

# Western Sub Regional RTEP: AEP Supplemental Projects

March 15, 2024

# 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

# AEP Transmission Zone M-3 Process Pike County, KY

**Need Number:** AEP-2022-AP034

**Process Stage:** Solution Meeting 3/15/2024

**Previously Presented:** Need Meeting 06/15/2022

**Project Driver:**

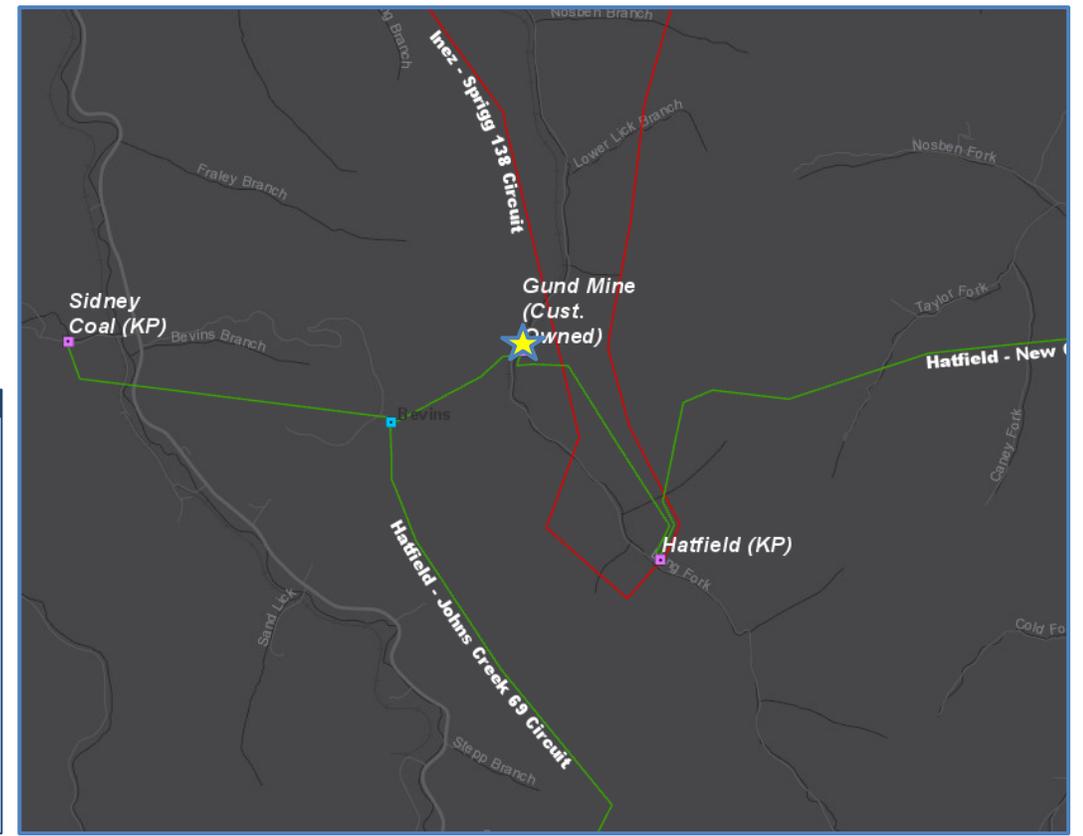
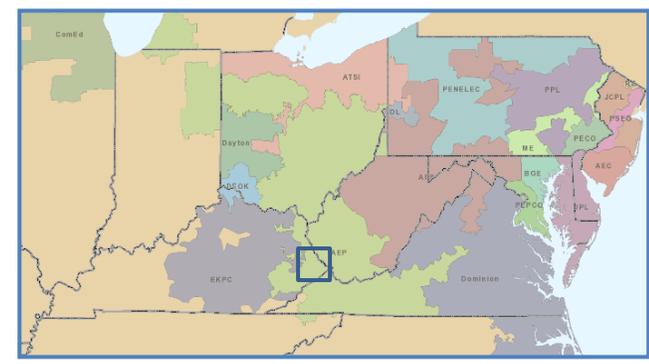
Customer Service Criteria/ Operational Flexibility and Efficiency

**Specific Assumption Reference:**

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 11,12 and 14)

**Problem Statement:**

- A customer has requested service for 20 MW peak load out of the Gund metering location in Pike County, KY.
- Gund metering is an existing delivery point served via a Hard tap from Hatfield - Johns Creek 69kV line. Hard Taps have no switching capability and result in longer restoration times for any outage along the line.



Legend	
Station	★
Circuit	—
	12 kV
	14 kV
	23 kV
	34 kV
	40 kV
	46 kV
	69 kV
	88 kV
	115 kV
	138 kV
	161 kV
	230 kV
	345 kV
	500 kV
	765 kV

# AEP Transmission Zone M-3 Process Pike County, KY

**Need Number:** AEP-2024-AP001

**Process Stage:** Solution Meeting 3/15/2024

**Previously Presented:** Need Meeting 02/16/2024

**Project Driver:**

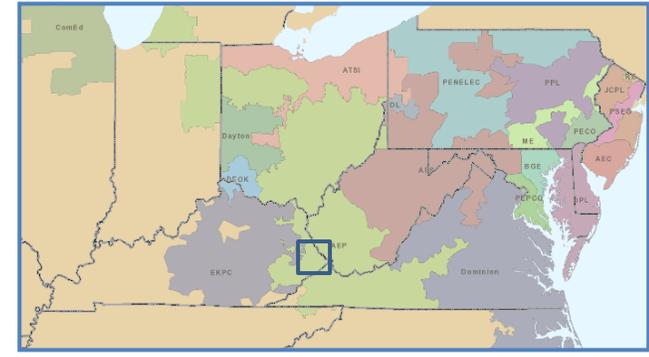
Customer Service Criteria

**Specific Assumption Reference:**

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

**Problem Statement:**

- A customer has requested service for 7 MW peak load out of the Bevins switching station location in Pike County, KY, with proposed in service in 12/2024. The customer has plans to increase the load in the future at this delivery point.



Legend	
Station	★
Circuit	—
	12 kV
	14 kV
	23 kV
	34 kV
	40 kV
	46 kV
	69 kV
	88 kV
	115 kV
	138 kV
	161 kV
	230 kV
	345 kV
	500 kV
	765 kV

# AEP Transmission Zone M-3 Process Pike County, KY

**Need Number(s):** AEP-2022-AP034, AEP-2024-AP001

**Process Stage:** Solutions Meeting 3/15/2024

**Proposed Solution:**

At Gund Metering Point, install new revenue metering for a 20 MW customer load connection. Install a new 69kV manual switch on the customer side of the hard tap. **Estimated Cost: \$1.15M**

At Bevins Metering Point, motorize the existing switch at Bevins towards Gund to facilitate the connection of a 7 MW customer load to existing delivery point. **Estimated Cost: \$0.59M**

**Estimated Total Transmission Cost: \$1.74M**

**Ancillary Benefits:** Installation of new SCADA functionality at Bevins adds more sectionalizing capability to the 69kV line.

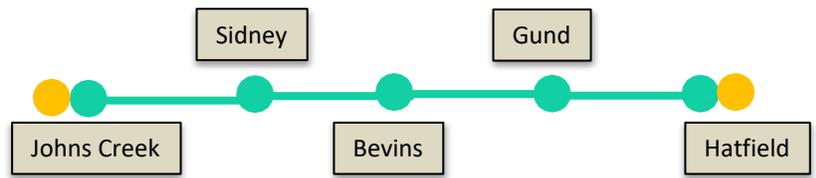
**Alternatives Considered:** Fix the 69kV hard Tap at Gund Metering Point by adding a phase over phase switch. This alternative was not picked because of the difficult terrain at the location of the hard tap. Estimated Cost: \$4M

**Projected In-Service:** 11/15/2024

**Project Status:** Engineering

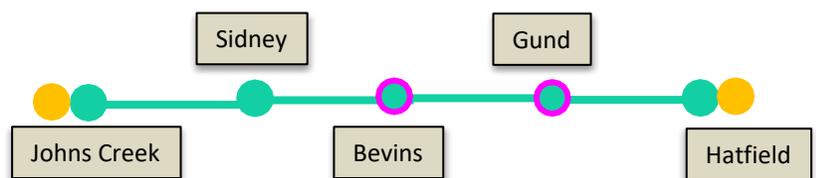
**Model Year:** 2025

**Existing**



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

**Proposed**

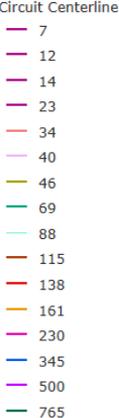


# AEP Transmission Zone M-3 Process Markle, Indiana

**Need Number:** AEP-2023-IM021  
**Process Stage:** Solutions Meeting: 03/15/2024  
**Previously Presented:** Need Meeting: 10/20/2023  
**Supplemental Project Driver:** Customer Need  
**Specific Assumption Reference:** AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13)  
**Model:** 2028 RTEP

**Problem Statement:**  
WVPA has requested a new delivery point for a peak load of 12MW in Markle, Indiana.

**Requested ISD:** 06/01/2025



# AEP Transmission Zone M-3 Process Project Markle

**Need Number:** AEP-2023-IM021

**Process Stage:** Solution Meeting 03/15/2024

**Proposed Solution:**

Install a 3-way phase over phase switch on the Sorenson-Van Buren 138kV circuit. From the new switch, install a ~2.5 mile 138kV line to the customer delivery point. Low-side metering will be installed in the customer owned station.

**Total Estimated Transmission Cost: \$9.4 M**

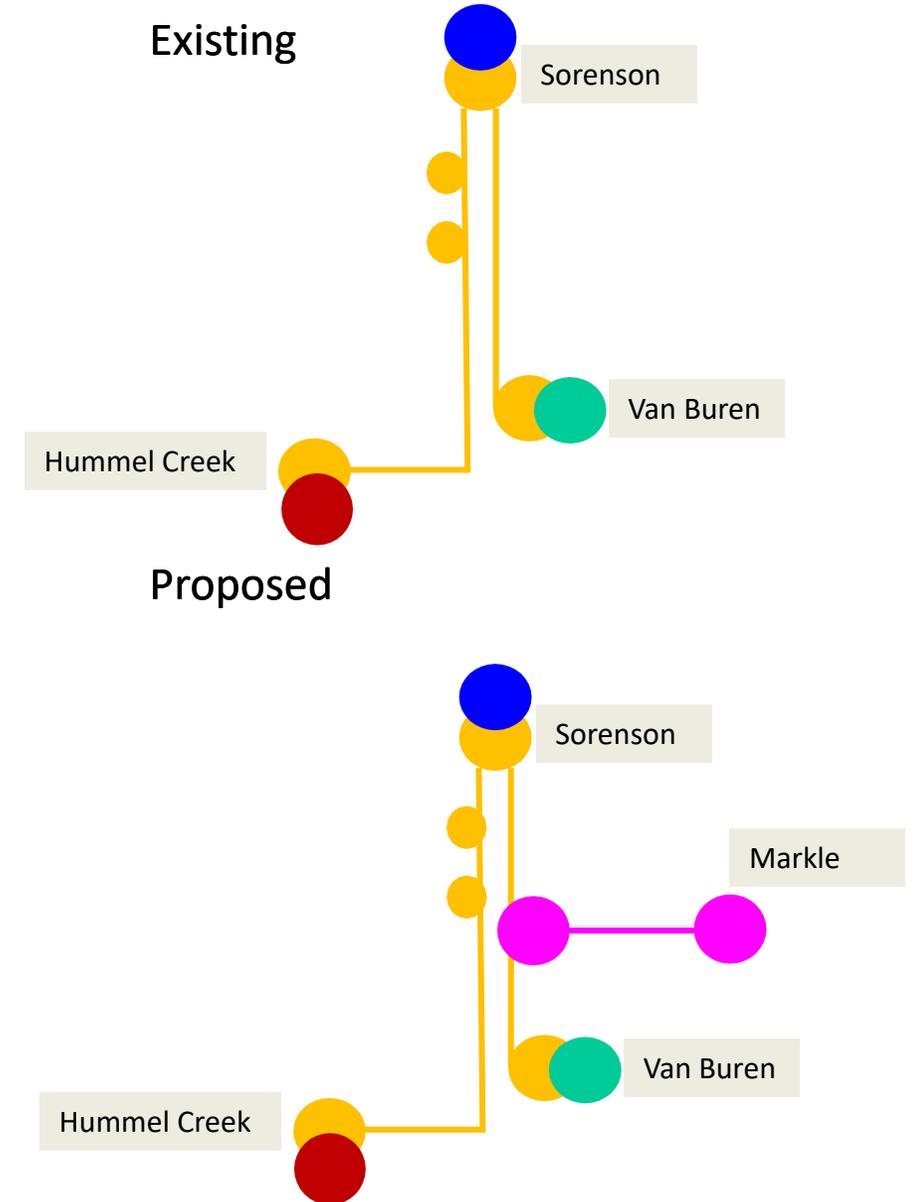
**Alternative considered:**

Install a double circuit line from the new 138kV switch to the customer. Due to the load size of this customer request this alternate was not chosen.

**Total Cost: \$12M**

**Projected In-Service:** 10/1/2026

**Project Status:** Scoping



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

# AEP Transmission Zone M-3 Process Lancaster, Ohio

**Need Number:** AEP-2023-OH078

**Process Stage:** Solutions Meeting 03/15/2024

**Previously Presented:** Needs Meeting 10/20/2023

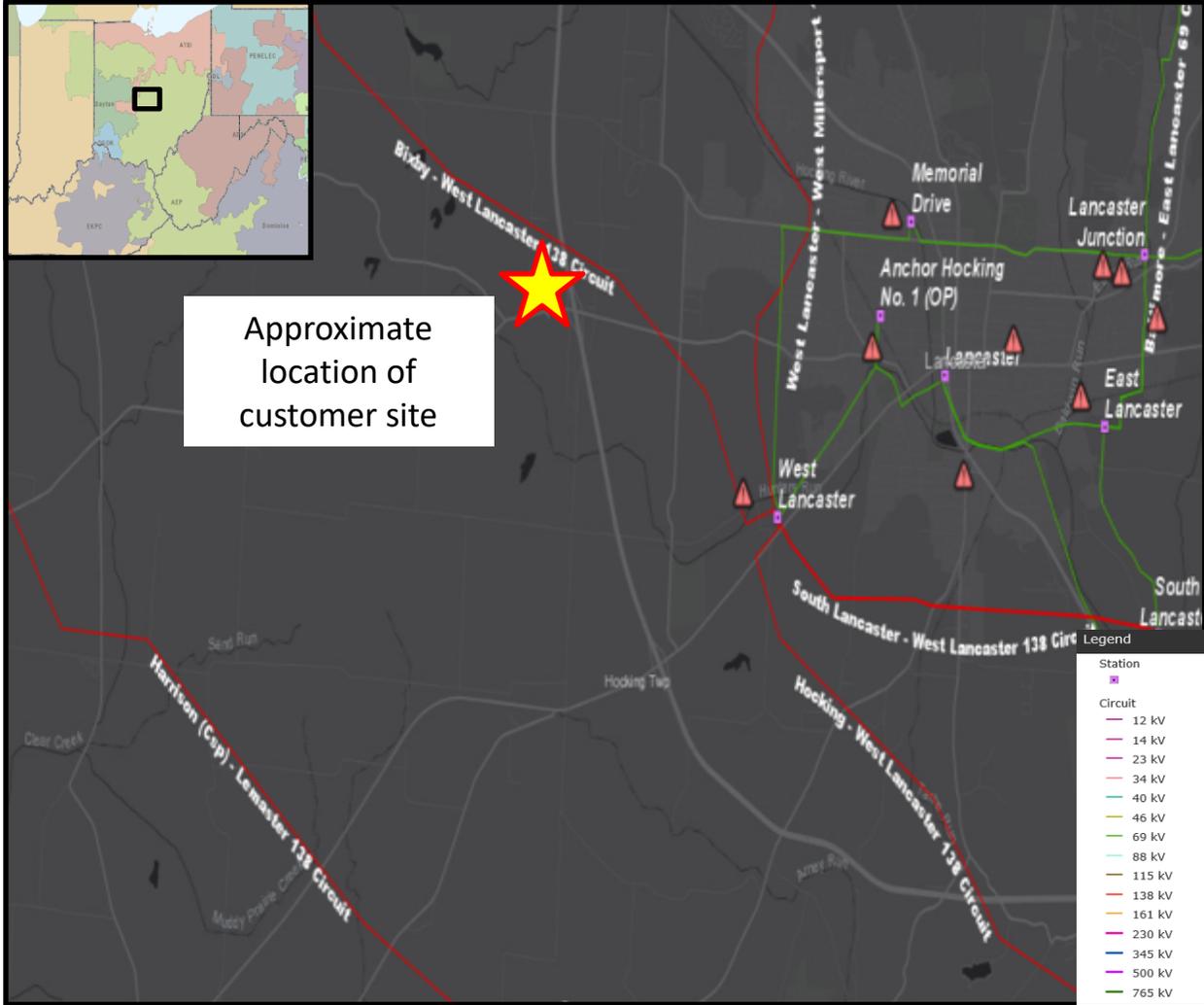
**Project Driver:** Customer Service

**Specific Assumption Reference:**

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

**Problem Statement:**

- A customer has requested additional transmission service in Lancaster Ohio, near Sifford station.
- Initial project build out supplemental number is s2527.
- The incremental projected demand for the site is 96 MW, bringing the total load for the customer's site to 196 MW.
- Customer requested in-service date of 09/30/2024.



# AEP Transmission Zone M-3 Process Lancaster, Ohio

**Need Number:** AEP-2023-OH078

**Process Stage:** Solutions Meeting 03/15/2024

**Proposed Solution:**

- **Sifford Station:** Sifford station will be built out to accommodate two new 138 kV feeds to the customer. This will include the installation of 4-3000A 40kA 138 kV circuit breakers and associated equipment. **Estimated Cost: \$6.373M**
- **Sifford – Ruble #2 138 kV Feed A:** Install 138 kV line extension from AEP’s Sifford station to serve the customer’s station located just south of the Sifford station. **Estimated Cost: \$2.948M**
- **Sifford – Ruble #2 138 kV Feed B:** Install a second 138 kV line from AEP’s Sifford station to serve the customer’s station located just south of the Sifford station to meet customer’s redundancy requirements at the site. **Estimated Cost: \$0M (fully reimbursable)**

**Total Estimated Cost: \$9.322M**

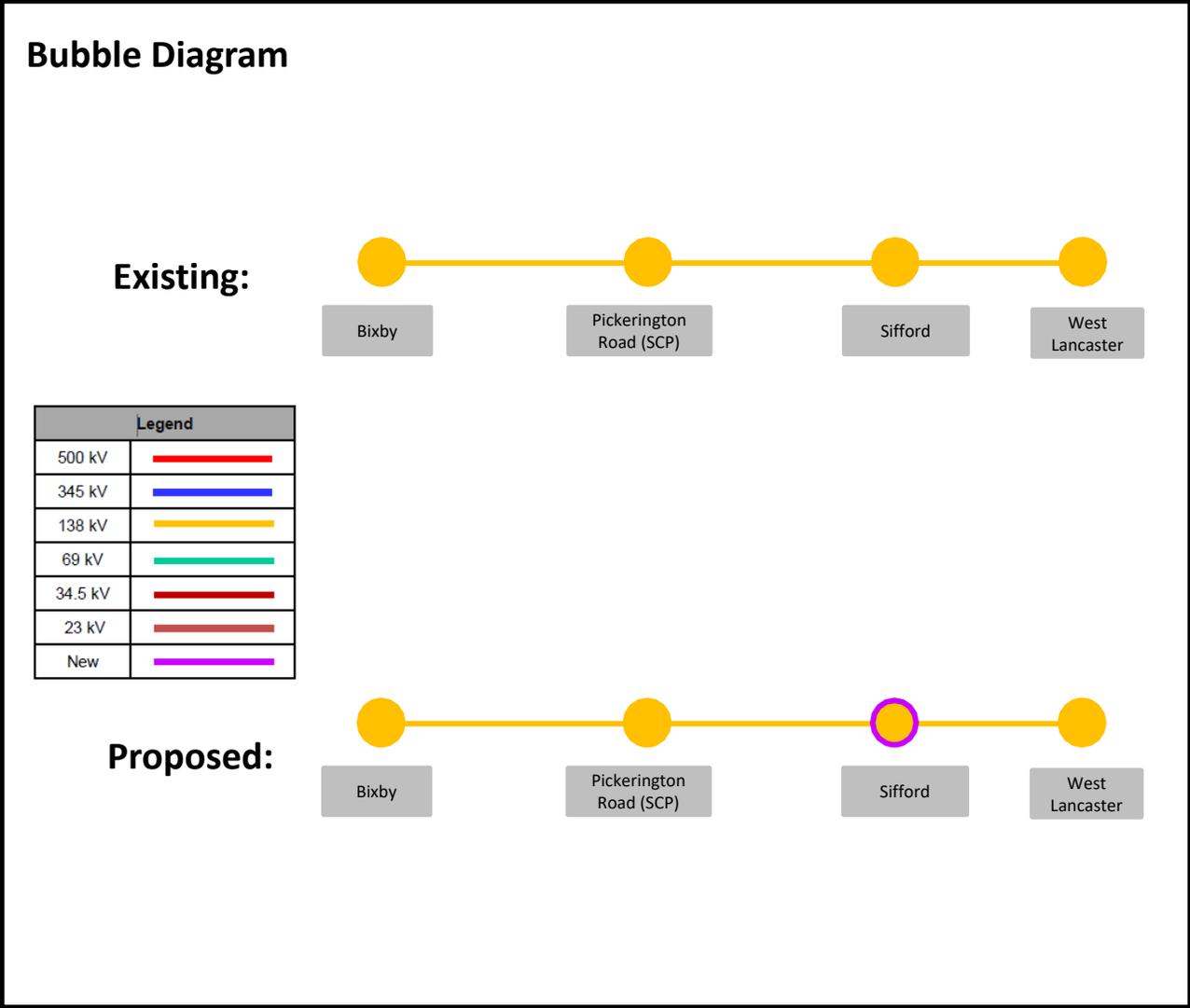
**Alternatives Considered:**

Given the location of the request on the customer's site near Sifford station no other alternative was considered.

**Projected In-Service:** 09/30/2024

**Projected Status:** Engineering

**Model:** 2028 RTEP



# AEP Transmission Zone M-3 Process Roanoke, VA

**Need Number:** AEP-2024-AP002

**Process Stage:** Solution Meeting 3/15/2024

**Previously Presented:** Need Meeting 2/16/2024

**Project Driver:**

Equipment Condition/Performance/Risk, Operational Flexibility

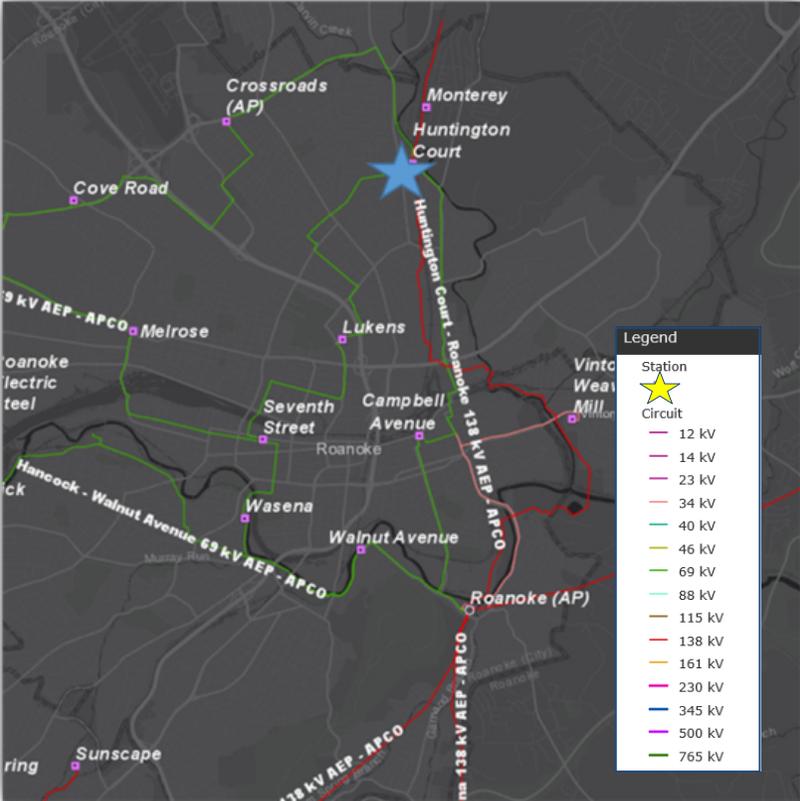
**Specific Assumption Reference:**

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13, 14)

**Problem Statement:**

Huntington Court Station:

- 69 kV Circuit Breakers
  - E, H and M are all 1994 vintage, 72PM31-20 type, SF6 circuit breakers. Circuit breakers of this type across the AEP system have had reports of moisture ingress into the breaker tank. This moisture ingress leads to increased maintenance and a higher risk of failure. These breakers have documented issues with failures to close due to burned up coils. There have been five catastrophic failures involving this model type across the AEP system. As the components of these units age and become brittle like the O-rings and gaskets, SF6 leaks become more prevalent.
  - Two of these circuit breakers, E and M, have exceeded the manufacturer’s designed number of full fault operations (13 and 9 respectively, with 6 being the manufacturer’s recommended maximum).
  - CB-M has a documented malfunction for an SF6 leak.
- Relaying
  - Huntington Court currently deploys 82 relays, implemented to ensure the adequate protection and operation of the substation. Currently, 45 of the 82 relays (55% of all station relays) are in need of replacement. Of these, 40 of these are of the electromechanical and static type which have significant limitations with regards to spare part availability and fault data collection and retention. These relays lack vendor support. In addition, there are 5 legacy microprocessor based relays that need replaced.
- Operational Flexibility and Efficiency
  - 69/12 kV Transformer #2 does not have a high side circuit switcher or high side breaker. Faults on this bank temporarily outage the 69 kV Bus #2 and there is no low-side load breaking device.
  - 69/34.5 kV Transformer #4 utilizes low-side hookstick vacuum bottle switches. Circuit breakers or vacuum bottle MOABs are recommended to allow for proper sectionalizing.



# AEP Transmission Zone M-3 Process Roanoke, VA

**Need Number:** AEP-2024-AP002

**Process Stage:** Solutions Meeting 3/15/2024

**Proposed Solution:**

Huntington Court Station:

- Replace 69 kV circuit breakers “E”, “H”, and “M” and previously identified electromechanical and legacy microprocessor relaying. Install high-side circuit switcher on 138/12 kV T2 and low-side breaker on 138/34.5 kV T4. **Estimated Cost: \$0 (Distribution)**

**Total Estimated Transmission Cost: \$0**

**Ancillary Benefit:**

- Will coordinate with work being performed under baseline project b3289.2 to install a circuit switcher on T1 to minimize outage impact.

**Alternatives Considered:**

- Rebuild the Huntington Court 69 kV facilities as ring bus configuration, replacing 69 kV CBs “E”, “H”, and “M” and identified relaying. Install low-side breaker on 138/34.5 kV T4. Due to lack of space and limited other needs at the station, this option was not pursued.

**Projected In-Service:** 11/30/2025

**Project Status:** Scoping

**Station Work Only**

**No Bubble Diagram Needed**

# AEP Transmission Zone M-3 Process Ridgeway, VA

**Need Number:** AEP-2024-AP003

**Process Stage:** Solution Meeting 3/15/2024

**Previously Presented:** Need Meeting 2/16/2024

**Project Driver:**

Customer Service

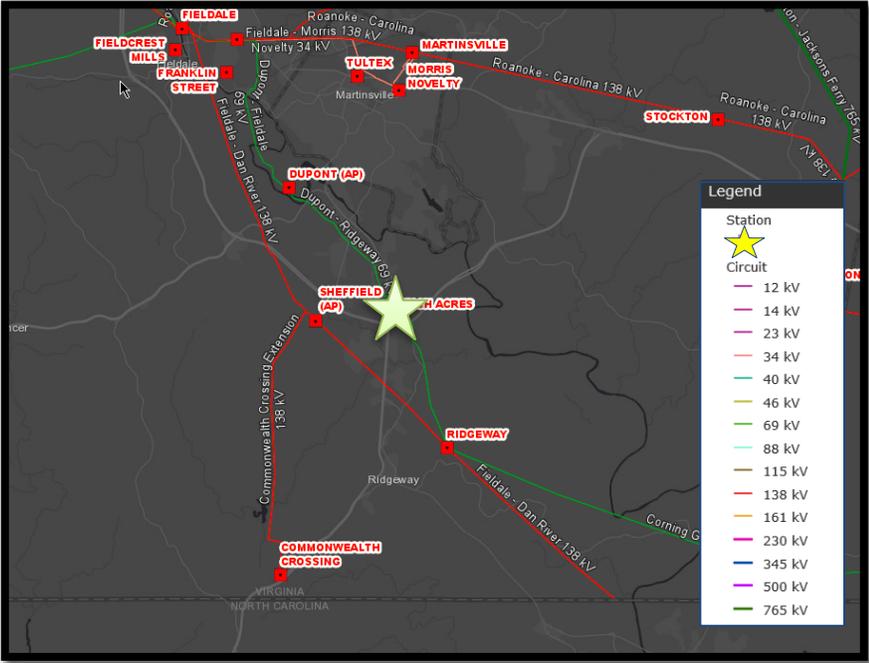
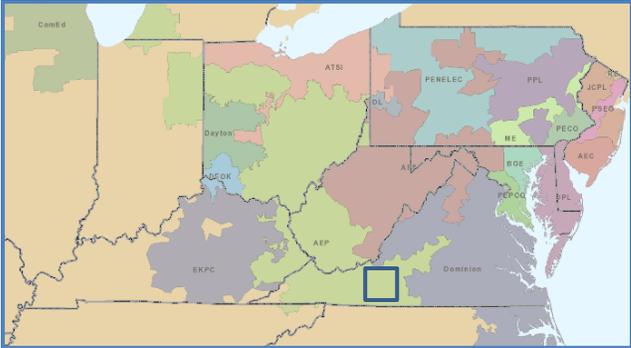
**Specific Assumption Reference:**

AEP Guidelines for Transmission Owner Identified Needs (AEP Customer Service Slide 12)

**Problem Statement:**

Rich Acres Station:

There are 4 industrial/manufacturing customers, totaling approximately 12.9 MW of load, served out of Rich Acres Station. These customers have experienced 7 Transmission outages in 2023. The customers have asked AEP to investigate. Due to the nature of the load served at Rich Acres, any outage is costly and time consuming to recover from, resulting in lost product for these facilities. Today, there is no fault interrupting devices at the station to help protect customers from outages.



# AEP Transmission Zone M-3 Process Ridgeway, VA

**Need Number:** AEP-2024-AP003

**Process Stage:** Solutions Meeting 3/15/2024

**Proposed Solution:**

- Replace existing 69 kV MOABs “W” and “Y” with new 69 kV circuit breakers, new 69 kV box bay and transclosure to house the new relaying. **Estimated Cost: \$0 (Distribution)**
- The existing 69 kV MOAB switch is located on the opposite side of the street from the station requiring a new 69 kV “in and out” line extension (two spans, separate structures) from the existing line to the new 69 kV box bay. **Estimated Cost: \$1.4 M**

**Total Estimated Transmission Cost: \$1.4 M**

**Alternatives Considered:**

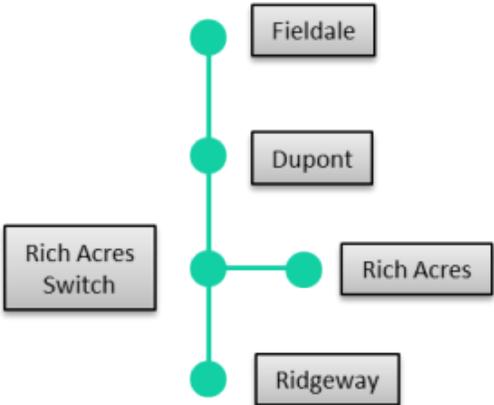
- Install 69 kV circuit breakers at DuPont Station, which would decrease the amount of exposure to line faults on the associated circuit, however installing breakers at Rich Acres provides the best reliability by eliminating customer exposure at Rich Acres from line fault events completely.

**Projected In-Service:** 06/17/2025

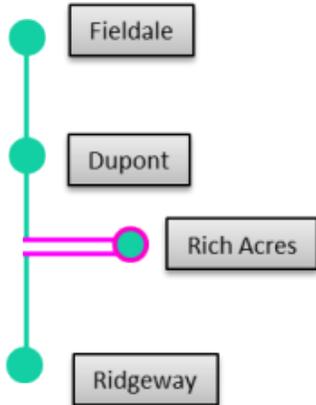
**Project Status:** Scoping

**Model:** N/A

Existing



Proposed



Legend	
500 kV	<span style="color: red;">—</span>
345 kV	<span style="color: blue;">—</span>
138 kV	<span style="color: yellow;">—</span>
69 kV	<span style="color: green;">—</span>
34.5 kV	<span style="color: red;">—</span>
23 kV	<span style="color: brown;">—</span>
New	<span style="color: purple;">—</span>

# AEP Transmission Zone M-3 Process West Lancaster – West Millersport 138 kV

**Need Number:** AEP-2024-OH029

**Process Stage:** Solutions Meeting 03/15/2024

**Previously Presented:** Needs Meeting 02/16/2024

**Project Driver:** Equipment Material/Condition/Performance/Risk

**Specific Assumption Reference:**

AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 13)

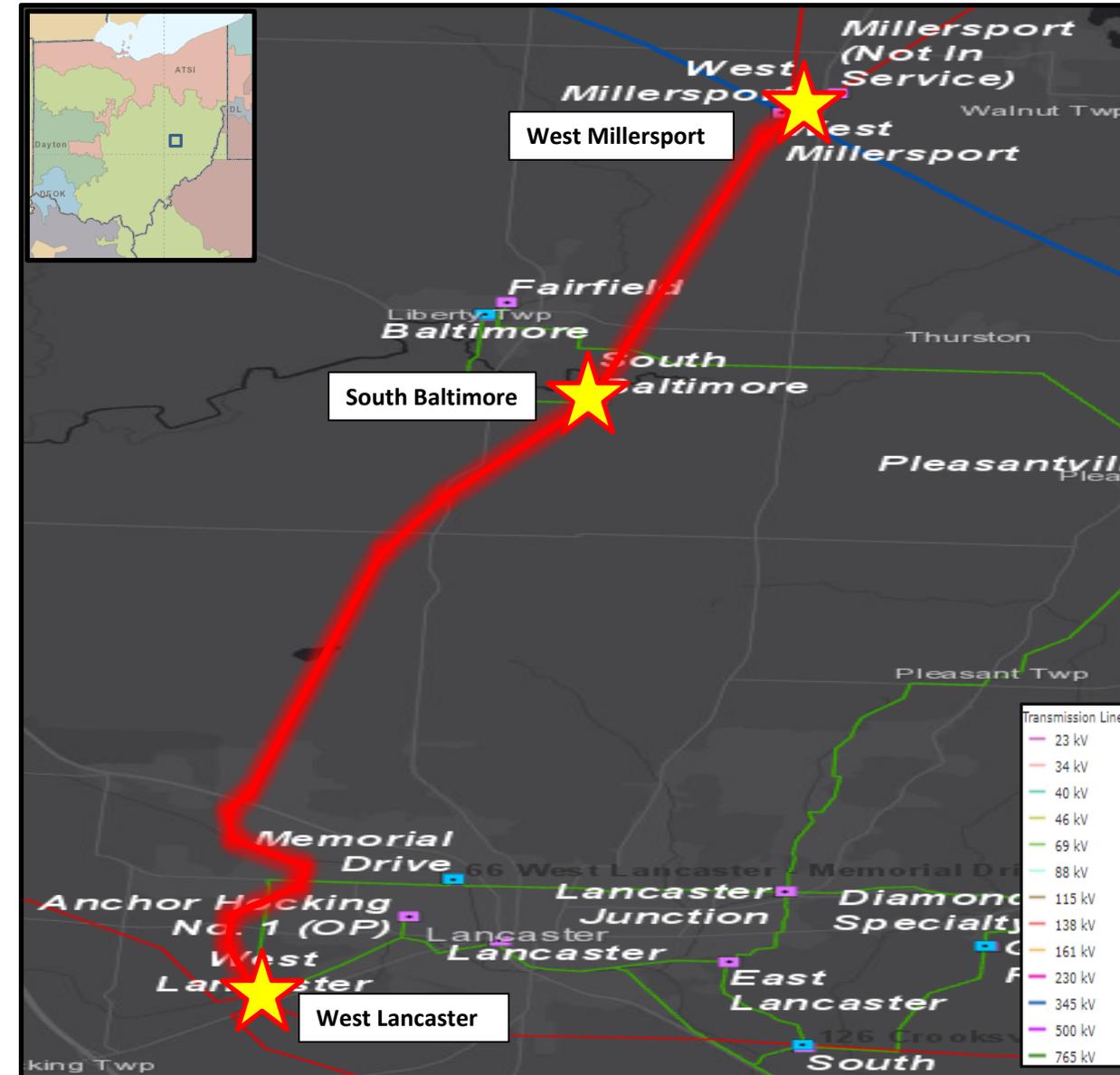
**Problem Statement:**

**Line Name: West Lancaster - South Baltimore - West Millersport 138 kV Line**

- Original Install Date (Age): 1954
- Length of Line: 14.4 miles
- Total structure count: 104 of Pole Wood & Pole Steel
  - Wood: 50 from 1950s, 7 from 1960s, 5 from 1970s, 10 from 1980s, and 3 from 1990s.
  - Steel: 29 from 2010s
- Conductor Type: 14.4 miles of 397,500 CM ACSR 30/7 (Lark) from 1954.

**Open Conditions:**

Currently, there are ~~90~~ **58** unique structures with at least one open condition, which relates to ~~86.5%~~ **55.7%** of the structures on the line. There are currently ~~102~~ **112** structures related open conditions including rot, woodpecker, damaged, cracked, loose, vines, split, disconnected, and insect damaged conditions. There are ~~2~~ **3** conductor related open conditions related to broken strands. There are currently 8 open conditions related to broken ground lead wires. There are also 17 hardware related open conditions including broken and missing molding, damaged guy wires, missing guy guards, and burnt and broken insulators.



# AEP Transmission Zone M-3 Process West Lancaster – West Millersport 138 kV

**Need Number:** AEP-2024-OH029

**Process Stage:** Solutions Meeting 03/15/2024

**Proposed Solution:**

- **West Lancaster – South Baltimore – West Millersport 138 kV :** Rebuild ~14.4 miles of the line between West Lancaster and West Millersport stations using 1033 ACSS 54/7 conductor. **Estimated Cost: \$38.7M**
- **West Lancaster Station:** Replace existing bus and line risers at the station, upgrade line relays. **Estimated Cost: \$1.0M**
- **South Baltimore Station:** Replace existing bus and line risers at the station, upgrade line relays. While at the station some additional site concerns such as the existing fence will be addressed. **Estimated Cost: \$0.7M**

**Total Estimated Cost: \$40.4M**

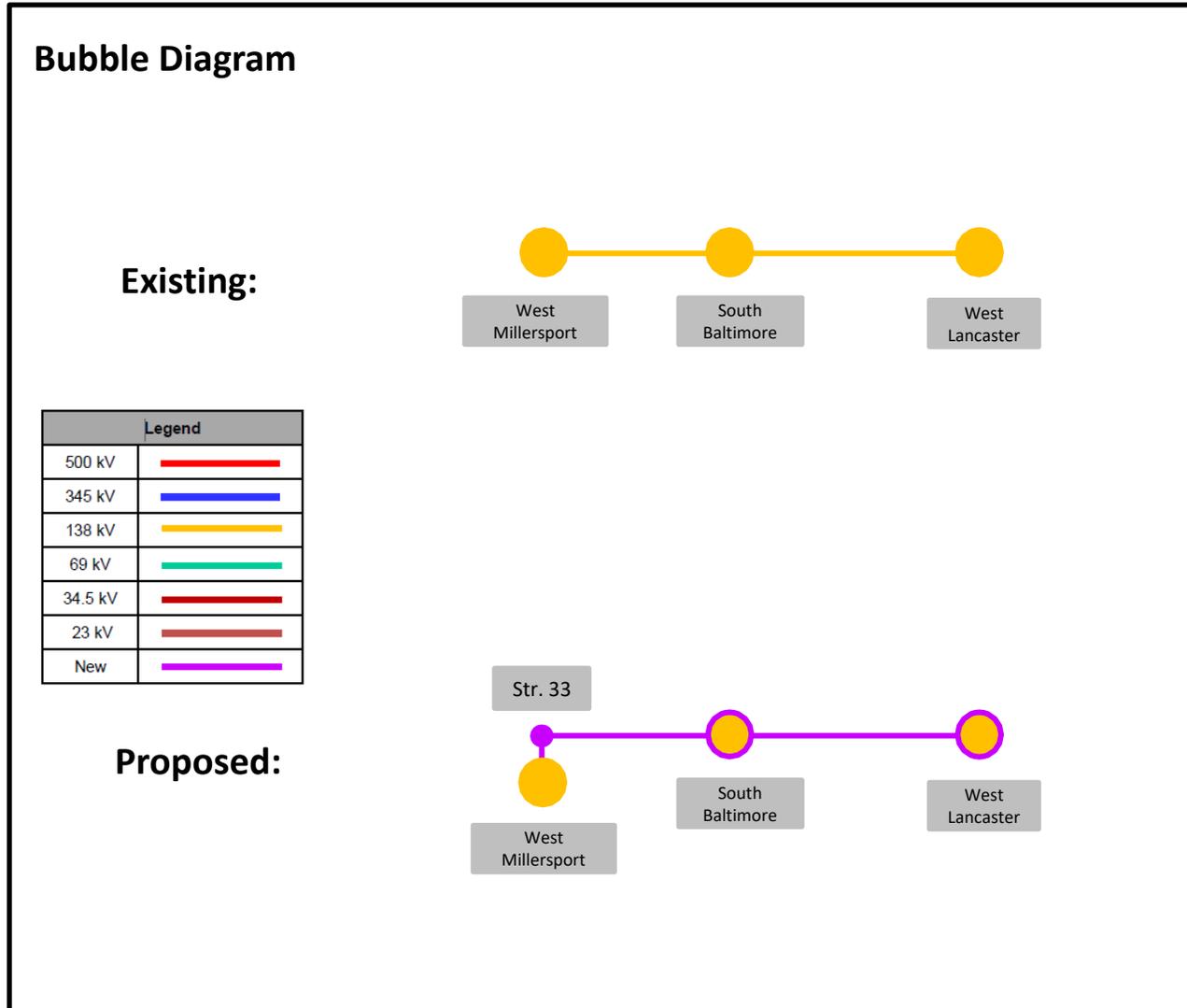
**Alternatives Considered:**

An alternative considered involved reutilizing the existing steel poles on the the 138 kV line. After further engineering analysis was completed, it was determined that the existing steel poles would need replaced in order to install the proposed conductor. This conductor was chosen to help support future growth in the area.

**Projected In-Service:** 10/31/2026

**Projected Status:** Scoping

**Model:** 2028 RTEP



# 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

3/1/2024– V1 – Original version posted to pjm.com