

May 2, 2016

Testimony of Robert B. Weir

CASE NUMBER: PUE-2015-00107

**Virginia Electric and Power Company - for Approval
and Certification of Electric Facilities Haymarket 230
kV Double Circuit Transmission Line and 230-34.5 kV
Haymarket Substation**

Good Evening:

My name is Robert B. Weir and I reside at xxx, Haymarket, VA 20169, a location within 250 feet of one of the proposed Railroad Routes. I am here this evening to speak in opposition to all routes contained in application case number PUE-2015-00107 and dispute the need described therein.

Dominion Virginia Power (Dominion) proposes to construct a new overhead 230 kilovolt (kV) double circuit transmission line, using existing transportation corridors where possible, and new right of way (ROW) that will tap into the existing Gainesville to Loudoun transmission line near the Route 234 Bypass and extend to a new substation west of the Haymarket town limits.

Dominion has engaged in a two-phase approach to the project. The first phase, now completed, required the addition of distribution reinforcements to the existing distribution lines (double-build) along Washington Street in the Town of Haymarket to provide “bridging power” until the new transmission lines have been completed and energized. The first phase was constructed to provide dedicated 34.5 kV service to a single Dominion client at the terminus, allowing it to begin operations.

Phase two entails the construction of the overhead 230 kV double circuit transmission line and substation at its terminus. The sole factor determining the terminus of the route is a single Dominion customer with an immediate 100 mW power demand. Dominion states that the customer that will be the primary consumer of electricity provided by the 230 kV lines. This customer is also the sole consumer for the power supplied by the dedicated 34.5 kV lines.

Citing a confidentiality agreement, Dominion would not, upon direct questioning, release the name of the customer to the Haymarket Town Council or Haymarket Planning Commission. Likewise, Prince William County has refused to identify the customer at that location citing a similar non-disclosure agreement. Although not delineated in any presentations by Dominion or public forums by Prince William County, VAData Inc. at 410 Terry Avenue, N, Seattle WA 98109, a wholly-owned subsidiary of Amazon.com, Inc. (Amazon), is in the process of receiving

approval to build a 491,625 square foot data center at 15505 John Marshall Highway¹. The ownership of that parcel was transferred by deed from Midwood Center I, LLC to VAData, Inc. on September 11, 2015 for consideration of \$8,683,686 and recorded at document number 201509140076566 in the Circuit Court of Prince William County (Exhibit 1). Said change in ownership is also recorded in the Prince William County Real Estate Assessments database (Exhibit 2). Subsequently, on December 4, 2015 the Prince William Board of County Supervisors entered into both a Stormwater Management/BMP Facilities Maintenance Agreement (Exhibit 3) and a Hold Harmless Agreement (Exhibit 4) with VAData for that site and on April 19, 2016 VAData, Inc. recorded a dedication of .84091 acres of lot 3 of the land of Midwood Center I, LLC to the Prince William Board of County Supervisors and the Prince William County Service Authority (Exhibit 5). The final site plan currently under review by Prince William County for the proposed data center contains a detail on page 109 of 111 that denotes a substation to be “designed by other under separate permit” on a 4.64 acre portion of the parcel (Exhibit 6). These documents serve as clear evidence that both the dedicated 34.5 kV service and the 230 kV double circuit transmission line serve Amazon and its subsidiaries, the primary beneficiaries of the new lines and primary consumers of the power supplied.

NEED

In the fall of 2014 Dominion asserted the need for the Haymarket 230kV Line and Substation project was due to increased energy demand and future growth projections within the Haymarket area and western Prince William County, particularly that area west of Route 15. Dominion initially claimed the need came as a result of the rapid growth of the high-tech and commercial sectors in the region. Similarly, Dominion stated that current demand from growth had already outgrown the steady and reliable infrastructure that is in place today, and would strain the existing system, thus causing issues for the community and its economic development efforts. Dominion held that the proposed transmission infrastructure would address forecast increases in energy demand that would exceed the capabilities of the current distribution system beginning in 2017. Despite those assertions, at the time Dominion provided no indication that the local load

¹ Prince William County Land Plan Review Status, Final Site Plan No. 15-00046R00S01, http://eservice.pwcgov.org/apps/landstatus/review.asp?CaseNo=15-00046R00S01&ParcelNo=7298-42-4221&Status=Quality_Control (as of October 9, 2014)

was projected to result in violations of either federally-mandated reliability criteria on existing facilities or the North American Electric Reliability Corporation (NERC) Transmission Reliability Criteria. Rather, Dominion noted that the primary driver for the new substation was an expected block load addition from an existing local customer that has rapid and substantial plans for expansion.²

What Dominion did not reveal was that it had collaborated with Prince William County on a marketing trip in September 2013 to Seattle (home to Amazon.com, Inc.), a trip organized to showcase Prince William County as a premier data center location. In December 2013, Jeff Kazmarek, Director of the Prince William County Department of Economic Development, reported the trip to the Prince William County Board of Supervisors and noted that as result of the trip, Dominion was in the process of finalizing the pre-certification of a data center site in Prince William County³, presumably to ensure that the site had immediate access to its electric power requirements. That Prince William County had collaborated with Dominion and Amazon was further demonstrated when upon advice of legal counsel Prince William County withdrew as a respondent in the instant case to avoid discovery that might reveal damaging correspondence between the county, Dominion and/or Amazon, allowing the county to shield its efforts behind a non-disclosure agreement it had entered into with Amazon. It bears noting that Dominion's legal counsel has repeatedly asserted that it has a similar non-disclosure agreement with the customer.

In order to present the merits of its initial proposal and solicit public input, Dominion held a public meeting with the Haymarket Town Council on August 25, 2014, and the Haymarket Planning Commission on September 8, 2014.

At the August 25, 2014 meeting with the Haymarket Town Council, Dominion presented, among other materials, a singular preferred route (denoted in red) with no alternate routes (Exhibit 7), a map of preliminary route options that were considered (Exhibit 8) and a rendering of the "double-build" distribution reinforcements to be added to the existing distribution lines in order to provide "bridging power" to the customer. Dominion also provided a map denoting the "Line Termination and Potential Substation Location" (Exhibit 9) that denoted the proposed substation

² Haymarket 230 kV Line and Substation Project, <https://www.dom.com/about/electric-transmission/haymarket/index.jsp>

³ <http://eservice.pwcgov.org/documents/bocs/agendas/2013/1210/7-A.pdf>

being located on that same 4.64 acre portion of the Amazon parcel identified on the final site plan as the location for a substation to be “designed by other under separate permit”.

Subsequently, at the September 8, 2014 meeting with the Haymarket Planning Commission Dominion presented, among other materials, a map denoting modified route options based on community feedback (Exhibit 10). Dominion also provided maps of the Study Area and Route Constraints (Exhibits 11, 12 and 13).

In the course of the meeting with the Haymarket Planning Commission, Dominion reasserted that the need for the Haymarket 230kV Line and Substation project was due to increased energy demand and future growth projections within the Haymarket area and western Prince William County, principally as a result of the rapid growth of the high-tech and commercial sectors in the region. In support thereof, Dominion’s representatives enumerated several approved development projects, almost exclusively from dated Prince William County land development data. Dominion was informed by the Planning Commission that many of those proposed developments had been struck from the County’s land use maps. The principal examples cited were the proposed commercial and industrial components of the Villages of Piedmont II development which lies just west of Route 15. Although Dominion’s calculations were based on the development as originally approved, on May 1, 2012 the Prince William County Board of Supervisors approved Comprehensive Plan Amendment PLN2011-00188 and its corresponding Rezoning Plan 2011-00359 (Exhibits 14 and 15) which dramatically altered the approved uses for the development. As a result of those approvals, 2,170,517 square feet of Industrial and Flex uses, 473,540 square feet of Retail use and 365,533 square feet of Office use were eliminated. Those 3 million square feet of industrial and commercial uses were replaced with 335 single family dwellings and 383 acres of land dedicated to preservation and passive recreation (Exhibit 16).

Further, the vast majority of property west of Route 15 and within Prince William County is zoned “Agricultural or Estate” and contained within the Rural Area Boundary (see Exhibit 17). Similarly, all of the land west of Route 15 and within Fauquier County is zoned Rural Agricultural or Rural Conservation (Exhibit 18), effectively negating Dominion’s assertion that the region could experience rapid growth in the high-tech and commercial sectors.

In fact, the only local, existing business expansion plan that creates an immediate need for a transmission solution beginning in 2017 is the plan for a pre-certified data center at the terminus of the proposed route. That premise is confirmed in a July 14, 2015 email from Greg E. Mathe, (Manager, Electric Transmission Communications, Dominion Virginia Power) (Exhibit 19) in response to a question as to whether the need for this line would cease if Dominion's "client" abandoned the project. In the e-mail, Mr. Mathe states:

“Since the area is growing, there could be a need at some point, but the immediacy of the new infrastructure would no longer be there. New transmission facilities would still be useful to Dominion's and NOVEC's distribution operations to serve the native growth, but as of today that growth alone is not enough of a driver to necessitate new electric transmission facilities in our five year planning horizon”.

Nonetheless, in Application No. 272 filed November 6, 2015 Dominion unequivocally states that the electric facilities proposed in the “application are necessary so that Dominion Virginia Power can provide service requested by a retail electric service customer (the “Customer”) for a new data center campus in Prince William County, Virginia and maintain reliable electric service to its customers in the area”.

Given that Dominion has intentionally made the “need” for the proposed transmission line and substation a moving target and has based the proposal, at least in part, on dated information, it is impossible to reach a logical conclusion regarding the costs and benefits of the proposed project. As Dominion has alternately stated that the purpose of the project is to serve the “Customer” and the native growth in the area; and then noted “that growth alone is not enough of a driver to necessitate new electric transmission facilities” in their five year planning horizon, the public and the State Corporation Commission (SCC) can not arrive at an informed conclusion as to the costs and benefits of the proposed project. As such, I would ask that the SCC contract an independent analysis of the need in western Prince William County absent the project of Dominion's “Customer” before rendering any decision with regard to the instant application.

ROUTING

From August 25, 2014 to the present, Dominion has proposed at least ten alternate routes and variations for the proposed transmission lines. Each of the proposed routes has multiple adverse impacts on the existing residential and commercial properties they cross or adjoin.

As a preliminary matter, it is troubling that large portions of many of the proposed routes fall well outside of the Study Area map provided by Dominion to the Haymarket Planning Commission on September 8, 2014 (Exhibit 11). In fact the proposed routes designated as the New Road and Wheeler alternatives lie almost entirely outside of the designated study area, and thus call into question the validity of any proposed route or map submitted by Dominion.

Prince William County Comprehensive Plan

None of the routes fall within the “Designated Corridors or Routes for Electric Transmission Lines of 150 Kilovolts or More” as delineated in the Long Range Land Use Chapter of the Prince William County Comprehensive Plan⁴ (Exhibit 20) and thus do not comport with Land Use Policy 3.14, “Designated Corridors or Routes for Electric Transmission Lines of 150 Kilovolts or More,” that designates the corridors that all future electric utility lines of 150 kilovolts or more should follow. This is of particular concern as the new overhead lines would allow for the unrestricted construction of substations and communication arrays on or near the towers and within Dominion’s ROW, all without public hearings or public facilities reviews. It bears noting that as Prince William County has formally requested consideration of its Comprehensive Plan, the provisions of § 56-46.1 of the Code of Virginia mandate that the SCC take the Comprehensive Plan into consideration

Lastly, it should be noted that although they bisect heavily populated residential subdivisions, the routes, terminus point and proposed substation are not located in the principal area of future or currently planned residential, commercial and industrial growth.

Town of Haymarket

⁴ Prince William County Long-Range Land Use Plan, pages LU-7, LU-37

The aesthetics of the design create a visual impact that is not in concordance with the vision of the Town of Haymarket as detailed in the Town of Haymarket's Historic District Ordinance and Comprehensive Plan. Further, several of the proposed routes traverse a large portion of the Town's Conservation District, two of the Gateways into the Town's Historic District, the area of the Town that constitutes a portion of the Journey Through Hallowed Ground and the Town's Planned Interchange Park.

Dominion has attempted to satisfy the provisions of § 56-46.1 of the Code of Virginia and the Department of Historic Resources (DHR) guidelines by having an Environmental Constraint Identification and Routing Study prepared by Dutton and Associates dated 2015 (Dutton Report), identified as Appendix B in the instant application. The purpose of those provisions is to minimize the adverse impact of such power lines on historic districts. At present, the entirety of the Town of Haymarket constitutes a historic district. The impact of the proposed routes on that historic district is unclear as the Dutton Report does not delineate the town boundary nor does it expressly state the manner in which the Town Historic District will be addressed as required by statute. I must presume that these deficiencies come largely as a result of Dominion's failure to consult with the Town of Haymarket as provided in DHR guideline I(B), effectively denying the town and its residents the opportunity to voice their concerns or point out material resources that were not adequately considered. It must therefore be presumed that the report and by extension the application for the overhead routes do not comply with relevant sections of Title 56 of the Code of Virginia or the DHR guidelines.

Visual Impact

Dominion has also failed to accurately present the visual impact of all of the overhead routes. In both their public presentation materials and the Dutton Report, Dominion has consistently failed to accurately assess the visual impact of the overhead options. Dominion has also failed to provide images that accurately depict the visual impact on historic resources or views from the entirety of the properties considered. Multiple photos are denoted as representing views from properties that are different from the location of the actual photo and several are used to

represent the purported view from multiple resources. The failure of Dominion to accurately represent the visual impact of the overhead lines on historic as well as private properties makes it impossible for the SCC and the public to make an accurate assessment of the visual impact of the overhead routes.

Environment

Several of the proposed routes traverse designated wetlands, the 100 year flood plain and upon information and belief, the routes will traverse areas containing several endangered species. The Railroad Route presents the most significant environmental issues as it traverse those areas for nearly one mile. It should be noted that despite those environmental constraints, Dominion has failed to elaborate on the fiscal impact those constraints would have on the construction of the proposed Railroad Route. Additionally, the terminus location is located with the flood plain and its development is subject to the issuance of Federal Wetlands permits. Further, page 86 of 111 of the final site plan estimates peak monthly water usage at 5,459,472 gallons (Exhibit 21) but does not detail the method of discharge. Given those circumstances, the proposed routes and substation location may make concordance with the provisions of the Chesapeake Bay Act difficult and expensive for both Prince William County and the Town of Haymarket.

UNDERGROUND COST

In its opposition to the hybrid alternative Dominion has asserted that the cost of constructing underground transmission lines is prohibitively expensive, several orders of magnitude more than the construction of overhead lines, and presents additional maintenance challenges. While Dominion's professional staff has stated that historically such underground construction costs ten times that of overhead construction, data from similar projects indicates that the true cost is less than two to three times that of overhead construction. In fact, Dominion's own cost estimates for a hypothetical underground single circuit transmission line delineates a cost only 7.68 times that of overhead construction⁵. Further, I am aware of dedicated fiber optic lines servicing the Amazon site that have already been buried in the southern I-66 ROW and that on or about

⁵ <http://dls.virginia.gov/commission/pdf/CostAnalysis.pdf>

October 8, 2014, Dominion filed a request with VDOT to bury the transmission lines on the north side of I-66.

It should be noted that Dominion has undertaken or completed the construction of several underground transmission lines in Arlington County, Loudoun County and the City of Alexandria. Those underground transmission lines ranged in length from one half to nearly four miles and traversed densely populated urban and suburban areas, areas with limited ROW, and areas where overhead transmission lines were deemed unacceptable for visual amenity reasons. Examples of those underground transmission lines are the following:

Arlington County, Radnor Heights 230 kV Underground Transmission Lines and Substation⁶

Dominion constructed 3.7 miles of new 230kV underground electric transmission lines and a new electrical substation to support future growth and continue to provide reliable electricity to customers in Arlington County.

Arlington County, City of Alexandria, Glebe – Potomac River Substation New 230kV Line and Substation Modifications⁷

Dominion constructed a new underground transmission line between Dominion's Glebe Substation located at the intersection of S. Glebe Road and S. Eads Street, and Pepco's Station C Substation at the intersection of Slaters Lane and E. Abingdon Drive.

Loudoun County, Beaumeade - NIVO 230kV Double-Circuit Line⁸

In the Ashburn area of Loudoun County Dominion installed a 230 kV double circuit underground transmission line, approximately 2700 feet (0.5 mile±) long, from the existing Beaumeade substation to a new substation (NIVO) located near the intersection of Smith Switch Road and Chilum Place.

The public record clear indicates that the use of underground routes for high voltage transmission lines has increased dramatically in recent years. Although once limited to large urban areas, New York City has not permitted construction of overhead lines since the 1890's, underground transmission lines are increasingly being constructed in suburban and rural environments and indeed in the entirety of some jurisdictions. The State of Connecticut enacted legislation (Public Act No. 04-246, 2004) mandating the burial of high-voltage power lines and the Commonwealth of Virginia is currently underwriting the replacement of many overhead distribution lines with

⁶ <https://www.dom.com/about/electric-transmission/radnor/index.jsp>

⁷ <https://www.dom.com/about/electric-transmission/glebe/index.jsp>

⁸ <https://www.dom.com/about/electric-transmission/ashburn/index.jsp>

underground lines. Similarly, as a result of blackouts caused by the ice storm of 1998 and more recently Superstorm Sandy, several northeastern states are currently giving priority to underground transmission options and/or initiating legislation to mandate that all new power transmission lines be constructed underground.

Nearly a decade ago, Connecticut Light & Power in conjunction with The United Illuminating Co., understood the need for an expansion of the transmission system in southwest Connecticut. As a result, the first of several 345-kV transmission projects with significant underground components took place as early as 2006. The growing list of projects at that time included :

- CL&P's Bethel — Norwalk project. This project included 2.1 miles (3.4 km) of 345-kV XLPE cable, from Plumtree Substation to Hoyt's Hill Road in Connecticut.
- CL&P and United Illuminating's Middletown — Norwalk project. This project included 24 miles (39 km) of 345-kV XLPE cable from East Devon to Singer and Singer to Norwalk in Connecticut.
- ComEd's Transmission Reliability Reinforcement project. This project included 10 miles (16 km) of 345-kV XLPE cable connecting the Crawford, Taylor and West Loop substations in Chicago, Illinois, U.S.
- ITC Transmission's Bismarck — Troy project. This project included 10 miles of 345 kV in Detroit, Michigan, U.S.
- Neptune Regional Transmission System (RTS) and Long Island Power Authority's (LIPA's) Duffy Avenue Converter Substation to Newbridge Road Substation project. The project included 2.5 miles (4 km) of 345-kV XLPE cable. (This was a small part of the overall Neptune RTS project, which consists of 67 miles (108 km) of a 500-kV high-voltage dc submarine cable system.)

- LIPA and New York State Department of Transportation's Newbridge Road connector project. A total of 13 miles (20 km) — 4 miles (6.4 km) of the Western Connector and 9 miles (14.5 km) of the Eastern Connector — of 345-kV XLPE cable was proposed.

Additional examples can be found in states such as Vermont, New York and New Hampshire in which underground transmission lines extend for lengths as long as 333 miles. Large scale examples, both existing and planned, can be found elsewhere in New England with underground runs ranging from 150 to 230 miles.

It should be noted that the utility companies, which preferred the construction of overhead transmission lines in those jurisdictions, made similar claims regarding their expense, noting that they “would spend on average \$3million per mile on overhead and \$15-20 million per mile on underground cable”. A 2013 analysis by the Conservative Law Foundation of three such projects in New England, determined that the actual cost of underground lines averaged \$5.47 million per mile, a finding supported in 2014 by the CEO of Transmission Developers Inc., the contractor for one of the projects, who noted that the actual cost for the underground portion of that project was roughly \$5 million per mile.

Such initiatives are not limited to the United States, Belgium has banned overhead lines since 1992 and as result of the outages experienced after the winter storms of 1999 France has mandated that at least 25% of its high voltage lines be placed underground.

Despite these examples, Dominion, in a fashion consistent with utilities in other states, has continued to assert that the cost of constructing underground transmission lines is prohibitively expensive, despite its construction of just such facilities in other NOVA jurisdictions.

Upon review, the terrain to be traversed for the Haymarket 230 kV Transmission Line is significantly less challenging than that contemplated in the New England examples, presumably resulting in a lower cost per mile. Additionally, as underground transmission lines require a significantly smaller ROW and in the instant case could be constructed largely within existing VDOT easements, the acquisition costs should be greatly diminished.

A review of Dominion's existing projects suggests that their opposition to placing the lines underground may be based more on a desire to monetize Dominion's existing ROW than in determining the best option for transmission. Should the lines be placed underground and within the VDOT ROW, Dominion would not be afforded that opportunity and the state would benefit from the ownership of the ROW. It should be noted that Dominion offered to bury the distribution lines to the customer's site at its expense but only in exchange for the Town of Haymarket's support of the Railroad Route proposal.

Upon consideration of similar projects in NOVA and the consistent average construction cost per mile across several projects and jurisdictions, Dominion's assertions regarding the actual expense of burying the instant high voltage transmission line appear unfounded.

While the hybrid route may have significantly higher construction costs, those costs would be mitigated by its minimal visual impact, low EMF, protection from adverse weather conditions, elimination of a corona discharge, elimination of the potential for brush fires, lower maintenance costs, lower ROW acquisition costs, minimal impact on the value of surrounding properties, greater physical security, potentially lower life cycle costs and the reduced potential for accidents.

Thus, the construction of the hybrid underground route would largely address the property value, aesthetic and health concerns of local residents. It would also provide for a transmission system largely immune to the effects of inclement weather or natural phenomena such as lightning and would reduce the potential for accidental damage caused by individuals, vehicles, wildlife, etc. Similarly, it would create a utility infrastructure more secure from the threat of sabotage or terrorism. Lastly, placing the lines underground would result in lower maintenance costs as well as lower initial ROW acquisition costs.

Historically, both overhead and underground high voltage transmission lines have been presumed to have a life cycle of thirty-five years. Thus when calculating the life cycle cost for each, the initial construction cost weighs heavily in the average life cycle cost for each system.

The higher construction and ultimately life cycle cost of underground lines have typically been cited by power providers as the greatest weakness of underground initiatives given that the costs are typically passed on to the ratepayers. Dominion has asserted such and further claims that fault location and repair of underground transmission lines could take days or weeks in the case of outages whereas overhead line fault location and repair could generally be accomplished in one day. While that scenario may have been true as recently as a decade ago, advances in technology render such thinking obsolete. The oil filled conduits historically used to carry underground transmission lines have been replaced with more cost-effective and lower maintenance technology and current smart grid technology provides machine learning methods that assure almost instantaneous fault location through advances in technology and monitoring equipment. As a result, power companies have largely switched from reactive maintenance plans to proactive maintenance plans.

Thus given the significantly lower average actual construction costs experienced in New England, 25%-33% of the construction costs originally estimated by the power companies, in conjunction with technological advances that allow for nearly instantaneous fault location, the life cycle cost models of past decades are likely obsolete. Further, given that underground power transmission facilities are largely secure from the effects of weather, natural phenomena, accidents and sabotage, the number of outages and subsequent repairs are fewer than those experienced by overhead transmission facilities drawing the delta of costs for the systems closer and diminishing the power companies claims of higher life cycle expenditures.

SUMMATION

For the aforementioned concerns and deficiencies regarding need, routing and cost estimation I stand in opposition to all routes contained in application case number PUE-2015-00107 and dispute the need described therein. However, if the SCC determines that a route must be approved, I support the I-66 hybrid route as the least objectionable of the proposed routes and the only route that minimizes the impact to existing properties, provided that Amazon, as the sole beneficiary, be required to pay the acquisition and construction costs.