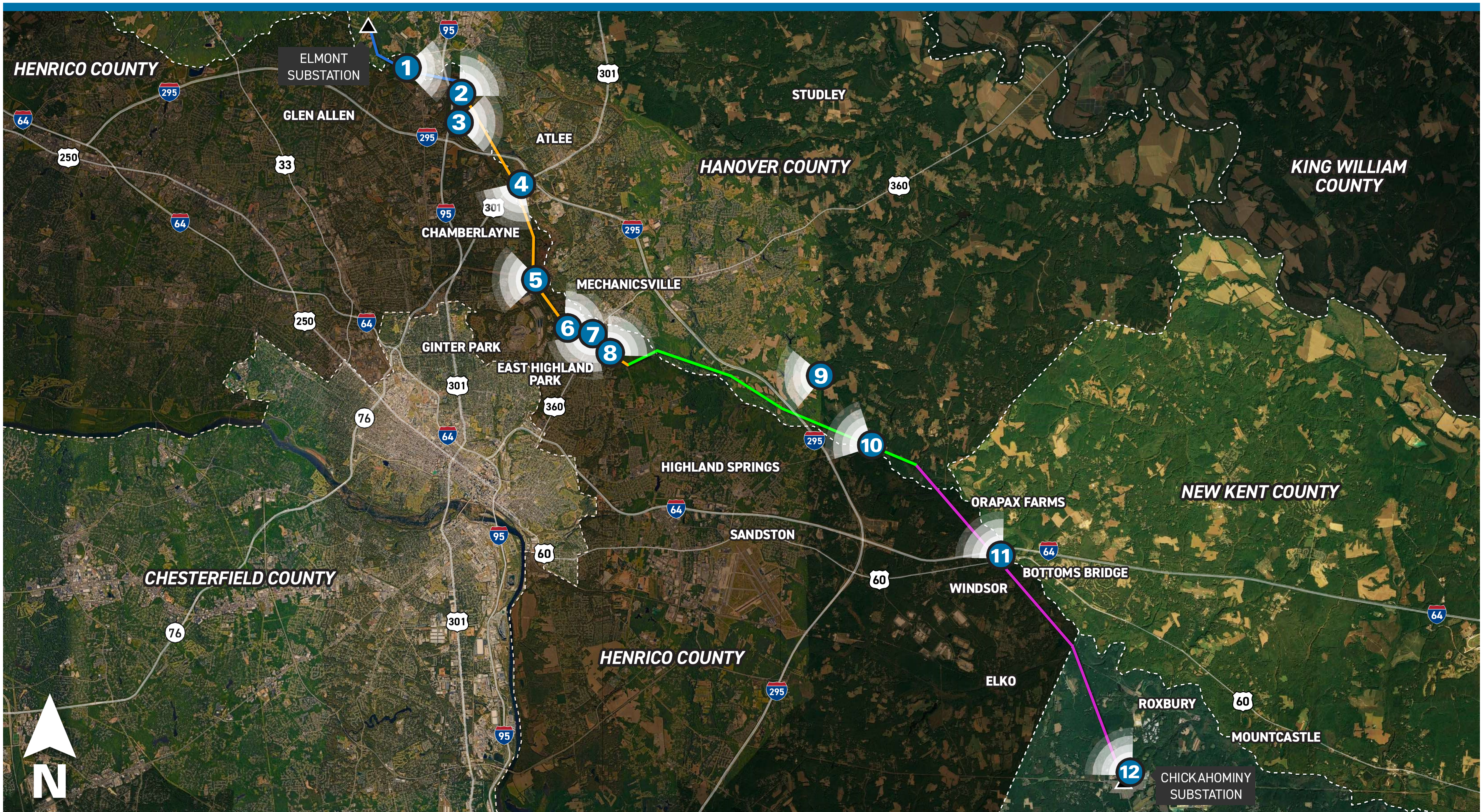
# ELMONT TO CHICKAHOMINY
Transmission Line Project

## Photo Location Map

1 Viewpoint Location ▲ Existing Substation — Phase 1 — Phase 2 — Phase 3 — Phase 4

Dominion Energy®



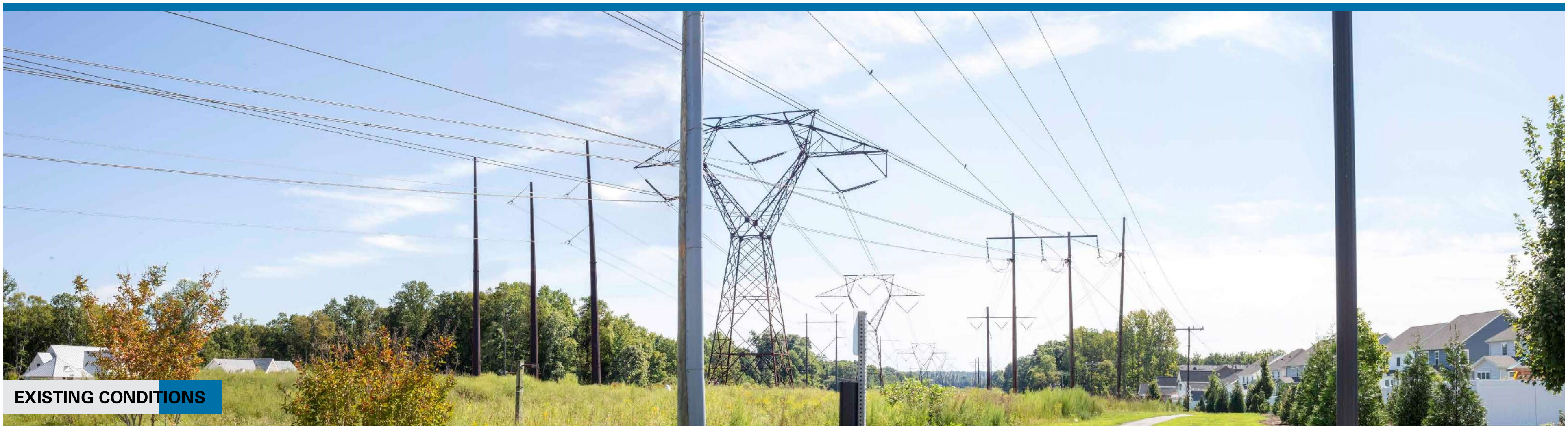
# ELMONT TO CHICKAHOMINY
Transmission Line Project

## Viewpoint 1

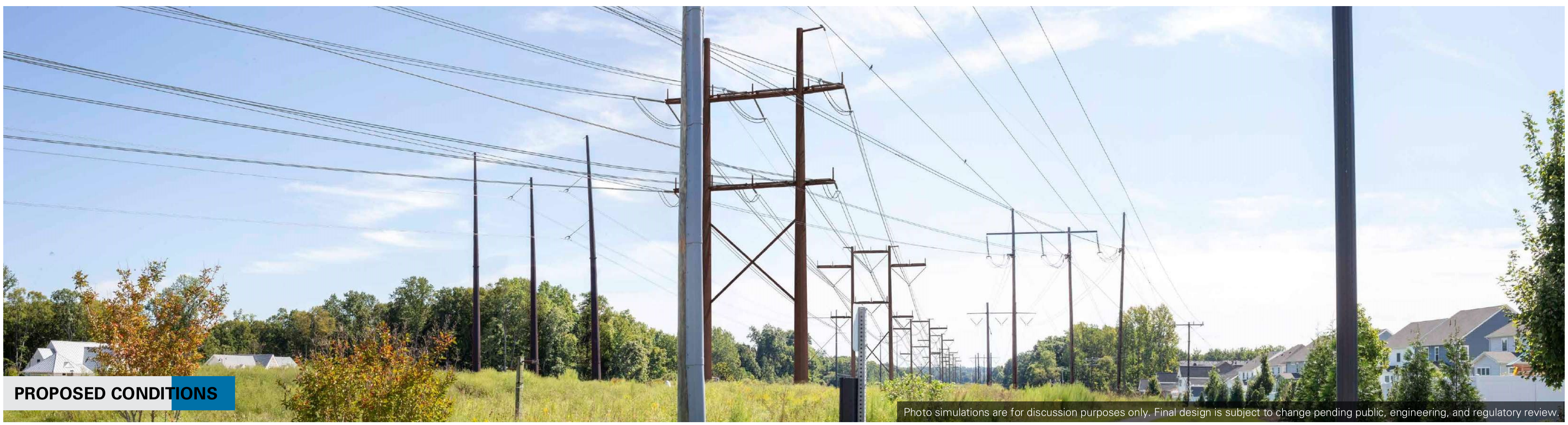
**Date:** 09/14/2022 **Time:** 10:14 am **Viewing Direction:** East

1 Viewpoint Location — Phase 1


Dominion Energy®



EXISTING CONDITIONS



PROPOSED CONDITIONS

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

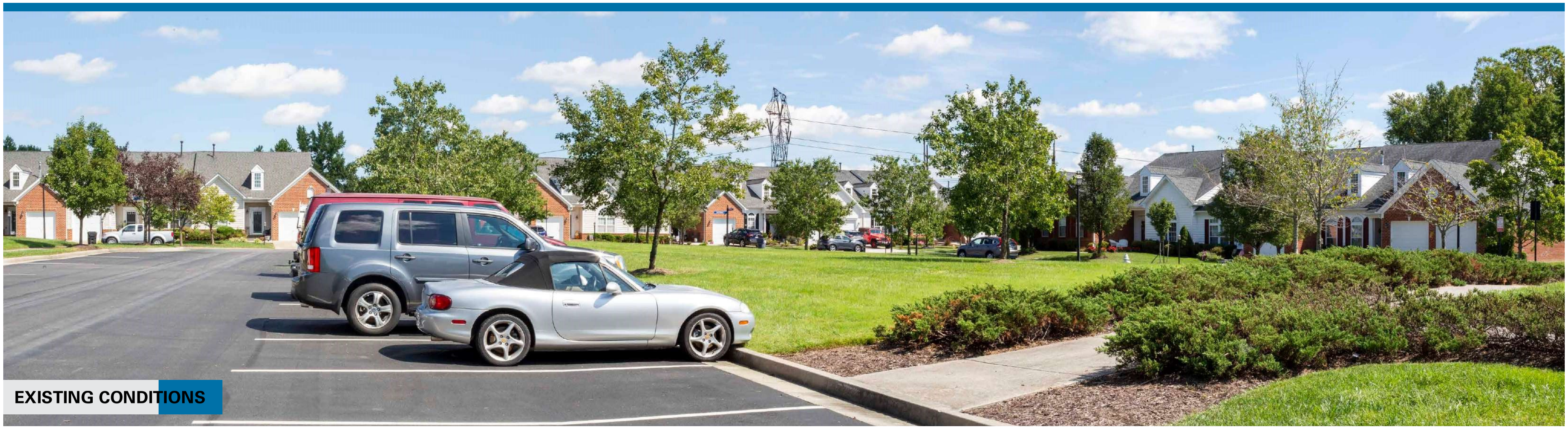
# ELMONT TO CHICKAHOMINY
Transmission Line Project

## Viewpoint 2

**Date:** 09/14/2022 **Time:** 10:54 am **Viewing Direction:** Northeast

2 Viewpoint Location — Phase 2


Dominion Energy®



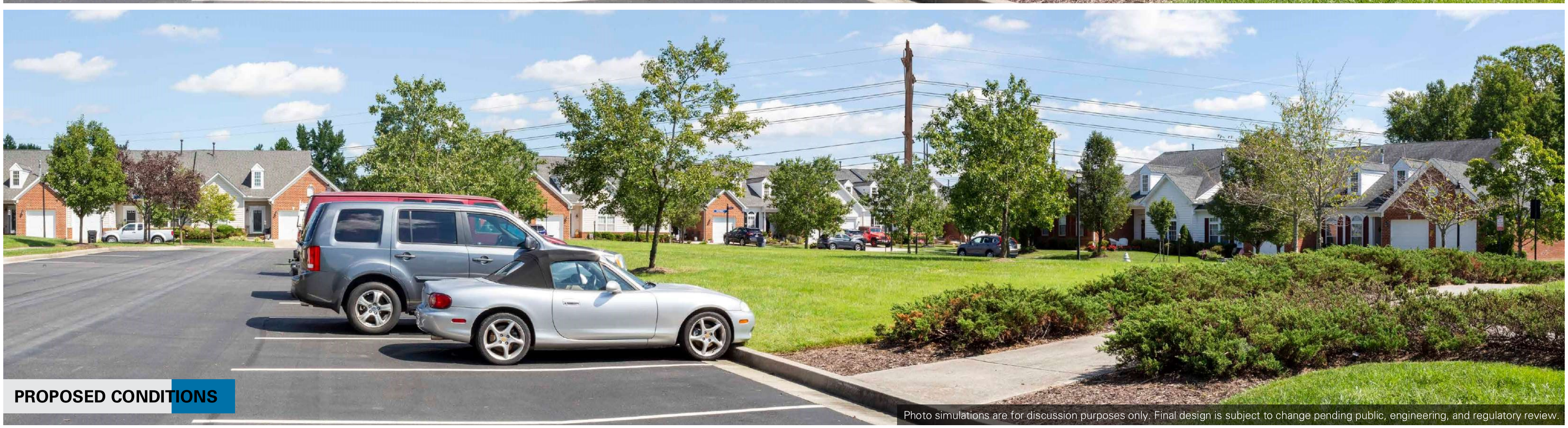




Photo simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

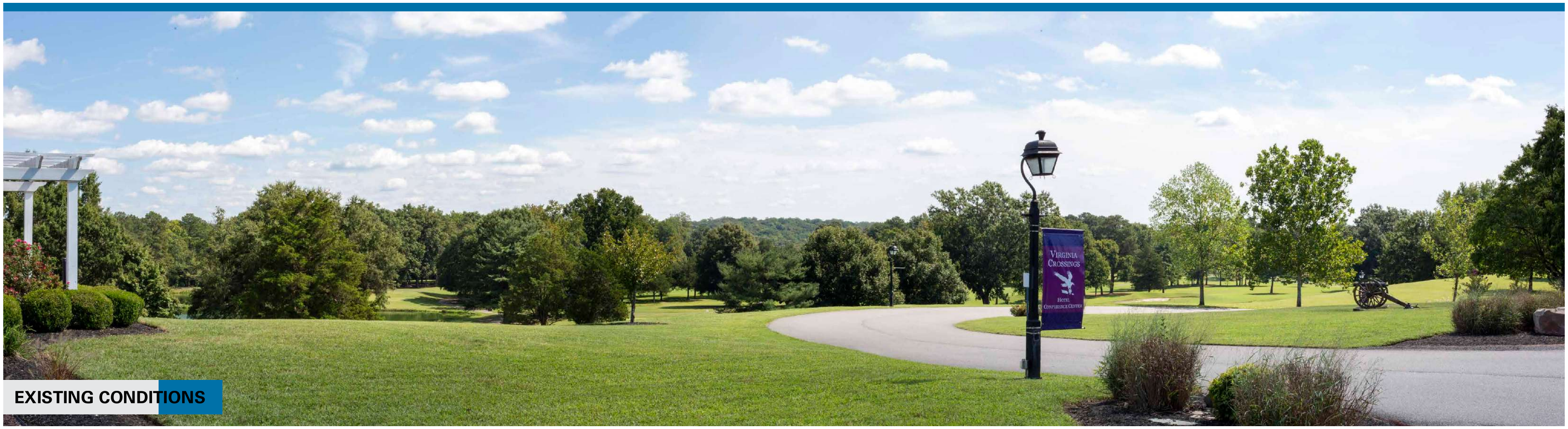
# ELMONT TO CHICKAHOMINY
Transmission Line Project

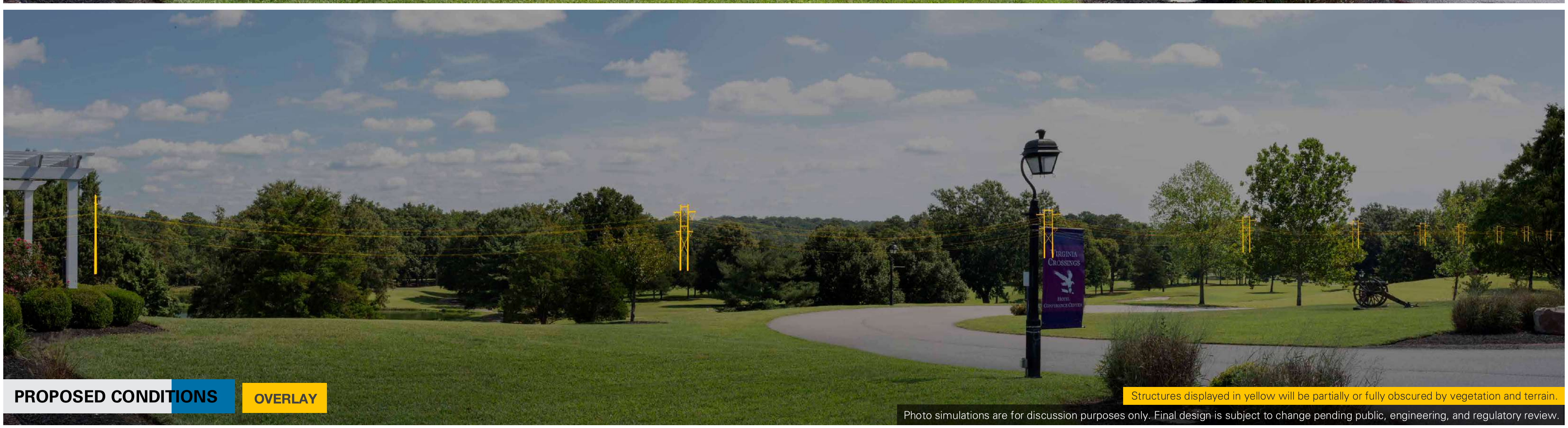
## Viewpoint 3

**Date:** 09/14/2022 **Time:** 11:04 am **Viewing Direction:** East

3 Viewpoint Location — Phase 2


Dominion Energy®



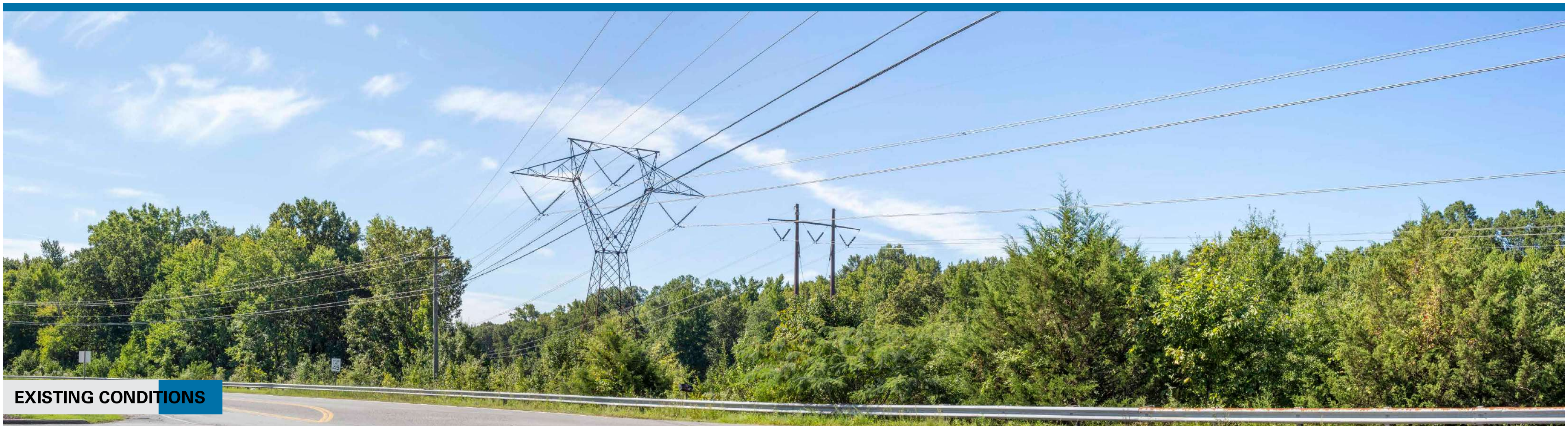



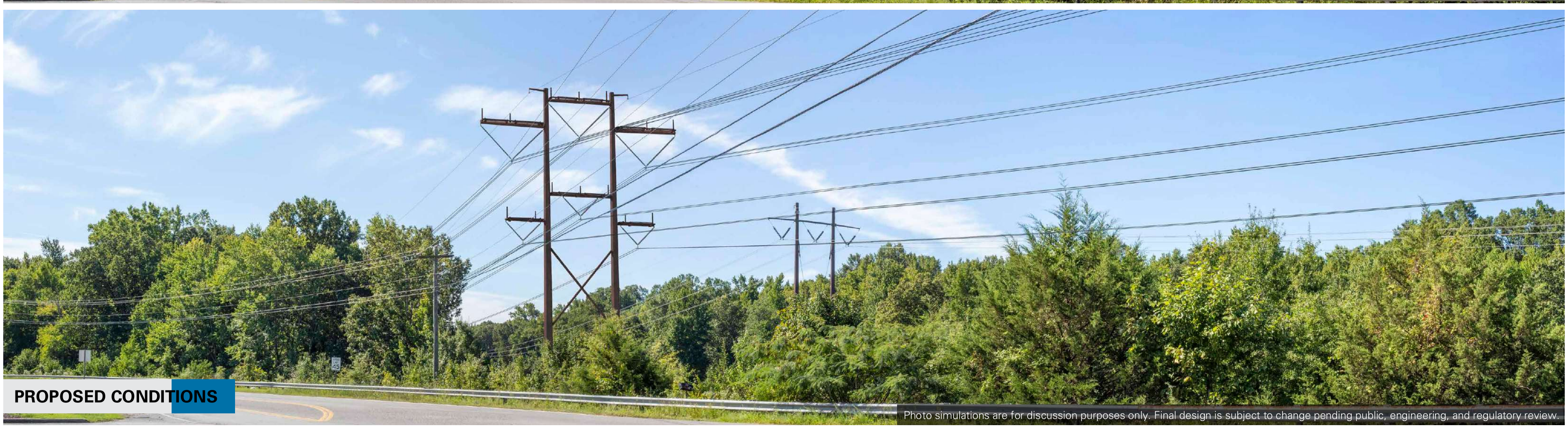
# ELMONT TO CHICKAHOMINY
Transmission Line Project

## Viewpoint 4

**Date:** 09/14/2022 **Time:** 9:40 am **Viewing Direction:** Southwest

4 Viewpoint Location — Phase 2

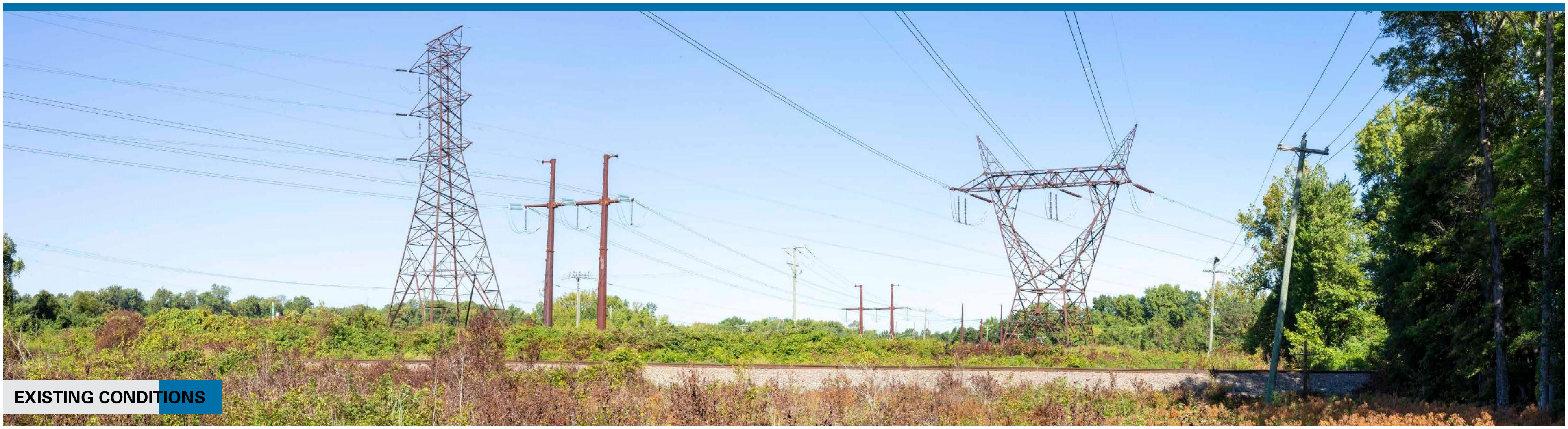
# ELMONT TO CHICKAHOMINY
Transmission Line Project

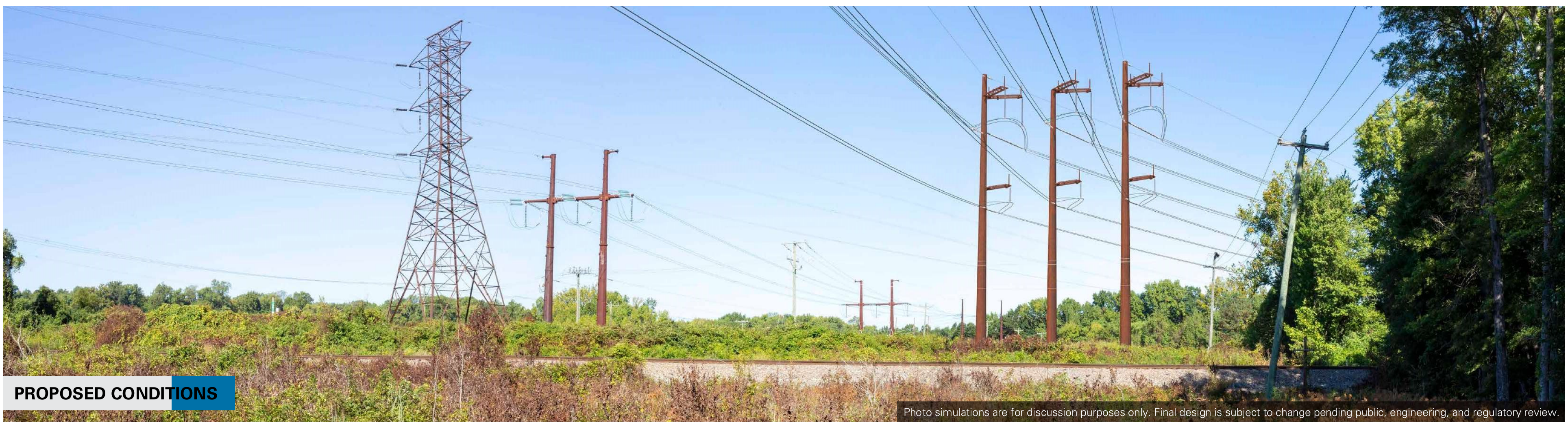
## Viewpoint 5

**Date:** 09/14/2022 **Time:** 9:23 am **Viewing Direction:** West

5 Viewpoint Location — Phase 2


Dominion Energy®



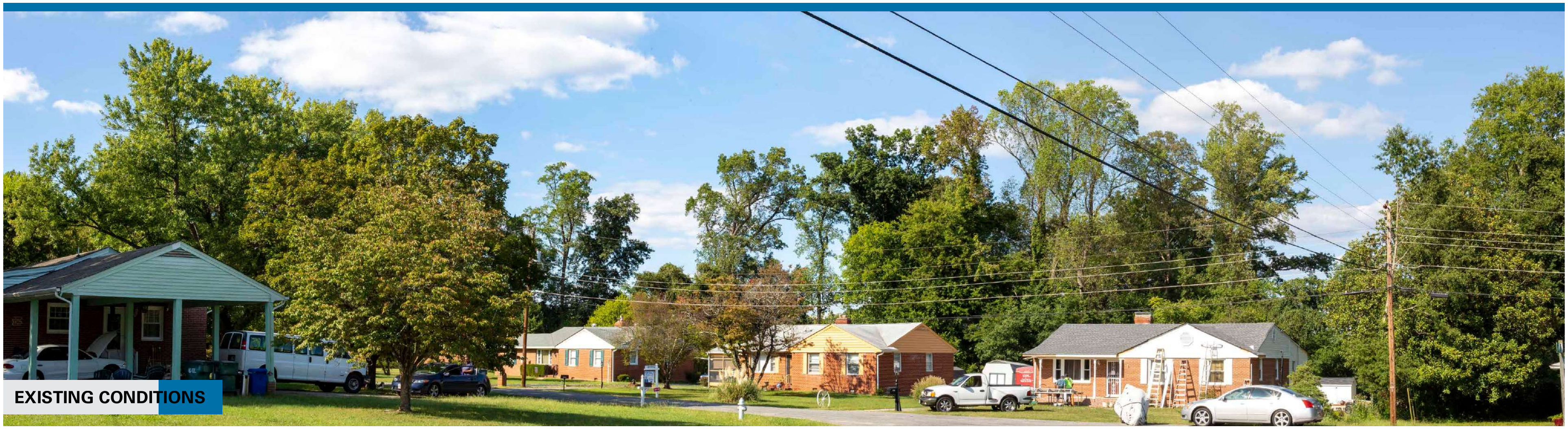
# ELMONT TO CHICKAHOMINY
Transmission Line Project

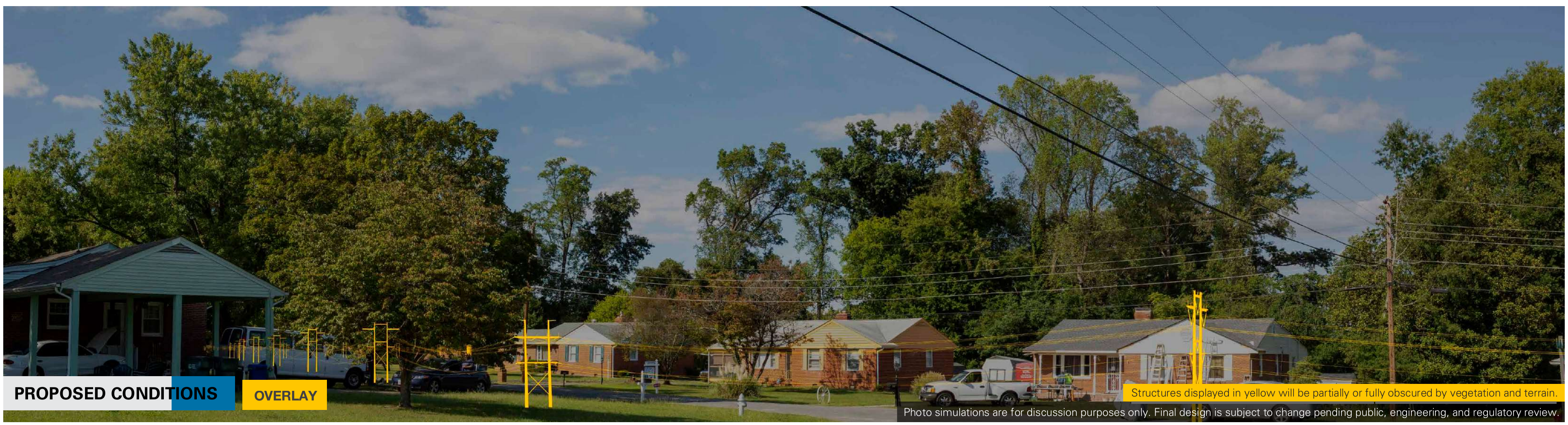
## Viewpoint 6

**Date:** 09/14/2022 **Time:** 3:00 pm **Viewing Direction:** Northeast

6 Viewpoint Location — Phase 2


Dominion Energy



# ELMONT TO CHICKAHOMINY
Transmission Line Project

## Viewpoint 7

**Date:** 09/14/2022 **Time:** 3:17 pm **Viewing Direction:** Southwest

7 Viewpoint Location — Phase 2


Dominion Energy®

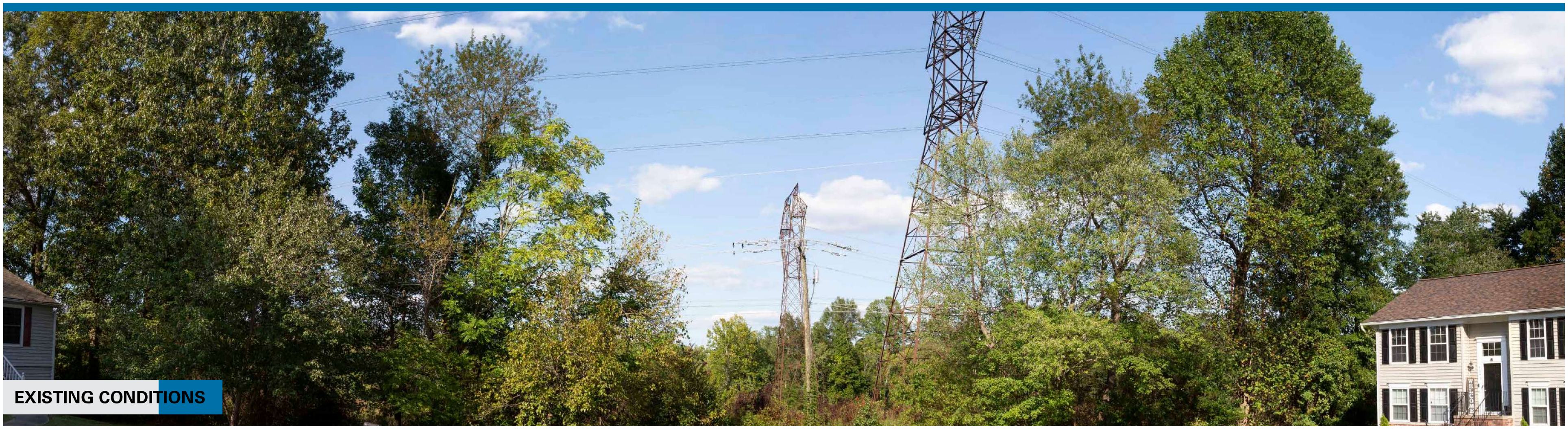

# ELMONT TO CHICKAHOMINY
Transmission Line Project

## Viewpoint 8

**Date:** 09/14/2022 **Time:** 3:30 pm **Viewing Direction:** Northeast

8 Viewpoint Location — Phase 2 — Phase 3


Dominion Energy®



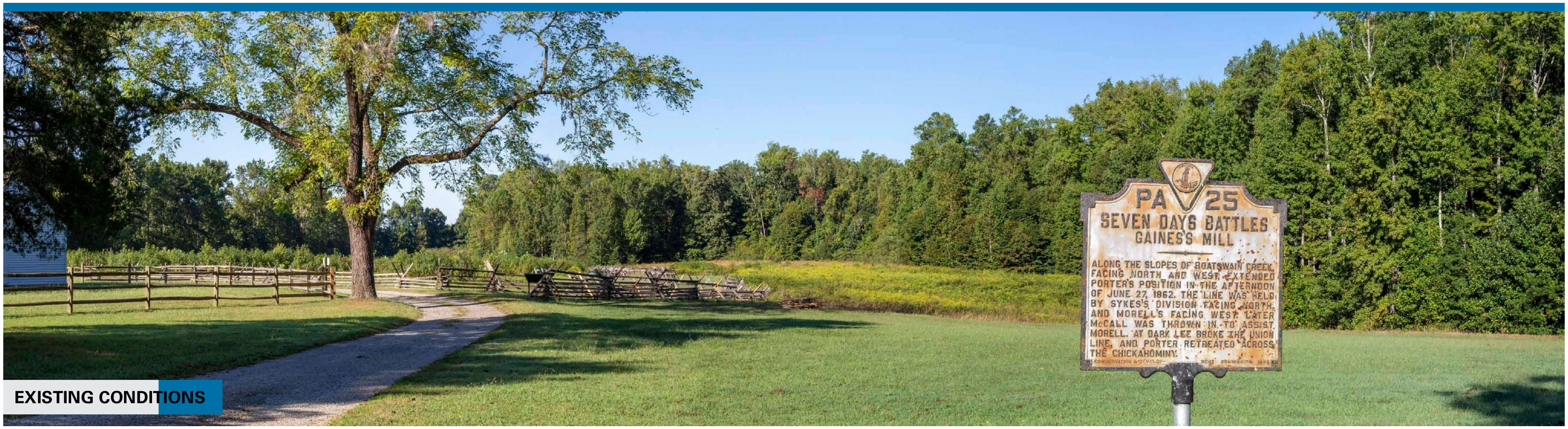

# ELMONT TO CHICKAHOMINY
Transmission Line Project

## Viewpoint 9

**Date:** 09/14/2022 **Time:** 8:20 am **Viewing Direction:** Southwest

9 Viewpoint Location — Phase 3


Dominion Energy®




EXISTING CONDITIONS


PROPOSED CONDITIONS OVERLAY

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

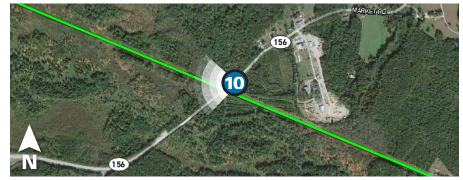
Photo simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

# ELMONT TO CHICKAHOMINY
Transmission Line Project

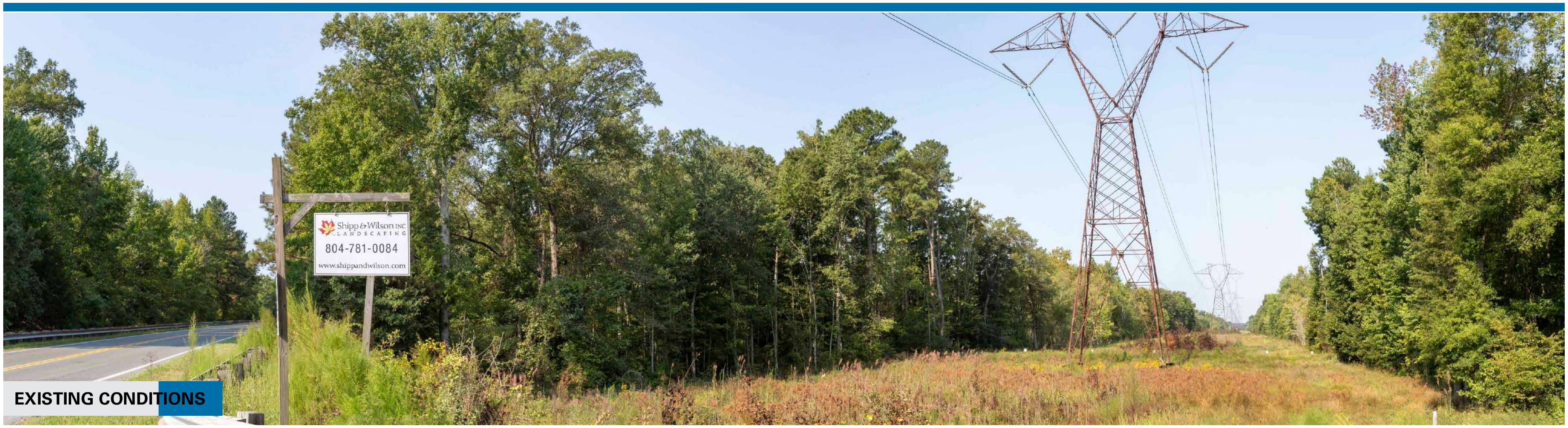
## Viewpoint 10

**Date:** 09/15/2022 **Time:** 9:25 am **Viewing Direction:** West

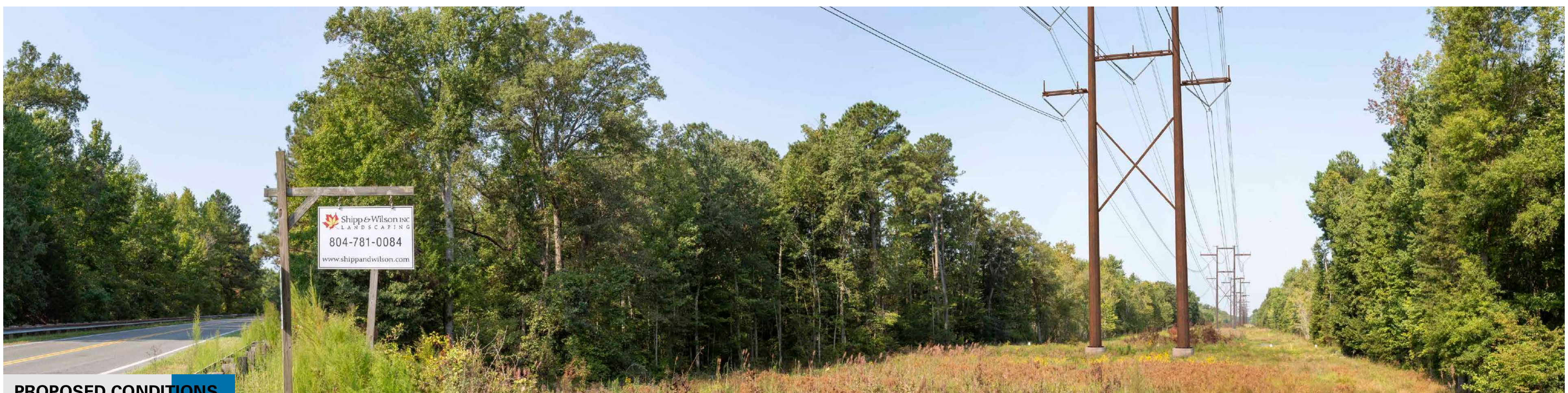
10 Viewpoint Location — Phase 3




Dominion Energy®




EXISTING CONDITIONS




PROPOSED CONDITIONS

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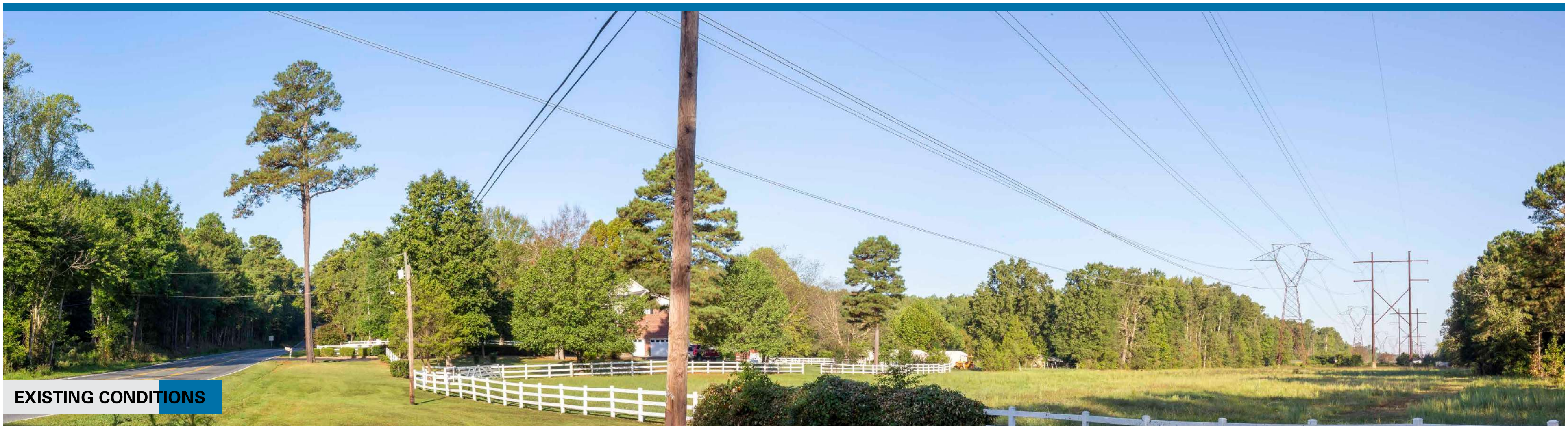
# ELMONT TO CHICKAHOMINY
Transmission Line Project

## Viewpoint 11

**Date:** 09/14/2022 **Time:** 7:27 am **Viewing Direction:** Northwest

11 Viewpoint Location — Phase 4


Dominion Energy®



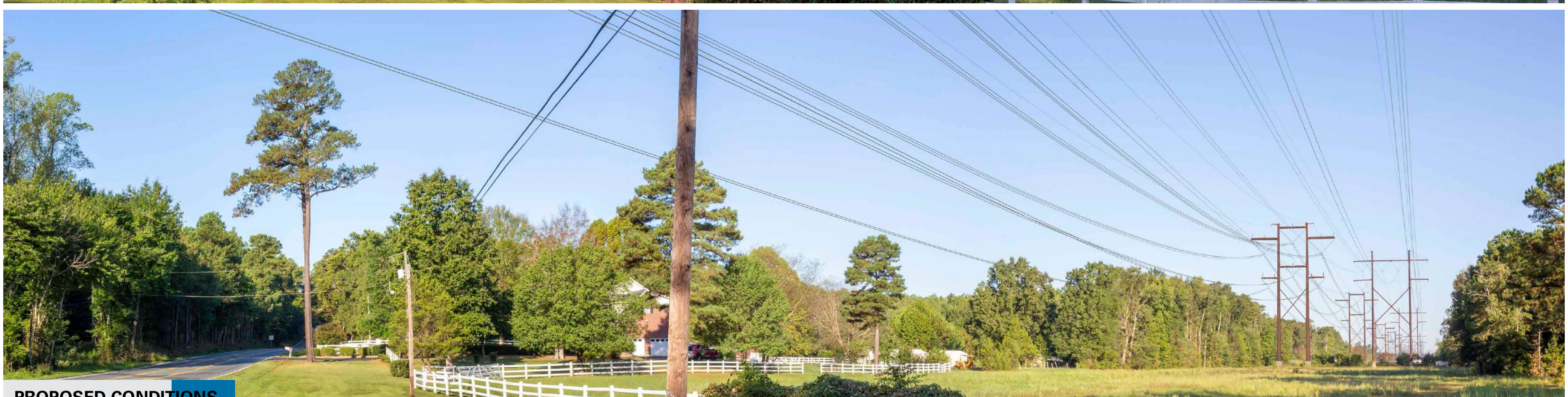



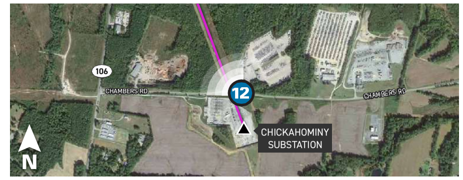

Photo simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

# ELMONT TO CHICKAHOMINY
Transmission Line Project

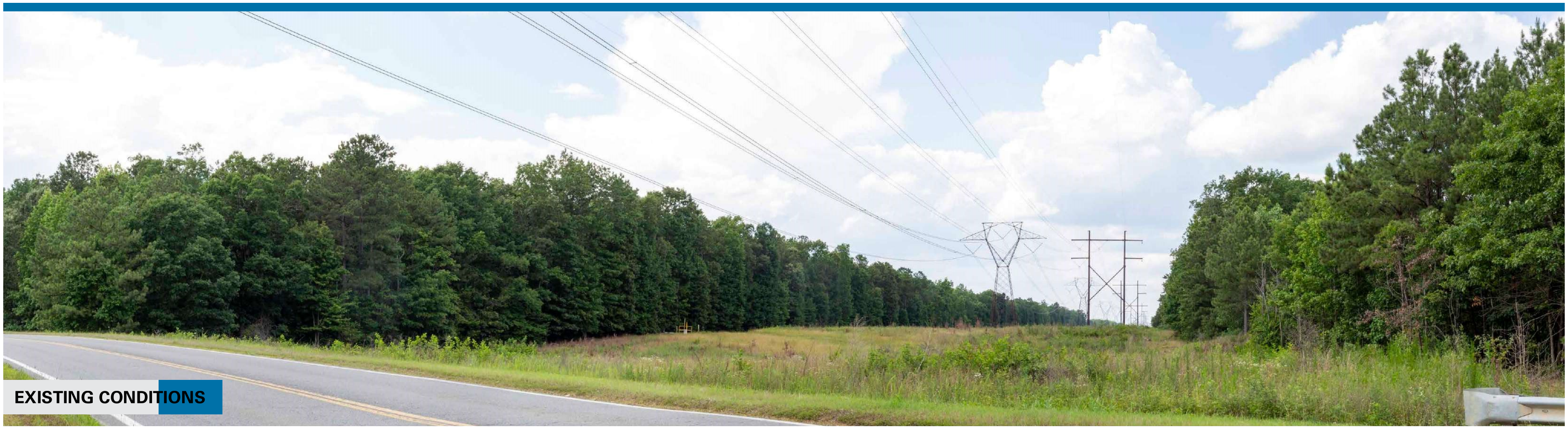
## Viewpoint 12

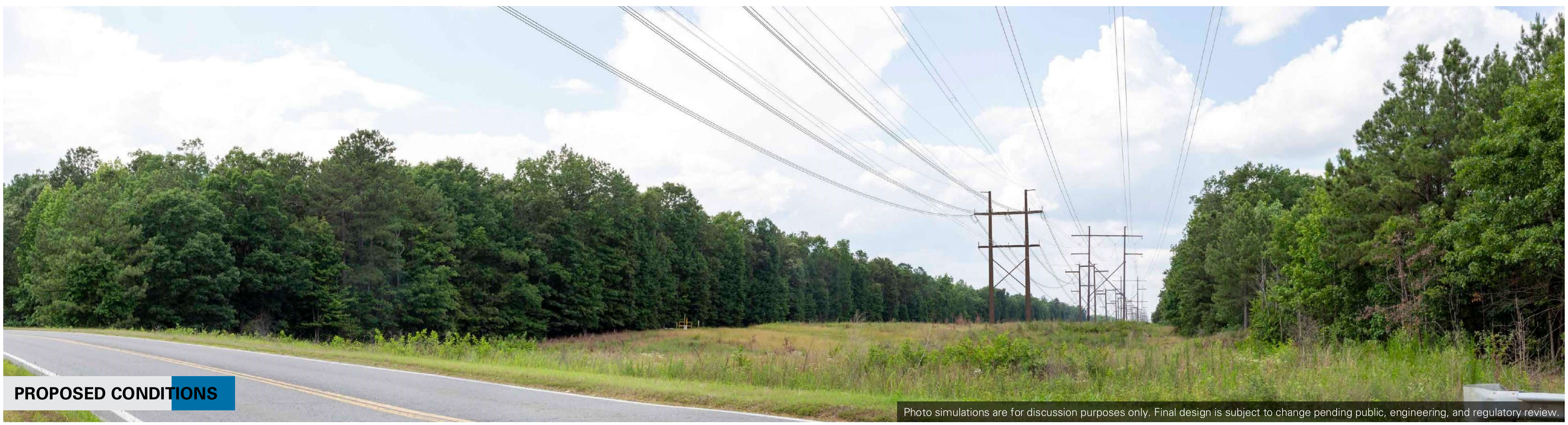
**Date:** 06/27/2023 **Time:** 2:47 pm **Viewing Direction:** Northwest

12 Viewpoint Location — Phase 4




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: The proposed Rebuild Project is located entirely within existing maintained rights-of-way. In reviewing aerial photography, the Company identified two potential unauthorized encroachments (outbuildings) in the Rebuild Project's right-of-way that may need to be demolished or relocated to construct the Rebuild Project. The Company will confirm the location of the outbuildings prior to construction and coordinate with landowners as needed.

The Company is not aware of any residence that encroaching on the existing corridor and does not expect to have any residences demolished or relocated in connection with the Rebuild Project.

**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 Line #557 was completed in 1971 and the right-of-way has been in continuous use since that time. The proposed Rebuild Project is located in an existing transmission line right-of-way that contains several parallel lines. Leaving Elmont Substation, Line #557 runs parallel to Line #283, Line #2127, Line #216, and Line #2075 for approximately 0.8 mile. At Holly Hill Road, Lines #2127 Line #216 veer south while Line #557 continues to run parallel with Line #283 and Line #2075 for an additional 2.5 miles. Prior to crossing the Chickahominy River, Line #2075 veers east while Line #557 continues to run parallel with Line #283 for another approximately 4.6 miles.

Prior to crossing Meadowbridge Road, Line #217 joins Line #557 and Line #283 in the transmission line corridor and these three lines run parallel for approximately 3.1 miles. At a point approximately 1.0 mile east of where the transmission line corridor crosses the Mechanicsville Turnpike (Route 360), Lines #217 and #283 leave the corridor and Line #557 continues for approximately 8.6 miles. Lastly, at a point approximately 1.7 miles prior to crossing Interstate 64, Line #2075 joins the transmission line corridor and runs parallel to Line #557 for approximately 8.1 miles.

## 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 Charles City County Comprehensive Plan[24] was adopted in 2014. The Henrico County Comprehensive Plan[25] was adopted in 2009 replacing the County's 2010 Comprehensive Plan. The Hanover County Comprehensive Plan[26] was adopted in 2023 and is updated every five years. Each plan is intended to be used as a long-term guide for responsible growth management, community preservation and development, and the preservation and access of natural amenities for the future.

The proposed Rebuild Project utilizes existing transmission line right-of-way for the entire length of the project. The existing right-of-way is regularly maintained up to 235 feet for operation of transmission lines. The right-of-way currently crosses largely agricultural and undeveloped land. As currently outlined in the Charles City, Henrico, and Hanover County Plans, no additional development zones are planned within the existing transmission line right-of-way. The Company engaged with Charles City, Henrico, Hanover Counties for feedback on the proposed Rebuild Project and to understand any concerns or comments on the Rebuild Project. See Section V.D. The Rebuild Project is not expected to interfere with future planning in Charlies City, Henrico, or Hanover Counties.

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[24] *See* https://www.charlescityva.us/335/Comprehensive-Plan.
[25] *See* https://henrico.gov/planning/2026-comprehensive-plan/.
[26] *See* https://www.hanovercounty.gov/199/Comprehensive-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. Virginia Code §§ 3.2-200 – 3.2-206 were repealed effective July 1, 2024. However, the General Assembly enacted a substantially similar requirement to Va. Code § 3.2-205, which is codified at Va. Code § 10.1-1119.7. Accordingly, the Company reviewed Comprehensive Plans and County Ordinances to determine whether the governing bodies of Charles City, Henrico, and Hanover Counties, in cooperation with the U.S. Department of Agriculture ("USDA") have designated important farmlands within their jurisdiction under Va. Code § 10.1-1119.7 B.

   Charles City, Henrico, and Hanover Counties have not designated "important farmlands." Henrico County has designated "prime agriculture" areas which are based on the use of the property, not soil classifications outlined in Va. Code § 10.1-1119.7. See Section III.A for information on prime farmland and farmland of statewide importance crossed by the Rebuild Project.

   The proposed Rebuild Project is not expected to impact current land uses in Charles City, Henrico, or Hanover Counties as the Rebuild Project is being constructed within existing right-of-way that has been in use since 1971, and agriculture is a compatible use within a transmission line corridor (see Section II.A).

2. Not applicable.

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

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

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

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

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

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

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

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

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

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

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

10. **Any state scenic river;**

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

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

Response: A Stage 1 Pre-Application Analysis was prepared by Dutton in accordance with VDHR's *Guidelines for Assessing Impacts for Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia*. That report is included as Attachment 2.I.1 to the DEQ Supplement and addresses the potential impacts from the Rebuild Project to historic resources identified by the VDHR's tiered survey guidance.

1. The NRHP-Listed Richmond National Battlefield Park (DHR 043-6408) and NRHP-Listed Indian Springs Farm Site (DHR 043-6408) are both crossed by the Rebuild Project and NRHP-Listed Hogan House (DHR 042-0120) is located within 0.5 mile of the Rebuild Project.

2. There are seven battlefields crossed by the Rebuild Project, one of which has been determined eligible for listing in the NRHP, and three of which have been determined potentially eligible for listing in the NRHP. These battlefields are outlined below:

   - Savage Station Battlefield (043-0308) – Eligible
   - Saint Mary's Church Battlefield (DHR 018-5004) – Potentially Eligible
   - Cold Harbor Battlefield (DHR 042-5017) – Potentially Eligible
   - Gaines' Mill Battlefield (DHR 042-5018) – Potentially Eligible
   - Beaver Dam Creek Battlefield (042-5479)
   - Fair Oaks/Seven Pines Battlefield (043-5081)
   - Yellow Tavern Battlefield (DHR 043-5108)

   Additionally, there is one architectural resource (Richmond-Ashland Trolley Line (DHR 043-5347)) and one archaeological resource (Prehistoric Camp Site (DHR 44CC0390)) that have been determined potentially eligible for listing in the NRHP that are crossed by the Rebuild Project.

   For additional information on sites within VDHR's tiered survey guidance, please see Section I of the DEQ Supplement.

3. None.

4. None

5. None.

6. None.

7. None.

8. None.

9. The existing right-of-way intersects three conservation easements, two of which are managed by the Nature Conservancy and one that is managed by Ducks Unlimited. See Attachment II.A.9. As noted previously, each of the conservation easements was created after the establishment of the existing transmission line corridor.

10. The Chickahominy River is designated as a state scenic river from Route 360 downriver to the intersection of the Hanover, Henrico and New Kent County lines. The Rebuild Project generally parallels the Chickahominy River and crosses the mainstem of the river twice along this 9.2-mile section of the Rebuild Project.

11. The Rebuild Project crosses through three locality-owned parks: (1) Vawter Street Park (Henrico County); (2) Meadowview Park (Henrico County); and (3) Izaak Walton Park (Charles City County).

12. The Richmond National Battlefield Park, which is crossed by the Rebuild Project, is owned by the National Park Service. In addition, the Rebuild Project crosses a small portion of land held by the Civil War Trust.

## 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 reviewed the FAA website, aerial photography, and the AirNav website to identify public use airports, airports operated by a federal agency or the U.S. Department of Defense, airports or heliports with at least one FAA-approved instrument approach procedure, and public use or military airports within 10 nautical miles of the Rebuild Project. The following table provides a summary of the airports and heliports identified:

| Name | Approximate Distance and Direction from the Proposed Project | Use |
|---|---|---|
| Hanover County Municipal Airport (OFP) | 2.38 NM E | Public |
| Richmond International Airport (RIC) | 4.22 NM SW | Public |
| New Kent County Airport (W96) | 4.25 NM E | Public |
| VCU Health System-Main Hospital Heliport (VG45) | 3.55 NM SW | Private |
| VCU Health System-I Lot Heliport (8VA0) | 3.16 NM SW | Private |
| Innsbrook Technical Center Heliport (VG02) | 5.24 NM W | Private |

| Name | Approximate Distance and Direction from the Proposed Project | Use |
|---|---|---|
| Innsbrook Pavilion Heliport (9VA8) | 5.66 NM W | Private |
| St. Mary's Hospital Heliport (37VA) | 4.75 NM W | Private |
| Chippenham Hospital Heliport (6VA3) | 7.71 NM SW | Private |
| McGuire Va Medical Center Heliport (0VA6) | 6.62 NM SW | Private |
| VCU Health New Kent ED Heliport (99VA) | 0.75 NM W | Private |

Since the FAA manages air traffic in the United States, it will evaluate any physical objects that may affect the safety of aeronautical operations through an obstruction evaluation. The Company will coordinate with the Virginia Department of Aviation ("DOAv") and the FAA as necessary to obtain all appropriate permits. If required during the permitting process, Dominion Energy Virginia will submit an FAA Form 7460-1 Notice pursuant to 14 CFR Part 77 for any tower locations that meet the review criteria.

## 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 existing right-of-way to be used for the Rebuild Project does not cross any scenic Virginia byways.[25] Use of the existing right-of-way minimizes or eliminates permanent incremental impacts at road crossings. To avoid the need for any additional right-of-way, all road crossings will occur at a similar angle and alignment as the existing transmission lines' crossing.

[25] VDOT 2021 Virginia's Byways. Accessed: January 2025. Retrieved from: https://www.vdot.virginia.gov/travel-traffic/travelers/virginia-byways/.

## 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 Charles City, Henrico, and Hanover County Administrators regarding the proposed Rebuild Project. Below is a list of coordination efforts that have occurred with other municipal, state and federal agencies:

- Coordination with the U.S. Army Corps of Engineers, DEQ, Virginia Marine Resources Commission, and VDOT will take place as appropriate to obtain necessary approvals for the Rebuild Project.

- Letters were submitted to Charles City County, Hanover County, and Henrico County pursuant to Va. Code § 15.2-2202 E to describe the Rebuild Project and request comments. See Section V.D of this Appendix.

- 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.

- In March 2025, the Company solicited comments via letter from several federally-recognized and state-recognized Native American tribes, including:

    - Catawba Indian Nation
    - Cheroenhaka (Nottoway) Indian Tribe
    - Chickahominy Indian Tribe
    - Chickahominy Indian Tribe Eastern Division
    - Chickahominy Tribe
    - Delaware Nation, Oklahoma
    - Mattaponi Tribe
    - Monacan Indian Nation
    - Nottoway Indian Tribe of Virginia
    - Pamunkey Indian Tribe
    - Pamunkey Indian Tribal Resource Office
    - Patawomeck Indian Tribe of Virginia
    - Rappahannock Tribe
    - Upper Mattaponi Indian Tribe

A copy of the letter template is included as Attachment III.J.1.

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

Dominion Energy Virginia
Dominion Energy North Carolina
Electric Transmission
5000 Dominion Boulevard
Glen Allen, VA 23060
DominionEnergy.com

March 11, 2025

**Elmont-Chickahominy Electric Transmission Rebuild Project**

Dear Chief Red Hawk,

Dominion Energy is dedicated to maintaining safe, reliable, and affordable electric service in the communities we serve. You are receiving this project announcement letter as part of our efforts to proactively communicate early with Tribal Nations who may have an interest in this area. With your unique perspective, you can help us better plan projects in their earliest stages. Please note, this letter is not a notification of formal government-to-government consultation from any state or federal agency. Dominion Energy has been and continues to be committed to creating and maintaining strong, open, supportive, and mutually beneficial relationships with Tribal Nations.

We are proposing to rebuild a 500 kilovolt (kV) electric transmission line between our Elmont and Chickahominy substations. The approximately 28-mile transmission line corridor crosses through Hanover, Henrico, and Charles City counties and will not require new right of way. This project is needed to replace aging infrastructure that has reached the end of its service life.

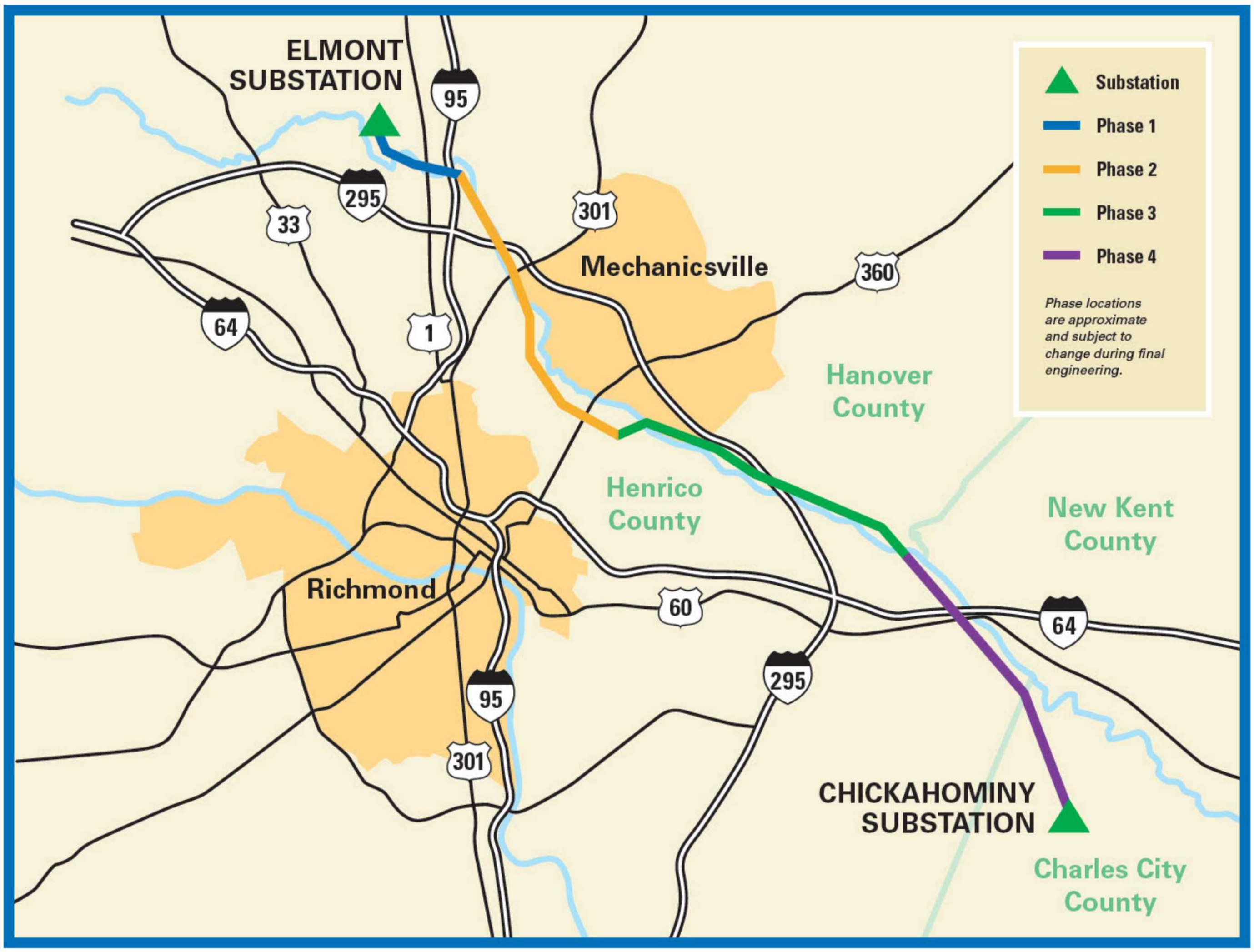
This project requires review by the Virginia State Corporation Commission (SCC). We are still in the conceptual phase of the project and more details will be provided as activities progress. Enclosed is a project map and fact sheet for your reference. Providing your input now allows us to consider any concerns you may have as we work to meet the project's needs. Please feel free to notify other relevant organizations that may have an interest in the project area. For reference, other recipients of this letter include county and state historic, cultural, and scenic organizations.

If you have questions or would like to set up a meeting to discuss the project, contact me by calling 804-944-5313 or sending an email to Janae.p.johnson@dominionenergy.com. You may also contact Tribal Relations Manager Ken Custalow by sending an email to Ken.Custalow@dominionenergy.com or calling 804-837-2067.

Sincerely,

Janae' Johnson

Janae Johnson
Communications Consultant
The Electric Transmission Project Team




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

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

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

Response: In March 2025, the Company solicited comments via letter from the community leaders, environmental groups, and business groups identified below. A copy of the letter template is included as Attachment III.K.1.

| Name | Organization |
|---|---|
| Ms. Elizabeth S. Kostelny | Preservation Virginia |
| Mr. Thomas Gilmore | American Battlefield Trust |
| Mr. Jim Campi | American Battlefield Trust |
| Mr. Max Hokit | American Battlefield Trust |
| Mr. Steven Williams | Colonial National Historical Park |
| Ms. Eleanor Breen, PhD, RPA | Council of Virginia Archaeologists |
| Ms. Elaine Chang | National Trust for Historic Preservation |
| Ms. Leighton Powell | Scenic Virginia |
| Ms. Julie Bolthouse | Piedmont Environmental Council |
| Mr. John McCarthy | Piedmont Environmental Council |
| Dr. Cassandra Newby-Alexander, Dean | Norfolk State University |
| Mr. Roger Kirchen, Archaeologist | Virginia Department of Historic Resources |
| Ms. Adrienne Birge-Wilson | Virginia Department of Historic Resources |
| Mr. Dave Dutton | Dutton + Associates, LLC |

Dominion Energy Virginia
Dominion Energy North Carolina
Electric Transmission
5000 Dominion Boulevard
Glen Allen, VA 23060
DominionEnergy.com

March 11, 2025

**Elmont-Chickahominy Electric Transmission Rebuild Project**

Dear Ms. Kostelny,

Dominion Energy is dedicated to maintaining safe, reliable, and affordable electric service in the communities we serve. As a valued stakeholder with a unique perspective, you can help us meet these objectives as we plan necessary electric infrastructure projects. We are reaching out to you as we have an upcoming project in your area that may interest you.

We are proposing to rebuild a 500 kilovolt (kV) electric transmission line between our Elmont and Chickahominy substations. The approximately 28-mile transmission line corridor crosses through Hanover, Henrico, and Charles City counties and will not require new right of way. This project is needed to replace aging infrastructure that has reached the end of its service life.

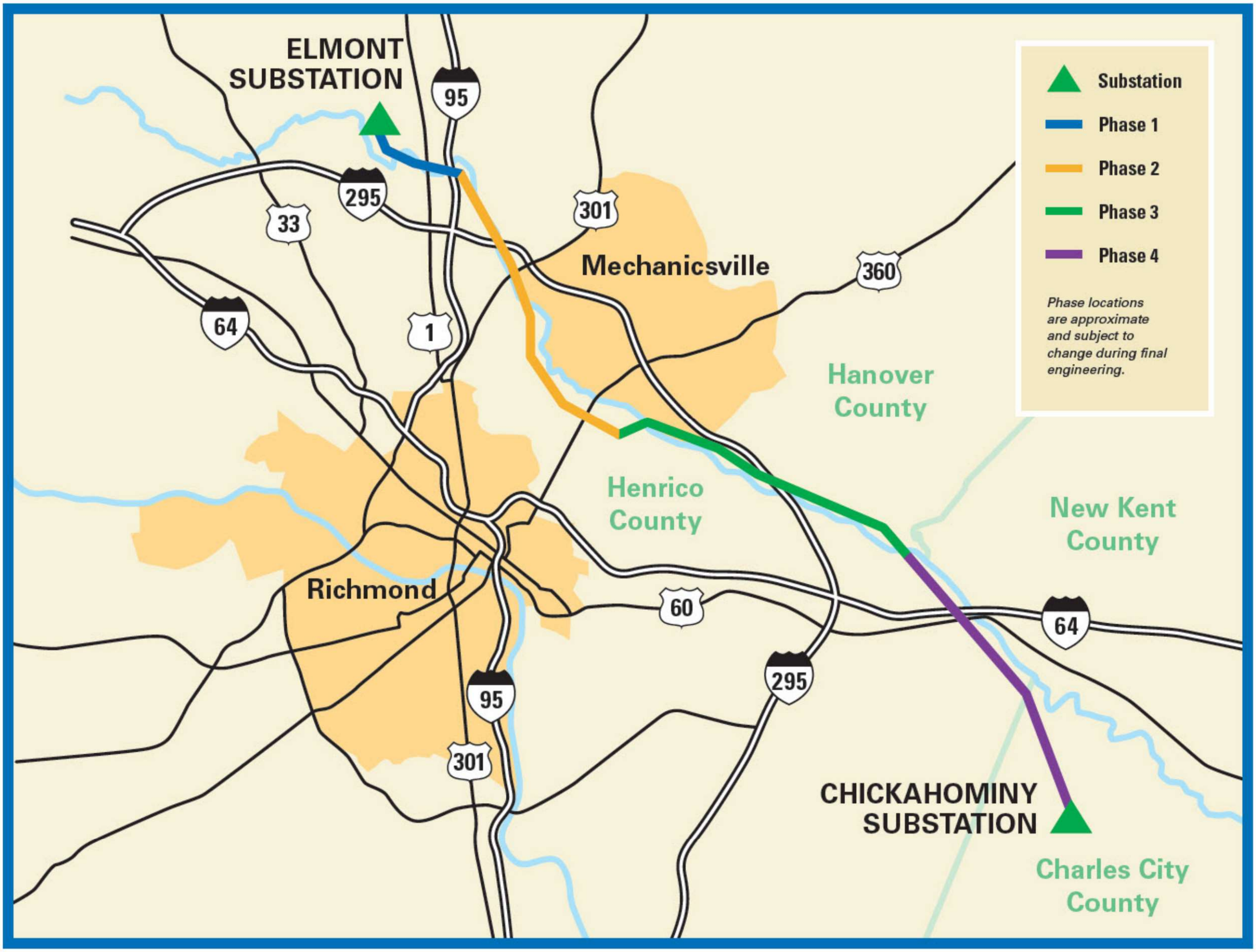
Enclosed is a project map and fact sheet for your reference. This project requires review by the Virginia State Corporation Commission (SCC). Providing your input now allows us to consider any concerns you may have as we work to meet the project's needs. Please feel free to notify other relevant organizations that may have an interest in the project area. For reference, other recipients of this letter include county and state historic, cultural, and scenic organizations, as well as Tribal Nations.

We will host in-person community meetings prior to submitting to the SCC in spring 2025. Please visit the project webpage at DominionEnergy.com/Elmont-chickahominy for meeting updates and more project information.

If you have questions or would like to set up a meeting to discuss the project, contact me by calling 804-944-5313 or sending an email to Janae.p.johnson@dominionenergy.com.

Sincerely,

Janae Johnson
Communications Consultant
The Electric Transmission Project Team




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

## 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 Rebuild Project are listed below.

**Potential Permits**

| Activity | Permit | Agency/Organization |
|---|---|---|
| Impacts to wetlands and waters of the U.S. | Nationwide Permit 57 | U.S. Army Corps of Engineers |
| Impacts to wetlands and State surface waters | 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 |
| Construction activities in Richmond National Battlefield Park | Special Use Permit | National Park Service |
| Archaeological Investigations on Federal Lands | Archaeological Resources Protection Act (ARPA) Permit | National Park Service |
| Work within Henrico County Right-of-way | ROW Permit | Henrico County |
| Work within Norfolk Southern Right-of-Way | ROE Permit | Norfolk Southern |
| Work Within CSX Railroad Corridor | ROE Permit and Aerial Crossing | CSX Transportation |

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

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

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

This section describes the levels of EMF associated with the existing and proposed transmission line. EMF levels are provided for both historical (2024) and future (2029) annual average and maximum (peak) loading conditions.

**Existing lines – Historical average loading**

EMF levels were calculated for the existing lines at ***historical average*** load conditions as shown in the ampacity table below and at an operating voltage of 525 kV for Line #557 and 242 kV for each adjacent 230 kV circuit when supported on the existing structures. See Attachments II.A.5.a, II.A.5.c, II.A.5.e, II.A.5.g, II.A.5.i, and II.A.5.k.

| Line No. | Historical Average Loading (Amps) |
|---|---|
| 557 | 338 |
| 2075 | 152 |
| 217 | 275 |
| 283 | 249 |
| 2127 | 87 |
| 216 | 289 |

These field levels were calculated at mid-span where the conductors are closest to the ground and the conductors are at an historical average load operating temperature. The proposed future 230kV circuits were not included in the calculations.

EMF levels at the edge of the maintenance limits for the existing lines at the historical average loading:

| Existing Conditions - Historical Average Loading (2025) | | | | |
|---|---|---|---|---|
| **Attachment** | **Left Edge ROW Per II.A.5 Drawing View** | | **Right Edge ROW Per II.A.5 Drawing View** | |
| | Electric Field (kV/m) | Magnetic Field (mG) | Electric Field (kV/m) | Magnetic Field (mG) |
| **II.A.5.a** | 2.671 | 16.839 | 0.409 | 3.493 |
| **II.A.5.c** | 2.750 | 16.587 | 2.689 | 16.303 |
| **II.A.5.e** | 0.097 | 12.855 | 2.558 | 15.585 |
| **II.A.5.g** | 1.115 | 10.820 | 2.621 | 14.988 |
| **II.A.5.i** | 1.874 | 17.757 | 0.513 | 5.124 |
| **II.A.5.k** | 2.934 | 17.203 | 0.255 | 4.183 |

**Existing lines – Historical peak loading**

EMF levels were calculated for the existing lines at ***historical peak*** load conditions as shown in the ampacity table below and at an operating voltage of 525 kV for Line #557 and 242 kV for each adjacent 230 kV circuit when supported on the existing structures. See Attachments II.A.5.a, II.A.5.c, II.A.5.e, II.A.5.g, II.A.5.i, and II.A.5.k.

| Line No. | Historical Peak Loading (Amps) |
|---|---|
| 557 | 1333 |
| 2075 | 594 |
| 217 | 949 |
| 283 | 906 |
| 2127 | 345 |
| 216 | 989 |

These field levels were calculated at mid-span where the conductors are closest to the ground and the conductors are at an historical peak load operating temperature. The proposed future 230kV circuits were not included in the calculations.

EMF levels at the edge of the maintenance limits for the existing lines at the historical peak loading:

| Existing Conditions - Historical Peak Loading (2025) | | | | |
|---|---|---|---|---|
| **Attachment** | **Left Edge ROW Per II.A.5 Drawing View** | | **Right Edge ROW Per II.A.5 Drawing View** | |
| | Electric Field (kV/m) | Magnetic Field (mG) | Electric Field (kV/m) | Magnetic Field (mG) |
| **II.A.5.a** | 2.671 | 66.434 | 0.409 | 13.763 |
| **II.A.5.c** | 2.750 | 65.416 | 2.689 | 64.298 |
| **II.A.5.e** | 0.097 | 46.875 | 2.558 | 60.962 |
| **II.A.5.g** | 1.115 | 39.688 | 2.621 | 59.173 |
| **II.A.5.i** | 1.874 | 64.477 | 0.513 | 20.181 |
| **II.A.5.k** | 2.934 | 67.803 | 0.255 | 15.268 |

**Proposed Rebuild Project – Projected Average Loading in 2029**

EMF levels were calculated for the proposed Rebuild Project at the ***projected average*** load conditions as shown in the ampacity table below and at an operating voltage of 525 kV for Line #557 and 242 kV for each adjacent 230 kV circuit when supported on the proposed Rebuild Project structures. See Attachments II.A.5.b, II.A.5.d, II.A.5.f, II.A.5.h, II.A.5.j, and II.A.5.l.

| Line No. | Projected Average Loading (Amps) |
|---|---|
| 557 | 434 |
| 2075 | 72 |
| 217 | 454 |
| 283 | 58 |
| 2127 | 72 |
| 216 | 31 |

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. The proposed future 230kV circuits were not included in the calculations.

EMF levels at the edge of the maintenance limits for the proposed Rebuild Project at the projected average loading:

| Proposed Project - Projected Average Loading (2029) | | | | |
|---|---|---|---|---|
| **Attachment** | **Left Edge ROW Per II.A.5 Drawing View** | | **Right Edge ROW Per II.A.5 Drawing View** | |
| | Electric Field (kV/m) | Magnetic Field (mG) | Electric Field (kV/m) | Magnetic Field (mG) |
| **II.A.5.b** | 2.014 | 14.981 | 0.144 | 4.309 |
| **II.A.5.d** | 2.061 | 15.528 | 2.064 | 15.539 |
| **II.A.5.f** | 0.079 | 7.168 | 2.066 | 15.981 |
| **II.A.5.h** | 1.063 | 4.988 | 1.948 | 14.625 |
| **II.A.5.j** | 1.761 | 5.164 | 0.488 | 5.410 |
| **II.A.5.l** | 1.681 | 13.469 | 0.251 | 1.656 |

**Proposed Rebuild Project – Projected Peak Loading in 2029**

EMF levels were calculated for the proposed Rebuild Project at the ***projected peak*** load conditions as shown in the ampacity table below and at an operating voltage of 525 kV for Line #557 and 242 kV for each adjacent 230 kV circuit when supported on the proposed Rebuild Project structures. See Attachments II.A.5.b, II.A.5.d, II.A.5.f, II.A.5.h, II.A.5.j, and II.A.5.l.

| Line No. | Projected Peak Loading (Amps) |
|---|---|
| 557 | 723 |
| 2075 | 120 |
| 217 | 757 |
| 283 | 96 |
| 2127 | 120 |
| 216 | 52 |

These field levels were calculated at mid-span where the conductors are closest to the ground and the conductors are at the projected peak load operating temperature. The proposed future 230kV circuits were not included in the calculations.

EMF levels at the edge of the maintenance limits for the proposed Rebuild Project at the projected peak loading:

| Proposed Project - Projected Peak Loading (2029) | | | | |
|---|---|---|---|---|
| **Attachment** | **Left Edge ROW Per II.A.5 Drawing View** | | **Right Edge ROW Per II.A.5 Drawing View** | |
| | Electric Field (kV/m) | Magnetic Field (mG) | Electric Field (kV/m) | Magnetic Field (mG) |
| **II.A.5.b** | 2.014 | 24.957 | 0.144 | 7.178 |
| **II.A.5.d** | 2.061 | 25.868 | 2.064 | 25.887 |
| **II.A.5.f** | 0.079 | 11.928 | 2.066 | 27.528 |
| **II.A.5.h** | 1.063 | 8.304 | 1.948 | 24.364 |
| **II.A.5.j** | 1.761 | 8.586 | 0.488 | 9.013 |
| **II.A.5.l** | 1.681 | 22.439 | 0.251 | 2.759 |

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

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

Response: The conclusions of multidisciplinary scientific review panels assembled by national and international scientific agencies during the past few decades are the foundation of the Company's opinion that no adverse health effects are anticipated to result from the operation of the proposed Project. Each of these panels has evaluated the scientific research related to health and extremely low frequency ("ELF") EMF, also referred to as power-frequency (50/60 Hertz ["Hz"]) EMF, and provided conclusions that form the basis of guidance to governments and industries. The Company regularly monitors the recommendations of these expert panels to guide their approach to EMF.

Research on EMF and human health varies widely in approach. Some studies evaluate the effects on biological responses of high, short-term EMF exposure not typically found in people's day-to-day lives, while others evaluate the effects of common, low EMF exposures found throughout communities. Studies also have evaluated the possibility of effects (*e.g.*, cancer, neurodegenerative diseases, and reproductive effects) of long-term exposure. Altogether, this research includes well over 100 epidemiologic studies of people in their natural environment and many more laboratory studies of animals (*in vivo*) and isolated cells and tissues (*in vitro*). Standard scientific procedures, such as weight-of-evidence methods, were used by the expert panels assembled by scientific agencies to identify, review, and summarize the results of this large and diverse research.

The reviews of biological and health research related to ELF EMF have been conducted by numerous scientific and health agencies, including, for example, the European Health Risk Assessment Network on Electromagnetic Fields Exposure ("EFHRAN"), the International Commission on Non-Ionizing Radiation Protection ("ICNIRP"), the World Health Organization ("WHO"), the Institute of Electrical and Electronics Engineers ("IEEE")'s International Committee on Electromagnetic Safety ("ICES"), the Scientific Committee on Health, Environmental and Emerging Risks ("SCHEER") (formerly the Scientific Committee on Emerging and Newly Identified Health Risks ["SCENIHR"]) of the European Commission, and the Swedish Radiation Safety Authority ("SSM") (formerly the Swedish Radiation Protection Authority ["SSI"]) (WHO, 2007; SCENIHR, 2009, 2015; EFHRAN, 2010, 2012; ICNIRP, 2010; SSM, 2015, 2016, 2018, 2019, 2020, 2021, 2022, 2024a, 2024b; ICES, 2019; SCHEER, 2024). The general scientific consensus of the agencies that have reviewed this research, relying on generally accepted scientific methods, is that the scientific evidence does not confirm that common sources of EMF in the environment, including transmission lines and other parts of the electric system, appliances, etc., are a cause of any adverse health effects.

The most recent reviews on this topic include the 2015 and 2024 reports by SCENIHR and SCHEER, respectively, and annual reviews published by SSM (*i.e.*, for the years 2015 through 2024). These reports, similar to previous reviews, found that the scientific evidence does not confirm the existence of any adverse health effects caused by environmental or community exposure to EMF.

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

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

**References**

European Health Risk Assessment Network on Electromagnetic Fields Exposure (EFHRAN). Report on the Analysis of Risks Associated to Exposure to EMF: *In Vitro* and *In Vivo* (Animals) Studies. Milan, Italy: EFHRAN, 2010.

European Health Risk Assessment Network on Electromagnetic Fields Exposure (EFHRAN). Risk Analysis of Human Exposure to Electromagnetic Fields (Revised). Report D2 of the EFHRAN Project. Milan, Italy: EFHRAN, 2012.

International Commission on Non-ionizing Radiation Protection (ICNIRP). Guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz to 100 kHz). Health Phys 99: 818-36, 2010.

International Committee on Electromagnetic Safety (ICES). IEEE Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields 0 to 300 GHz. IEEE Std C95.1-2019. New York, NY: IEEE, 2019.

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.

Scientific Committee on Health, Environmental and Emerging Risks (SCHEER). Potential Health Effects of Exposure to Electromagnetic Fields (EMF): Update with Regard to Frequencies between 1 Hz and 100 kHz. Brussels, Belgium: Commission E, 2024.

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.

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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.

Swedish Radiation Safety Authority (SSM). Research 2022:16. Recent Research on EMF and Health Risk – Sixteenth report from SSM's Scientific Council on Electromagnetic Fields, 2021. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2022.

Swedish Radiation Safety Authority (SSM). 2024:05 Recent Research on EMF and Health Risk, Seventeenth report from SSM's Scientific Council on Electromagnetic Fields, 2022. Stockholm, Sweden: SSM, 2024a.

Swedish Radiation Safety Authority (SSM). 2024:12 Recent Research on EMF and Health Risk, Eighteenth report from SSM's Scientific Council on Electromagnetic Fields, 2023. Stockholm, Sweden: SSM, 2024b.

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."[26]

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

- WHO, which published one of the most comprehensive and detailed reviews of the relevant scientific peer-reviewed literature in 2007;
- SCHEER (formerly SCENIHR), a committee of the European Commission, which published its assessments in 2009, 2015, and 2024;
- The SSM, which has published annual reviews of the relevant peer-reviewed scientific literature since 2003, with its most recent reviews published in 2024; and,
- EFHRAN, which published its reviews in 2010 and 2012.

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

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

comprehensive review of the literature by SCENIHR, published in 2015, concluded that "no mechanisms have been identified and no support is existing [*sic*] from experimental studies that could explain these findings, which, together with shortcomings of the epidemiological studies prevent a causal interpretation" (SCENIHR, 2015, p. 16). In their 2024 report providing an update on the potential health effects of exposure to electromagnetic fields in the 1 Hz to 100 kilohertz ("kHz") range, SCHEER concluded that "overall, there is weak evidence concerning the association of ELF-MF [magnetic field] exposure with childhood leukaemia" (SCHEER 2024, p. 9).

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 February 15, 2025, provide additional evidence and contribute to clarification of previous findings. Overall, new research studies have not provided evidence to alter the previous conclusions of scientific and health organizations, including WHO and SCENIHR.

Epidemiologic studies of EMF and childhood leukemia published during the above referenced period include:

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

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

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

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

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

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

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

- Kyriakopoulou et al. (2018) assessed the association between childhood acute leukemia and parental occupational exposure to social contacts, chemicals, and electromagnetic fields. The study was conducted at a major pediatric hospital in Greece and included 108 cases and 108 controls matched for age, gender, and ethnicity. Statistically non-significant associations were observed between paternal exposure to magnetic fields and childhood acute leukemia for any of the exposure periods examined (1 year before conception; during pregnancy; during breastfeeding; and from birth until diagnosis); maternal exposure was not assessed due to the limited sample size. No associations were observed between childhood acute leukemia and exposure to social contacts or chemicals.

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

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

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

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

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

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

- Amoon et al. (2022) conducted a pooled analysis of four studies of residential exposure to magnetic fields and childhood leukemia published following a 2010 pooled analysis by Kheifets et al. (2010). The study by Amoon et al. (2022) compared the exposures of 24,994 children with leukemia to the exposures of 30,769 controls without leukemia in California, Denmark, Italy, and the United Kingdom. Exposure was assessed by measured or calculated magnetic fields at their residences. The exposure of these two groups to magnetic fields were found not to significantly differ. A decrease in the combined effect estimates in epidemiologic studies was observed over time, and the authors concluded that their findings, based on the most recent studies, were "not in line" with previous pooled analyses that reported an increased risk of childhood leukemia.

- Brabant et al. (2022) performed a literature review and meta-analysis of studies of childhood leukemia and magnetic-field exposure. The overall analysis included 21 epidemiologic studies published from 1979 to 2020. The authors reported a statistically significant association, which they noted was "mainly explained by the studies conducted before 2000." The authors reported a statistically significant association between childhood leukemia and measured or calculated magnetic-field exposures > 0.4 μT (4 mG); no statistically significant overall associations were reported between childhood leukemia and lower magnetic-field exposure (< 0.4 μT [4 mG]), residential distance from power lines, or wire coding configuration. An association between childhood leukemia and electric blanket use was also reported. The overall results were likely influenced by the inclusion of a large number of earlier studies; 10 of the 21 studies in the main analysis were published prior to 2000. Studies published prior to 2000 included fewer studies deemed to be of higher study quality, as determined by the authors, compared to studies published after 2000.

- Nguyen et al. (2022) investigated whether potential pesticide exposure from living in close proximity to commercial plant nurseries confounds the association between magnetic-field exposure and childhood leukemia development reported within the California study population previously analyzed in Crespi et al. (2016) and Kheifets et al. (2017). The authors in Nguyen et al. (2022) noted that while the association between childhood leukemia and magnetic-field exposure was "slightly attenuated" after adjusting for nursery proximity or when restricting to subjects living > 300 meters from nurseries, their results "do not support plant nurseries as an explanation for observed childhood leukemia risks." The authors further noted that close residential proximity to nurseries may be an independent risk factor for childhood leukemia.

- Guo et al. (2023) reported conducting a systematic review and meta-analysis of studies published from 2015 to 2022 that evaluated associations between magnetic-field exposure and childhood leukemia development. Three meta-analyses were conducted to evaluate the relationship using different exposure metrics. In the first meta-analysis, magnetic-field levels ranging from 0.4 μT (4 mG) to 0.2 μT (2 mG) were associated with a statistically significant reduced risk of childhood leukemia development (*i.e.*, a protective association). In the second meta-analysis, exposure was based on wiring configuration codes, and the reported pooled relative risk estimates demonstrated a statistically significant increased association with childhood leukemia. In the third meta-analysis, exposure was categorized into groupings of magnetic-field strength; no statistically significant associations with childhood leukemia were reported for any of the groupings, including for magnetic-field levels ≥ 0.4 μT (4 mG). There are significant limitations of this study that prevent meaningful interpretations of the results. Most of the analyses of magnetic fields did not state whether measurements and calculations were included, and the authors provided no description of the methods used for their analyses, no data tables to support their findings, and no references to the number and type of studies included. In fact, much of the article's introduction discusses ionized radiation. The authors also do not report relevant metrics for evaluating meta-analyses such as study heterogeneity.

- Malagoli et al. (2023) examined associations between exposure to magnetic fields from high voltage power lines (≥ 132 kV) and childhood leukemia development in a case-control study of children in Italy. The study included 182 cases diagnosed with childhood leukemia between 1998 and 2019 and 726 controls matched based on age, sex, and Italian province. The authors assessed magnetic-field exposure by calculating the distance from each participant's residence to the nearest high voltage power line and classifying that distance into one of three exposed categories (participants living < 100 meters, 100 to < 200 meters, or 200 to < 400 meters from the power lines) or as unexposed (participants living ≥ 400 meters from the power lines). The authors reported a non-statistically significant association between childhood leukemia and a residence distance of <100 meters; no statistically significant associations were reported for any distance, including when stratifying by age (< 5 or ≥ 5 years) or when restricting to acute lymphoblastic leukemia ("ALL").

- Nguyen et al. (2023) extended their previous investigation (Nguyen et al., 2022) into whether pesticide exposure was an independent risk factor or confounder for childhood leukemia in the presence of magnetic-field exposure from high voltage power lines by examining the potential impact of specific pesticide exposure factors (*e.g.*, intended use, chemical class, active ingredient). The authors found no statistically significant associations between distance to high voltage power lines or magnetic-field exposure and childhood leukemia, including when adjusting for pesticide exposures. Several of the examined pesticides were determined by the authors to be potential independent risk factors for childhood leukemia.

- Zagar et al. (2023) examined the relationship between magnetic fields and childhood cancers, including childhood leukemia, in Slovenia. Cancer cases, including 194 cases of leukemia, were identified from the Slovenian Cancer Registry; cases were then classified into one of five calculated magnetic-field exposure levels (ranging from < 0.1 μT [< 1 mG] to ≥ 0.4 μT [≥ 4 mG]) based on residential distance to high voltage (*e.g.*, 110-kV, 220-kV, and 400-kV) power lines. The authors reported that less than 1% of Slovenian children and adolescents lived in an area near high voltage power lines. No differences in the development of childhood cancers, including leukemia, brain tumors, or all cancers combined, were reported across the five exposure categories.

- Crespi et al. (2024) assessed the association between residential proximity to electricity transformers in multi-story residential buildings and childhood leukemia development in the International Transformer Exposure study. Participants were required to live in an apartment building that contained a built-in transformer; exposure was estimated using the participants' apartment location relative to the transformer and categorized as high exposure (located above or adjacent to the transformer), intermediate exposure (located on the same floor as apartments in the high exposure category), or unexposed (all other apartments). In the pooled analyses of five countries' data, a total of 74 cases and 20,443 controls were included; 18 of the 74 cases were identified in the intermediate or high exposure categories. No significant associations were reported between proximity to residential transformers and childhood leukemia. Sensitivity analyses performed using the data from one of the five countries (Finland) where a cohort study design was used, also reported no significant associations. The authors concluded that the evidence for an elevated risk of childhood leukemia from proximity to residential transformers was "weak."

- Duarte-Rodríguez et al. (2024) conducted a population-based case-control study to examine the geographical distribution of childhood ALL cases in Mexico City, Mexico. Cases and controls were geolocated using the most recent residential address, and a spatial scan statistic was used to detect spatial clusters of cancer cases. The authors identified eight spatial clusters of cases, representing nearly 40% of all cases included in the study (n=1,054 cases). The authors noted that six of the eight spatial clusters were located in proximity to high voltage power lines and high voltage electric installations (distances not specified), and that the remaining two clusters were located near former petrochemical industrial facility sites. Since the study did not directly assess magnetic-field exposure and made no conclusions about magnetic-field exposure and cancer development, this study adds little value to the existing literature regarding a potential association between exposure to ELF EMF and childhood leukemia development.

- Malavolti et al. (2024) examined the association between magnetic-field exposure from transformer stations and childhood leukemia in the same Italian study population as Malagoli et al. (2023). Magnetic-field exposure was estimated based on residential distance to the nearest transformer station, and participants were then categorized as exposed or unexposed using two different distance cut-points: residing within a radius of 15 or 25 meters from the transformer station (exposed); residing ≥ 15 meters or ≥ 25 meters from the transformer station (unexposed). No significant associations were reported for all leukemias, or ALL specifically, when either distance cut-point was used, and in fact no association at all (an odds ratio = 1.0) was observed when the more stringent cut-point of 15 meters was used. In sub-analyses that stratified by participant age (< 5 years vs. ≥ 5 years), no significant associations were reported for either age category.

- Norzaee et al. (2024) conducted a hospital-based case-control study that investigated the association between residential proximity to urban land uses (such as highways, petrol stations, power lines, and bus stations) and childhood leukemia and lymphoma in Tehran, Iran. The study population included 428 childhood leukemia and 428 childhood lymphoma cases, diagnosed between 2016 and 2021, and 428 controls, selected from the same hospitals as the cases. To be eligible for inclusion in the study, cases and controls had to have been living at their residence for at least 1 year prior to enrollment and be between 1 and 15 years of age. Logistic regression models adjusting for parental smoking, sex, birth year, and family history of cancer, indicated some statistically significant associations with proximity to petrol stations and highways but not with proximity to power lines. Children living within 100 meters of highways had increased odds of developing leukemia and lymphoma compared to children living at a further distance from highways, while proximity to petrol stations (< 100 meters) was associated with leukemia development but not lymphoma. The authors reported an association between childhood leukemia development and living within 50 meters of power lines compared to living further away, but this finding was not statistically significant. The authors also noted that this evaluation was based on a limited sample size of only 12 cases. No associations were observed between proximity to power lines and childhood lymphoma development.

Epidemiologic studies of EMF and neurodegenerative diseases published during the above referenced period include:

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

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

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

- Fischer et al. (2015) conducted a population-based case-control study that included 4,709 cases of ALS diagnosed between 1990 and 2010 in Sweden and

23,335 controls matched to cases on year of birth and sex. The study subjects' occupational exposures to ELF magnetic fields and electric shocks were classified based on their occupations, as recorded in the censuses and corresponding job-exposure matrices. Overall, neither magnetic fields nor electric shocks were related to ALS.

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

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

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

- Checkoway et al. (2018) investigated the association between Parkinsonism[27] and occupational exposure to magnetic fields and several other agents (endotoxins, solvents, shift work) among 800 female textile workers in

[27] 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).

Shanghai. Exposure to magnetic fields was assessed based on the participants' work histories. The authors reported no statistically significant associations between Parkinsonism and occupational exposure to any of the agents under study, including magnetic fields.

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

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

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

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

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

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

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

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

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

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

- Grebeneva et al. (2021) evaluated disease rates among electric power company workers in the Republic of Kazakhstan. The authors included three groups of "exposed" workers who "were in contact with equipment generating [industrial frequency EMF]" (a total of 161 workers), as well as 114 controls "who were not associated with exposure to electromagnetic fields." Disease rates were assessed "based on analyzing the sick leaves of employees" from 2010 to 2014 and expressed as "incidence rate per 100 employees." The authors reported a higher "incidence rate" of "diseases of the nervous system" in two of the exposed categories compared to the non-exposed group. No meaningful conclusions from the study could be drawn, however, because no specific diagnoses within "diseases of the nervous system" were identified in the paper and no clear description was provided on how the authors defined and calculated "incidence rate" for the evaluated conditions. In addition, no measured or calculated magnetic-field levels were presented by the authors.

- Filippini et al. (2021) conducted a meta-analysis to assess the dose-response relationship between residential exposure to magnetic fields and ALS. The authors identified six ALS epidemiologic studies, published between 2009 and 2020, that assessed exposure to residential magnetic fields by either distance from overhead power lines or magnetic-field modeling. They reported a decrease in risk of ALS in the highest exposure categories for both distance-based and modeling-based exposure estimates. The authors also reported that their dose-response analyses "showed little association between distance from power lines and ALS"; the data were too sparse to conduct a dose-response analysis for modeled magnetic-field estimates. The authors noted that their study was limited by small sample size, "imprecise" exposure categories, the potential for residual confounding, and by "some publication bias."

- Jalilian et al. (2021) conducted a meta-analysis of occupational exposure to ELF magnetic fields and electric shocks and development of ALS. The authors included 27 studies from Europe, the United States, and New Zealand that were published between 1983 and 2019. A weak, statistically significant association was reported between magnetic-field exposure and ALS, and no association was observed between electric shocks and ALS. Indications of publication bias and "moderate to high" heterogeneity were identified for the studies of magnetic-field exposure and ALS, and the authors noted that "the results should be interpreted with caution."

- Goutman et al. (2022) examined occupational exposures, including "electromagnetic radiation" exposure, and associations with ALS in a case-control study of Michigan workers across various industries. The study included 381 cases diagnosed with ALS, all patients at the University of Michigan's Pranger ALS clinic, and 272 controls recruited from an online database for the University of Michigan. Participants were enrolled from 2010 to 2020 and completed a written survey of their work history and occupational exposures to nine exposure categories, including electromagnetic fields, particulate matter ("PM"), and pesticides. Exposure to electromagnetic fields was ascertained with a binary question asking whether they were "[e]xposed to power lines, transformation [*sic*] stations or other EM [electromagnetic radiation]?" The analysis was adjusted for age, sex, and military service. No association was observed between electromagnetic field exposure and ALS, while exposure to PM, pesticides, and metals, among others, were determined by the authors to be "associated with an increased ALS risk in this cohort."

- Sorahan and Nichols (2022) investigated magnetic-field exposure and mortality from MND in a large cohort of employees of the former Central Electricity Generating Board of England and Wales. The study included nearly 38,000 employees first hired between 1942 and 1982 and still employed in 1987. Estimates of exposure magnitude, frequency, and duration were calculated using data from the power stations and the employees' job histories, and were described in detail in a previous publication (Renew et al., 2003). Mortality from MND in the total cohort was observed to be similar to national rates. No statistically significant dose-response trends were observed with lifetime, recent, or distant magnetic-field exposure; statistically significant associations were observed for some categories of recent exposure, but not for the highest exposure category.

- Duan et al. (2023) conducted a meta-summary of ALS and exposure to magnetic fields, which was 1 of 22 non-genetic risk factors evaluated across 67 studies for its association with ALS. Six of the 67 studies examined magnetic-field exposure and associations with ALS; of the six studies identified, the authors included four case-control studies and one cohort study in their meta-analysis. Pooling results from these studies resulted in significant increased odds of ALS among individuals with higher (but undefined) exposure to magnetic fields. However, this pooled odds ratio for magnetic-field exposure (1.22) was below the minimum odds ratio threshold of 1.3 set by the authors as the criterion for defining an exposure as an ALS risk factor. In addition, the authors identified "substantial" heterogeneity between studies evaluating magnetic-field exposure and ALS.

- In a subsequent publication of the same study as Goutman et al. (2022), Goutman et al. (2023) assessed the potential for the same nine exposure categories, including "electromagnetic radiation" exposure, to be risk factors for ALS progression, including survival and onset segment (bulbar, cervical, lumbar). Electromagnetic field exposure was not significantly associated with ALS survival or with bulbar onset compared to lumbar, but was significantly associated with cervical onset compared to lumbar. It is worth noting that an association with cervical onset compared to lumbar was observed in the majority (7/9) of the exposure categories. The authors make no concluding statements on electromagnetic field exposure and ALS and instead emphasize that occupational pesticide exposure and working in military operations were significantly associated with worse ALS survival.

- Saucier et al. (2023) carried out three systematic reviews of studies that evaluated relationships between urbanization, air pollution, and water pollution, and ALS development. The authors identified five studies that assessed whether electromagnetic fields (of varying frequencies) and high voltage infrastructure were significant urbanization risk factors for ALS, but make no conclusion about magnetic-field exposure and ALS development based on these studies, therefore adding little value to the existing literature.

- Vasta et al. (2023) examined the relationship between residential distance to power lines and ALS development in a cohort study of 1,098 participants in Italy. The authors reported no differences in the age of ALS onset or ALS progression rate between low-exposed and high-exposed participants based on residential distance to power lines at the time of the participants' diagnosis. Similarly, no differences were observed when exposure was based on residential distance to repeater antennas.

- Vitturi et al. (2023) conducted a systematic review and meta-analysis of case-control studies examining potential occupational risk factors related to multiple sclerosis, including solvents, mercury, pesticides, and low-frequency magnetic fields. The authors included 24 studies in their review, but only one of the included studies investigated exposure to magnetic fields (Pedersen et al., 2017, discussed above), thereby adding little new information to the existing body of research.

- Jones et al. (2025) conducted an "umbrella review," which is a review of systematic reviews and meta-analyses of environmental risk factors for various types of dementia and mild cognitive impairment. The authors included 19 review articles, containing 37 meta-analyses, published between 2008 and 2023, in their analysis, and identified nine exposures associated with higher risk of all-cause dementia, including particulate matter, carbon monoxide, shift work, chronic noise, and ELF magnetic fields; several of these exposures, including ELF magnetic fields, were also identified as being associated with Alzheimer's disease dementia. The authors' analysis of ELF magnetic-field exposure and all-cause dementia, however, was based on a single study, and the analysis of ELF magnetic-field exposure and Alzheimer's disease dementia was based on only four studies, three of which were rated as being of "low" or "moderate" study quality, thereby adding little valuable information to the existing body of research. The authors did not identify any systematic reviews reporting associations between any of these environmental factors and mild cognitive impairment.

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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 Rebuild Project is provided as Attachment V.A. A written description of the route is as follows:

The proposed route for the Rebuild Project is located within an approximately 27.6-mile right-of-way currently occupied by an existing 500 kV transmission corridor. The existing transmission corridor right-of-way for the proposed route originates at the Company's existing Chickahominy Substation in Charles City County and heads northwest for approximately 3.5 miles in Charles City County and continues approximately 11.2 miles in Henrico County and 13.0 miles in Hanover County before reaching the Company's existing Elmont Substation in Hanover County. The right-of-way crosses the Chickahominy River, Possum Run, Boar Swamp, Elder Swamp, Boatswain Creek, Beaverdam Creek, Horse Creek, Upham Brook, Turner Run, and unnamed tributaries. In Charles City County, the Rebuild Project crosses Chambers Road, Roxbury Road (Route 106), and Charles City Road (Route 600). In Henrico County, the Rebuild Project crosses White Oak Road, Williamsburg Road (Pocahontas Trail) (Route 33/60), Interstate 64, Swamp Lane, Mechanicsville Road (Route 360), Richmond Henrico Turnpike (Route 627), Interstate 95, and Lakeridge Parkway. In Hanover County, the Rebuild Project crosses N Airport Road (Route 156), Interstate 295, Hope Haven Drive, Creighton Road (Route 615), Power Road, Chamberlayne Road (Route 301), Washington Highway (Route 1), and Holly Hill Road.

For the overall Rebuild Project, the minimum structure height is approximately 119 feet, the maximum structure height is approximately 165 feet and the average structure height is approximately 145 feet, based on preliminary conceptual design, including foundation reveal and subject to change based on final engineering design.