

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. They concluded that "... *the 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.*"²⁰

The continuing scientific research on EMF exposure and health has resulted in a number of 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. One of the most comprehensive and detailed reviews of the relevant scientific peer-reviewed literature was published by the World Health Organization (WHO) in 2007. The conclusion of the WHO, as currently expressed on its website, is consistent with the earlier VDH conclusions: "*Based on a recent in-depth review of the scientific literature, the WHO concluded that current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields.*"²¹

Research published in the peer-reviewed literature subsequent to the WHO report has been reviewed by several scientific organizations, including most notably:

- SCENIHR, a committee of the European Commission, that published its assessments in 2009 and 2015;
- The Swedish Radiation Safety Authority ("SSM"), formerly the Swedish Radiation Protection Authority ("SSI"), that has published annual reviews of the relevant peer-reviewed scientific literature since 2003, with its most

²⁰ <http://www.vdh.virginia.gov/content/uploads/sites/12/2016/02/highfinal.pdf>

²¹ <http://www.who.int/peh-emf/about/WhatisEMF/en/index1.html>

recent review published in 2016; and,

- EFHRAN that 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 are consistent with the conclusions of the VDH and the WHO reports. With respect to the statistical association observed in some of the childhood leukemia epidemiologic studies, the most recent comprehensive review of the literature by SCENIHR, published in 2015, concluded that “no mechanisms have been identified and no support is existing [sic] from experimental studies that could explain these findings, which, together with shortcomings of the epidemiological studies prevent a causal interpretation” (SCENIHR, 2015, p. 16).

While research is continuing on various aspects of EMF exposure and health, many of the recent publications have focused on an epidemiologic assessment of EMF exposure and childhood leukemia and neurodegenerative diseases. Of these, the following recent publications provided additional evidence and contributed to clarification of previous findings. Overall, new research results have not provided evidence to alter the previous conclusions of scientific and health organizations.

Recent epidemiologic studies of EMF and childhood leukemia:

- Sermage-Faure et al. (2013) used geocoded information on residential addresses and power line locations in France to evaluate distance of residence to high-voltage power lines and the risk of childhood leukemia. The study included 2,779 cases of childhood leukemia diagnosed between 2002 and 2007, and 30,000 control children. Overall, no statistically significant associations were reported between childhood leukemia risk and residential distance to high-voltage power lines.
- Bunch et al. (2014) included over 53,000 childhood cancer cases, diagnosed between 1962 and 2008, and over 66,000 healthy children as controls, in their case-control epidemiologic study in the United Kingdom. The study provided an update and extension of an earlier study (Draper et al., 2005). The update extended the study period by 13 years, included Scotland in addition to England and Wales, and included 132-kilovolt (kV) transmission lines in addition to 275-kV and 400-kV transmission lines. Unlike the earlier study (Draper et al., 2005) that relied on a smaller sample, the updated study by Bunch et al. (2014) reported no overall association between residential proximity to power lines and childhood cancer development. Data were also analyzed from the same case-control study in the United Kingdom to assess the potential association between residential proximity to high-voltage underground cables and childhood cancer development (Bunch et al., 2015). 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. (2014, 2015) published two case-control studies that investigated the potential association between residential proximity to power lines and childhood cancer in Denmark. One of the studies included 1,698 childhood leukemia cases and twice as many controls; no statistical association with residential distance to power lines was reported (Pedersen et al., 2014). The other study included all cases of leukemia (n=1,536), central nervous system tumor, and malignant lymphoma (n=417) diagnosed before the age of 15 between 1968 and 2003 in Denmark, along with 9,129 healthy control children matched on sex and year of birth (Pedersen et al., 2015). 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.
- 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 were reported for leukemia or brain tumor with residential distance to power lines.

Recent epidemiologic studies of EMF and neurodegenerative diseases:

- 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 cases' and controls' residence to the nearest high-voltage power line (50 kV 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.

References

Bunch KJ, Keegan TJ, Swanson J, Vincent TJ, Murphy MF. Residential distance at birth from overhead high-voltage powerlines: childhood cancer risk in Britain 1962-2008. *Br J Cancer* 110: 1402-1408, 2014.

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Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR). *Opinion on Potential Health Effects of Exposure to Electromagnetic Fields (EMF)*. Brussels, Belgium: European Commission, 2015.

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Sorahan T and Mohammed N. Neurodegenerative disease and magnetic field exposure in UK electricity supply workers. *Occup Med (Lond)* 64: 454-460, 2014.

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World Health Organization (WHO). *Environmental Health Criteria 238: Extremely Low Frequency (ELF) Fields*. Geneva, Switzerland: World Health Organization, 2007.

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 Line #224 Partial Rebuild Projects is provided as Attachment V.A. For each of the Rebuild Projects, a written description of the route is as follows:

Pamunkey River Rebuild

The proposed route for the Pamunkey River Rebuild is an approximately 1.7 mile right-of-way currently occupied by an existing 230 kV transmission line located within King William and New Kent Counties, Virginia. The existing transmission line right-of-way is 120 feet wide, and originates from the southern side of Old Sweet Hall Ferry Crossing (SR 624), crossing over the Cousiac Marsh and Pamunkey River, and terminates on the northern side of Sweet Hall Road (SR 634). The existing nine structures to be replaced (Structures #224/226 through #224/234) range in height from 67 feet to 190 feet and the proposed structures range in height from 61 feet to 196 feet. The existing average structure height is 128 feet and the proposed average structure height is 131 feet.

Mattaponi River Rebuild

The proposed route for the Mattaponi River Rebuild is an approximately 1.3 mile right-of-way currently occupied by an existing 230 kV transmission line located within King and Queen and King William Counties, Virginia. The existing transmission line right-of-way is 120 feet wide, and originates from the eastern side of Court House Landing Road (SR 655), crossing over the Mattaponi River and the Gleason Marsh, and terminates on the northern side of Wakema Road (SR 640). The existing seven structures to be replaced (Structures #224/180 through #224/186) range in height from 61 feet to 188 feet and the proposed structures range in height from 61 feet to 196 feet. The existing average structure height is 109 feet and the proposed average structure height is 120 feet.

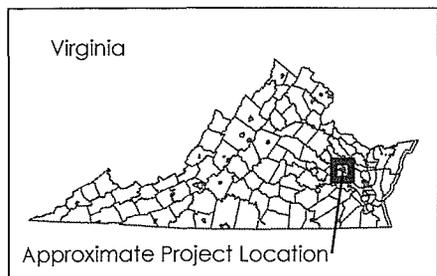
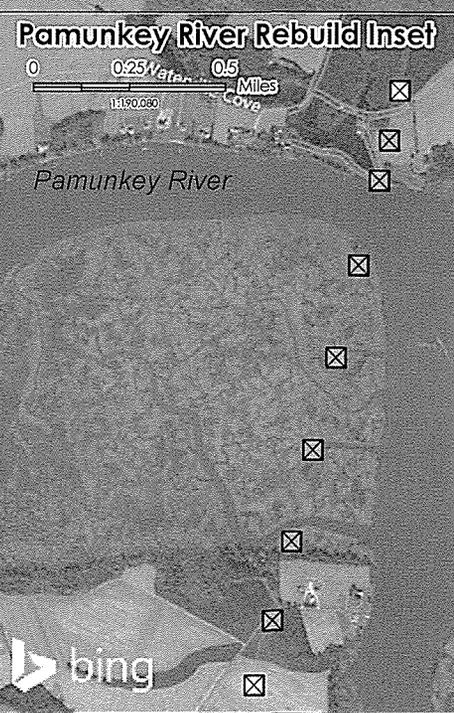
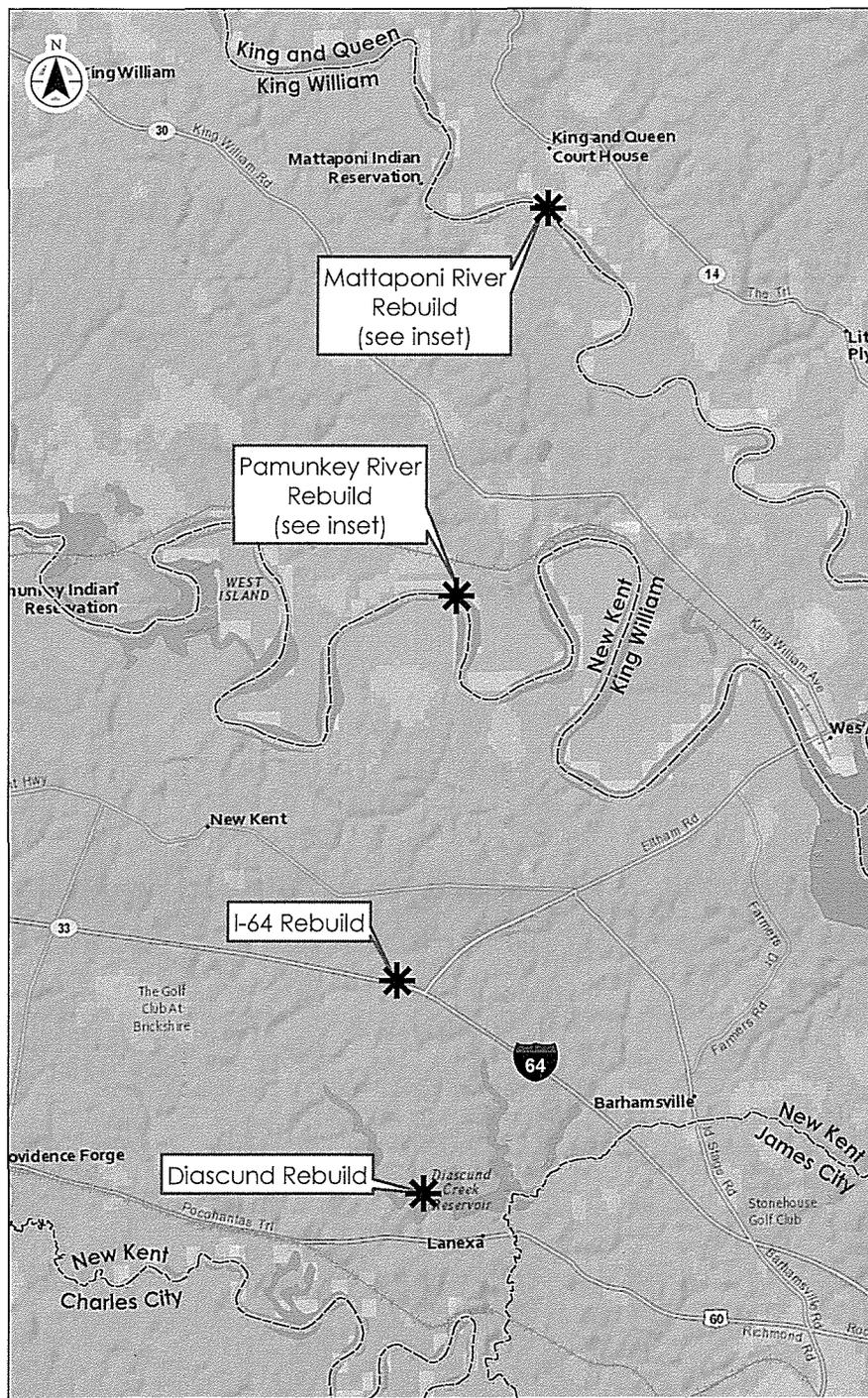
I-64 Rebuild

The proposed route for the I-64 Rebuild is an approximately 0.5 mile right-of-way currently occupied by an existing 230 kV transmission line located in New Kent County, Virginia. The existing transmission line right-of-way is 120 feet wide, and originates from the northern side of Stage Road (SR 632), crossing over Interstate 64, and terminates on the eastern side of Good Hope Road (SR 627). The existing four structures to be replaced (Structures #224/268 through #224/271) range in height from 61 feet to 133.5 feet and the proposed structures range in height from 66 feet to 147.4 feet. The existing average structure height is 94 feet and the proposed average structure height is 103 feet.

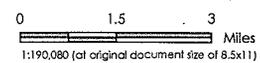
Diascund Rebuild

The proposed Diascund Rebuild consists of one existing double circuit 230 kV transmission line structure (Structure #224/297, 2016/6) proposed to be rebuilt into two monopole transmission support structures. The existing transmission line structure is located within New Kent County, on the north bank of the Diascund Creek Reservoir, east of North Waterside Drive (SR 627). The existing structure is 142.4 feet in height and is proposed to be rebuilt into two structures that are 140 feet in height. The existing average structure height is 139.5 feet and the proposed average structure height is 135 feet.

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- Proposed Replacement 3-Pole Structure
- Proposed Replacement Lattice Tower



Project Location: King William, King and Queen and New Kent Counties, VA
 Prepared by MGS on 2018-04-06
 Technical Review by TPS on 2018-06-07
 Independent Review by JBJ on 2018-06-07

Client/Project: Dominion Energy Virginia
 Line #224 Partial Rebuild Projects

Attachment: V.A

Title: Notification Map

- Notes
- Coordinate System: NAD 1983 StatePlane Virginia South FIPS 4502 Feet
 - Tower Locations provided by Dominion Energy Virginia
 - Information contained herein is preliminary in nature and subject to final engineering
 - Base Map © National Geographic and Orthomogery © Bing Maps
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V. NOTICE

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

Response: The application is available at the following locations:

Dominion Energy Virginia
701 East Cary Street, 12th Floor
Richmond, Virginia 23219
Attn: John A. Mulligan, Senior Siting and Permitting Specialist

<https://www.dominionenergy.com/line224>

V. NOTICE

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

Response: The following agency representatives may reasonably be expected to have an interest in the Line #224 Partial Rebuild Projects. Instead of furnishing a copy of the Application to these parties, the Company has sent a letter noting the availability of the Application for the Line #224 Partial Rebuild Projects on the Company's website.

Ms. Bettina Rayfield, Manager Environmental Impact Review and Long Range
Priorities Program
Office of Environmental Impact Review
Department of Environmental Quality
P.O. Box 1105
Richmond, Virginia 23218

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

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

Ms. Julie Langan, Director
Review and Compliance Division
Department of Historic Resources
2801 Kensington Avenue
Richmond, Virginia 23221

Ms. Amy M. Ewing
Virginia Department of Games and Inland Fisheries
7870 Villa Park, Suite 400
Henrico, Virginia 23228

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

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

Mr. Tony Watkinson
Habitat Management Division
Virginia Marine Resources Commission
2600 Washington Avenue, 3rd Floor
Newport News, Virginia 23607

Mr. Charles M. Shaver
King William Local Wetlands Board
180 Horse Landing Road, #4
King William, Virginia 23086

Mr. Justin Stauder
New Kent Local Wetlands Board
12007 Courthouse Circle
PO Box 150
New Kent, Virginia 23124

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

Mr. Tom Walker
US Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Mr. Kyle Winter
Virginia Department of Environmental Quality
Piedmont Regional Office
4949-A Cox Road
Glen Allen, Virginia 23060

Mr. Michael Dowd
Department of Environmental Quality
Air Division
P.O. Box 1105
Richmond, Virginia 23218

Mr. Robert Alexander
Obstruction Evaluation Specialist
Federal Aviation Administration
FAA Eastern Regional Office
159-30 Rockaway Blvd
Jamaica, New York 11434

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

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

Ms. Marcie Parker, P.E.
Fredericksburg District Engineer
Virginia Department of Transportation
Fredericksburg District Office
87 Deacon Road
Fredericksburg, Virginia 22405

Mr. Bart Thrasher
Richmond District Engineer
Virginia Department of Transportation
Richmond District Office
2430 Pine Forest Drive
Colonial Heights, Virginia 23834

Ms. Bobbi Tassinari
County Administrator
180 Horse Landing Road, #4
King William, Virginia 23086

Mr. Wally Horton
Planning Department
180 Horse Landing Road #4
King William, Virginia 23086

Mr. Rodney Hathaway
County Administrator
12007 Courthouse Circle
PO Box 150
New Kent, Virginia 23124

Ms. Kelli Le Duc, Director
Planning Department
12007 Courthouse Circle
PO Box 150
New Kent, Virginia 23124

Mr. Thomas Swartzweider
County Administrator
242 Allens Circle, Suite L
King & Queen C.H., Virginia 23085

V. NOTICE

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

Response: In accordance with Va. Code § 15.2-2202 E, letters were mailed to the County Administrators in each locality where the Line #224 Partial Rebuild Projects are located, including Ms. Bobbie Tassinari of King William County, Mr. Rodney Hathaway of New Kent County, and Mr. Thomas Swartzweider of King and Queen County, advising of the Company's intention to file this Application and inviting the Counties to consult with the Company about the Line #224 Partial Rebuild Projects. Copies of these letters are included as Attachment V.D.

Dominion Energy Virginia
701 East Cary Street, Richmond, VA 23219
DominionEnergy.com



March 29, 2018

Mr. Rodney Hathaway
New Kent County Administrator
12007 Courthouse Circle
New Kent, Virginia 23124

**Reference: 230 kV Transmission Line #224 Partial Rebuild Projects
King William County, King and Queen County, New Kent County, Virginia
Notice Pursuant to Va. Code § 15.2-2202 E
Applicant: Virginia Electric and Power Company (Dominion Energy Virginia)**

Dear Mr. Hathaway,

Dominion Energy Virginia (the "Company") is proposing to wreck and rebuild portions of its 230 kV transmission line, Line #224, which is located in King and Queen County, King William County and New Kent County, Virginia. Select structures have been identified as requiring replacement due to the deterioration of the foundations and/or structures that are nearing the end of their service life. A total of, 21 structures in four different locations, inclusive of two river crossings, are scheduled for replacement. The project is entirely within cleared and maintained transmission line right-of-way ("ROW") and no additional ROW is anticipated. The proposed project is part of an ongoing effort to provide reliable electric service consistent with North American Electric Reliability Corporation Reliability Standards. The structures have been in operation for over five decades and need to be replaced to maintain reliability for Dominion Energy's customers.

As the project involves proposed work to an existing 230 kV transmission line, the Company is preparing an application for a certificate of public convenience and necessity from the State Corporation Commission ("SCC"). Pursuant to the Code of Virginia § 15.2-2202, Dominion Energy Virginia is writing to notify the County of New Kent of the proposed project in advance of the SCC filing. The Company respectfully requests that the County of New Kent submit any comments or additional information that would have bearing on the proposed project within 30 days of the date of this letter. If the County of New Kent would like to receive a GIS shapefile of the transmission line route to assist in the project review or if there are any questions, please do not hesitate to contact me at (804) 771-6937 or John.A.Mulligan@dominionenergy.com. The Company appreciates your assistance with this project review and looks forward to any additional information the County of New Kent may have to offer.

Regards,

Dominion Energy Virginia

A handwritten signature in black ink that reads "John A. Mulligan". The signature is written in a cursive style and is positioned below the printed name of the Dominion Energy Virginia.

John A. Mulligan
Senior Siting and Permitting Specialist

Attachment: Project Overview Map

Dominion Energy Virginia
701 East Cary Street, Richmond, VA 23219
DominionEnergy.com



March 29, 2018

Mr. Thomas Swartzweider
County Administrator
King and Queen County
Administrators Office
242 Allens Circle, Suite L
King & Queen C.H., VA 23085

**Reference: 230 kV Transmission Line #224 Partial Rebuild Projects
King William County, King and Queen County, New Kent County, Virginia
Notice Pursuant to Va. Code § 15.2-2202 E
Applicant: Virginia Electric and Power Company (Dominion Energy Virginia)**

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John A. Mulligan
Senior Siting and Permitting Specialist

Attachment: Project Overview Map

Dominion Energy Virginia
701 East Cary Street, Richmond, VA 23219
DominionEnergy.com



March 29, 2018

Ms. Bobbie Tassinari
County Administrator
180 Horse Landing Road, #4
King William, Virginia 23086

**Reference: 230 kV Transmission Line #224 Partial Rebuild Projects
King William County, King and Queen County, New Kent County, Virginia
Notice Pursuant to Va. Code § 15.2-2202 E
Applicant: Virginia Electric and Power Company (Dominion Energy Virginia)**

Dear Ms. Tassinari,

Dominion Energy Virginia (the "Company") is proposing to wreck and rebuild portions of its 230 kV transmission line, Line #224, which is located in King and Queen County, King William County and New Kent County, Virginia. Select structures have been identified as requiring replacement due to the deterioration of the foundations and/or structures that are nearing the end of their service life. A total of, 21 structures in four different locations, inclusive of two river crossings, are scheduled for replacement. The project is entirely within cleared and maintained transmission line right-of-way ("ROW") and no additional ROW is anticipated. The proposed project is part of an ongoing effort to provide reliable electric service consistent with North American Electric Reliability Corporation Reliability Standards. The structures have been in operation for over five decades and need to be replaced to maintain reliability for Dominion Energy's customers.

As the project involves proposed work to an existing 230 kV transmission line, the Company is preparing an application for a certificate of public convenience and necessity from the State Corporation Commission ("SCC"). Pursuant to the Code of Virginia § 15.2-2202, Dominion Energy Virginia is writing to notify the County of New Kent of the proposed project in advance of the SCC filing. The Company respectfully requests that the County of New Kent submit any comments or additional information that would have bearing on the proposed project within 30 days of the date of this letter. If the County of New Kent would like to receive a GIS shapefile of the transmission line route to assist in the project review or if there are any questions, please do not hesitate to contact me at (804) 771-6937 or John.A.Mulligan@dominionenergy.com. The Company appreciates your assistance with this project review and looks forward to any additional information the County of New Kent may have to offer.

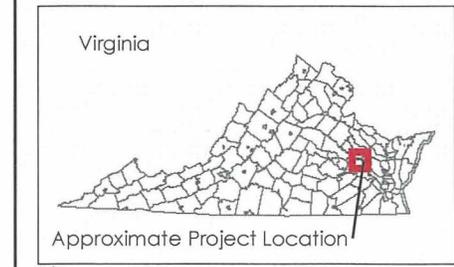
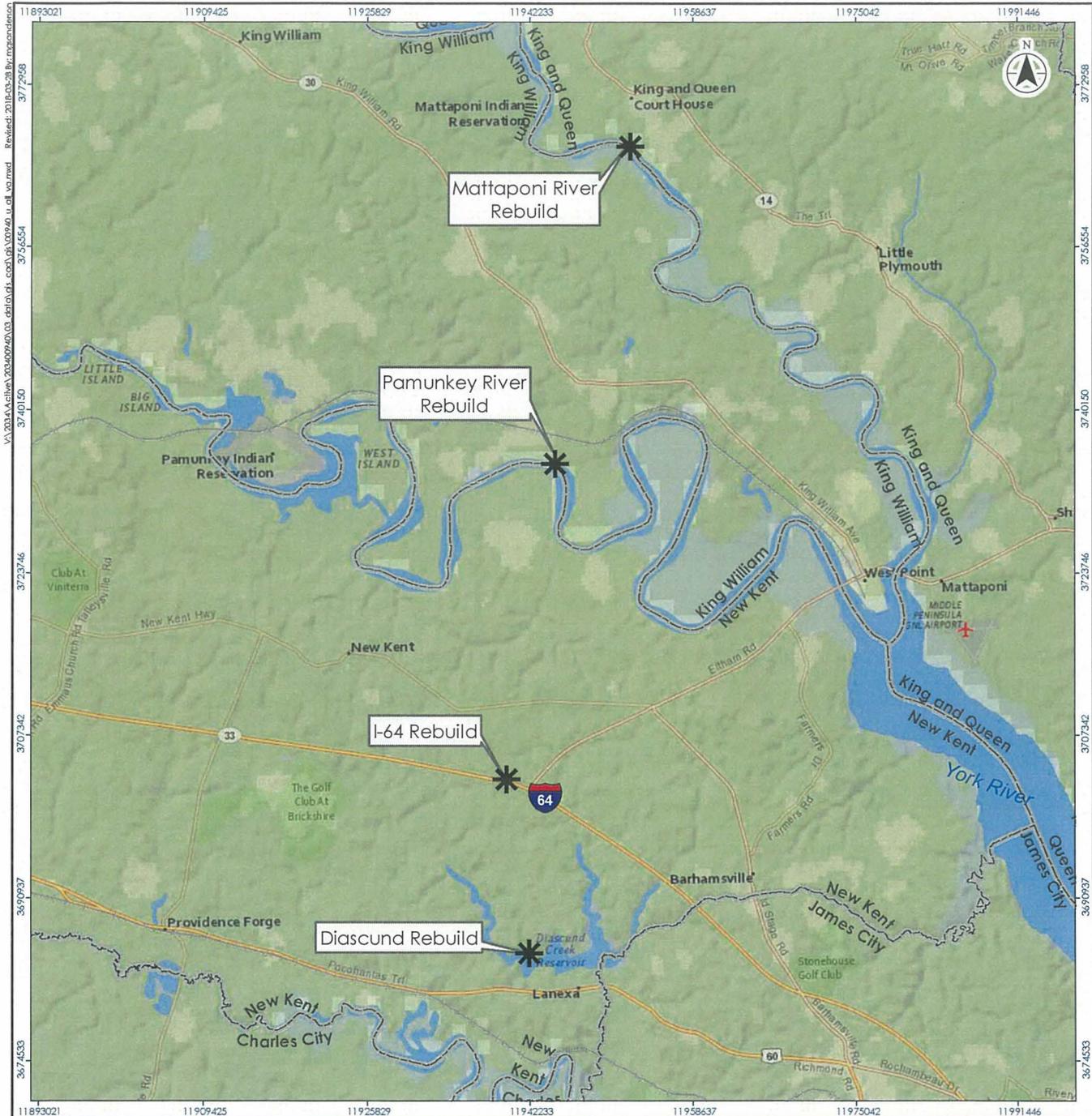
Regards,

Dominion Energy Virginia

A handwritten signature in black ink that reads "John A. Mulligan".

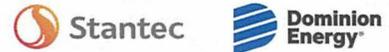
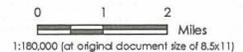
John A. Mulligan
Senior Siting and Permitting Specialist

Attachment: Project Overview Map



- Notes**
1. Coordinate System: NAD 1983 StatePlane Virginia South FIPS 4502 Feet
 2. Base Map © National Geographic
 3. Tower Locations provided by Dominion Energy Virginia

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Project Location: King William, King and Queen and New Kent Counties, VA
 Prepared by JLB on 2018-02-20
 Technical Review by MGS on 2018-02-20
 Independent Review by JBJ on 2018-03-08

Client/Project: Dominion Energy Virginia
 Line #224 Partial Rebuild Projects

Attachment: V.A

Title: Notification Map

Direct Testimony

COMMONWEALTH OF VIRGINIA
STATE CORPORATION COMMISSION

APPLICATION OF)
)
VIRGINIA ELECTRIC AND POWER COMPANY) Case No. PUR-2018-00090
)
For approval and certification of electric)
transmission facilities: Lanexa-Northern Neck)
Line #224 230 kV transmission line)
partial rebuild projects)

**IDENTIFICATION AND SUMMARIES OF DIRECT WITNESSES
OF VIRGINIA ELECTRIC AND POWER COMPANY**

Robert B. Smith

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

Sarah Rana

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

Furmose J. Gomez

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

W. Chase Bland

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

John A. Mulligan

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

Witness Direct Testimony Summary

Witness: Robert B. Smith

Title: Principal Engineer – Electric Transmission Line Engineering

Summary:

Company Witness Robert B. Smith will sponsor those portions of the Appendix providing the engineering justifications for the proposed projects, as follows:

- Section I.B: This section provides the line design and operational features of the proposed projects.

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

**DIRECT TESTIMONY
OF
ROBERT B. SMITH
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2018-00090**

1 **Q. Please state your name, position, and business address.**

2 A. My name is Robert B. Smith, and I am a Principal Engineer in the Electric Transmission
3 department of Virginia Electric and Power Company (“Dominion Energy Virginia” or the
4 “Company”). My business address is One James River Plaza, 701 East Cary Street,
5 Richmond, Virginia 23219. A statement of my background and qualifications is included
6 as Appendix A.

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

8 A. I have the responsibility of performing and coordinating the structural and foundation
9 design and analysis of Company transmission line, substation, and communication
10 structures. I also provide mentoring and technical direction to other engineers within the
11 Structural Engineering section of the Electric Transmission department.

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

13 A. In order to maintain the structural integrity and reliability of its transmission system and
14 perform needed maintenance on its existing facilities, Dominion Energy Virginia
15 proposes to rebuild, entirely within existing right-of-way, four separate segments of its
16 existing Lanexa-Northern Neck Line #224 230 kV transmission line in King and Queen,
17 King William, and New Kent Counties based on the condition of the foundations and
18 structures.

1 In the four separate segments, the Company proposes to: (i) remove and replace nine
2 structures and foundations spanning the Pamunkey River and crossing adjacent tidal
3 marshlands (the “Pamunkey River Rebuild”); (ii) remove and replace seven structures
4 and foundations spanning the Mattaponi River and crossing adjacent tidal marshlands
5 (the “Mattaponi River Rebuild”); (iii) remove and replace two double circuit COR-
6 TEN^{®1} lattice structures and two adjacent wood H-frame structures, which are currently
7 supporting a single transmission circuit, and foundations on the existing 230 kV Line
8 #224 crossing Interstate 64 in New Kent County west of the intersection of I-64 and
9 Route 3 (the “I-64 Rebuild”); and (iv) remove and replace one double circuit COR-TEN[®]
10 lattice structure, which is currently supporting one transmission circuit for Line #224 and
11 another for Line #2016, and foundation, with two DDE 2-pole structures and foundations
12 (the “Diascund Rebuild”) (collectively, the Pamunkey River Rebuild, Mattaponi River
13 Rebuild, I-64 Rebuild, and Diascund Rebuild are referred to as the “Line #224 Partial
14 Rebuild Projects” or the “Rebuild Projects”).

15 I am sponsoring Section I.B of the Appendix.

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

17 **A.** Yes, it does.

¹ Registered trademark of the United States Steel Corporation.

**BACKGROUND AND QUALIFICATIONS
OF
ROBERT B. SMITH**

Robert B. Smith received a Bachelor of Science in Civil Engineering Technology from the University of Pittsburgh at Johnstown in 1978. He has been licensed as a Professional Engineer in the Commonwealth of Virginia since 1987. Mr. Smith has been employed by the Company for 39 years. His experience with the Company includes positions of Associate Designer to Assistant Engineer (1978-1982), Associate Engineer to Engineer to Senior Engineer (1983-1994), Staff Engineer (1995-1999), Engineer III (2000-2010), Consulting Engineer (2011-2017), and Principal Engineer (2018-present). All of his positions have been in the Structural Engineering section of the Company's Electric Transmission department.

Witness Direct Testimony Summary

Witness: Sarah Rana

Title: Engineer III – Electric Transmission Planning

Summary:

Company Witness Sarah Rana will adopt and sponsor those portions of the Appendix describing the Company's transmission system and the need for, and benefits of, the proposed projects, as follows:

- Section I.C: This section describes the present system and details how the proposed projects will effectively satisfy present and projected future load demand requirements.
- Section I.D: Although not applicable to the proposed Rebuild Projects, this section describes critical contingencies and associated violations due to the inadequacy of the existing system.
- Section I.E: Although not applicable to the proposed Rebuild Projects, this section explains feasible project alternatives.
- Section I.G: This section provides a system map for the affected area.
- Section I.H: This section provides the desired in-service date of the proposed projects and the estimated construction time.
- Section I.J: Although not applicable to the proposed Rebuild Projects, this section provides information about the project if it has been approved by the RTO.
- Section I.K: Although not applicable to the proposed Rebuild Projects, this section provides outage history and maintenance history for existing transmission lines if the proposed project is a rebuild and is due in part to reliability issues.
- Section I.M: Although not applicable to the proposed Rebuild Projects, this section, when applicable, contains information for transmission lines interconnecting a non-utility generator.
- Section II.A.3: This section provides colored maps of existing or proposed rights-of-way in the vicinity of the proposed project.
- Section II.A.10: This section provides details of the construction plans for the proposed project, including requested and approved line outage schedules.

Additionally, Company Witness Rana adopts and co-sponsors the following portion of the Appendix:

- Section I.A (co-sponsored with Company Witness Furmose J. Gomez): This section details the primary justifications for the proposed project.
- Section I.L (co-sponsored with Company Witness Furmose J. Gomez): This section provides details on the deterioration of structures and associated equipment as applicable.

A statement of Ms. Rana's background and qualifications is attached to her testimony as Appendix A.

**DIRECT TESTIMONY
OF
SARAH RANA
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2018-00090**

1 **Q. Please state your name, position, and business address.**

2 A. My name is Sarah Rana, and I am an Engineer III in the Electric Transmission Planning
3 department of Virginia Electric and Power Company (“Dominion Energy Virginia” or the
4 “Company”). A statement of my qualifications and background is provided as Appendix
5 A.

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

7 A. I am responsible for planning the Company’s electric transmission system for voltages of
8 69 kilovolt (“kV”) through 500 kV.

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

10 A. In order to maintain the structural integrity and reliability of its transmission system and
11 perform needed maintenance on its existing facilities, Dominion Energy Virginia
12 proposes to rebuild, entirely within existing right-of-way, four separate segments of its
13 existing Lanexa-Northern Neck Line #224 230 kV transmission line in King and Queen,
14 King William, and New Kent Counties based on the condition of the foundations and
15 structures.

16 In the four separate segments, the Company proposes to: (i) remove and replace nine
17 structures and foundations spanning the Pamunkey River and crossing adjacent tidal
18 marshlands (the “Pamunkey River Rebuild”); (ii) remove and replace seven structures

1 and foundations spanning the Mattaponi River and crossing adjacent tidal marshlands
2 (the “Mattaponi River Rebuild”); (iii) remove and replace two double circuit COR-
3 TEN^{®1} lattice structures and two adjacent wood H-frame structures, which are currently
4 supporting a single transmission circuit, and foundations on the existing 230 kV Line
5 #224 crossing Interstate 64 in New Kent County west of the intersection of I-64 and
6 Route 3 (the “I-64 Rebuild”); and (iv) remove and replace one double circuit COR-TEN[®]
7 lattice structure, which is currently supporting one transmission circuit for Line #224 and
8 another for Line #2016, and foundation, with two DDE 2-pole structures and foundations
9 (the “Diascund Rebuild”) (collectively, the Pamunkey River Rebuild, Mattaponi River
10 Rebuild, I-64 Rebuild, and Diascund Rebuild are referred to as the “Line #224 Partial
11 Rebuild Projects” or the “Rebuild Projects”).

12 The purpose of my testimony is to describe the Company’s transmission system and the
13 need for, and benefits of, the proposed Line #224 Partial Rebuild Projects. I am
14 sponsoring Sections I.C, I.D, I.E, I.G, I.H, I.J, I.K, I.M, II.A.3, and II.A.10 of the
15 Appendix. Additionally, I am co-sponsoring Sections I.A and I.L of the Appendix with
16 Company Witness Furmose J. Gomez.

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

18 **A.** Yes, it does.

¹ Registered trademark of the United States Steel Corporation.

**BACKGROUND AND QUALIFICATIONS
OF
SARAH RANA**

Sarah Rana graduated from Minnesota State University with a Bachelor's Degree in Electrical Engineering in 2006. She started with the Company in January 2007 as an Engineer I in the Substation Engineering Department in the role of System Protection. Since then, Ms. Rana's experience has included System Protection, Transmission System Operations Reliability, Transmission System Operations Planning, and Transmission Planning. She was promoted to Engineer III in July 2013 when she started her present job in the Electric Transmission Planning Department.

Witness Direct Testimony Summary

Witness: Furmose J. Gomez

Title: Transmission Line Engineer – Electric Transmission Line Engineering

Summary:

Company Witness Furmose J. Gomez will sponsor those portions of the Appendix providing an overview of the design of the overhead transmission line components of the proposed electric transmission facilities from a transmission line engineering perspective, as follows:

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

Additionally, Company Witness Gomez adopts and co-sponsors the following portions of the Appendix:

- Section I.A (co-sponsored with Company Witness Sarah Rana): This section details the engineering justifications for the proposed projects.
- Section I.I (co-sponsored with Company Witness W. Chase Bland): This section provides the estimated total cost of the proposed projects.
- Section I.L (co-sponsored with Company Witness Sarah Rana): This section provides details on the deterioration of structures and associated equipment as applicable.

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

**DIRECT TESTIMONY
OF
FURMOSE J. GOMEZ
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2018-00090**

1 **Q. Please state your name, position, and business address.**

2 A. My name is Furmose J. Gomez, and I am a Transmission Line Engineer in the Electric
3 Transmission Line Engineering Department of the Company. My business address is
4 One James River Plaza, 701 East Cary Street, Richmond, Virginia 23219. A statement
5 of my qualifications and background is provided as Appendix A.

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

7 A. I am responsible for the estimating and conceptual design on high voltage transmission
8 line projects from 69 kilovolt (“kV”) to 500 kV.

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

10 A. In order to maintain the structural integrity and reliability of its transmission system and
11 perform needed maintenance on its existing facilities, Dominion Energy Virginia
12 proposes to rebuild, entirely within existing right-of-way, four separate segments of its
13 existing Lanexa-Northern Neck Line #224 230 kV transmission line in King and Queen,
14 King William, and New Kent Counties based on the condition of the foundations and
15 structures.

16 In the four separate segments, the Company proposes to: (i) remove and replace nine
17 structures and foundations spanning the Pamunkey River and crossing adjacent tidal
18 marshlands (the “Pamunkey River Rebuild”); (ii) remove and replace seven structures

1 and foundations spanning the Mattaponi River and crossing adjacent tidal marshlands
2 (the “Mattaponi River Rebuild”); (iii) remove and replace two double circuit COR-
3 TEN^{®1} lattice structures and two adjacent wood H-frame structures, which are currently
4 supporting a single transmission circuit, and foundations on the existing 230 kV Line
5 #224 crossing Interstate 64 in New Kent County west of the intersection of I-64 and
6 Route 3 (the “I-64 Rebuild”); and (iv) remove and replace one double circuit COR-TEN[®]
7 lattice structure, which is currently supporting one transmission circuit for Line #224 and
8 another for Line #2016, and foundation, with two DDE 2-pole structures and foundations
9 (the “Diascund Rebuild”) (collectively, the Pamunkey River Rebuild, Mattaponi River
10 Rebuild, I-64 Rebuild, and Diascund Rebuild are referred to as the “Line #224 Partial
11 Rebuild Projects” or the “Rebuild Projects”).

12
13 The purpose of my testimony is to describe the design characteristics of the transmission
14 facilities for the proposed Line #224 Partial Rebuild Projects, and also to discuss electric
15 and magnetic field (“EMF”) levels for the Rebuild Projects. I am sponsoring Sections
16 I.F, II.A.5, II.B.1 to II.B.5, and IV of the Appendix. I am also co-sponsoring Sections I.A
17 and I.L of the Appendix with Company Witness Sarah Rana and Section I.I of the
18 Appendix with Company Witness W. Chase Bland.

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

20 **A.** Yes, it does.

¹ Registered trademark of the United States Steel Corporation.

**BACKGROUND AND QUALIFICATIONS
OF
FURMOSE J. GOMEZ**

Furmose J. Gomez graduated from North Carolina Agricultural & Technical State University in 2005 with a Bachelor of Science in Civil Engineering. He joined the Company in 2008 and has held various engineering titles within the Electric Transmission Engineering department, where he currently works as a Transmission Line Engineer.

Witness Direct Testimony Summary

Witness: W. Chase Bland

Title: Conceptual Engineer – Substation Engineering

Summary:

Company Witness W. Chase Bland sponsors or co-sponsors the following portions of the Appendix describing the work to be performed at existing substations, as follows:

- Section I.N: This section provides the proposed and existing generating sources, distribution circuits or load centers planned to be served by all new substations, switching stations, and other ground facilities associated with the proposed projects.
- Section II.C: This section describes and furnishes plan drawings of the substation, switching station, and other ground facilities associated with the proposed projects.

Additionally, Company Witness Gomez adopts and co-sponsors the following portions of the Appendix:

- Section I.I (co-sponsored with Company Witness Furmose J. Gomez): This section provides the estimated total cost of the proposed projects.

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

**DIRECT TESTIMONY
OF
W. CHASE BLAND
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2018-00090**

1 **Q. Please state your name, position, and business address.**

2 A. My name is W. Chase Bland, and I am a Conceptual Engineer in the Substation
3 Engineering section of the Electric Transmission group of the Company. My business
4 address is 2400 Grayland Avenue, Richmond, Virginia 23220. A statement of my
5 qualifications and background is provided as Appendix A.

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

7 A. I am responsible for conceptual design, scope development, and cost estimating for all
8 new high voltage transmission switching stations, transmission substations, and
9 distribution substations.

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

11 A. In order to maintain the structural integrity and reliability of its transmission system and
12 perform needed maintenance on its existing facilities, Dominion Energy Virginia
13 proposes to rebuild, entirely within existing right-of-way, four separate segments of its
14 existing Lanexa-Northern Neck Line #224 230 kV transmission line in King and Queen,
15 King William, and New Kent Counties based on the condition of the foundations and
16 structures.

17 In the four separate segments, the Company proposes to: (i) remove and replace nine
18 structures and foundations spanning the Pamunkey River and crossing adjacent tidal

1 marshlands (the “Pamunkey River Rebuild”); (ii) remove and replace seven structures
2 and foundations spanning the Mattaponi River and crossing adjacent tidal marshlands
3 (the “Mattaponi River Rebuild”); (iii) remove and replace two double circuit COR-
4 TEN^{®1} lattice structures and two adjacent wood H-frame structures, which are currently
5 supporting a single transmission circuit, and foundations on the existing 230 kV Line
6 #224 crossing Interstate 64 in New Kent County west of the intersection of I-64 and
7 Route 3 (the “I-64 Rebuild”); and (iv) remove and replace one double circuit COR-TEN[®]
8 lattice structure, which is currently supporting one transmission circuit for Line #224 and
9 another for Line #2016, and foundation, with two DDE 2-pole structures and foundations
10 (the “Diascund Rebuild”) (collectively, the Pamunkey River Rebuild, Mattaponi River
11 Rebuild, I-64 Rebuild, and Diascund Rebuild are referred to as the “Line #224 Partial
12 Rebuild Projects” or the “Rebuild Projects”).

13 The purpose of my testimony is to sponsor Sections I.N and II.C of the Appendix and to
14 co-sponsor Section I.I of the Appendix with Company Witness Furmose J. Gomez

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

16 **A.** Yes, it does.

¹ Registered trademark of the United States Steel Corporation.

**BACKGROUND AND QUALIFICATIONS
OF
W. CHASE BLAND**

W. Chase Bland graduated in 2008 with a Bachelor's Degree in Mechanical Engineering and Minor in Mathematics and Physics from Virginia Commonwealth University. He is registered as an Engineer in Training in the Commonwealth of Virginia as of 2013. From 2008 to 2010, he worked for the Company in the Substation Engineering (Physical Design) Department where he held the position of Engineer I for substation upgrade construction projects. In 2010, he was promoted to Engineer II in the Substation Engineering (Physical Design) Department where he expanded the scope of projects to include substation build-outs, upgrades, and new substations. In 2014, he was promoted to Engineer III in the Substation Engineering (Physical Design) Department. His responsibilities in all three positions included working closely with construction crews to communicate detailed drawings clearly to execute a project successfully and ensuring that the crews had all physical material correctly specified and on site on time. In 2015, Mr. Bland became a Conceptual Engineer (Engineer III) in the Conceptual Engineering Department. His responsibilities include conceptual design, scope development, and cost estimating for substation construction for the Company.

Mr. Bland has previously testified before the State Corporation Commission of Virginia.

Witness Direct Testimony Summary

Witness: John A. Mulligan

Title: Senior Siting and Permitting Specialist

Summary:

Company Witness John Mulligan sponsor those portions of the Appendix providing an overview of the design of the route for the proposed projects, as follows:

- Section II.A.1: This section provides the length of the proposed corridor and viable alternatives to the proposed projects.
- Section II.A.2: This section provides a map showing the route of the proposed project in relation to notable points close to the proposed projects.
- Section II.A.4: Although not applicable to the proposed projects, this section, when applicable, explains why the existing right-of-way is not adequate to serve the need.
- Section II.A.6 to II.A.8: These sections provide detail regarding the right-of-way for the proposed projects.
- Section II.A.9: This section describes the proposed route selection procedures and details alternative routes considered.
- Section II.A.11: This section details how the construction of the proposed projects follows the provisions discussed in Attachment 1 of the Guidelines.
- Section II.A.12: This section identifies the counties and localities through which the proposed projects will pass and provides General Highway Maps for these localities.
- Section II.B.6: This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section III: This section details the impact of the proposed projects on scenic, environmental, and historic features.
- Section V: This section provides information related to public notice of the proposed projects.

Additionally, Mr. Mulligan sponsors the DEQ Supplement provided as part of the Company's Application.

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

**DIRECT TESTIMONY
OF
JOHN A. MULLIGAN
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2018-00090**

1 **Q. Please state your name, position, and business address.**

2 A. My name is John Mulligan, and I am Senior Siting and Permitting Specialist for Virginia
3 Electric and Power Company (“Dominion Energy Virginia” or the “Company”). My
4 office is located at 701 East Cary Street, Richmond, Virginia 23219. A statement of my
5 qualifications and background is provided as Appendix A.

6 **Q. What are your responsibilities as Senior Siting and Permitting Specialist?**

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

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

14 A. In order to maintain the structural integrity and reliability of its transmission system and
15 perform needed maintenance on its existing facilities, Dominion Energy Virginia
16 proposes to rebuild, entirely within existing right-of-way, four separate segments of its
17 existing Lanexa-Northern Neck Line #224 230 kV transmission line in King and Queen,

1 King William, and New Kent Counties based on the condition of the foundations and
2 structures.

3 In the four separate segments, the Company proposes to: (i) remove and replace nine
4 structures and foundations spanning the Pamunkey River and crossing adjacent tidal
5 marshlands (the “Pamunkey River Rebuild”); (ii) remove and replace seven structures
6 and foundations spanning the Mattaponi River and crossing adjacent tidal marshlands
7 (the “Mattaponi River Rebuild”); (iii) remove and replace two double circuit COR-
8 TEN^{®1} lattice structures and two adjacent wood H-frame structures, which are currently
9 supporting a single transmission circuit, and foundations on the existing 230 kV Line
10 #224 crossing Interstate 64 in New Kent County west of the intersection of I-64 and
11 Route 3 (the “I-64 Rebuild”); and (iv) remove and replace one double circuit COR-TEN[®]
12 lattice structure, which is currently supporting one transmission circuit for Line #224 and
13 another for Line #2016, and foundation, with two DDE 2-pole structures and foundations
14 (the “Diascund Rebuild”) (collectively, the Pamunkey River Rebuild, Mattaponi River
15 Rebuild, I-64 Rebuild, and Diascund Rebuild are referred to as the “Line #224 Partial
16 Rebuild Projects” or the “Rebuild Projects”).

17 The purpose of my testimony is to provide an overview of design of the route for the
18 proposed Line #224 Partial Rebuild Projects. I am sponsoring Sections II.A.1, II.A.2,
19 II.A.4, II.A.6 to II.A.8, II.A.9, II.A.11, II.A.12, II.B.6, III, and V of the Appendix. I am
20 also sponsoring the DEQ Supplement provided as part of the Company’s Application.

¹ Registered trademark of the United States Steel Corporation.

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

2 A. Yes. Letters dated March 29, 2018 were delivered to the County Administrators in each
3 municipality where the Line #224 Partial Rebuild Projects are located, including Ms.
4 Bobbie Tassinari of King William County, Mr. Rodney Hathaway of New Kent County,
5 and Mr. Thomas Swartzweider of King and Queen County, advising of the Company's
6 intention to file this Application and inviting the Counties to consult with the Company
7 about the Rebuild Projects. Copies of these letters are included as Appendix Attachment
8 III.J.1.

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

10 A. Yes, it does.

**BACKGROUND AND QUALIFICATIONS
OF
JOHN A. MULLIGAN**

John A. Mulligan graduated from Old Dominion University in 2000 with a Bachelor of Science in Biology. He joined the Company's Transmission Right-of-Way Group in June 2015 as a Senior Siting and Permitting Specialist, the position he currently holds. Prior to joining the Company, he worked as an Environmental Inspector for the County of Henrico from June 2005 to June 2015.