

Western Sub Regional RTEP: AEP Supplemental Projects

May 17, 2024

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

AEP Transmission Zone M-3 Process Illinois Road, IN/Gateway, IN

Need Number: AEP-2024-IM012

Process Stage: Need Meeting SRRTEP-W - 05/17/2024

Project Driver: Equipment Condition/Performance/Risk

Specific Assumption References:

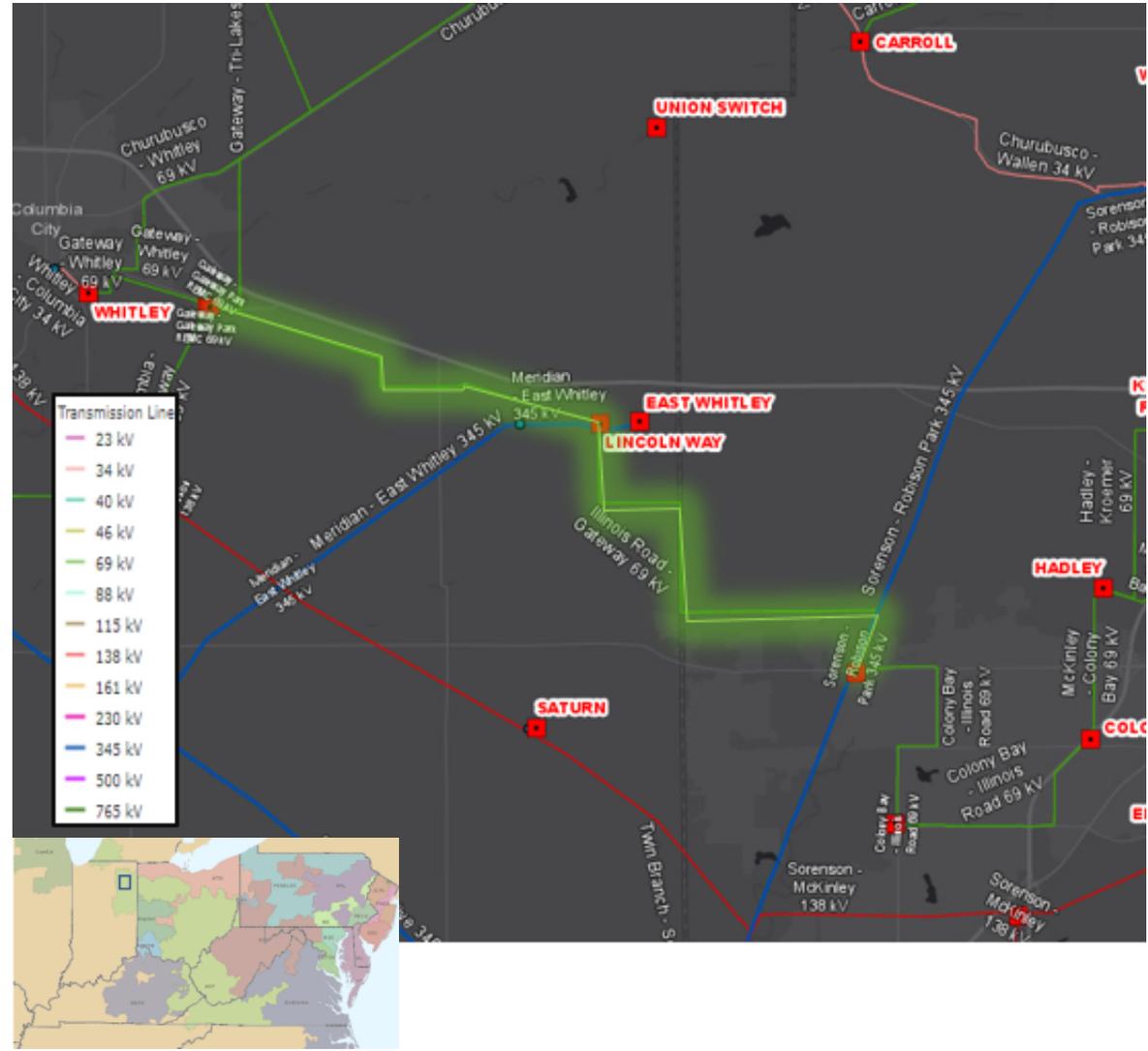
AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13)

Problem Statement:

Illinois Road – Gateway 69kV

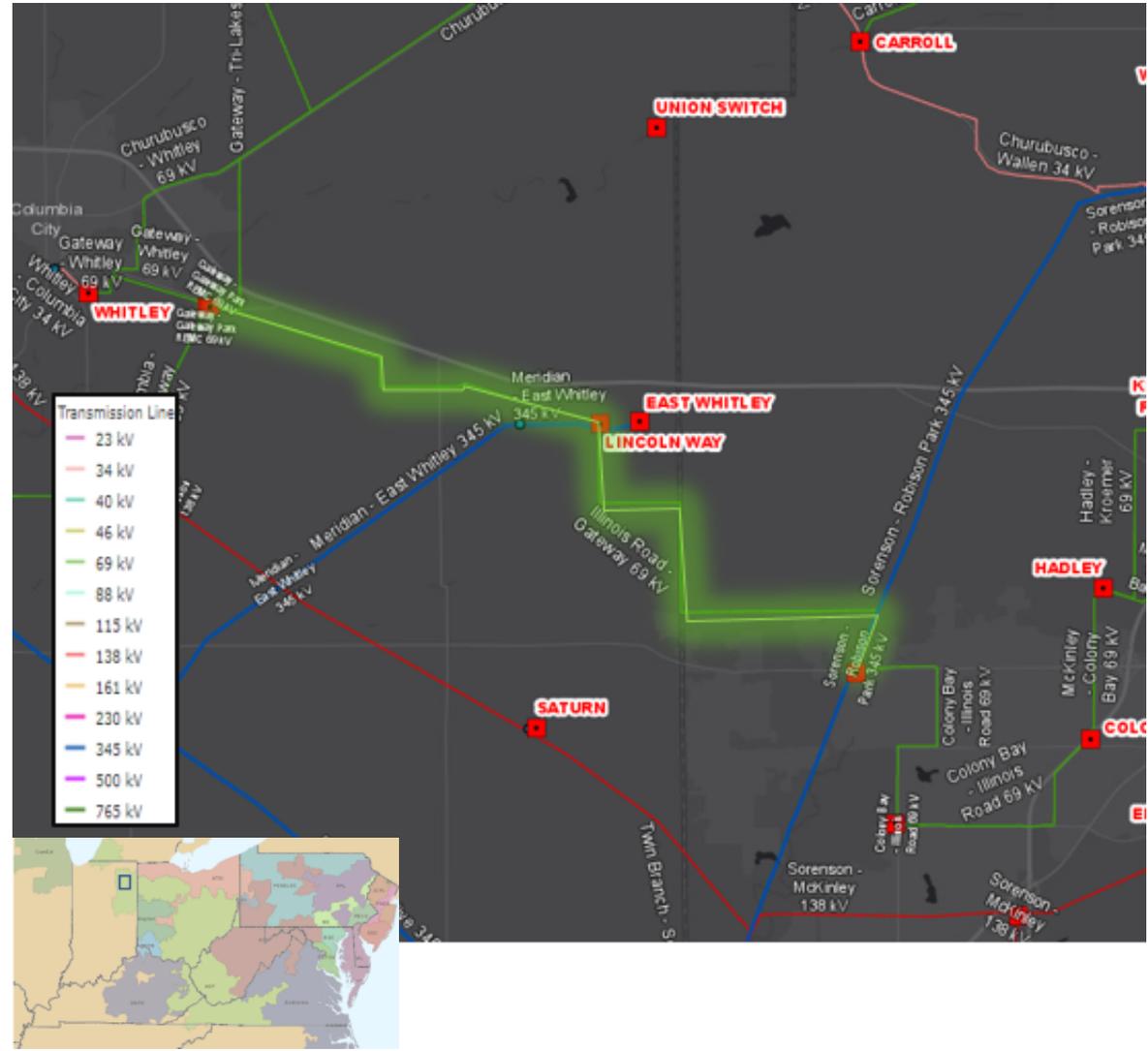
The Illinois – Gateway 69kV line is 12.39 miles long constructed in 1973. The line consists primarily of original single circuit wood pole structures with legacy porcelain horizontal post insulators. Some pole replacements have taken place in 2015, 2018, 2021.

From January 1, 2019 to December 31, 2023, there have been 6 momentary and 4 permanent outages on the Gateway – Illinois Road 69kV Circuit. The momentary outages were due to lightning, foreign interference related to other utility or distributor equipment, and a circuit switcher failure. The direct permanent outages were due to multiple broken poles during a windstorm, a relay malfunction, and a circuit switcher failure.



Problem Statement (Conti.):

As of January 4, 2024, there are 59 structures with at least one open structural condition, which relates to 22% of the structures on the line. Structure conditions causes: woodpecker, broken , insect damage, rot heart, rot shell, split, leaning transverse, burnt, damaged, rot top, sitting in water, strength deficiency, and unauthorized attachment, knee/vee braces broken and loose, and 1 is related to a damaged push pole. There is currently 1 open conductor condition with broken strands. There is currently 1 open shielding/grounding condition related to a disconnected ground rod. There are currently 11 open hardware conditions such as horizontal post insulators with burnt/corroded, flashed, broken, and twisted causes, and guys with an exposed guy anchor, loose guy wire, and a missing guy guard. Twenty-six structures were assessed by an aerial drone and by a ground crew. Of those structures assessed, 100% had reported conditions, and the following were the most common conditions found: The majority of wood poles have moderate wood decay that includes shell decay, insect damage, and woodpecker holes. Several poles also have heavy checking and rotted pole tops. Several structures assessed are in potential wetland areas and in most cases are very difficult and expensive to access with vehicles and equipment. Insulators are gray porcelain HP design. A few flashed insulators were found. In some locations, insulators are pulling away from the pole. Structure down-leads are aluminum on stand-off brackets and pole butt wrap.



Need Number: AEP-2022-AP013

Process Stage: Cancellation 5/17/2024

Previously Presented: 02/18/2022

Project Driver: Customer Service

Specific Assumption References:

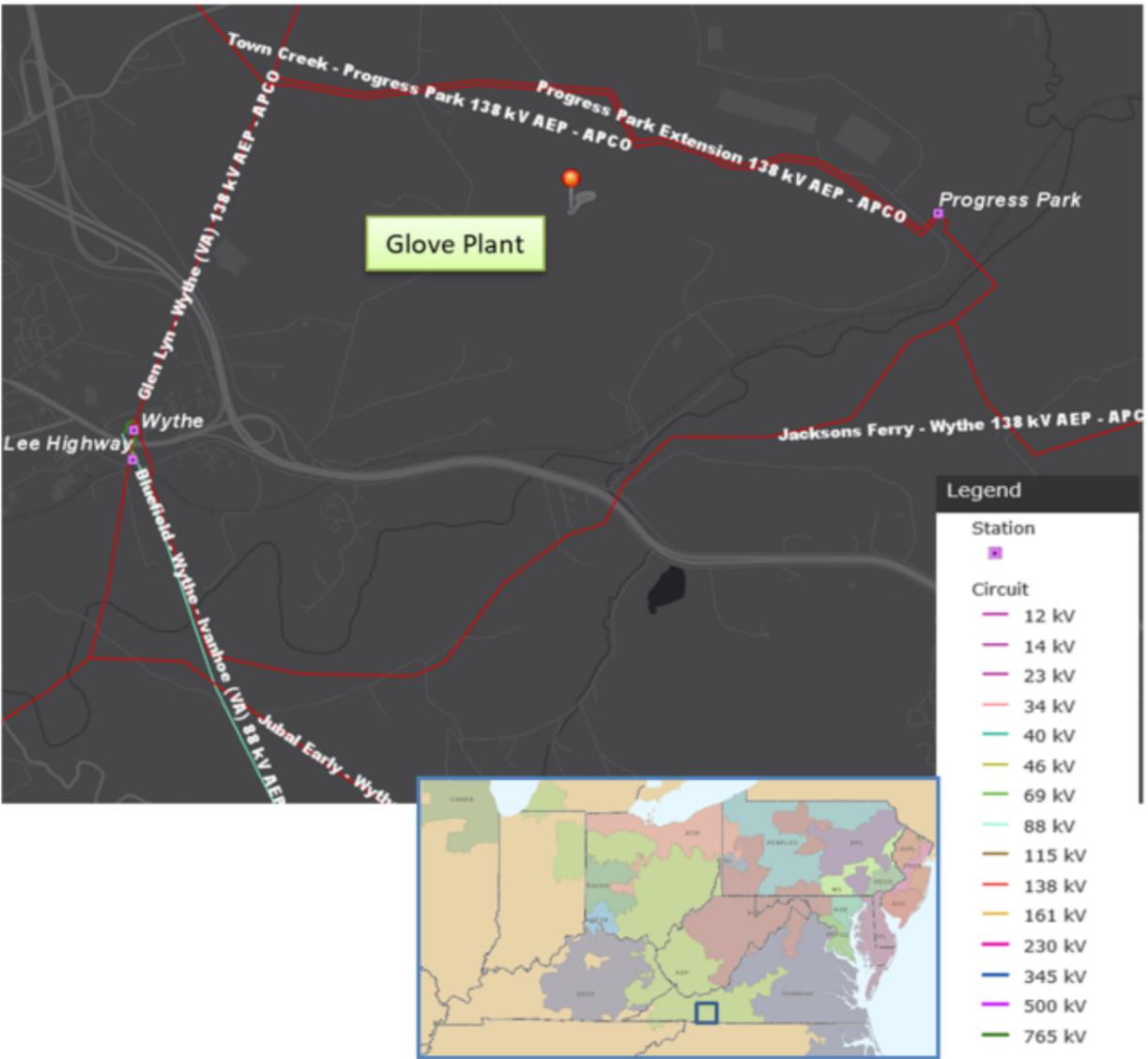
AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 12)

Problem Statement:

AEP Distribution has requested a new delivery point (Glove Plant).

A customer is constructing a manufacturing facility which will bring on a load that is projected to grow to 59.5MW by May 2026.

Reason for the Cancellation: The customer has withdrawn the request for a new delivery point. This need can be cancelled.



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

Need Number: AEP-2023-AP024

Process Stage: Solutions Meeting 5/17/2024

Previously Presented: Need Meeting 10/20/2023

Project Driver: Customer Service

Specific Assumption References:

AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 12)

Problem Statement:

Customer Service:

- Coronado Global Resources Inc. has requested new delivery point for their facility at Jones Fork Rd, Buchanan County, VA.
- The anticipated Peak load for this facility is 2 MW (future possible load ramp of up to 5MW).
- The customer has requested an ISD of 06/01/2024.



AEP Transmission Zone M-3 Process Raikes Branch Delivery Point

Need Number: AEP-2023-AP024

Process Stage: Solutions Meeting 5/17/2024

Proposed Solution:

Raikes Branch Metering Install: Remove an existing wood pole structure on the Raikes Branch customer delivery line and install a new pole that will have the new metering equipment. This cost is reimbursable from the customer; the previous delivery point switches are still in good condition and do not need replaced.

Estimated Cost: \$0 M

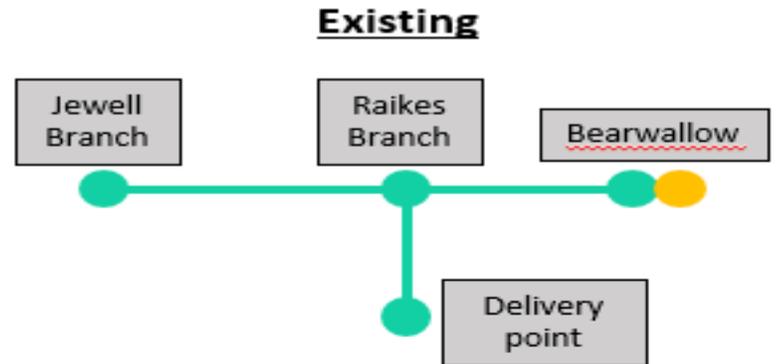
Ancillary Benefit: This solution is able to reuse an existing phase over phase switch to connect the 2 MW load request. The Raikes Branch delivery point is currently unused after a previous customer discontinued operation.

Alternatives Considered:

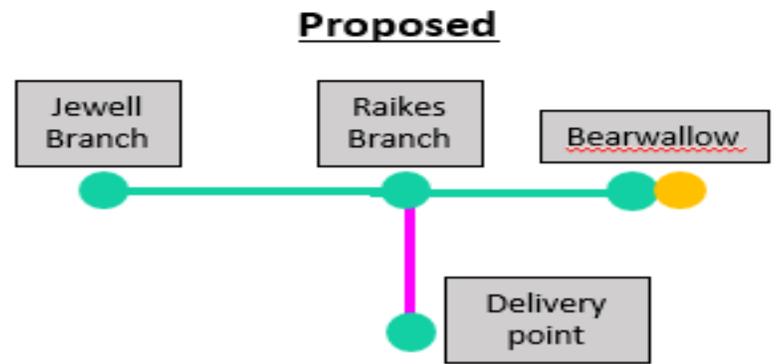
Install a new 69kV phase over phase switch for the customer delivery point on a different location on the line. Considering the existing switch that's available for use and the location of the customer request, this option was not pursued. Further, a new switch installation would be more costly.

Projected In-Service: 10/3/2024

Project Status: Engineering



Legend	
500 kV	Red line
345 kV	Blue line
138 kV	Yellow line
69 kV	Green line
34.5 kV	Red line
23 kV	Red line
New	Purple line



Need Number: AEP-2021-AP025

Process Stage: Solutions Meeting 5/17/2024

Previously Presented: Need Meeting 6/15/2021

Project Driver: Equipment Condition/Performance/Risk

Specific Assumption References:

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13)

Problem Statement:

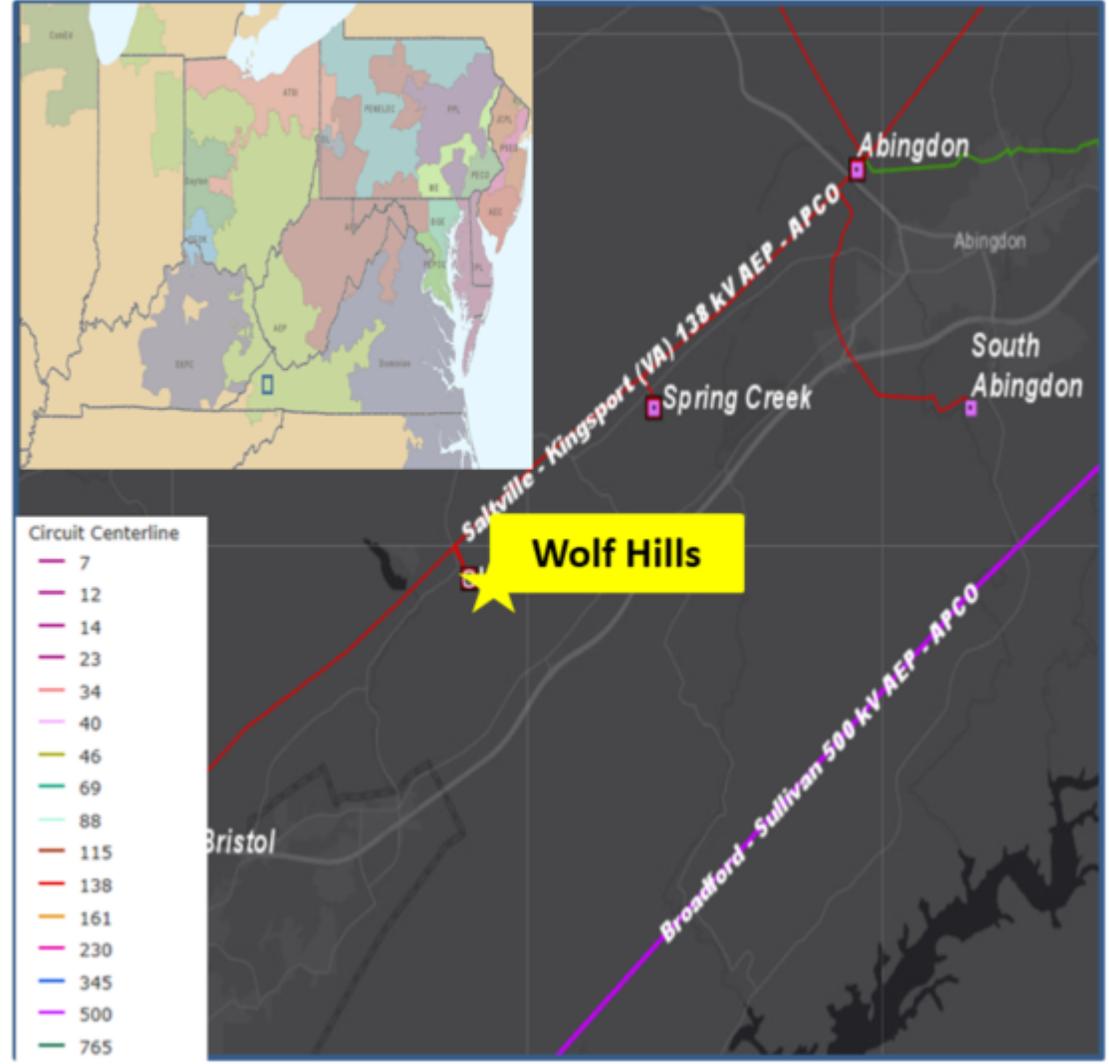
Station Name: Wolf Hills

Circuit Breakers A, B, C & D (138 KV) Concerns:

- All of these breakers are HVB145-40000 type, SF6 filled. These breakers are 2000 (CBs B, C, & D) and 2001 (CB A) vintage and manufactured by GE-Hitachi.
- This type of CB requires maintenance beyond the typical SF6 model type because of air trip mechanisms. The entire air system must be rebuilt whenever maintenance is performed resulting in significant costs.
- The HVB145 model family has the propensity to mechanically pump closed instead of locking open as it awaits an electrical close command from the relaying. This presents a high mis-operation risk on the system.
- All of these breakers have exceeded or met the manufacturer’s designed number of full fault operations of 10 - Breakers A, B, C, and D have experienced 43, 35, 12, and 10 fault operations, respectively. While each of these fault operations is likely not at the full fault current rating of the circuit breakers, fault operations of any magnitude come with accelerated aging.
- Environmental concerns: The HVB circuit breaker model used in this station has a high occurrence of SF6 gas leaks. There have been 215 malfunction records of “Low Gas” or “Adding SF6” across the AEP System. This is an environmental concern since SF6 is a potent greenhouse gas with a high climate change potential, and its concentration in the earth’s atmosphere is rapidly increasing.

Relay concerns:

- Currently, 25 of the 33 relays (76% of all station relays) are in need of replacement.
- There are 12 electromechanical and 3 static type relays which have significant limitations with regards to fault data collection and retention, lack sufficient spare part availability, and lack vendor support. There are 10 microprocessor relays that utilize obsolete firmware.



AEP Transmission Zone M-3 Process Wolf Hills Breaker Replacement

Need Number: AEP-2021-AP025

Process Stage: Solutions Meeting 5/17/2024

Proposed Solution:

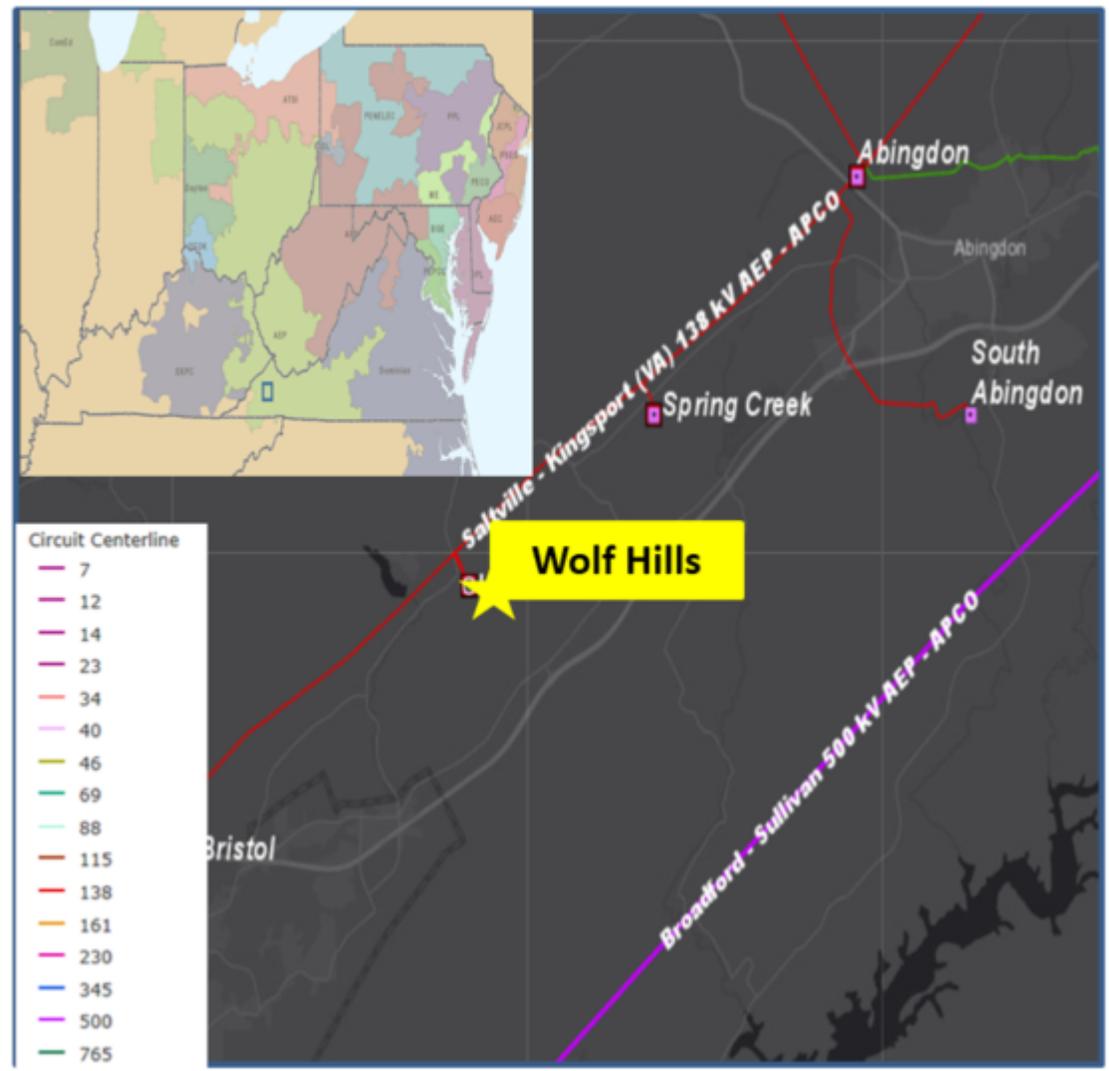
Wolf Hills Breaker Replacements: Replace existing 138 kV circuit breakers A, B, C, and D with four new 138 kV 3000 A 40 kA circuit breakers and install a new a new 138 kV 3000 A 40 kA circuit breaker between Wolf Hills 138 kV Bus #1 and Wolf Hills 138 kV Bus #2. Upgrade control house and install primary and backup station service.

Transmission Cost Estimate: \$5.3 M

Alternatives Considered: Rebuild Wolf Hills Station and reconfigure the 138 kV yard into an 8 breaker ring bus configuration. This would require station expansion which is not feasible in the current location and rebuilding completely in the clear would be cost prohibitive.

Projected In-Service: 9/10/2027

Project Status: Scoping



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

5/7/2024– V1 – Original version posted to pjm.com