

# Dominion Supplemental Projects

Transmission Expansion Advisory  
Committee  
September 6, 2022

# Needs

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

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

**Need Number:** DOM-2022-0053

**Process Stage:** Need Meeting 09/06/2022

**Project Driver:** Equipment Material Condition, Performance and Risk

## Specific Assumption References:

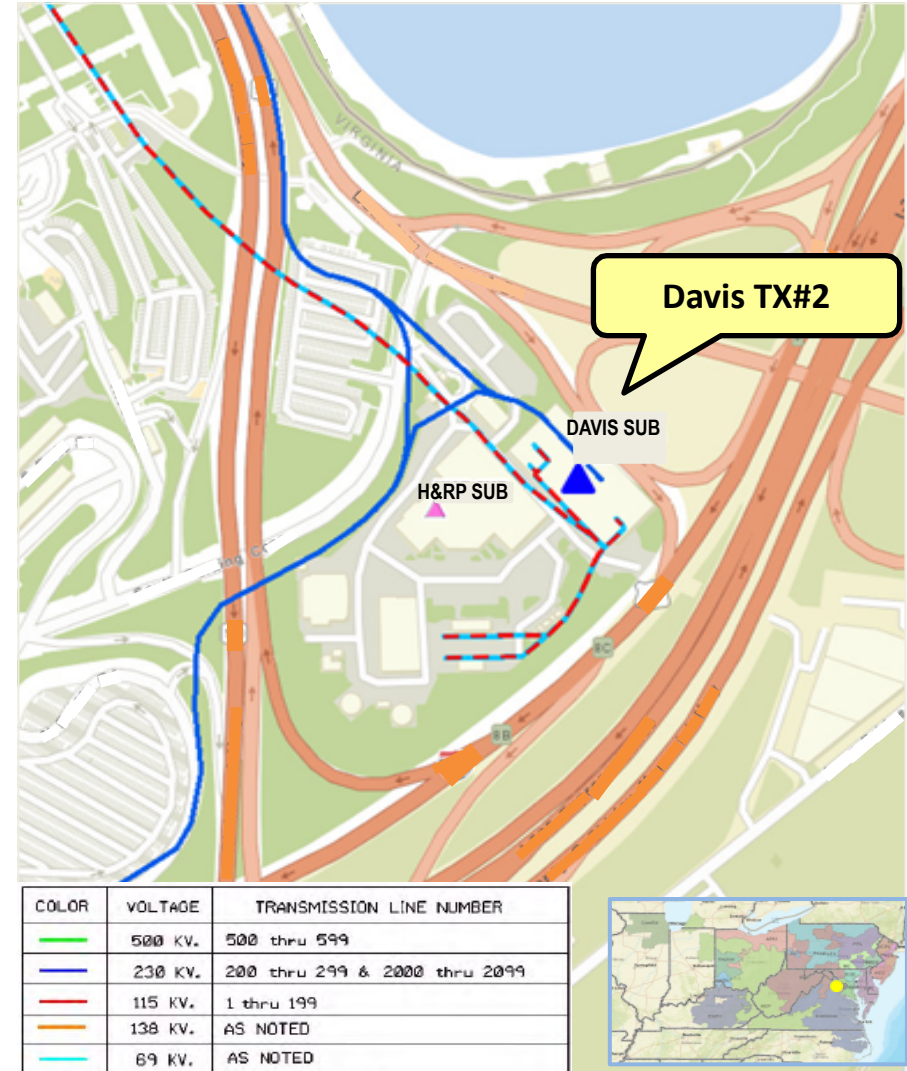
See details on Equipment Material Condition, Performance and Risk in Dominion's Planning Assumptions presented in December 2021.

## Problem Statement:

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

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

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



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

**Need Number:** DOM-2022-0051

**Process Stage:** Need Meeting 09/06/2022

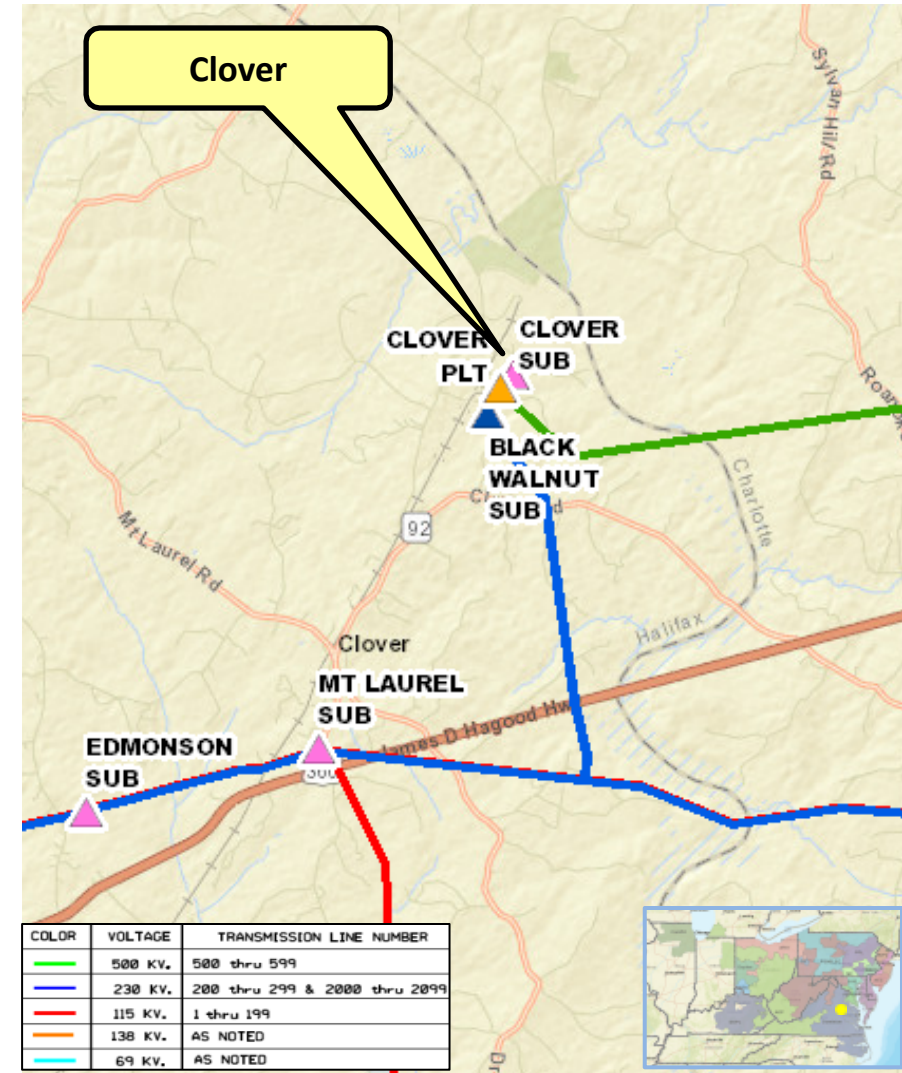
**Project Driver:** Equipment Material Condition, Performance and Risk

## Specific Assumption References:

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

## Problem Statement:

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



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

**Need Number:** DOM-2022-0052

**Process Stage:** Need Meeting 09/06/2022

**Project Driver:** Equipment Material Condition, Performance and Risk

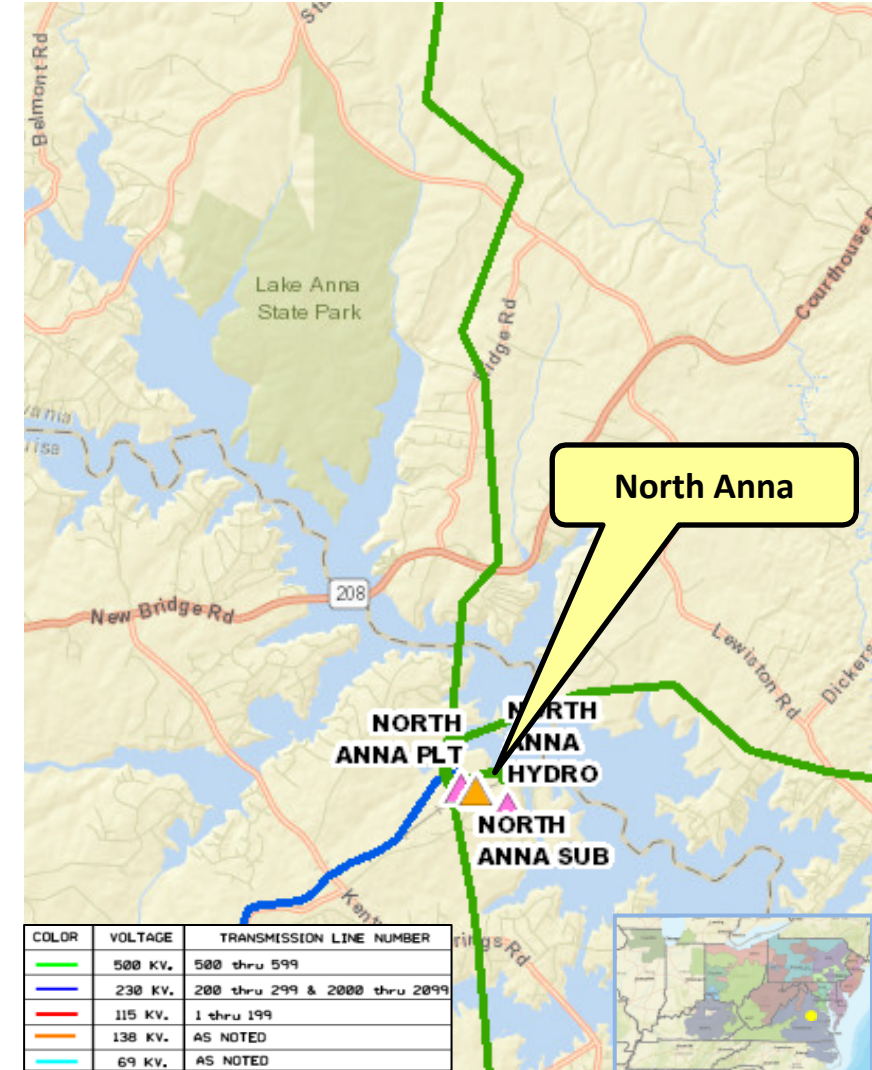
## Specific Assumption References:

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

## Problem Statement:

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

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



# Solutions

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

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

**Need Number:** DOM-2022-0023

**Process Stage:** Solutions Meeting 09/06/2022

**Previously Presented:** Need Meeting 04/12/2022

**Project Driver:** Equipment Material Condition, Performance and Risk

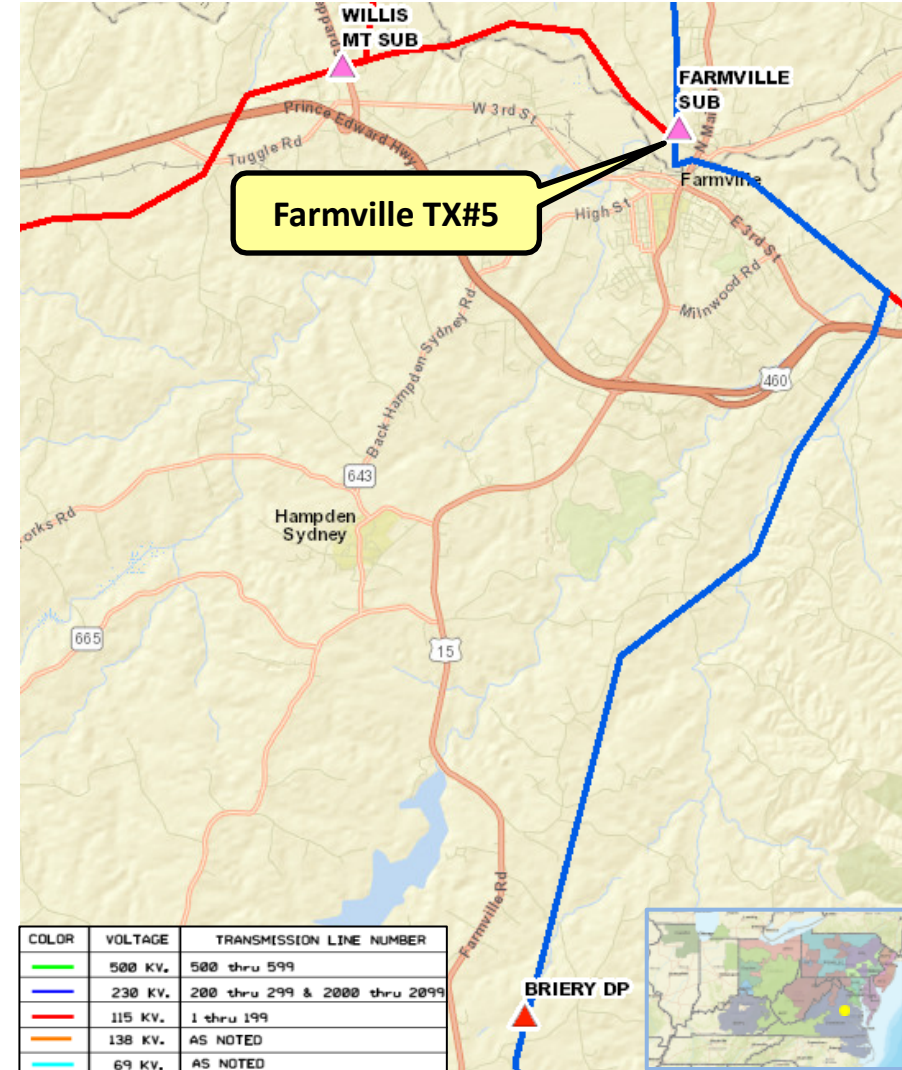
## **Specific Assumption References:**

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

## **Problem Statement:**

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

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



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

**Need Number:** DOM-2022-0023

**Process Stage:** Solutions Meeting 09/06/2022

**Proposed Solution:**

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

**Estimated Project Cost:** \$6.4 M

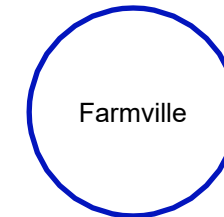
**Alternatives Considered:**

None

**Projected In-service Date:** 11/30/2023

**Project Status:** Engineering

**Model:** 2025 RTEP





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

**Need Number:** DOM-2022-0024

**Process Stage:** Solutions Meeting 09/06/2022

**Previously Presented:** Need Meeting 04/12/2022

**Project Driver:** Equipment Material Condition, Performance and Risk

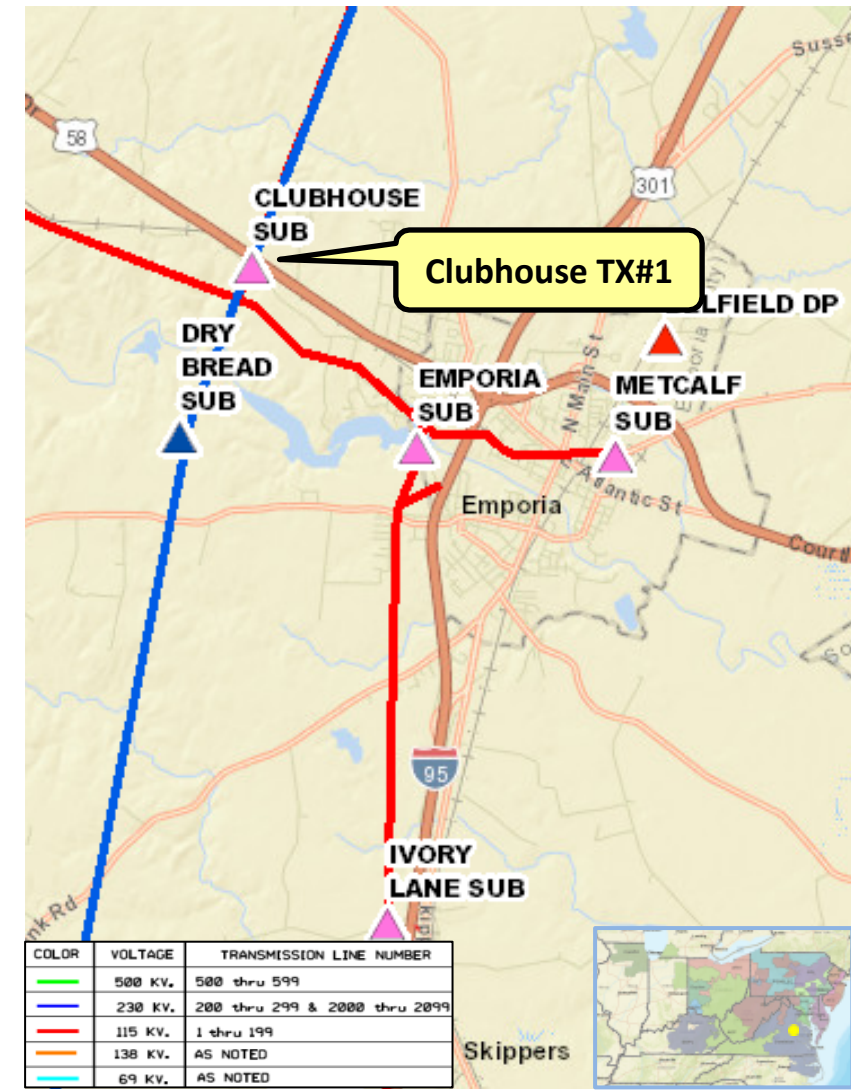
## Specific Assumption References:

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

## Problem Statement:

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

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



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

**Need Number:** DOM-2022-0024

**Process Stage:** Solutions Meeting 09/06/2022

**Proposed Solution:**

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

**Estimated Project Cost:** \$6.6 M

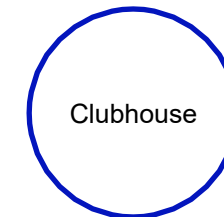
**Alternatives Considered:**

None

**Projected In-service Date:** 05/31/2023

**Project Status:** Engineering

**Model:** 2025 RTEP



# Dominion Transmission Zone: Supplemental Customer Load Request

**Need Number:** DOM-2022-0049

**Process Stage:** Solutions Meeting 09/06/2022

**Previously Presented:** Need Meeting 08/09/2022

**Project Driver:** Customer Service

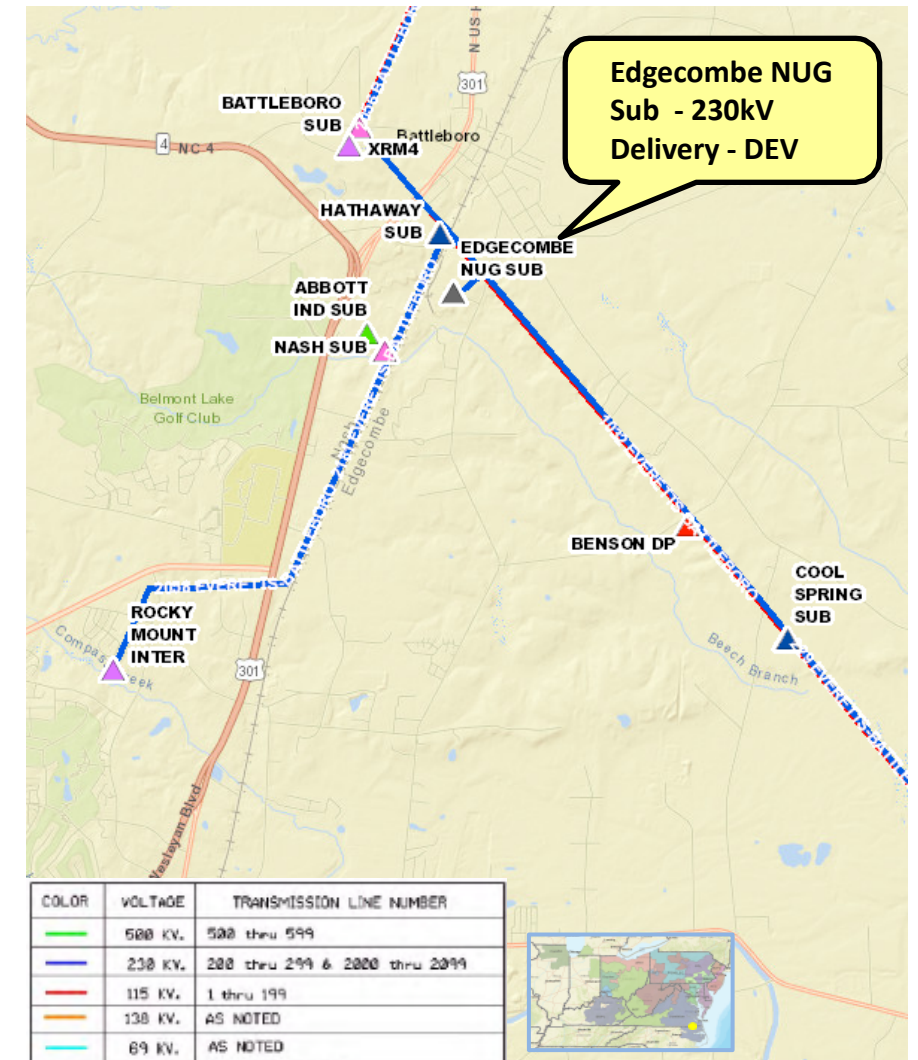
## Specific Assumption References:

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

## Problem Statement:

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

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



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

**Need Number:** DOM-2022-0049

**Process Stage:** Solutions Meeting 09/06/2022

**Proposed Solution:**

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

**Estimated Project Cost:** \$0.75 M

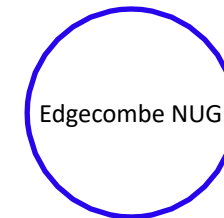
**Alternatives Considered:**

No feasible alternatives

**Projected In-service Date:** 12/30/2022

**Project Status:** Engineering

**Model:** 2025 RTEP



# Dominion Transmission Zone: Supplemental Customer Load Request

**Need Number:** DOM-2022-0033

**Process Stage:** Solutions Meeting 09/06/2022

**Previously Presented:** Need Meeting 06/07/2022

**Project Driver:** Customer Service

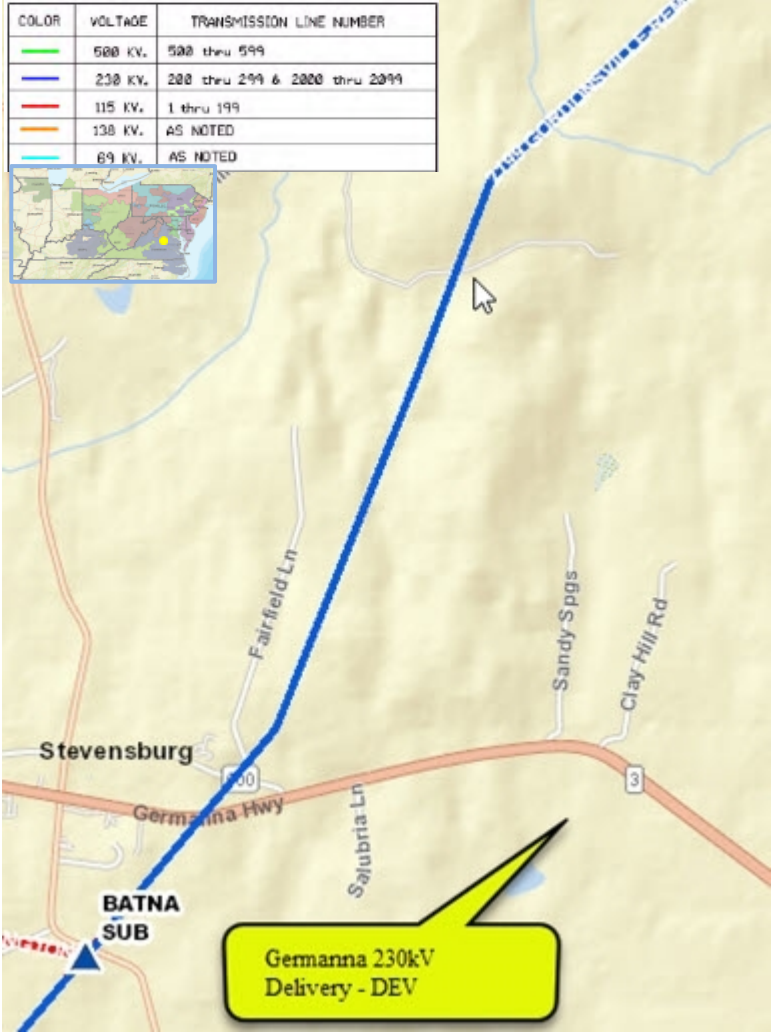
**Specific Assumption References:**

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

**Problem Statement:**

DEV distribution has submitted a DP Request for a new 230kV substation (Germanna) to serve a data center complex in Culpeper County with a total projected load of 139 MW. Requested in-service date is 01/01/2025.

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



# Dominion Transmission Zone: Supplemental Germanna 230kV Delivery Point

**Need Number:** DOM-2022-0033

**Process Stage:** Solutions Meeting 09/06/2022

**Proposed Solution:**

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

**Estimated Project Cost:** \$55 M

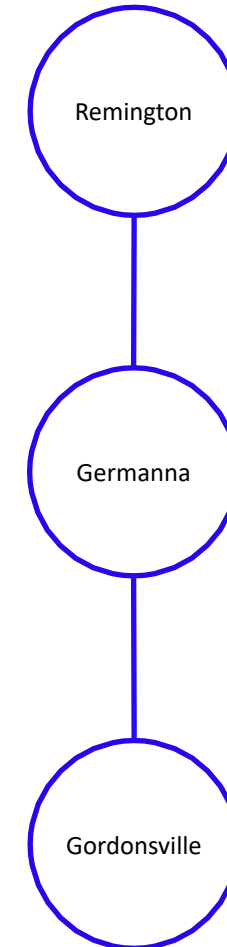
**Alternatives Considered:**

No feasible alternatives

**Projected In-service Date:** 01/01/2025

**Project Status:** Engineering

**Model:** DNH2025, RTEP2026



# Dominion Transmission Zone: Supplemental Customer Load Request

**Need Number:** DOM-2022-0034

**Process Stage:** Solutions Meeting 09/06/2022

**Previously Presented:** Need Meeting 06/07/2022

**Project Driver:** Customer Service

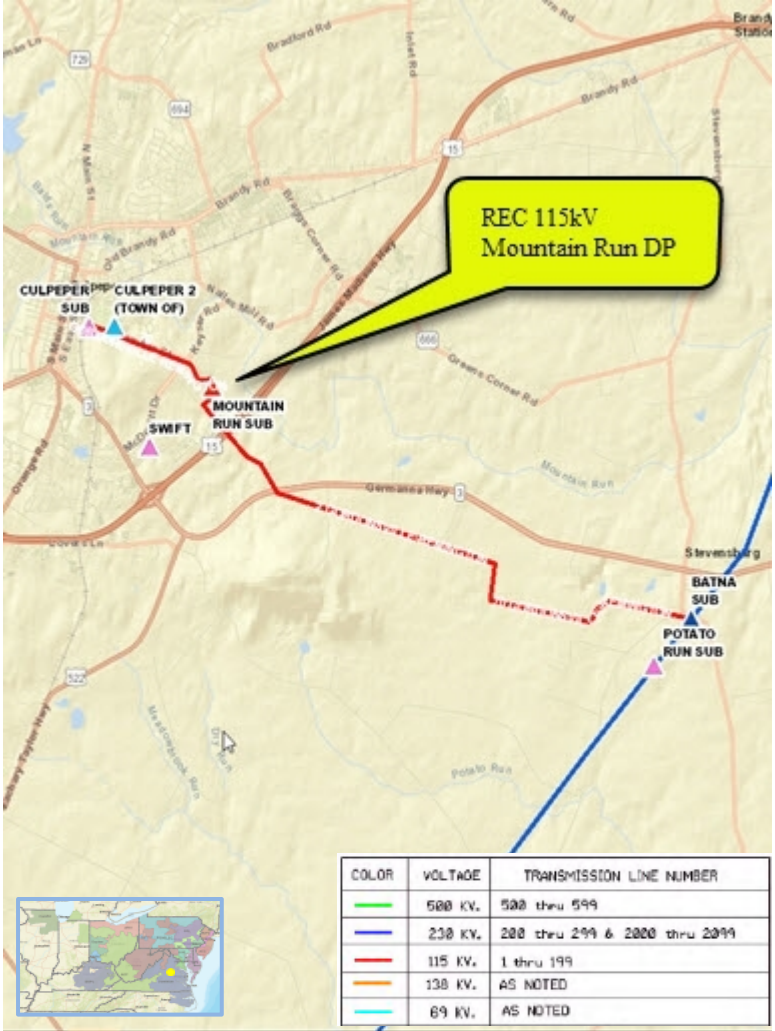
**Specific Assumption References:**

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

**Problem Statement:**

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

Initial In-Service Load	Projected 2027 Load
Summer: <del>39.2</del> <b>51</b> MW	Summer: <del>111.5</del> <b>140.7</b> MW



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

**Need Number:** DOM-2022-0034

**Process Stage:** Solutions Meeting 09/06/2022

## Proposed Solution:

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

## Estimated Project Cost: \$60 M (Total)

Transmission Line - \$22M

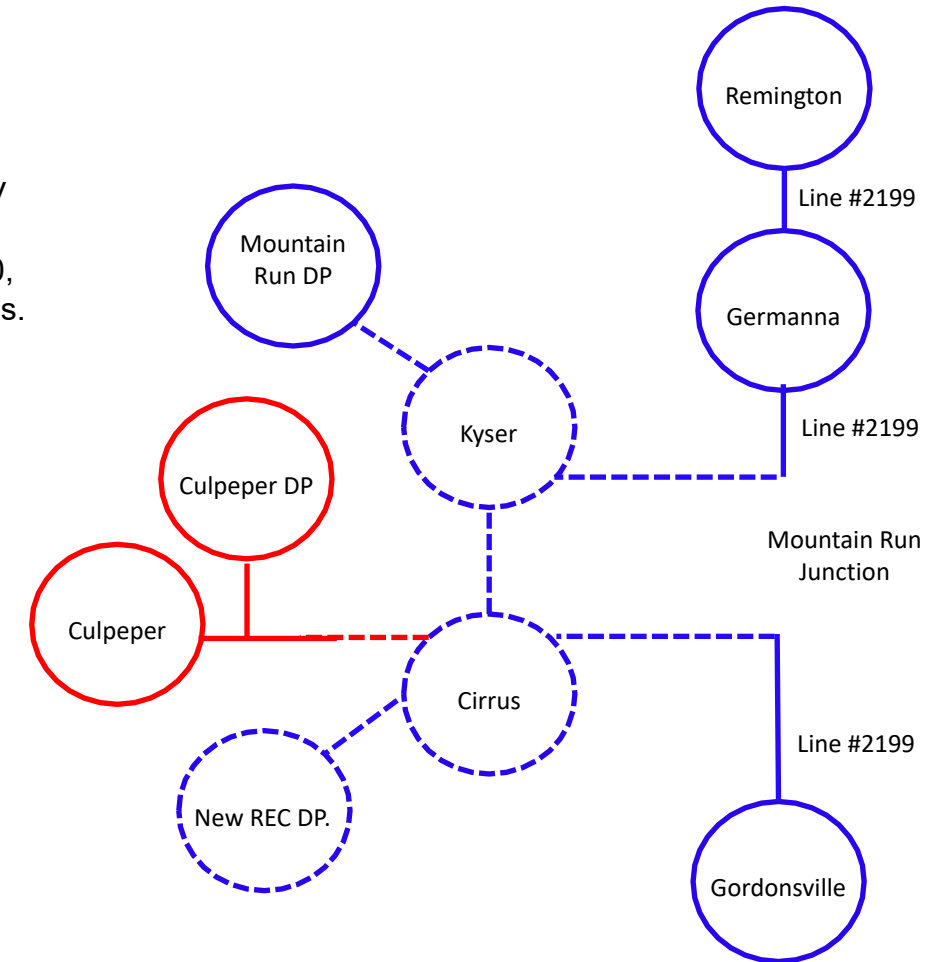
Substation - \$38M

**Alternatives Considered:** No feasible alternatives

**Projected In-service Date:** 12/30/2025

**Project Status:** Conceptual

**Model:** 2025 RTEP





# Dominion Transmission Zone: Supplemental Do No Harm Analysis

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

**Process Stage:** Solution Meeting 09/06/2022

**Project Driver:** Do No Harm Analysis

## Specific Assumption References:

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

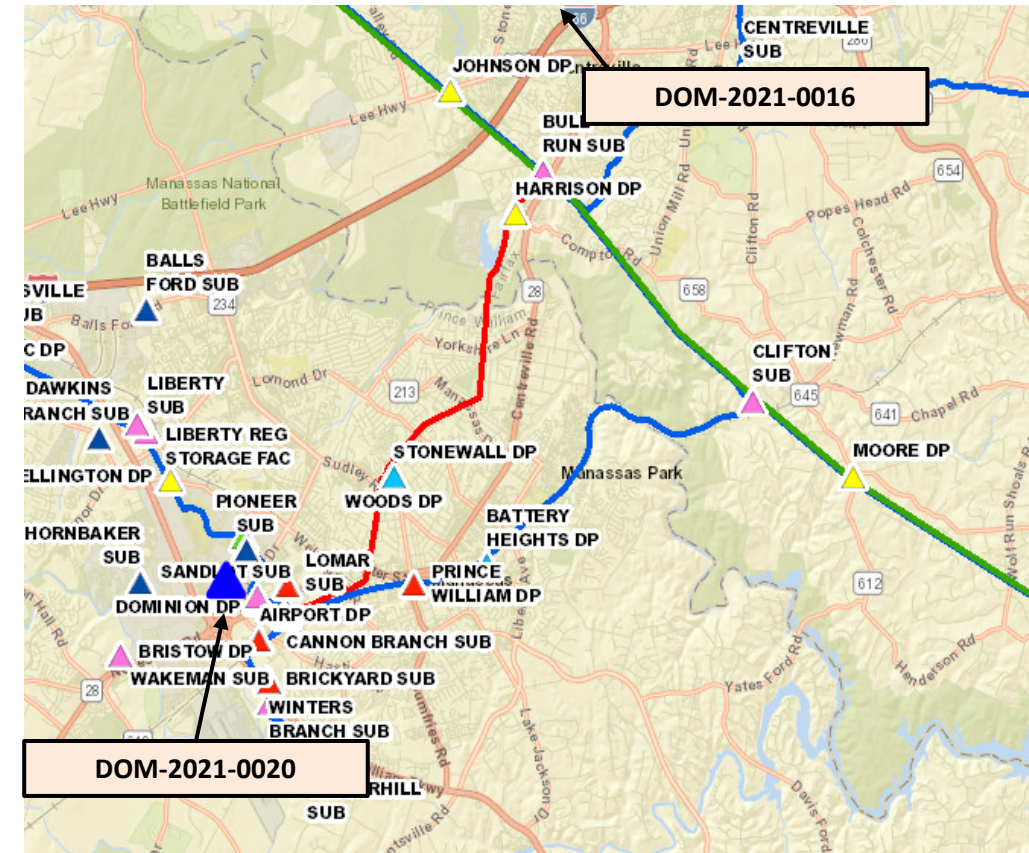
## Problem Statement:

N-1-1 thermal violations have been identified on the following facility in the 2022

Do-No-Harm analysis:

- Ox-Braddock Line
  - Contingency Scenario: DVP\_P1-2: LN 541 and DVP\_P1-2: LN 2022

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



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

# Dominion Transmission Zone: Supplemental Do No Harm Analysis

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

**Process Stage:** Solution Meeting 09/06/2022

**Proposed Solution:**

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

**Estimated Project Cost:** \$43.5M (Total)

Transmission Line Cost: \$37.0M

Substation Cost: \$6.5M

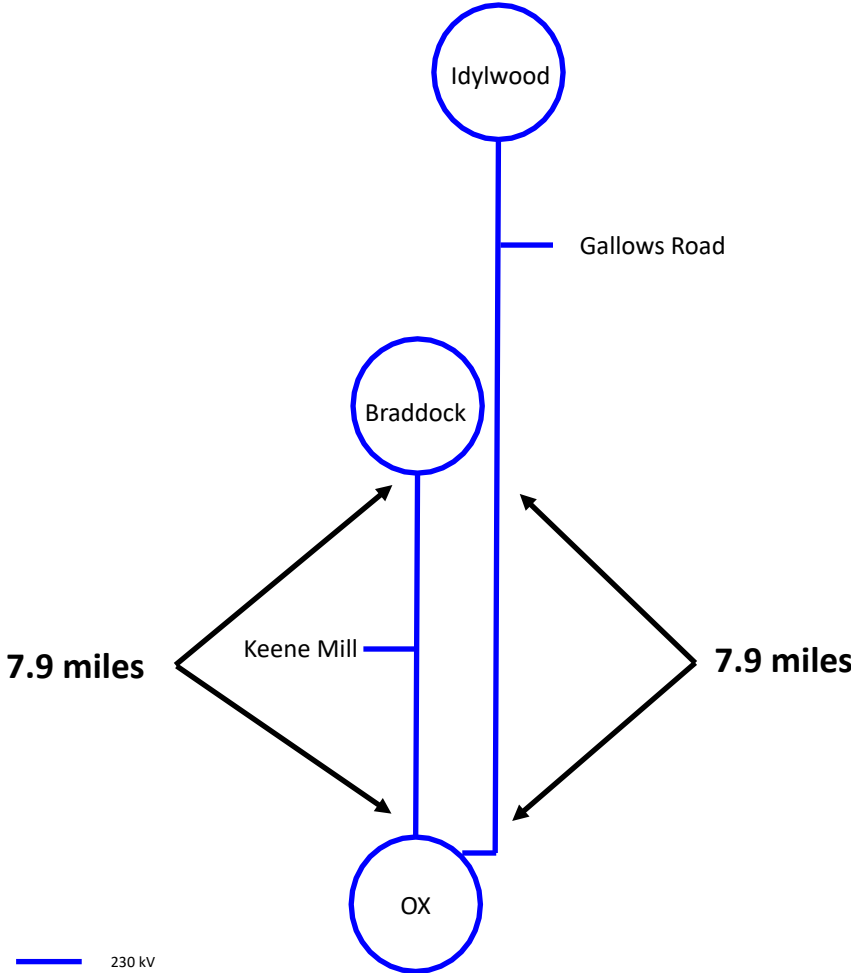
**Alternatives Considered:**

No feasible alternatives

**Projected In-service Date:** 06/30/2027

**Project Status:** Conceptual

**Model:** 2025 RTEP



# Cancellation

# Dominion Transmission Zone: Supplemental Customer Load Request

**Need Number:** DOM-2021-0018

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

**Project Driver:** Customer Service

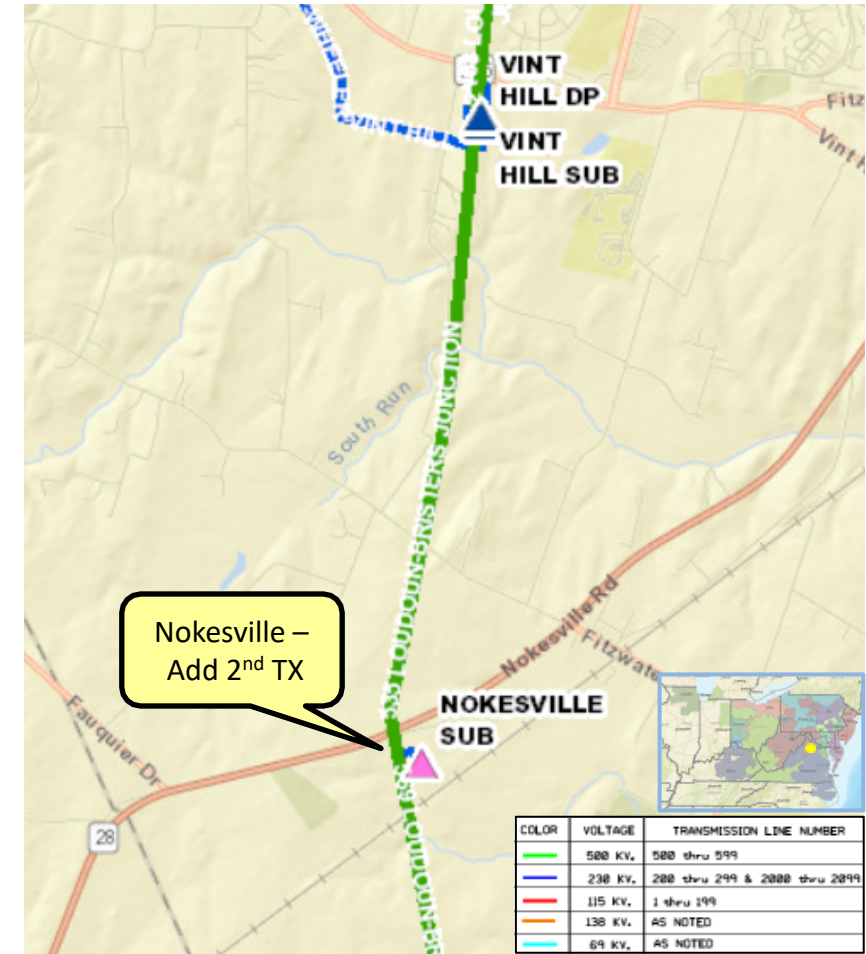
**Specific Assumption References:**

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

**Problem Statement:**

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

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



# Appendix

# High level M-3 Meeting Schedule

Assumptions	Activity	Timing
	Posting of TO Assumptions Meeting information	20 days before Assumptions Meeting
	Stakeholder comments	10 days after Assumptions Meeting
Needs	Activity	Timing
	TOs and Stakeholders Post Needs Meeting slides	10 days before Needs Meeting
	Stakeholder comments	10 days after Needs Meeting
Solutions	Activity	Timing
	TOs and Stakeholders Post Solutions Meeting slides	10 days before Solutions Meeting
	Stakeholder comments	10 days after Solutions Meeting
Submission of Supplemental Projects & Local Plan	Activity	Timing
	Do No Harm (DNH) analysis for selected solution	Prior to posting selected solution
	Post selected solution(s)	Following completion of DNH analysis
	Stakeholder comments	10 days prior to Local Plan Submission for integration into RTEP
	Local Plan submitted to PJM for integration into RTEP	Following review and consideration of comments received after posting of selected solutions

# Revision History

08/26/2022 – V1 – Original version posted to pjm.com