus Station and the Keyser Station, on land purchased by the Company from the REC Customer.

- Update line protection settings at the Company's existing Remington, Germanna, Gordonsville, Oak Green, and Culpeper Substations.

The Cirrus-Keyser 230 kV Loop, construction of Lines #2283, #2284, #2288, and #2289, additional line work, construction of the Cirrus and Keyser Stations and related substation work are collectively referred to as the "Project."

Culpeper County has seen significant development over the last decade. Much of this development is caused in large part by the increase in data center development in the Northern Virginia region. A new data center is the main load driver for this Project. Within this area, the Company projects load growth of approximately 61 MW initially by 2024, and expects that load to grow to 320 MW by 2034. This load growth is a combination of data center growth (20 MW by 2024; 220 MW by 2034) and other load growth on the REC system. The additional REC load on the Mountain Run Substation is approximately 100 MW by 2034, creating a total of 320 MW load. According to Dominion Energy Virginia transmission planning criteria, each substation cannot supply more than 300 MW of load. Additionally, any substation that serves more than 100 MW of load should be networked to the system and may not be served radially.

Approximately 78 MW of load by 2034 from Culpeper Substation and Culpeper Delivery Point ("DP") is also expected in the area. The existing transmission system in the Culpeper area is a 115 kV system which supplies the loads by Lines #2 and #70. Attempting to serve 398 MW of load from this system would overload these lines, create voltage problems, and violate the NERC TPL standard and Dominion Energy Virginia's transmission planning criteria. Constructing both the Cirrus and Keyser Stations will meet the aforementioned criteria. These proposed switching stations will be connected to each other, where one would provide two feeds to the existing Mountain Run Substation[5] and the other one will provide two feeds to the new Mountain Run 3 Substation.

As part of this Project, the Company proposes to construct a new, approximately 5.2-mile overhead 230 kV double circuit transmission line-loop. This 5.2 mile line-loop will be built entirely on the existing 100-foot-wide right-of-way. To do this, the Company proposes cutting the existing 230 kV overhead Line #2199 (from Gordonsville-Remington) at Structure #2199/100 (the "Mountain Run Junction"). This will result in three separate lines, specifically: (i) 230 kV Gordonsville-Cirrus Line #2199, (ii) 230 kV Cirrus-Keyser Line #2278, and (iii) 230 kV Keyser-Germanna Line #2276 (collectively, the "Cirrus-Keyser 230 kV Loop").

The Company further proposes to construct two overhead 230 kV transmission Lines, Line #2283 and Line #2284. Line #2283 will be 0.15 miles in length, and Line #2284 will be .10

[5] The existing Mountain Run Substation will contain two delivery points, referred to herein as "Mountain Run 1 and 2."

miles in length. Both will be built in a new right-of-way provided by the REC Customer. Lines #2283 and #2284 will run from the proposed Keyser Station to the existing Mountain Run 1 and 2. Next, the Company proposes to construct two overhead 230 kV transmission lines, Line #2288 and Line #2289, approximately 0.10-mile in length. Lines #2288 and Line #2289 will run from the proposed Cirrus Station to the proposed Mountain Run 3 Substation and will not require any new right-of-way. Third, the Company proposes to build a new section of overhead 115 kV single circuit transmission line (Line #70), approximately 0.07-mile in length, in new right-of-way provided by the REC Customer. This new section of Line #70 will run from the proposed Cirrus Station to existing Structure #70/1255.

The majority of the proposed structures are 230 kV double circuit weathering steel monopoles with davit arms. There are several single circuit weathering steel structures required at the Mountain Run Junction to allow Line #2 to cross underneath Lines #2199 and #2276, including monopoles with no arms and 3-pole structures. Additionally, there are several single circuit weathering steel monopoles required near Keyser and Cirrus Stations to facilitate entry into the substations, including monopoles with static davit arms and monopoles with staggered davit arms.

To ensure that the Company can still meet the area demands and to prevent additional outages during construction, the Company will need to build an approximately 5.4 mile temporary 115 kV single circuit energized line from Mountain Run Junction to existing structure #70/1257. This temporary line will require a 15-foot temporary construction right-of-way for approximately 5.0 miles, with the exception of a 0.01-mile segment near the Mountain Run Junction where the additional temporary right-of-way requirement varies from 15 feet to 45 feet. The remaining 0.4 miles from existing structure 2/1251 (70/3) to existing Structure 70/1257 will require a 40 feet temporary right-of-way. These temporary facilities will be in service for approximately twelve months during construction and will be removed upon energization of the Cirrus-Keyser 230 kV Loop. See Sections I.A, I.F, II.A.6, and II.A.10.

The Company also proposes to construct two new 230 kV switching stations located along Frank Turnage Drive, the Cirrus Station and the Keyser Station, on land purchased by the Company from the REC Customer. The line protection settings will also be updated at the Company's existing Remington, Germanna, Gordonsville, Oak Green, and Culpeper Substations.

The proposed Cirrus Station will be constructed with an ultimate design of nine 230 kV circuit breakers, four 230 kV line terminals, two 230-34.5 kV, 168 MVA transformers, two 115 kV circuit breakers, one 115 kV line terminal and other associated equipment. It will be designed to accommodate future growth in the area with a build-out of three additional 230 kV circuit breakers, two additional 230 kV line terminals, and a 230 kV capacitor bank. A new control enclosure will also be installed to accommodate the protective relay and communications cabinets. The total area required to build the station is approximately five acres.

The proposed Keyser Station will be constructed with an ultimate design of six 230 kV circuit breakers, four 230 kV line terminals, and other associated equipment. It will be designed to accommodate future growth in the area with a build-out of four additional 230 kV circuit breakers, two additional 230 kV line terminals and two 230 kV capacitor banks. A new control enclosure will also be installed to accommodate the protective relay and communications cabinets. The total area required to build the station is approximately four acres.

The estimated conceptual cost for the project is $63.1 million, which includes $26.3 million for transmission-related work and $36.8 million for substation related work (in 2022 dollars).

The desired in-service target date for the proposed Project is December 30, 2025. The Company estimates it will take approximately 26 months for detailed engineering, materials, procurement, permitting, real estate, and construction after a final order from the Commission. To support this estimated construction timeline and construction plan, the Company respectfully requests a final order by October 31, 2023. The Company estimates that construction should begin around November 1, 2024, and will be completed by December 30, 2025. This schedule is contingent upon obtaining the necessary permits and scheduling outages. Dates may need to be adjusted based on permitting delays or design modifications in order to comply with additional agency requirements identified during the permitting application process, as well as ability to schedule outages, or unpredictable delays due to labor shortages or materials/supply issues.

I. NECESSITY FOR THE PROPOSED PROJECT

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

Response: The Project is necessary to provide service to a Rappahannock Electric Cooperative ("REC") data center customer ("REC Customer") to serve a new data center campus (the "Campus") in Culpeper County, Virginia, to maintain reliable service for the overall growth in the Project area, and to comply with mandatory Northern American Electric Reliability Corporation ("NERC") Reliability Standards.

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

The Company is part of the PJM Interconnection, L.L.C. ("PJM") regional transmission organization ("RTO"), which provides service to a large portion of the eastern United States. PJM is currently responsible for ensuring the reliability and coordinating the movement of electricity through all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia. This service area has a population of approximately 65 million and, on August 2, 2006, set a record high of 166,929 megawatts ("MW") for summer peak demand, of which Dominion Energy Virginia's load portion was approximately 19,256 MW. On August 9, 2022, the Company set a record high of 21,156 MW for summer peak demand. On February 20, 2015, the Company set a winter and all-time record demand of 21,651 MW. Based on the 2022 PJM Load Forecast, the DOM Zone is expected to grow with average growth rates of 2.2% summer and 2.6% winter over the next 10 years compared to the PJM average of 0.4% and 0.7% over the same period for the summer and winter, respectively.

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

NERC has been designated by the Federal Energy Regulatory Commission ("FERC") as the electric reliability organization for the United States. Accordingly, NERC requires that the planning authority and transmission planner develop planning criteria to ensure compliance with NERC Reliability Standards. Mandatory NERC Reliability Standards require that a transmission owner ("TO") develop facility interconnection requirements that identify load and generation interconnection minimum requirements for a TO's transmission system, as well as the TO's reliability criteria.[6]

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.[7] 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.[8] 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

[6] *See* FAC-001-3 (R1, R3) (effective April 1, 2021), which can be found at https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/virginia/parallel-generation/facility-interconnection-requirements-signed.pdf?la=en&rev=38f51ffb04b1489f921b32a41d9887c8.
[7] PJM Manual 14B (effective July 1, 2021) focuses on the RTEP process and can be found at https://www.pjm.com/-/media/documents/manuals/m14b.ashx.
[8] *See* PJM Manual 14B, Attachment D: PJM Reliability Planning Criteria.

reliability criteria violations caused by proposed generation, merchant transmission, or long-term firm transmission service requests; and (iii) supplemental projects are projects initiated by the TO in order to interconnect new customer load, address degraded equipment performance, improve operational flexibility and efficiency, and increase infrastructure resilience. The Project is classified as a supplemental project initiated by the TO to interconnect new customer load. While supplemental projects are included in the RTEP, the PJM Board does not actually approve such projects. See Section I.J for a discussion of the PJM process as it relates to this Project.

Load Driver for the Project

Culpeper County has seen significant development over the last decade. Much of this development is caused in large part by the increase in data center development in the Northern Virginia region.

A new data center is the main load driver for this Project. Within this area, the Company projects load growth of approximately 61 MW initially by 2024 and expects that load to grow to 320 MW by 2034. This load growth is a combination of data center growth (20 MW by 2024; 220 MW by 2034) and other load growth on the REC system. The additional REC load on the Mountain Run Substation is approximately 100 MW by 2034, creating a total of 320 MW load. According to Dominion Energy Virginia transmission planning criteria, each substation cannot supply more than 300 MW of load. Additionally, any substation that services more than 100 MW of load should be networked to the system and may not be served radially. Approximately 78 MW of load by 2034 from the Culpeper Substation and Culpeper Delivery Point ("DP") is also expected in the area.

Data centers demand a large amount of electricity. If the Company attempted to serve that demand from a 115 kV line, that 115 kV line would exceed its capacity limit. Moreover, serving large loads from a 115 kV system may negatively impact the system voltage as well. The existing transmission system in the Culpeper area is a 115 kV system which supplies the loads via Lines #2 and #70. Attempting to serve 398 MW of load from this system would overload these lines, create voltage problems, and violate the NERC TPL standard and Dominion Energy Virginia's transmission planning criteria. A 230 kV line system is necessary to provide reliable service to this REC Customer.

The Project will serve existing and future load with a stronger and more reliable system. Converting the east-west sections of Lines #2 and #70 to 230 kV and connecting them to Line #2199 will provide the required 230 kV supply to the Culpeper area. It should be mentioned that the two 230 kV connections will be sufficient until the total load in the Culpeper area reaches 300 MW. Once it exceeds this value, new 230 kV lines will need to be built to meet the NERC TPL criteria, potentially in the same corridor. Current forecasts show that this need will occur sometime between 2026 and 2030.

Area Substation – Mountain Run Substation

The load area where this data center is being developed is currently served by the Mountain Run Substation. This substation currently has distribution equipment limitations preventing it from serving the data center development. If the unserved load (61 MW by 2024; 320 MW by 2034) were connected to existing Mountain Run 1 and 2, the existing distribution substation equipment would overload. Connecting the REC Customer's requested load to Mountain Run Substation alone would result in (i) substation transformer thermal overloads, and (ii) violation of the Company's transmission system planning criteria set forth in the Facilities Interconnection Requirement ("FIR") document.[9]

According to Dominion Energy Virginia transmission planning criteria, each substation cannot supply more than 300 MW of load. There is a total of 220 MW of load that will be contracted from this data center by 2034, served by the proposed Cirrus-Keyser 230 kV Loop. The additional REC load on the Mountain Run Substation is about 100 MW by 2034, making it a total of 320 MW load. Approximately 78 MW of load from Culpeper and Culpeper DP will be served from these two new switching stations. Moreover, any substation that serves more than 100 MW of load should be networked to the system and may not be served radially. Attempting to serve 398 MW of load from this system would overload these lines, create voltage problems, and violate the NERC TPL standard and Dominion Energy Virginia's transmission planning criteria. Constructing both the Cirrus and Keyser Stations will meet the aforementioned criteria. These proposed stations will be connected to each other, where one would provide two feeds to the existing Mountain Run Substation and the other one would provide two feeds to the new data center substation—Mountain Run 3 Substation. See <u>Attachment I.A.1</u> for a map of the load area and the Project location.

Bridging Capacity

The ultimate demand and need for power for the REC Customer is more than the local area at Mountain Run Substation can provide. It was determined that the Company needed to look for a solution that could accommodate the increased demand. In the existing system, adding the requested load would cause Line #153 to be loaded to 108.2% of its emergency capacity rating under N-1-1SCRD conditions. Also, a segment of Line #2 from Mitchel DP to Oak Green Substation would be at 132% of its emergency capacity rating under N-1 conditions. Both of these overloads are violations of NERC TPL and Dominion Energy Virginia's transmission planning criteria.

[9] *See supra* n. 3.

For all the reasons discussed above, it was determined that the Mountain Run Substation cannot currently accommodate the Customer's power needs.

As part of this Project, the Company proposes to construct a new, approximately 5.2-mile overhead 230 kV double circuit transmission line-loop. This 5.2-mile line-loop will be built entirely on the existing 100-foot-wide right-of-way. To do this, the Company proposes cutting the existing 230 kV overhead Line #2199 (from Gordonsville-Remington) at Structure #2199/100 (the "Mountain Run Junction"). This will result in three separate lines, specifically: (i) 230 kV Gordonsville-Cirrus Line #2199, (ii) 230 kV Cirrus-Keyser Line #2278, and (iii) 230 kV Keyser-Germanna Line #2276 (collectively, the "Cirrus-Keyser 230 kV Loop").

The 5.2-mile proposed route of the Cirrus-Keyser 230 kV Loop requires the removal of a portion of one existing 115 kV double circuit transmission line (Line #2 and Line #70) located entirely within the existing right-of-way between existing Structures #2/1201-1253 and Structures #70/53-1. It then requires the installation of a new, overhead single circuit 115 kV line which requires an additional 25 feet of right-of-way from the edge of the existing 100 feet right-of-way for approximately 0.02-mile from proposed Structure #2/486A to proposed Structure #2/486B to connect Lines #2 and #70 at the Mountain Run Junction.

The Company also proposes to construct two overhead 230 kV transmission lines, Line #2283 and Line #2284. Line #2283 will be 0.15 mile in length, and Line #2284 will be 0.10 mile in length. Both will be built in new right-of-way provided by the REC Customer and will run from the proposed Keyser Station to the existing Mountain Run 1 and 2. Next, the Company proposes to construct two overhead 230 kV transmission lines, Line #2288 and Line #2289, approximately 0.01-mile in length. Lines #2288 and Line #2289 will run from the proposed Cirrus Station to the proposed Mountain Run 3 Substation and will not require any new right-of-way.

Third, the Company proposes to build a new section of overhead 115 kV single circuit transmission line (Line #70), approximately 0.07-mile in length, in new right-of-way provided by the REC Customer. This new section of Line #70 will run from the proposed Cirrus Station to existing Structure #70/1255.

To ensure that the Company can still meet the area demands and to prevent additional outages during construction, the Company will need to build an approximately 5.4-mile temporary 115 kV single circuit energized line from the Mountain Run Junction near Structure 2/1201 (70/53) to existing structure #70/1257, feeding Culpeper DP and Town of Culpeper. The centerline of the temporary line will be situated within five feet from the south edge of the existing right-of-way for 5.0 miles. This temporary line will require a additional 15-foot temporary construction right-of-way for approximately 5.0 miles, with the exception of a 0.01 mile segment near the Mountain Run Junction where the additional temporary right-of-way requirement varies from 15 feet to 45 feet. See Figure 1 in Attachment I.A.2. The remaining 0.4 miles from existing structure 2/1251 (70/3) to existing Structure 70/1257 will require a 40 feet temporary right-of-way. See Figure 2 in Attachment I.A.2. When the Cirrus-Keyser 230 kV Loop is energized, the temporary line will be removed.

The Company also proposes to construct two new 230 kV switching stations located along Frank Turnage Drive, the Cirrus Station and the Keyser Station, on land purchased by the Company from the REC Customer. The line protection settings will also be updated at the Company's existing Remington, Germanna, Gordonsville, Oak Green, and Culpeper Substations.

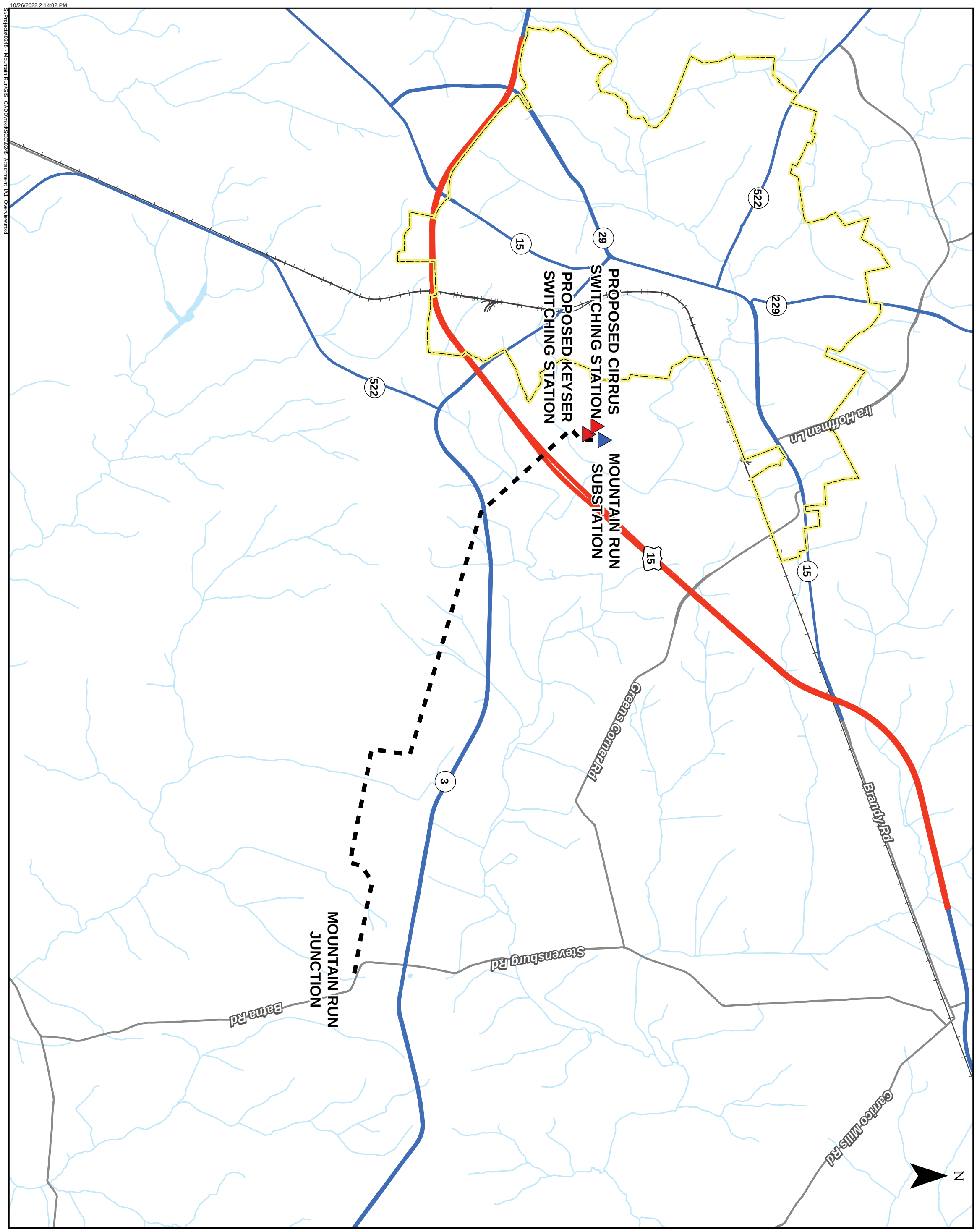
The proposed Cirrus Station will be constructed with an ultimate design of nine 230 kV circuit breakers, four 230 kV line terminals, two 230-34.5 kV, 168 MVA transformers, two 115 kV circuit breakers, one 115 kV line terminal and other associated equipment. It will be designed to accommodate future growth in the area with a build-out of three additional 230 kV circuit breakers, two additional 230 kV line terminals, and a 230 kV capacitor bank. A new control enclosure will also be installed to accommodate the protective relay and communications cabinets. The total area required to build the station is approximately five acres.

The proposed Keyser Station will be constructed with an ultimate design of six 230 kV circuit breakers, four 230 kV line terminals, and other associated equipment. It will be designed to accommodate future growth in the area with a build-out of four additional 230 kV circuit breakers, two additional 230 kV line terminals and two 230 kV capacitor banks. A new control enclosure will also be installed to accommodate the protective relay and communications cabinets. The total area required to build the station is approximately four acres.

See Attachment I.A.3 for diagrams of existing and proposed Project lines, structures, and DPs. See Attachment II.A.2 for a map depicting the proposed Project.

***

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



ATTACHMENT I.A.1

PROJECT OVERVIEW MAP

Cirrus - Keyser 230 kV Loop and Related Projects

Culpeper County, Virginia

Owner/ Applicant:
Dominion Energy Virginia

C2 Env Project:	Prepared By:	Date:
0245	TMP	07/28/22

0 0.375 0.75 1.5 Miles

Scale is 1 IN = 0.75 Miles when printed at original size of 11x17

LEGEND

- Project Centerline
- Proposed Dominion Substation
- Existing REC Substation
- Limited Access Highway
- US or VA Primary Highway
- Local or Main Road
- Railroad
- NHD Stream/River
- NHD Waterbody
- Town of Culpeper

Notes:
1. Basemap from ESRI Topographic Map
2. Project centerline provided by Dominion Energy
3. Roads and railroads from VGIN
4. Streams, rivers and waterbodies from USGS National Hydrography Data

APPROXIMATE PROJECT LOCATION

SHEET 1 OF 1

Attachment I.A.2

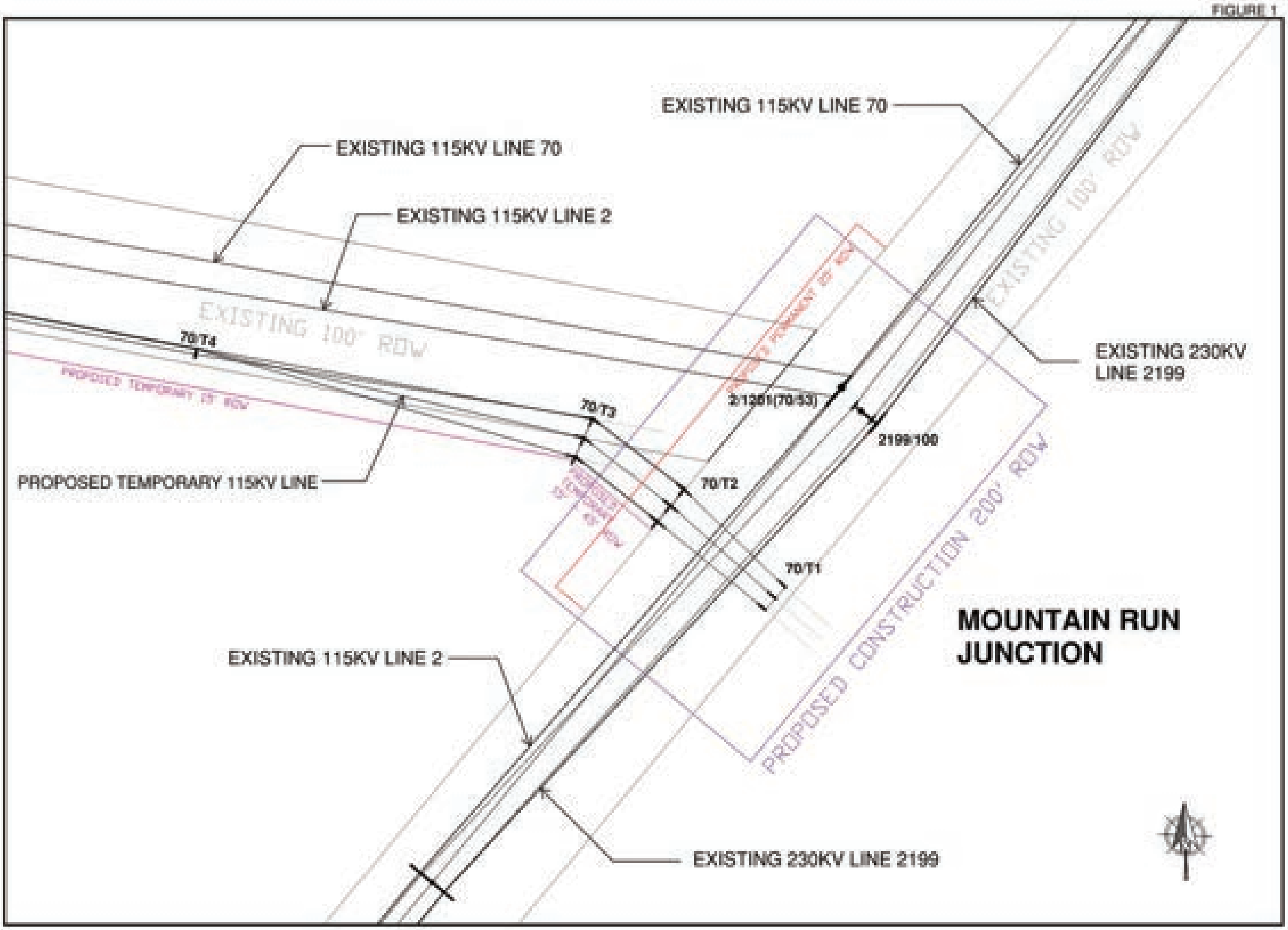


FIGURE 2

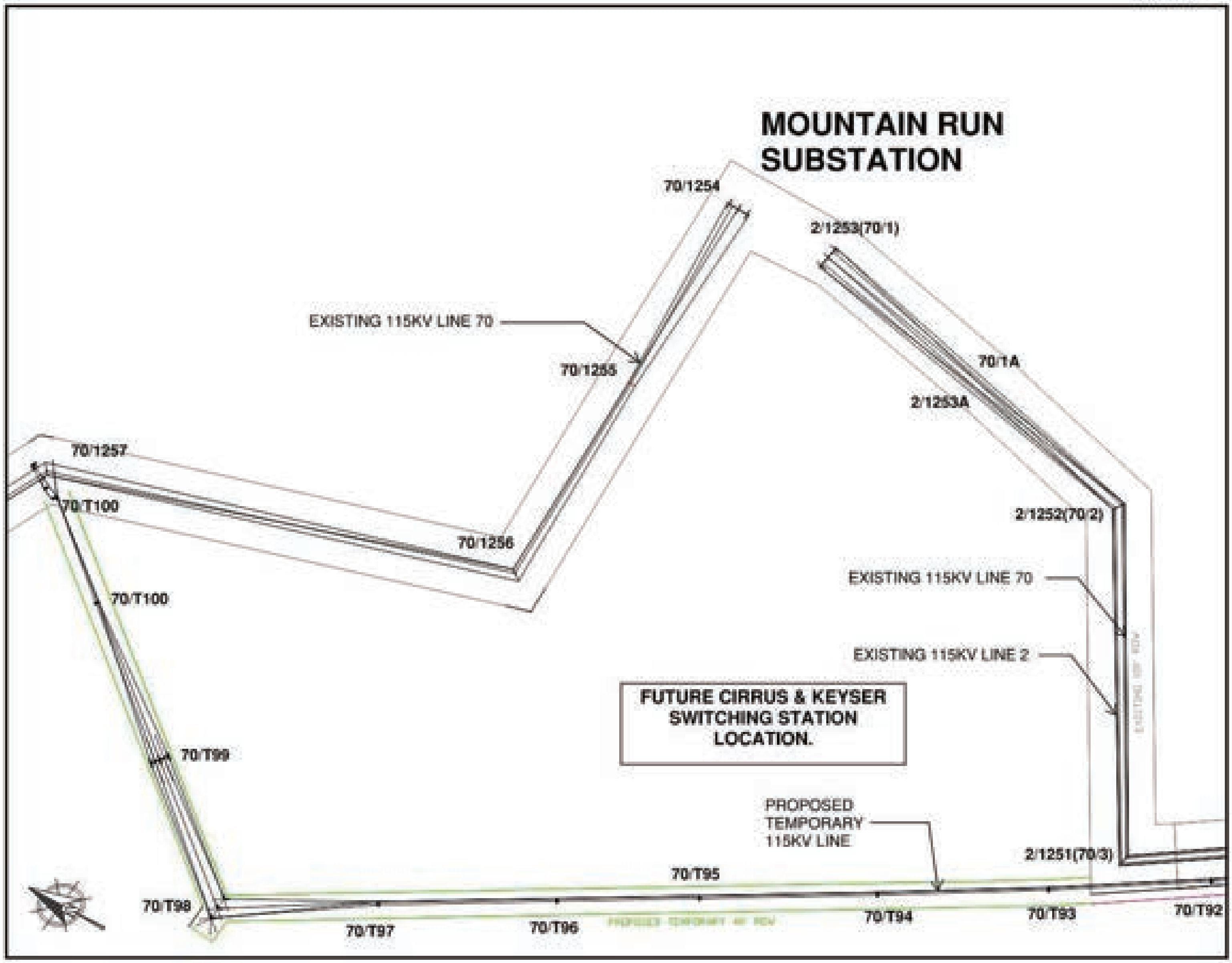

MOUNTAIN RUN
SUBSTATION
70/1254
2/1253(70/1)
EXISTING 115KV LINE 70
70/1255
70/1A
2/1253A
70/1257
70/T100
70/1256
2/1252(70/2)
70/T100
EXISTING 115KV LINE 70
EXISTING 115KV LINE 2
FUTURE CIRRUS & KEYSER
SWITCHING STATION
LOCATION.
70/T99
PROPOSED
TEMPORARY
115KV LINE
2/1251(70/3)
70/T95
70/T98
70/T97
70/T96
70/T94
70/T93
70/T92

Diagram of Existing Lines, Structures, and DPs

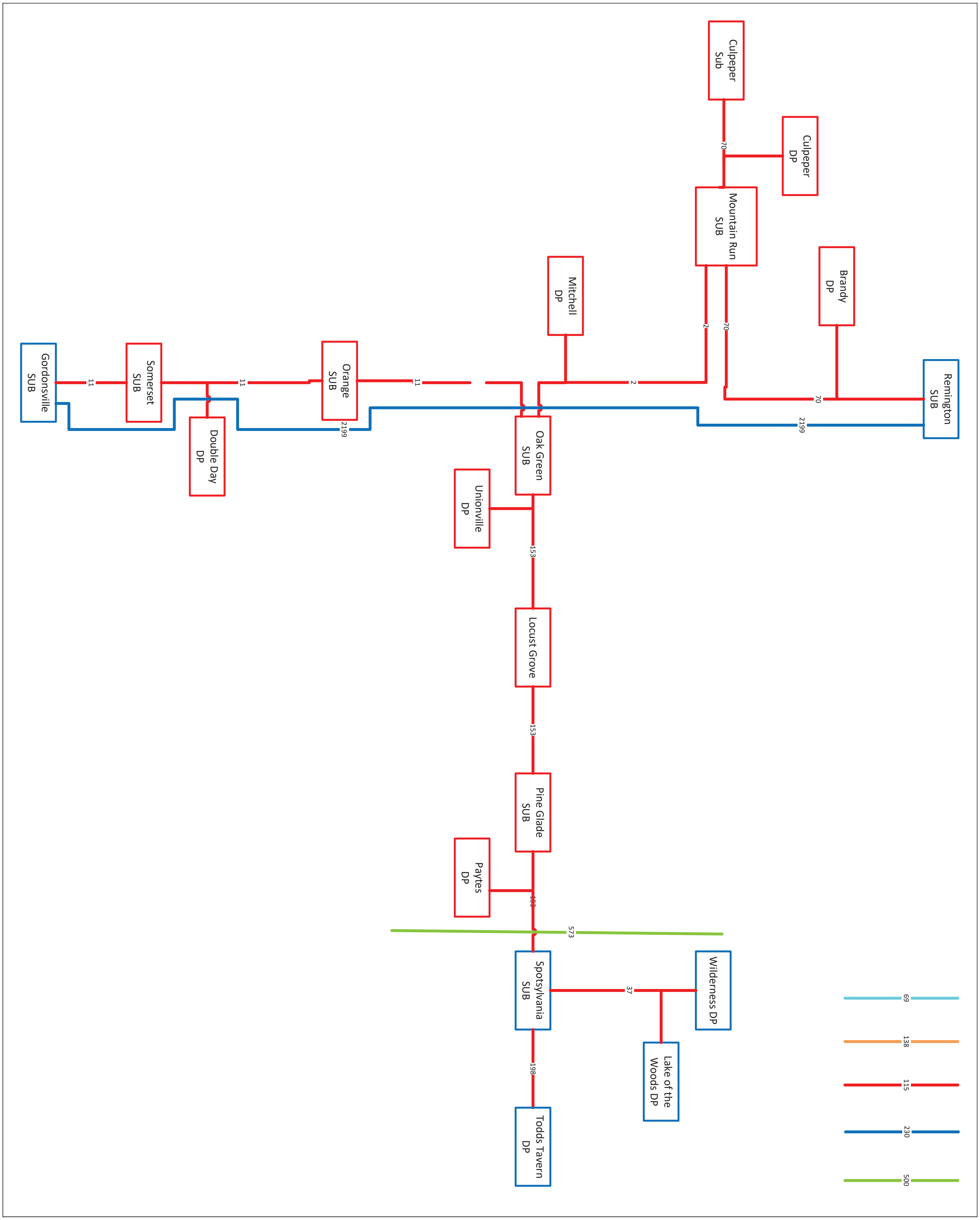


Diagram of Proposed Lines, Structures, and DPs

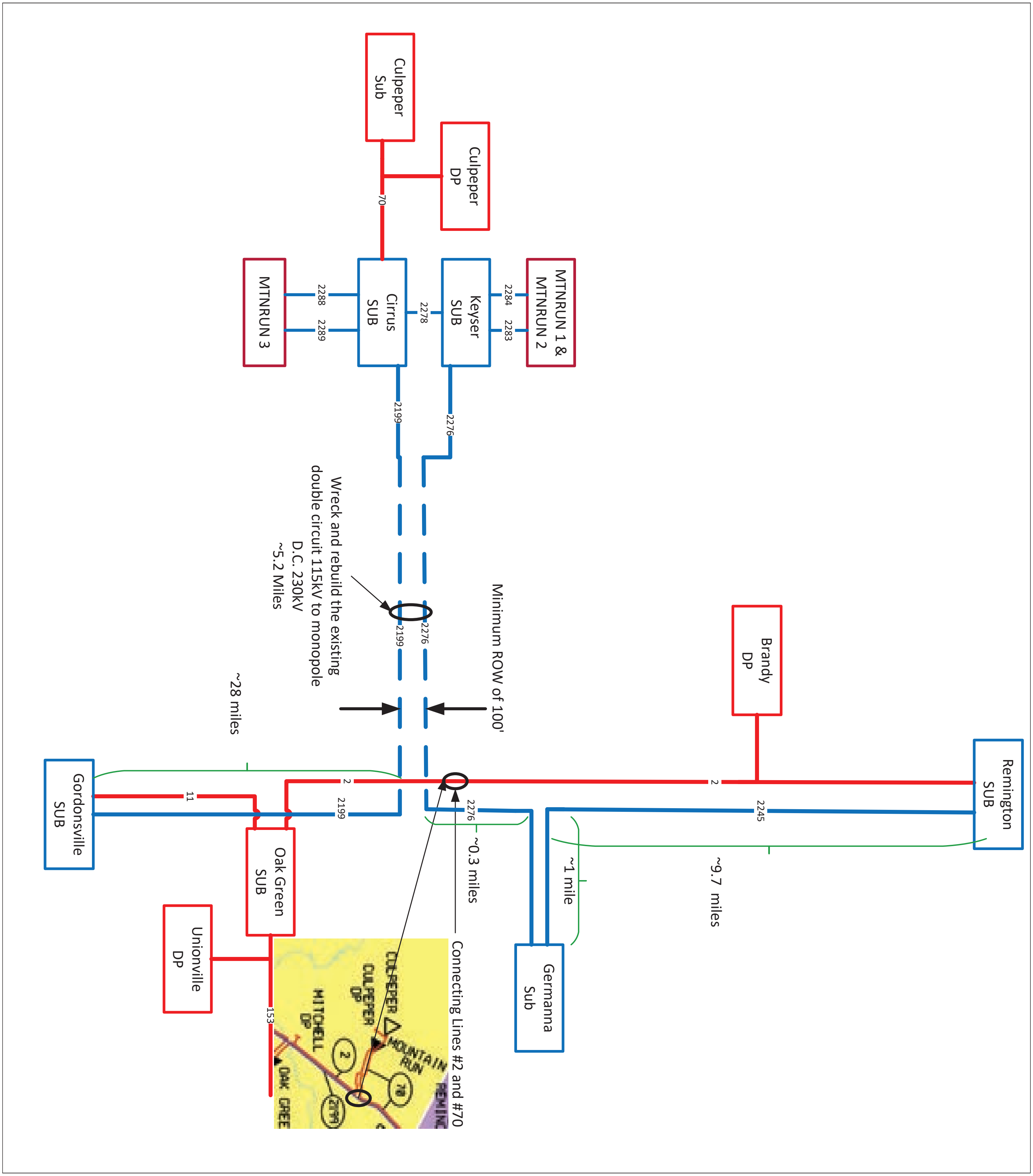
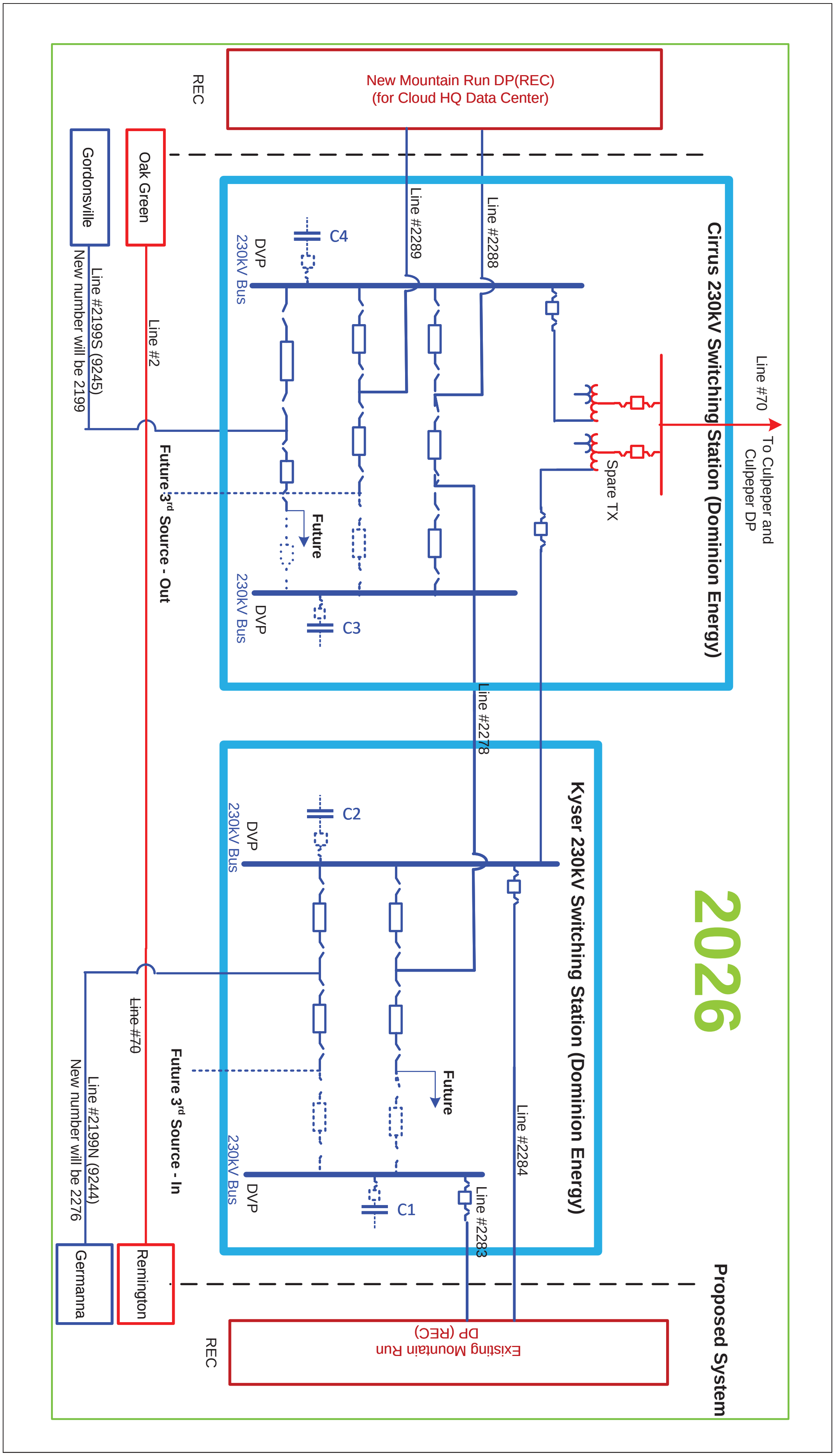


Diagram of Proposed Substations



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: **(1) Engineering Justification for the Project**

See Section I.A of the Appendix.

(2) Known Future Projects

When the load demand reaches 300 MW, a new 230 kV line will eventually be required to prevent the existing system infrastructure from exceeding the 300 MW load loss limits imposed by NERC TPL001 and the Dominion Energy Facility Interconnection Requirements. It is likely that these new lines will be needed given the load growth on the data center campus and potential future load demand in the area. The Company expects this need to materialize between 2026 and 2030. At that time, the Company may need to expand the right-of-way and bring another double circuit 230 kV source to both the Cirrus Station and the Keyser Station to prevent a 300 MW loss of load violation. When studying the 300 MW load loss in the area, the loads served from Germanna Switching Station (serving a new data center) should be considered. The eventual worst-case scenario impacting load loss would be loss of Lines #2245 (Remington – Germanna) and Line #2199 (Gordonsville – Cirrus) under N-1-1 studies.

(3) Planning Studies

See Section I.A. of the Appendix, which references the Mountain Run Substation equipment overloads, line overloads, voltage problems, and violations of the NERC TPL standard and Dominion Energy Virginia's transmission planning criteria without the proposed Project.

Dominion Energy Virginia's Electric Transmission Planning group performs planning studies to ensure delivery of bulk power to a continuously changing customer demand under a wide variety of operating conditions. Studies are performed in coordination with the Company's RTO (*i.e.*, PJM) and in accordance with NERC Reliability Standards. In completing these studies, the Company considered all other known generation and transmission facilities impacting the affected load area.

In order to maintain reliable service to customers of the Company and to comply with mandatory NERC Reliability Standards, specifically Facility Connection ("FAC") standard FAC-001,[10] the Company's FIR[11] document addresses the interconnection requirements of generation, transmission, and electricity end-user facilities. The purpose of the NERC FAC standards is to avoid adverse impacts on reliability by requiring each TO to establish facility connection and performance requirements in accordance with FAC-001, and requiring the TO and end-users to meet and adhere to the established facility connection and performance requirements in accordance with FAC-002.

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

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

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

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

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

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

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

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

Facilities List

See Attachment I.G for existing transmission facilities in the affected Culpeper County 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: The new data center is in Culpeper County. The parcel consists of approximately 13 acres. See Attachment I.A.1 for a map of the load area and the location of the data center project that provides the need for the Project. See Attachment I.G for the portion of the Company's transmission facilities in the Project. The Cirrus Station and the Keyser Station will be the source of transmission power for the REC Customer's data center development. The projected load for the data center in 10 years is projected to be approximately 220 MW of contract load and the total projected load for REC is 320 MW.

See Attachment I.C.1. Attachment I.C.1 shows existing loading at Mountain Run Substation and references the remaining available load at each station. Attachment I.C.1 also illustrates existing loading at Mountain Run Substation with data center load and shows potential loading at the Cirrus and Keyser Stations.

Note that Attachment I.C.1 includes only the normal feed circuits to the REC Customer's data center project; they do not include any alternate feed loads.

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

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

The proposed Cirrus Station is designed to ultimately have 168 MVA transformers installed in the station. Each 168 MVA transformer will have a normal overload rating ("NOL") of 185 MVA. The transformers will be responsible for sourcing the 115 kV line supplying the Culpeper Substation and Culpeper DP.

The proposed Keyser Station is designed to ultimately have 168 MVA transformers installed in the station. Each 168 MVA transformer will have a NOL of 185 MVA. The transformers will be responsible for sourcing the 115 kV line supplying the Culpeper Substation and Culpeper DP, if the 230/115 kV transformer at Cirrus is out due to a contingency or for maintenance.

Substation Name	Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
MTNRUN1,2	Load	41	42	43	57.625	72.25	86.875	101.5	116.125	130.75	145.375	160
MTNRUN3 (data center)	Load	20	150	150	151.25	152.5	153.75	155	156.25	157.5	158.75	160
Sum		61	192	193	208.875	224.75	240.625	256.5	272.375	288.25	304.125	320
Culpeper		69.5	70.3	70.9	71.7	72.7	73.6	74.5	75.4	76.3	77.2	78.15
Sum		130.5	262.3	263.9	280.575	297.45	314.225	331	347.775	364.55	381.325	398.15
Max Capacity of Existing Mountain Run		100	100	100	100	100	100	100	100	100	100	100
(MW) Available Load		-30.5	-162.3	-163.9	-180.575	-197.45	-214.225	-231	-247.775	-264.55	-281.325	-298.15

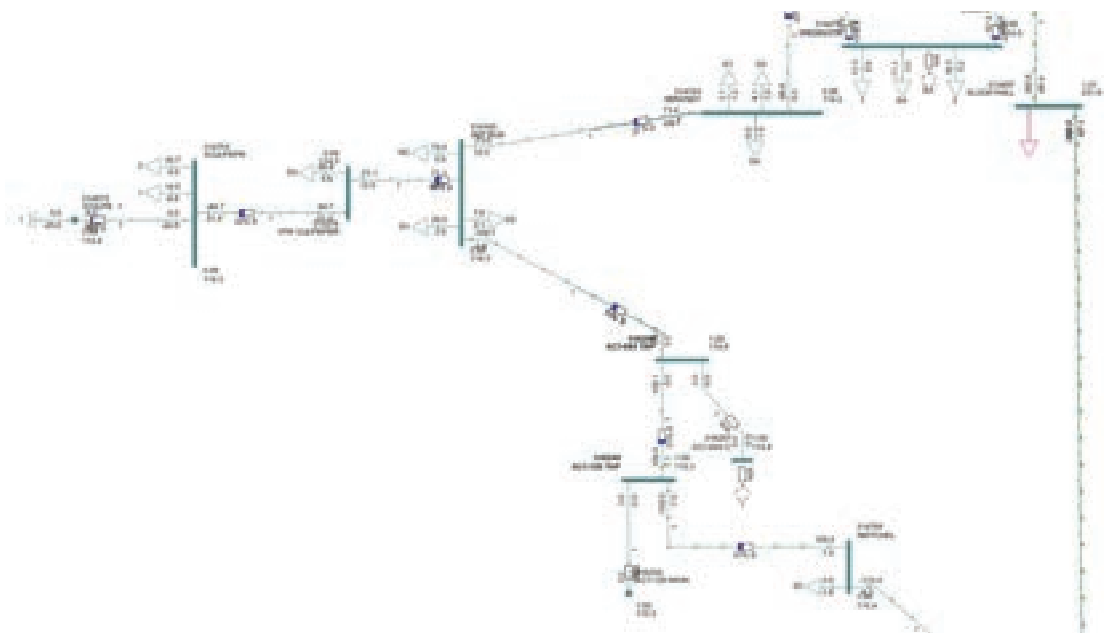
I. NECESSITY FOR THE PROPOSED PROJECT

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:

Model Used: RTEP2025

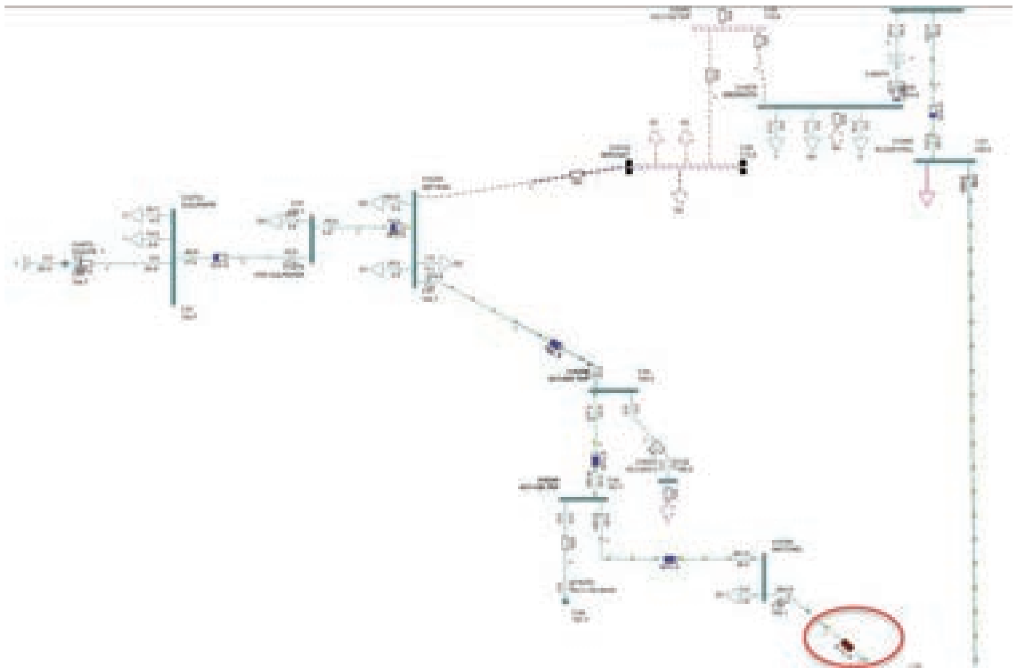
Figure 1: Topology of the Area Before this Project



Without the proposed Project, serving the requested load will cause overloads and voltage violations. The most important ones are as follows:

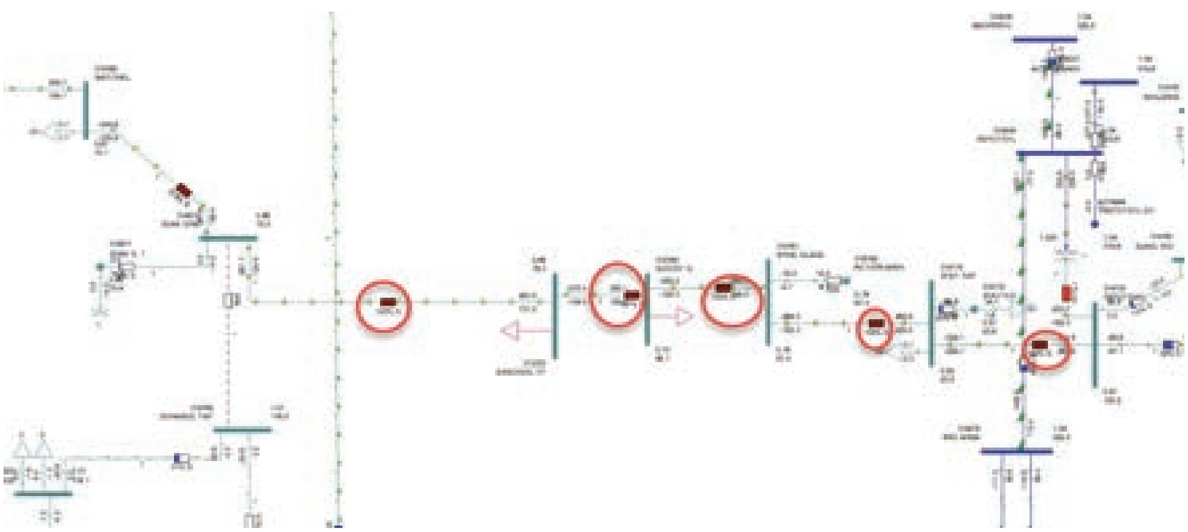
- 3MITCHEL - 314815 3OAK GRE -115 kV will be overloaded for 32.5% under loss of segment of Line 70 between Mountain Run to Remington. Also, voltages below 0.95P.U. are observed under various N-1 scenarios with the worst case being 0.91 under the same N-1 scenario described above.

Figure 2: Overload of Mitchell - Oak Green Under Bus Fault at Brandy



- Line #153 will be overloaded for 60% under loss of Line #11 and Mountain Run-Remington 115 kV segment of Line #70.

Figure 3: Overload of Line 152 under N-1-1 condition

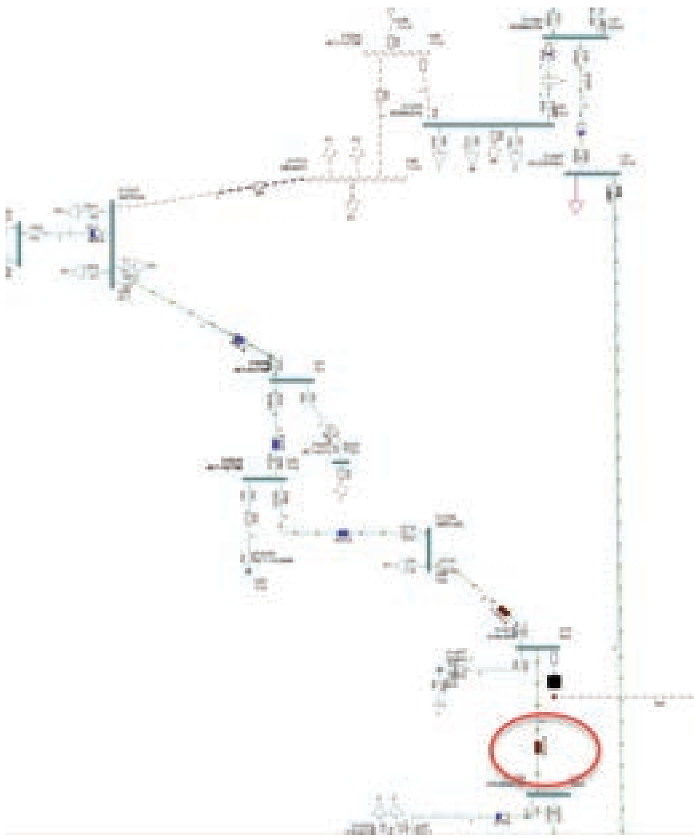


- A segment of Line 70 will be overloaded under loss of Line #153 and line #11.

Figure 4: Overload of a Segment of Line 70 Under N-1-1

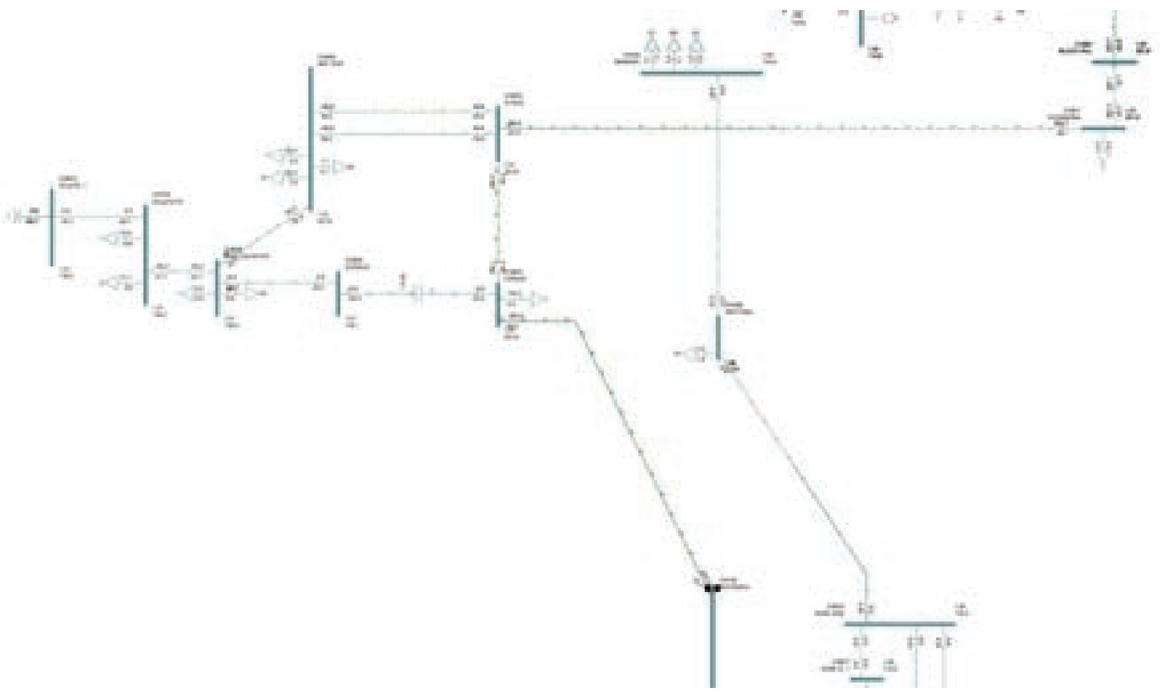
- Line #11 will be overloaded for 50% under loss of Line #153 and Mountain Run-Remington 115 kV segment of Line #70.

Figure 5: Overload of a Segment of Line 11 Under N-1-1



- Low voltages observed in Culpeper area and on delivery point on Line #153. Depending on how the load at Mountain Run materializes, 300 MW load drop criteria will be violated under loss of Line #2 and Line #70.

Figure 6: Topology of the System After the Project



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: **Transmission Alternatives**

There are no feasible project alternatives for meeting the REC Customer's demand needs. See Section I.J and Attachment I.J.1 and Attachment I.J.2 of the Appendix.

Analysis of Demand-Side Resources

Pursuant to the Commission's November 26, 2013, Order entered in Case No. PUE-2012-00029, and its November 1, 2018, Final Order entered in Case No. PUR-2018-00075 ("2018 Final Order"), the Company is required to provide analysis of demand-side resources ("DSM") incorporated into the Company's planning studies. DSM is the broad term that includes both energy efficiency ("EE") and demand response ("DR"). In this case, PJM and the Company have identified a need for the proposed Project to comply with mandatory NERC Reliability Standards, while maintaining the overall long-term reliability of the transmission system.[12] Notwithstanding, when performing an analysis based on PJM's 50/50 load forecast, there is no adjustment in load for DR programs that are considered in PJM's fixed resource requirement ("FRR") plan 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 reliability pricing model 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 reflected in Attachment I.C.1, the projected load at the existing Mountain Run Substation (Mountain Run 1 and 2) without the Project and with the REC Customer's data center fully built out is 398 MW. By way of comparison, statewide, the Company achieved demand savings of 308.4 MW (net) / 396.8 MW (gross) from its DSM Programs in 2021.

[12] 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: The proposed Project includes the removal of the following (see Section II.B.5 for replacement structures):

40 double circuit 115 kV tangent steel pole structures. The existing structure numbers are:

- 2/1202(70/52) to 2/1206(70/48)
- 2/1209(70/45)
- 2/1212(70/42) to 2/1219(70/35)
- 2/1221(70/33)
- 2/1222(70/32)
- 2/1224(70/30) to 2/1241(70/13)
- 2/1243(70/11)
- 2/1244(70/10)
- 2/1247(70/7) to 2/1250(70/4))

12 double circuit 115 kV double dead-end steel pole structures. The existing structure numbers are:

- 2/1201(70/53)
- 2/1207(70/47)
- 2/1208(70/46)
- 2/1210(70/44)
- 2/1211(70/43)
- 2/1220(70/34)
- 2/1223(70/31)
- 2/1242(70/12)
- 2/1245(70/9)
- 2/1246(70/8)
- 2/1251(70/3)
- 2/1252(70/2)

2 single circuit 115 kV staggered arms double dead-end steel pole structures. The existing structure numbers are:

- 70/1A
- 2/1253A

1 single circuit 115 kV braced-post tangent structure steel pole structure. That structure is:

- 70/1255

The proposed Project includes the installation of the following (see Section II.B.5 for proposed structures):

Ten (10) single circuit 230 kV double dead end steel pole structures. The proposed structure numbers are:

- 2276/100
- 2276/150 to 2276/152
- 2199/100
- 2199/50 to 2199/49
- 2278/2 to 2278/3
- 2283/1

Two (2) single circuit 115 kV double dead-end steel 3-pole structures. The proposed structure numbers are:

- 2/486A and 2/486B

Two (2) single circuit 230 kV staggered arms double dead-end steel pole structures. The proposed structure numbers are:

- 2283/2
- 2284/1

Thirty-Nine (39) double circuit 230 kV tangent steel pole structures. The proposed structure numbers are:

- 2276/101(2199/99) to 2276/106(2199/94)
- 2276/108(2199/92)
- 2276/111(2199/89) to 2276/118(2199/82)
- 2276/120(2199/80) to 2276/121(2199/79)
- 2276/123(2199/77) to 2276/140(2199/60)
- 2276/146(2199/54) to 2276/149(2199/51)

Ten (10) double circuit 230 kV double dead end steel pole structures. The proposed structure numbers are:

- 2276/107(2199/93)
- 2276/109(2199/91) to 2276/110(2199/90)
- 2276/119(2199/81)
- 2276/122(2199/78)
- 2276/141(2199/59)

- 2276/142(2199/58) to 2276/145(2199/55)

The existing 115 kV Line #2 and Line #70 3-phase 1033.5 ACSR conductors (approximately 5.2 miles) will be replaced from the Mountain Run Junction location at existing Structure ##2/1201 (70/53) to the new Cirrus and Keyser Stations which will be located south of the existing Mountain Run Substation. Existing lines have normal/emergency transfer capability of 352 MVA. Similarly, the two existing 3#6 Alumoweld shield wires (approximately 5.2 miles) will be replaced from the junction location to the new Cirrus and Keyser Stations. The new conductor will be 3-phase bundled 768.2 ACSS/TW/HS double-bundle rated for 250°C with transfer capability of 1,572 MVA. New shield wires will be two DNO-11410 OPGW for approximately 5.2 miles from the Mountain Run Junction location to the Cirrus and Keyser Stations.

The new 230 kV Line #2283 and Line #2284 will be installed from the new Keyser Station to the existing Mountain Run Substation. The new conductor will be a 3-phase bundled 768.2 ACSS/TW/HS single-bundle rated for 250°C with transfer capability of 1,572 MVA. The new shield wires will consist of one DNO-11410 OPGW for approximately 0.15 mile on Line #2283 from the Keyser Station location to the existing Mountain Run Substation and approximately 0.10 mile on Line #2284 from the existing Mountain Run Substation to the Keyser Station.

The new 230 kV Line #2278 will be installed from the new Keyser Station to the new Cirrus Station. The new conductor will be a 3-phase bundled 768.2 ACSS/TW/HS single-bundle rated for 250°C with transfer capability of 1,572 MVA. The new shield wires will be one 7#7 Alumoweld for approximately 0.10 mile.

The existing 115 kV Line #70 3-phase single 1033.5 ACSR (approximately 0.07 miles) from Mountain Run Substation to existing Structure #70/2055 will be a wreck and rebuild to accommodate the new termination point to the Cirrus Station. The existing line has a normal/emergency transfer capability of 352 MVA.

To accommodate the proposed Line #2199 and Line #2276 to the new Cirrus and Keyser Stations, the existing Mountain Run Junction location will need be reconfigured such that the new 230 kV lines to Cirrus and Keyser Stations will tap to the existing line #2199 (Remington-Gordonsville) and will cross over the existing 115 kV Line #2 in the final arrangement.

The existing arrangement at the Mountain Run Junction location consists of one single circuit 230 kV structure supporting Line #2199 from Remington to Gordonsville and one double circuit 115 kV tap structure that supports Line #2 and Line #70 including a 115 kV line that runs to the existing Mountain

Run Substation. The proposed arrangement will require two 3-pole structures to replace the existing 115 kV tap structure.

One 3-pole structure will be installed on the north side of existing tap to intercept existing Line #70 conductor and shield wire, and the second 3-pole structure is to be installed on the south side of the tap to intercept the existing Line #2 conductor and shield wire. New bundled 768.2 ACSS/TW/HS conductor will be installed between the 3-pole structures to allow for the overhead crossings of proposed 230 kV lines to the Cirrus and Keyser Stations and to combine existing 115 kV Line #2 and Line #70. Lines #70 and #2 will be combined and renumbered as Line #2. The 115 kV line connecting the Cirrus Station to Culpeper will remain Line #70.

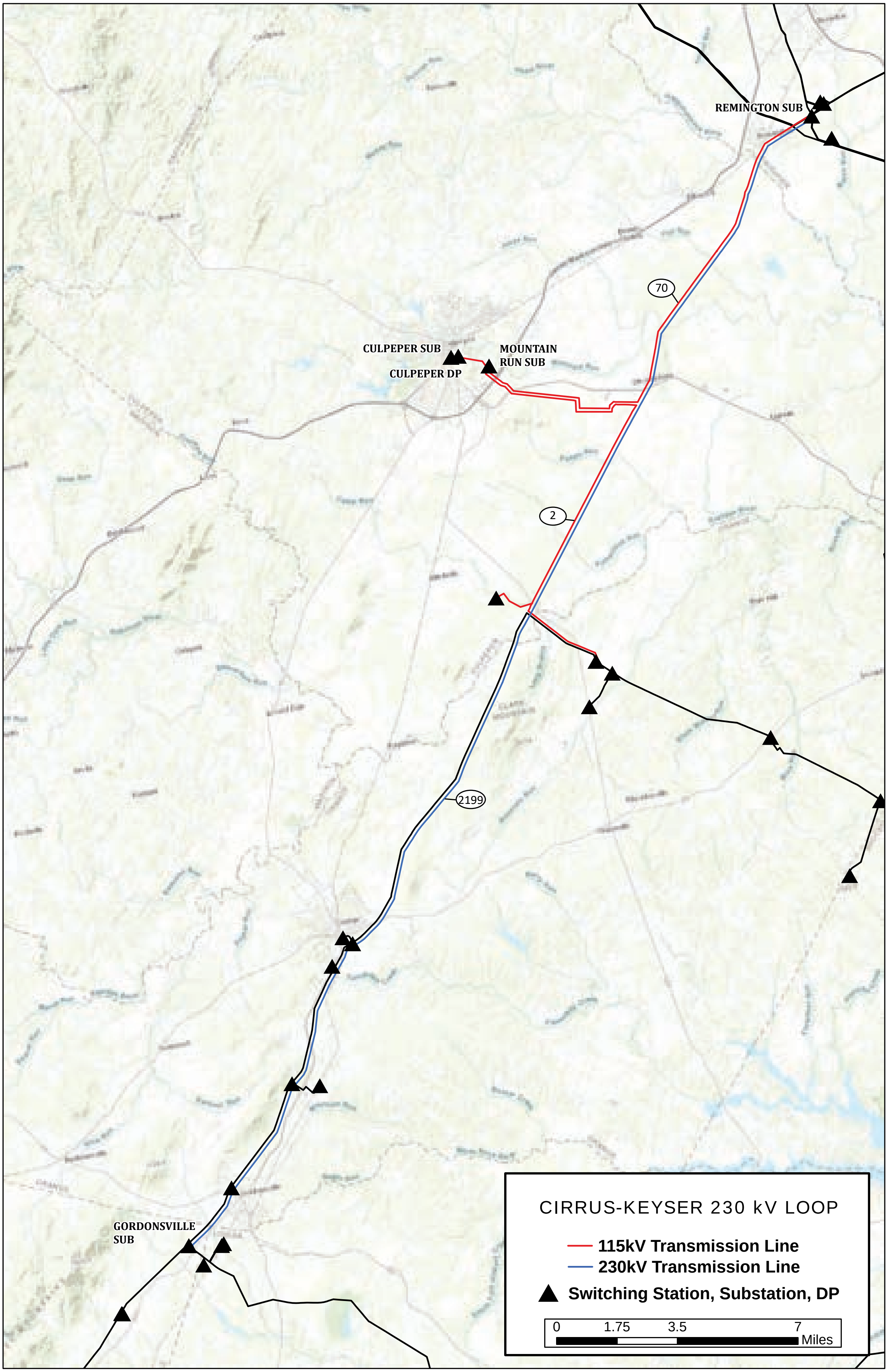
The existing 230 kV structure at the Mountain Run Junction location will be replaced with two 230 kV single circuit 90-degree dead end monopoles to split existing Line #2199 in two 230 kV circuits (Line #2199 and Line #2276) going to the new Cirrus and Keyser Stations.

The proposed Project includes the installation and removal of temporary structures and conductors to ensure that the Company can still meet the area demands and prevent additional outages during construction. These temporary facilities will be in service for approximately twelve months during construction and will be removed upon energization of the Cirrus-Keyser 230 kV Loop.

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.


REMINGTON SUB
70
CULPEPER SUB
CULPEPER DP
MOUNTAIN RUN SUB
2
2199
GORDONSVILLE SUB
CIRRUS-KEYSER 230 kV LOOP
115kV Transmission Line
230kV Transmission Line
Switching Station, Substation, DP
0
1.75
3.5
7
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 December 30, 2025.

The Company estimates it will take approximately 26 months for detailed engineering, materials, procurement, permitting, real estate, and construction after a final order from the Commission. To support this estimated construction timeline and construction plan, the Company respectfully requests a final order by October 31, 2023. The Company estimates that construction should begin around November 1, 2024, and will be completed by December 30, 2025.

This schedule is contingent upon obtaining the necessary permits and scheduling outages. Dates may need to be adjusted based on permitting delays or design modifications in order to comply with additional agency requirements identified during the permitting application process, as well as ability to schedule outages or unpredictable delays due to labor shortages or materials/supply issues.

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 for the project is $63.1 million, which includes $26.3 million for transmission-related work and $36.8 million for substation related work (in 2022 dollars).

I. NECESSITY FOR THE PROPOSED PROJECT

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

Response: The Project was submitted to PJM on June 7, 2022, and the solution slide was submitted to PJM on September 6, 2022. See Attachments I.J.1 and I.J.2, respectively. The Company presented new information regarding the change in load ramp to PJM on November 2, 2022. Even though the load ramp changed, PJM is not requiring the Company to present the solution again because the solution is not impacted by the new load values.

Needs

Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2022-0017

Process Stage: Need Meeting 06/07/2022

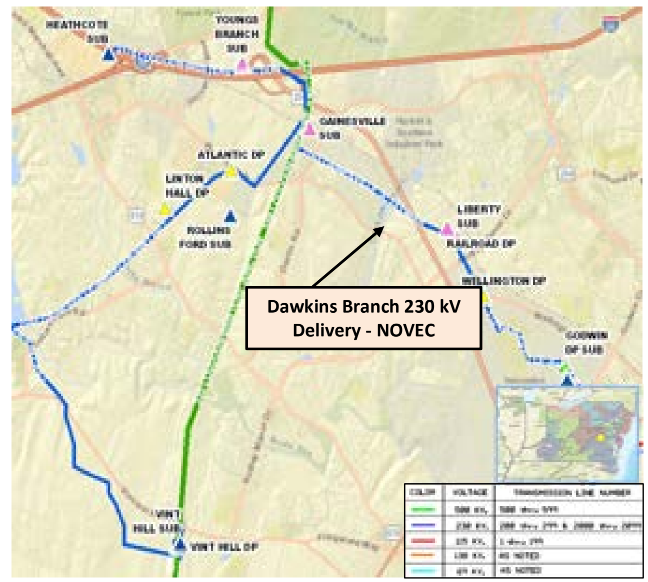
Project Driver: Customer Service

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

Problem Statement:
NOVEC has submitted a DP Request for a new substation (Dawkins Branch) to serve a data center complex in Prince William County with a total load in excess of 60 MW by 2026.

Requested in-service date is 07/01/2023.

Initial In-Service Load	Projected 2027 Load
Summer: 10.0 MW	Summer: 73.0 MW



Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2022-0019

Process Stage: Need Meeting 06/07/2022

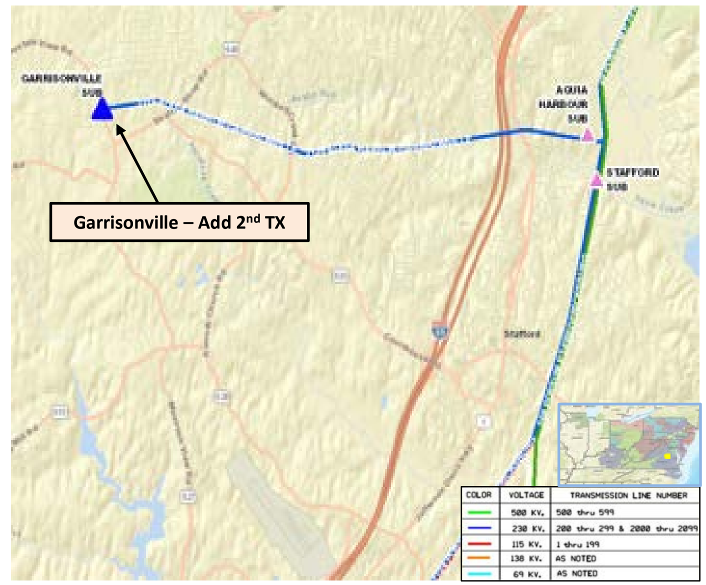
Project Driver: Customer Service

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 a 2nd distribution transformer at Garrisonville Substation in Stafford County. The new transformer is being driven by significant area load growth.

Requested in-service date is 12/31/2023.

Initial In-Service Load	Projected 2027 Load
Winter: 68.5 MW	Winter: 74.4 MW



Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2022-0020

Process Stage: Need Meeting 06/07/2022

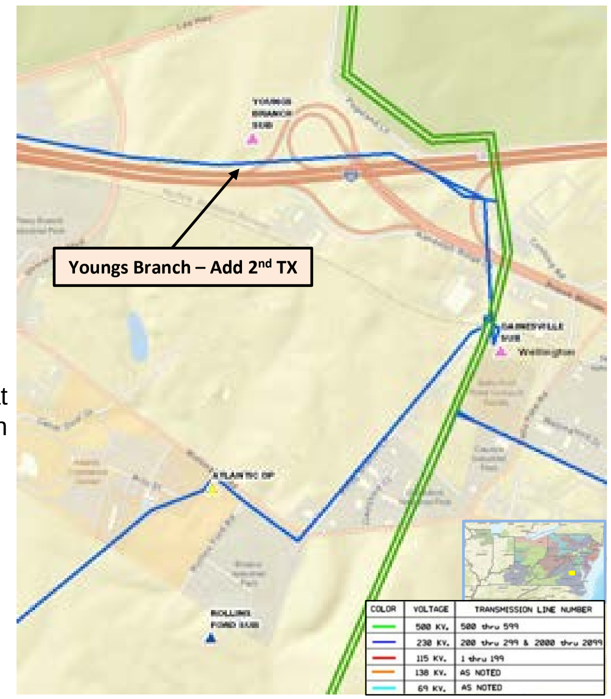
Project Driver: Customer Service

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 a 2nd distribution transformer at Youngs Branch Substation in Prince William County. The new transformer is being driven by datacenter load growth.

Requested in-service date is 10/15/2023.

Initial In-Service Load	Projected 2027 Load
Winter: 19.8 MW	Winter: 124.5 MW



Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2022-0032

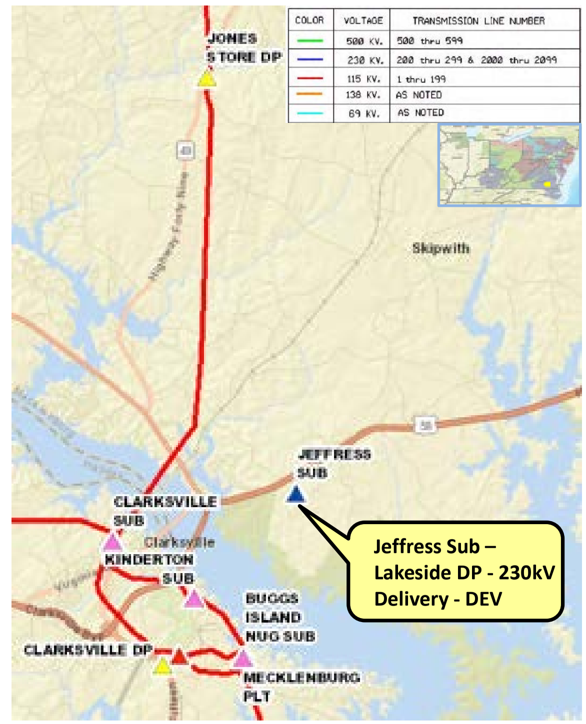
Process Stage: Need Meeting 06/07/2022

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 delivery point request (Lakeside DP) for a new delivery point to serve a data center customer in Clarksville, VA. The total load is in excess of 100 MW. The customer requests service by July 1, 2026.

Initial In-Service Load	Projected 2027 Load
Summer: 70.0 MW	Summer: 123.0 MW



Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2022-0033

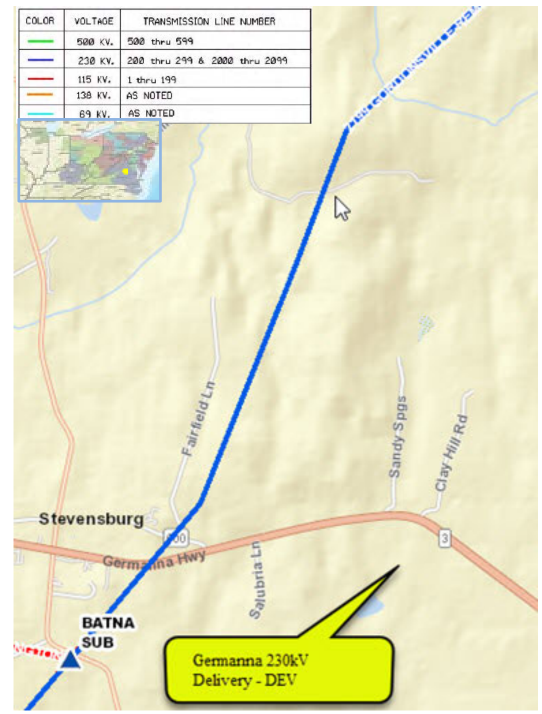
Process Stage: Need Meeting 06/07/2022

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 230kV substation (Germanna) to serve a data center complex in Culpeper County with a total projected load of 139 MW. Requested in-service date is 01/01/2025.

Initial In-Service Load	Projected 2027 Load
Summer: 78 MW	Summer: 124.6 MW



Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2022-0034

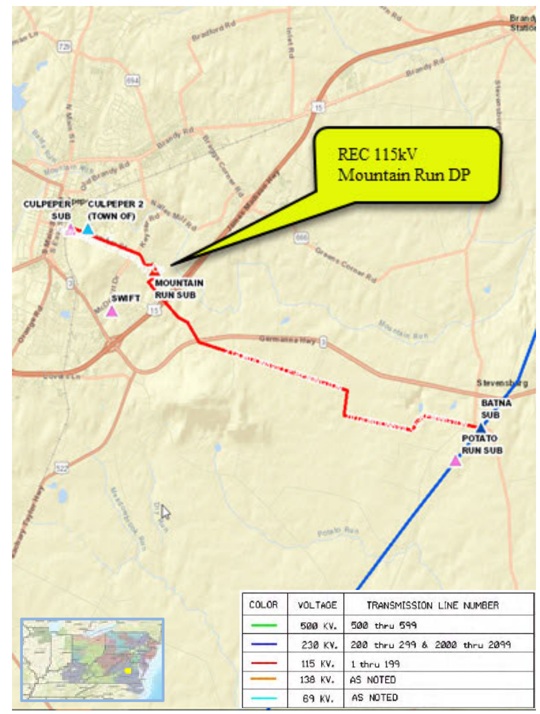
Process Stage: Need Meeting 06/07/2022

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:
Rappahannock Electric Cooperative (REC) has submitted a DP Request to increase capacity at their existing 115kV Mountain Run DP to serve a new data center complex in Culpeper County with a total projected load of 242 MW. The requested in-service date is 06/01/2024.

Initial In-Service Load	Projected 2027 Load
Summer: 39.2 MW	Summer: 111.5 MW



Solutions

Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2022-0026

Process Stage: Solutions Meeting 06/07/2022

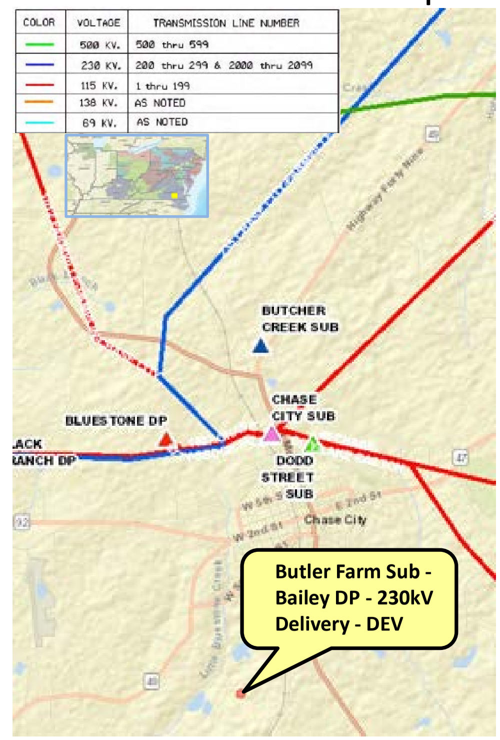
Previously Presented: Need Meeting 05/10/2022

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 delivery point request (Bailey DP) for a new delivery point to serve a data center customer in Chase City, VA. The total load is in excess of 100 MW. The customer requests service by July 1, 2025.

Initial In-Service Load	Projected 2027 Load
Summer: 1.0 MW	Summer: 74.8 MW



Dominion Transmission Zone: Supplemental
Butler Farm 230kV Delivery - DEV

Need Number: DOM-2022-0026

Process Stage: Solutions Meeting 06/07/2022

Proposed Solution:

- Obtain land and build a new 500/230kV Finneywood switching station at the intersection of Line #556 (Clover-Rawlings) and Line #235 (Cloud – Farmville).
- Cut and terminate Line #556 into Finneywood 500/230kV switching station. Cut and terminate Line #235 into Finneywood 500/230kV switching station. In the new Finneywood switching station, install two 840 MVA 500/230kV transformers, a 230kV breaker and half bus with 12 breakers and a 500kV ring bus with 6 breakers.
- Construct Butler Farm 230kV substation with four 230kV breaker ring bus to terminate two 230kV lines. Construct one new 230kV transmission line for approximately 20 miles from Clover Sub to Butler Farm Substation. Construct one new 230kV transmission line for approximately 10 miles from Finneywood Sub to Butler Farm Substation.
- New right-of-way will be needed for both transmission lines. New conductor to have a minimum summer normal rating of 1573 MVA.

Estimated Project Cost: $180.0 M (Total)

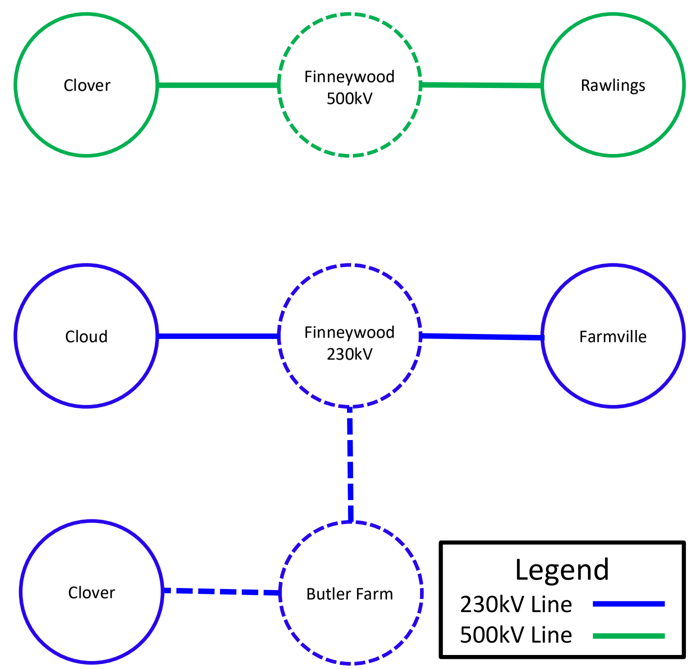
Transmission Line	$60M
500kV Substation	$100M
230kV Substation	$20M

Alternatives Considered:

No feasible alternatives

Projected In-service Date: 07/01/2025

Project Status: Engineering



Needs

Dominion Transmission Zone: Supplemental
Equipment Material Condition, Performance and Risk

Need Number: DOM-2022-0053

Process Stage: Need Meeting 09/06/2022

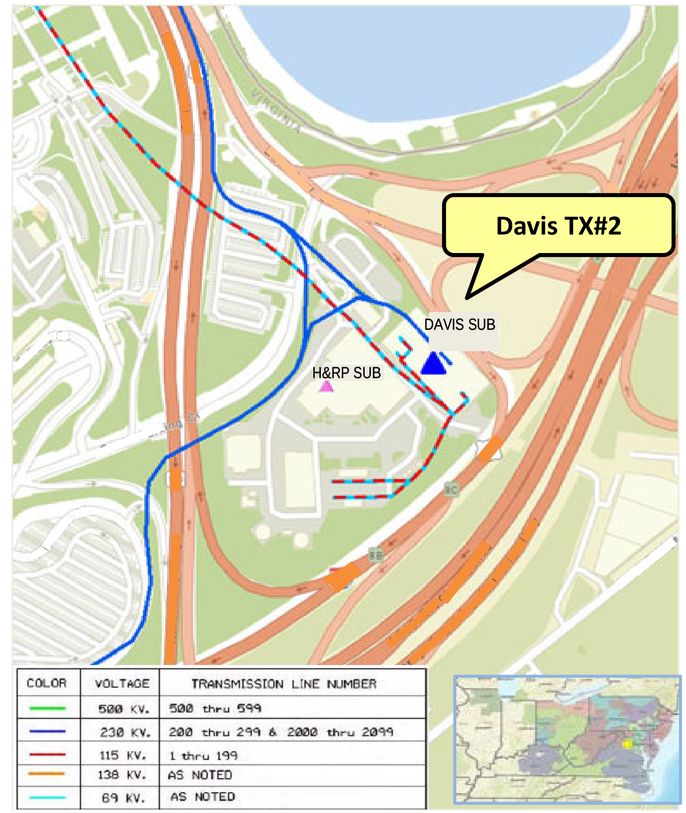
Project Driver: Equipment Material Condition, Performance and Risk

Specific Assumption References:
See details on Equipment Material Condition, Performance and Risk in Dominion's Planning Assumptions presented in December 2021.

Problem Statement:
Davis TX#2 is a 168 MVA, 230/69/13.2 kV transformer bank that was manufactured in 1990. This transformer bank has been identified for replacement based on the results of Dominion's transformer health assessment (THA) process. Detailed drivers include:

- Age (>30 years old).
- Reduced BIL ratings (2 levels below standard).
- Tertiary winding design not meeting current MVA requirement for loading.
- Degraded porcelain type bushings.

Additionally, a protection scheme update at Davis requires the addition of multiple external bushing CT's to the low-voltage and high-voltage bushings which will compromise strike distances on the bushings. The ability to add more internal CT's was not considered when the transformer was ordered in 1989.



Dominion Transmission Zone: Supplemental
Equipment Material Condition, Performance and Risk

Need Number: DOM-2022-0051

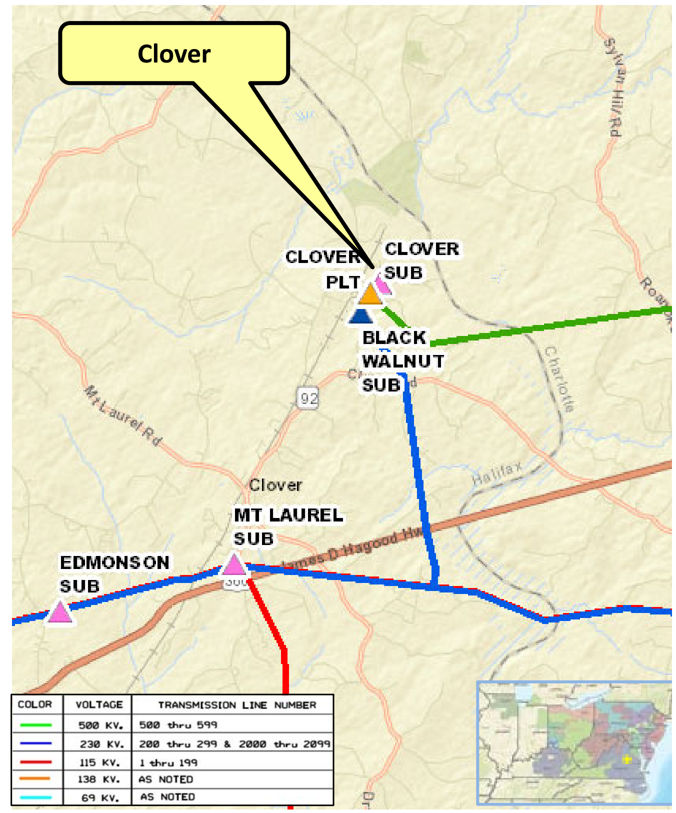
Process Stage: Need Meeting 09/06/2022

Project Driver: Equipment Material Condition, Performance and Risk

Specific Assumption References:
See details on Equipment Material Condition, Performance and Risk in Dominion's Planning Assumptions presented in December 2021.

Problem Statement:

Dominion Energy has identified a need to replace five 230kV breakers (L912, 206812, SX1212, SX12T235 & 23512) and six disconnect switches (SX1214, SX1215, SX1218, 23518, 23514, & 23515) at Clover Substation. These breakers and switches were manufactured in 1993 and are at end of life. Additionally, there has been an increase in maintenance issues and difficulties in obtaining spare parts.



Dominion Transmission Zone: Supplemental
Equipment Material Condition, Performance and Risk

Need Number: DOM-2022-0052

Process Stage: Need Meeting 09/06/2022

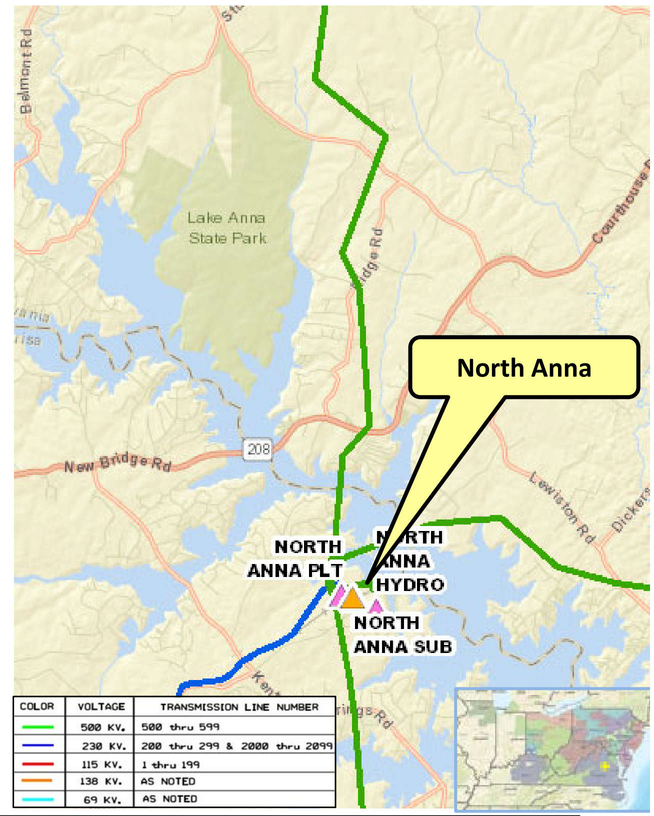
Project Driver: Equipment Material Condition, Performance and Risk

Specific Assumption References:
See details on Equipment Material Condition, Performance and Risk in Dominion's Planning Assumptions presented in December 2021.

Problem Statement:

Dominion Energy has identified a need to replace 230kV equipment at North Anna substation:

- Breaker 25502 at end of life, manufactured in 1993
- Center breaker switches H304, H305, 25504 and 25505 at end of life about 20 years old
- Line #255 wave trap at end of life 21 years old
- Transformer #3 high side circuit switcher H302 due to fault interruption requirements



Solutions

Dominion Transmission Zone: Supplemental
Equipment Material Condition, Performance and Risk

Need Number: DOM-2022-0023

Process Stage: Solutions Meeting 09/06/2022

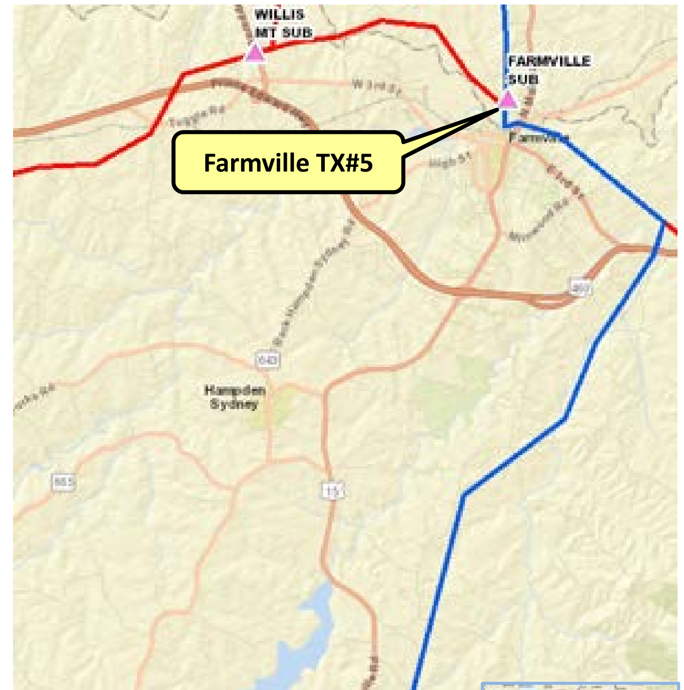
Previously Presented: Need Meeting 04/12/2022

Project Driver: Equipment Material Condition, Performance and Risk

Specific Assumption References:
See details on Equipment Material Condition, Performance and Risk in Dominion's Planning Assumptions presented in December 2021.

Problem Statement:
Farmville TX#5 is a 168 MVA, 230/115/13.2 kV transformer bank that was manufactured in 1981. This transformer bank has been identified for replacement based on the results of Dominion's transformer health assessment (THA) process. Detailed drivers include:

- Age (>40 years old).
- Reduced BIL ratings (3 levels below standard).
- Tertiary winding design not meeting current MVA requirement for loading.
- Degraded porcelain type bushings.
- Oil DGA indicates high CO and CO2 levels; potential break down of dielectric paper insulation on main current carrying conductors inside the transformer.
- THA score less than 80.



COLOR	VOLTAGE	TRANSMISSION LINE NUMBER
	500 KV.	500 thru 599
	230 KV.	200 thru 299 & 2000 thru 2099
	115 KV.	1 thru 199
	138 KV.	AS NOTED
	69 KV.	AS NOTED

Dominion Energy

Dominion Transmission Zone: Supplemental
Replace Farmville TX#5 - DEV

Need Number: DOM-2022-0023
Process Stage: Solutions Meeting 09/06/2022

Proposed Solution:
Replace Farmville TX#5 with a new three-phase, 230/115/13.2 kV, 168 MVA unit.
Include other ancillary equipment (high side breaker, arresters, switches, relays, etc.) as needed.

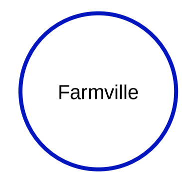
Estimated Project Cost: $6.4 M

Alternatives Considered:
None

Projected In-service Date: 11/30/2023

Project Status: Engineering

Model: 2025 RTEP



Dominion Transmission Zone: Supplemental
Equipment Material Condition, Performance and Risk

Need Number: DOM-2022-0024

Process Stage: Solutions Meeting 09/06/2022

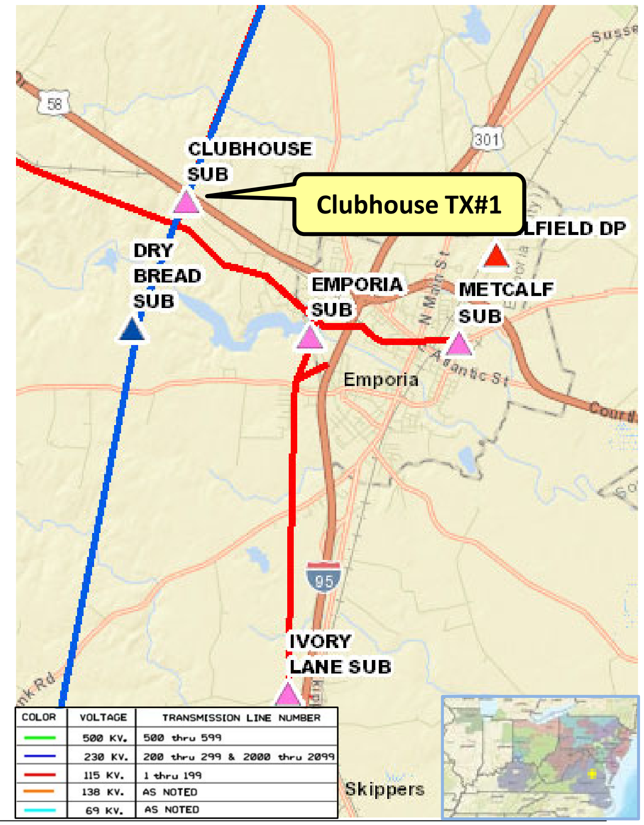
Previously Presented: Need Meeting 04/12/2022

Project Driver: Equipment Material Condition, Performance and Risk

Specific Assumption References:
See details on Equipment Material Condition, Performance and Risk in Dominion's Planning Assumptions presented in December 2021.

Problem Statement:
Clubhouse TX#1 is a 168 MVA, 230/115/13.2 kV transformer bank that was manufactured in 1981. This transformer bank has been identified for replacement based on the results of Dominion's transformer health assessment (THA) process. Detailed drivers include:

- Age (>40 years old).
- Reduced BIL ratings (3 levels below standard).
- Tertiary winding design not meeting current MVA requirement for loading.
- Degraded porcelain type bushings.
- Oil DGA indicates high CO and CO2 levels; potential break down of dielectric paper insulation on main current carrying conductors inside the transformer.
- THA score less than 80.



Dominion Energy

Dominion Transmission Zone: Supplemental
Replace Clubhouse TX#1 - DEV

Need Number: DOM-2022-0024
Process Stage: Solutions Meeting 09/06/2022

Proposed Solution:
Replace Clubhouse TX#1 with a new three-phase, 230/115/13.2 kV, 224 MVA unit.
Include other ancillary equipment (arresters, switches, relays, etc.) as needed.

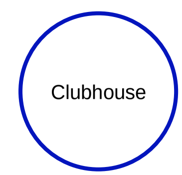
Estimated Project Cost: $6.6 M

Alternatives Considered:
None

Projected In-service Date: 05/31/2023

Project Status: Engineering

Model: 2025 RTEP



Dominion Transmission Zone: Supplemental Customer Load Request

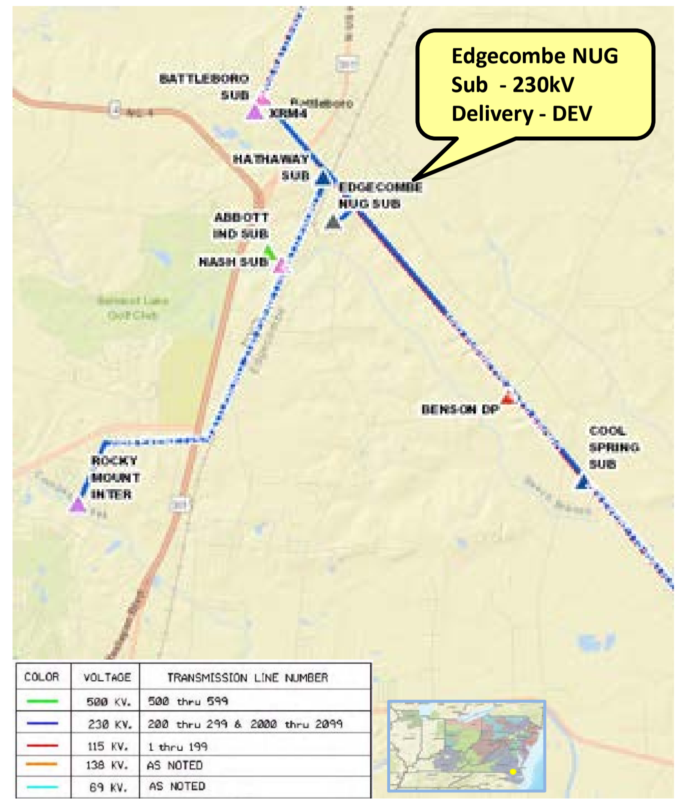
Need Number: DOM-2022-0049
Process Stage: Solutions Meeting 09/06/2022
Previously Presented: Need Meeting 08/09/2022

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 delivery point request to serve a crypto mining customer in Battleboro, NC. The total load is less than 100 MW. The customer requests service by December 30, 2022.

Initial In-Service Load	Projected 2027 Load
Winter: 95.0 MW	Summer: 95.0 MW



Dominion Transmission Zone: Supplemental
Edgecombe NUG Sub – 230kV Delivery- DEV

Need Number: DOM-2022-0049
Process Stage: Solutions Meeting 09/06/2022

Proposed Solution:
Provide single 230kV feed to the customer from Edgecombe NUG sub.

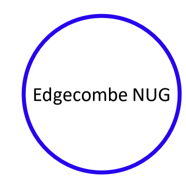
Estimated Project Cost: $0.75 M

Alternatives Considered:
No feasible alternatives

Projected In-service Date: 12/30/2022

Project Status: Engineering

Model: 2025 RTEP



Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2022-0033
Process Stage: Solutions Meeting 09/06/2022
Previously Presented: Need Meeting 06/07/2022

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 230kV substation (Germanna) to serve a data center complex in Culpeper County with a total projected load of 139 MW. Requested in-service date is 01/01/2025.

Initial In-Service Load	Projected 2027 Load
Summer: 78 MW	Summer: 124.6 MW

Dominion Transmission Zone: Supplemental
Germanna 230kV Delivery Point

Need Number: DOM-2022-0033

Process Stage: Solutions Meeting 09/06/2022

Proposed Solution:

Interconnect the new substation by cutting and extending Line #2199 (Remington-Gordonsville) to the proposed Germanna Substation. Lines to terminate in a 230kV four-breaker ring arrangement with an ultimate arrangement of a six-breaker ring.

Estimated Project Cost: $55 M

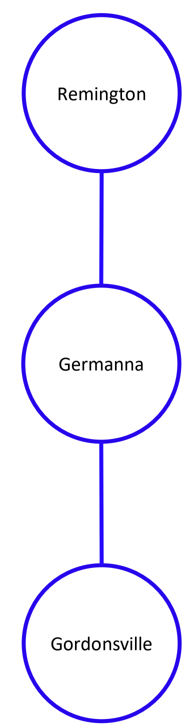
Alternatives Considered:

No feasible alternatives

Projected In-service Date: 01/01/2025

Project Status: Engineering

Model: DNH2025, RTEP2026



Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2022-0034
Process Stage: Solutions Meeting 09/06/2022
Previously Presented: Need Meeting 06/07/2022

Project Driver: Customer Service

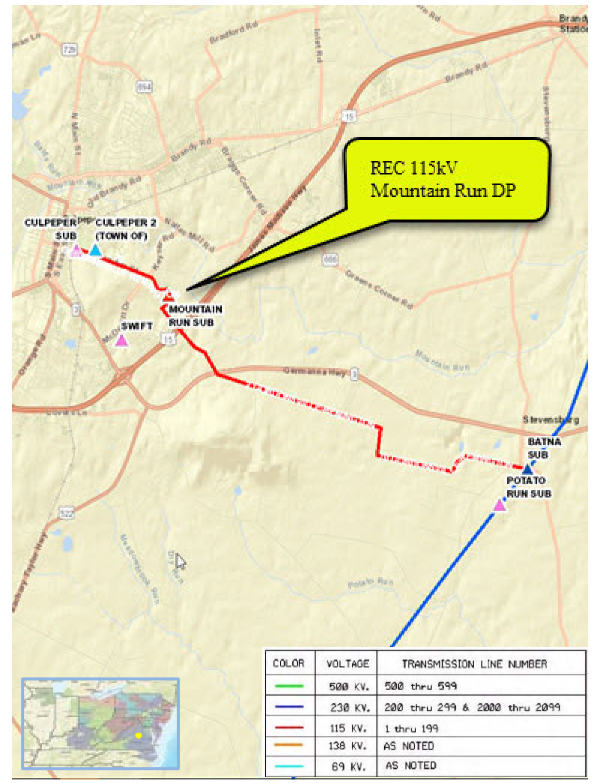
Specific Assumption References:

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

Problem Statement:

Rappahannock Electric Cooperative (REC) has submitted ~~a~~ two DP Requests. One to increase capacity at their existing 115kV Mountain Run DP and one for a new substation in the vicinity of the Mountain Run DP ~~to increase capacity at their existing 115kV Mountain Run DP~~ to serve a new data center complex in Culpeper County with a total projected load of ~~242~~ 350 MW. The requested in-service date is 06/01/2024.

Initial In-Service Load	Projected 2027 Load
Summer: ~~39.2~~ 51 MW	Summer: ~~111.5~~ 140.7 MW



Dominion Transmission Zone: Supplemental Mountain Run 230kV Delivery - REC

Need Number: DOM-2022-0034

Process Stage: Solutions Meeting 09/06/2022

Proposed Solution:

1. Build new Kyser switching station to feed REC's existing Mountain Run DP. The initial build will include four 230kV breakers, associated bus, switches, etc.
2. Build new Cirrus switching station to feed REC's new DP. The initial build will include four 230kV breakers, associated bus, switches, etc.
3. Wreck and rebuild approximately five miles of existing double-circuit 115kV Line #2 and Line #70, using 230kV construction, from Mountain Run Junction to the new Kyser/Cirrus switching stations.
4. Cut 230kV Line #2199 at Mountain Run Junction and feed the rebuilt double-circuit line to Kyser/Cirrus switching stations.
5. Re-connect the remaining sections of 115kV Lines #2 and Line #70 at Mountain Run Junction.
6. REC to convert their existing Mountain Run DP to 230kV.
7. Install a 230/115kV – 168 MVA transformer and spare at Cirrus switching station to maintain the 115kV feed to Culpeper and Culpeper DP.

Estimated Project Cost: $60 M (Total)

Transmission Line - $22M

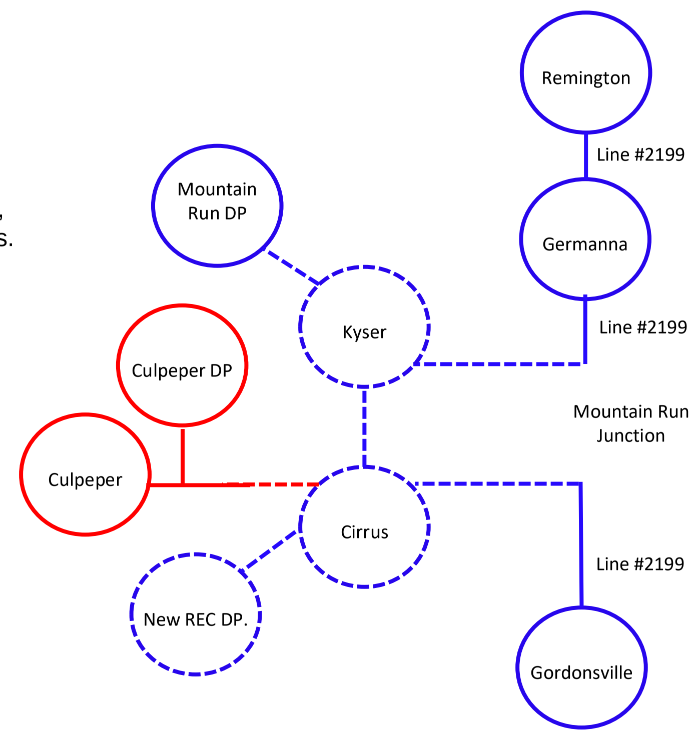
Substation - $38M

Alternatives Considered: No feasible alternatives

Projected In-service Date: 12/30/2025

Project Status: Conceptual

Model: 2025 RTEP



Dominion Transmission Zone: Supplemental Do No Harm Analysis

Need Number: DOM-2021-0016-DNH & DOM-2021-0020-DNH
Process Stage: Solution Meeting 09/06/2022
Project Driver: Do No Harm Analysis

Specific Assumption References:

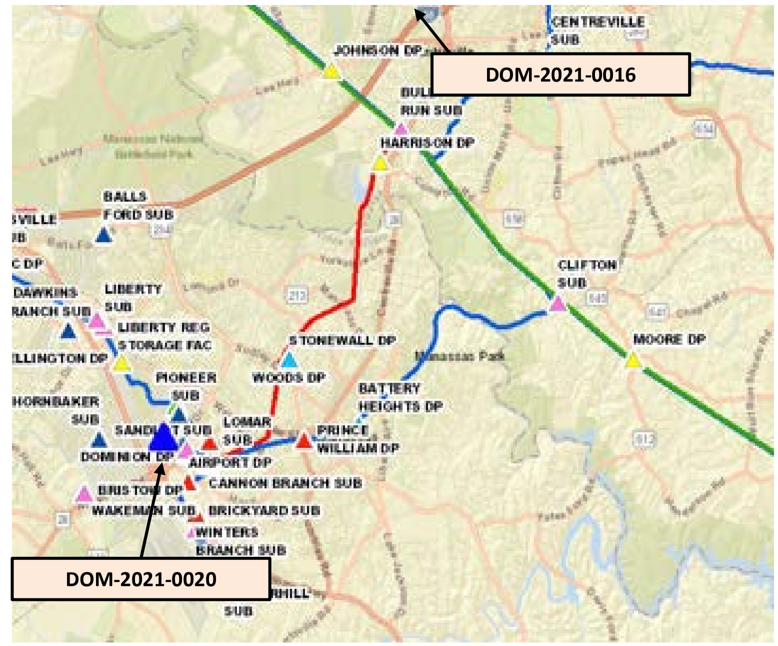
Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria.

Problem Statement:

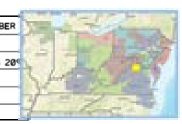
PJM has identified N-1-1 thermal violations on the following facility in the 2022 Do-No-Harm analysis:

- Ox-Braddock Line
  - Contingency Scenario: DVP_P1-2: LN 541 and DVP_P1-2: LN 2022

The violations are caused by previously presented Supplemental Projects DOM-2021-0016 & DOM-2021-0020 in the Dominion Zone.



COLOR	VOLTAGE	TRANSMISSION LINE NUMBER
	500 KV.	500 thru 599
	230 KV.	200 thru 299 & 2000 thru 20[illegible]
	115 KV.	1 thru 199
	138 KV.	AS NOTED
	69 KV.	AS NOTED



Dominion Transmission Zone: Supplemental
Do No Harm Analysis

Need Number: DOM-2021-0016-DNH & DOM-2021-0020-DNH

Process Stage: Solution Meeting 09/06/2022

Proposed Solution:
Rebuild approx. 7.9 miles of double-circuit Line from Ox to Braddock and partial Line#2097 (Ox-Idylwood) to current 230kV standards. The normal summer rating of the line conductor will be 1573 MVA.

Estimated Project Cost: $43.5M (Total)

Transmission Line Cost: $37.0M

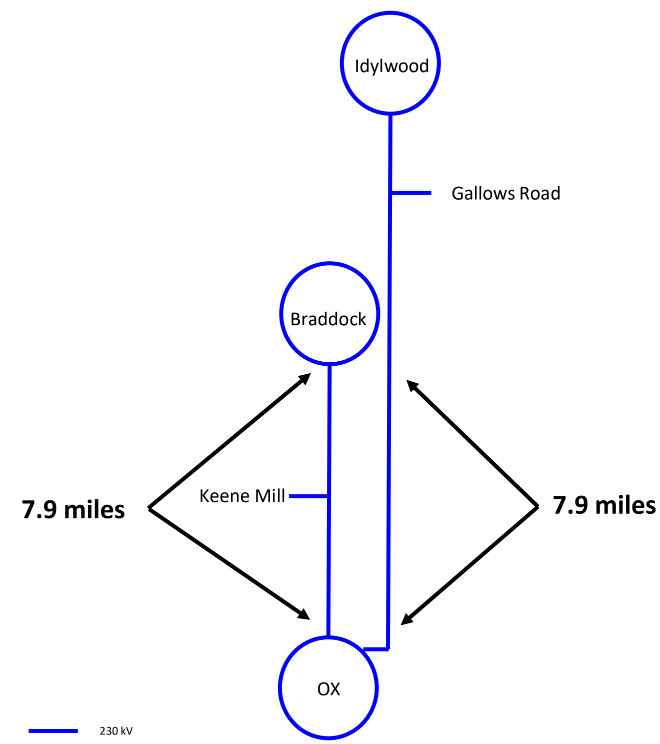
Substation Cost: $6.5.0M

Alternatives Considered:
No feasible alternatives

Projected In-service Date: 06/30/2027

Project Status: Conceptual

Model: 2025 RTEP



Dominion Transmission Zone: Supplemental Do No Harm Analysis

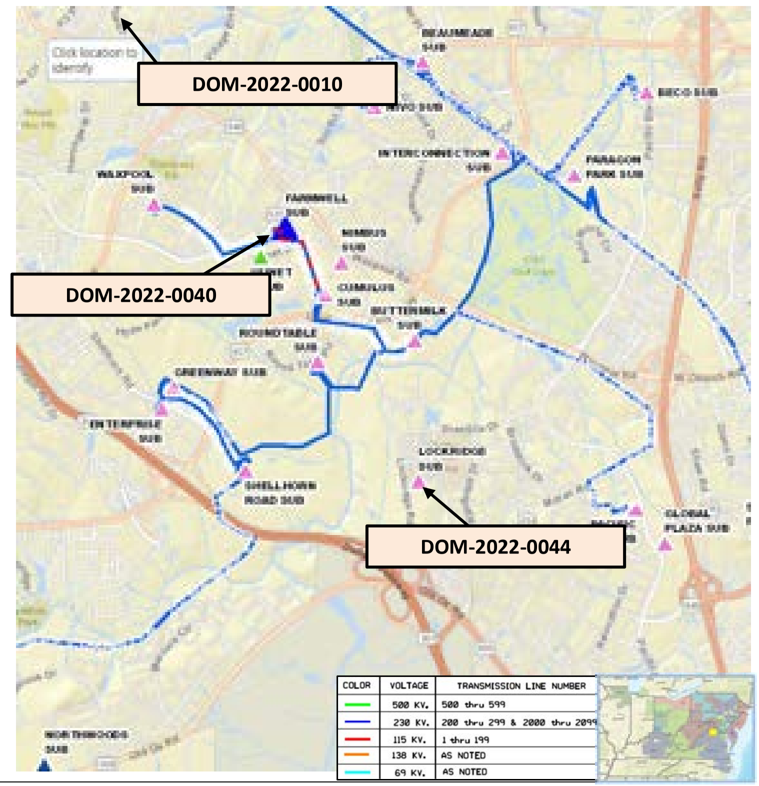
Need Number: DOM-2022-0010-DNH, DOM-2022-0040-DNH, & DOM-2022-0044-DNH
Process Stage: Solution Meeting 09/06/2022
Project Driver: Do No Harm Analysis

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

Problem Statement:
PJM has identified N-1-1 thermal violations on the following facilities in the 2022 Do-No-Harm analysis:

- Loudoun 500-230 kV TX#1
  - Contingency Scenario: DVP_P1-2: LN 502 and DVP_P1-2: LN 584
- Loudoun 500-230 kV TX#2
  - Contingency Scenario: DVP_P1-2: LN 502 and DVP_P1-2: LN 584

The violations are caused by previously presented Supplemental Projects DOM-2022-0010, DOM-2022-0040, and DOM-2022-0044 in the Dominion Zone.



Dominion Transmission Zone: Supplemental Do No Harm Analysis

Need Number: DOM-2022-0010-DNH, DOM-2022-0040-DNH, & DOM-2022-0044-DNH

Process Stage: Solution Meeting 09/06/2022

Proposed Solution:

- Install (2) 1400MVA 500-230 kV transformers and associated 500kV and 230kV equipment (breakers, switches, leads) at a new Substation (called Auburn Farm) near Loudoun substation
- Cut and loop 500kV line #559 (Mosby–Clifton) as well as line #569 (Loudoun–Morrisville) as the 500kV sources into Auburn Farm Substation
- Cut and loop 230kV line #2008 (Loudoun–Cub Run) as well as line #2173 (Loudoun–Elklick) as the 230kV sources into Auburn Farm Substation

Estimated Project Cost: $115.0M (Total)

Transmission Line Cost: $15.0M

Substation Cost: $100.0M

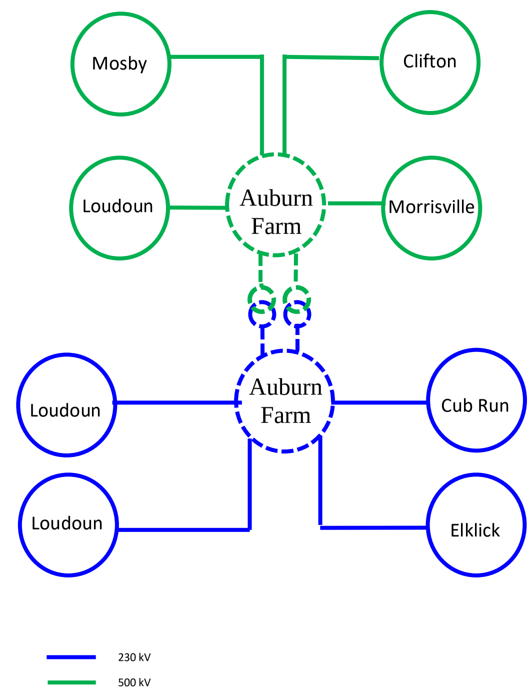
Alternatives Considered:

No feasible alternatives

Projected In-service Date: 06/30/2027

Project Status: Conceptual

Model: 2025 RTEP



Dominion Transmission Zone: Supplemental Do No Harm Analysis

Need Number: DOM-2022-0046-DNH & DOM-2022-0047-DNH
Process Stage: Solutions Meeting 09/06/2022
Project Driver: Do No Harm Analysis

Specific Assumption References:

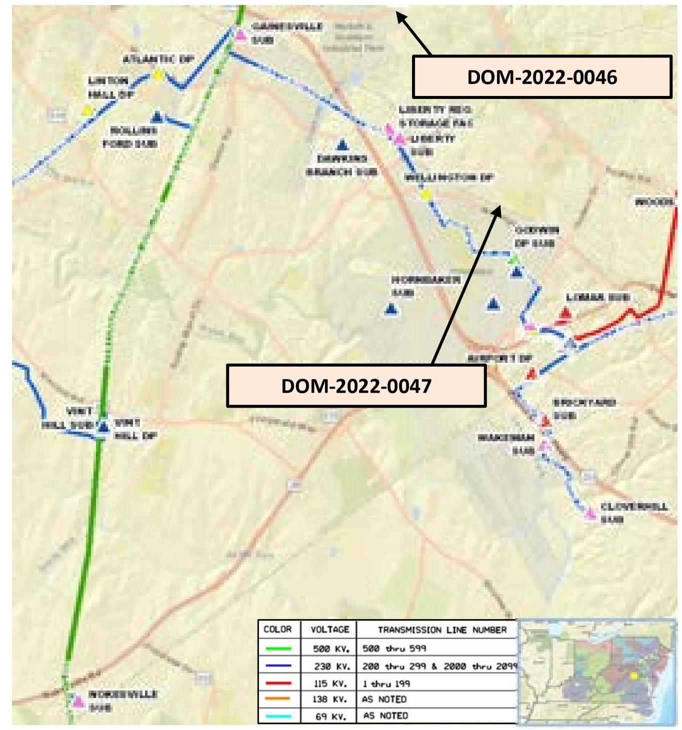
Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria.

Problem Statement:

PJM has identified N-1-1 thermal violations on the following separate facilities in the 2022 Do-No-Harm analysis:

- Line #2101 (Nokesville to Bristers Segment)
  - Contingency Scenario: DVP_P1-2: LN 569 and DVP_P1-2: LN 539
- Bristers 500-230 kV TX#1
  - Contingency Scenario: DVP_P1-3: 8BRISTER-TX#1 and DVP_P1-2: LN 539
- Bristers 500-230 kV TX#2
  - Contingency Scenario: DVP_P1-3: 8BRISTER-TX#2 and DVP_P1-2: LN 539

The violations are caused by previously presented Supplemental Projects DOM-2021-0046 and DOM-2021-0047 in the Dominion Zone.



Dominion Transmission Zone: Supplemental Do No Harm Analysis

Need Number: DOM-2022-0046-DNH & DOM-2022-0047-DNH
Process Stage: Solutions Meeting 09/06/2022

Proposed Solution (Part 1 of 2):
To address: 230 kV Line Violation
- Reconductor approximately 9.2 miles of Line #2101 (Nokesville to Bristers) using a higher capacity conductor as well as terminal equipment upgrades to achieve a minimum normal summer conductor rating of 1573 MVA.

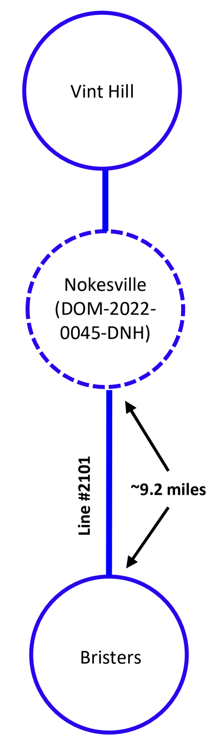
Estimated Project Cost: $23.0M

Alternatives Considered:
No feasible alternatives

Projected In-service Date: 12/31/2027

Project Status: Conceptual

Model: 2025 RTEP



Dominion Transmission Zone: Supplemental Do No Harm Analysis

Need Number: DOM-2022-0046-DNH & DOM-2022-0047-DNH
Process Stage: Solutions Meeting 09/06/2022

Proposed Solution (Part 2 of 2):
To address: Bristers 500-230 kV TX #1 & 2 Violation

- Install (2) 1400 MVA 500-230 kV transformer and associated 500 kV and 230 kV equipment (breakers, switches, leads) at Vint Hill Substation to supply the area with a 500 kV source
- Cut and loop 500 kV line #535 (Loudoun – Meadowbrook) and #569 (Loudoun - Morrisville) as the 500 kV sources into the proposed 500 kV ring bus
- Vint Hill Substation will be expanded to the north of the existing site to accommodate the 500 kV ring required for the addition of the new transformers
- Existing terminations for 230 kV line #2174 (Wheeler – Vint Hill), line #2101 (Bristers – Vint Hill), and line #2163 (Liberty – Vint Hill) will be rearranged to terminate into the expanded Vint Hill Substation
- 230 kV line #2114 (Remington CT – Rollins Ford) will also be cut and looped into the expanded Vint Hill Substation due to spatial constraints along the existing right-of-way

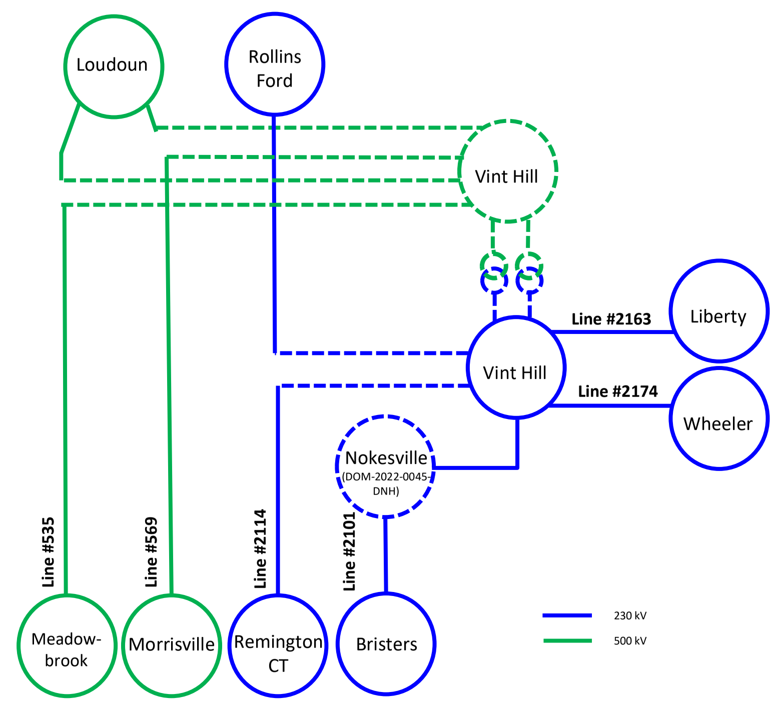
Estimated Project Cost: $115.0M (Total)
Transmission Line Cost: $5.0M
Substation Cost: $110.0M

Alternatives Considered:
No feasible alternatives

Projected In-service Date: 12/31/2027

Project Status: Conceptual

Model: 2025 RTEP



Cancellation

Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2021-0018

Process Stage: Cancellation Meeting 09/06/2022, Initial TEAC Meeting 04/06/2021

Project Driver: Customer Service

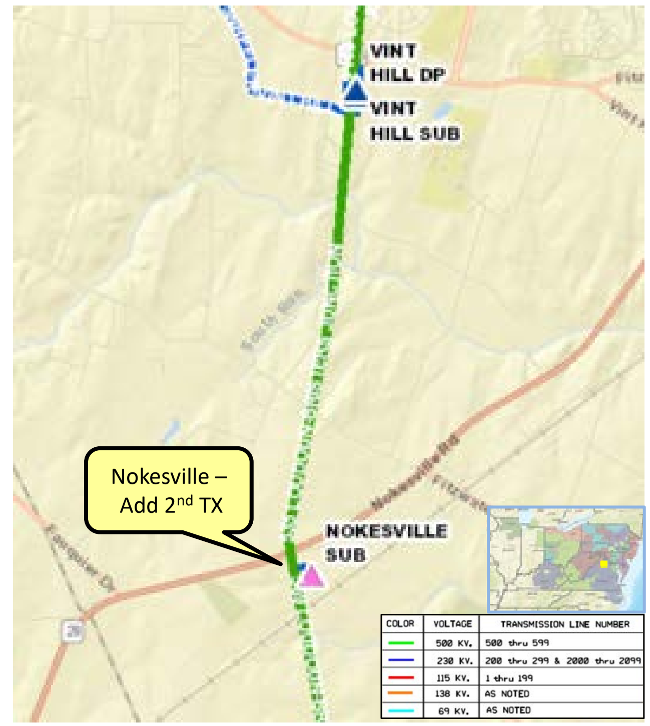
Specific Assumption References:

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

Problem Statement:

DEV Distribution no longer has the need to add a 2nd distribution transformer at Nokesville Substation in Prince William County due to load not growing in the area as anticipated. The requested in-service date was 11/01/2022. The original need slide was presented on 04/06/2021 and the solution slide on 05/11/2021.

Initial In-Service Load	Projected 2027 Load
Summer: 27.2 MW	Summer: 63.4 MW



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.

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: This project does not include any distribution or generation facility. The Company will provide service to both the existing Mountain Run Substation and the proposed Mountain Run 3 Substation at 230 kV. 115 kV will be supplied to the Culpeper Substation and the Town of Culpeper DP. See also Section I.A. and Attachment I.G.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (ROW)

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

Response: The Project includes the wreck and rebuild of Lines #2 and #70 and the construction of approximately 5.2 miles of a new, overhead 230 kV double circuit transmission line loop consisting of the 230 kV Gordonsville-Cirrus Line #2199, the 230 kV Cirrus-Keyser Line #2278 and the 230 kV Keyser-Germanna Line #2276 (collectively, the "Cirrus-Keyser 230 kV Loop"). New right-of-way is needed to expand the existing right-of-way by 25 feet at the Mountain Run Junction, Structure #2199/100. New right-of-way on the REC Customer's property is also needed to connect the Cirrus Station to the existing Line #70. Temporary right-of-way for approximately 5.4 miles from the Mountain Run Junction to existing Structure #70/1257 will also be needed during construction for the installation of a temporary line.

No alternative routes are proposed because alternatives to the Project would require extensive acquisitions of new permanent rights-of-way. See Section II.A.9 of the Appendix for an explanation of the Company's route selection process.

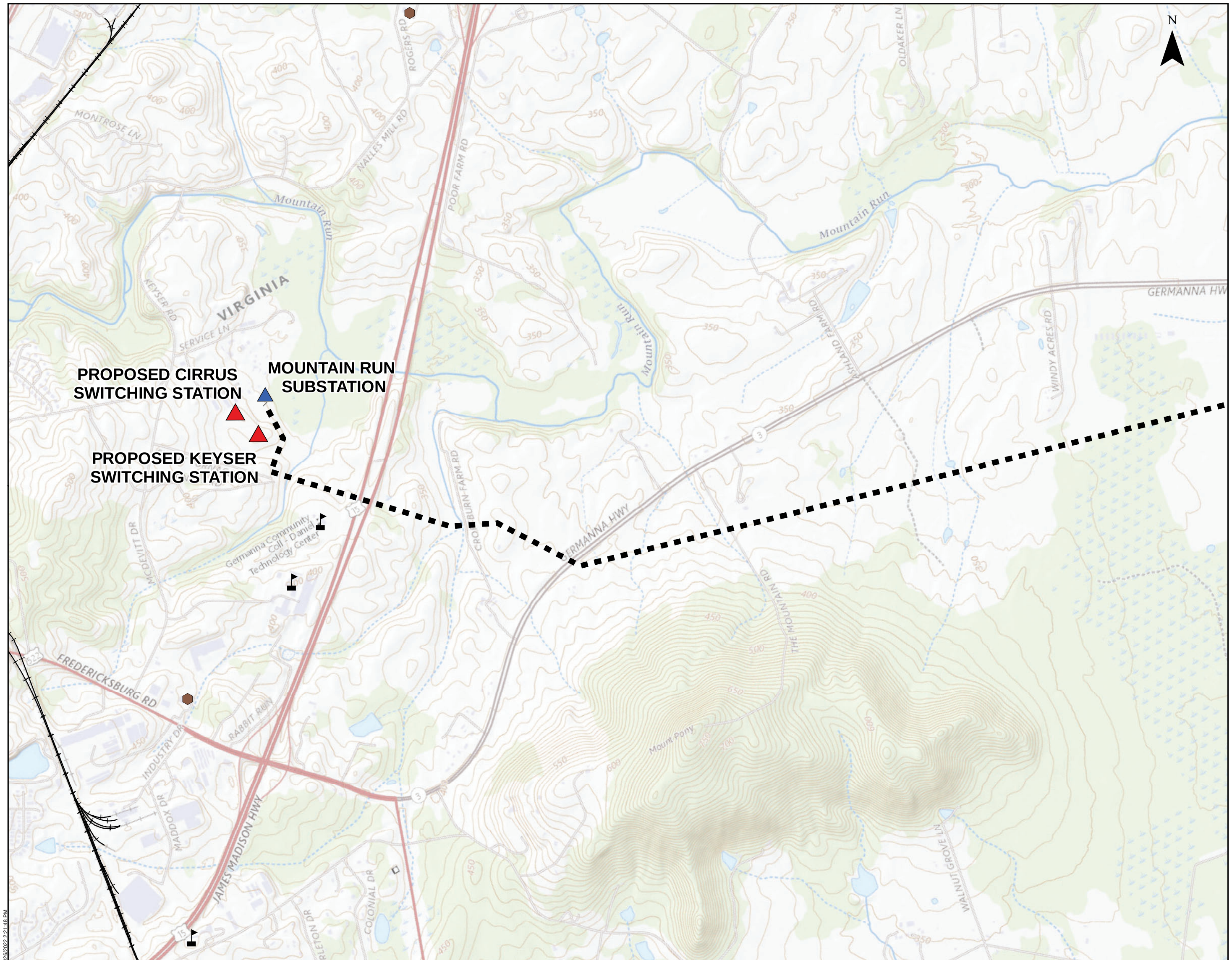
II. DESCRIPTION OF THE PROPOSED PROJECT

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. The Project is generally located within the existing Lines #70 and #2 right-of-way for approximately 5.2 miles from the Mountain Run Junction to the Keyser and Cirrus Stations. No other utility lines are co-located within the existing right-of-way. The project crosses through a Virginia Outdoors Foundation easement near the Mountain Run Junction. No portion of the right-of-way is proposed to be quitclaimed or relinquished.

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



ATTACHMENT II.A.2
ENVIRONMENTAL CONSTRAINTS MAP
Cirrus - Keyser 230 kV Loop and Related Projects
Culpeper County, Virginia

Owner/ Applicant:
Dominion Energy Virginia

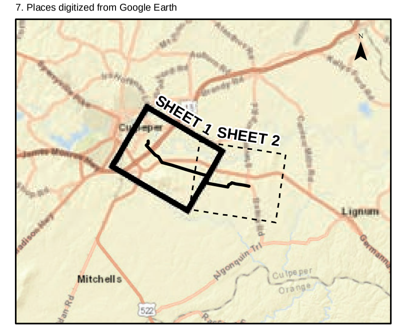
C2 Env Project:	Prepared By:	Date:
0245	TMP	07/28/22

0 750 1,500 3,000 Feet
Scale is 1 IN = 1,500 FT when printed at original size of 11x17

LEGEND

- Project Centerline
- Proposed Dominion Substation
- Existing REC Substation
- Civil War Trust Land
- Privately Owned Conservation Land
- Virginia DHR Easement
- Virginia Outdoors Foundation Easement
- School
- Church
- Railroad

Notes:
1. Basemap from ESRI Topographic and World Street Map
2. Project centerline provided by Dominion
3. Railroads from VGIN
4. Conservation lands and easements from VDCR and USGS PADUS
6. Historic resources from VDHR
7. Places digitized from Google Earth



C2 ENVIRONMENTAL
Dominion Energy

SHEET 1 OF 2

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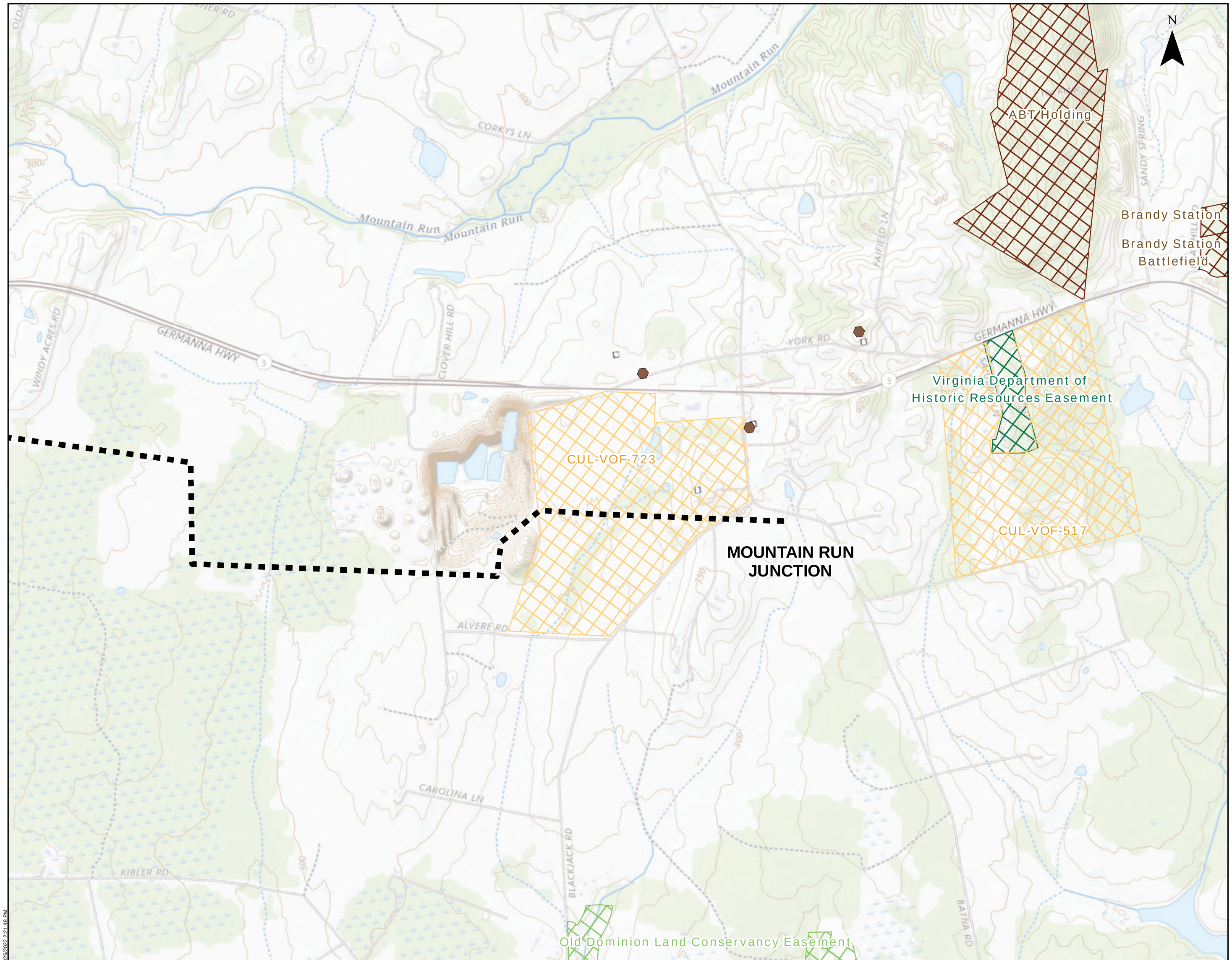


ATTACHMENT II.A.2
ENVIRONMENTAL CONSTRAINTS MAP

Cirrus - Keyser 230 kV Loop and Related Projects

Culpeper County, Virginia

Owner/ Applicant:
Dominion Energy Virginia

C2 Env Project:	Prepared By:	Date:
0245	TMP	07/28/22

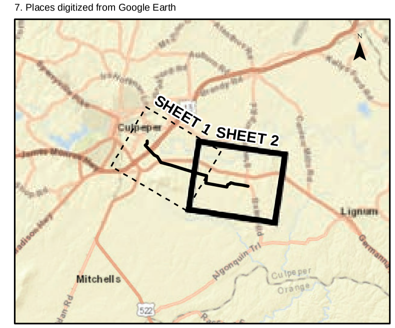
0 750 1,500 3,000 Feet

Scale is 1 IN = 1,500 FT when printed at original size of 11x17

LEGEND

- Project Centerline
- Proposed Dominion Substation
- Existing REC Substation
- Civil War Trust Land
- Privately Owned Conservation Land
- Virginia DHR Easement
- Virginia Outdoors Foundation Easement
- School
- Church
- Railroad

Notes:
1. Basemap from ESRI Topographic and World Street Map
2. Project centerline provided by Dominion
3. Railroads from VGIN
4. Conservation lands and easements from VDCR and USGS PADUS
6. Historic resources from VDHR
7. Places digitized from Google Earth



C2 ENVIRONMENTAL

Dominion Energy

SHEET 2 OF 2

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II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (ROW)

3. Provide a drawing(s) of the ROW cross section showing typical transmission line structure placements referenced to the edge of the right-of-way. This drawing should include:

a. ROW width for each cross section drawing;

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

c. Existing utility facilities on the ROW;

Response: See Attachment I.G.

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: As proposed, the Project contemplates that the Company will wreck Line #2 and Line #70, both 115 kV lines, traveling from Mountain Run Junction to the Mountain Run Substation and rebuild these lines as a double-circuit 230 kV Line #2199 and Line #2276 entirely within the existing right-of-way. For 230 kV Line #2199/#2276 to cross-over 115 kV Line #2, an additional 25 feet of right-of-way is needed for installation of the required 3-pole structures and to meet forestry clearances.

Lines #2283 and #2284 connect the Keyser Station to the existing Mountain Run Substation (Mountain Run 1 and 2) and will be built in new right-of-way provided by the REC Customer.

Lines #2288 and #2289 will run from the proposed Cirrus Station to the proposed Mountain Run 3 Substation and will not require any new right-of-way.

The Company will also re-route Line #70 into Cirrus Station by constructing a new section of overhead 115 kV single circuit transmission line approximately 0.07-miles in length in a new right-of-way provided by the REC Customer.

To ensure that the Company can still meet the town of Culpeper's demand needs during construction, the Company will also need to obtain a temporary construction easement to build an approximately 5.4 mile temporary 115 kV line from existing Structure #2/1201 (70/53) to existing Structure #70/1257. See Section I.A. for a description of the temporary line and right-of-way needed during construction. Upon completion of construction of the Cirrus-Keyser 230 kV Loop, the temporary line will be removed.

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.

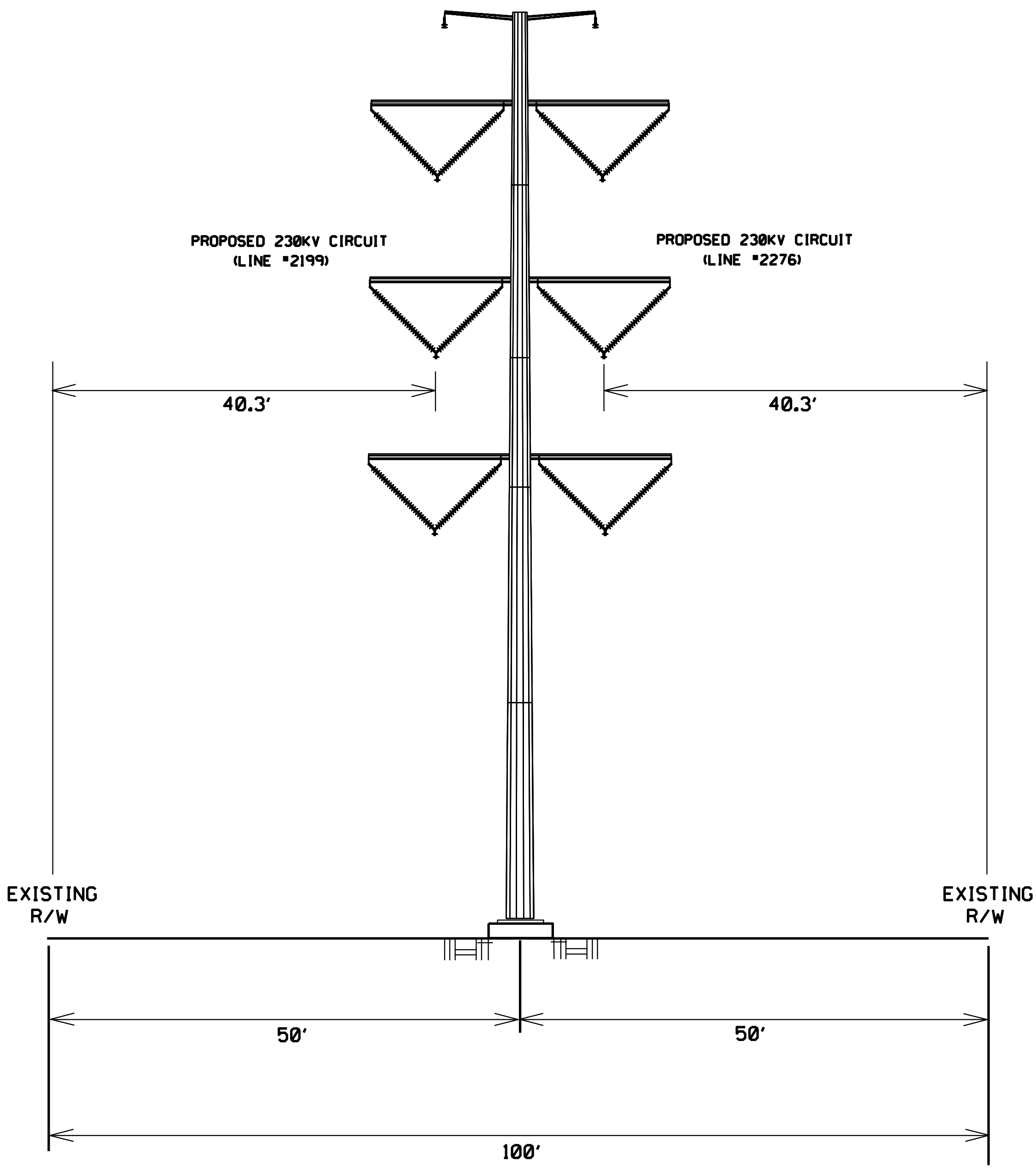
Response: See the following attachments:

- Attachment II.A.5.a
- Attachment II.A.5.b
- Attachment II.A.5.c
- Attachment II.A.5.d

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

LINE #2199 GORDONSVILLE - CIRRUS
LINE #2276 CIRRUS - REMINGTON

PROPOSED CONFIGURATION



TYPICAL RIGHT OF WAY LOOKING TOWARD CIRRUS SUBSTATION

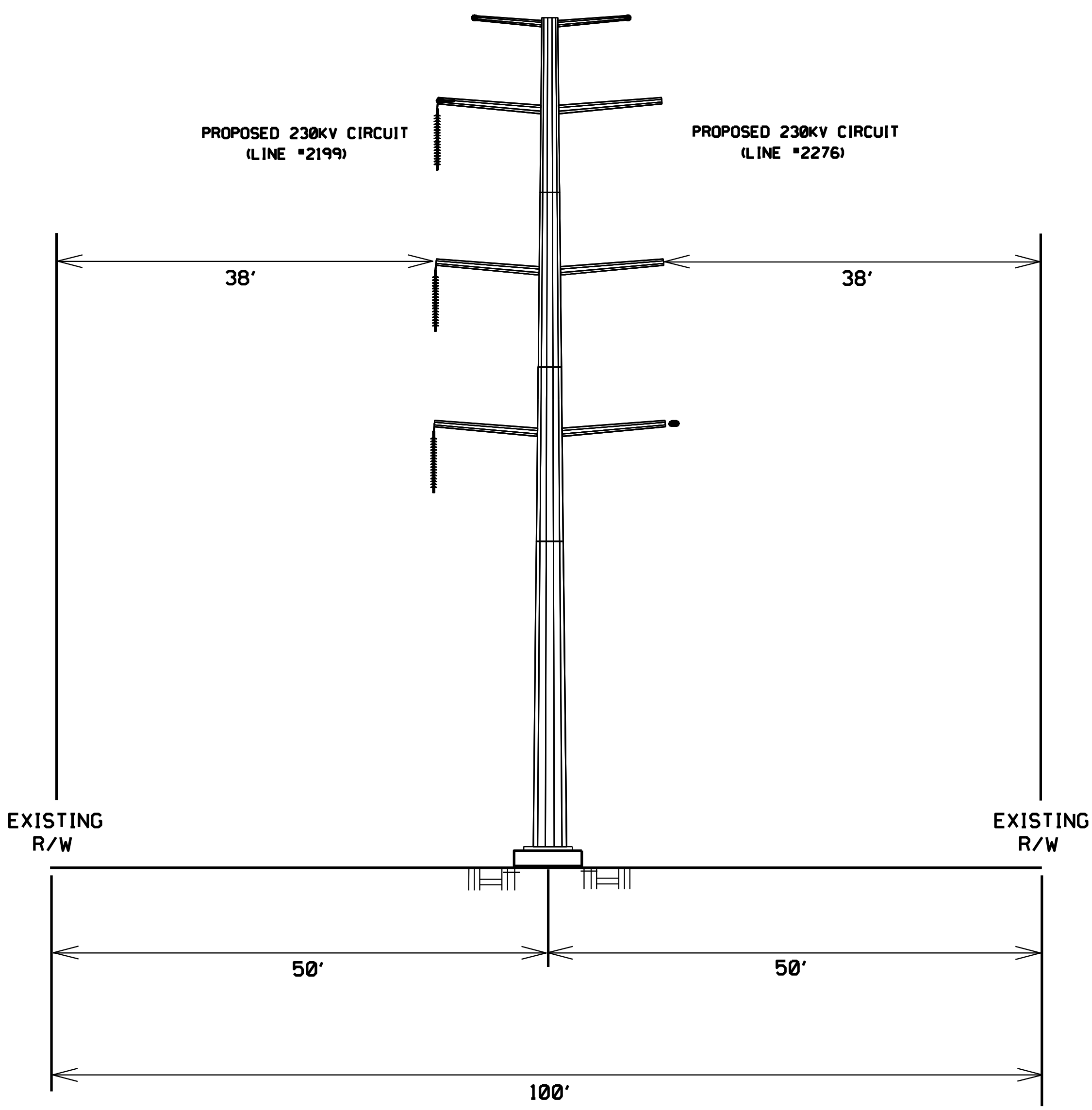
PRELIMINARY

NOTE:

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

LINE #2199 GORDONSVILLE - CIRRUS
LINE #2276 CIRRUS - REMINGTON

PROPOSED CONFIGURATION



TYPICAL RIGHT OF WAY LOOKING TOWARD CIRRUS SUBSTATION

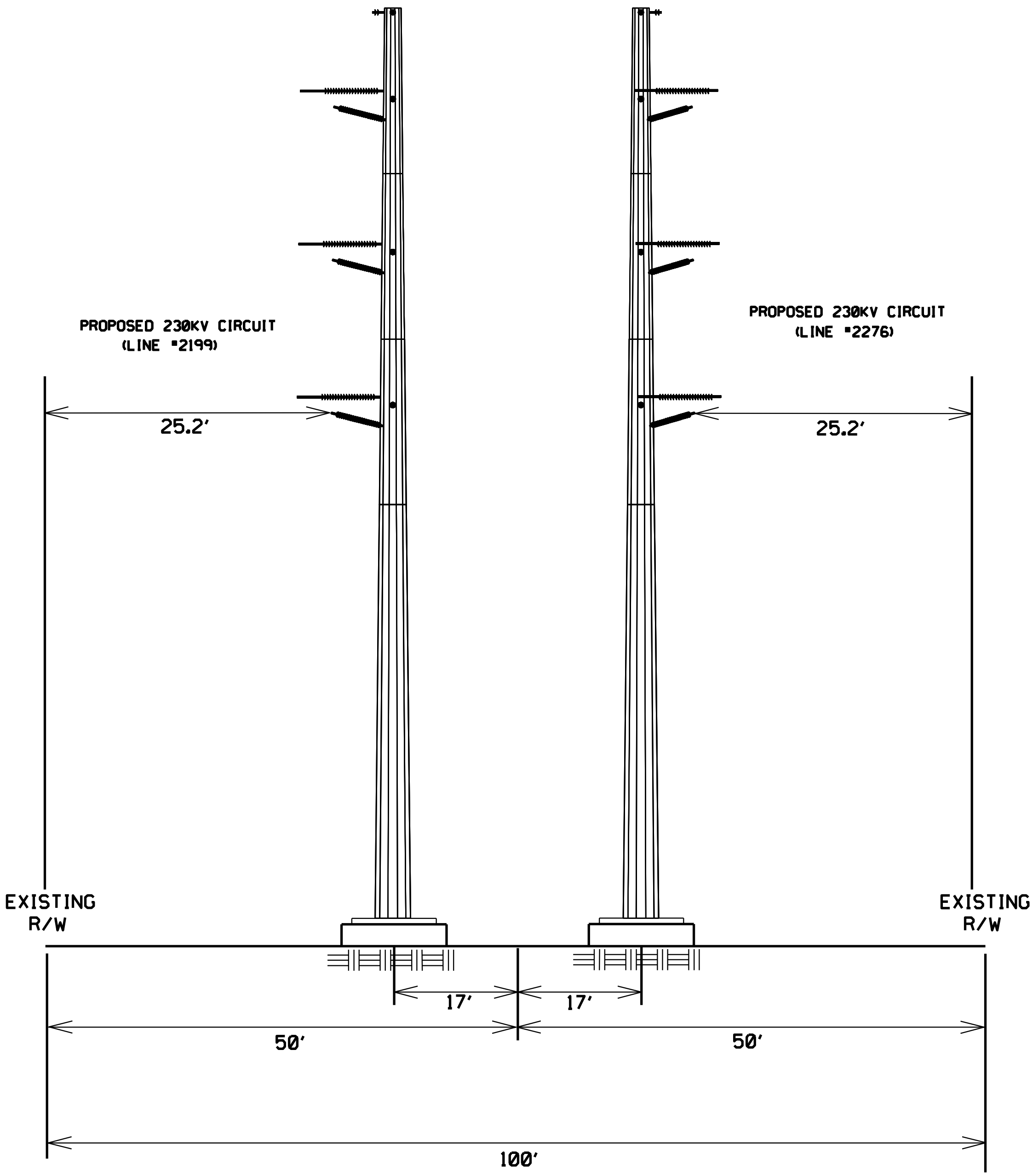
PRELIMINARY

NOTE:

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

LINE #2199 GORDONSVILLE - CIRRUS
LINE #2276 CIRRUS - REMINGTON

PROPOSED CONFIGURATION



TYPICAL RIGHT OF WAY LOOKING TOWARD CIRRUS SUBSTATION

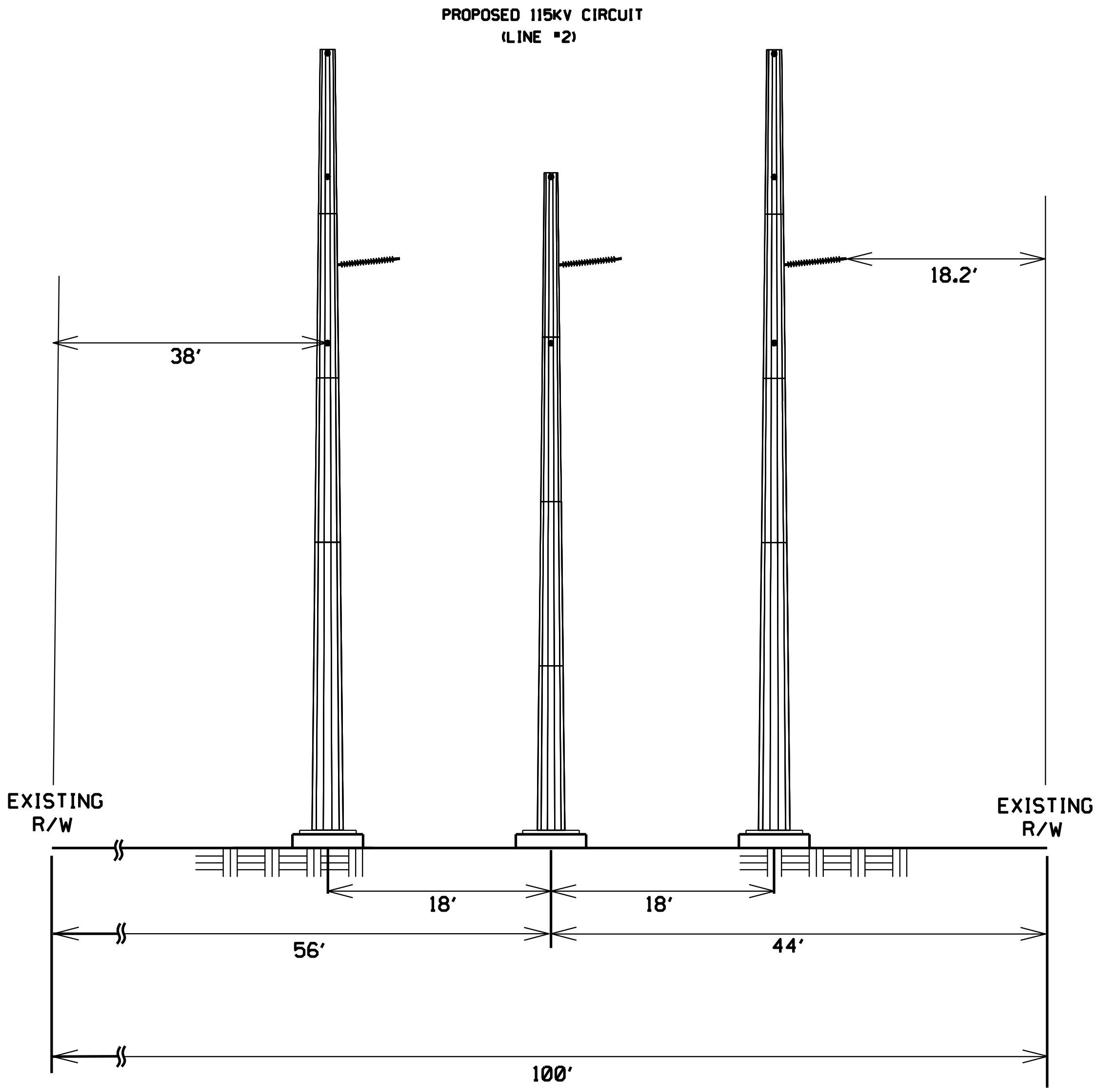
PRELIMINARY

NOTE:

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

LINE #2 OAK GREEN - REMINGTON

PROPOSED CONFIGURATION



TYPICAL RIGHT OF WAY LOOKING TOWARD OAK GREEN SUBSTATION

NOTE:

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

II. DESCRIPTION OF THE PROPOSED PROJECT

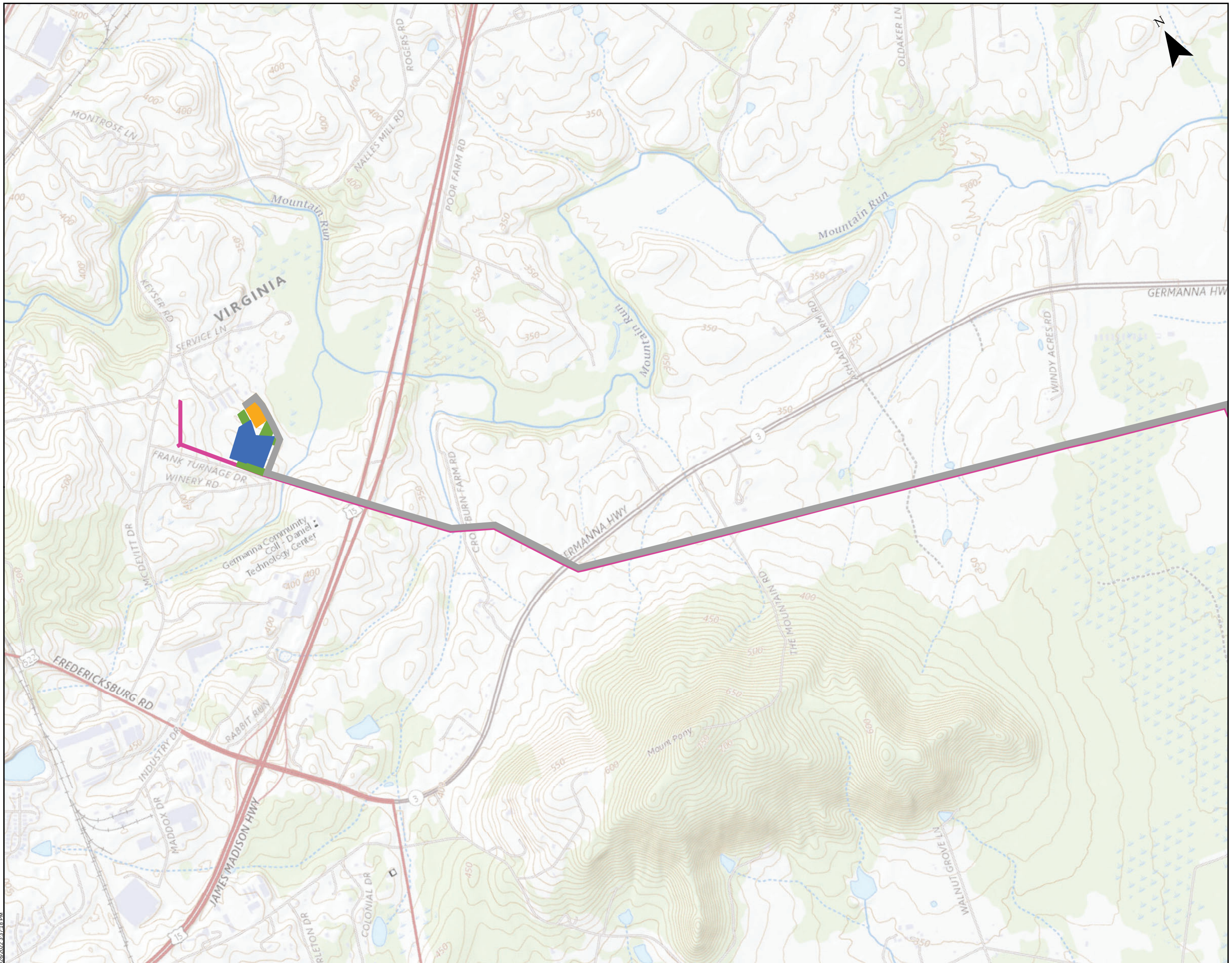
A. Right-of-way (ROW)

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

Response: As discussed in Section II.A.4, the Project includes the wreck and rebuild of Lines #2 and #70 and the construction of a new, overhead 230 kV double circuit transmission line loop. The Company acquired easements for the approximately 5.2 miles of existing right-of-way from 1928 to 2009. The existing right-of-way is approximately 5.2 miles, and 100 feet wide and extends from the Mountain Run Junction to the Mountain Run Substation.

To ensure that the Company can still meet the town of Culpeper's demand needs during construction, the Company will need to obtain a temporary easement to build one temporary 115 kV energized line from the Mountain Run Junction to the Mountain Run Substation. The temporary line will only be required during construction and will be removed once the new Cirrus-Keyser 230 kV Loop is energized.

New right-of-way is also needed on REC Customer's property to connect the Cirrus Station with the existing Line #70, and then Keyser Station to the existing Mountain Run Substation. Expansion of the existing right-of-way at the Mountain Run Junction by approximately 25 feet is needed to accommodate the installation of a new 3-pole structure at the interconnect. See <u>Attachment II.A.6</u>.



ATTACHMENT II.A.6
EXISTING AND PROPOSED RIGHT-OF-WAY MAP
Cirrus - Keyser 230 kV Loop and Related Projects

Culpeper County, Virginia

Owner/ Applicant:
Dominion Energy Virginia

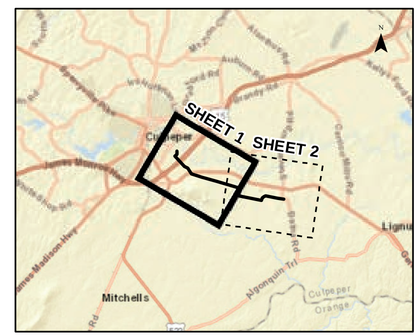
C2 Env Project:	Prepared By:	Date:
0245	TMP	10/24/22

0 750 1,500 3,000 Feet
Scale is 1 IN = 1,500 FT when printed at original size of 11x17

SITE DATA

- Existing Right-of-Way
- Proposed Temporary Right-of-Way
- Proposed Permanent Right-of-Way
- Existing Mountain Run Substation
- Proposed Cirrus and Keyser Switching Stations

Notes:
1. Basemap from USGS Topo
2. Substation footprints and right-of-way dimensions provided by Dominion



C2 ENVIRONMENTAL
Dominion Energy

SHEET 1 OF 2

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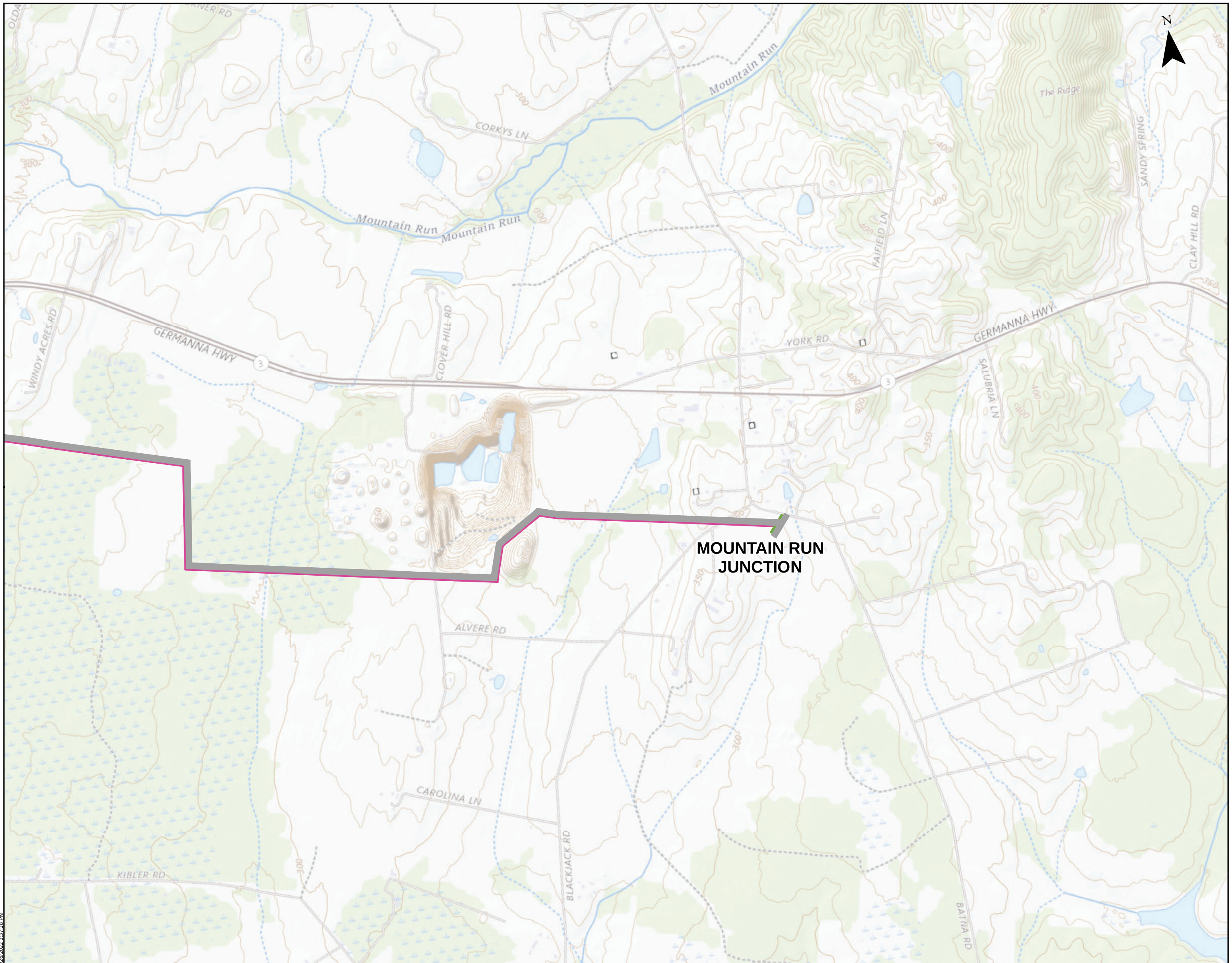


ATTACHMENT II.A.6
EXISTING AND PROPOSED RIGHT-OF-WAY MAP
Cirrus - Keyser 230 kV Loop and Related Projects

Culpeper County, Virginia

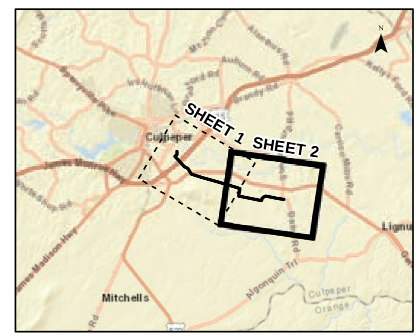
Owner/ Applicant:
Dominion Energy Virginia

C2 Env Project:	Prepared By:	Date:
0245	TMP	10/24/22

0 750 1,500 3,000 Feet
Scale is 1 IN = 1,500 FT when printed at original size of 11x17

SITE DATA
- Existing Right-of-Way
- Proposed Temporary Right-of-Way
- Proposed Permanent Right-of-Way
- Existing Mountain Run Substation
- Proposed Cirrus and Keyser Switching Stations

Notes:
1. Basemap from USGS Topo
2. Substation footprints and right-of-way dimensions provided by Dominion



C2 ENVIRONMENTAL
Dominion Energy

SHEET 2 OF 2

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II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (ROW)

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

Response: The existing transmission right-of-way, which is approximately 5.2 miles in length and 100-feet wide, is currently cleared and maintained for the operation of existing transmission facilities. No clearing for new permanent right-of-way is expected to be required. Clearing for a temporary construction easement is needed along an approximately 5.4-mile corridor for the installation of a temporary line during construction.

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

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

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

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:

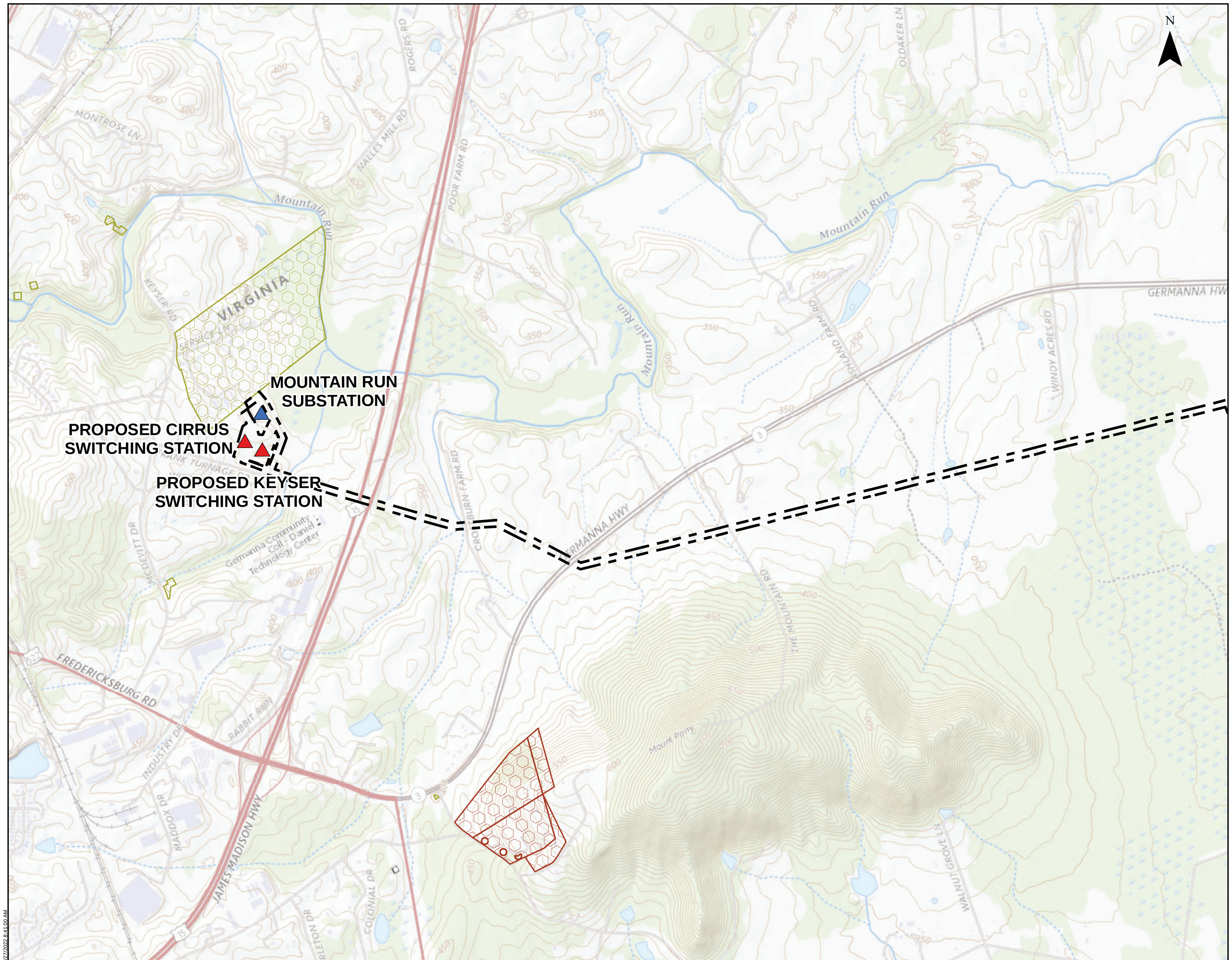
- Agriculture
- Hiking Trails
- Fences
- Perpendicular Road Crossings
- Perpendicular Utility Crossings
- Residential Driveways
- Wildlife / Pollinator Habitat

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: For the Project, the proposed Cirrus-Keyser 230 kV Loop alignment maximizes the use of existing right-of-way. The permanent line can largely be constructed within the existing corridor with minimal new right-of-way required. Use of existing right-of-way generally minimizes impacts on the natural and human environments and is consistent with FERC Guideline #1, included as Attachment 1 to these Guidelines, which states that existing rights-of-way should be given priority when adding new transmission facilities, and §§ 56-46.1 and 56-529 of the Code of Virginia ("Va. Code"), which promote the use of existing rights-of-way for new transmission facilities. See Attachment II.A.9, Section II.A.4 and Attachment II.A.2 for additional information. For the remainder of the Project, minimal new right-of-way is needed with much of the new right-of-way being located on, and provided by, the REC customer, for which there were no routing alternatives.



ATTACHMENT II.A.9

CONSERVATION EASEMENTS MAP

Cirrus - Keyser 230 kV Loop and Related Projects

Culpeper County, Virginia

Owner/ Applicant:
Dominion Energy Virginia

C2 Env Project:	Prepared By:	Date:
0245	TMP	07/28/22

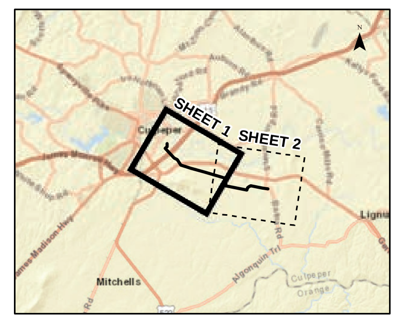
0 750 1,500 3,000 Feet

Scale is 1 IN = 1,500 FT when printed at original size of 11x17

SITE DATA

- Proposed Dominion Substation
- Existing REC Substation
- Civil War Trust Land
- Privately Owned Conservation Land
- Virginia DHR Easement
- Virginia Outdoors Foundation Easement
- Locally Owned Land
- State Owned Land
- Federally Owned Land

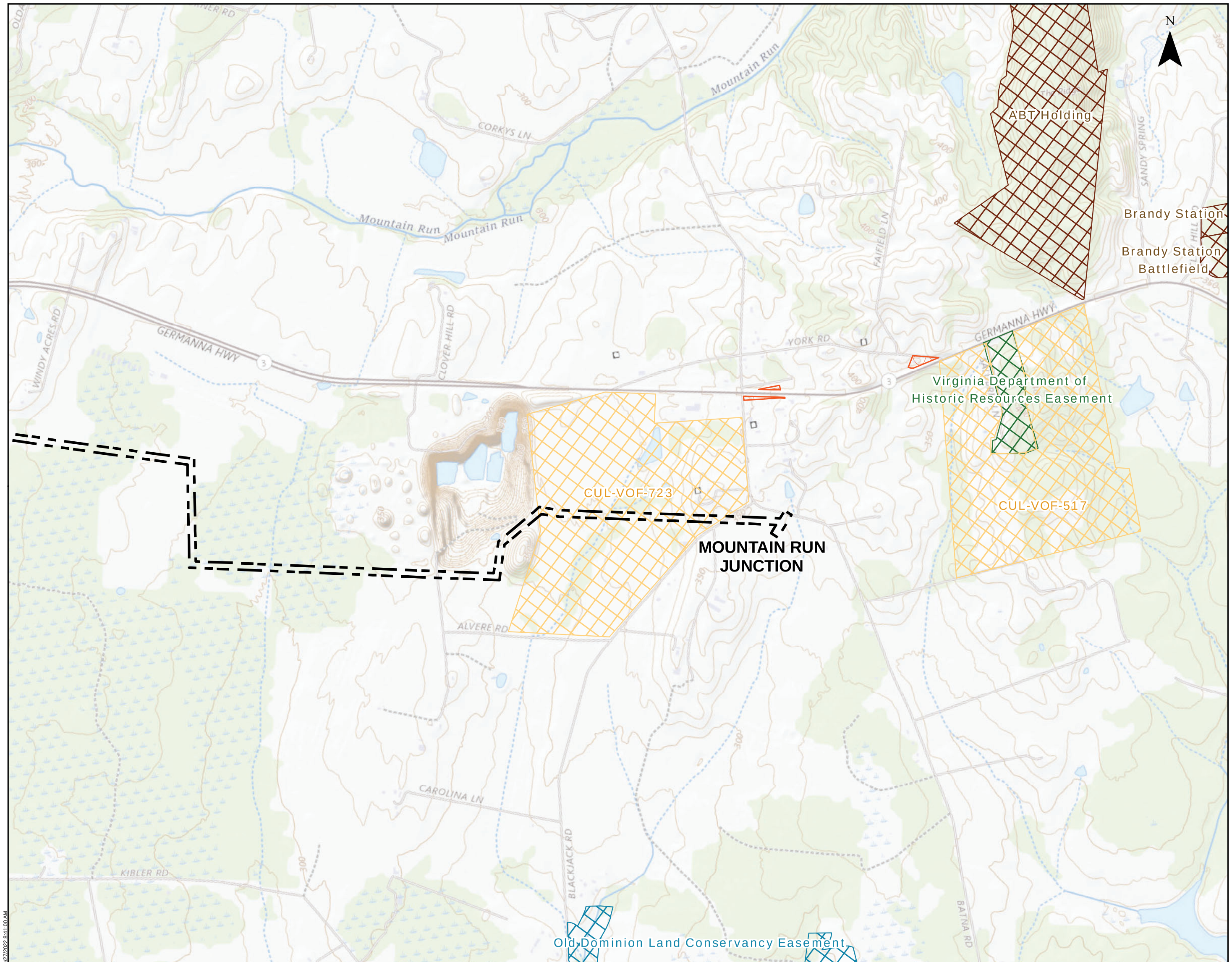
Notes:
1. Basemap from USGS Topo
2. Project centerline provided by Dominion
3. Conservation lands and easements from VDCR and USGS PADUS



C2 ENVIRONMENTAL

Dominion Energy

SHEET 1 OF 2



ATTACHMENT II.A.9

CONSERVATION EASEMENTS MAP

Cirrus - Keyser 230 kV Loop and Related Projects

Culpeper County, Virginia

Owner/ Applicant:
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C2 Env Project:	Prepared By:	Date:
0245	TMP	07/28/22

0 750 1,500 3,000 Feet

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SITE DATA

- Proposed Dominion Substation
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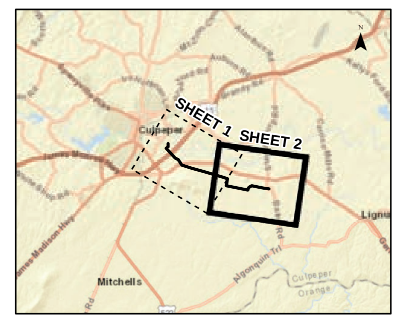
- Locally Owned Land
- State Owned Land
- Federally Owned Land

Notes:
1. Basemap from USGS Topo
2. Project centerline provided by Dominion
3. Conservation lands and easements from VDCR and USGS PADUS



SHEET 2 OF 2

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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 Cirrus-Keyser 230 kV Loop in a manner that minimizes outage times on Line #2199. Assuming construction commences around November 1, 2024, the cut-in of Lines #2199, #2276, and #2278, going to Cirrus and Keyser Stations should start around November 15, 2025. The cut-in process will require a PJM outage eDart ticket on Line #2199. The line cut-in should only require a 30-day outage.

The Company has requested an outage from PJM for Line #2199 starting on November 17, 2025. The eDart number for this outage has not been assigned by PJM yet. It is customary for PJM not to grant approval of outages until shortly before the outages are expected to occur and, therefore, it may be subject to change.

To ensure that the Company can still meet the area demands and to prevent additional outages during construction, the Company will need to build an approximately 5.4-mile temporary 115 kV single circuit energized line from Mountain Run Junction to existing structure #70/1257. When the Cirrus-Keyser 230 kV Loop is energized, the temporary line will be removed.

II. DESCRIPTION OF THE PROPOSED PROJECT

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

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

Response: Attachment 1 to these Guidelines provides a tool routinely used by the Company in routing its transmission line projects. The FERC Guidelines, included as Attachment 1 to these Guidelines, are a tool routinely used by the Company in routing its transmission line projects.

In accordance with Attachment 1 of these Guidelines, there is a strong preference for the use of existing utility right-of-way whenever feasible. The Project is largely within existing right-of-way and will not require an increase in operating voltage. New permanent right-of-way is needed to construct a 0.07-mile segment of new overhead 115 kV single circuit transmission line (Line #70) to connect the proposed Cirrus Station to existing Structure #70/1255. This segment of new right-of-way is being provided by the REC customer. Additional permanent right-of-way provided by the REC customer will be required to construct Line #2283 (0.15 miles) and Line #2284 (0.10 miles) from the Keyser Station to the existing Mountain Run 1, as well as for Line #2288 and line #2289, both 0.01 miles in length, from the Cirrus Station to the proposed REC Mountain Run 2. As such, only minimal new right-of-way is needed with much of the new right-of-way being located on, and provided by, the REC customer.

The Project will require the construction of an approximately 5.4-mile temporary line adjacent to the existing right-of-way, which will require a variable width 15 to 45-foot temporary construction easement at the Mountain Run Junction, a 15-foot temporary construction easement for approximately 5.0 miles, and a 40-foot temporary easement for approximately 0.4 miles between structures #70/3 and #70/1257. These temporary facilities will be in service for approximately twelve months during the construction and will be removed and allow for regrowth upon energization of the Project.

By utilizing the existing transmission corridor to the maximum extent possible, the proposed Project will minimize impact to any site listed on the National Register of Historic Places ("NRHP"). Thus, the proposed Project is consistent with Guideline #2 (where practical, rights-of-way should avoid sites listed on the NRHP). The Company will coordinate with the Virginia Department of Historic Resources ("VDHR") regarding its plans prior to engineering and construction of the Project to avoid or minimize impacts. A Stage I Pre-Application Analysis prepared by Dutton & Associates ("Dutton") was submitted to the VDHR on November 8, 2022, as further discussed in Section III.A of this Appendix. See Attachment 2.I.1 of the DEQ Supplement.

The Company will coordinate with VDHR through review of the Stage I Pre-Application Analysis regarding these findings.

The Company has communicated with several 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). See Sections III.B and III.J of this Appendix and the DEQ Supplement.

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")

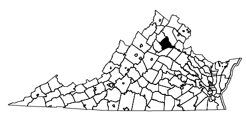
12. a. Detail counties and localities through which the line will pass. If any portion of the line will be located outside of the Applicant's certificated service area: (1) identify each electric utility affected; (2) state whether any affected electric utility objects to such construction; and (3) identify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

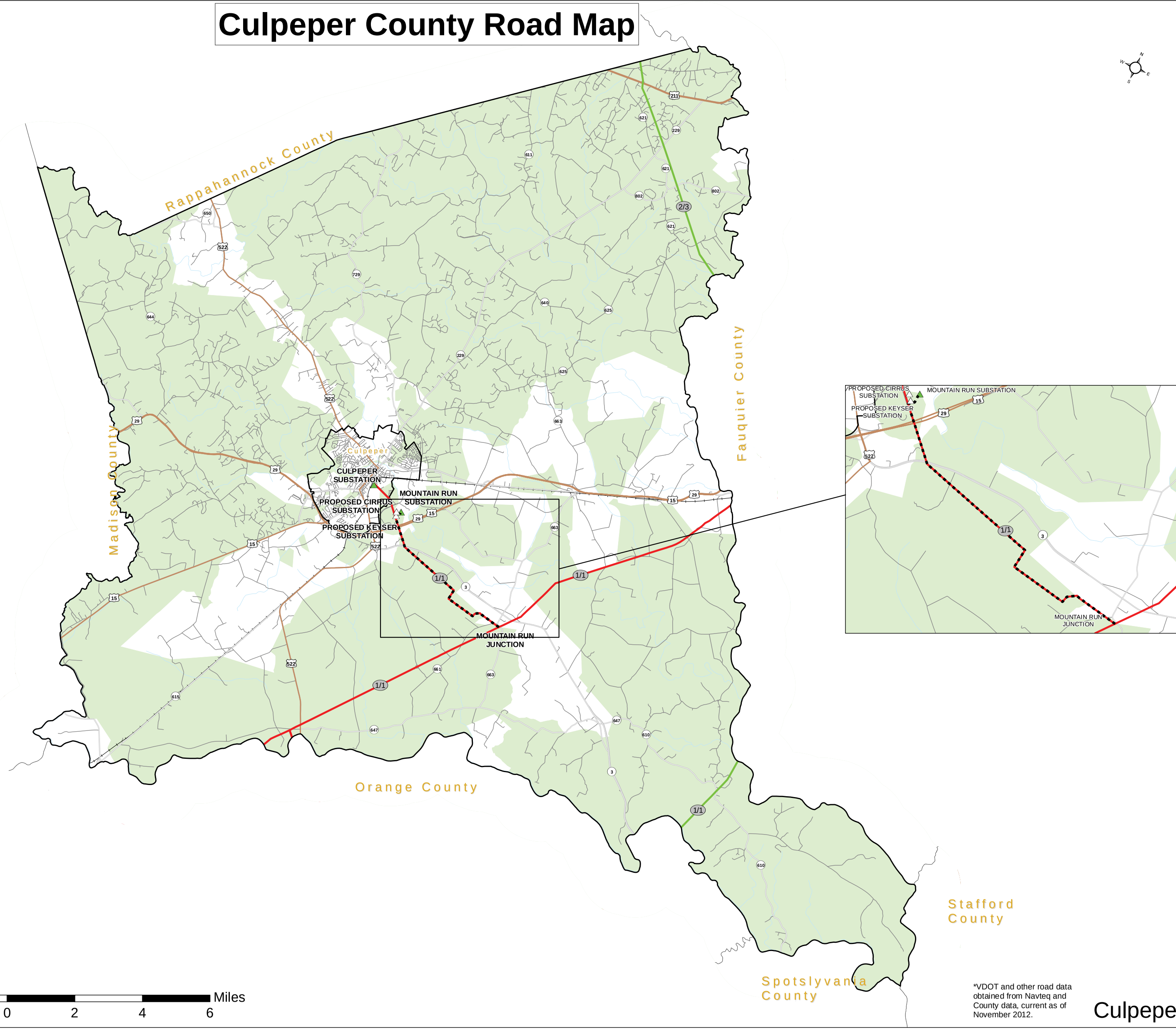
Response: a. The Project traverses Culpeper County, Virginia for approximately 5.2 miles. The Project is located within the Company's service territory as well as Rappahannock Electric Cooperative's service territory.

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

Culpeper 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 July 28, 2022. 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.

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

SIGNATURE

DATE 11/8/2022 TITLE Chief Engineering & Grid Operations Officer

Legend

- Proposed 230 kV Conversion
- Number of Lines of Structures/Number of Circuits
- Proposed Dominion Substation
- Existing REC Substation
- 115 kV
- 230 kV
- 500 kV

Provider Service Territory

- REC
- VEPCO

*VDOT and other road data obtained from Navteq and County data, current as of November 2012.

Culpeper

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

1. Detail number of circuits and their design voltage and transfer capabilities.

Response: The proposed double circuit 230 kV Line #2199 and Line #2276 from the Mountain Run Junction to the new Cirrus and Keyser Stations will be designed and operated at 230 kV with no anticipated voltage upgrade and have a transfer capability of 1,572 MVA.

The proposed single circuit 230 kV Line #2283 from the new Keyser Station to the existing Mountain Run Substation will be designed and operated at 230 kV with no anticipated voltage upgrade and have a transfer capability of 1,572 MVA.

The proposed single circuit 230 kV Line #2284 from the existing Mountain Run Substation to new Keyser Station will be designed and operated at 230 kV with no anticipated voltage upgrade and have a transfer capability of 1,572 MVA.

The proposed single circuit 230 kV Line #2278 from the new Keyser Station to new Cirrus Station will be designed and operated at 230 kV with no anticipated voltage upgrade and have a transfer capability of 1,572 MVA.

The proposed rearrangement of existing 115 kV Line #70 from the new Cirrus Station to structure #70/1255 will be designed and operated at 115 kV with no anticipated voltage upgrade and have a transfer capability of 393 MVA.

The proposed rearrangement of existing 115 kV Line #2 and Line #70 at the Mountain Run Junction will be designed per 230 kV standard requirements but operated at 115 kV. There is an anticipated upgrade in the future to 230 kV. The installed conductor will have a transfer capability of 1,572 MVA.

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

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

Response: The proposed double circuit and single circuit 230 kV lines will include 3-phase bundled 768.2 ACSS/TW/HS conductors. The bundled 768.2 ACSS/TW/HS conductor is designed for maximum operating temperature of 250°C and is the Company standard for new 230 kV construction.

The proposed single circuit 115 kV from the Cirrus Station to Structure #70/1255 will include 3-phase 768.2 ACSS/TW/HS conductors. The 768.2 ACSS/TW/HS conductor is designed for maximum operating temperature of 250°C and is the Company standard for new 115 kV construction.

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

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

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

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

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

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

e. the foundation material;

f. the average width at cross arms;

g. the average width at the base;

h. the maximum, minimum and average structure heights;

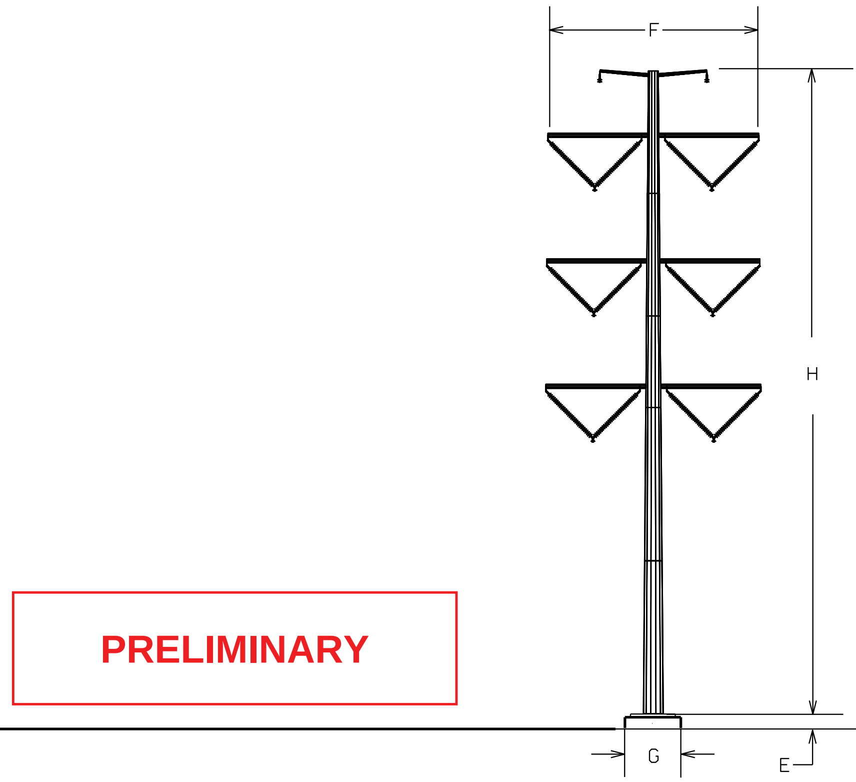
i. the average span length; and

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

Response: See the following attachments:

- Attachment II.B.3.a
- Attachment II.B.3.b
- Attachment II.B.3.c
- Attachment II.B.3.d
- Attachment II.B.3.e
- Attachment II.B.3.f

230KV LINE #2199 CIRRUS - STR. 100
230kV LINE #2276 STR. 100 -KEYSER



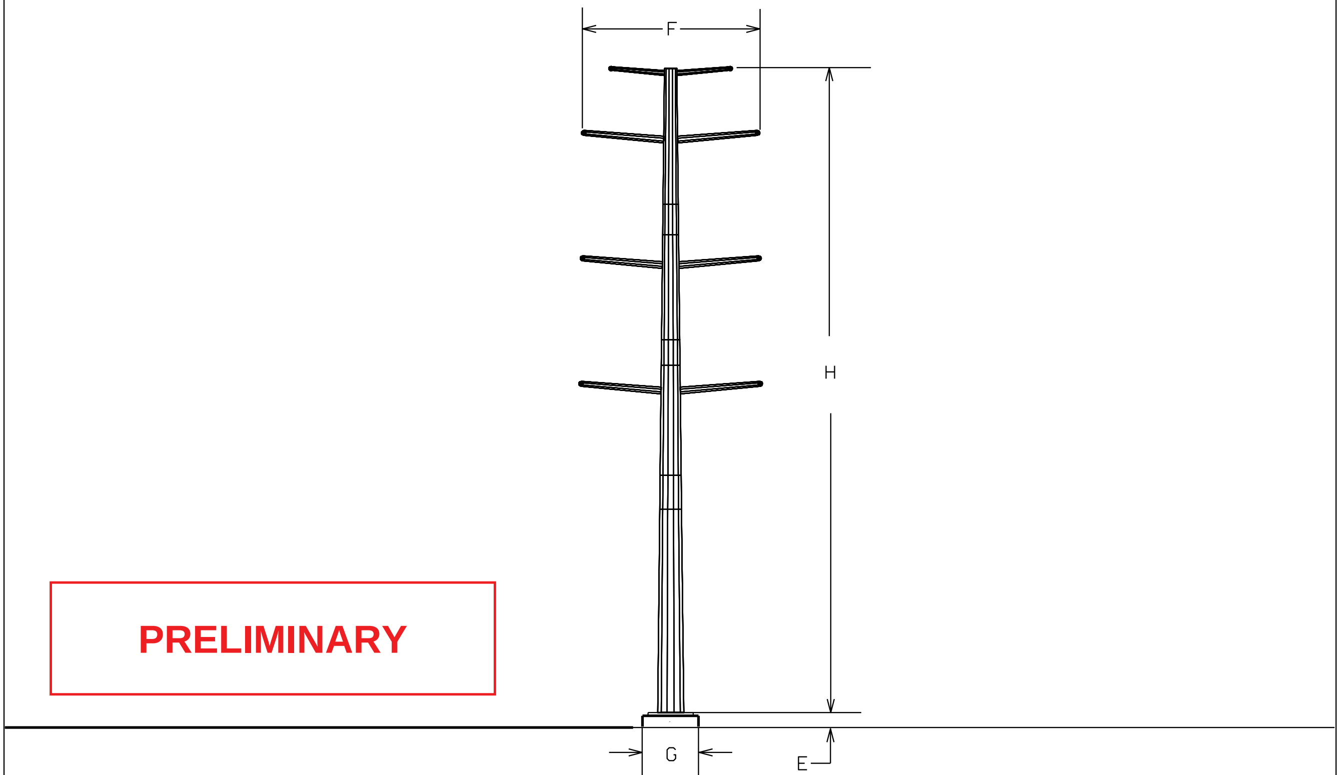
DOUBLE CIRCUIT SUSPENSION MONOPOLE STRUCTURE

A. MAPPING OF THE ROUTE:	SEE ATTACHMENT II.B.5
B. RATIONALE FOR STRUCTURE TYPE:	MAINTAINS THE EXISTING CIRCUITS VERTICAL CONFIGURATION.
C. LENGTH OF R/W (STRUCTURE QTY):	5.2 MILES (39)
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONAL FOR MATERIAL:	WEATHERING STEEL WAS SELECTED TO MATCH THE STEEL POLE STRUCTURES CARRYING LINES #2199 & #2276
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 2
F. AVERAGE WIDTH AT CROSS ARM:	35'
G. AVERAGE WIDTH AT BASE:	6' DIAMETER FOUNDATION (SEE NOTE 3)
H. MINIMUM STRUCTURE HEIGHT:	90'
MAXIMUM STRUCTURE HEIGHT:	110'
AVERAGE STRUCTURE HEIGHT:	100'
I. AVERAGE SPAN LENGTH (RANGE):	530' (305' - 651')
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTE:

1. INFORMATION CONTAINED ON DRAWING IS PRELIMINARY IN NATURE AND SUBJECT TO CHANGE DURING FINAL DESIGN.
2. MINIMUM FOUNDATION REVEAL SHALL BE 1.5'
3. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING.
4. STRUCTURE HEIGHTS ARE MEASURED FROM THE STRUCTURE CENTERLINE.

230KV LINE #2199 CIRRUS - STR. 100
230kV LINE #2276 STR. 100 - KEYSER



DOUBLE CIRCUIT DEADEND MONOPOLE STRUCTURE

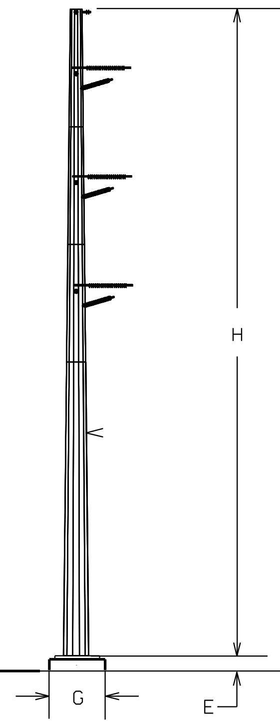
A. MAPPING OF THE ROUTE:	SEE ATTACHMENT II.B.5
B. RATIONALE FOR STRUCTURE TYPE:	MAINTAINS THE EXISTING CIRCUITS VERTICAL CONFIGURATION.
C. LENGTH OF R/W (STRUCTURE QTY):	5.2 MILES (11)
D. STRUCTURE MATERIAL: RATIONAL FOR MATERIAL:	WEATHERING STEEL WEATHERING STEEL WAS SELECTED TO MATCH THE STEEL POLE STRUCTURES CARRYING LINES #2199 & #2276
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 2
F. AVERAGE WIDTH AT CROSS ARM:	26'
G. AVERAGE WIDTH AT BASE:	6' DIAMETER FOUNDATION (SEE NOTE 3)
H. MINIMUM STRUCTURE HEIGHT: MAXIMUM STRUCTURE HEIGHT: AVERAGE STRUCTURE HEIGHT:	85' 115' 95'
I. AVERAGE SPAN LENGTH (RANGE):	524' (345' - 646')
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTE:

1. INFORMATION CONTAINED ON DRAWING IS PRELIMINARY IN NATURE AND SUBJECT TO CHANGE DURING FINAL DESIGN.
2. MINIMUM FOUNDATION REVEAL SHALL BE 1.5'
3. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING.
4. STRUCTURE HEIGHTS ARE MEASURED FROM THE STRUCTURE CENTERLINE.

230kV LINE #2199 STR. 100
230kV LINE #2276 STR. 100

PRELIMINARY



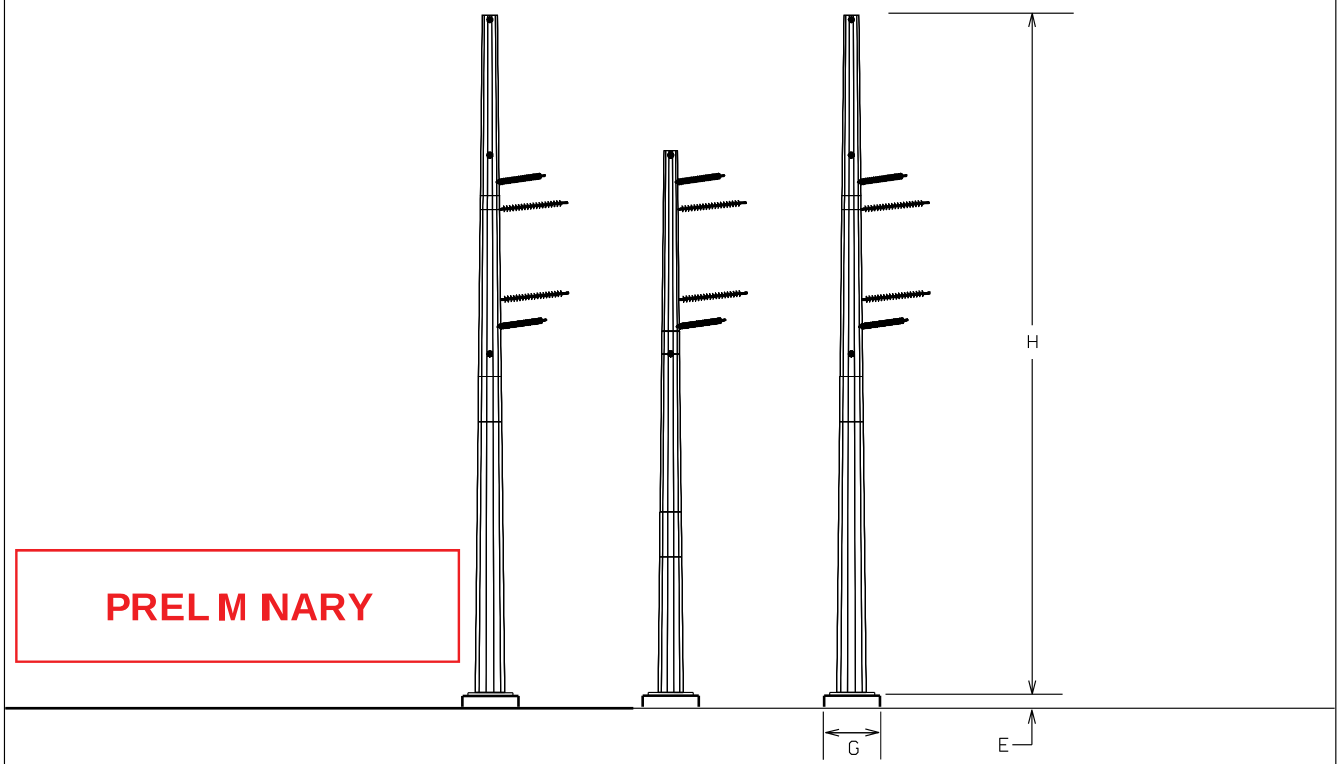
SINGLE CIRCUIT DEADEND MONOPOLE STRUCTURE

A. MAPPING OF THE ROUTE:	SEE ATTACHMENT II.B.5
B. RATIONALE FOR STRUCTURE TYPE:	MAINTAINS THE EXISTING CIRCUITS VERTICAL CONFIGURATION.
C. LENGTH OF R/W (STRUCTURE QTY):	5.2 MILES (2)
D. STRUCTURE MATERIAL: RATIONAL FOR MATERIAL:	WEATHERING STEEL WEATHERING STEEL WAS SELECTED TO MATCH THE STEEL POLE STRUCTURES CARRYING LINES #2199 & #2276
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 2
F. AVERAGE WIDTH AT CROSS ARM:	N/A
G. AVERAGE WIDTH AT BASE:	6' DIAMETER FOUNDATION (SEE NOTE 3)
H. MINIMUM STRUCTURE HEIGHT: MAXIMUM STRUCTURE HEIGHT: AVERAGE STRUCTURE HEIGHT:	110' 110' 110'
I. AVERAGE SPAN LENGTH (RANGE):	586' (585' - 587')
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTE:

1. INFORMATION CONTAINED ON DRAWING IS PRELIMINARY IN NATURE AND SUBJECT TO CHANGE DURING FINAL DESIGN.
2. MINIMUM FOUNDATION REVEAL SHALL BE 1.5'
3. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING.
4. STRUCTURE HEIGHTS ARE MEASURED FROM THE STRUCTURE CENTERLINE.

115KV LINE #2 STR. 486A & STR. 486B



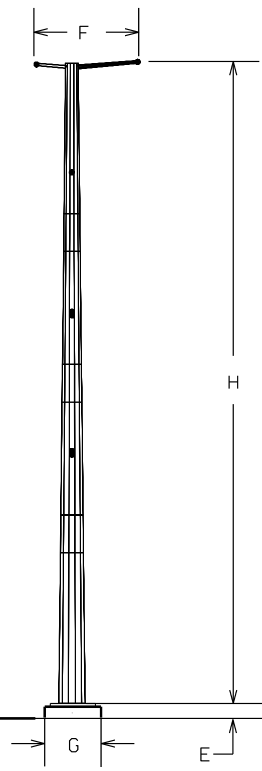
SINGLE CIRCUIT 3-POLE STRUCTURE

A. MAPPING OF THE ROUTE:	SEE ATTACHMENT II.B.5
B. RATIONALE FOR STRUCTURE TYPE:	ALLOWS CIRCUIT TO CROSS UNDERNEATH OTHER CIRCUITS IN HORIZONTAL CONFIGURATION.
C. LENGTH OF R/W (STRUCTURE QTY):	JUNCTION LOCATION (2)
D. STRUCTURE MATERIAL: RATIONAL FOR MATERIAL:	WEATHERING STEEL WEATHERING STEEL WAS SELECTED TO MATCH THE STEEL POLE STRUCTURES CARRYING LINES #2199 & #2276
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 2
F. AVERAGE WIDTH AT CROSS ARM:	N/A
G. AVERAGE WIDTH AT BASE:	6' DIAMETER FOUNDATION (SEE NOTE 3)
H. MINIMUM STRUCTURE HEIGHT: MAXIMUM STRUCTURE HEIGHT: AVERAGE STRUCTURE HEIGHT:	75'-65'-75' (L-M-R) 75'-65'-75' (L-M-R) 75'-65'-75' (L-M-R)
I. AVERAGE SPAN LENGTH (RANGE):	236' (127' - 344')
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTE:

1. INFORMATION CONTAINED ON DRAWING IS PRELIMINARY IN NATURE AND SUBJECT TO CHANGE DURING FINAL DESIGN.
2. MINIMUM FOUNDATION REVEAL SHALL BE 1.5'
3. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING.
4. STRUCTURE HEIGHTS ARE MEASURED FROM THE STRUCTURE CENTERLINE.

230KV LINE #2199 STR. 50 - 49, 230KV LINE #2276 STR. 150 - 152
230kV LINE #2278 STR. 2-3. 230kV LINE #2283 STR. 2
115kV LINE #70 STR. 1255



PREL M NARY

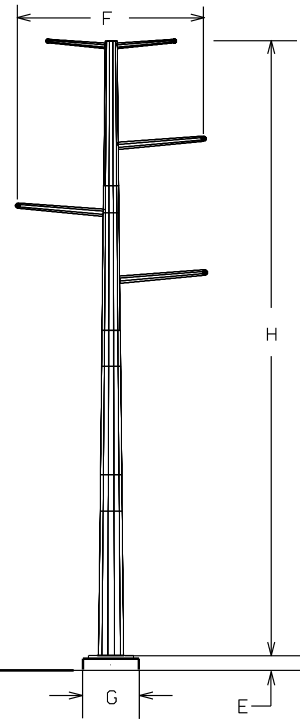
SINGLE CIRCUIT DEADEND MONOPOLE W/ STATIC ARM STRUCTURE

A. MAPPING OF THE ROUTE:	SEE ATTACHMENT II.B.5
B. RATIONALE FOR STRUCTURE TYPE:	MAINTAINS THE EXISTING CIRCUITS VERTICAL CONFIGURATION.
C. LENGTH OF R/W (STRUCTURE QTY):	LINE #2276/#2199 5.2 MILES (5), LINE #2278 0.10 MILES (2), LINE #2283 0.15 MILES (1), LINE #70 0.07 MILES (1)
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONAL FOR MATERIAL:	WEATHERING STEEL WAS SELECTED TO MATCH THE STEEL POLE STRUCTURES CARRYING LINES #2199 & #2276
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 2
F. AVERAGE WIDTH AT CROSS ARM:	9'
G. AVERAGE WIDTH AT BASE:	6' DIAMETER FOUNDATION (SEE NOTE 3)
H. MINIMUM STRUCTURE HEIGHT:	80'
MAXIMUM STRUCTURE HEIGHT:	85'
AVERAGE STRUCTURE HEIGHT:	80'
I. AVERAGE SPAN LENGTH (RANGE):	357' (346' - 366')
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTE:

1. INFORMATION CONTAINED ON DRAWING IS PRELIMINARY IN NATURE AND SUBJECT TO CHANGE DURING FINAL DESIGN.
2. MINIMUM FOUNDATION REVEAL SHALL BE 1.5'
3. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING.
4. STRUCTURE HEIGHTS ARE MEASURED FROM THE STRUCTURE CENTERLINE.

230KV LINE #2283 STR. 3
230kV LINE #2284 STR. 2



PRELIMINARY

SINGLE CIRCUIT DEADEND MONOPOLE W/ STAGGERED ARMS STRUCTURE

A. MAPPING OF THE ROUTE:	SEE ATTACHMENT II.B.5
B. RATIONALE FOR STRUCTURE TYPE:	HELPS TO MAINTAIN PHASE-TO-PHASE CLEARANCES WHEN ROLLING HORIZONTAL AT SUBSTATION STRUCTURES.
C. LENGTH OF R/W (STRUCTURE QTY):	LINE #2283 0.15 MILES (1), LINE #2284 0.10 MILES (1),
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONAL FOR MATERIAL:	WEATHERING STEEL WAS SELECTED TO MATCH THE STEEL POLE STRUCTURES CARRYING LINES #2199 & #2276
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 2
F. AVERAGE WIDTH AT CROSS ARM:	25'
G. AVERAGE WIDTH AT BASE:	6' DIAMETER FOUNDATION (SEE NOTE 3)
H. MINIMUM STRUCTURE HEIGHT:	80'
MAXIMUM STRUCTURE HEIGHT:	85'
AVERAGE STRUCTURE HEIGHT:	80'
I. AVERAGE SPAN LENGTH (RANGE):	311' (288' - 334')
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTE:

1. INFORMATION CONTAINED ON DRAWING IS PRELIMINARY IN NATURE AND SUBJECT TO CHANGE DURING FINAL DESIGN.
2. MINIMUM FOUNDATION REVEAL SHALL BE 1.5'
3. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING.
4. STRUCTURE HEIGHTS ARE MEASURED FROM THE STRUCTURE CENTERLINE.

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: Not applicable.

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: The proposed approximate structure heights are from the conceptual design created to estimate the cost of the Project and are subject to change based on final engineering design. The approximate structure heights do not include foundation reveal.

See Attachment II.B.5.

(Existing) Line/Str #	(Existing) Struct. Height (ft)	(Proposed) Line/Str #	(Proposed) Struct. Height (ft)
-	-	2276/100	110
2199/100	100	2199/100	110
2/1201 (70/53)	80	2/486A	75
-	-	2/486B	75
2/1202 (70/52)	80	2276/101 (2199/99)	100
2/1203 (70/51)	80	2276/102 (2199/98)	100
2/1204 (70/50)	80	2276/103 (2199/97)	100
2/1205 (70/49)	80	2276/104 (2199/96)	105
2/1206 (70/48)	80	2276/105 (2199/95)	105
2/1207 (70/47)	80	2276/106 (2199/94)	95
2/1208 (70/46)	80	2276/107 (2199/93)	90
2/1209 (70/45)	80	2276/108 (2199/92)	95
2/1210 (70/44)	80	2276/109 (2199/91)	105
2/1211 (70/43)	80	2276/110 (2199/90)	95
2/1212 (70/42)	80	2276/111 (2199/89)	100
2/1213 (70/41)	80	2276/112 (2199/88)	95
2/1214 (70/40)	80	2276/113 (2199/87)	100
2/1215 (70/39)	80	2276/114 (2199/86)	100

(Existing) Line/Str #	(Existing) Struct. Height (ft)	(Proposed) Line/Str #	(Proposed) Struct. Height (ft)
2/1216 (70/38)	80	2276/115 (2199/85)	100
2/1217 (70/37)	80	2276/116 (2199/84)	100
2/1218 (70/36)	80	2276/117 (2199/83)	105
2/1219 (70/35)	80	2276/118 (2199/82)	100
2/1220 (70/34)	80	2276/119 (2199/81)	100
2/1221 (70/33)	80	2276/120 (2199/80)	100
2/1222 (70/32)	80	2276/121 (2199/79)	100
2/1223 (70/31)	80	2276/122 (2199/78)	100
2/1224 (70/30)	80	2276/123 (2199/77)	100
2/1225 (70/29)	80	2276/124 (2199/76)	100
2/1226 (70/28)	80	2276/125 (2199/75)	100
2/1227 (70/27)	80	2276/126 (2199/74)	110
2/1228 (70/26)	80	2276/127 (2199/73)	105
2/1229 (70/25)	80	2276/128 (2199/72)	105
2/1230 (70/24)	80	2276/129 (2199/71)	100
2/1231 (70/23)	80	2276/130 (2199/70)	105
2/1232 (70/22)	80	2276/131 (2199/69)	100
2/1233 (70/21)	80	2276/132 (2199/68)	105
2/1234 (70/20)	80	2276/133 (2199/67)	100
2/1235 (70/19)	80	2276/134 (2199/66)	100
2/1236 (70/18)	80	2276/135 (2199/65)	105
2/1237 (70/17)	80	2276/136 (2199/64)	100
2/1238 (70/16)	80	2276/137 (2199/63)	105
2/1239 (70/15)	80	2276/138 (2199/62)	100
2/1240 (70/14)	80	2276/139 (2199/61)	105
2/1241 (70/13)	80	2276/140 (2199/60)	105

(Existing) Line/Str #	(Existing) Struct. Height (ft)	(Proposed) Line/Str #	(Proposed) Struct. Height (ft)
2/1242 (70/12)	80	2276/141 (2199/59)	90
2/1243 (70/11)	90	2276/142 (2199/58)	90
2/1244 (70/10)	90	2276/143 (2199/57)	90
2/1245 (70/9)	90	2276/144 (2199/56)	90
2/1246 (70/8)	90	2276/145 (2199/55)	115
2/1247 (70/7)	90	2276/146 (2199/54)	95
2/1248 (70/6)	80	2276/147 (2199/53)	110
2/1249 (70/5)	90	2276/148 (2199/52)	105
2/1250 (70/4)	80	2276/149 (2199/51)	105
2/1251 (70/3)	100	2276/150 (2199/50)	90
2/1252 (70/2)	90	2276/151	80
-	-	2276/152	80
-	-	2276/153	70
-	-	2199/49	90
-	-	2199/48 (2278/4)	70
-	-	2278/1	70
-	-	2278/2	85
-	-	2278/3	85
-	-	2283/1	70
-	-	2283/2	85
(70/1A)	85	2283/3	85
-	-	2284/1	70
2/1253A ()	70	2284/2	75

(Existing) Line/Str #	(Existing) Struct. Height (ft)	(Proposed) Line/Str #	(Proposed) Struct. Height (ft)
-	-	70/1254	70

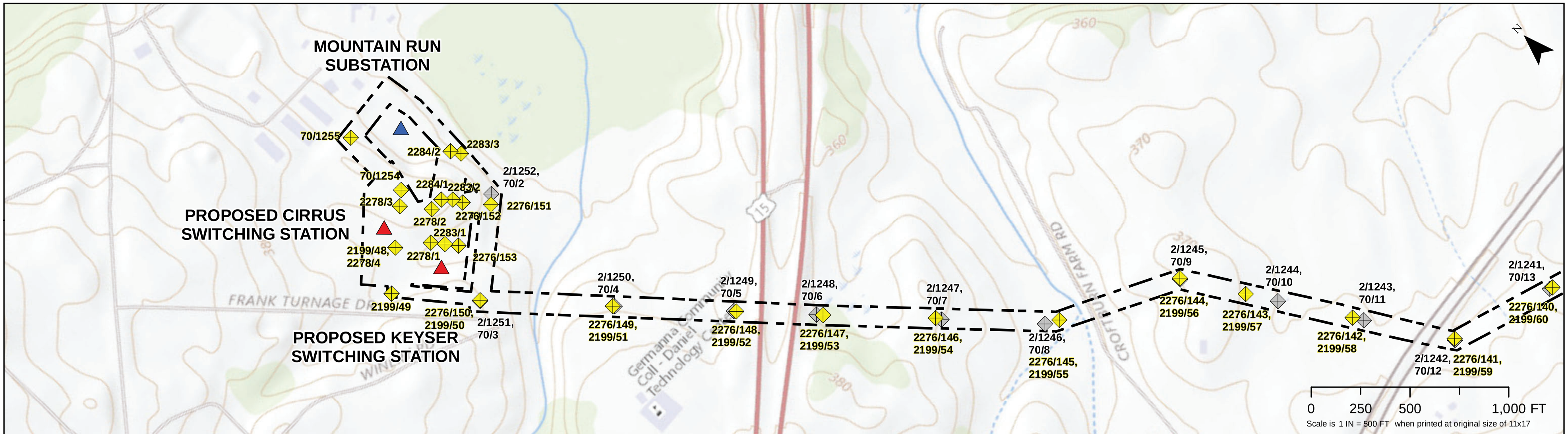
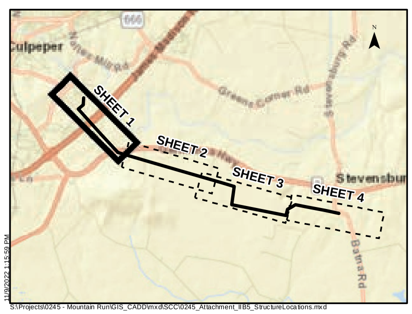


TABLE II.B.5

Existing Structure Number	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Existing Structure Height (Feet)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Proposed Structure Number	**70/1255**	**70/1254**	**2284/2**	**2284/1**	**2283/3**	**2283/2**	**2283/1**	**2278/3**	**2278/2**	**2278/1**	**2199/49**	**2199/48, 2278/4**	**2276/153**
Proposed Structure Height (Feet)	80	70	75	70	85	85	70	85	85	70	90	70	70

Existing Structure Number	**N/A**	**2/1252, 70/2**	**2/1251, 70/3**	**2/1250, 70/4**	**2/1249, 70/5**	**2/1248, 70/6**	**2/1247, 70/7**	**2/1246, 70/8**	**2/1245, 70/9**	**2/1244, 70/10**	**2/1243, 70/11**	**2/1242, 70/12**	**2/1241, 70/13**
Existing Structure Height (Feet)	N/A	90	100	80	90	80	90	90	90	90	90	80	80
Proposed Structure Number	**2276/152**	**2276/151**	**2276/150, 2199/50**	**2276/149, 2199/51**	**2276/148, 2199/52**	**2276/147, 2199/53**	**2276/146, 2199/54**	**2276/145, 2199/55**	**2276/144, 2199/56**	**2276/143, 2199/57**	**2276/142, 2199/58**	**2276/141, 2199/59**	**2276/140, 2199/60**
Proposed Structure Height (Feet)	80	80	90	105	105	110	95	115	90	90	90	90	105

Notes: 1. Structure locations and heights provided by Dominion Energy Virginia.
2. Structure locations and heights provided by Dominion Energy Virginia and subject to final engineering. Structure heights are relative to ground level and do not include foundation reveal.
3. Basemap from ESRI Topographic and World Street Map.



SITE DATA
- Project Area
- Proposed Structure
- Existing Structure
- Proposed Dominion Switching Station
- Existing REC Substation

ATTACHMENT II.B.5

STRUCTURE LOCATION MAP

Cirrus - Keyser 230 kV Loop and Related Projects

Culpeper County, Virginia

Owner/ Applicant:
Dominion Energy Virginia

C2 Env Project:	Prepared By:	Date:
0245	TMP	07/28/22

SHEET 1 OF 4

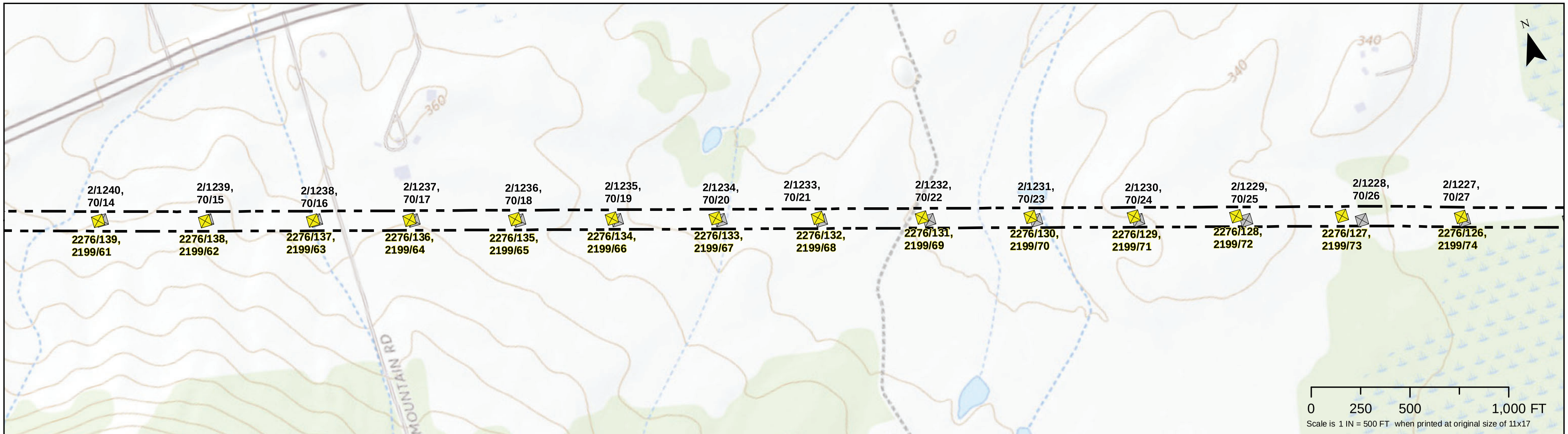
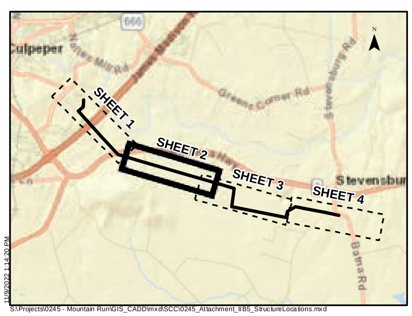


TABLE II.B.5

Existing Structure Number	2/1240, 70/14	2/1239, 70/15	2/1238, 70/16	2/1237, 70/17	2/1236, 70/18	2/1235, 70/19	2/1234, 70/20
Existing Structure Height (Feet)	80	80	80	80	80	80	80
Proposed Structure Number	2276/139, 2199/61	2276/138, 2199/62	2276/137, 2199/63	2276/136, 2199/64	2276/135, 2199/65	2276/134, 2199/66	2276/133, 2199/67
Proposed Structure Height (Feet)	105	100	105	100	105	100	100

Existing Structure Number	2/1233, 70/21	2/1232, 70/22	2/1231, 70/23	2/1230, 70/24	2/1229, 70/25	2/1228, 70/26	2/1227, 70/27
Existing Structure Height (Feet)	80	80	80	80	80	80	80
Proposed Structure Number	2276/132, 2199/68	2276/131, 2199/69	2276/130, 2199/70	2276/129, 2199/71	2276/128, 2199/72	2276/127, 2199/73	2276/126, 2199/74
Proposed Structure Height (Feet)	105	100	105	100	105	105	110

Notes: 1. Structure locations and heights provided by Dominion Energy Virginia.
2. Structure locations and heights provided by Dominion Energy Virginia and subject to final engineering. Structure heights are relative to ground level and do not include foundation reveal.
3. Basemap from ESRI Topographic and World Street Map.



SITE DATA

- Project Area
- Proposed Structure
- Existing Structure
- Proposed Dominion Switching Station
- Existing REC Substation

ATTACHMENT II.B.5

STRUCTURE LOCATION MAP

Cirrus - Keyser 230 kV Loop and Related Projects

Culpeper County, Virginia

Owner/ Applicant:
Dominion Energy Virginia

C2 Env Project:	Prepared By:	Date:
0245	TMP	07/28/22

SHEET 2 OF 4

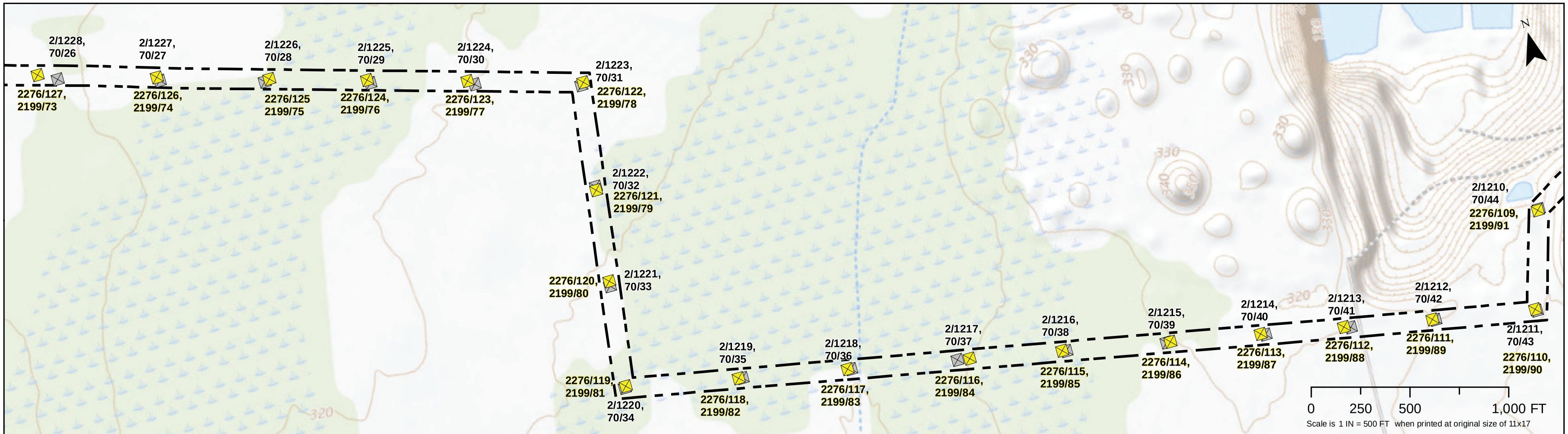
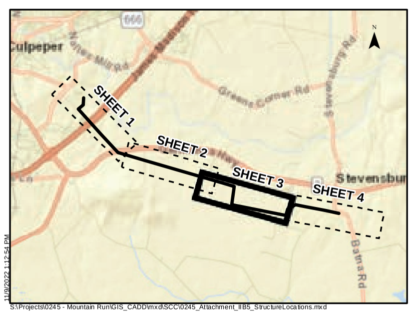


TABLE II.B.5

Existing Structure Number	**2/1228, 70/26**	**2/1227, 70/27**	**2/1226, 70/28**	**2/1225, 70/29**	**2/1224, 70/30**	**2/1223, 70/31**	**2/1222, 70/32**	**2/1221, 70/33**	**2/1220, 70/34**	**2/1219, 70/35**
Existing Structure Height (Feet)	80	80	80	80	80	80	80	80	80	80
Proposed Structure Number	**2276/127, 2199/73**	**2276/126, 2199/74**	**2276/125, 2199/75**	**2276/124, 2199/76**	**2276/123, 2199/77**	**2276/122, 2199/78**	**2276/121, 2199/79**	**2276/120, 2199/80**	**2276/119, 2199/81**	**2276/118, 2199/82**
Proposed Structure Height (Feet)	105	110	100	100	100	100	100	100	100	100

Existing Structure Number	**2/1218, 70/36**	**2/1217, 70/37**	**2/1216, 70/38**	**2/1215, 70/39**	**2/1214, 70/40**	**2/1213, 70/41**	**2/1212, 70/42**	**2/1211, 70/43**	**2/1210, 70/44**
Existing Structure Height (Feet)	80	80	80	80	80	80	80	80	80
Proposed Structure Number	**2276/117, 2199/83**	**2276/116, 2199/84**	**2276/115, 2199/85**	**2276/114, 2199/86**	**2276/113, 2199/87**	**2276/112, 2199/88**	**2276/111, 2199/89**	**2276/110, 2199/90**	**2276/109, 2199/91**
Proposed Structure Height (Feet)	105	100	100	100	100	95	100	95	105

Notes: 1. Structure locations and heights provided by Dominion Energy Virginia.
2. Structure locations and heights provided by Dominion Energy Virginia and subject to final engineering. Structure heights are relative to ground level and do not include foundation reveal.
3. Basemap from ESRI Topographic and World Street Map.



SITE DATA

- Project Area
- Proposed Structure
- Existing Structure
- Proposed Dominion Switching Station
- Existing REC Substation

C2 ENVIRONMENTAL

Dominion Energy®

ATTACHMENT II.B.5

STRUCTURE LOCATION MAP

Cirrus - Keyser 230 kV Loop and Related Projects

Culpeper County, Virginia

Owner/ Applicant:
Dominion Energy Virginia

C2 Env Project:	Prepared By:	Date:
0245	TMP	07/28/22

SHEET 3 OF 4

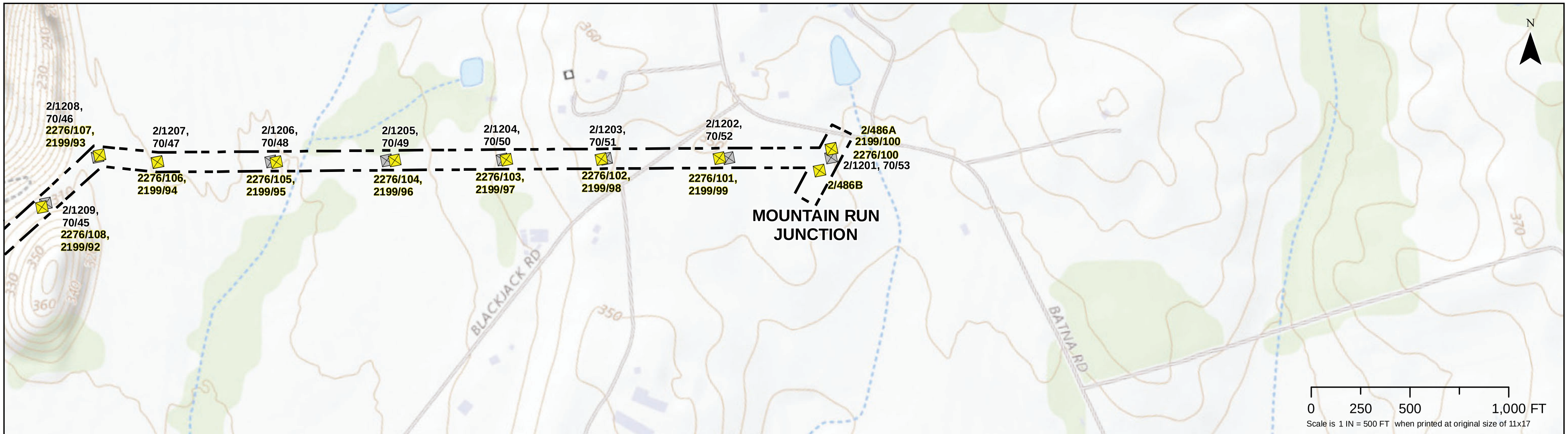
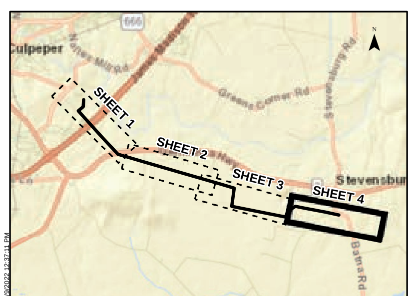


TABLE II.B.5

Existing Structure Number	2/1209, 70/45	2/1208, 70/46	2/1207, 70/47	2/1206, 70/48	2/1205, 70/49	2/1204, 70/50	2/1203, 70/51	2/1202, 70/52	2/1201, 70/53	N/A	N/A	N/A
Existing Structure Height (Feet)	80	80	80	80	80	80	80	80	80	N/A	N/A	N/A
Proposed Structure Number	2276/108, 2199/92	2276/107, 2199/93	2276/106, 2199/94	2276/105, 2199/95	2276/104, 2199/96	2276/103, 2199/97	2276/102, 2199/98	2276/101, 2199/99	2/486A	2/486B	2276/100	2199/100
Proposed Structure Height (Feet)	95	90	95	105	105	100	100	100	75	75	110	110

Notes: 1. Structure locations and heights provided by Dominion Energy Virginia.
2. Structure locations and heights provided by Dominion Energy Virginia and subject to final engineering. Structure heights are relative to ground level and do not include foundation reveal.
3. Basemap from ESRI Topographic and World Street Map.



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SITE DATA
- Project Area
- Proposed Structure
- Existing Structure
- Proposed Dominion Switching Station
- Existing REC Substation

ATTACHMENT II.B.5

STRUCTURE LOCATION MAP

Cirrus - Keyser 230 kV Loop and Related Projects

Culpeper County, Virginia

Owner/ Applicant:
Dominion Energy Virginia

C2 Env Project:	Prepared By:	Date:
0245	TMP	07/28/22

SHEET 4 OF 4

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] Please see Attachment II.B.6.a.i through Attachment II.B.6.a.iv for photographs or representations of typical existing facilities to be removed.

[b] Please see Attachment II.B.6.b.i through Attachment II.B.6.b.iv for comparable photographs or representations for proposed structures.

[c] Visual simulations showing the appearance of the proposed transmission structures are provided for identified historic properties within 1.0 mile of the Project centerline. These simulations were created using GIS modeling to depict whether the existing and proposed structures are or will be visible from historic properties. Attachment II.B.6.c includes the photo simulation locations, as well as photographs of existing structures and simulations of proposed structures from selected observation points. Historical simulation points are provided in the table below.

Resource Name	Observation Point #	Comment
Rose Hill (VDHR# 023-0018)	10, 11, 12	Minimal Impact - Photo Simulation confirmed that the multiple structures already visible from the property will increase in height above intervening vegetation, however, there will not be any new visibility of structures currently screened.
Salubria (VDHR# 023-0020)	17	No Impact- Photo Simulation confirmed that all structures will remain screened behind or beneath the intervening terrain and vegetation.

Resource Name	Observation Point #	Comment
Hansbrough Ridge Winter Encampment (VDHR# 023-0068)	18	Minimal Impact- Photo Simulation confirmed there will be no visibility of any structures from public vantage along the road, however, could not be conducted from the more elevated landform on private property where it is expected that visibility of some structures may already exist
Mount Pony Rural Historic District (VDHR# 023-0084)	3, 4, 5, 6, 7, 8	Minimal Impact - Photo Simulation confirmed that the numerous structures already visible across wide and open fields will remain visible and the change in height will be minimally perceptible at the distance they are seen. It is also confirmed that the increase in height will not permit substantial visibility of additional structures currently screened.
Signal Hill (VDHR# 023- 5023)	5	Minimal Impact – Photo Simulation confirmed that the multiple structures already visible from public vantage will remain with no additional visibility of structures currently screened, however, could not confirm views from the private property where it is expected that additional structures are currently visible across the open landscape.
Croftburn Farm (VDHR# 023-5040)	3, 4	Minimal Impact - Photo Simulation confirmed that the shift in structure location adjacent to the property to permit retention of structure height will not increase visibility from public vantage.

Resource Name	Observation Point #	Comment
Brandy Station Battlefields (VDHR# 023-5040)	8, 13, 14, 15, 16, 17, 18, 19, 20	Minimal Impact – Photo Simulation confirmed that those structures associated with the project that are currently visible will remain as such and the increase in height will not permit visibility of additional structures. Multiple structures and infrastructure not included in this project are also visible from throughout the landscape.
Zimmerman's Tavern (VDHR# 023-5162)	14, 15	Minimal Impact- Photo Simulation confirmed that no structures will be visible from public vantage in front of the house, while several structures currently visible from the edge of the property may rise slightly higher above the distant treeline, although would be seen in conjunction with other modern features.
Mountain Run Historic District (VDHR# 023-5441)	19	Minimal Impact- Photo Simulation confirmed that structures will generally remain screened behind or beneath intervening vegetation, and if select structures were to rise slightly above the treeline, they would be at a distance of more than a mile away and therefore not likely perceptible.
House, 19564 Alvere Road (VDHR# 023-5494)	9	Minimal Impact- Photo Simulation confirmed that a number of structures currently visible from public vantage will rise slightly higher above the intervening vegetation while others will remain screened. Because the property immediately borders the project, it is expected that there may be limited increase in visibility from vantages in the immediate vicinity, however, views from the house will not change substantially.

Resource Name	Observation Point #	Comment
Morton's Ford Battlefield (VDHR# 068-5007)	9, 10, 13	Minimal Impact- Photo Simulation confirmed that the change in height of the numerous structures currently visible will not substantially change or diminish views that also include extensive other development and infrastructure not associated with this project.
South East Street Historic District (VDHR# 204-0064)	2	No Impact- Photo Simulation confirmed that all structures and the proposed substation will not be visible and remain completely screened by intervening development and vegetation.
Culpeper National Cemetery (VDHR# 204-0069)	1	No Impact- Photo Simulation confirmed that all structures and the proposed substation will not be visible and remain completely screened by intervening development and vegetation.

Existing Structure Type:
115 kV Double Circuit Steel Monopole (Deadend)

Existing Structure Type:
115 kV Double Circuit Steel Monopole (Tangent)

Dominion Energy

Existing Structure Type:
115 kV Single Circuit Steel Monopole Staggered Arms (Deadend)

Dominion Energy

Existing Structure Type:
115 kV Double Circuit Steel Monopole (Modified Deadend)

Dominion Energy

Proposed Structure Type:
230 kV Double Circuit Steel Monopole (Deadend)

Dominion Energy®

Proposed Structure Type:
230 kV Double Circuit Steel Monopole (Tangent)

Dominion Energy

Proposed Structure Type:
230 kV Single Circuit Steel Monopole (Deadend)

Dominion Energy

Proposed Structure Type:

230 kV Single Circuit Steel 3-Pole (Deadend)

Dominion Energy

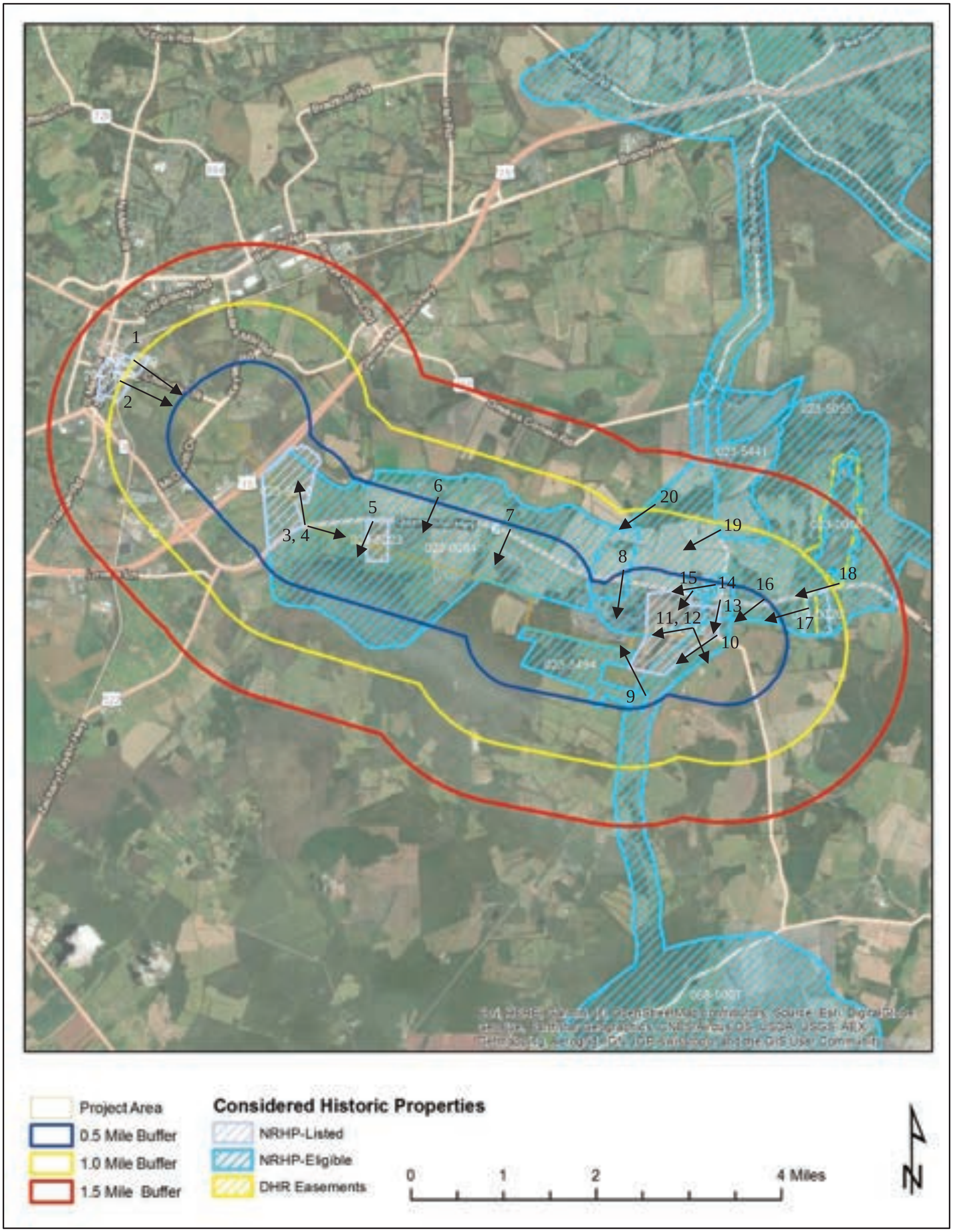


Figure 1: Location and direction of photo simulations from considered historic properties within their respective study tiers around the project alignment.

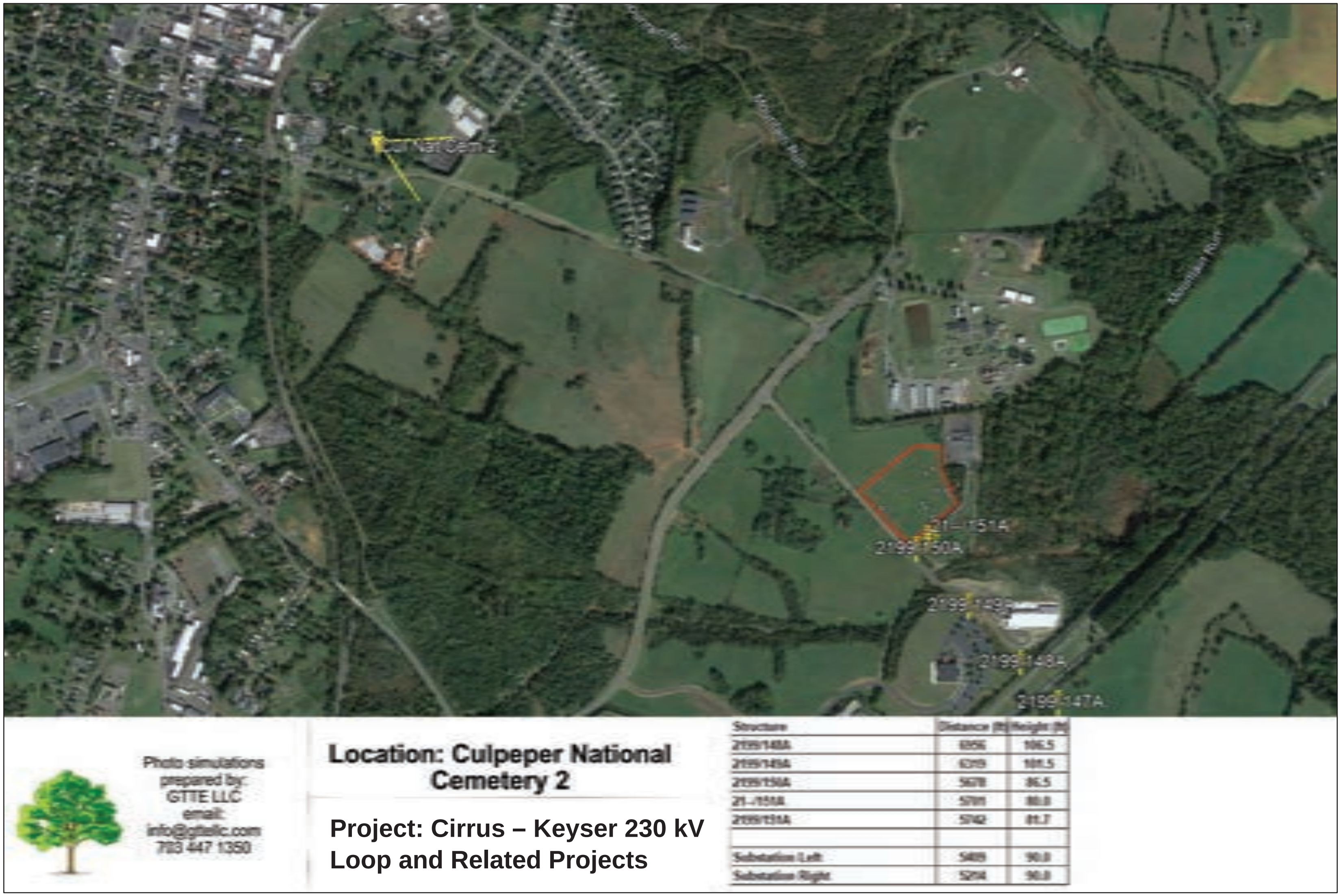


Photo Simulation 1: Culpeper National Cemetery – Simulation location, direction of view, and substation and structures modeled from Officers' circle. Source: GTTE, LLC

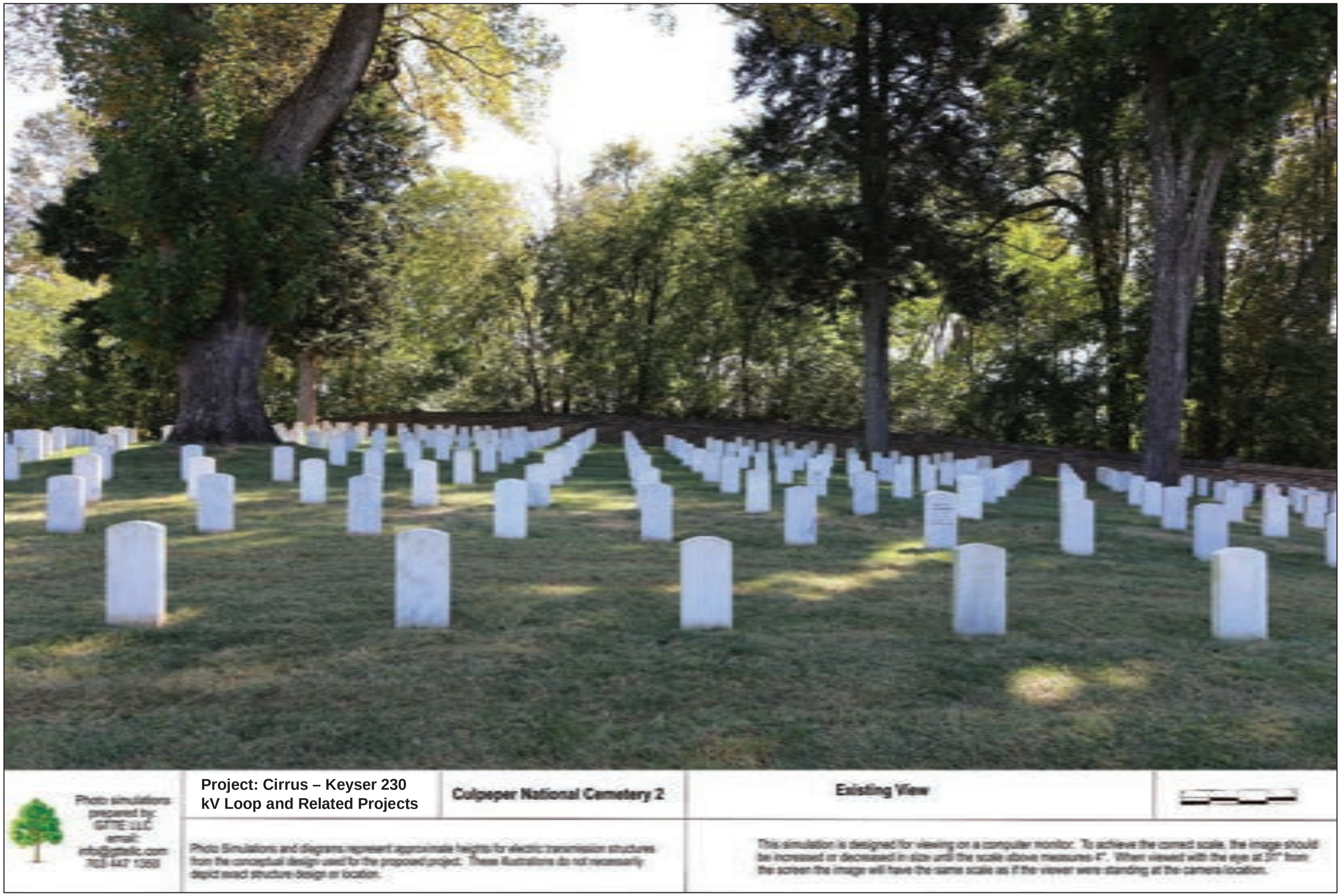


Photo Simulation 1: Culpeper National Cemetery – Existing view from Officers' circle. Source: GTTE, LLC

Photo Simulation 1: Culpeper National Cemetery – Proposed view from Officers' circle – (Substation shown as yellow box and structures not visible shown in yellow). Source: GTTE, LLC

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

Location: Culpeper National Cemetery 2

Project: Cirrus – Keyser 230 kV Loop and Related Projects

Structure	Distance (ft)	Height (ft)
2199/148A	7715	106.5
2199/149A	7098	101.5
2199/150A	6465	86.5
21-/151A	6501	80.0
2199/151A	6549	81.7
Substation Left	5409	90.0
Substation Right	5294	90.0

Photo Simulation 2: South East Street Historic District – Simulation location, direction of view, and substation and structures modeled from Chandler Street. Source: GTTE, LLC

Photo Simulation 2: South East Street Historic District – Existing view from Chandler Street. Source: GTTE, LLC

Photo Simulation 2: South East Street Historic District – Proposed view from Chandler Street – (Substation shown as yellow box and structures not visible shown in yellow). Source: GTTE, LLC

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

Location: Loc 2 North

Project: Cirrus – Keyser 230 kV Loop and Related Projects

Structure	Distance (ft)	Height (ft)
2199/142A	345	90.0
2199/143A	808	90.0
2199/144A	1129	90.0

Photo Simulation 3: Croftburn/ Mount Pony Rural Historic District – Simulation location, direction of view, and structures modeled from southeastern corner of property looking north. Source: GTTE, LLC

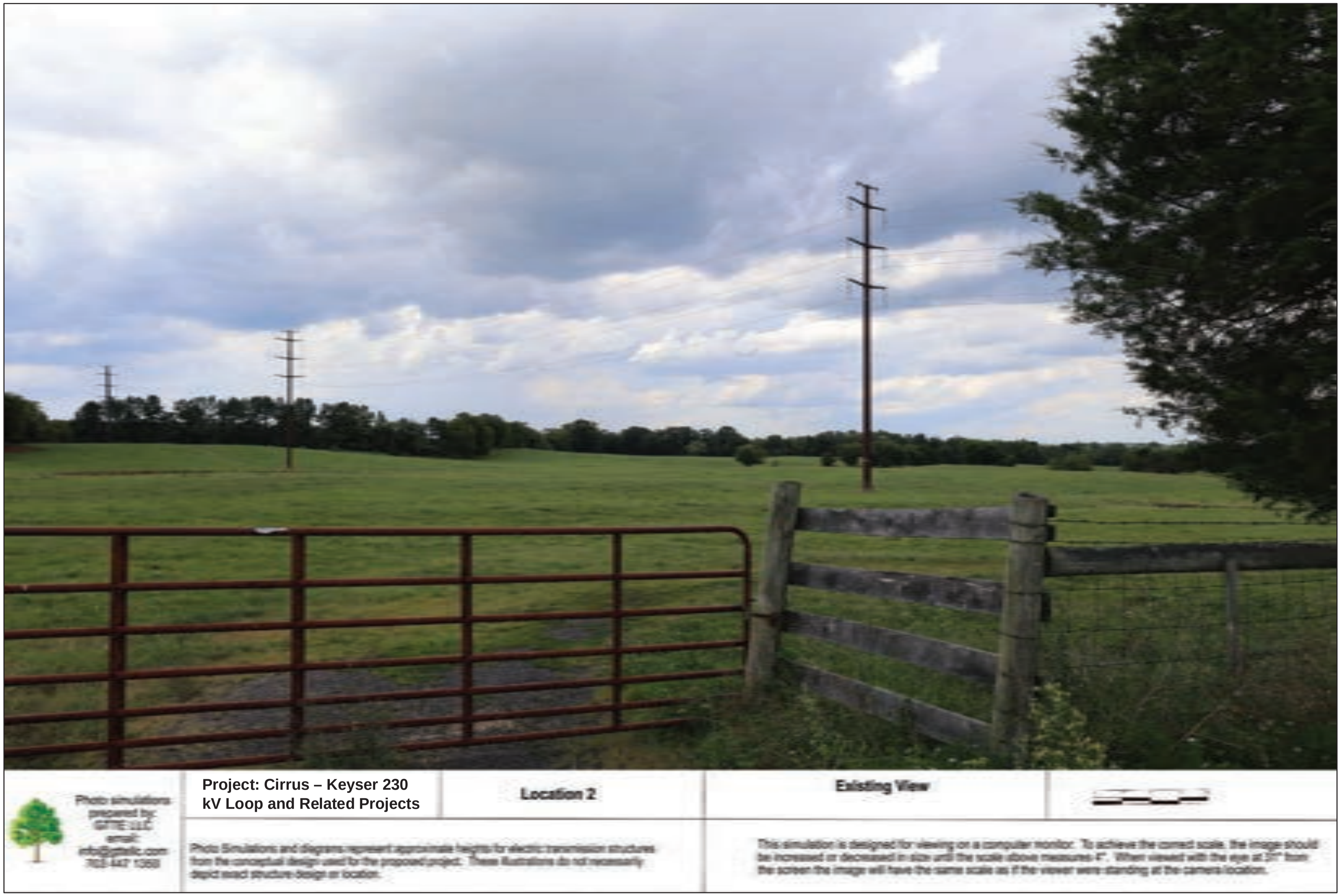


Photo Simulation 3: Croftburn/ Mount Pony Rural Historic District – Existing view from southeastern corner of property looking north. Source: GTTE, LLC

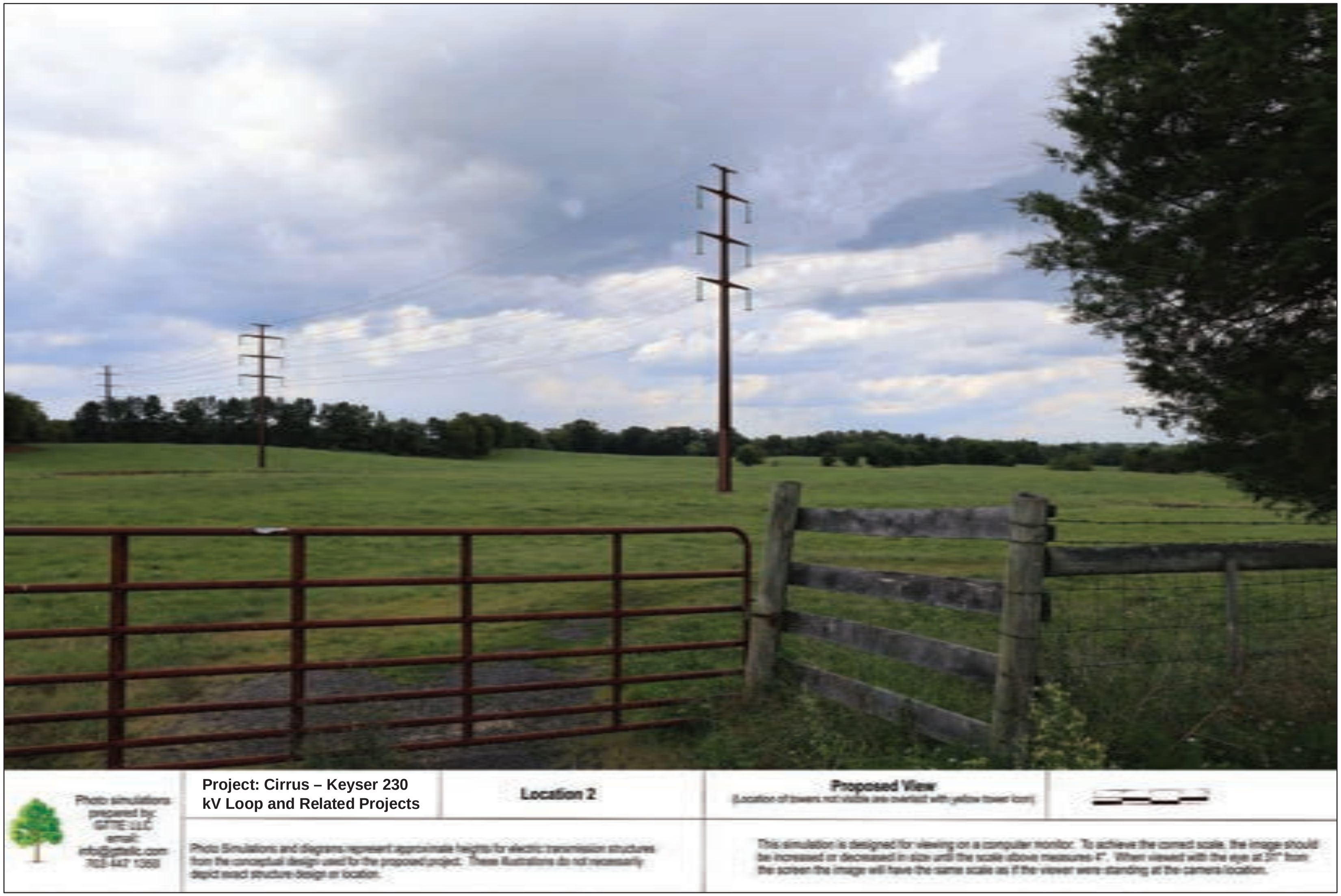


Photo Simulation 3: Croftburn/ Mount Pony Rural Historic District – Proposed view from southeastern corner of property looking north – (Visible structure shown as it would appear). Source: GTTE, LLC

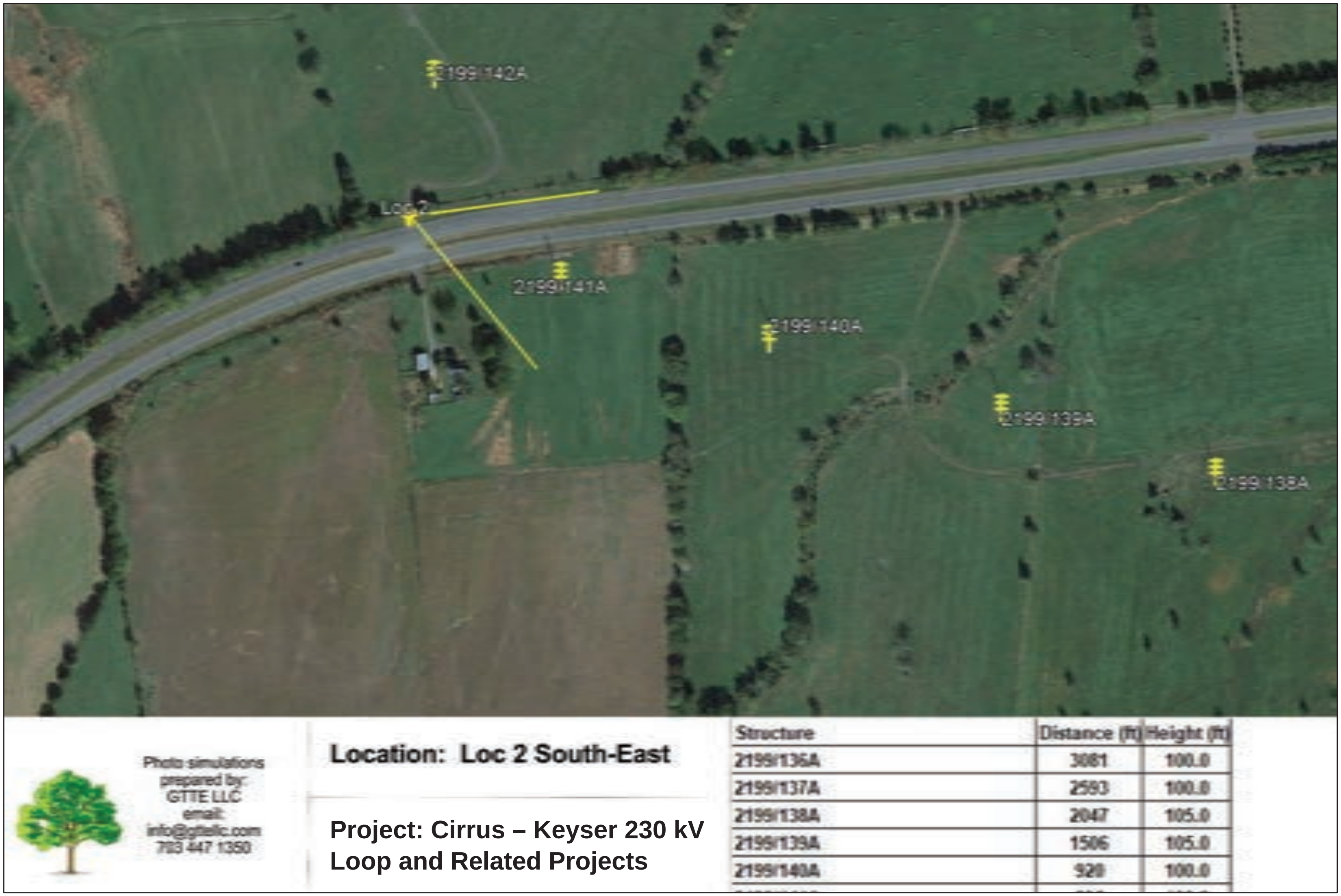
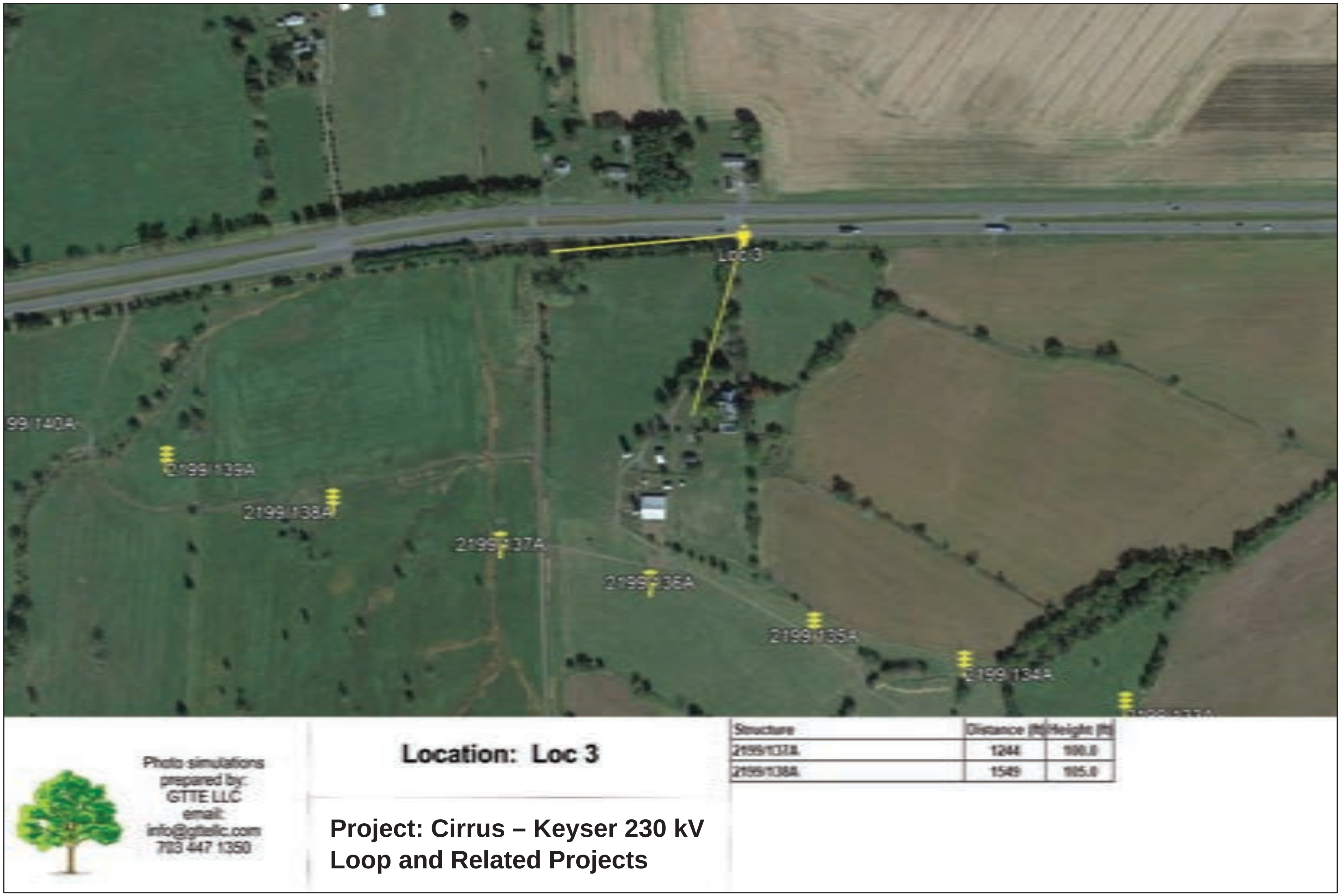


Photo Simulation 4: Croftburn/ Mount Pony Rural Historic District – Simulation location, direction of view, and structures modeled across road from southeastern corner of property. Source: GTTE, LLC

Photo Simulation 4: Croftburn/ Mount Pony Rural Historic District – Existing view across road from southeastern corner of property. Source: GTTE, LLC

Photo Simulation 4: Croftburn/ Mount Pony Rural Historic District – Proposed view across road from southeastern corner of property – (Visible structures shown as they would appear). Source: GTTE, LLC



Structure	Distance (ft)	Height (ft)
2199/137A	1244	100.0
2199/138A	1549	105.0

Photo Simulation 5: Signal Hill/ Mount Pony Rural Historic District – Simulation location, direction of view, and structures modeled from front of driveway. Source: GTTE, LLC

Photo Simulation 5: Signal Hill/ Mount Pony Rural Historic District – Existing view from front of driveway. Source: GTTE, LLC

Photo Simulation 5: Signal Hill/ Mount Pony Rural Historic District – Proposed view from front of driveway – (Visible structures shown as they would appear). Source: GTTE, LLC

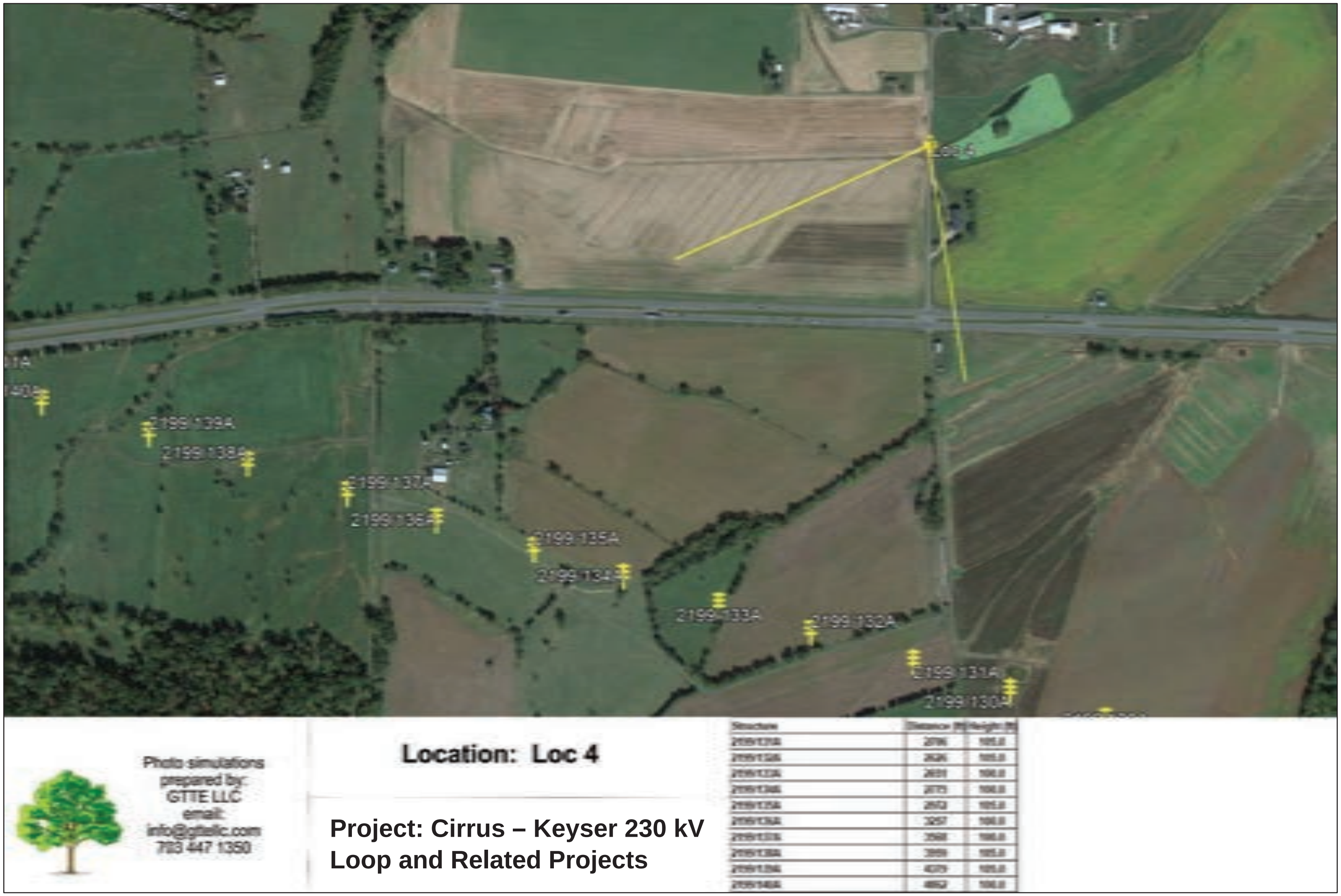


Photo Simulation 6: Mount Pony Rural Historic District – Simulation location, direction of view, and structures modeled from Ashland Farm Road. Source: GTTE, LLC

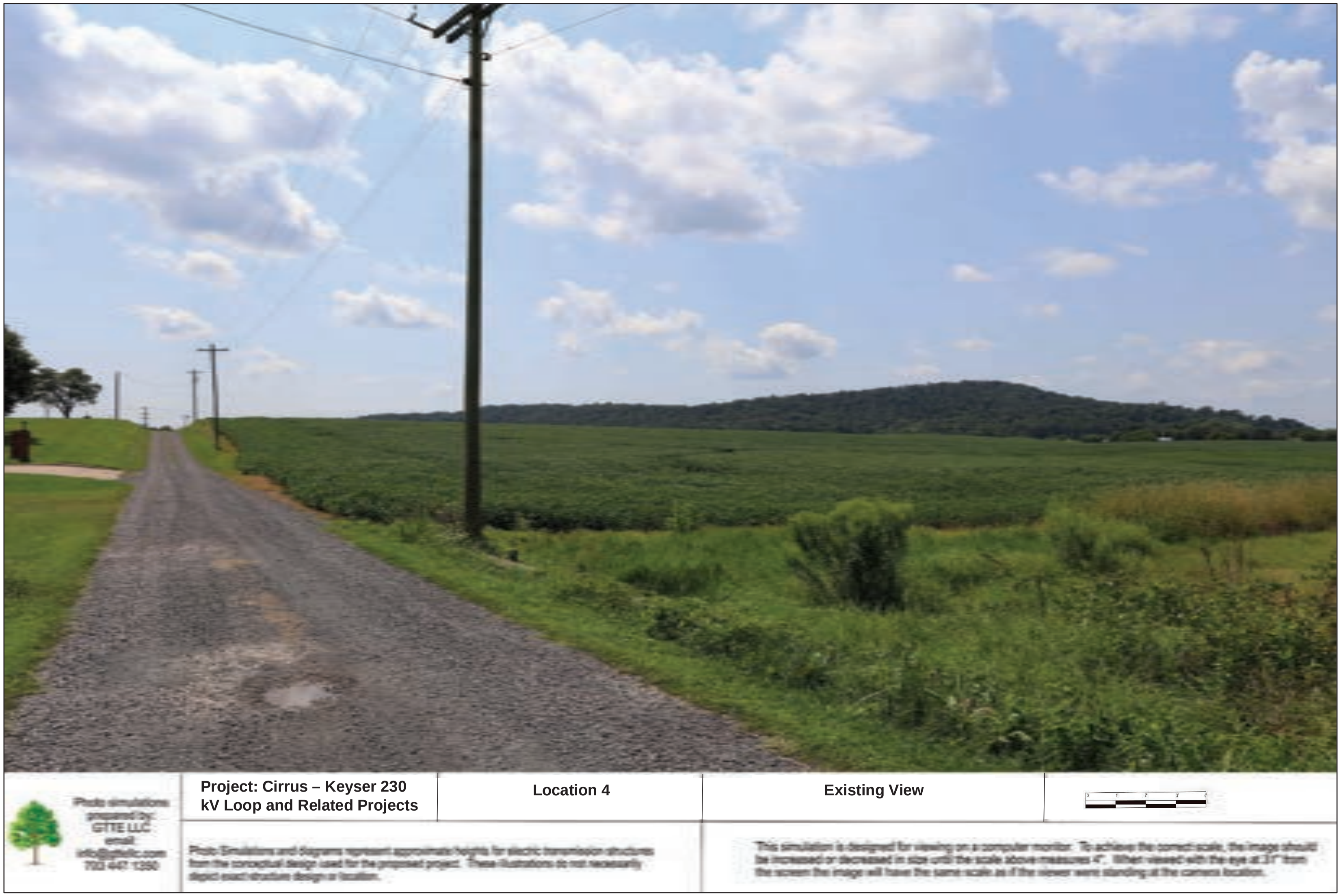


Photo Simulation 6: Mount Pony Rural Historic District – Existing view from Ashland Farm Road. Source: GTTE, LLC

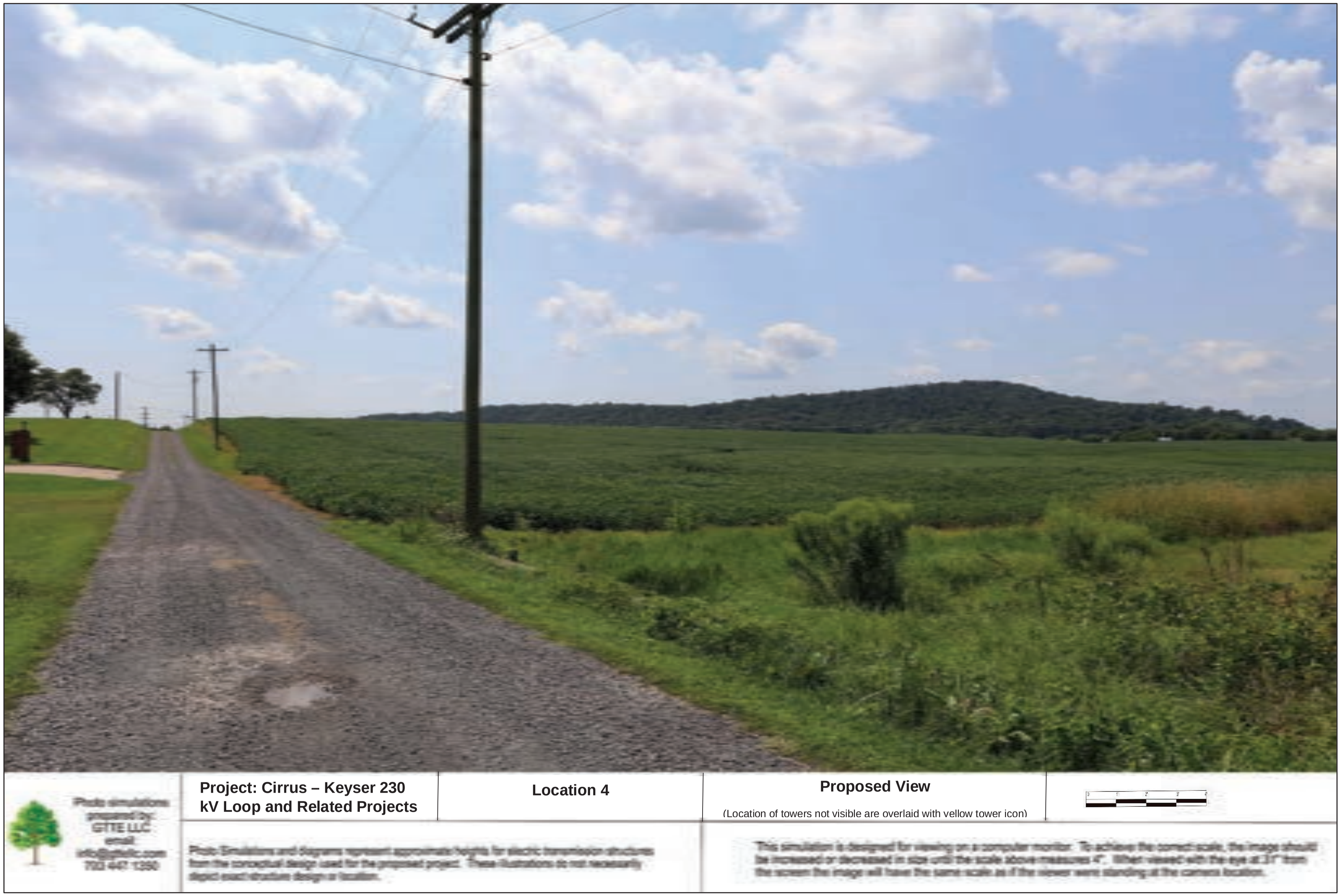


Photo Simulation 6: Mount Pony Rural Historic District – Proposed view from Ashland Farm Road – (Visible structures shown as they would appear). Source: GTTE, LLC

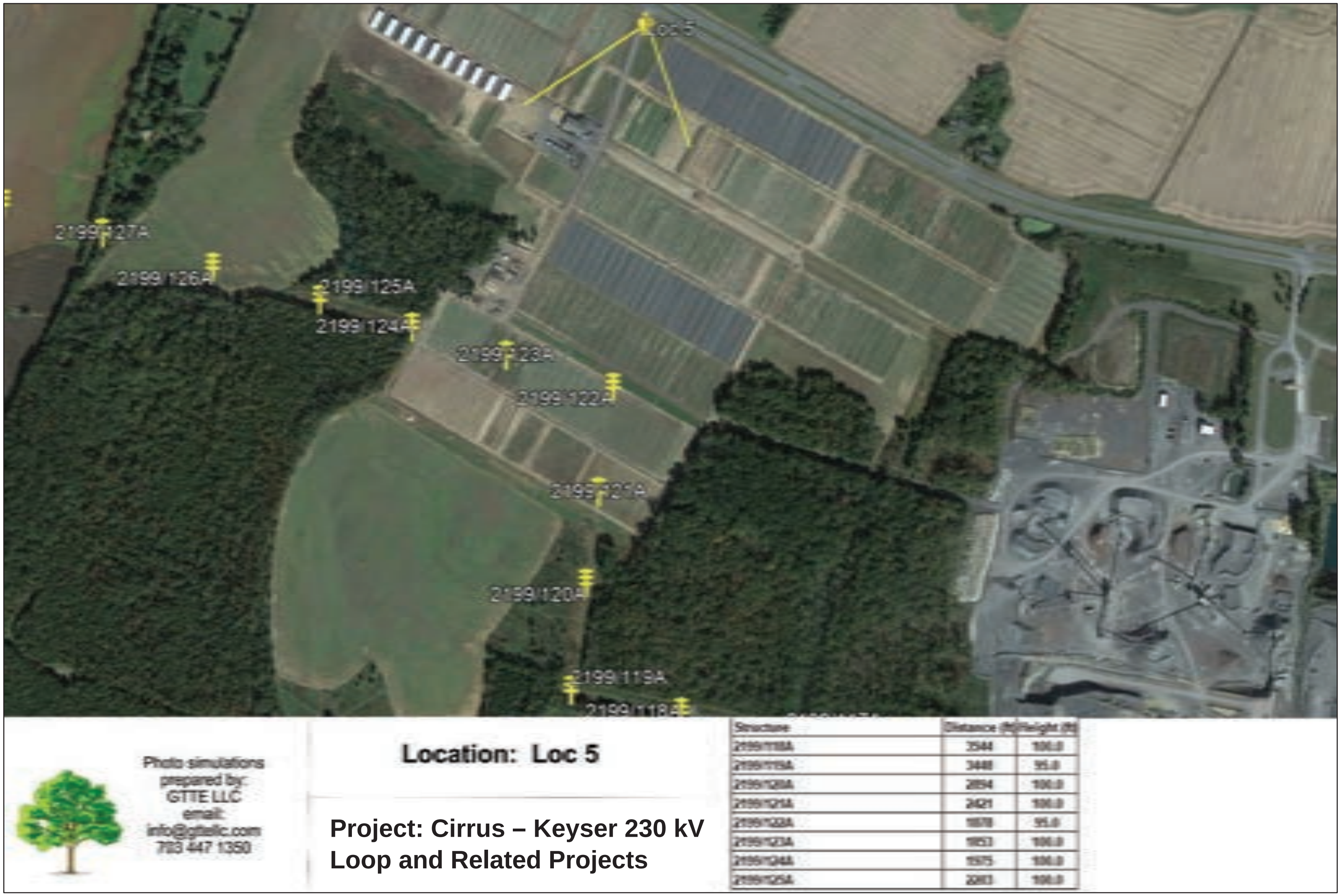


Photo Simulation 7: Mount Pony Rural Historic District – Simulation location, direction of view, and structures modeled from Route 3 at Moerings Nursery. Source: GTTE, LLC

Photo Simulation 7: Mount Pony Rural Historic District – Existing view from Route 3 at Moerings Nursery. Source: GTTE, LLC

Photo Simulation 7: Mount Pony Rural Historic District – Proposed view from Route 3 at Moerings Nursery – (Visible structures shown as they would appear. Structures not visible shown in yellow). Source: GTTE, LLC

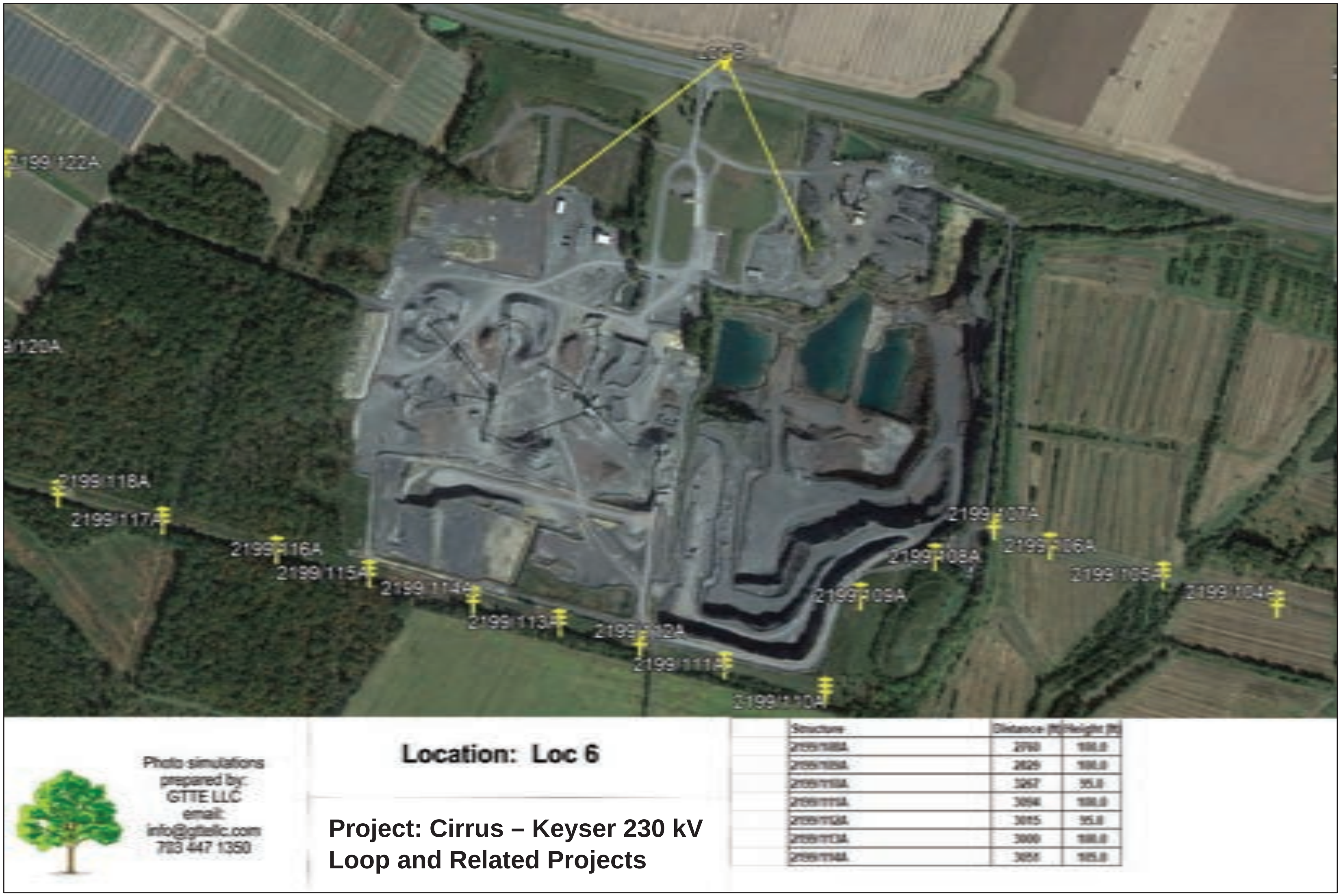


Photo Simulation 8: Mount Pony Rural Historic District/ Brandy Station Battlefield – Simulation location, direction of view, and structures modeled from Route 3 at Clover Hill Road. Source: GTTE, LLC

Photo Simulation 8: Mount Pony Rural Historic District/ Brandy Station Battlefield – Existing view from Route 3 at Clover Hill Road. Source: GTTE, LLC

Photo Simulation 8: Mount Pony Rural Historic District/ Brandy Station Battlefield – Proposed view from Route 3 at Clover Hill Road – (Visible structure shown as it would appear. Structures not visible shown in yellow). Source: GTTE, LLC

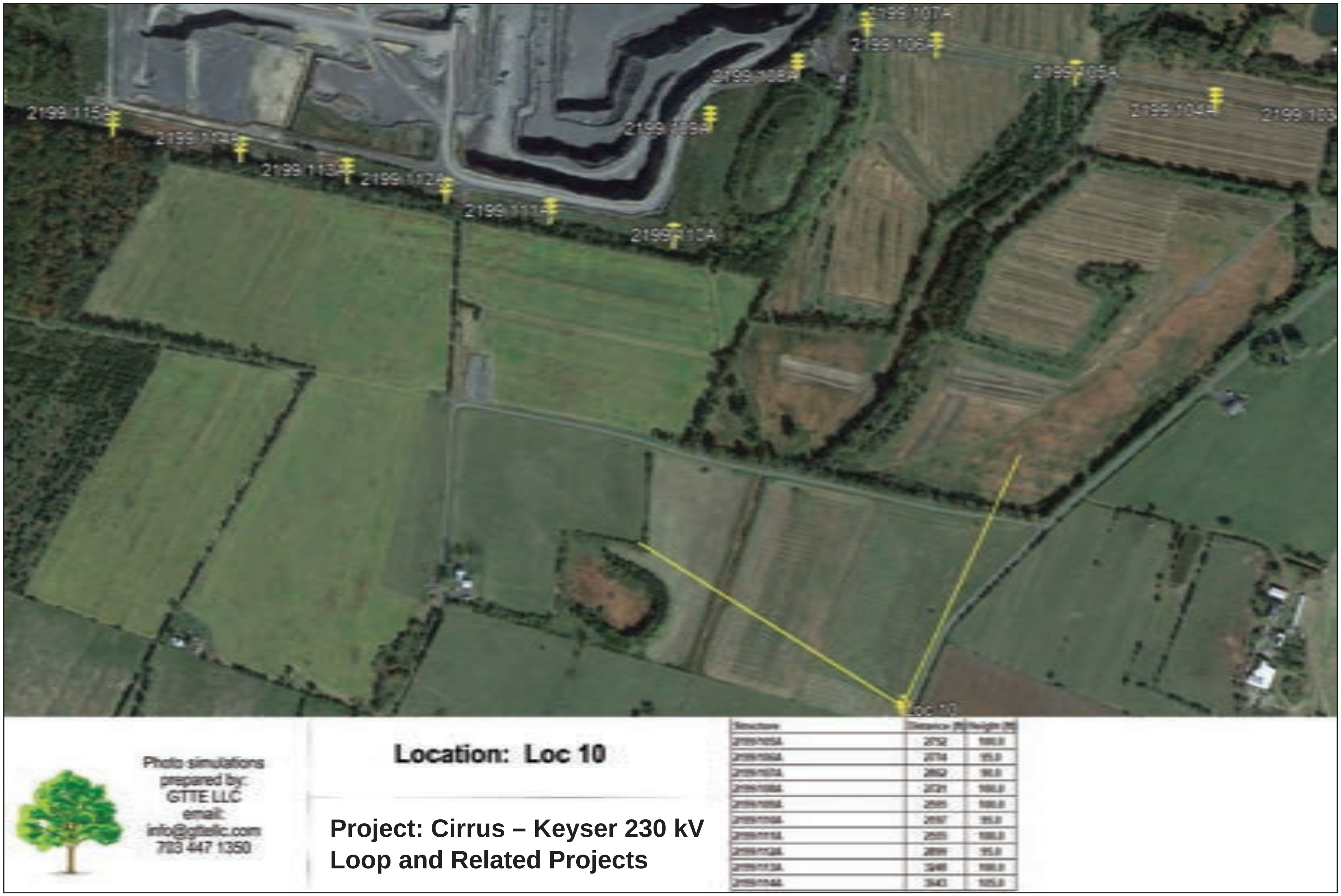


Photo Simulation 9: House at 19564 Alvere Road/ Mortons Ford Battlefield – Simulation location, direction of view, and structures modeled from Blackjack Road. Source: GTTE, LLC

Photo Simulation 9: House at 19564 Alvere Road/ Mortons Ford Battlefield – Existing view from Blackjack Road. Source: GTTE, LLC

Photo Simulation 9: House at 19564 Alvere Road/ Mortons Ford Battlefield – Proposed view from Blackjack Road – (Visible structures shown as they would appear. Structures not visible shown in yellow). Source: GTTE, LLC

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

Location: Loc 11

Project: Cirrus – Keyser 230 kV Loop and Related Projects

Structure	Distance (ft)	Height (ft)
2199/102A	736	100.0
2199/103A	1197	100.0
2199/104A	1752	100.0

Photo Simulation 10: Rose Hill/ Mortons Ford Battlefield – Simulation location, direction of view, and structures modeled from Batna Road. Source: GTTE, LLC

Photo Simulation 10: Rose Hill/ Mortons Ford Battlefield – Existing view from Batna Road. Source: GTTE, LLC

Photo Simulation 10: Rose Hill/ Mortons Ford Battlefield – Proposed view from Batna Road – (Visible structures shown as they would appear. Structures not visible shown in yellow). Source: GTTE, LLC

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

Location: Loc 12 South

Structure	Distance (ft)	Height (ft)
2199/102A	258	100.0

Project: Cirrus – Keyser 230 kV Loop and Related Projects

Photo Simulation 11: Rose Hill – Simulation location, direction of view, and structures modeled from driveway looking southeast. Source: GTTE, LLC

Photo Simulation 11: Rose Hill – Existing view from driveway looking southeast. Source: GTTE, LLC

Photo Simulation 11: Rose Hill – Proposed view from driveway looking southeast – (Visible structure shown as it would appear). Source: GTTE, LLC

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

Location: Loc 12 West

Project: Cirrus – Keyser 230 kV Loop and Related Projects

Structure	Distance (ft)	Height (ft)
2199/103A	420	100.0
2199/104A	946	100.0
2199/105A	1538	100.0
2199/106A	2133	95.0

Photo Simulation 12: Rose Hill – Simulation location, direction of view, and structures modeled from driveway looking southeast. Source: GTTE, LLC

Photo Simulation 12: Rose Hill – Existing view from driveway looking southwest. Source: GTTE, LLC

Photo Simulation 12: Rose Hill – Proposed view from driveway looking southwest – (Visible structure shown as it would appear). Source: GTTE, LLC

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

Location: Loc 9

Project: Cirrus – Keyser 230 kV Loop and Related Projects

Structure	Distance (ft)	Height (ft)
2199/100	1917	100.0
2199/101A	1800	100.0
2199/102A	1858	100.0
2199/103A	2038	100.0

Photo Simulation 13: Mortons Ford Battlefield/ Brandy Station Battlefield – Simulation location, direction of view, and structures modeled from Batna Road at Route 3. Source: GTTE, LLC

Photo Simulation 13: Mortons Ford Battlefield/ Brandy Station Battlefield – Existing view from Batna Road at Route 3. Source: GTTE, LLC

Photo Simulation 13: Mortons Ford Battlefield/ Brandy Station Battlefield – Proposed view from Batna Road at Route 3 – (Visible structure shown as it would appear. Structures not visible shown in yellow). Source: GTTE, LLC

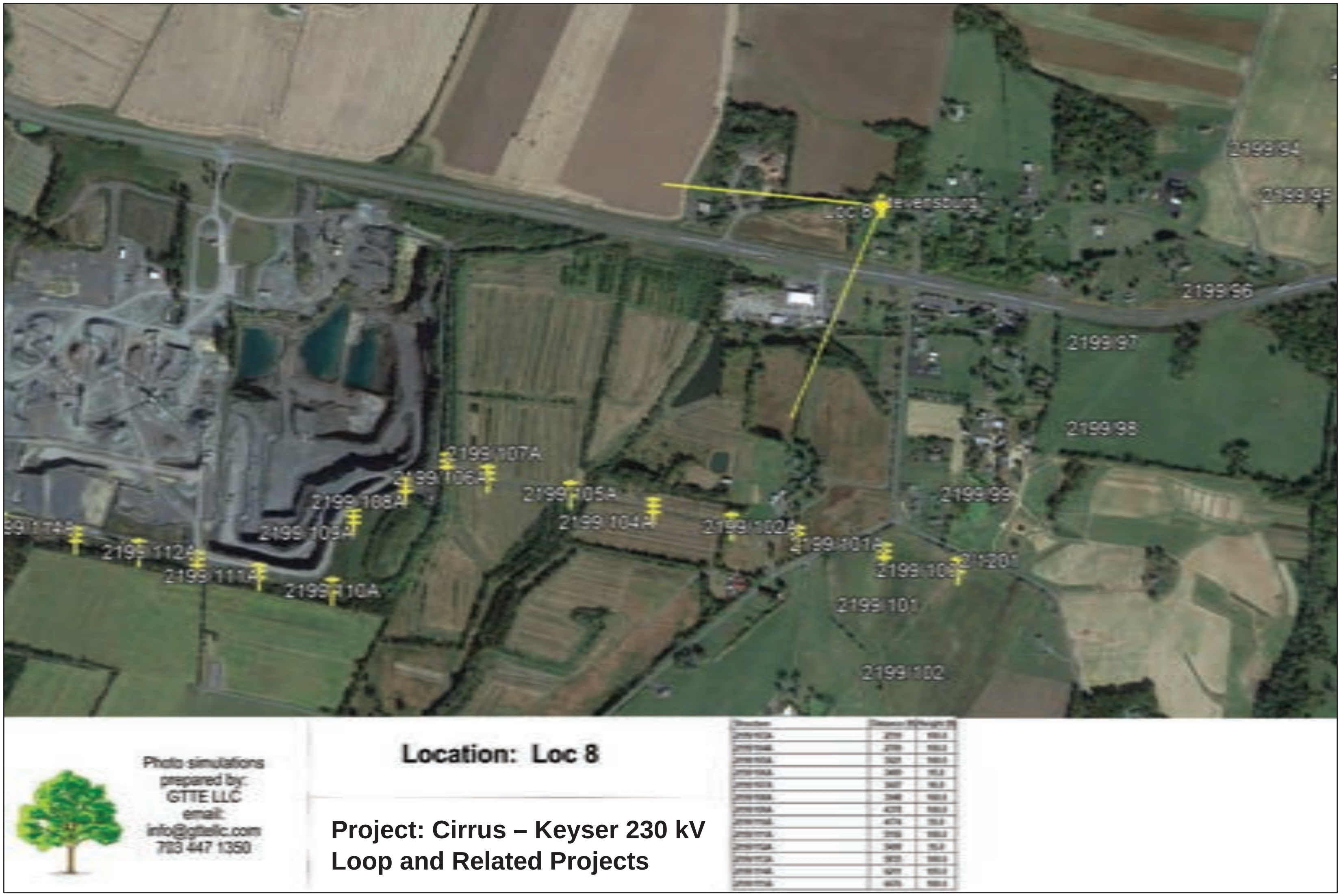


Photo Simulation 14: Zimmerman's Tavern/ Brandy Station Battlefield – Simulation location, direction of view, and structures modeled from front of the building. Source: GTTE, LLC

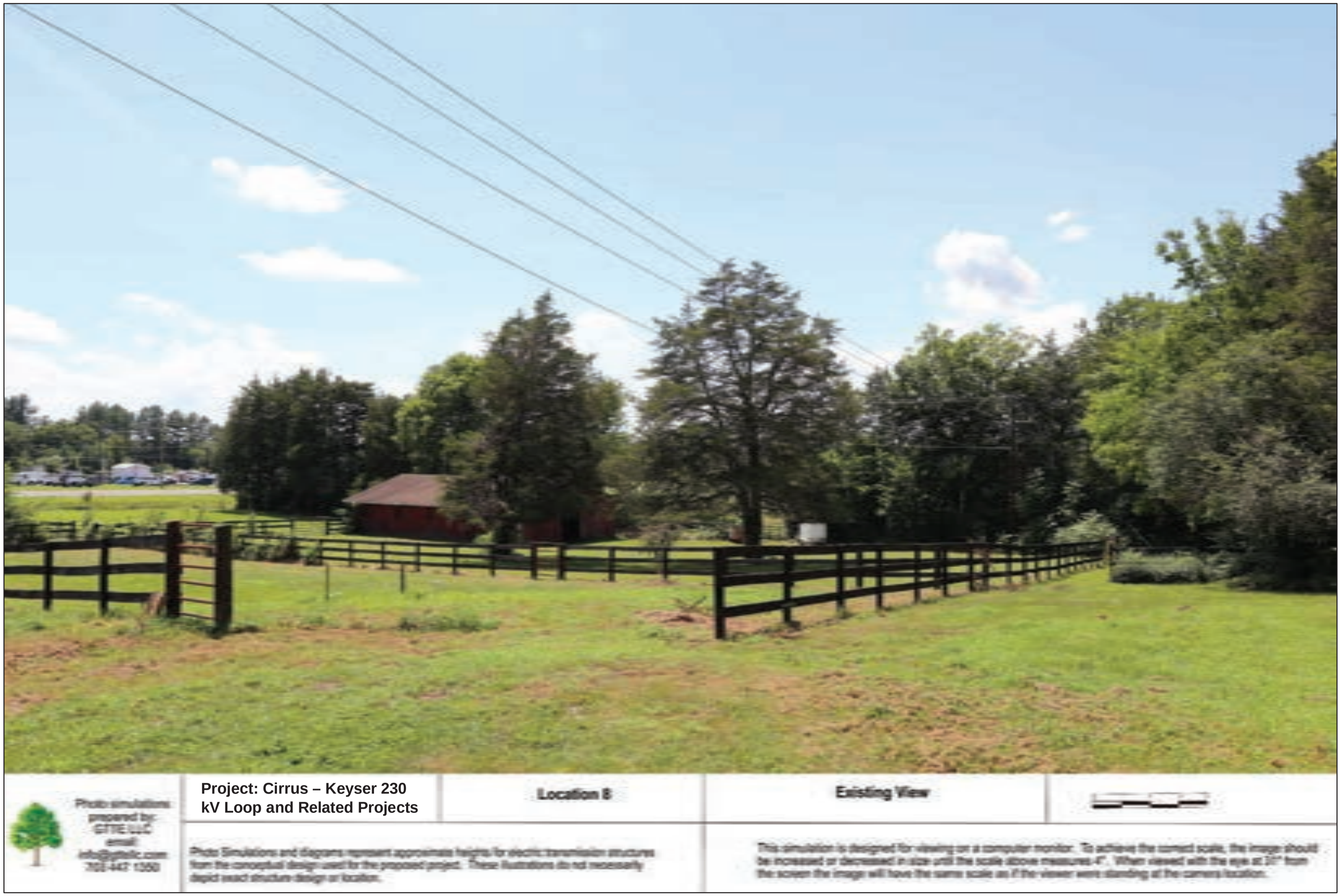


Photo Simulation 14: Zimmerman's Tavern/ Brandy Station Battlefield – Existing view from front of the building. Source: GTTE, LLC

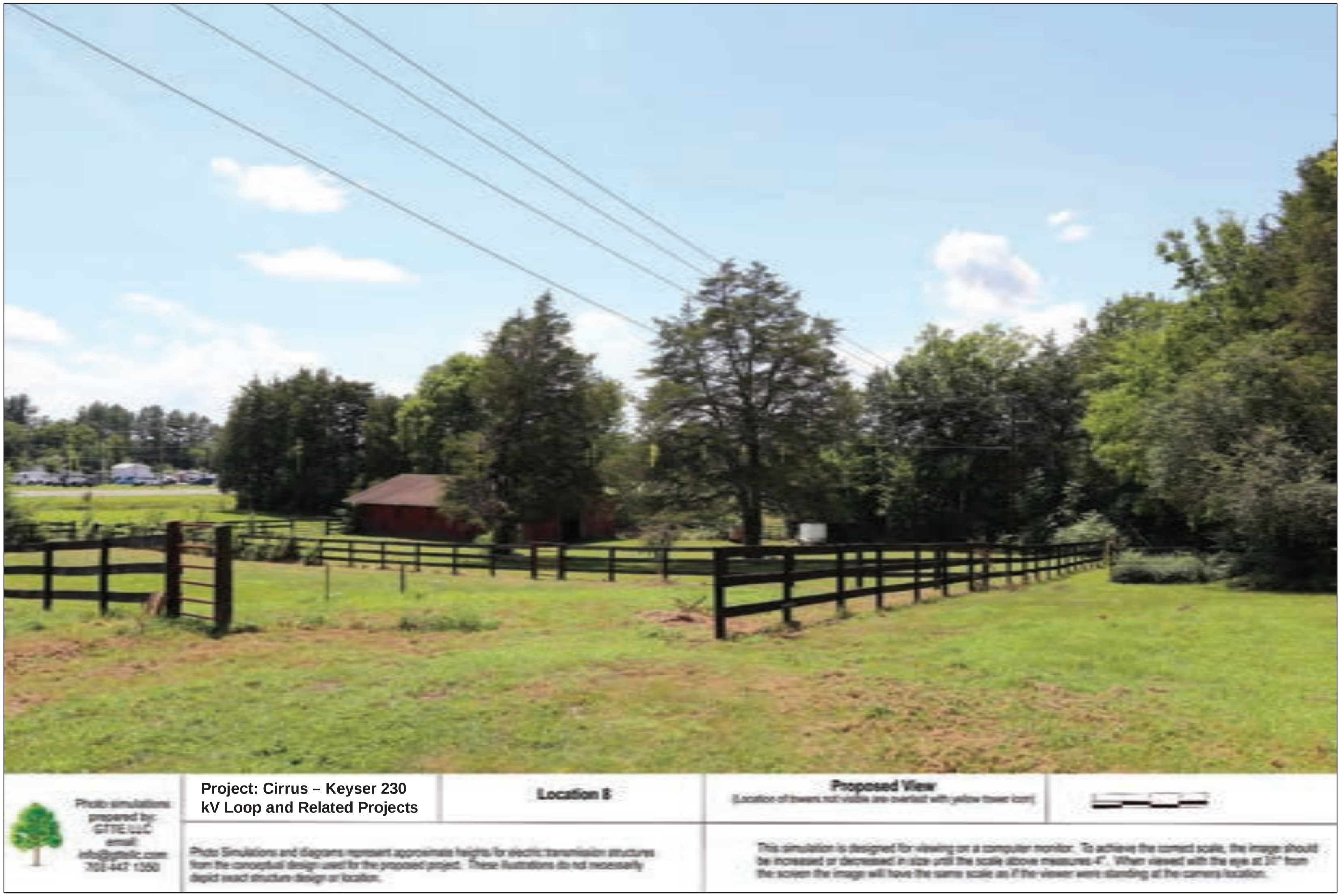


Photo Simulation 14: Zimmerman's Tavern/ Brandy Station Battlefield – Proposed view from front of the building – (Structures not visible shown in yellow). Source: GTTE, LLC

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

Location: Loc 7

Project: Cirrus – Keyser 230 kV Loop and Related Projects

Structure	Distance (ft)	Height (ft)
2199/102A	2230	100.0
2199/103A	2072	100.0
2199/104A	2016	100.0
2199/105A	2134	100.0

Photo Simulation 15: Zimmerman's Tavern/ Brandy Station Battlefield – Simulation location, direction of view, and structures modeled from west edge of property along Route 3. Source: GTTE, LLC

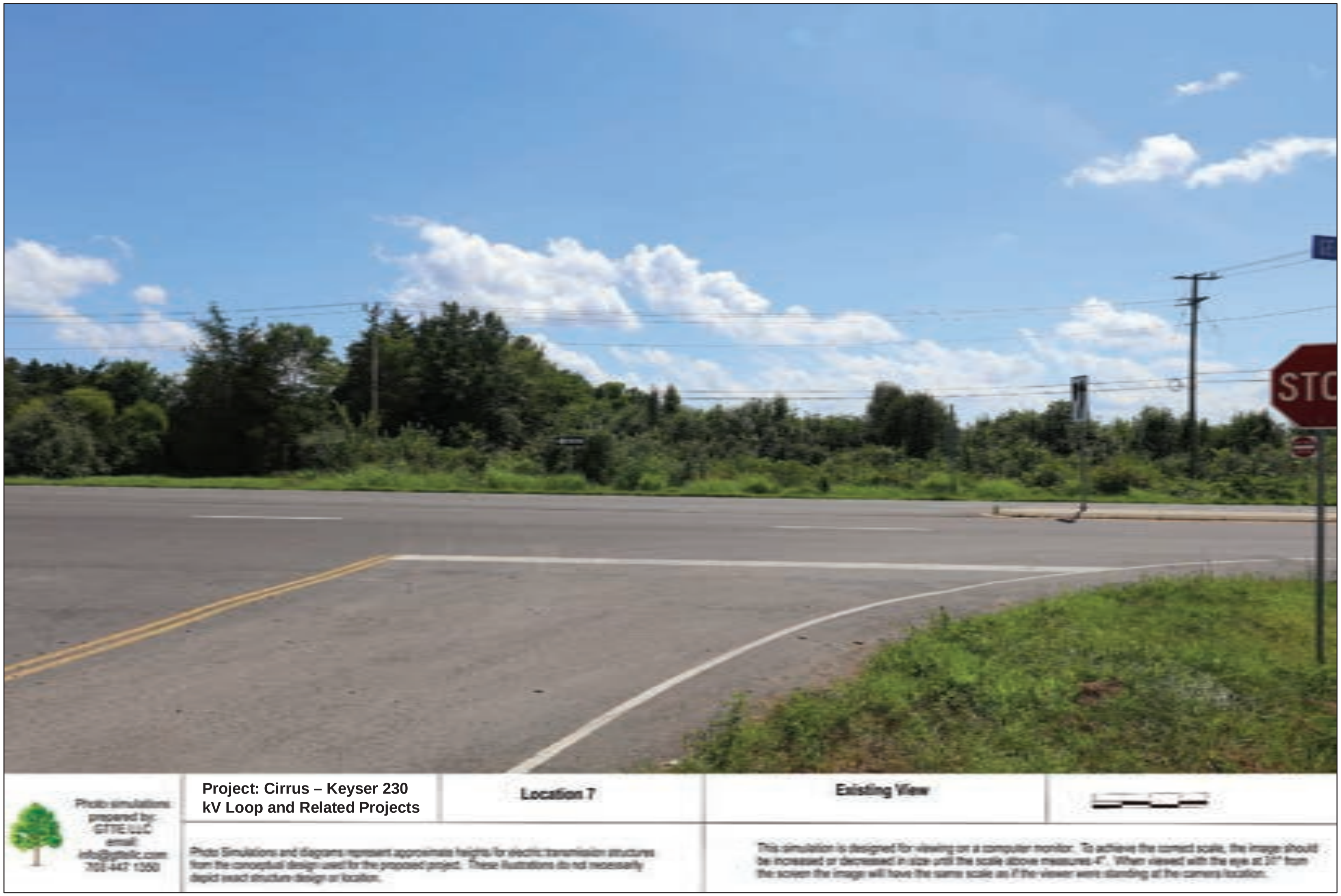


Photo Simulation 15: Zimmerman's Tavern/ Brandy Station Battlefield – Existing view from west edge of property along Route 3. Source: GTTE, LLC

Photo Simulation 15: Zimmerman's Tavern/ Brandy Station Battlefield – Proposed view from west edge of property along Route 3 – (Visible structures shown as they would appear. Structures not visible shown in yellow). Source: GTTE, LLC

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

Location: Loc 13

Project: Cirrus – Keyser 230 kV Loop and Related Projects

Structure	Distance (ft)	Height (ft)
2199/100	3263	100.0
2199/101A	3549	100.0
2199/102A	4010	100.0
2199/103A	4392	100.0

Photo Simulation 16: Brandy Station Battlefield – Simulation location, direction of view, and structures modeled from Wayside at York Road. Source: GTTE, LLC

Photo Simulation 16: Brandy Station Battlefield – Existing view from Wayside at York Road. Source: GTTE, LLC

Photo Simulation 16: Brandy Station Battlefield – Proposed view from Wayside at York Road – (Structures not visible shown in yellow). Source: GTTE, LLC

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

Location: Loc 15

Project: Cirrus – Keyser 230 kV Loop and Related Projects

Structure	Distance (ft)	Height (ft)
2199/100	3877	100.0
2199/101A	4326	100.0
2199/102A	4876	100.0
2199/103A	5311	100.0
2199/104A	5828	100.0

Photo Simulation 17: Salubria/ Brandy Station Battlefield – Simulation location, direction of view, and structures modeled from Salubria Lane. Source: GTTE, LLC

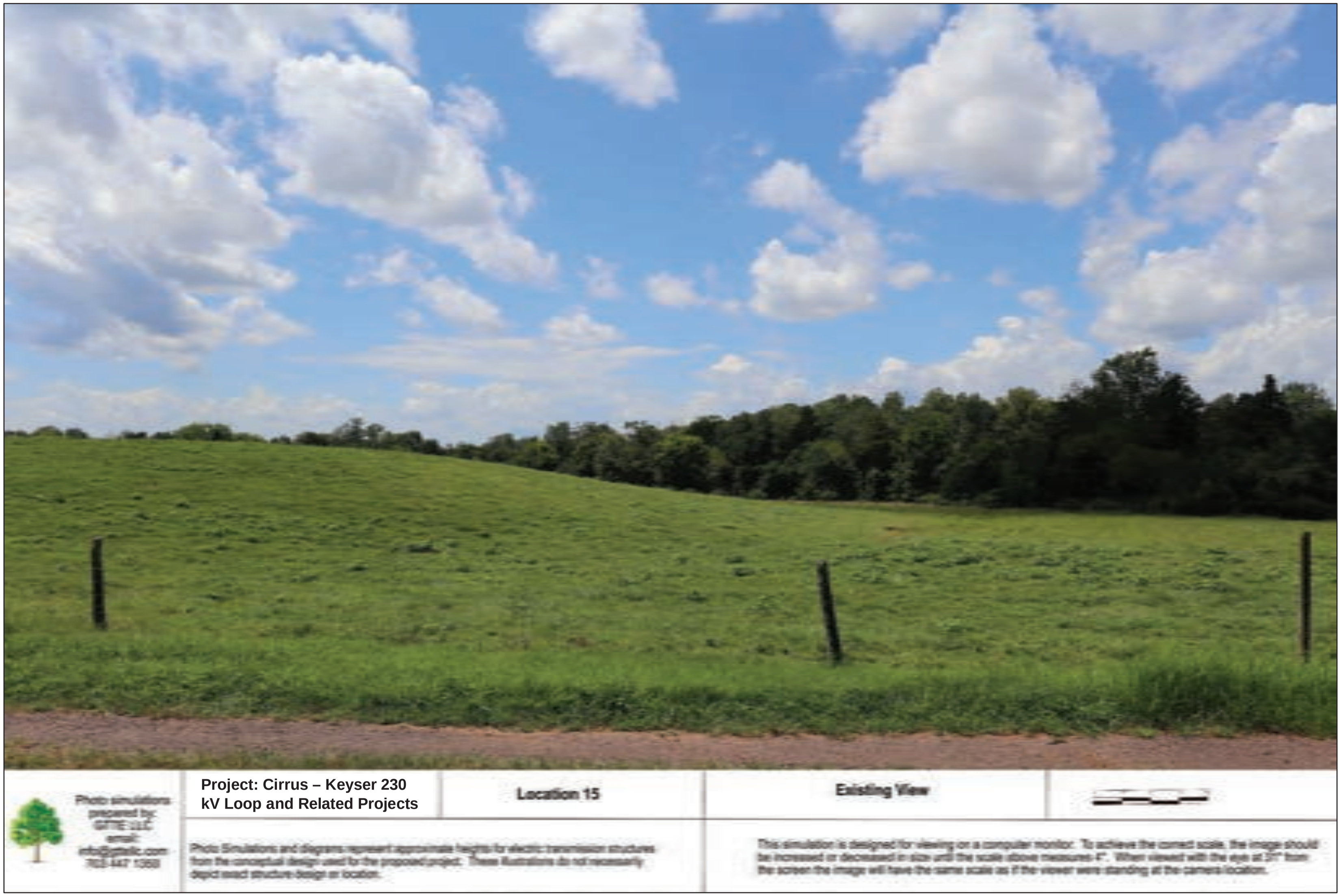


Photo Simulation 17: Salubria/ Brandy Station Battlefield – Existing view from Salubria Lane. Source: GTTE, LLC

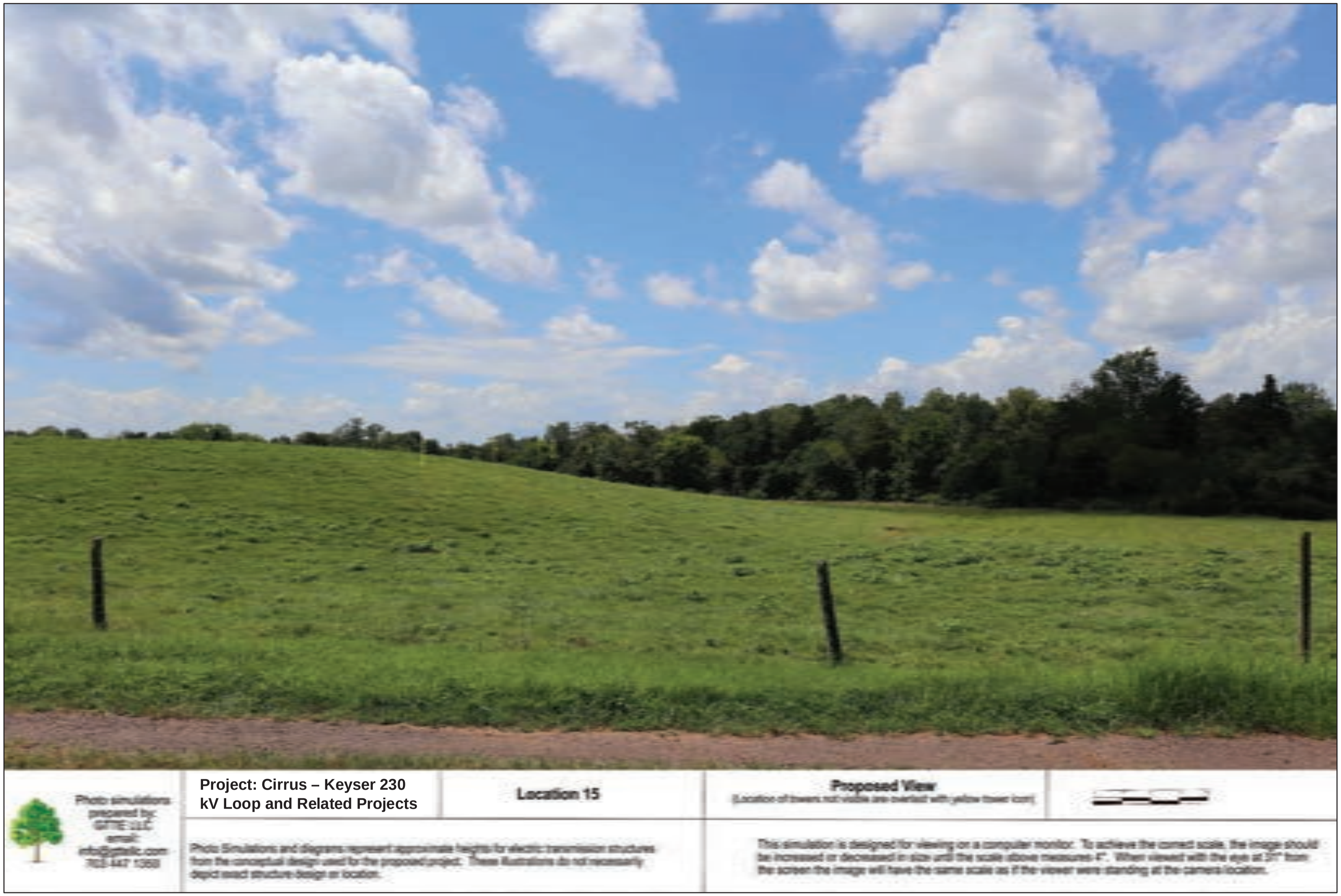


Photo Simulation 17: Salubria/ Brandy Station Battlefield – Proposed view from Salubria Lane – (Structures not visible shown in yellow). Source: GTTE, LLC

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

Location: Loc 14

Project: Cirrus – Keyser 230 kV Loop and Related Projects

Structure	Distance (ft)	Height (ft)
2199/100	5695	100.0
2199/101A	6118	100.0
2199/102A	6636	100.0
2199/103A	7846	100.0

Photo Simulation 18: Hansborough Ridge/ Brandy Station Battlefield – Simulation location, direction of view, and structures modeled from Route 3 at entrance to Hansbrough Ridge. Source: GTTE, LLC

Photo Simulation 18: Hansborough Ridge/ Brandy Station Battlefield – Existing view from Route 3 at entrance to Hansbrough Ridge. Source: GTTE, LLC

Photo Simulation 18: Hansborough Ridge/ Brandy Station Battlefield – Proposed view from Route 3 at entrance to Hansbrough Ridge – (Structures not visible shown in yellow). Source: GTTE, LLC

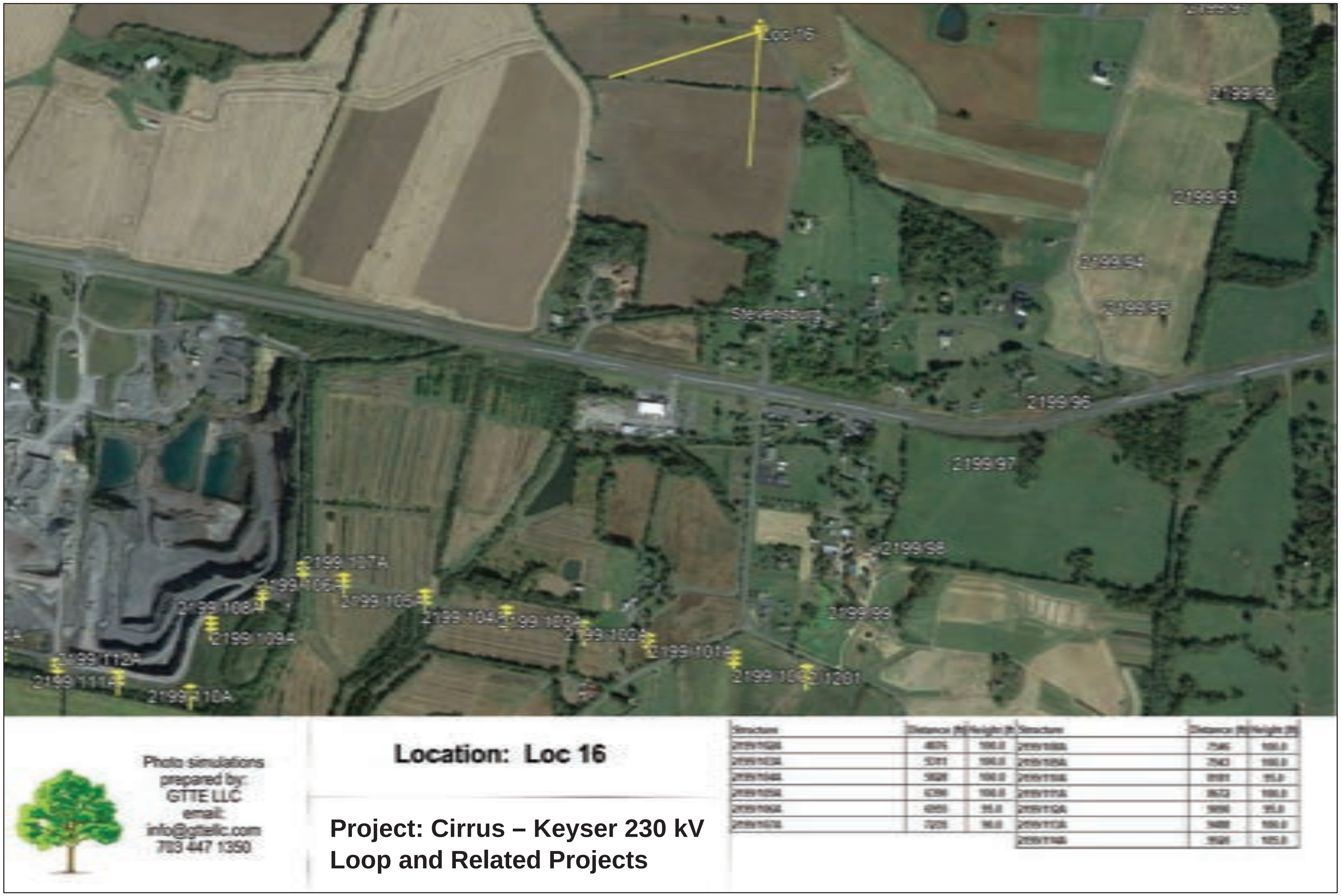


Photo Simulation 19: Brandy Station Battlefield/ Mountain Run Historic District – Simulation location, direction of view, and structures modeled from Stevensburg Road. Source: GTTE, LLC

Photo Simulation 19: Brandy Station Battlefield/ Mountain Run Historic District – Existing view from Stevensburg Road. Source: GTTE, LLC

Photo Simulation 19: Brandy Station Battlefield/ Mountain Run Historic District – Proposed view from Stevensburg Road – (Structures not visible shown in yellow). Source: GTTE, LLC

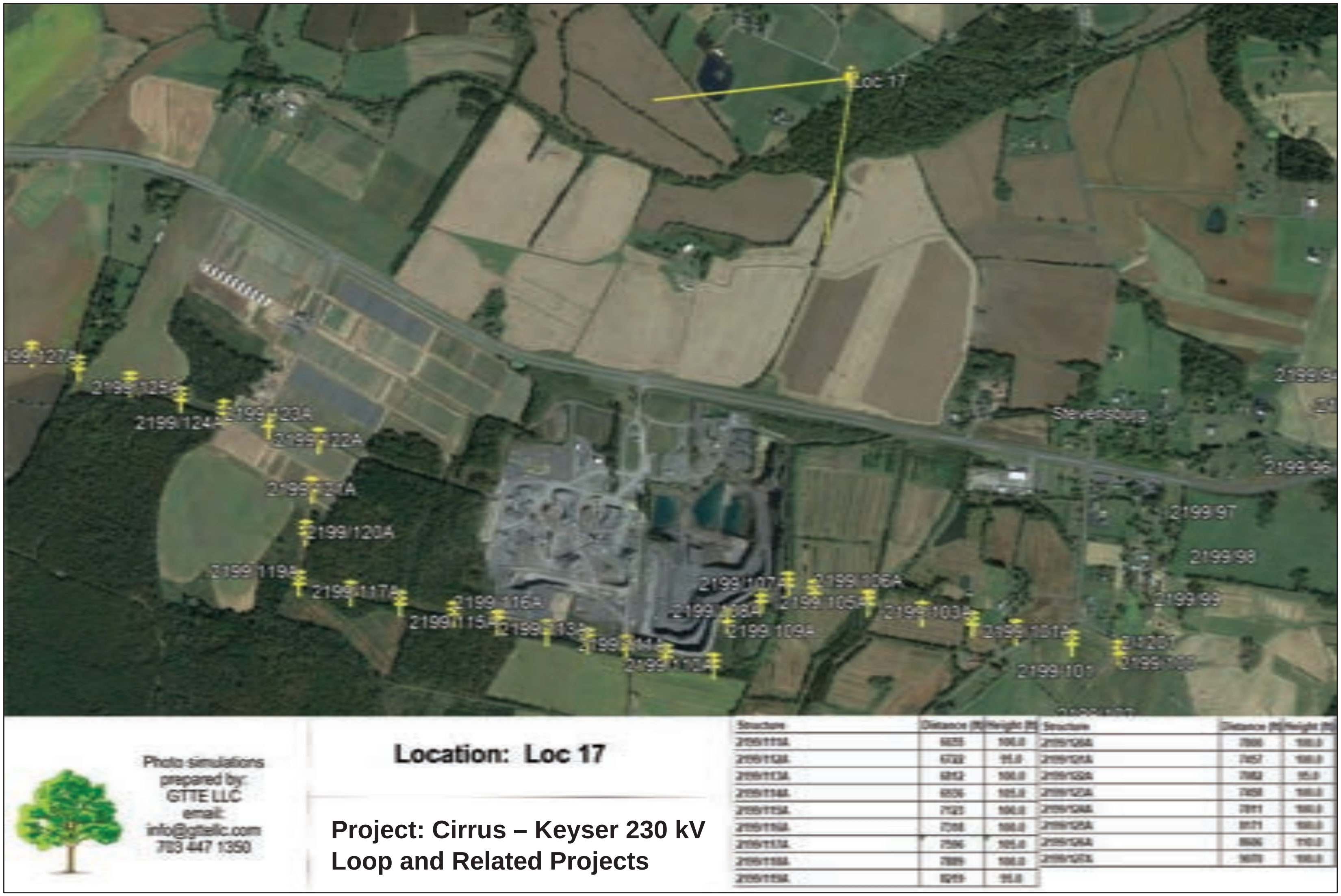


Photo Simulation 20: Brandy Station Battlefield – Simulation location, direction of view, and structures modeled from Mountain Run Winery. Source: GTTE, LLC

Photo Simulation 20: Brandy Station Battlefield – Existing view from Mountain Run Winery. Source: GTTE, LLC

Photo Simulation 20: Brandy Station Battlefield – Proposed view from Mountain Run Winery – (Structures not visible shown in yellow). Source: GTTE, LLC

II. DESCRIPTION OF THE PROPOSED PROJECT

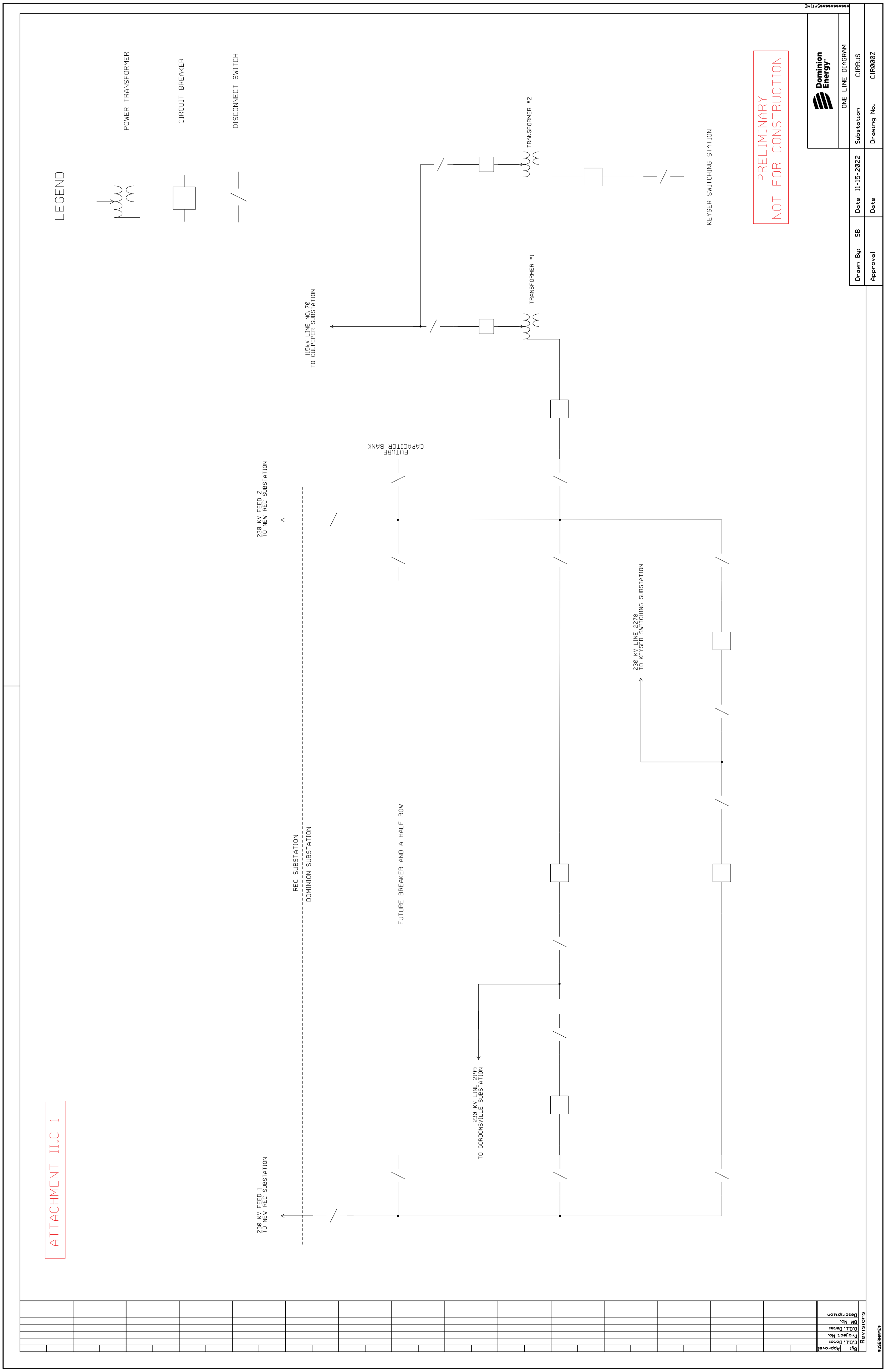
C. Describe and furnish plan drawings of all new substations, switching stations, and other ground facilities associated with the proposed project. Include size, acreage, and bus configurations. Describe substation expansion capability and plans. Provide one-line diagrams for each.

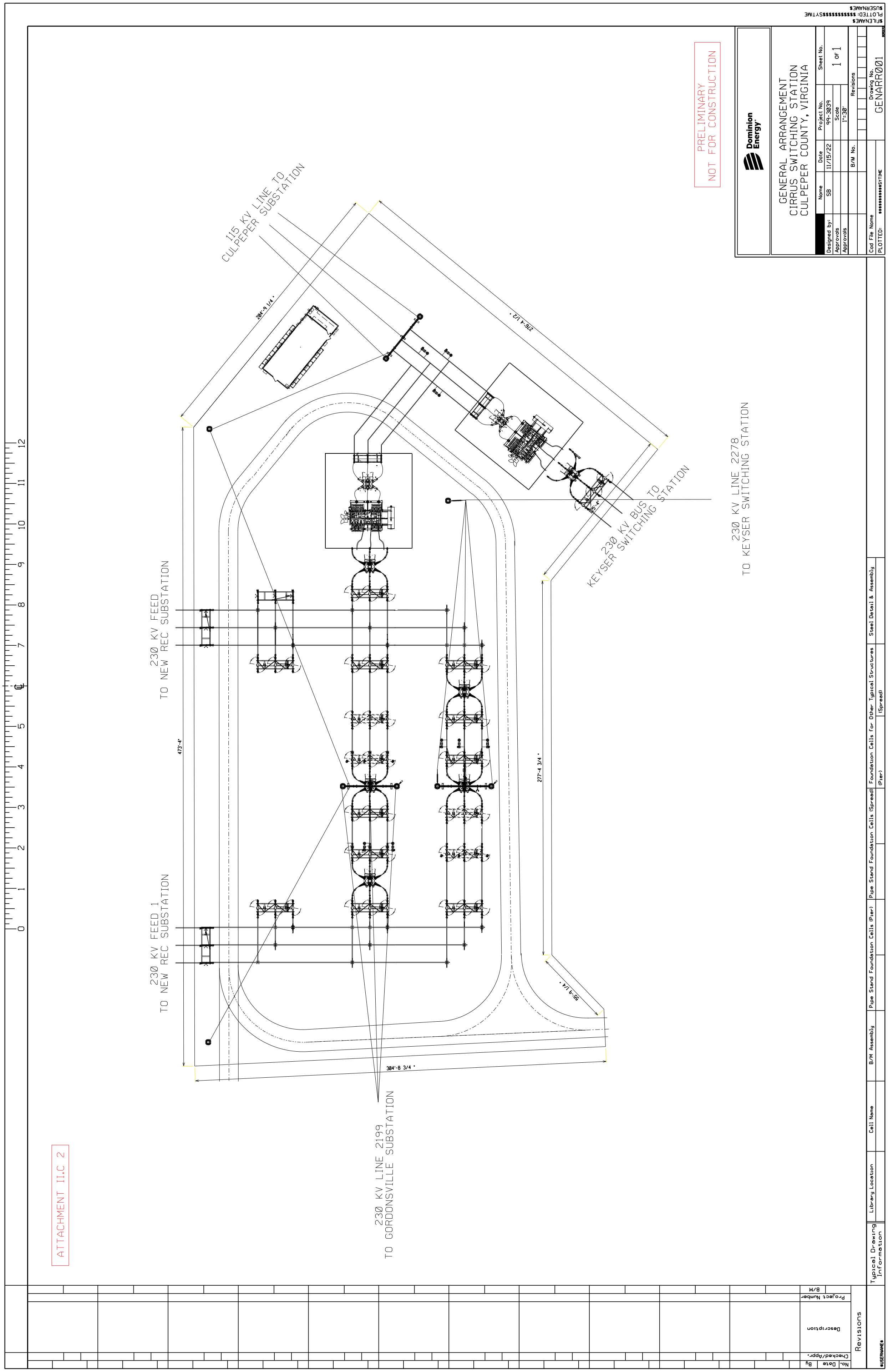
Response: The proposed Project requires construction of two new switching stations in Culpeper County, Virginia—Cirrus and Keyser Stations. The line protection settings will also be updated at the Company's existing Remington, Germanna, Gordonsville, Oak Green, and Culpeper Substations.

The proposed Cirrus Station initially will be constructed with six 230 kV circuit breakers, two 230 kV line terminals, two 230 kV REC delivery points, two 230-115 kV, 168 MVA transformers, two 115 circuit breakers, one 115 kV line terminal and other associated equipment. In total, it will be designed to accommodate future growth in the area with a build-out of four additional 230 kV circuit breakers, two additional 230 kV line terminals and a 230 kV capacitor bank. Additionally, a new control enclosure will be installed to accommodate the protective relay and communications cabinets. The total area required to build Cirrus Station is approximately five acres.

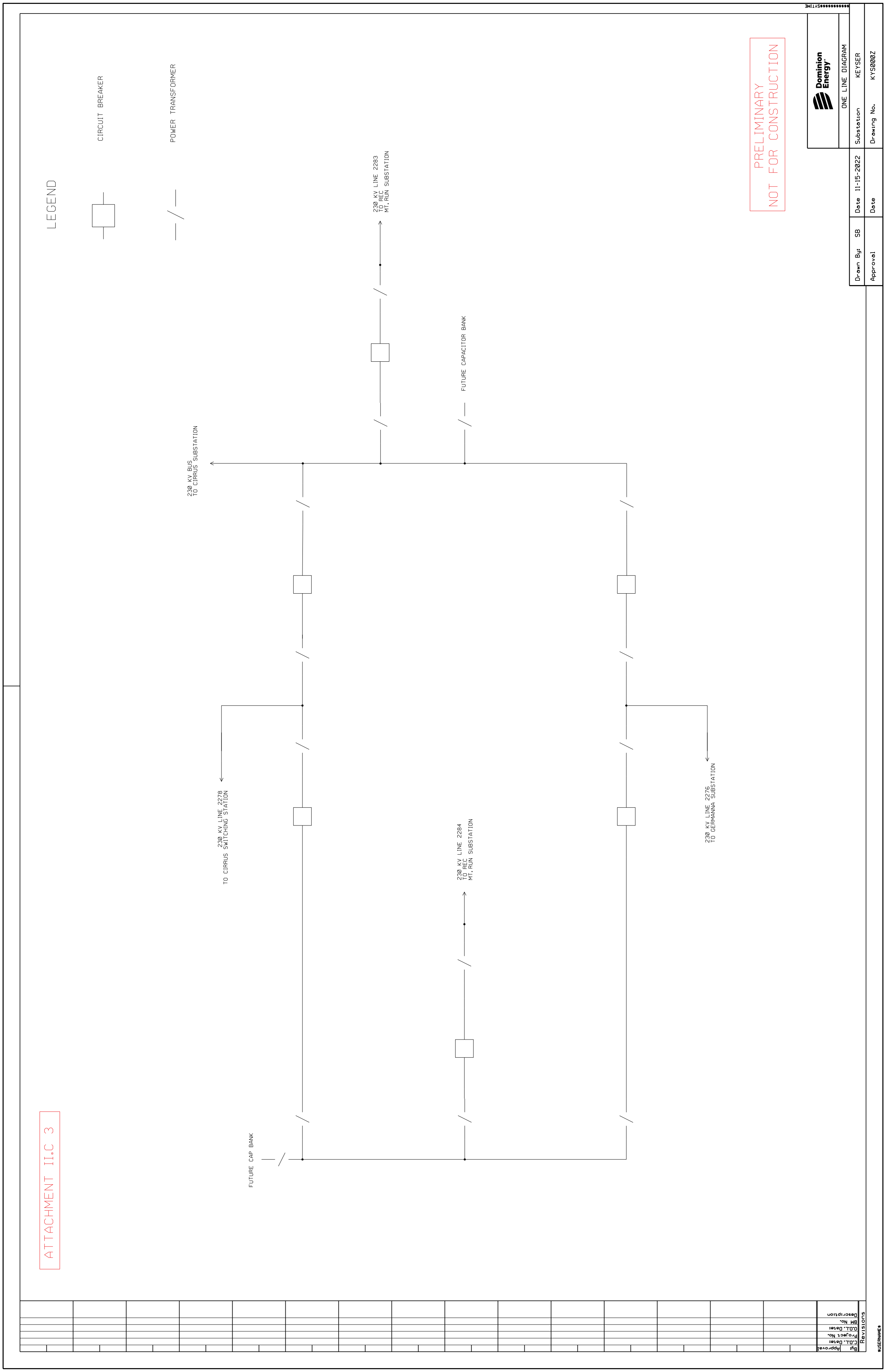
The proposed Keyser Station initially will be constructed with six 230 kV circuit breakers, four 230 kV line terminals and other associated equipment. In total, it will be designed to accommodate future growth in the area with a build-out of four additional 230 kV circuit breakers, two additional 230 kV line terminals and two 230 kV capacitor banks. Additionally, a new control enclosure will be installed to accommodate the protective relay and communications cabinets. The total area required to build Keyser Station is approximately four acres.

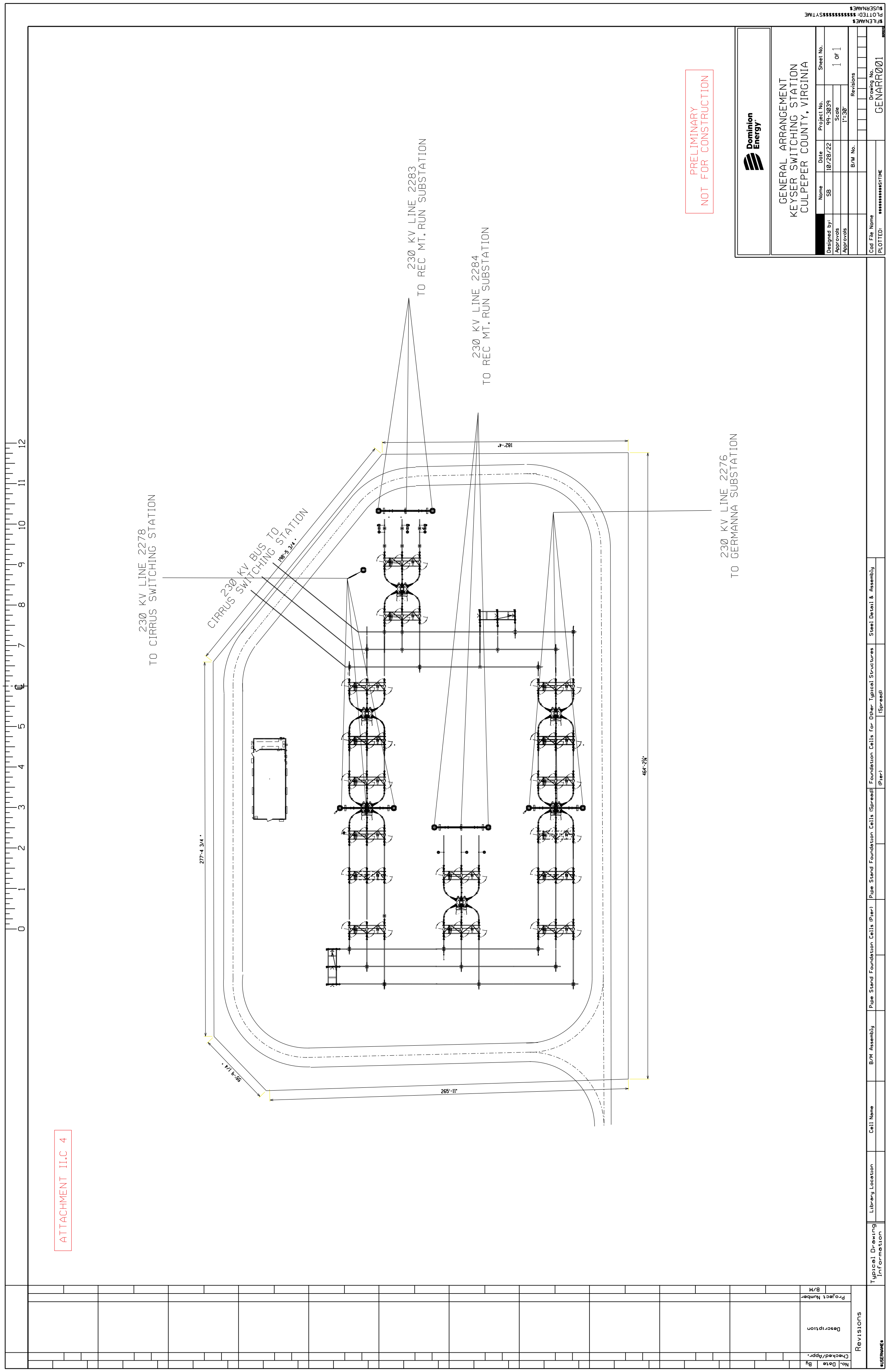
The one-line and general arrangement for the proposed Cirrus Station are provided as <u>Attachment II.C.1</u> and <u>Attachment II.C.2</u>, respectively. The one-line and general arrangement for the proposed Keyser Station are provided as <u>Attachment II.C.3</u> and <u>Attachment II.C.4</u>, respectively.


LEGEND
POWER TRANSFORMER
CIRCUIT BREAKER
DISCONNECT SWITCH
TRANSFORMER #2
TRANSFORMER #1
KEYSER SWITCHING STATION
PRELIMINARY
NOT FOR CONSTRUCTION
115kV LINE NO.70
TO CULPEPER SUBSTATION
FUTURE
CAPACITOR BANK
230 KV FEED 2
TO NEW REC SUBSTATION
230 KV LINE 2230
TO KEYSER SWITCHING SUBSTATION
REC SUBSTATION
DOMINION SUBSTATION
FUTURE BREAKER AND A HALF ROW
230 KV LINE 2199
TO GORDONSVILLE SUBSTATION
230 KV FEED 1
TO NEW REC SUBSTATION
ATTACHMENT II.C 1
Dominion Energy
ONE LINE DIAGRAM
Substation CIRRUS
Drawing No. CIR000Z
Drawn By: SB
Date 11-15-2022
Approval
Date
Revisions



PRELIMINARY
NOT FOR CONSTRUCTION
115 KV LINE TO
CULPEPER SUBSTATION
230 KV LINE 2278
TO KEYSER SWITCHING STATION
230 KV BUS TO
KEYSER SWITCHING STATION
230 KV FEED
TO NEW REC SUBSTATION
230 KV FEED 1
TO NEW REC SUBSTATION
230 KV LINE 2199
TO GORDONSVILLE SUBSTATION
204'-9 1/4"
278'-4 1/2"
473'-4"
277'-4 3/4"
55'-9 1/4"
304'-8 3/4"
ATTACHMENT II.C 2
Dominion Energy
GENERAL ARRANGEMENT
CIRRUS SWITCHING STATION
CULPEPER COUNTY, VIRGINIA
Designed by:
Approvals
Approvals
Name
SB
Date
11/15/22
Project No.
99-3039
Scale
1"=30'
Sheet No.
1 of 1
B/M No.
Revisions
Cad File Name
PLOTTED:
Drawing No.
GENARR001
Typical Drawing Information
Library Location
Cell Name
B/M Assembly
Pipe Stand Foundation Cells (Spread)
Pipe Stand Foundation Cells (Pier)
Foundation Cells for Other Typical Structures (Pier)
(Spread)
Steel Detail & Assembly
Revisions
No.
Date
By
Checked/Appr.
Description
Project Number
B/M


LEGEND
CIRCUIT BREAKER
POWER TRANSFORMER
230 KV LINE 2283
TO REC
MT.RUN SUBSTATION
FUTURE CAPACITOR BANK
230 KV BUS
TO CIRRUS SUBSTATION
230 KV LINE 2278
TO CIRRUS SWITCHING STATION
230 KV LINE 2284
TO REC
MT.RUN SUBSTATION
230 KV LINE 2276
TO GERMANNA SUBSTATION
FUTURE CAP BANK
ATTACHMENT II.C 3
PRELIMINARY
NOT FOR CONSTRUCTION
Dominion Energy
ONE LINE DIAGRAM
Substation KEYSER
Drawing No. KYS000Z
Drawn By: SB
Date 11-15-2022
Approval
Date
Revisions


GENERAL ARRANGEMENT
KEYSER SWITCHING STATION
CULPEPER COUNTY, VIRGINIA
Dominion Energy
PRELIMINARY
NOT FOR CONSTRUCTION
Designed by: SB
Date 10/20/22
Project No. 99-3039
Scale 1"=30'
Sheet No. 1 OF 1
Drawing No. GENARR001
230 KV LINE 2283
TO REC MT. RUN SUBSTATION
230 KV LINE 2284
TO REC MT. RUN SUBSTATION
230 KV LINE 2276
TO GERMANNA SUBSTATION
230 KV LINE 2278
TO CIRRUS SWITCHING STATION
230 KV BUS TO
CIRRUS SWITCHING STATION
182'-4"
464'-2½"
265'-11"
277'-4 3/4"
ATTACHMENT II.C.4
Revisions
Typical Drawing Information

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: **Land Use**

The proposed Project is located in Culpeper County. The Project area is largely characterized as agricultural and open space areas. The Project also runs adjacent to an existing quarry for approximately 0.73 miles.

Farmlands/Forests

According to the Natural Resources Conservation Service Data ("NRCS"), within the right-of-way, there are approximately 12.1 acres of prime farmland and approximately 52.0 acres of farmland of statewide importance. Prime farmland is an NRCS designation based on soil composition and is defined by the U.S. Department of Agriculture as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is available for these uses. Farmland of statewide importance includes land that nearly meets the criteria for prime farmland and has been designated by the Virginia Department of Agriculture and Consumer Services and Virginia Department of Conservation and Recreation as important for the production of food, feed, forage, fiber, and oilseed crops and that economically produces high yields of crops when treated and managed according to acceptable farming methods. Farmland classifications are not based on current land use.

As the right-of-way has been in use since the early 1960s, it is not expected that the Project will permanently impact farmland, as most farming uses are able to co-exist with the transmission line.

Prime farmlands and farmlands of statewide importance within the Project area are depicted in Attachment III.A.1.

Wetlands

The Project is located within the Rapidan-Upper Rappahannock watershed, Hydrologic Unit Code 02080103. According to the U.S. Geological Survey ("USGS") topographic quadrangle (Culpeper East, VA [2019]), the existing transmission line corridor crosses Mountain Run, a named perennial stream, in two separate locations.

The Company has field delineated wetlands and other waters of the United States using the *Routine Determination Method* as outlined in the *1987 Corps of Engineers Wetland Delineation Manual* and methods described in the *2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0)*. Total jurisdictional resources within the proposed Project right-of-way are provided in the table below.

Identified jurisdictional resources within the Cirrus-Keyser 230 kV Loop and Related Projects project area:

Resource	Area/Length (±)
Palustrine Emergent Wetland	8.70 AC
Palustrine Scrub Shrub Wetland	0.00 AC
Palustrine Forested Wetland	0.15 AC
Palustrine Unconsolidated Bottom Open Water	0.00 AC
Perennial Stream Channel	887 LF
Intermittent Stream Channel	704 LF
Ephemeral Stream Channel	546 LF
Jurisdictional Ditch	350 LF

Historic Features

In accordance with the *Guidelines for Assessing Impacts of Proposed Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia (2008)*, a Stage I Pre-Application Analysis was conducted by Dutton + Associates, Inc. This report was submitted to the VDHR on November 8, 2022, and is included as Attachment 2.I.1 to the DEQ Supplement. The table below summarizes the resources considered in the assessment.

VDHR Guidelines for Impacts of Proposed Transmission Lines

Radial Buffer (in miles)	Considered Resources
1.5	National Historic Landmarks
1.0	Above resources, and: National Register Properties (listed) Battlefields Historic Landscapes (e.g. Rural HD)
0.5	Above resources, and: National Register-eligible (as determined by VDHR)
0.0 (within ROW)	Above resources, and: Archaeological Sites

No National Historic Landmark ("NHL")-listed architectural resources are located within the 1.5-mile radius of the Project centerline. Four properties that are listed in the NRHP are located within 1.0-mile or closer of the Project centerline. Two battlefields and three historic landscapes are located within 1.0 mile or closer to the Project, and two properties that have been determined eligible for listing in the NRHP are within 0.5 mile or closer to the Project. Of these resources, three of the NRHP-listed properties as well as one archaeological site are directly crossed by the Project area.

Threatened and Endangered Species

Online database searches for threatened and endangered species in the vicinity of the Project, including the U.S. Fish and Wildlife ("USFWS") Information for Planning and Consultation ("IPaC") system, the Virginia Department of Wildlife Resources ("DWR") Virginia Fish and Wildlife Information Service ("VAFWIS"), Virginia Department of Conservation and Recreation ("DCR"), Natural Heritage Data Explorer ("NHDE"), and the Center for Conservation Biology ("CCB") Bald Eagle Nest Locator, were conducted, which identified federal- and state-listed species that have the potential to occur within the Project right-of-way. These resources are identified in the report included as Attachment 2.G.1 to the DEQ Supplement. The Company intends to reasonably minimize any impact on these resources and coordinate with pertinent agencies, as appropriate.

New and updated information is continually added to DCR's Biotics database. Following the DCR-DNH SCC planning stage project review, the Company shall re-submit project information with completed information services order form and a map to DCR-DNH or submit the Project on-line through the Natural Heritage Data Explorer. This review shall occur during the final design stage of engineering and upon any major modifications of the Project during construction (i.e., deviations, permanent or temporary, from the original study area and/or the relocation of a tower(s) into sensitive areas) for an update on natural heritage information and coordination of potential project modifications to avoid and minimize impacts to natural heritage resources.

Dwellings

According to Culpeper County GIS data, there are approximately 5 dwellings within 500 feet of the centerline of the Project, 0 dwellings within 250 feet of the centerline, and 0 dwellings within 100 feet of the centerline.

ATTACHMENT III.A.1

PRIME FARMLAND MAP

Cirrus - Keyser 230 kV Loop and Related Projects

Culpeper County, Virginia

Owner/ Applicant:
Dominion Energy Virginia

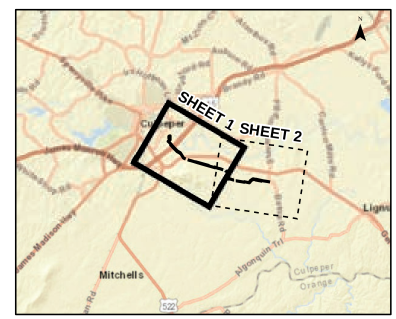
C2 Env Project:	Prepared By:	Date:
0245	TMP	07/28/22

0 750 1,500 3,000 Feet
Scale is 1 IN = 1,500 FT when printed at original size of 11x17

LEGEND

- Proposed Dominion Substation
- Existing REC Substation
- Project Area
- All Areas are Prime Farmland (+/- 12.1 AC)
- Farmland of Statewide Importance (+/- 52.0 AC)

Notes:
1. Basemap from ESRI World Imagery
2. Project right-of-way provided by Dominion
3. Roads from VGIN
4. Farmland from NRCS Soil Survey



C2 ENVIRONMENTAL
Dominion Energy

SHEET 1 OF 2

ATTACHMENT III.A.1

PRIME FARMLAND MAP

Cirrus - Keyser 230 kV Loop and Related Projects

Culpeper County, Virginia

Owner/ Applicant:
Dominion Energy Virginia

C2 Env Project:	Prepared By:	Date:
0245	TMP	07/28/22

0 750 1,500 3,000 Feet
Scale is 1 IN = 1,500 FT when printed at original size of 11x17

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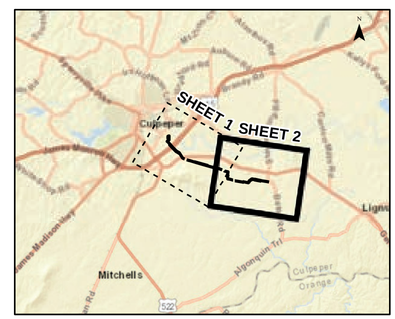


C2 ENVIRONMENTAL

Dominion Energy

SHEET 2 OF 2

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: In accordance with § 15.2-2202 E of the Code of Virginia, a letter was delivered to the County Administrator in Culpeper County advising of the Company's intent to file this Application. The letter also invited these localities to consult with the Company about the Project. The letter is included as Attachments V.D.1. See Section V.D of this Appendix.

On July 6, 2022, the Company launched an internet website dedicated to the proposed Project: www.dominionenergy.com/cirruskeyser. The website includes a description and benefits of the proposed Project, an explanation of need, route maps, photo simulations, a project overview video, and information on the Commission review process.

On July 11, 2022, the Company sent project announcement mailers to 53 property owners within 1,000 feet of the Project right-of-way. Each mailer included a postcard with an overview map and the URL to the project website. The postcards provided a brief overview of the respective proposed Project and advised recipients of environmental fieldwork taking place along the existing ROW. Copies of the postcard with the overview map are respectively included as Attachment III.B.1.

On October 12, 2022, the Company sent informational postcards to the same property owners inviting them to attend a virtual community meeting to learn more about the proposed Project. The postcard is included as Attachment III.B.2. Newspaper advertisements for the open house, included as Attachment III.B.3 and Attachment III.B.4, were also placed in the Culpeper Star Exponent, the Culpeper Times, and the Free Lance Star in both hardcopy and online editions. In addition, digital advertisements for the open houses, included in Attachment III.B.4, targeting residents in Culpeper County made 347,547 impressions and resulted in 2,050 link clicks on desktop and mobile devices.

One virtual community meeting was held on Wednesday, October 26 at 6 p.m. EST; twelve participants attended. A recording of this virtual meeting was added to the Project's website, and post-event advertisements in the same media as noted above directed readers to the project's website to view the recording.

A variety of project information, graphics, and photographs were presented during the virtual community meeting, including overview maps, sample existing and proposed structure graphics, and photo simulations of the proposed Project from key locations. See Attachment III.B.5 for photo simulations of the proposed Project from key locations. Community meeting materials have been posted on the website for the proposed Project.

As part of preparing for this Project, the Company researched the demographics of the surrounding communities using 2021 U.S. Census data and other database sources. This information revealed that there are five Census Block Groups ("CBGs") within the Project area that fall within one mile of the existing transmission line corridor. A review of ethnicity, income, age, and education census data identified populations within the study area that meet the U.S. Environmental Protection Agency threshold to be defined as Environmental Justice Communities ("EJ Communities"). Communities of color have been identified in one of three CBGs within the Project study area. Two of three CBGs within the Project study area were identified as low-income communities. One CBG was identified as both a community of color and a low-income population.

Pursuant to Va. Code §§ 56.46.1 C and 56-259 C and FERC Guidelines, there is a strong preference for the use of existing utility right-of-way whenever feasible. Existing 115 kV Line #2 and Line #70 will be wrecked and rebuilt as the double circuit Cirrus – Keyser 230 kV Loop within the existing 100-foot corridor. While the project is located largely within existing right-of-way, limited areas of new right-of-way are required. Specifically, an additional 25 feet of right-of-way is required adjacent to the existing 100-foot right-of-way at the Mountain Run Junction for the installation of a new three-pole structure. In addition, new right-of-way is needed to connect the Cirrus and Keyser Stations to the existing Line #70 and Mountain Run 1 and 2. Temporary right-of-way will be required for approximately 5.4 miles to construct a temporary 115 kV line to maintain service to Culpeper DP during construction. The temporary line will be removed upon completion of the permanent line. The structural height average will increase by 24% or approximately 18 feet from an average height of 82 feet to an average of 100 feet. Height differences will vary per structural location. Based on the analysis of the Project, the Company does not anticipate disproportionately high or adverse impacts to the surrounding community and the EJ Communities located within the study area, consistent with the Project design to reasonably minimize adverse impacts.

In addition to its evaluation of impacts, the Company has and will continue to engage the EJ Communities and others affected by the Project in a manner that allows them to meaningfully participate in the project development and approval process so that their views and input can be taken into consideration. See Attachment III.B.6 for a copy of the Company's Environmental Justice Policy.

Dominion Energy image. Not project specific.

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

Dominion Energy®

Actions Speak Louder

Local Power Line Project Information Enclosed

IMPORTANT

Local Power Line Project Information

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

Mountain Run 230 kV Electric Transmission Rebuild Project

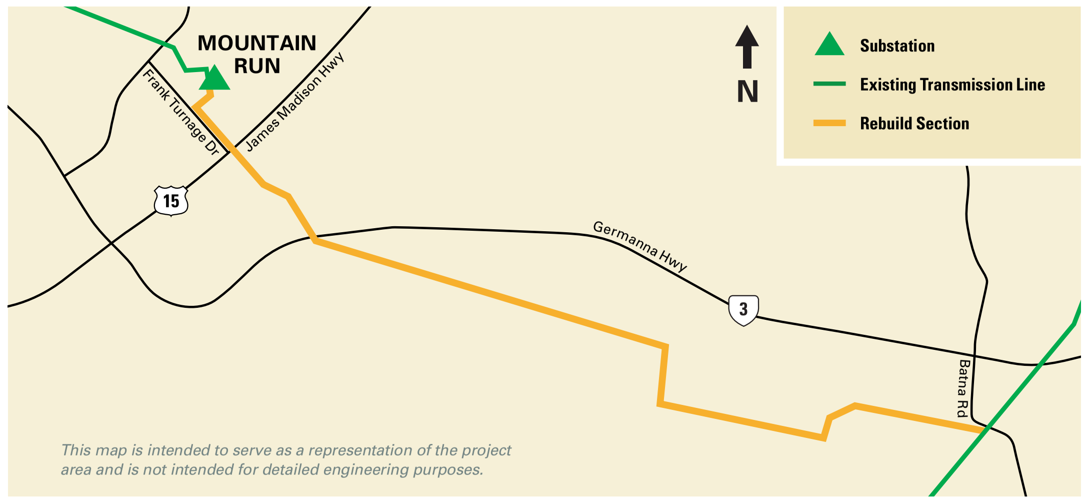
AT DOMINION ENERGY, we are committed to continually reviewing and analyzing our energy infrastructure to provide safe, reliable, and affordable electricity to our neighbors. You are receiving this postcard to notify you about upcoming transmission line work in your area of Culpeper County. To accommodate economic development growth in the area, we plan to rebuild the existing transmission line structures and uprate the current line voltage from 115 kilovolts to 230 kilovolts. These lines span approximately five miles from Batna Road, crossing Germanna and James Madison Highways, and ending at a substation near Frank Turnage Drive.

To prepare for this project, crews will be in your area over the coming days to perform initial fieldwork including surveying wetland and other natural and cultural resources. You may see Dominion Energy personnel and contractors with light-duty vehicles in the existing right of way corridors. Once the initial fieldwork is completed and conceptual plans are identified, additional project details will be provided.

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

CONTACT US

Visit our website at DominionEnergy.com/mountainrun for project updates. Or contact us by sending an email to powerline@dominionenergy.com or calling 888-291-0190.



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

AT DOMINION ENERGY, protecting the grid and making it secure against natural and man-made acts is a top priority. We work alongside government officials to prepare for potential incidents that could affect our ability to provide electricity safely and reliably to the communities we serve. Learn how we're keeping you safe at powerlines101.dominionenergy.com.

Dominion Energy image. Not project specific.

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

Dominion Energy®

Actions Speak Louder

YOU'RE INVITED TO A VIRTUAL COMMUNITY MEETING

IMPORTANT

Local Power Line Project Information

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

Cirrus-Keyser 230 kV Transmission Line Rebuild — Virtual Community Meeting

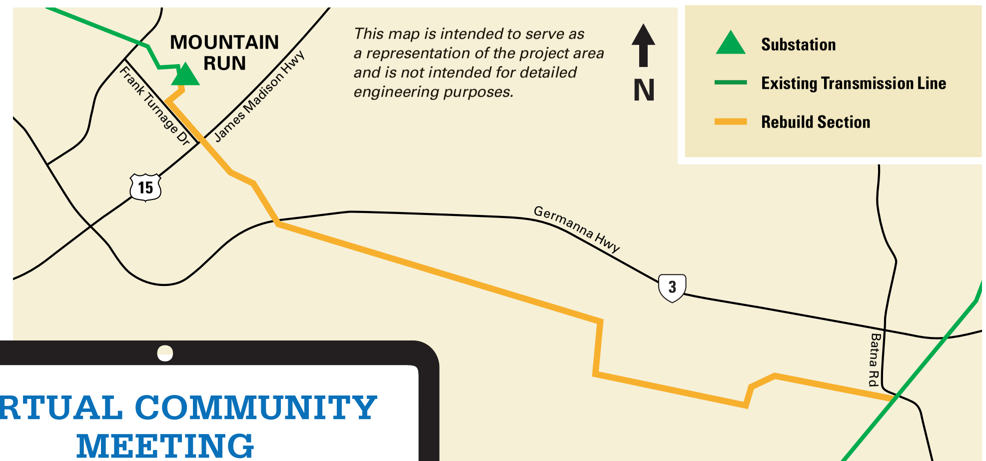
AT DOMINION ENERGY, we are dedicated to maintaining reliable and secure electric service in the communities we serve. You are receiving this postcard because we would like to keep you informed about the need for an electric transmission line infrastructure project in your area of Culpeper County, Virginia.

The Cirrus-Keyser 230 kV Transmission Line Rebuild project will support economic growth and development in Culpeper County, and will include a rebuild of an existing transmission line corridor with new structures and a higher capacity conductor. This rebuild will allow the line, currently operating at 115 kilovolts (kV), to operate at 230 kV and meet increased energy demand from customers.

Additionally, the project will require building two new substations, which we're calling Cirrus and Keyser, on existing customer property and installing a temporary transmission line to support area energy reliability during construction. The two new substations will be adjacent to the existing Mountain Run substation referenced on the attached map.

To learn more about this project, we invite you to attend a virtual community meeting via Webex on Wednesday, October 26, 2022 from 6–7 p.m. During this meeting, you can learn more about our construction process, timelines and ask questions to our subject matter experts.

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



VIRTUAL COMMUNITY MEETING

Live Via Webex Events

Wednesday, Oct. 26, 2022 • 6–7 p.m.

Join the meeting by visiting our website, DominionEnergy.com/cirruskeyser.

A recording will be available on the project website after the meeting.

AT DOMINION ENERGY, protecting the grid and making it secure against natural and man-made acts is a top priority. We work alongside government officials to prepare for potential incidents that could affect our ability to provide electricity safely and reliably to the communities we serve. Learn how we're keeping you safe at powerlines101.dominionenergy.com.

CONTACT US

Visit our website at DominionEnergy.com/cirruskeyser for project updates. Or contact us by calling 888-291-0190 or ending an email to powerline@dominionenergy.com.

charles ryan associates

Dominion Energy
Electric Transmission

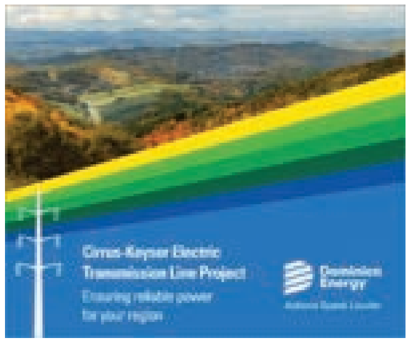
Cirrus-Keyser
Pre Event Newspaper

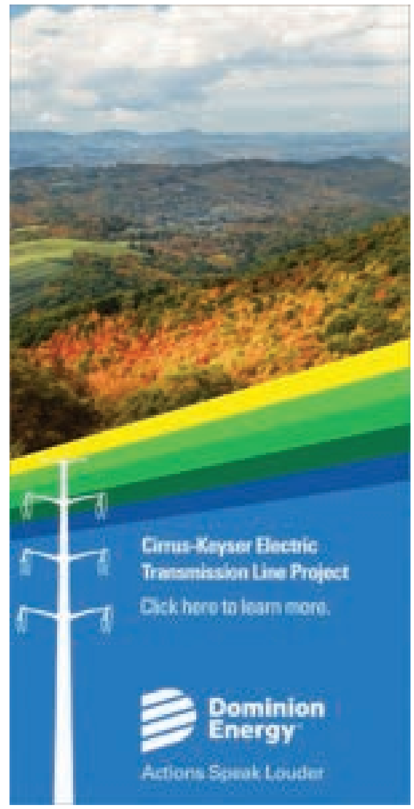
charles ryan associates

Dominion Energy Electric Transmission Contact:
Steve Precker, stephen.s.precker@dominionenergy.com

Dominion Energy Electric Transmission

Cirrus-Keyser Awareness Display





Dominion Energy Electric Transmission

Cirrus-Keyser Nextdoor & Social Imagery

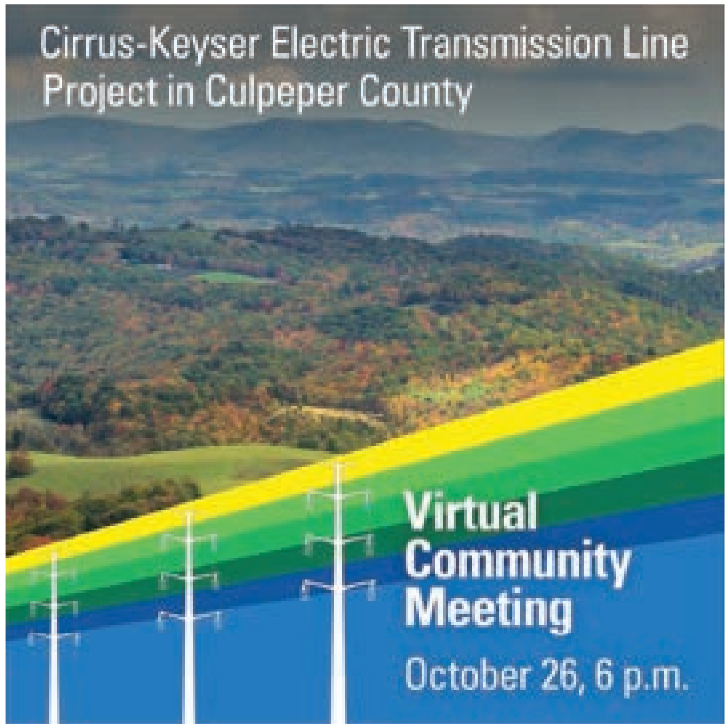
Pre-Event Nextdoor Image:

Post-Event Nextdoor Image:

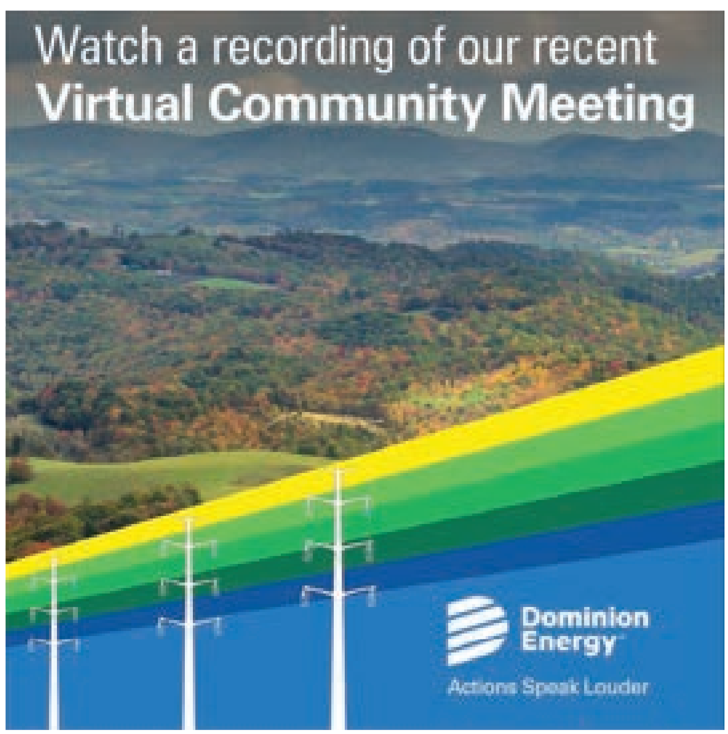
Dominion Energy Electric Transmission

Cirrus-Keyser
Social Videos

Pre-Event Video (click to play)



Post-Event Video (click to play)



CIRRUS-KEYSER
230 kV Rebuild Project

Photo Simulation Locations

- Proposed Route
- Existing Transmission Line
- Proposed Substation Expansion
- Photo Simulation

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

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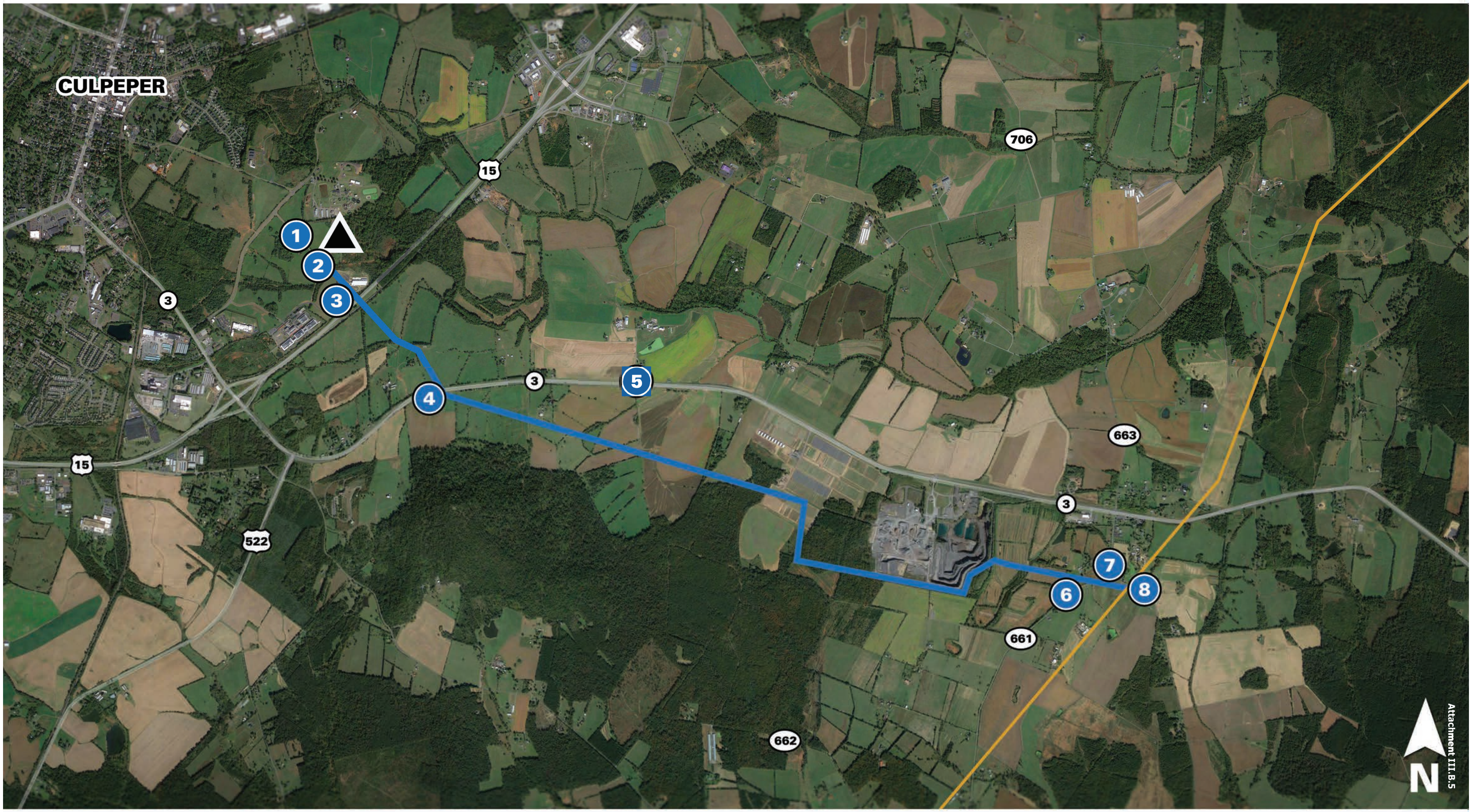

Existing Conditions

Temporary Line Conditions

CIRRUS-KEYSER
230 kV Rebuild Project

Simulation 1
Date: 8/12/2022
Time: 10:13 am
Direction: Southeast

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

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CIRRUS-KEYSER
230 kV Rebuild Project

Simulation 1
Date: 8/12/2022
Time: 10:13 am
Direction: Southeast

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

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Existing Conditions

Temporary Line Conditions

CIRRUS-KEYSER
230 kV Rebuild Project

Simulation 2
Date: 8/12/2022
Time: 10:22 am
Direction: Southeast

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

Dominion Energy

CIRRUS-KEYSER
230 kV Rebuild Project

Simulation 2
Date: 8/12/2022
Time: 10:22 am
Direction: Southeast

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

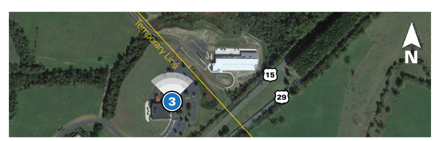
Dominion Energy

Existing Conditions

Temporary Line Conditions

CIRRUS-KEYSER
230 kV Rebuild Project

Simulation 3
Date: 8/12/2022
Time: 10:35 am
Direction: North



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

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Existing Conditions

Proposed Conditions

CIRRUS-KEYSER
230 kV Rebuild Project

Simulation 3
Date: 8/12/2022
Time: 10:35 am
Direction: North

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

Dominion Energy®

Existing Conditions

Temporary Line Conditions

CIRRUS-KEYSER
230 kV Rebuild Project

Simulation 4
Date: 8/12/2022
Time: 11:01 am
Direction: East

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

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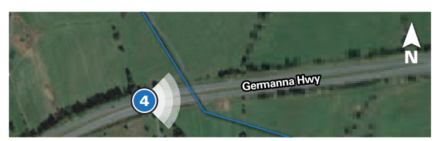
CIRRUS-KEYSER
230 kV Rebuild Project

Simulation 4
Date: 8/12/2022
Time: 11:01 am
Direction: East



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

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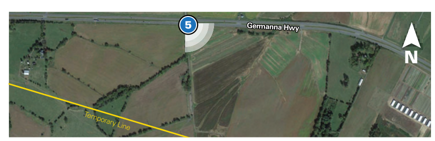
CIRRUS-KEYSER
230 kV Rebuild Project

Simulation 5
Date: 8/12/2022
Time: 8:37 am
Direction: Southeast

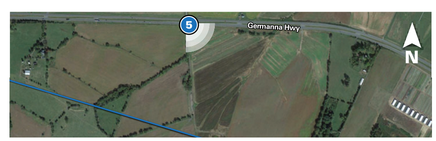


Visualization is for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

Dominion Energy®

CIRRUS-KEYSER
230 kV Rebuild Project

Simulation 5
Date: 8/12/2022
Time: 8:37 am
Direction: Southeast



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

Dominion Energy®

CIRRUS-KEYSER
230 kV Rebuild Project

Simulation 6
Date: 8/12/2022
Time: 11:14 am
Direction: Northeast

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

Dominion Energy®

Existing Conditions

Proposed Conditions

CIRRUS-KEYSER
230 kV Rebuild Project

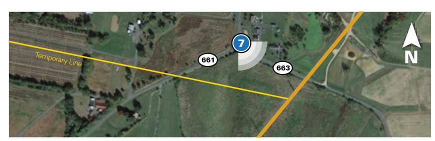
Simulation 6
Date: 8/12/2022
Time: 11:14 am
Direction: Northeast

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

Dominion Energy®

CIRRUS-KEYSER
230 kV Rebuild Project

Simulation 7
Date: 8/12/2022
Time: 7:45 am
Direction: Southeast



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

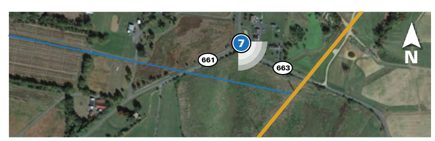
Dominion Energy®

Existing Conditions

Proposed Conditions

CIRRUS-KEYSER
230 kV Rebuild Project

Simulation 7
Date: 8/12/2022
Time: 7:45 am
Direction: Southeast



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

Dominion Energy®

CIRRUS-KEYSER
230 kV Rebuild Project

Simulation 8
Date: 9/13/2022
Time: 12:48 pm
Direction: Southwest

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

Dominion Energy®

CIRRUS-KEYSER
230 kV Rebuild Project

Simulation 8
Date: 9/13/2022
Time: 12:48 pm
Direction: Southwest

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

Dominion Energy

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: During an initial review of the Project transmission corridor, no encroachments were identified within the Project right-of-way. The Company is not aware of any residences encroaching on the existing corridor and does not expect to have any residences or other buildings demolished or relocated in connection with the Project as proposed.

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: Construction of the existing Lines #70 and #2 was completed around 1928. These lines have been in continuous use since that time. The existing transmission lines do not currently parallel any other transmission lines, railroad tracks, highways, or pipeline corridors. A portion of the Project from existing Structure #70/37 and #2/1217 to Structure #70/46 and #2/1208 are adjacent to the Luck Stone Quarry.

The right-of-way was acquired in 1928. The line was rebuilt from the Mountain Run Junction to the Mountain Run Substation in 2008, and was completed in June 2009. The main corridor that goes from Gordonsville Substation to this junction, up to Remington Substation, was completed in 2019.

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

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

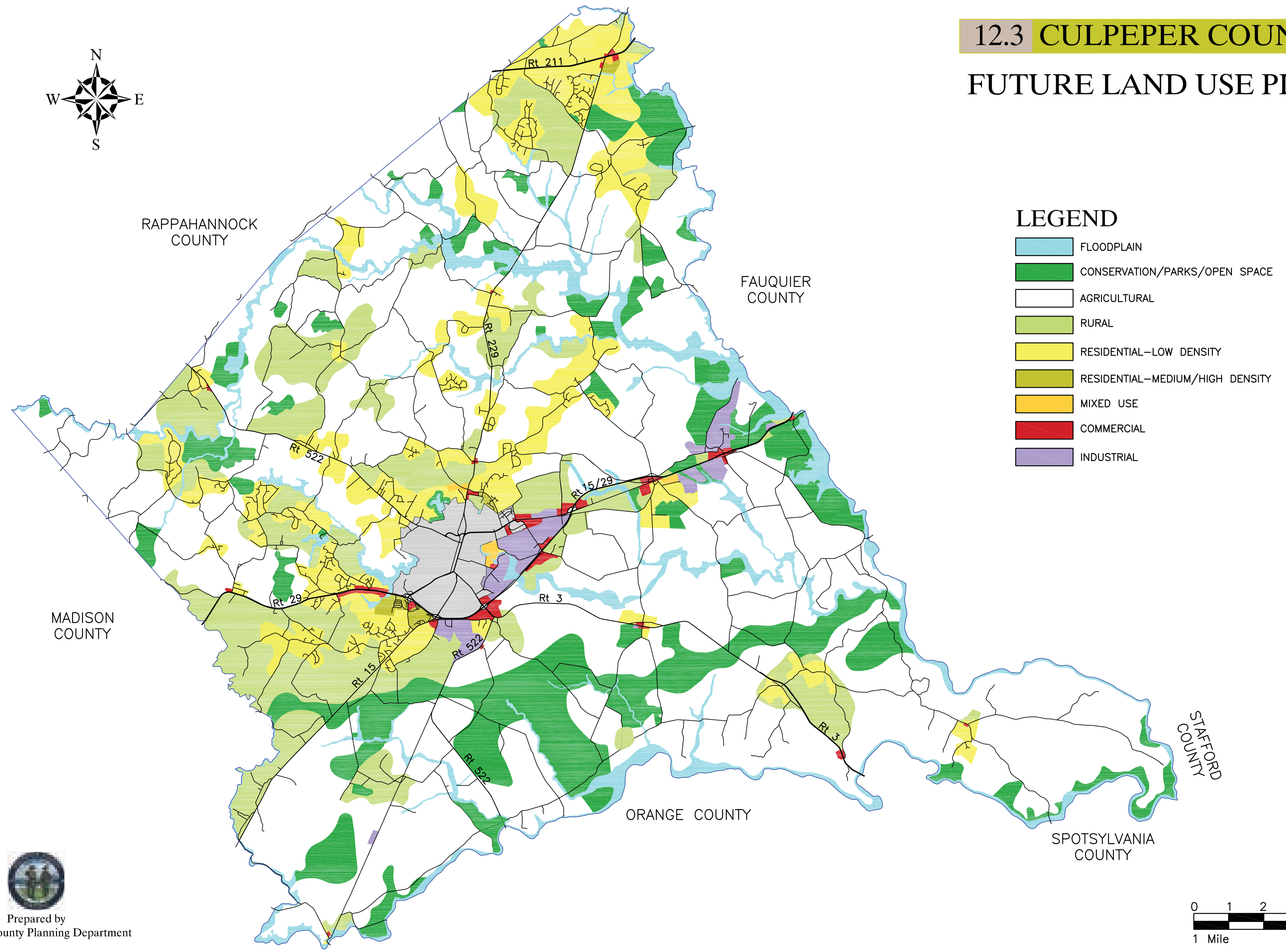
Response: The Company reviewed the *Culpeper County Comprehensive Plan* to evaluate the effect the Project could have on future development. The placement and construction of electric transmission lines is not addressed within these plans. The Project is located within existing right-of-way or on Company-owned property to the maximum extent feasible. A temporary easement along the approximately 5.4-mile corridor will be required to build a temporary 115 kV energized line from the Mountain Run Junction to existing Structure #70/1257. The temporary line will only be required during construction and will be removed once the new Cirrus – Keyser 230 kV Loop is energized. New right-of-way is also needed on the REC Customer's property to connect the Cirrus Station with the existing Line #70 and the Keyser Station to Mountain Run 1 and 2. Expansion of the existing right-of-way at the Mountain Run Junction is needed to accommodate the new interconnect.

While areas of new right-of-way and a temporary right-of-way are required for the Project, the Project is not expected to permanently affect land use. The Project is also not expected to impact the character of this locality as the transmission corridor has been in use for at least 94 years.

See <u>Attachment III.E</u> for the County Land Use Maps.

12.3 CULPEPER COUNTY

FUTURE LAND USE PLAN



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.

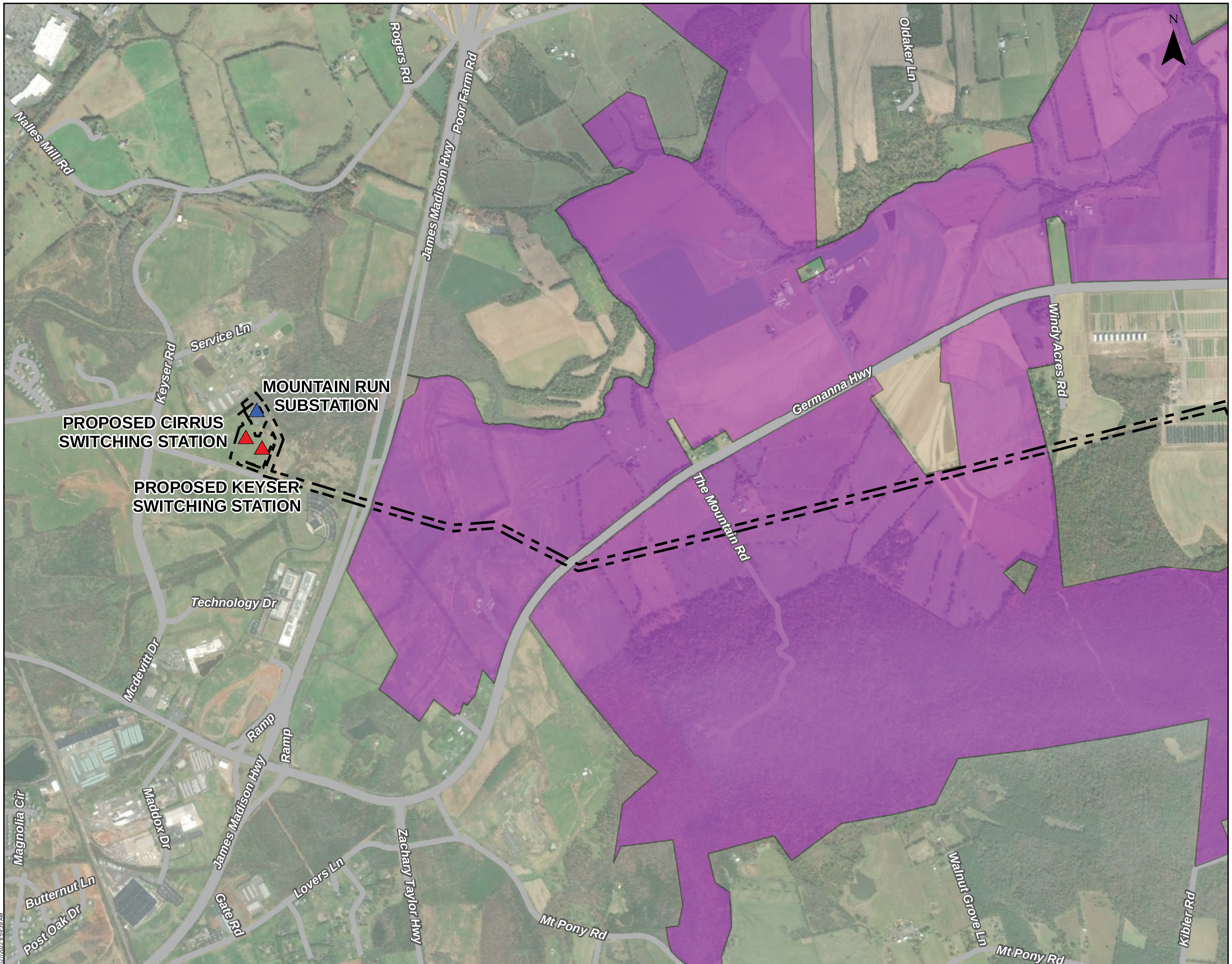
Response: 1. Culpeper County has designated important farmland within their jurisdiction through the implementation of Agricultural and Forestal Districts ("AFDs"). The Virginia Agricultural and Forestal Districts Act provides for the creation of conservation districts. These districts are designed to conserve, protect, and encourage the development and improvement of a locality's agricultural and forested lands for the production of food and other products, while also conserving and protecting land as valued natural and ecological resources. These districts are voluntary agreements between landowners and the locality and, offer benefits to landowners when they agree to keep their land in its current use for between four and 10 years. AFDs are established under the guidelines set forth by the Code of Virginia, § 15.2-4300; a district must contain at least 200 acres. Conservation efforts, such as AFDs, are informed by the soils surveys and classifications under the Virginia Agricultural Model, which is used to determine the agricultural value of lands crossed by the proposed routes. The Virginia Agricultural Model was developed to quantify the relative suitability of lands for agricultural activity across the state and is assessed primarily based on inherent soil suitability, but also accounts for current land cover as well as travel time between agricultural producers and consumers. The model ranks land into five classes based on the suitability determination (Class I being low suitability and Class V being high suitability).

Approximately 2.54 miles (30.8 acres) of the Project crosses through the Stevensburg Agricultural/Forestal District.

2a. See Attachment III.F.2.a.

2b. The new permanent right-of-way is required on the REC Customer's property and at the Mountain Run Junction to expand the existing right-of-way. To ensure that the Company can still meet the town of Culpeper's demand needs during construction, the Company will also need to obtain a temporary easement to build an approximately 5.2-mile temporary 115 kV energized line from the Mountain Run Junction to the Mountain Run Substation. The temporary line will only be required during construction and will be removed once the new Cirrus-Keyser 230 kV Loop is energized. Use of the existing corridor minimizes the need for additional right-of-way and encroachment on these designated farmlands.

2c. The Project is not expected to impact this farmland as the existing lines have been in operation since 1928 and because agricultural uses are largely consistent with transmission line corridors.



ATTACHMENT III.F.2.a

AGRICULTURAL AND FORESTAL DISTRICT MAP

Cirrus - Keyser 230 kV Loop and Related Projects

Culpeper County, Virginia

Owner/ Applicant:
Dominion Energy Virginia

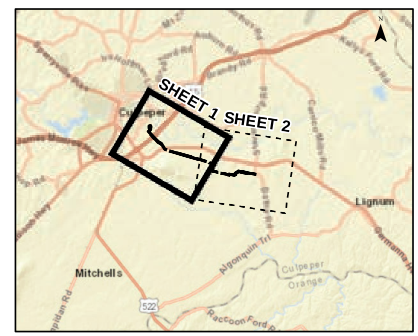
C2 Env Project:	Prepared By:	Date:
0245	TMP	07/28/22

0 750 1,500 3,000 Feet
Scale is 1 IN = 1,500 FT when printed at original size of 11x17

LEGEND

- Proposed Dominion Substation
- Existing REC Substation
- Project Area
- Agricultural and Forestal District (+/- 30.8 AC)

Notes:
1. Basemap from ESRI World Imagery
2. Project right-of-way provided by Dominion
3. Roads from VGIN
4. Agricultural and Forestal Districts from Culpeper County Online GIS



C2 ENVIRONMENTAL
Dominion Energy

SHEET 1 OF 2

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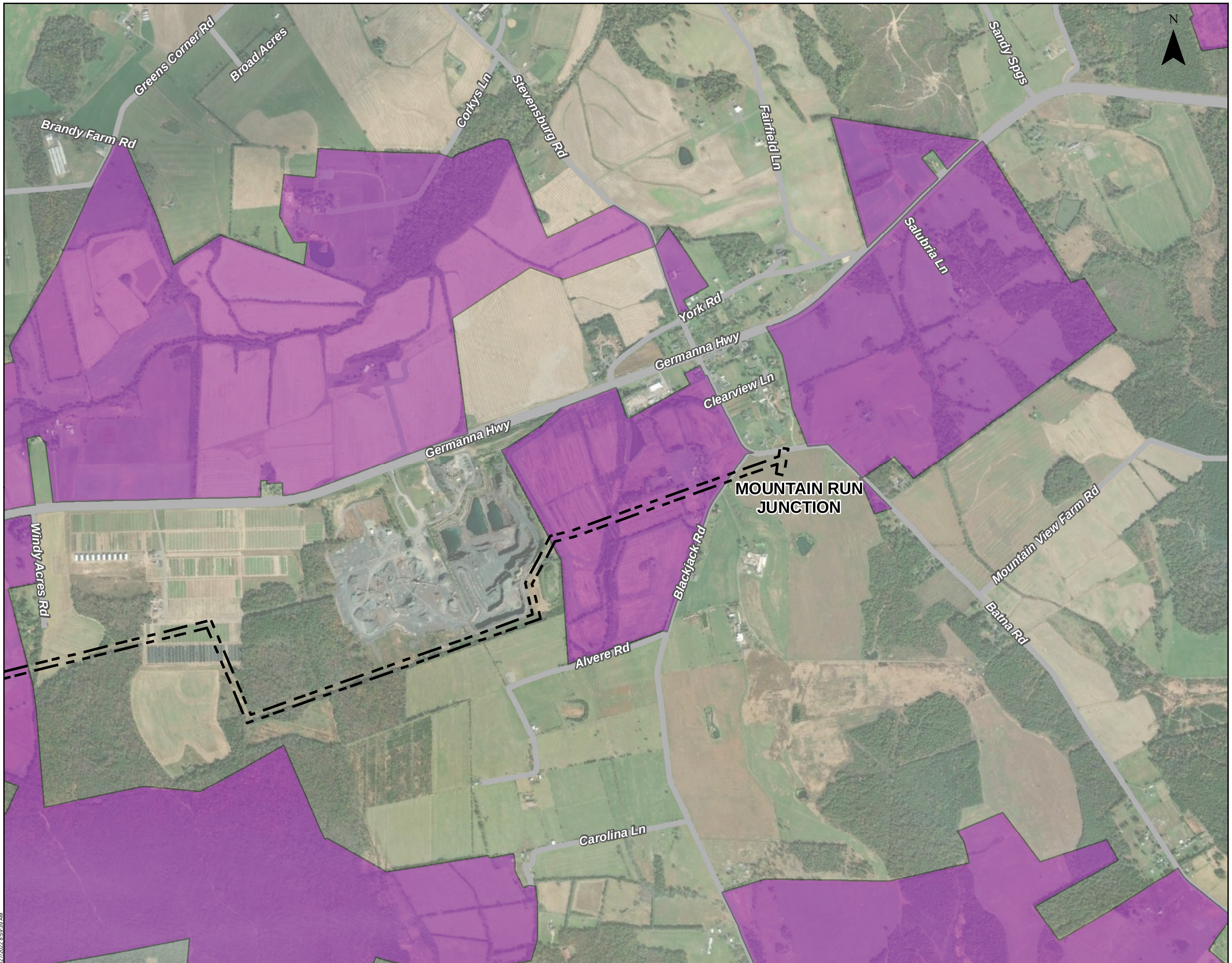


ATTACHMENT III.F.2.a

AGRICULTURAL AND FORESTAL DISTRICT MAP

Cirrus - Keyser 230 kV Loop and Related Projects

Culpeper County, Virginia

Owner/ Applicant:

Dominion Energy Virginia

C2 Env Project:	Prepared By:	Date:
0245	TMP	07/28/22

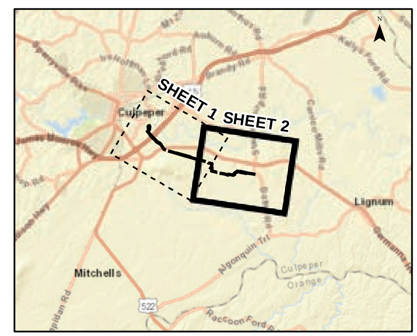
0 750 1,500 3,000 Feet

Scale is 1 IN = 1,500 FT when printed at original size of 11x17

LEGEND

- Proposed Dominion Substation
- Existing REC Substation
- Project Area
- Agricultural and Forestal District (+/- 30.8 AC)

Notes:
1. Basemap from ESRI World Imagery
2. Project right-of-way provided by Dominion
3. Roads from VGIN
4. Agricultural and Forestal Districts from Culpeper County Online GIS



C2 ENVIRONMENTAL

Dominion Energy

SHEET 2 OF 2

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10/27/2022 8:59:39 AM

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. There are four architectural resources listed on the National Register of Historic Places within 1.0 mile of the Project.

2. There are two properties that have been determined eligible for listing, three historic landscapes and two battlefields within 1.0 mile of the Project.

3. None.

4. One unevaluated archaeological site is directly crossed by the Project.

5. None.

6. None.

7. None.

8. None.

9. The Project crosses through a Virginia Outdoors Foundation conservation easement (CUL-VOF-723) associated with the Rose Hill Game Reserve property. An additional 15-foot-wide temporary easement will be required for the construction of the temporary 115 kV Line. Upon completion of construction, the temporary line will be removed. See Attachment II.A.9.

10. None.

11. None.

12. The Project crosses through the Rose Hill Game Reserve property near the eastern end of the rebuild activity.

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

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

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

The Company has reviewed the FAA's website (https://oeaaa.faa.gov/oeaaa/external/portal.jsp) to identify airports within 10 miles of the proposed Project. Based on this review, one FAA-restricted airport was identified:

- Culpeper Regional Airport, 6.5 miles north of the Mountain Run Junction

Two private airports/helipads are located within ten miles of the line. The Company will work with these private entities as appropriate:

- Berryvale Airport, a private airfield, is located 4.4 miles north of the proposed Cirrus Station.
- The UVA Culpeper Medical Center heliport is 2.1 miles southwest of the proposed Cirrus Station.

In an email dated October 13, 2022, the Virginia Department of Aviation ("DOAv") stated that a Form 7460 will need to be submitted to the FAA to initiate an aeronautical study to ensure that the proposed Project will not constitute a hazard to air navigation should any structures exceed a height of 200 feet above ground level. The Company will submit Form 7460 as appropriate based on final engineering and design; however, no structures exceed this threshold at the time of this application. See also Section 2.N of the DEQ Supplement.

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

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

Response: The Project does not cross any scenic Virginia byways. Use of the existing right-of-way to the maximum extent practical 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: As described in Section V.D, the Company solicited feedback from the Culpeper County Administrator regarding the proposed Project. Below is a list of coordination that has occurred with other municipal, state and federal agencies:

- A Wetland and Waters Review has been completed and sent to DEQ's Office of Wetlands and Stream Protection to initiate the wetlands impact consultation. See Attachment 2.D.1 of the DEQ Supplement.
- A Stage I Pre-Application Analysis has been prepared and submitted to VDHR. See Attachment 2.I.1 of the DEQ Supplement.
- The Company solicited comments from the Virginia Marine Resources Commission ("VMRC") and the Corps regarding the proposed Project. See Attachment 2 of the DEQ Supplement.
- The Company requested comments from the USFWS, DWR, and DCR regarding the proposed Project. See Attachment 2 of the DEQ Supplement.
- The Company solicited the Culpeper County Administrator for comments on the proposed Project. See Attachment 2 of the DEQ Supplement.
- The Company solicited comments from the FAA and DOAv regarding the proposed Project. See Attachment 2 of the DEQ Supplement.
- Letters were submitted to the agencies listed in Section V.C on October 12, 2022 describing the Project and requesting comment.
- A letter was submitted to Culpeper County pursuant to Va. Code § 15.2-2202 E to describe the Project and request comment. See Section V.D of this Appendix.
- On October 12, 2022, the Company sent letters to the Virginia Department of Historic Resources.
- In October 2022, the Company solicited comments via letter from several federally-recognized Native American tribes, including:

  Cheroenhaka (Nottoway) Indian Tribe
  Chickahominy Indian Tribe
  Chickahominy Indian Tribe Eastern Division
  Mattaponi Tribe
  Monacan Nation
  Nansemond Indian Nation
  Nottoway Indian Tribe of Virginia
  Pamunkey Indian Tribal Resource Office
  Pamunkey Indian Tribe
  Patawomeck Indian Tribe of Virginia

Rappahannock Tribe
The Upper Mattaponi Indian Tribe

A copy of the letter template, which included a project overview map is included as Attachment III.J.

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

[insert date]

Cirrus-Keyser 230 kV Transmission Line Rebuild Project (Culpeper County)

Dear [insert name]:

At Dominion Energy, we are dedicated to maintaining reliable and secure electric service in the communities we serve. As a valued stakeholder with a vested interest in the community, we would like to inform you of the need for an electric transmission line infrastructure project in Culpeper County, Virginia.

The Cirrus-Keyser 230 kV Transmission Line Rebuild project, will support economic growth and development in Culpeper County, and will include a rebuild of an existing transmission line corridor with new structures and a higher capacity conductor. This rebuild will allow the line, currently operating at 115 kilovolts (kV), to operate at 230 kV and meet increased energy demand from customers.

Additionally, the project will require building two new substations, which we're calling Cirrus and Keyser, on existing customer property and installing a temporary transmission line to support area energy reliability during construction. The two new substations will be adjacent to the existing Mountain Run substation referenced on the attached map. This transmission line corridor spans just over five miles from Batna Road, crossing Germanna and James Madison Highways, and ending at substations near Frank Turnage Drive. We currently anticipate filing an application for this project with the State Corporation Commission this fall and will host a virtual community meeting prior to doing so.

We are meeting with property owners and engaging the broader public on this project, as well as coordinating with our partners at the local government level, over the course of the coming weeks and months. We will post status updates to project's website at www.dominionenergy.com/cirruskeyser.

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

If you would like to meet to discuss, or if you have any initial questions, please do not hesitate to contact us by sending an email to Stephen.S.Precker@dominionenergy.com or calling 888-291-0190.

Sincerely,

Steve Precker
The Electric Transmission Project Team

[insert date]

Cirrus-Keyser 230 kV Transmission Line Rebuild Project (Culpeper County)

Dear [insert name]:

At Dominion Energy, we are dedicated to maintaining reliable and secure electric service in the communities we serve. As a valued stakeholder with a vested interest in the community, we would like to inform you of the need for an electric transmission line infrastructure project in Culpeper County, Virginia.

The Cirrus-Keyser 230 kV Transmission Line Rebuild project, will support economic growth and development in Culpeper County, and will include a rebuild of an existing transmission line corridor with new structures and a higher capacity conductor. This rebuild will allow the line, currently operating at 115 kilovolts (kV), to operate at 230 kV and meet increased energy demand from customers.

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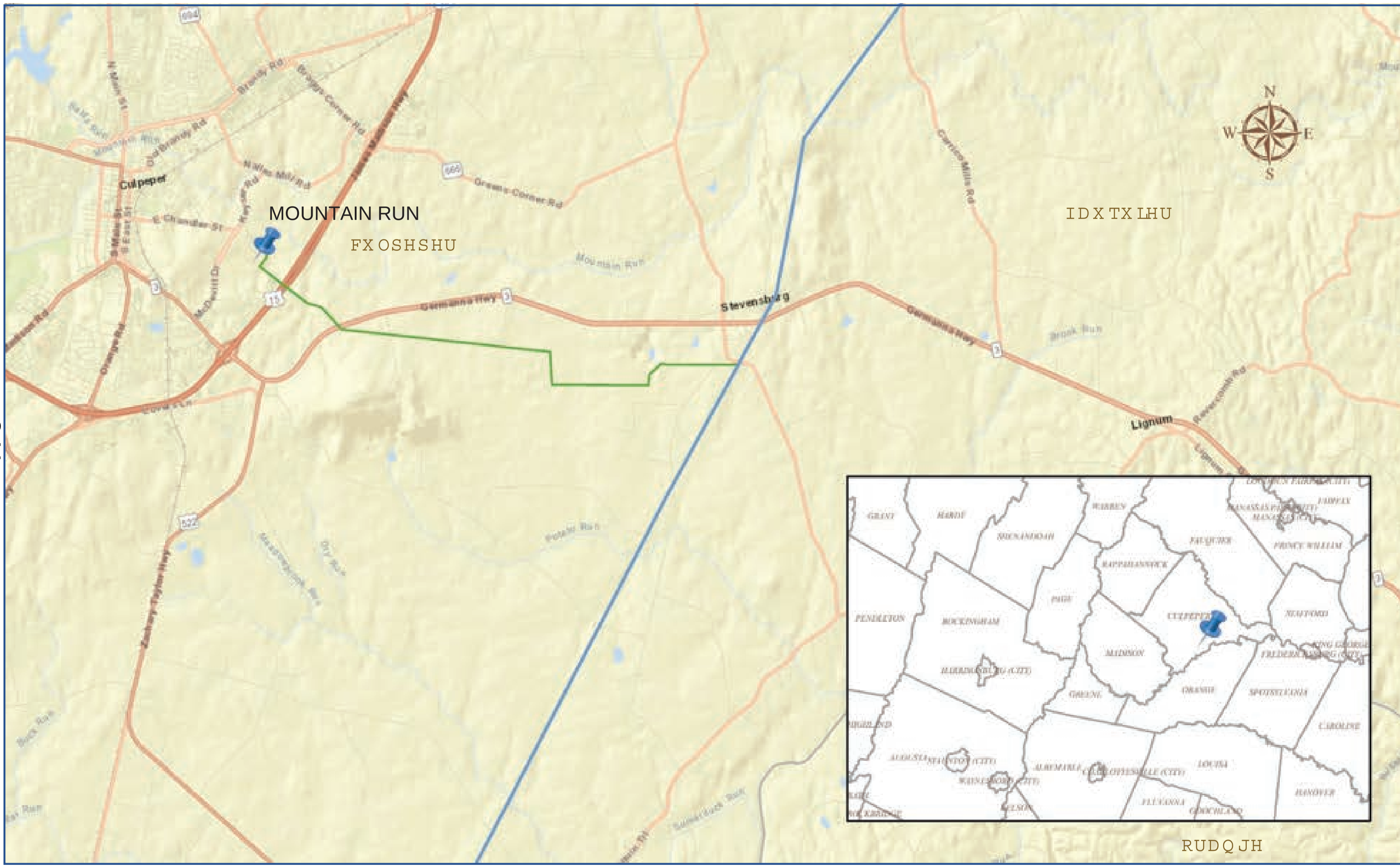
Please feel free to notify other relevant organizations that may have an interest in the project area. For reference, recipients of this letter include other county and statewide historic, cultural and scenic organizations and Native American Tribes.

If you would like to meet to discuss, or if you have any initial questions, please do not hesitate to contact us by sending an email to Stephen.S.Precker@dominionenergy.com or calling 888-291-0190. You may also contact Tribal Relations Manager Ken Custalow by sending an email to Ken.Custalow@dominionenergy.com or calling 804-837-2067.

Sincerely,

Steve Precker
The Electric Transmission Project Team



Rebuild Line
Existing Line
Substation

Dominion Energy

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

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

Response: On October 11, 2022, the Company solicited comments via letter from the nongovernmental organizations and private citizen groups identified below. A copy of the letter template and overview map is included as Attachment III.J.

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	Council of Virginia Archaeologists
Ms. Leighton Powell	Scenic Virginia
Mr. Alexander Macaulay	Macaulay & Jamerson
Ms. Elaine Chang	National Trust for Historic Preservation
Ms. Julie Bolthouse	Piedmont Environmental Council
Mr. John McCarthy	Piedmont Environmental Council
Dr. Cassandra Newby-Alexander	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

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.

Anticipated Permits

Activity	Permit	Agency
Impacts to wetlands and waters of the U.S.	Nationwide Permit	U.S. Army Corps of Engineers
Impacts to wetlands and waters of the U.S.	Virginia Water Protection Permit	Virginia Department of Environmental Quality
Work within, over or under state subaqueous bottom	Subaqueous Bottom Permit	Virginia Marine Resources Commission
Discharges of Stormwater from Construction Activities	Construction General Permit	Virginia Department of Environmental Quality
Work within VDOT right-of-way	Land Use Permit	Virginia Department of Transportation
Airspace obstruction evaluation	FAA 7460-1	Federal Aviation Administration

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: **<u>Overhead Transmission Circuits</u>**

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

This section describes the levels of EMF associated with the proposed transmission lines. EMF levels are provided for both historical (2022) and future (2025) annual average and maximum (peak) loading conditions.

Existing Lines – Historical average loading in 2022.

EMF levels were calculated for the existing lines at the historical average load condition (205 amps for Line #2, 158 amps for Line #70, 354 amps for Line #2199) and at an operating voltage of 120.75 and 241.5 kV when supported on the existing structures – <u>Attachments II.A.5.a</u>, <u>II.A.5.b</u>, <u>II.A.5.c</u>, and <u>II.A.5.d</u>.

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 rights-of-way for the existing lines at the historical average loading:

	Left Edge Looking Towards Harpers		Right Edge Looking Towards Harpers	
	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
Attachment II.A.5.a	0.095	5.888	0.095	3.116
Attachment II.A.5.b	0.097	6.337	0.097	3.444
Attachment II.A.5.c	0.102	6.214	0.102	3.382
Attachment II.A.5.d	2.088	15.677	0.173	7.106

Existing Lines – Historical peak loading in 2022.

EMF levels were calculated for the existing lines at the historical peak load condition (394 amps for Line #2, 376 amps for Line #70, 1165 amps for Line #2199) and at an operating voltage of 120.75 and 241.5 kV when supported on the existing structures – Attachments II.A.5.a, II.A.5.b, II.A.5.c, and II.A.5.d.

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 rights-of-way for the existing lines at the historical average loading:

	Left Edge Looking Towards Harpers		Right Edge Looking Towards Harpers	
	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
Attachment II.A.5.a	0.093	9.877	0.094	8.774
Attachment II.A.5.b	0.095	10.742	0.095	9.601
Attachment II.A.5.c	0.101	10.546	0.101	9.426
Attachment II.A.5.d	2.107	55.184	0.172	11.399

Proposed project – Projected average loading in 2025

EMF levels were calculated for the proposed Project at the projected average load condition (89 amps for Line #2 and 528.5 amps for Line #2199, 309.5 amps for Line #2276) and at operating voltages of 120.75 kV and 241.5 kV when supported on the proposed Project structures – see Attachments II.A.5.a, II.A.5.b, II.A.5.c, and II.A.5.d.

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

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

	Left Edge Looking towards Harpers		**Right Edge** Looking towards Harpers	
	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
Attachment II.A.5.a	0.326	7.332	0.326	2.413
Attachment II.A.5.b	0.364	8.790	0.363	2.517
Attachment II.A.5.c	0.313	8.405	0.313	2.646
Attachment II.A.5.d	1.784	31.318	1.341	6.757

Proposed project – Projected peak loading in 2025

EMF levels were calculated for the proposed Project at the projected peak load condition (178 amps for Line #2 and 1057 amps for Line #2199, 619 amps for Line #2276) and at operating voltages of 120.75 kV and 241.5 kV when supported on the proposed Project structures – see Attachments II.A.5.a, II.A.5.b, II.A.5.c, and II.A.5.d.

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

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

	Left Edge Looking towards Harpers		Right Edge Looking towards Harpers	
	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
Attachment II.A.5.a	0.326	14.802	0.324	4.902
Attachment II.A.5.b	0.363	14.794	0.361	5.116
Attachment II.A.5.c	0.309	16.987	0.310	5.375
Attachment II.A.5.d	1.785	62.568	3.513	37.627

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

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

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

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

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

The most recent reviews on this topic include the 2015 report by SCENIHR and annual reviews published by SSM (*e.g.*, for the years 2015 through 2021). These reports, similar to previous reviews, found that the scientific evidence does not confirm the existence of any adverse health effects caused by environmental or community exposure to EMF.

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

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

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.

Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR). Health Effects of Exposure to EMF. Brussels, Belgium: European Commission, 2009.

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.

Swedish Radiation Safety Authority (SSM). Research 2015:19. Recent Research on EMF and Health Risk - Tenth report from SSM's Scientific

Council on Electromagnetic Fields. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2015.

Swedish Radiation Safety Authority (SSM). Research 2016:15. Recent Research on EMF and Health Risk - Eleventh report from SSM's Scientific Council on Electromagnetic Fields, 2016. Including Thirteen years of electromagnetic field research monitored by SSM's Scientific Council on EMF and health: How has the evidence changed over time? Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2016.

Swedish Radiation Safety Authority (SSM). Research 2018:09. Recent Research on EMF and Health Risk - Twelfth report from SSM's Scientific Council on Electromagnetic Fields, 2017. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2018.

Swedish Radiation Safety Authority (SSM). Research 2019:08. Recent Research on EMF and Health Risk – Thirteenth Report from SSM's Scientific Council on Electromagnetic Fields, 2018. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2019.

Swedish Radiation Safety Authority (SSM). Research 2020:04. Recent Research on EMF and Health Risk – Fourteenth Report from SSM's Scientific Council on Electromagnetic Fields, 2019. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2020.

Swedish Radiation Safety Authority (SSM). Research 2021:08. Recent Research on EMF and Health Risk – Fifteenth report from SSM's Scientific Council on Electromagnetic Fields, 2020. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2021.

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."[13]

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

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

The above reviews provide detailed analyses and summaries of relevant recent peer-reviewed scientific publications. The conclusions of these reviews that the evidence overall does not confirm the existence of any adverse health effects due to exposure to EMF below scientifically established guideline

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

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

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

Recent epidemiologic studies of EMF and childhood leukemia include:

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

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

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

- Bunch et al. (2016) and Swanson and Bunch (2018) published additional analyses using data from an earlier study (Bunch et al., 2014). Bunch et al. (2016) reported that the association with distance to power lines observed in earlier years was linked to calendar year of birth or year of cancer diagnosis, rather than the age of the power lines. Swanson and Bunch (2018) re-analyzed data using finer exposure categories (e.g., cut-points of every 50-meter distance) and broader groupings of diagnosis date (e.g., 1960-1979, 1980-1999, and 2000-on) and reported no overall associations between exposure categories and childhood leukemia for the later periods (1980 and on), and consistent pattern for the periods prior to 1980.

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

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

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

- Kyriakopoulou et al. (2018) assessed the association between childhood acute leukemia and parental occupational exposure to social contacts, chemicals, and electromagnetic fields. The study was conducted at a major pediatric hospital in Greece and included 108 cases and 108 controls matched for age, gender, and ethnicity. Statistically non-significant associations were observed between paternal exposure to magnetic fields and childhood acute leukemia for any of the exposure periods examined (1 year before conception; during pregnancy; during breastfeeding; and from birth until diagnosis); maternal exposure was not assessed due to the limited sample size. No associations were observed between childhood acute leukemia and exposure to social contacts or chemicals.
- Auger et al. (2019) examined the relationship between exposure to EMF during pregnancy and risk of childhood cancer in a cohort of 784,000 children born in Quebéc. Exposure was defined using residential distance to the nearest high-voltage transmission line or transformer station. The authors reported statistically non-significant associations between proximity to transformer stations and any cancer, hematopoietic cancer, or solid tumors. No associations were reported with distance to transmission lines.
- Crespi et al. (2019) investigated the relationship between childhood leukemia and distance from high-voltage lines and calculated magnetic-field exposure, separately and combined, within the California study population previously analyzed in Crespi et al. (2016) and Kheifets et al. (2017). The authors reported that neither close proximity to high-voltage lines nor exposure to calculated magnetic fields alone were associated with childhood leukemia; an association was observed only for those participants who were both close to high-voltage lines (< 50 meters) and had high calculated magnetic fields (≥ 0.4 microtesla [i.e., ≥ 4 milligauss]). No associations were observed with low-voltage power lines (< 200 kV). In a subsequent study, Amoon et al. (2020) examined the potential impact of dwelling type on the associations reported in Crespi et al. (2019). Amoon et al. (2020) concluded that while the type of dwelling at which a child resides (e.g., single-family home, apartment, duplex, mobile home) was associated with socioeconomic status and race or ethnicity, it was not associated with childhood leukemia and did not appear to be a potential confounder in the relationship between childhood leukemia and magnetic-field exposure in this study population.
- Swanson et al. (2019) conducted a meta-analysis of 41 epidemiologic studies of childhood leukemia and magnetic-field exposure published between 1979 and 2017 to examine trends in childhood leukemia

development over time. The authors reported that while the estimated risk of childhood leukemia initially increased during the earlier period, a statistically non-significant decline in estimated risk has been observed from the mid-1990s until the present (*i.e.*, 2019).

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

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

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

Recent epidemiologic studies of EMF and neurodegenerative diseases include:

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

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

- Koeman et al. (2015, 2017) analyzed data from the Netherlands Cohort Study of approximately 120,000 men and women who were enrolled in the cohort in 1986 and followed up until 2003. Lifetime occupational history, obtained through questionnaires, and job-exposure matrices on ELF magnetic fields and other occupational exposures were used to assign exposure to study subjects. Based on 1,552 deaths from vascular dementia, the researchers reported a statistically not significant association of vascular dementia with estimated exposure to metals, chlorinated solvents, and ELF magnetic fields. However, because no exposure-response relationship for cumulative exposure was observed and because magnetic fields and solvent exposures were highly correlated with exposure to metals, the authors attributed the association with ELF magnetic fields and solvents to confounding by exposure to metals (Koeman et al., 2015). Based on a total of 136 deaths from ALS among the cohort members, the authors reported a statistically significant, approximately two-fold association with ELF magnetic fields in the highest exposure category. This association, however, was no longer statistically significant when adjusted for exposure to insecticides (Koeman et al., 2017).

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

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

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

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

- Checkoway et al. (2018) investigated the association between Parkinsonism[14] 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

[14] 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).

association was reported between occupational exposure to EMF and Alzheimer's disease; no association was observed for Parkinson's disease.

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

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

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

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

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

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

- Huang et al. (2020) conducted a meta-analysis of 43 epidemiologic studies examining potential occupational risk factors for dementia or mild cognitive impairment. The authors included five cohort studies and seven case-control studies related to magnetic-field exposure. For both study types, the authors reported positive associations between dementia and work-related magnetic-field exposures. The paper, however, provided no information on the occupations held by the study participants, their magnetic-field exposure levels, or how magnetic-field levels were assessed; therefore, the results are difficult to interpret. The authors also reported a high level of heterogeneity among studies. Thus, this analysis adds little, if any, to the overall weight of evidence on a potential association between dementia and magnetic fields.

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

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

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V. NOTICE

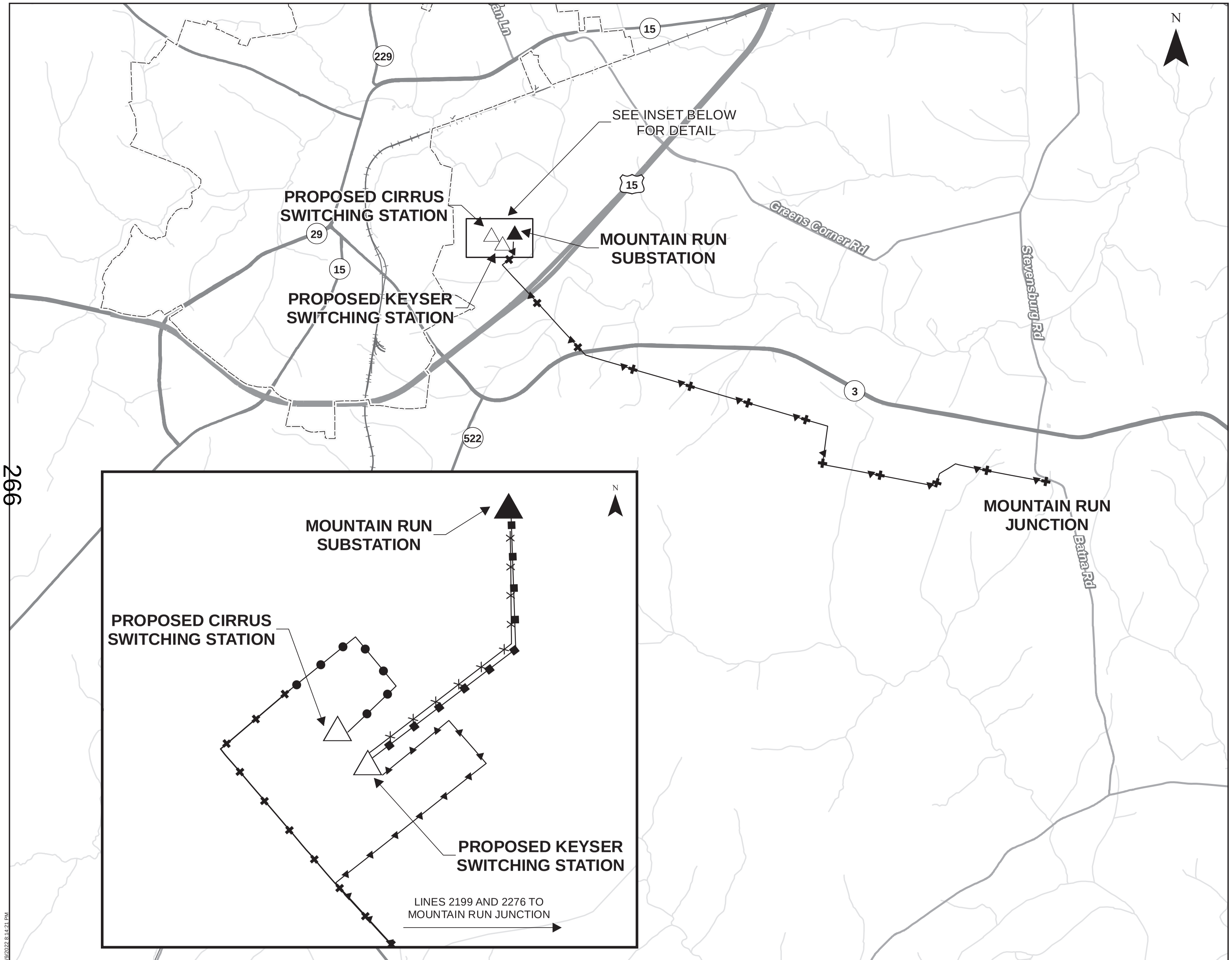
A. Furnish a proposed route description to be used for public notice purposes. Provide a map of suitable scale showing the route of the proposed project. For all routes that the Applicant proposed to be noticed, provide minimum, maximum and average structure heights.

Response: A map showing the existing route to be used for the Project is provided as Attachment V.A. A written description of the route is as follows:

The Project is located entirely in Culpeper County, VA and includes the construction of two new switching stations and interconnecting lines, as well as the construction of a new, approximately 5.2-mile overhead 230 kV double circuit transmission line loop. The proposed Cirrus and Keyser Stations will be constructed adjacent to Frank Turnage Drive and southwest of the existing Mountain Run Substation. The 230 kV transmission line loop will consist of three 230 kV lines; (i) 230 kV Gordonsville-Cirrus Line #2199, (ii) 230 kV Cirrus-Keyser Line #2278, and (iii) 230 kV Keyser-Germanna Line #2276 (collectively, the "Cirrus-Keyser 230 kV Loop"). The Cirrus-Keyser 230 kV Loop will be constructed within an existing 100-foot wide right-of-way originating at the existing Mountain Run Substation and extending approximately 5.2 miles east to the Mountain Run Junction. The two existing 115 kV Lines #2 and #70 will be removed between existing Structures #2/1201-1253 and Structures #70/53-1 and a new overhead single circuit 115 kV line, which will require an additional 25 feet of permanent right-of-way from the edge of the existing 100 feet of right-of-way for approximately 0.02-miles from proposed Structure #2/486A to proposed Structure #2/486B, will be constructed to connect Lines #2 and #70 at the Mountain Run Junction.

Two new 230 kV lines, Lines #2283 and #2284, will be constructed in 0.15 miles and 0.10 miles of new right-of-way, respectively, between the Keyser Station and the existing Mountain Run Substation. Proposed 230 kV Lines #2288 and #2289 will also be constructed, both approximately 0.01-miles in length, and will run from the proposed Cirrus Station to a proposed substation to be constructed by Rappahannock Electric Cooperative. No new right-of-way is required for these lines.

The Project area includes primarily farmland and rural areas. Waterways within the Project area include Mountain Run, and unnamed tributaries to Mountain Run, and unnamed tributaries to Potato Run. The Project crosses Frank Turnage Drive, James Madison Hwy (Route 15/29), Croftburn Farm Rd, Germanna Hwy (Route 3), and Blackjack Road (Route 661). The minimum proposed structure height is approximately 75 feet, the maximum proposed structure height is approximately 115 feet, and the average proposed structure height is approximately 100 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.



ATTACHMENT V.A

PROJECT NOTICE MAP

Cirrus - Keyser 230 kV Loop and Related Projects

Culpeper County, Virginia

Owner/ Applicant:
Dominion Energy Virginia

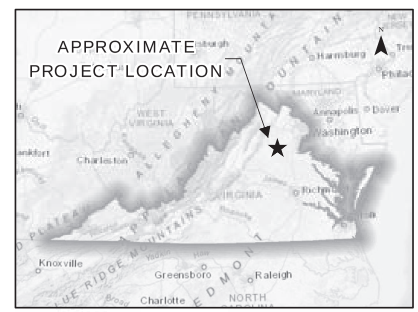
C2 Env Project:	Prepared By:	Date:
0245	TMP	07/28/22

0 0.375 0.75 1.5 Miles
Scale is 1 IN = 0.75 MIwhen printed at original size of 11x17

LEGEND

- Proposed Dominion Switching Station
- Existing REC Substation
- Proposed Centerline 2199
- Proposed Centerline 2276
- Proposed Centerline 2278
- Proposed Centerline 2283
- Proposed Centerline 2284
- Limited Access Highway
- US or VA Primary Highway
- Local or Main Road
- Railroad
- NHD Stream/River
- NHD Waterbody
- Town of Culpeper

Notes:
1. Basemap from ESRI Topographic Map
2. Project centerline provided by Dominion Energy
3. Roads and railroads from VGIN
4. Streams, rivers and waterbodies from USGS National Hydrography Data



C2 ENVIRONMENTAL

Dominion Energy

SHEET 1 OF 1

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: The Application will be made available electronically for public inspection at: www.dominionenergy.com/cirruskeyser.

V. NOTICE

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

Response: Ms. Bettina Rayfield,
Office of Environmental Impact Review
Department of Environmental Quality, Central Office
PO Box 1105
Richmond, Virginia 23218

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

Ms. Trish Beasley
VWP Permit Manager, Northern Regional Office
Department of Environmental Quality
13901 Crown Court
Woodbridge, VA 22193

Ms. Krystal McKelvey
Environmental Specialist, Planning & Recreation
Department of Conservation and Recreation
600 East Main Street, 24th Floor
Richmond, Virginia 23219

Ms. Rene Hypes
Environmental Review Coordinator, Natural Heritage Program
Department of Conservation and Recreation
600 East Main Street, 24th Floor
Richmond, Virginia 23219

Ms. Amy Martin
Environmental Services Biologist Manager
Virginia Department of Wildlife Resources
P.O. Box 90778
Henrico, Virginia 23228

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

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

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

Mr. Randy Owen
Habitat Management Division
Virginia Marine Resources Commission
Building 96, 380 Fenwick Road
Fort Monroe, Virginia 23651

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

Ms. Anna Lawston
U.S. Army Corps of Engineers
Norfolk District, Northern Section
PO Box 489
Amissville, VA 20106

Mr. Tucker Smith
U.S. Army Corps of Engineers
Norfolk District, Northern Section
9100 Arboretum Parkway, Suite 235
Richmond, VA 23236

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

Mr. Conrad Spencer, III
Virginia Department of Mine, Minerals, and Energy
1100 Bank Street
Washington Building, 8th Floor
Richmond, Virginia 23219

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

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

Mr. D. Mark Nesbit, P.E.
Warrenton Residence Administrator, Culpeper District
Virginia Department of Transportation
457 E. Shirley Ave.
Warrenton, VA 20186

Mr. John Egertson
Culpeper County Administrator
302 North Main Street
Culpeper, VA 22701

V. NOTICE

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

Response: In accordance with Va. Code §15.2-2202 E, a letter dated October 11, 2022, was sent to Mr. John Egertson, County Administrator in Culpeper County advising of the Company's intention to file this Application and inviting the County to consult with the Company about the Project. This letter is included as Attachment V.D.

Dominion Energy Virginia
10900 Nuckols Rd, 4th Floor
Glen Allen, VA 23060
DominionEnergy.com

October 11, 2022

Mr. John Egertson
Culpeper County Administrator
302 North Main Street
Culpeper, VA 22701

Reference: **Dominion Energy Virginia's Proposed Cirrus – Keyser 230 kV Loop and Related Projects in Culpeper County, Virginia**
Notice Pursuant to Va. Code §15.2-2202 E

Dear Mr. Egertson,

Dominion Energy Virginia (the "Company") is proposing to construct a new, approximately 5.2-mile overhead 230 kV double circuit transmission line-loop utilizing an existing 100-foot-wide right-of-way resulting in three separate lines: (i) the 230 kV Gordonsville-Cirrus Line #2199, (ii) the 230 kV Cirrus-Keyser Line #2278, and (iii) the 230 kV Keyser-Germanna Line #2276 (collectively, the "Cirrus-Keyser 230 kV Loop"). Two new substations, the Cirrus Substation and the Keyser Substation, will be constructed on customer and Company-owned property. The Project is largely located within existing right-of-way or on Company-owned property. However, additional permanent right-of-way is needed on customer property to connect the Cirrus Substation to the existing 115 kV Line #70 and at the Mountain Run Junction. Temporary right-of-way is also needed for the 5.2-mile corridor to install a temporary line during construction.

The Project is needed to provide service to a Rappahannock Electric Cooperative data center customer, to maintain reliable service for the overall growth in the region, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is in the process of preparing an application for a Certificate of Public Convenience and Necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). In advance of the filing of an application for a CPCN from the Commission, the Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Project within 30 days of the date of this letter. Enclosed is a Project Overview Map depicting the proposed Cirrus-Keyser 230 kV Loop and Related Projects, as well as the general Project location.

If you would like to receive a GIS shapefile of the route to assist in your project review or if you have any questions, please do not hesitate to contact Nancy Reid at (434) 532-7579 or Nancy.R.Reid@dominionenergy.com. We appreciate your assistance with this project review and looks forward to any additional information you may have to offer.

Sincerely,

Nancy R. Reid

Nancy R. Reid
Senior Siting and Permitting Specialist

Attachment: Project Map

COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

APPLICATION OF	)	
	)	
VIRGINIA ELECTRIC AND POWER COMPANY	)	Case No.: PUR-2022-00198
	)	
For approval and certification of electric transmission facilities: Cirrus – Keyser 230 kV Loop and Related Projects	)))	

IDENTIFICATION, SUMMARIES, AND TESTIMONY OF DIRECT WITNESSES
<u>CIRRUS – KEYSER 230 kV LOOP AND RELATED PROJECTS</u>

Mark R. Gill

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

Sherrill A. Crenshaw

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

Santosh Bhattarai

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

Nancy R. Reid

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

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Mark R. Gill

Title: Consulting Engineer – Electric Transmission Planning

Summary:

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

- Section I.C: 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: This section describes critical contingencies and associated violations due to inadequacy of the existing system.
- Section I.E: This section explains feasible project alternatives, when applicable.
- Section I.G: This section provides a system map for the affected area.
- Section I.H: This section provides the desired in-service date of the proposed project and the estimated construction time.
- 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 I.N: 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.
- 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 Gill co-sponsors the following sections of the Appendix:

- Section I.A (co-sponsored with Company Witnesses Sherrill A. Crenshaw, Santosh Bhattarai, and Nancy R. Reid): This section details the primary justifications for the proposed project.
- Section I.B (co-sponsored with Company Witness Sherrill A. Crenshaw): This section details the engineering justifications for the proposed project.
- Section I.I (co-sponsored with Company Witnesses Sherrill A. Crenshaw and Santosh Bhattarai): This section provides the estimated total cost of the proposed project.
- Section I.L (co-sponsored with Company Witness Sherrill A. Crenshaw): This section, when applicable, provides details on the deterioration of structures and associated equipment.

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

DIRECT TESTIMONY
OF
MARK R. GILL
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00198

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

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

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

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

A. To provide service to a Rappahannock Electric Cooperative ("REC") data center customer ("REC Customer") in Culpeper County, Virginia, to maintain reliable service for the overall growth in the Project area, and to comply with mandatory NERC Reliability Standards, Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company") proposes in Culpeper County, Virginia to:

- Construct a new, approximately 5.2-mile overhead 230 kV double circuit transmission line-loop. This 5.2 mile line-loop will be built entirely on the existing 100-foot-wide right-of-way and will result in three separate lines: (i) 230 kV Gordonsville-Cirrus Line #2199, (ii) 230 kV Cirrus-Keyser Line #2278, and (iii) 230 kV Keyser-Germanna Line #2276 (collectively, the "Cirrus-Keyser 230 kV Loop").

- Remove a portion of one existing 115 kV double circuit transmission line (Line #2 and Line #70) located entirely within the existing right-of-way between existing Structures #2/1201-1253 and Structures #70/53-1 and install a new, overhead single circuit 115 kV line which will require an additional 25 feet of permanent right-of-way from the edge of the existing 100 feet of right-of-way for approximately 0.02-miles from proposed Structure #2/486A to proposed Structure #2/486B to connect Lines #2 and #70 at the Mountain Run Junction.

- Construct two overhead 230 kV transmission Lines, Line #2283 and Line #2284. Line #2283 will be 0.15 miles in length, and Line #2284 will be 0.10 miles in length. Both will be built in new right-of-way provided by the REC Customer and will run from the proposed Keyser Switching Station ("Keyser Station") to the existing REC Mountain Run Substation ("Mountain Run Substation" or "Mountain Run 1 and 2").

- Construct two overhead 230 kV transmission lines, Line #2288 and Line #2289, approximately 0.01-miles in length. Lines #2288 and #2289 will run from the proposed Cirrus Switching Station ("Cirrus Station") to the proposed REC Mountain Run 3 Substation ("Mountain Run 3 Substation") and will not require any new right-of-way.

- Build a new section of overhead 115 kV single circuit transmission line (Line #70), approximately 0.07-miles in length in new right-of-way provided by the REC Customer. This new section of Line #70 will run from the proposed Cirrus Station to existing Structure #70/1255.

- Construct two new 230 kV switching stations located along Frank Turnage Drive, the Cirrus Station and the Keyser Station, on land purchased by the Company from the REC Customer.

- Update line protection settings at the Company's existing Remington, Germanna, Gordonsville and Oak Green Substations.

The new Cirrus-Keyser 230 kV Loop, construction of Lines #2283, #2284, #2288, and #2289, additional line work, construction of the Cirrus and Keyser Stations and related substation work are collectively referred to as the "Project."

The purpose of my testimony is to describe the Company's transmission system and the need for, and benefits of, the proposed Project. I am sponsoring Sections I.C, I.D, I.E, I.G, I.H, I.J, I.K, I.M, I.N, II.A.3, and II.A.10 of the Appendix. Additionally, I co-sponsor the Executive Summary and Section I.A. with Company Witnesses Sherill A.

Crenshaw, Santosh Bhattarai, and Nancy R. Reid; Section I.B. and Section I.L with Company Witness Sherill A. Crenshaw; and Section I.I with Company Witnesses Sherill A. Crenshaw and Santosh Bhattarai.

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

A. Yes, it does.

BACKGROUND AND QUALIFICATIONS
OF
MARK R. GILL

Mark R. Gill received a Bachelor of Science degree in Electrical Engineering from the University of Virginia in 1989. He has been licensed as a Professional Engineer in the Commonwealth of Virginia since 1994. He has been employed by the Company for 32 years. Mr. Gill's experience with the Company includes Customer Service (1988-1992), Circuit Calculations/System Protection (1992-1999), Distribution Planning (1999-2007) and Transmission Planning (2007-Present).

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

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Sherrill A. Crenshaw

Title: Principal Engineer – Electric Transmission Line Engineering

Summary:

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

- Section I.F: This section describes any lines or facilities that will be removed, replaced, or taken out of service upon completion of the proposed project.
- Section II.A.4: This section explains why the existing right-of-way is inadequate to serve the needs of the project.
- Section II.A.5: This section provides drawings of the right-of-way cross section showing typical transmission lines structure placements.
- Section II.B.1 to II.B.2: These sections provide the line design and operational features of the proposed project.
- Section II.B.3 to II.B.5: These sections provide supporting structure details along the proposed and alternative routes.
- Section IV: This section provides analysis on the health aspects of electric and magnetic field levels.

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

- Section I.A. (co-sponsored with Company Witnesses Mark R. Gill, Santosh Bhattarai, and Nancy R. Reid): This section details the primary justifications for the proposed project.
- Section I.B (co-sponsored with Company Witness Mark R. Gill): This section details the engineering justifications for the proposed project.
- Section I.I (co-sponsored with Company Witnesses Mark. R. Gill and Santosh Bhattarai): This section provides the estimated total cost of the proposed project.
- Section I.L. (co-sponsored with Company Witness Mark R. Gill): This section, when applicable, provides details on the deterioration of structures and associated equipment.
- Section II.B.6 (co-sponsored with Company Witness Nancy R. Reid): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section V.A (co-sponsored with Company Witness Nancy R. Reid): This section provides the proposed route description and structure heights for notice purposes.

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

DIRECT TESTIMONY
OF
SHERRILL A. CRENSHAW
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00198

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

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

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

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

A. To provide service to a Rappahannock Electric Cooperative ("REC") data center customer ("REC Customer") in Culpeper County, Virginia, to maintain reliable service for the overall growth in the Project area, and to comply with mandatory NERC Reliability Standards, Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company") proposes in Culpeper County, Virginia to:

- Construct a new, approximately 5.2-mile overhead 230 kV double circuit transmission line-loop. This 5.2 mile line-loop will be built entirely on the existing 100-foot-wide right-of-way and will result in three separate lines: (i) 230 kV Gordonsville-Cirrus Line #2199, (ii) 230 kV Cirrus-Keyser Line #2278, and (iii) 230 kV Keyser-Germanna Line #2276 (collectively, the "Cirrus-Keyser 230 kV Loop").

- Remove a portion of one existing 115 kV double circuit transmission line (Line #2 and Line #70) located entirely within the existing right-of-way between existing Structures #2/1201-1253 and Structures #70/53-1 and install a new, overhead single circuit 115 kV line which will require an additional 25 feet of permanent right-of-way from the edge of the existing 100 feet of right-of-way for approximately 0.02-miles from proposed Structure #2/486A to proposed Structure #2/486B to connect Lines #2 and #70 at the Mountain Run Junction.

- Construct two overhead 230 kV transmission Lines, Line #2283 and Line #2284. Line #2283 will be 0.15 miles in length, and Line #2284 will be 0.10 miles in length. Both will be built in new right-of-way provided by the REC Customer and will run from the proposed Keyser Switching Station ("Keyser Station") to the existing REC Mountain Run Substation ("Mountain Run Substation" or "Mountain Run 1 and 2").

- Construct two overhead 230 kV transmission lines, Line #2288 and Line #2289, approximately 0.01-miles in length. Lines #2288 and #2289 will run from the proposed Cirrus Switching Station ("Cirrus Station") to the proposed REC Mountain Run 3 Substation ("Mountain Run 3 Substation") and will not require any new right-of-way.

- Build a new section of overhead 115 kV single circuit transmission line (Line #70), approximately 0.07-miles in length in new right-of-way provided by the REC Customer. This new section of Line #70 will run from the proposed Cirrus Station to existing Structure #70/1255.

- Construct two new 230 kV switching stations located along Frank Turnage Drive, the Cirrus Station and the Keyser Station, on land purchased by the Company from the REC Customer.

- Update line protection settings at the Company's existing Remington, Germanna, Gordonsville and Oak Green Substations.

The new Cirrus-Keyser 230 kV Loop, construction of Lines #2283, #2284, #2288, and #2289, additional line work, construction of the Cirrus and Keyser Stations and related substation work are collectively referred to as the "Project."

The purpose of my testimony is to describe the design characteristics of the transmission facilities for the proposed Project, and also to discuss electric and magnetic field ("EMF") levels. I sponsor Sections: I.F, II.A.4, II.A.5, II.B.1 through II.B.5, and IV. Additionally, I co-sponsor the Executive Summary and Section I.A. with Company Witnesses Mark R. Gill, Santosh Bhattarai, and Nancy R. Reid; Section I.B. and I.L. with Company Witness

Mark R. Gill; Section I.I with Company Witnesses Mark R. Gill and Santosh Bhattarai; and Section II.B.6 and V.A with Company Witness Nancy R. Reid.

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

A. Yes, it does.

BACKGROUND AND QUALIFICATIONS
OF
SHERRILL A. CRENSHAW

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

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

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Santosh Bhattarai

Title: Engineer III – Substation Engineering

Summary:

Company Witness Santosh Bhattarai sponsors those sections of the Appendix describing the work to be performed at the existing and proposed substations for the proposed Project, as follows:

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

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

- Section I.A. (co-sponsored with Company Witnesses Mark R. Gill, Sherrill A. Crenshaw, and Nancy R. Reid): This section details the primary justifications for the proposed project.
- Section I.I (co-sponsored with Company Witnesses Mark. R. Gill and Sherrill A. Crenshaw): This section provides the estimated total cost of the proposed project.

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

DIRECT TESTIMONY
OF
SANTOSH BHATTARAI
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00198

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

Q. What are your responsibilities as a Consulting Engineer?

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

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

A. To provide service to a Rappahannock Electric Cooperative ("REC") data center customer ("REC Customer") in Culpeper County, Virginia, to maintain reliable service for the overall growth in the Project area, and to comply with mandatory NERC Reliability Standards, Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company") proposes in Culpeper County, Virginia to:

- Construct a new, approximately 5.2-mile overhead 230 kV double circuit transmission line-loop. This 5.2 mile line-loop will be built entirely on the existing 100-foot-wide right-of-way and will result in three separate lines: (i) 230 kV Gordonsville-Cirrus Line #2199, (ii) 230 kV Cirrus-Keyser Line #2278, and (iii) 230 kV Keyser-Germanna Line #2276 (collectively, the "Cirrus-Keyser 230 kV Loop").

- Remove a portion of one existing 115 kV double circuit transmission line (Line #2 and Line #70) located entirely within the existing right-of-way between existing Structures #2/1201-1253 and Structures #70/53-1 and install a new, overhead single circuit 115 kV line which will require an additional 25 feet of permanent right-of-way from the edge of the existing 100 feet of right-of-way for approximately 0.02-miles from proposed Structure #2/486A to proposed Structure #2/486B to connect Lines #2 and #70 at the Mountain Run Junction.

- Construct two overhead 230 kV transmission Lines, Line #2283 and Line #2284. Line #2283 will be 0.15 miles in length, and Line #2284 will be 0.10 miles in length. Both will be built in new right-of-way provided by the REC Customer and will run from the proposed Keyser Switching Station ("Kyser Station") to the existing REC Mountain Run Substation ("Mountain Run Substation" or "Mountain Run 1 and 2").

- Construct two overhead 230 kV transmission lines, Line #2288 and Line #2289, approximately 0.01-miles in length. Lines #2288 and #2289 will run from the proposed Cirrus Switching Station ("Cirrus Station") to the proposed REC Mountain Run 3 Substation ("Mountain Run 3 Substation") and will not require any new right-of-way.

- Build a new section of overhead 115 kV single circuit transmission line (Line #70), approximately 0.07-miles in length in new right-of-way provided by the REC Customer. This new section of Line #70 will run from the proposed Cirrus Station to existing Structure #70/1255.

- Construct two new 230 kV switching stations located along Frank Turnage Drive, the Cirrus Station and the Keyser Station, on land purchased by the Company from the REC Customer.

- Update line protection settings at the Company's existing Remington, Germanna, Gordonsville and Oak Green Substations.

The new Cirrus-Keyser 230 kV Loop, construction of Lines #2283, #2284, #2288, and #2289, additional line work, construction of the Cirrus and Keyser Stations and related substation work are collectively referred to as the "Project."

The purpose of my testimony is to describe the work to be performed as part of the Project at the Mountain Run, Cirrus, and Keyser Stations. As it pertains to station work, I am sponsoring Section II.C of the Appendix. I am also co-sponsoring the Executive

Summary and Section I.A of the Appendix with Company Witnesses Mark R. Gill, Sherrill A. Crenshaw, and Nancy R. Reid; and Section I.I with Company Witnesses Mark R. Gill and Sherrill A. Crenshaw.

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

A. Yes, it does.

BACKGROUND AND QUALIFICATIONS
OF
SANTOSH BHATTARAI

Santosh Bhattarai received a Master of Science degree in Electrical Engineering from South Dakota State University in 2006. Before working for the Company, Mr. Bhattarai worked at Electrical Consultants, Inc., from 2006 to 2009 in Billings, Montana as a Substation Design Engineer. Then, from 2010 to 2013, he worked at Electrical Consultants, Inc. in Madison, Wisconsin as a Substation Project Engineer. Mr. Bhattarai's responsibilities included the evaluation of the substation project requirements, development of project scope documents, estimates and schedules, preparation of specifications and bid documents, material procurement, development of detailed physical drawings, bill of materials, electrical schematics and wiring diagrams.

Mr. Bhattarai joined the Dominion Energy Virginia Substation Engineering department in November 2013 as an Engineer III. He was promoted to the Consulting Engineer in July 2019. He has been licensed as a Professional Engineer in the Commonwealth of Virginia since 2015. In recognition of his professional standing, the Institute of Electrical and Electronics Engineers ("IEEE") board elected him to the grade of Senior Member in 2017.

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

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Nancy R. Reid

Title: Siting and Permitting Specialist

Summary:

Company Witness Nancy R. Reid 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.1: This section provides the length of the proposed corridor and viable alternatives to the proposed project.
- Section II.A.2: This section provides a map showing the route of the proposed project in relation to notable points close to the proposed project.
- Sections II.A.6 to II.A.8: These sections provide details regarding the right-of-way for the proposed project.
- Section II.A.9: This section describes the proposed route selection procedures and details alternative routes considered.
- Section II.A.11: This section details how the construction of the proposed project follows the provisions discussed in Attachment 1 of the Transmission Appendix Guidelines.
- 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.
- Section III: This section details the impact of the proposed project on scenic, environmental, and historic features.
- Section V.B to D.: This section provides information related to public notice of the proposed project.

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

- Section I.A. (co-sponsored with Company Witnesses Mark R. Gill, Sherrill A. Crenshaw, and Santosh Bhattarai): This section details the primary justifications for the proposed project.
- Section II.A.4 (co-sponsored with Company Witness Sherrill A. Crenshaw): This section explains why the existing right-of-way is not adequate to serve the need, to the extent applicable.
- Section II.B.6 (co-sponsored with Company Witnesses Sherrill A. Crenshaw): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section V.A (co-sponsored with Company Witnesses Sherrill A. Crenshaw): This section provides the proposed route description and structure heights for notice purposes.

Finally, Ms. Reid sponsors the DEQ Supplement filed with the Application. A statement of Mr. Bhattarai's background and qualifications is attached to his testimony as Appendix A.

DIRECT TESTIMONY
OF
NANCY R. REID
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00198

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 Nancy R. Reid, and I am a Siting and Permitting Specialist for the Company. My business address is 10900 Nuckols Road, Glen Allen, Virginia 23060. A statement of my qualifications and background is provided as Appendix A.

Q. What are your responsibilities as a Siting and Permitting Specialist?

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. To provide service to a Rappahannock Electric Cooperative (“REC”) data center customer (“REC Customer”) in Culpeper County, Virginia, to maintain reliable service for the overall growth in the Project area, and to comply with mandatory NERC Reliability Standards, Virginia Electric and Power Company (“Dominion Energy Virginia” or the “Company”) proposes in Culpeper County, Virginia to:

- Construct a new, approximately 5.2-mile overhead 230 kV double circuit transmission line-loop. This 5.2 mile line-loop will be built entirely on the existing 100-foot-wide right-of-way and will result in three separate lines: (i) 230 kV Gordonsville-Cirrus Line #2199, (ii) 230 kV Cirrus-Keyser Line #2278, and (iii) 230 kV Keyser-Germanna Line #2276 (collectively, the "Cirrus-Keyser 230 kV Loop").

- Remove a portion of one existing 115 kV double circuit transmission line (Line #2 and Line #70) located entirely within the existing right-of-way between existing Structures #2/1201-1253 and Structures #70/53-1 and install a new, overhead single circuit 115 kV line which will require an additional 25 feet of permanent right-of-way from the edge of the existing 100 feet of right-of-way for approximately 0.02-miles from proposed Structure #2/486A to proposed Structure #2/486B to connect Lines #2 and #70 at the Mountain Run Junction.

- Construct two overhead 230 kV transmission Lines, Line #2283 and Line #2284. Line #2283 will be 0.15 miles in length, and Line #2284 will be 0.10 miles in length. Both will be built in new right-of-way provided by the REC Customer and will run from the proposed Keyser Switching Station ("Keyser Station") to the existing REC Mountain Run Substation ("Mountain Run Substation" or "Mountain Run 1 and 2").

- Construct two overhead 230 kV transmission lines, Line #2288 and Line #2289, approximately 0.01-miles in length. Lines #2288 and #2289 will run from the proposed Cirrus Switching Station ("Cirrus Station") to the proposed REC Mountain Run 3 Substation ("Mountain Run 3 Substation") and will not require any new right-of-way.

- Build a new section of overhead 115 kV single circuit transmission line (Line #70), approximately 0.07-miles in length in new right-of-way provided by the REC Customer. This new section of Line #70 will run from the proposed Cirrus Station to existing Structure #70/1255.

- Construct two new 230 kV switching stations located along Frank Turnage Drive, the Cirrus Station and the Keyser Station, on land purchased by the Company from the REC Customer.

- Update line protection settings at the Company's existing Remington, Germanna, Gordonsville and Oak Green Substations.

The new Cirrus-Keyser 230 kV Loop, construction of Lines #2283, #2284, #2288, and #2289, additional line work, construction of the Cirrus and Keyser Stations and related substation work are collectively referred to as the "Project."

The purpose of my testimony is to provide an overview or the route and permitting for the Proposed Project. I sponsor Sections II.A.1, II.A.2, II.A.6 to II.A.9, II.A.11, II.A.12, III, and V.B to V.D. I am also co-sponsoring the Executive Summary and Section I.A. with Company Witnesses Mark R. Gill, Sherrill A. Crenshaw, and Santosh Bhattarai; and Section II.A.4, II.B.6, and V.A with Company Witness Sherrill A. Crenshaw.

Q. Does this conclude your pre-filed testimony?

A. Yes, it does.

BACKGROUND AND QUALIFICATIONS
OF
NANCY R. REID

Nancy R. Reid earned her Bachelor's degree from Christopher Newport University in environmental biology with a minor in chemistry and her Master's degree in Safety and Environmental Management from Columbia Southern University. Her past work experience includes working for the City of Franklin and Southampton County as the Environmental Specialist where she developed the areas' stormwater management and permitting programs. Ms. Reid joined Dominion Energy in 2017 as an Environmental Compliance Coordinator where she assisted in developing the environmental program for the most efficient combined-cycle gas plant in the country and is now a Sitting and Permitting Specialist for Electric Transmission.

Ms. Reid has previously submitted pre-filed testimony to the State Corporation Commission of Virginia.