COMMONWEALTH OF VIRGINIA
STATE CORPORATION COMMISSION
DIVISION OF PUBLIC UTILITY REGULATION

REMAND STAFF TESTIMONY
ON THE
APPLICATION OF
VIRGINIA ELECTRIC AND POWER COMPANY
FOR APPROVAL AND CERTIFICATION OF
ELECTRIC TRANSMISSION FACILITIES:
HAYMARKET 230 kV DOUBLE-CIRCUIT TRANSMISSION LINE
AND 230-34.5 kV HAYMARKET SUBSTATION

Public Version

CASE NO. PUE-2015-00107

March 27, 2018

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PART A

Summary of the Remand Testimony of Staff Witness Joshipura

My remand testimony addresses the remand direct testimony of Dominion Energy Virginia ("DEV" or "Company") in its application to construct and operate electric facilities for a new 230-34.5 kV Haymarket Substation and a new 230 kV double transmission line from a tap point on a converted Line #124 to the new Haymarket Substation in Prince William County (collectively, "Project"). The following is a summary of my testimony:

- The Staff agrees with the Company that the existing distribution network in the Haymarket Load Area, operating at or near capacity as projected, is not adequate to support load growth in the Haymarket Load Area. Accordingly, the Staff believes that the Company has reasonably demonstrated the need for additional capacity into the Haymarket Load Area.
- Construction of a new distribution circuit to the Haymarket area, even if it were possible, is in Staff's opinion a less than optimal solution to the capacity needs of the area.
- Based on the information in the record, the Staff has found no reason to conclude that Buildings 2 and 3 of the Haymarket Campus will not be constructed.
- Due to the anticipated load growth in Haymarket Load Area and surrounding areas, and an existing transmission system within the area primarily comprising 230 kV transmission facilities, the Staff continues to believe that the proposed Project is the most optimal solution to support load growth in the Haymarket Load Area.

REMAND TESTIMONY
OF
NEIL JOSHIPURA

VIRGINIA ELECTRIC AND POWER COMPANY

CASE NO. PUE-2015-00107

Q1. PLEASE STATE YOUR NAME AND POSITION WITH THE STATE CORPORATION COMMISSION ("COMMISSION").

A1. My name is Neil Joshipura. I am a Senior Utilities Engineer in the Commission's Division of Public Utility Regulation.

Q2. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY IN THIS PROCEEDING?

A2. Yes. I submitted pre-filed testimony on behalf of Commission Staff ("Staff") in this proceeding on June 2, 2016. I also testified at the evidentiary hearing on June 22, 2016.

Q3. WHAT IS THE PURPOSE OF YOUR REMAND TESTIMONY?

A3. My remand testimony addresses the remand direct testimony of Dominion Energy Virginia ("DEV" or "Company") in its application to (i) convert its existing 115 kilovolt ("kV") Gainesville-Loudoun Line #124, located in Prince William and Loudoun Counties, to 230 kV operation; (ii) construct in Prince William County and the Town of Haymarket, a new 230 kV double circuit transmission line from a tap point approximately 0.5 mile north of the Company's existing Gainesville Substation on the converted Line #124 to a new 230-34.5 kV Haymarket

Substation; and (iii) construct a 230-34.5 kV Haymarket Substation (collectively, the "Project").

Specifically, I will address the continuing need for the Project and the updated cost estimates related to the routes and route variations proposed by the Company.

Q4. IS THE EXISTING DISTRIBUTION INFRASTRUCTURE ADEQUATE TO SUPPORT LOAD GROWTH IN THE HAYMARKET LOAD AREA?

A4. No. The Haymarket Load Area, which encompasses the area west of Route 29 and paralleling Route 50 and Heathcote Boulevard, is currently served by three 34.5 kV distribution circuits ("DC")—DCs #379, #695, and #378.[1] These three circuits have a total capacity of 126 megavolt-amperes ("MVA").[2] Company Witness Potter provided a table depicting the existing and subscribed load on these three DCs.[3] A copy of the table is provided below.

Circuit	Actual 2017 Peak Load (MVA)	Max Capacity (MVA)
DC #379	30.7	36
DC #695	35.7	36
DC #378	45.7	54
Total	112.1	126

Table 1: Existing Distribution Circuits

These numbers include customers that have historically been served by these circuits, and VADATA, Inc.'s, (the "Customer") two operational data center buildings: Building 0 (*i.e.*, the building that is adjacent to the Haymarket data center campus ("Haymarket Campus")) and Building 1 (*i.e.*, the first of the new buildings

[1] Remand Direct Testimony of Harrison Potter at 2-3.
[2] *Id* at 3.
[3] *Id.*

on the Haymarket Campus). As such, it is important to note that based on the existing load in the area served by these three circuits, only approximately 13.9 MVA of available capacity exists for future load growth in the Haymarket Load Area.[4]

According to the Company, even if Buildings 2 and 3 of the Haymarket Campus are not constructed, based on the estimated additional load associated with (i) projects that are currently in the Company's distribution design or construction queue, and (ii) other projects that have been publicly discussed, such as the Home Depot and Carter's Mill Residential Development, the available capacity on these three DCs is projected to be reduced further to approximately 3.65 MVA in 2019.[5]

According to the Company's Response to Staff Interrogatory No. 6-49,[6] in the hypothetical scenario that Buildings 2 and 3 are never constructed, the Company forecasts that DC #695 would overload in 2018 and DCs #378 and #379 would be loaded to 89% and 96%, respectively, in 2018. The Company states that continued operation of a distribution network at or near capacity, as in this projection, is not prudent utility practice.[7]

The Staff agrees with the Company that the distribution network in the Haymarket Load Area, operating at or near capacity as projected, is not adequate to support load growth in the Haymarket Load Area. Accordingly, the Staff believes that the Company has reasonably demonstrated the need for additional capacity into the Haymarket Load Area.

[4] 126 MVA (Max. Capacity) minus 112.1 MVA (2017 Peak) = 13.9 MVA Available Capacity
[5] Remand Direct Testimony of Harrison Potter at 6 and 9.
[6] Attachment 1 to Staff Remand Testimony.
[7] Company Response to Staff Interrogatory No. 6-49.

Q5. CAN THE CONSTRUCTION OF AN ADDITIONAL DISTRIBUTION CIRCUIT TO THE HAYMARKET LOAD AREA SUFFICIENTLY SUPPORT THE EXISTING AND SUBSCRIBED LOAD IN A RELIABLE MANNER?

A5. According to the Company's Response to Staff Interrogatory No. 6-51,[8] constructing an additional distribution circuit to the Haymarket Load Area is technically feasible from a thermal and capacity standpoint. However, there are certain operational drawbacks, to be discussed, that outweigh the technical feasibility benefit of this approach.

Currently, Building 0 is served by DCs #379 and #695 and Building 1 is served by DC #378. After constructing an additional theoretical distribution circuit, Building 0 would be primarily served by the new circuit, and Building 1 would be served by the existing DC #378. As such, this new circuit would relieve loading on DCs #379 and #695. Provision of this extra distribution circuit means additional capacity would become available in the Haymarket Load Area, providing the Company with greater flexibility to shift loads around in the event of a circuit outage. In particular, the Company would now be generally able to operate a "switch-before-fix" strategy that switches load from circuits experiencing a fault, to adjacent circuits, to quickly restore electricity. However, due to the heavy load drawn by the data centers, in the event of an outage occurring specifically on one of the circuits feeding the data center buildings, the ability to switch the Customer's load onto another feed may be limited based on the amount of capacity available

[8] Attachment 2 to Staff Remand Testimony.

on neighboring distribution circuits at the time of the outage. In other words, the Company cannot guarantee that all the Customer's load could be fully restored under certain conditions, even with an additional circuit.

Furthermore, the Company notes that constructing a new six-mile distribution circuit out of the Company's Gainesville Substation would require a new circuit path on new right-of-way from the Gainesville Substation to the Haymarket Load Area. Currently, the Company has two circuit paths to the Haymarket Load Area. In the first path, DC #379 and DC #695 are collocated on a double-circuit pole line, so any new circuit along this path would require triple-circuit pole lines. According to the Company, it does not build triple-circuit pole lines for significant mileage, so it would not prefer to install the new circuit along this route.[9] In the second path, according to the Company, DC #378 is limited to a single circuit due to physical and rights-of-way constraints.[10] As such, construction of a new distribution circuit would require new rights-of-way.

Even if the Company could obtain the necessary easements for a new distribution circuit, the combination of the Customer's load demand at the Haymarket Campus, capacity limitations of the distribution circuits, and the increased line exposure to outage events along four long distribution circuits, could result in a reduction in reliability in the Haymarket Load Area.

Finally, an additional distribution circuit to the Haymarket Load Area will not be sufficient to provide service to Buildings 2 and 3 of the Haymarket Campus,

[9] Company's Response to Staff Interrogatory No. 6-51.
[10] *Id.*

if constructed, because the total projected load in the Haymarket Load Area would exceed the maximum capacity of the four distribution circuits.[11]

In summary, construction of a new distribution circuit to the Haymarket area, even if it were possible, is in Staff's opinion a less than optimal solution to the capacity needs of the area, because (1) in the absence of Buildings 2 and 3, the magnitude of the load demand of existing Buildings 0 and 1 creates a potential difficulty in switching that load onto neighboring circuits in the event of an outage on circuits serving those Buildings (*i.e.*, limited "switch-before-fix" capability); and (2) in the presence of Buildings 2 and 3, an additional circuit constructed to the Haymarket Load Area would be inadequate to meet the load demand of the area.

Conversely, a transmission source into the Haymarket Load Area would support load growth, relieve capacity constraints on existing distribution circuits, improve reliability by reducing distribution line exposure, and provide a long-term solution. The Staff therefore continues to believe that transmission facilities provide the most optimal solution for the Haymarket Load Area.

Q6. HAS THE COMPANY PROVIDED ANY ADDITIONAL INFORMATION PERTAINING TO THE STATUS OF BUILDINGS 2 AND 3?

A6. Yes. The status of Buildings 2 and 3 is summarized in a letter from VADATA, Inc., to the Company, dated January 3, 2018.[12] The letter is provided as Confidential Attachment 3. **[BEGIN CONFIDENTIAL]** [redacted]

[11] *Id.*

[12] Remand Direct Testimony of Harrison Potter, Confidential Schedule 1.

[redacted] [END CONFIDENTIAL]

Accordingly, while it would certainly be better if the Customer provided direct testimony to the Commission, based on the information in the record, the Staff has no reason to conclude that Buildings 2 and 3 of the Haymarket Campus will not be built.[13]

Furthermore, [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL] This is a reduction from the 160 MVA stated in the Company's original application.[14] However, this reduction does not eliminate the need for a transmission source into the Haymarket Load Area, as previously discussed.

Q7. DOES THE STAFF BELIEVE THAT THE PROPOSED PROJECT, A DOUBLE-CIRCUIT 230 kV TRANSMISSION LINE, IS THE MOST OPTIMAL SOLUTION TO SUPPORT LOAD GROWTH IN THE HAYMARKET LOAD AREA?

A7. Yes. Due to the dynamic nature of load growth in Haymarket Load Area and surrounding areas and an existing transmission system within the area primarily comprised of 230 kV transmission facilities, a 230 kV transmission line is the most prudent solution to provide the necessary capacity and operational flexibility.

[13] An update on the permitting status of Buildings 2 and 3 is provided in the Company's response to Staff Interrogatory No. 8-56 dated March 2, 2018. (*See* Attachment 4 to Staff Remand Testimony)
[14] Appendix to the Company's Application, dated November 6, 2015, at 2.

Furthermore, Buildings 0 and 1 are currently operational and have a combined full build-out demand of [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL]. According to the Company, an additional load of [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL] is expected to materialize in the Haymarket Load Area before 2019. As such, even without including the projected load of Buildings 2 and 3, there could potentially be a total load of approximately [BEGIN CONFIDENTIAL] [redacted] [END CONFIDENTIAL] in the Haymarket Load Area by 2019. Accordingly, the projected load for the Haymarket Load Area, excluding Buildings 2 and 3, would be approximately 85% of the Company-established planning criteria for a radial transmission line,[15] which has a 100 MW threshold.[16] Thus, it would be prudent to create a network feed to the Haymarket Substation by constructing a double-circuit transmission line to eliminate the potential violation of loading a radial line to more than 100 MW.

As such, Staff continues to believe that the proposed Project is the most optimal solution to support load growth in the Haymarket Load Area.

Q8. PROVIDE A COST COMPARISON OF THESE THREE ROUTES: (i) I-66 OVERHEAD ROUTE; (ii) I-66 HYBRID ROUTE; AND (iii) MADISON ROUTE.

A8. In response to Staff Interrogatory No. 7-55,[17] the Company provided several tables that included an updated cost breakdown of each of the three routes. These tables

[15] Radial transmission lines are lines that consist of a single line that originates in a substation, serves load, and does not tie to any other transmission line or substation.
[16] The Company maintains "Facility Interconnection Requirements," which include the Company's Planning Criteria. Section C.2.6 of the Planning Criteria requires that the load on a single source radial transmission line be limited to 100 MW.
[17] Attachment 5 to Staff Remand Testimony.

included, for each route: (a) the original cost estimate, (b) each variation and associated incremental cost differential from the original cost estimated caused by such variation, and (c) the calculated new cost estimate, which incorporates the Company's preferred variations. The table below summarizes the Company's updated cost breakdown.

Transmission Line Work	I-66 Overhead	I-66 Hybrid	Madison
Original Estimate ($ million)	$30.2	$111.3	$47.0
Variations ($ million)	$0.2	$5.2	$0.0
Updated Estimate ($ million)	$30.4	$116.5	$47.0
Total Cost (Transmission Line + Substation)	$51.2	$171.9	$67.8

Table 2: Cost Estimates for Routes

According to the Company, the updated variations will add $0.2 million to the cost of the I-66 Overhead Route and $5.2 million to the cost of the I-66 Hybrid Route, respectively. The Company does not currently propose any route variations associated with the Madison Alternative Route. A detailed description of the variations in these two routes and their associated impacts is provided in separate testimony filed concurrently by Wayne D. McCoy, the Staff's environmental consultant.

Q9. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS.

A9. The Staff concludes that the Company has reasonably demonstrated a need for additional capacity into the Haymarket Load Area. While a solution utilizing distribution facilities is technically feasible, in Staff's opinion, a distribution level solution is a less than optimal solution for the capacity needs of the Haymarket

Load area. As such, the Staff continues to believe transmission facilities provide the most optimal solution for the Haymarket Load Area.

Furthermore, due to an existing transmission system within the area primarily comprised of 230 kV transmission facilities and the dynamic nature of load growth in Haymarket Load Area and surrounding areas, the Staff continues to believe that the proposed Project is the most prudent long-term solution.

Q10. DOES THIS CONCLUDE YOUR TESTIMONY?

A10. Yes.

ATTACHMENTS

Attachment 1

Company's Response to Staff Interrogatory No. 6-49

Virginia Electric and Power Company
Case No. PUE-2015-00107
Virginia State Corporation Commission Staff
Sixth Set

The following response to Question No. 49 of the Sixth Set of Interrogatories and Requests for Production of Documents Propounded by the Virginia State Corporation Commission Staff received on December 19, 2017 has been prepared under my supervision.

Harrison S. Potter
Engineer III
Dominion Energy Virginia

The following response to Question No. 49 of the Sixth Set of Interrogatories and Requests for Production of Documents Propounded by the Virginia State Corporation Commission Staff received on December 19, 2017 has been prepared under my supervision.

David J. Depippo
Senior Counsel
Dominion Energy Services, Inc.

Question No. 49

According to the Application, there are three 34.5 kV distribution circuits ("DC") serving the Haymarket load area: DC#378, DC#379, and DC#695. Attachment I.B.2 to the Appendix of the Application shows the historical and projected loads for these three 34.5 kV DCs. Provide separate, updated tables that incorporate any anticipated new loads (*e.g.*, Carter's Mill) on these three circuits, and identify when each circuit is projected to experience an overload condition for the following two scenarios:

(a) Buildings 2 and 3 are never placed into service;

(b) Buildings 2 and 3 are placed into service by the Company's updated in-service date.

Response:

(a) The Company objects to this request to the extent it requires original work. Notwithstanding and subject to the foregoing objections, the Company provides the following response. The response below required original work and presents a hypothetical. See the below chart for the load projections for DC#378, DC#379, and DC#695. Please note, these projections exclude any additional data center load growth from the existing buildings, as well as the hypothetical presented in the question that Buildings 2 and 3 are never placed into service. In the hypothetical scenario that Building 2 and Building 3 are never placed into service, DC#695 will overload in 2018 with the existing and subscribed load on the circuit. DC#378 will be loaded to 89% and DC#379 will be loaded to 96% in 2018.

	NOL (MVA)	2016	2017	2018	2019	2020	2021	2022	2023	2024
Gainesville TX#1	**84**	**44.2**	**44.6**	**48.5**	**48.8**	**49.1**	**49.3**	**49.6**	**49.9**	**50.1**
379	36	30.4	30.7	34.5	34.6	34.7	34.8	34.9	35.1	35.2
380	36	13.8	13.9	14.1	14.2	14.4	14.5	14.6	14.8	14.9

Gainesville TX#4	**84.0**	**79.7**	**81.4**	**83.9**	**87.8**	**88.1**	**88.5**	**88.9**	**89.2**	**89.6**
378	54	44.3	45.7	47.8	51.6	51.8	52.0	52.2	52.4	52.6
695	36	35.4	35.7	36.1	36.2	36.4	36.5	36.7	36.8	36.9

Continued operation of a distribution network at or near capacity is not prudent utility practice.

The Company objects to this request because it calls for a hypothetical and is vague. The question presumes that Buildings 2 and 3 are placed into service past the dates anticipated by the Customer. Buildings 2 and Buildings 3 cannot be served until Haymarket Substation is energized. See the Remand Direct Testimony of Company Witness Potter which notes that the revised need date for the Project is June 1, 2019, but the I-66 Overhead Route is anticipated to take 20-24 months to construct from Final Order while the Hybrid Route is anticipated to take 32-36 months from Final Order. Either route will result in the Haymarket Transmission Line being completed later than the revised need date. Assuming a Commission Final Order by June 1, 2018, the I-66 Overhead Route could be placed in-service in 1Q or 2Q 2020, with the Hybrid Route being placed into service in 1Q or 2Q 2021.

Attachment 2

Company's Response to Staff Interrogatory No. 6-51

Virginia Electric and Power Company
Case No. PUE-2015-00107
Virginia State Corporation Commission Staff
Sixth Set

The following response to Question No. 51 of the Sixth Set of Interrogatories and Requests for Production of Documents Propounded by the Virginia State Corporation Commission Staff received on December 19, 2017 has been prepared under my supervision.

Harrison S. Potter
Engineer III
Dominion Energy Virginia

The following response to Question No. 51 of the Sixth Set of Interrogatories and Requests for Production of Documents Propounded by the Virginia State Corporation Commission Staff received on December 19, 2017 has been prepared under my supervision as it pertains to legal matters.

/s/ David J. DePippo

David J. Depippo
Senior Counsel
Dominion Energy Services, Inc.

Question No. 51

Please describe the feasibility of adding an additional distribution circuit to the Haymarket load area from the Gainesville Substation to serve as an alternate feed to the currently operational data center buildings. Include the cost, reliability, constructability, and environmental impacts of this alternative. If this additional distribution circuit is feasible, would that allow the Company to operate a "switch-before-restore" method for the currently operational data center buildings?

Response:

The Company objects to this request to the extent it would require original work. Notwithstanding and subject to the foregoing objections, the Company provides the following response.

A new distribution circuit out of Gainesville Substation would require a new circuit path from Gainesville Substation to the Haymarket Load Area. Currently, Dominion Energy Virginia has

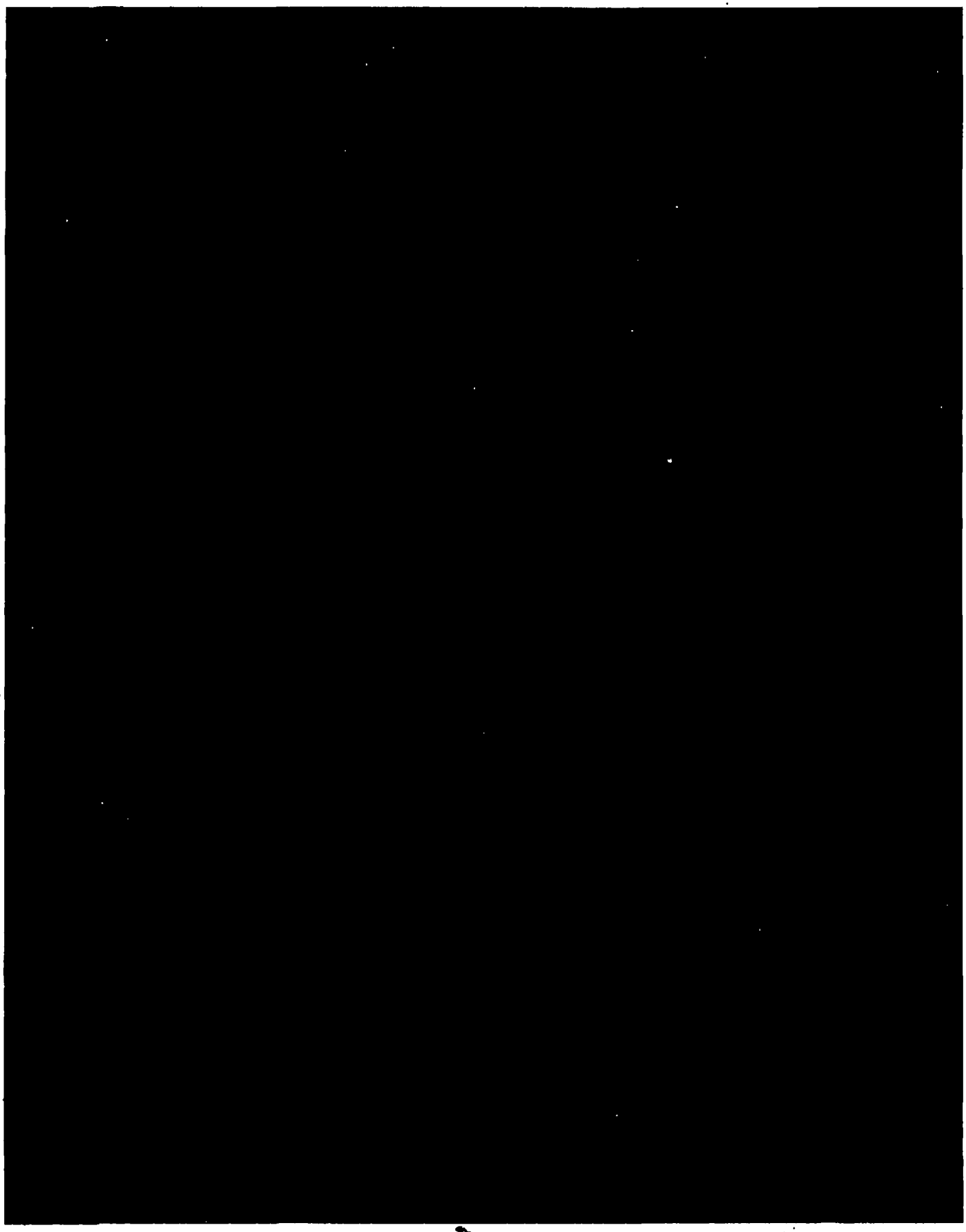
two circuit paths to Haymarket. DC#379 and DC#695 are already on a double circuit pole line and Dominion Energy Virginia does not triple build pole lines for significant mileage. The Company's distribution planning group inquired during the design and construction phase of DC#378 to build a second circuit and it was determined that due to physical and rights-of-way constraints the route was limited to a single circuit. See also Section 1.B of the Appendix.

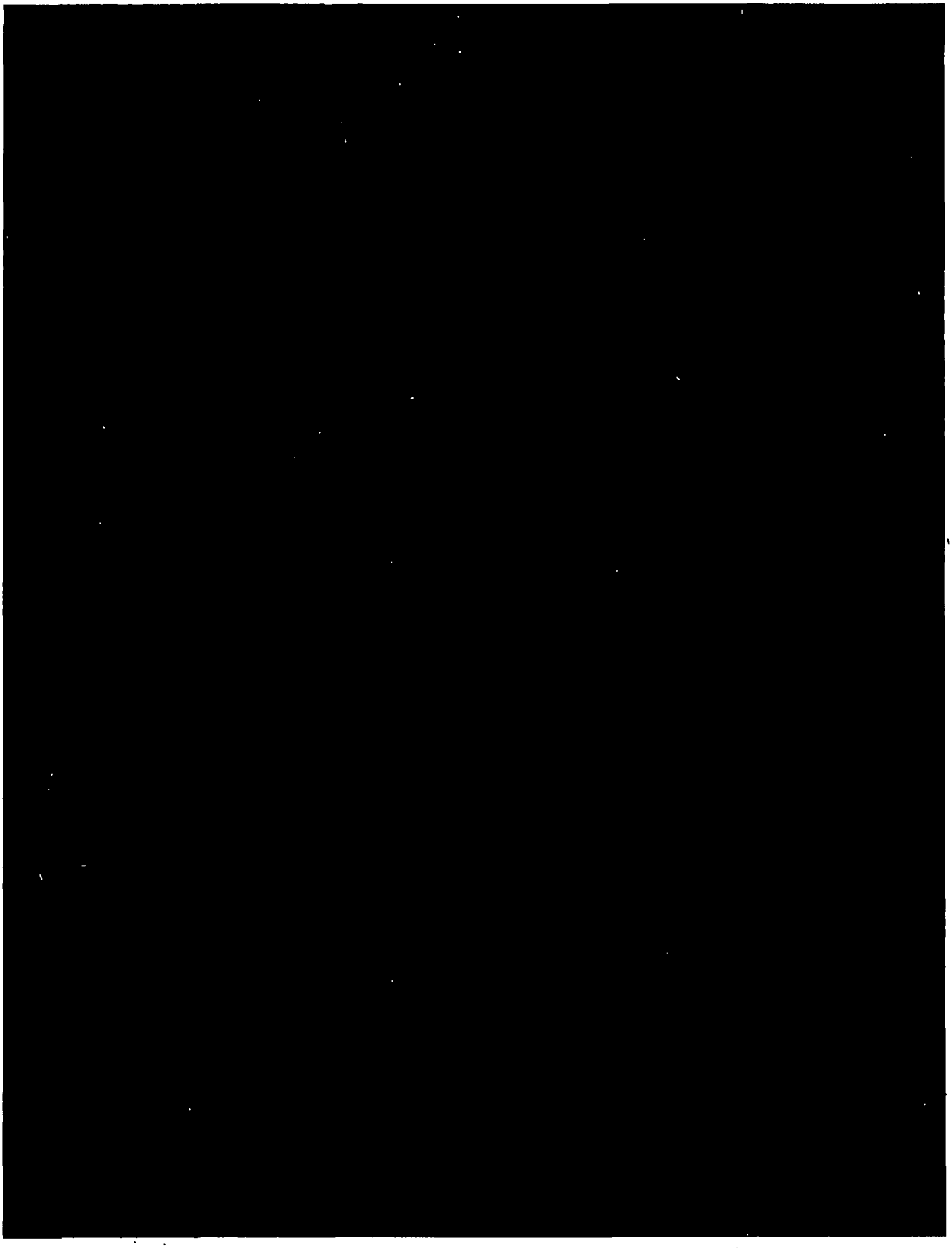
Assuming the Company was able to obtain all of the necessary easements for a new six-mile long distribution feeder from Gainesville to the Haymarket site, the plan would relieve Gainesville DC #378 and DC#695 of a portion of its Building 0 responsibility assuming the Company builds a traditional 36 MVA circuit. Thermally, this solution would work; however, prudent utility practice would not recommend installing six-mile long circuits to feed a load center. See fn. 8 of the Appendix. Using Gainesville to serve the Haymarket data center campus was always meant to be a temporary solution to power the Customer until a permanent substation solution could be permitted and constructed.

Additionally, the construction of an additional distribution circuit to the Haymarket Load Area would not support service to Buildings 2 and 3 of the Haymarket data center campus.

Attachment 3

VADATA Inc. Letter dated January 3, 2018





Attachment 4

Company's Response to Staff Interrogatory No. 8-56

Virginia Electric and Power Company
Case No. PUE-2015-00107
Virginia State Corporation Commission Staff
Eighth Set

The following response to Question No. 56 of the Eighth Set of Interrogatories and Requests for Production of Documents Propounded by the Virginia State Corporation Commission Staff received on February 21, 2018, has been prepared under my supervision.

Valerie M. Chafee for
David J. DePippo
Senior Counsel
Dominion Energy Services, Inc.

Question No. 56

With respect to all required permits (federal, state, and local) for the unconstructed buildings on the Haymarket Campus, please provide an update as to the current status of such permits, as well as continual updates as soon as they become available during the course of this proceeding.

Response:

The following is an update from VADATA, Inc. (the "Owner") regarding the status of federal, state, and local permits required to build the unconstructed buildings depicted on the approved site plan (the "Buildings") at the Midwood site (the "Site") in Haymarket.

Federal Permits: The U.S. Army Corps of Engineers (the "Corps") must issue a Clean Water Act Section 404 permit (the "Corps Permit") before the Owner can construct the Buildings on the Site. Pursuant to Section 106 of the National Historic Preservation Act, the Corps initiated a consultation concerning mitigation of the impact of the "Project" (as defined by the Corps) on the Buckland Mills Battlefield. On March 8, 2017, the Corps convened a meeting of all parties that desired to participate in the Section 106 consultation. On January 29, 2018, the Corps circulated to the consulting parties for their review and comment a draft Memorandum of Agreement ("MOA"), pursuant to which the Owner proposed certain terms to mitigate the impact of the Project on the Buckland Mills Battlefield. The Corps required the consulting parties to submit their comments by close of business on March 1, 2018. The Corps will forward any comments to the Owner for review and, if necessary, propose revisions to the MOA. Upon ratification of the MOA by the signatories thereto, the Corps will conclude the Section 106 consultation and issue the Corps Permit.

State Permits: A Virginia Stormwater Management Permit and a Virginia Water Protection Permit have been issued for the Site.

Local Permits: Prince William County approved the site plan for the Buildings, subject to issuance of federal and state wetlands permits, and issued a Land Disturbance Permit for the Site. Upon issuance of the Corps Permit, the Owner will submit a building permit application with Prince William County.

Attachment 5

Company's Response to Staff Interrogatory No. 7-55

Virginia Electric and Power Company
Case No. PUE-2015-00107
Virginia State Corporation Commission Staff
Seventh Set

The following response to Question No. 55 of the Seventh Set of Interrogatories and Requests for Production of Documents Propounded by the Virginia State Corporation Commission Staff received on January 16, 2018 has been prepared under my supervision.

Matthew E. Rudd
Project Engineer
Dominion Energy Technical Solutions, Inc.

The following response to Question No. 55 of the Seventh Set of Interrogatories and Requests for Production of Documents Propounded by the Virginia State Corporation Commission Staff received on January 16, 2018 has been prepared under my supervision.

Robert J. Shevenock II
Principal Engineer
Dominion Energy Technical Solutions, Inc.

Question No. 55

For the 1-66 Overhead, Madison, and 1-66 Hybrid routes described in Company Witness Berkin's remand direct testimony, please provide updated cost estimates for each route. Specifically, for each route, provide a table that includes the following information, as applicable:

(a) The original cost estimate of each individual route.
(b) Each variation and associated incremental cost differential from the original cost estimate caused by such variation. Please highlight the Company's preferred variations.
(c) The calculated new cost estimate for each route, which incorporates the Company's preferred variations.

Response:

See the table below for the requested cost estimate information. These cost estimates are for the transmission line portion of each route only, and do not include costs related to construction of the Haymarket Substation or for the switching station required for the I-66 Underground Route.

As to subpart (b) of this Request, the Company's preferred variations for each route are those presented in the Remand Direct Testimony of Company Witness Jon M. Berkin. No other variations are preferred.

	I-66 OH	Madison[6]	I-66 Hybrid OH Section	I-66 Hybrid UG Section
(a) Original Estimate	$30.2M	$47.0M	$15.3M	$96.0M
(b) Variations				
Jordan Lane[1]	+$0.2 M	*N/A*	*N/A*	*N/A*
FST Optimization[2]	$0.0	*N/A*	*N/A*	*N/A*
Walmart[3]	*N/A*	*N/A*	*N/A*	+$0.8M
I-66 OH Crossing[4]	$0.0	*N/A*	*N/A*	*N/A*
I-66 UG Crossing[5]	*N/A*	*N/A*	*N/A*	+$4.4M
(c) Updated Estimate	$30.4M	$47.0M	$15.3M	$101.2M

Notes:

1. The Jordan Lane variation is only for the I-66 Overhead Route and will result in one additional steel pole.
2. The FST Optimization Variation is only for the I-66 Overhead Route and will require the same quantity of poles.
3. The Walmart Variation is only for the I-66 Hybrid Route.
4. The preferred I-66 OH Crossing Variation will require the same quantity of poles.
5. The I-66 UG Crossing Variation applies only to the preferred I-66 Hybrid Route.
6. The Company does not advocate for selection of the Madison Alternative Route for the reasons stated in the Remand Direct Testimony of Company Witness Jon M. Berkin. Accordingly, the Company does not currently propose any route variations associated with the Madison Alternative Route.

PART B

Summary of the Remand Testimony of Staff Witness McCoy

My remand testimony addresses the remand direct testimony of Dominion Energy Virginia ("DEV" or "Company") in its application to construct and operate electric facilities for a new 230-34.5 kV Haymarket Substation and a new 230 kV double transmission line from a tap point on a converted Line #124 to the new Haymarket Substation in Prince William County (collectively, "Project"). The following is a summary of my testimony:

- MAE continues to recommend the I-66 Hybrid Alternative Route as the least environmentally impacting of the proposed routes.
- Dominion has submitted three modifications to the I-66 Hybrid Alternative Route, in an effort to reduce the critical angles in these locations.
- Additionally, Dominion has proposed two modifications of the Walmart Variation, in response to proposed development of the impacted parcels.
- MAE supports the three route modifications and either of the Walmart Variation modifications.

REMAND TESTIMONY
OF
WAYNE D. MCCOY

VIRGINIA ELECTRIC AND POWER COMPANY

CASE NO. PUE-2015-00107

Q1. PLEASE STATE YOUR NAME AND AFFILIATION.

A1. My name is Wayne D. McCoy. I am the President of Mid Atlantic Environmental LLC. ("MAE").

Q2. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A2. MAE was hired by the State Corporation Commission's Division of Public Utility Regulation to conduct an independent assessment of the Application filed in this case. MAE was tasked to review and evaluate the Haymarket Project's proposed routes and alternatives for the 230kV transmission line, the Haymarket 230kV Double Circuit Transmission Line and 230-34.5 kV Haymarket Substation.

Q3. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY IN THIS PROCEEDING?

A3. Yes. I submitted pre-filed testimony on June 2, 2016, regarding the comparative routing impacts in this case and offered an opinion on which route was the best option and had the least environmental impact. Additionally, I testified at the Evidentiary Hearing on June 22, 2016.

Q4. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A4. The purpose of this testimony is to provide remand direct testimony in this case.

Q5. PLEASE SUMMARIZE YOUR ANALYSIS OF THE VARIATIONS TO THE PROPOSED ROUTES.

A5. In my previous testimony, I supported the I-66 Hybrid Alternative Route as the least environmentally impacting route. This route is identified as being a total of 5.3 miles in length with approximately 3.2 miles of underground line. It lies parallel to I-66 for much of its underground alignment. Additionally, this alignment passes a significant number of residential structures. This visual impact was a contributing factor in support of this alternative versus the overhead/towered alignment. Subsequent to my testimony, Dominion introduced potential modifications of the I-66 Overhead Route and the I-66 Hybrid Alternative Route. The new proposed alignments and mapping are included in Jon Berkin's Remand Direct Testimony, filed on January 5, 2018.

The first modification is located between milepost 2.3 and milepost 2.5. This modification straightens the alignment and removes two angles.

The second is located between milepost 3.2 and milepost 3.3. This realignment removes a very sharp angle.

The third alteration involves the crossing I-66 by using directional drilling. This modification begins at milepost 4.1 and extends just past milepost 4.5. Previously, the proposed route paralleled Jordan Lane, prior to crossing Jefferson St. and turning south to cross perpendicular to I-66. The new modification proposes a diagonal horizontal drill under I-66. This alteration avoids the crossing of Jefferson Street and removes the critical angle at Walter Robinson Lane.

MAE previously supported the Walmart Variation, as it was less impacting to the corner of James Madison Highway and John Marshall Highway. Dominion is proposing two alternatives of this variation in response to proposed additional commercial development. MAE would support either of the proposed alternatives.

In summary, MAE supports the proposed modifications as identified by Dominion for the I-66 Hybrid Alternative Route.

We have reviewed the proposed modifications for the I-66 Overhead Route. Dominion identified a conservation easement held by the Department of Environmental Quality and the Army Corps of Engineers. The modification of the route places three noncontiguous towers inside the VDOT sound wall and easement beginning at milepost 3.4 and ending at milepost 3.56. One of the towers would be outside of the wall, between mileposts 3.53 and 3.75 and then the line would return to the inside of the wall for the remaining two structures. This modified Jordan Lane Variation route continues to the south of the original alignment, returning past milepost 3.9.

A modification, similar to the I-66 Hybrid Alternative Route, is seen beginning at milepost 4.1 and continuing past milepost 4.3. The purpose of this modification is to lessen the angle required to cross over I-66.

In coordination with Respondent FST Properties, LLC ("FST"), Dominion has offered an alternative that removes the line from the road frontage along John Marshall Highway and away from the undeveloped portion of the FST parcel. This modification would result in a western realignment beginning at milepost 4.5 and extending past John Marshall Highway to an area prior to milepost 4.7. The

proposed alignment then transitions to the west at a less critical angle behind the FST property, thus significantly reducing any impact to the FST property.

Based upon our updated analysis, MAE continue to recommend the I-66 Hybrid Alternative Route as the preferred route.

Q6. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS.

A6. Dominion has identified potential routing modifications in its filing of January 5, 2018. MAE supports the identified variances, as they are either in response to coordination with respondents or improve the constructability of the respective alternatives. MAE continues to believe the I-66 Hybrid Alternative Route would be the least impacting alignment, long term. However, if the Commission does not select this alternative, MAE recommends the I-66 Overhead Route.

Q7. DOES THIS CONCLUDE YOUR TESTIMONY?

A7. Yes, it does. Thank you.

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