



# Reliability Analysis Update

Sub Regional RTEP Committee - PJM West

October 15, 2021

# Scope Changes

## Baseline Reliability Projects



# AMPT Transmission Zone: Baseline Bowling Green (B3159) Scope Change

Previously Presented: 12/18/2019 SRRTEP, 1/17/2020 SRRTEP  
(Changes are marked in Red)

**Solution Criteria:** TO Planning Criteria

**Assumption Reference:** AMPT FERC 715

**Model Used for Analysis:** RTEP 2024 Summer

**Proposal Window Exclusion:** FERC 715 (TO Criteria), Below 100kV

### Problem Statement:

The transmission system in and around the area of Bowling Green (BG) OH, is currently arranged as a three source network. The sources are Midway – Grand Rapids 69kV, Brim - BG Sub 5 69kV, and Maclean – Pemberville 69kV. Thermal overloads and voltage violations (see next slide) have been identified on the 69kV in the area of bowling green and Pemberville during the N-1-1 loss of Brim – BG Substation #5 69kV line, combined with either the loss of the Midway – Grand Rapids 69kV or Maclean – Pemberville 69kV line.

### Proposed Solution (B3159):

Establish a new 138/69kV substation. Install one 138kV circuit breaker, one 138/69kV 130 MVA Transformer, three 69kV circuit breakers. Construct a 0.15 mile 138kV 795 ACSR transmission line between the FE Brim 138/69kV substation and the newly proposed AMPT substation (three steel poles). Loop the BG Sub #5 – BG Sub #2 69kV line in and out of the newly established substation. Complete the remote end terminal work at BG substations #2 and #5 to accommodate the new substation.

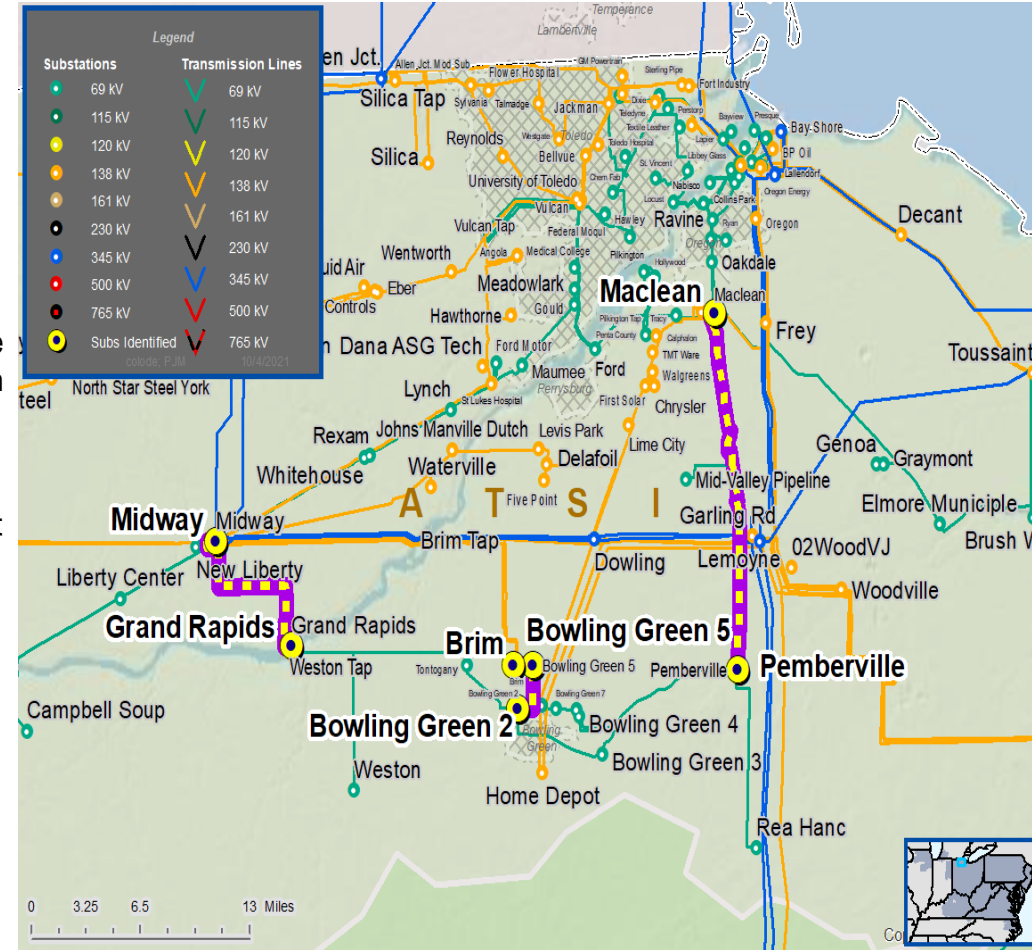
**Reason for Revision:** The original cost was a conceptual planning estimate and after more detailed engineering, has been determined to be low. Some costs were not originally included (remote end work), and others were based on industry guides that experience has now proven to be low. The latest estimated cost includes material escalation, and more detailed estimates of site-related costs, design, on-site construction support, internal labor, and contingency.

**Total Estimated Transmission Baseline Cost:** \$5.7M-\$ 10.1M

**Required IS Date:** 6/1/2024

**Projected IS Date:** 6/1/2022

**Status:** Construction



# Recommended Solution

## Baseline Reliability Projects



# Dayton Transmission Zone: Baseline Marysville Reactive Support

**Process Stage:** Recommended Solution

**Criteria:** Dayton 715 Criteria

**Assumption Reference:** 2026 RTEP assumption

**Model Used for Analysis:** 2026 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

**Problem Statement:**

FG: Dayton- VM1

In 2026 Summer RTEP case, low voltage violation at the Marysville 69kV bus is identified for a N-1 contingency.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
09MARYSV -09WOODST 69KV	50/55/50/55





# Dayton Transmission Zone: Baseline Marysville Reactive Support

## Recommended Solution:

**Marysville Substation:** Install two 69kV 16.6 MVAR cap banks; Install five 69kV circuit breakers; Upgrade station relaying; Replace 600A wave trap on the Marysville -Kings Creek 69kV (6660) Circuit. Estimated Cost: \$2.43M (B3341.1)

**Darby Substation:** Upgrade remote end relaying at Darby substation  
Estimated Cost: \$0.25M (B3341.2)

**Kings Creek:** Upgrade remote end relaying at Kings Creek Estimated Cost: \$0.25M (B3341.3)

\*Replacement of 600A wave trap on the Marysville - Kings Creek 69kV (6660) circuit is required as part of the project since the additional breaker installation on the Marysville - Darby 69kV circuit would result in a N-1 thermal overload of the 600A wave trap.

**Total Estimated Cost:** \$2.93M

## Preliminary Facility Rating:

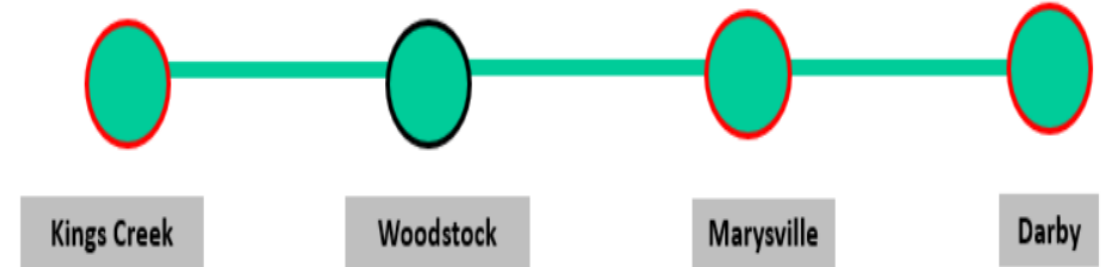
Branch	SN/SE/WN/WE (MVA)
09MARYSV -09WOODST 69KV	80/96/101/112

**Alternatives:** None

**Required IS date:** 6/1/2026

**Projected IS date:** 3/1/2026

**Previously Presented:** 9/17/2021





# AEP Transmission Zone: Baseline Kenny 138kV Breakers “102” and “106” Replacement

**Process Stage:** Recommended Solution

**Criteria:** Over Duty Breaker

**Assumption Reference:** 2026 RTEP assumption

**Model Used for Analysis:** 2026 short circuit model

**Proposal Window Exclusion:** Below 200kV

**Problem Statement:** Flowgates SC-3, SC-4

In 2026 RTEP short circuit model, Two (2) Kenny 138kV breakers are over duty: “102” (SC-3) and “106” (SC-4)

**Existing Facility Rating:** 2000A, 40 kA interrupting rating

**Recommended Solution:**

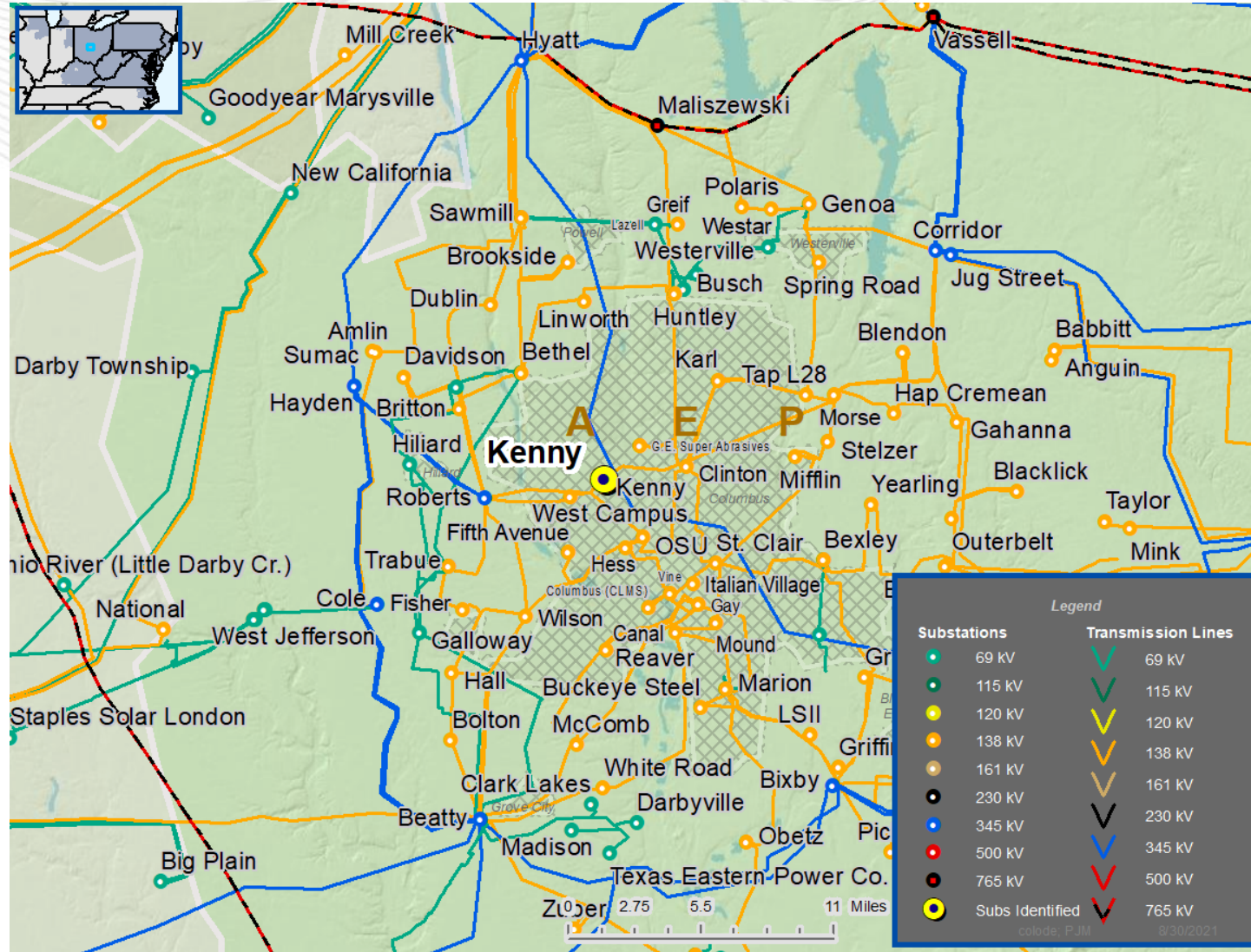
Replace the two (2) Kenny 138kV breakers , “102” (SC-3) and “106” (SC-4), each with a 3000A, 63 kA interrupting breaker (**B3338**)

**Estimated Cost:** \$0.76M Total or \$0.38M Each

**Required In-Service:** 6/1/2026

**Projected In-Service:** 9/1/2025

**Previously Presented:** 9/17/2021





# AEP Transmission Zone: Baseline Canal 138kV Breaker "3" Replacement

**Process Stage:** Recommended Solution

**Criteria:** Over Duty Breaker

**Assumption Reference:** 2026 RTEP assumption

**Model Used for Analysis:** 2026 short circuit model

**Proposal Window Exclusion:** Below 200kV

**Problem Statement:** Flowgate SC-5

In 2026 RTEP short circuit model, One (1) Canal 138kV breaker is over duty: "3"

**Existing Facility Rating:** 3000A, 40 kA interrupting rating

**Recommended Solution:**

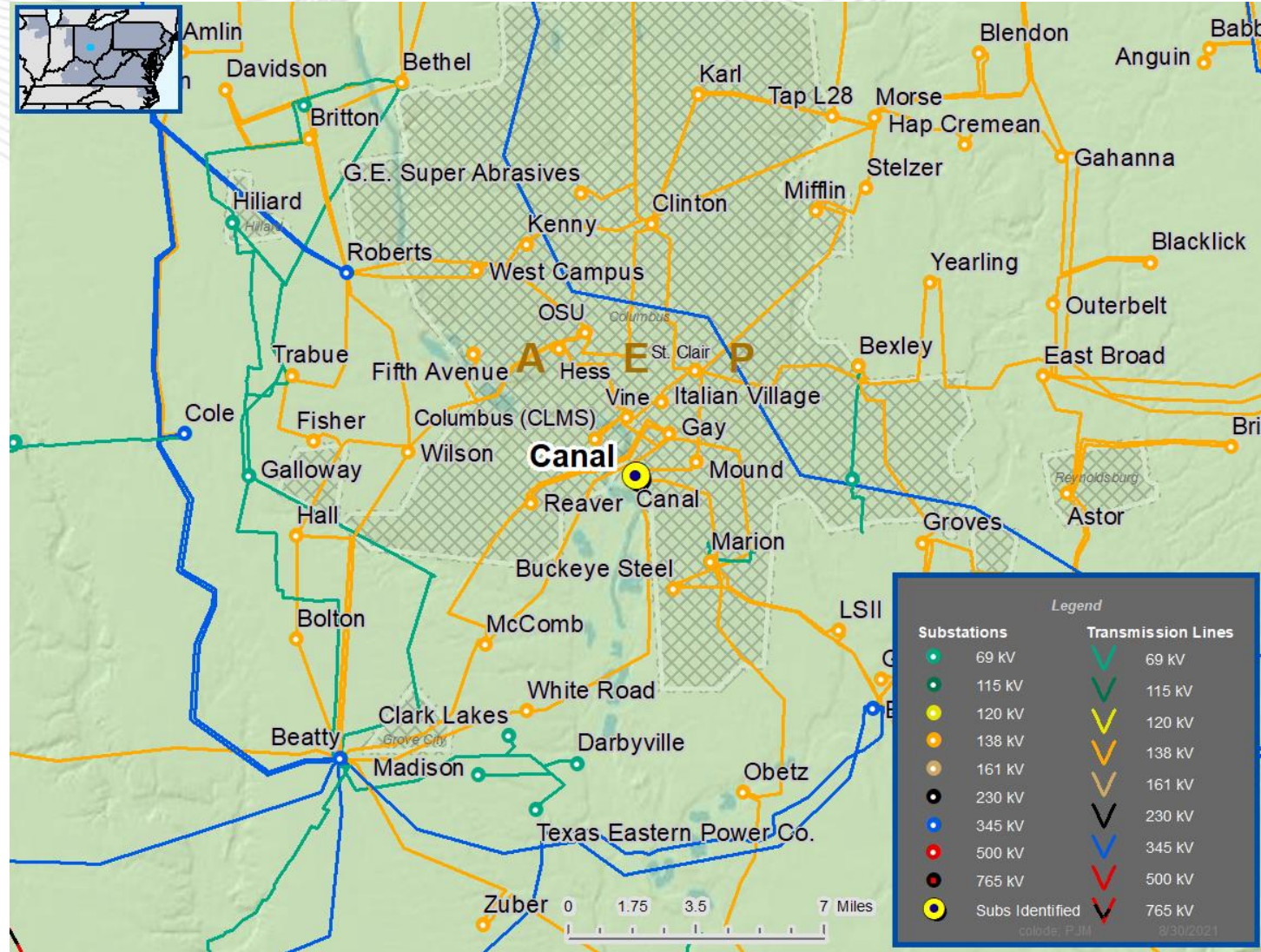
Replace the one (1) Canal 138kV breaker "3" with 3000A, 63 kA breaker (B3339)

**Estimated Cost:** \$0.48M

**Required In-Service:** 6/1/2026

**Projected In-Service:** 9/1/2025

**Previously Presented:** 9/17/2021







# AEP Transmission Zone: Baseline Hyatt 138kV Breaker “101N” Replacement

**Process Stage:** Recommended Solution

**Criteria:** Over Duty Breaker

**Assumption Reference:** 2026 RTEP assumption

**Model Used for Analysis:** 2026 short circuit model

**Proposal Window Exclusion:** Below 200kV

**Problem Statement:** Flowgate SC-6

In 2026 RTEP short circuit model, One (1) Hyatt 138kV breaker is over duty: “AB1(101N)”

**Existing Facility Rating:** 3000A, 50 kA interrupting rating

**Recommended Solution:**

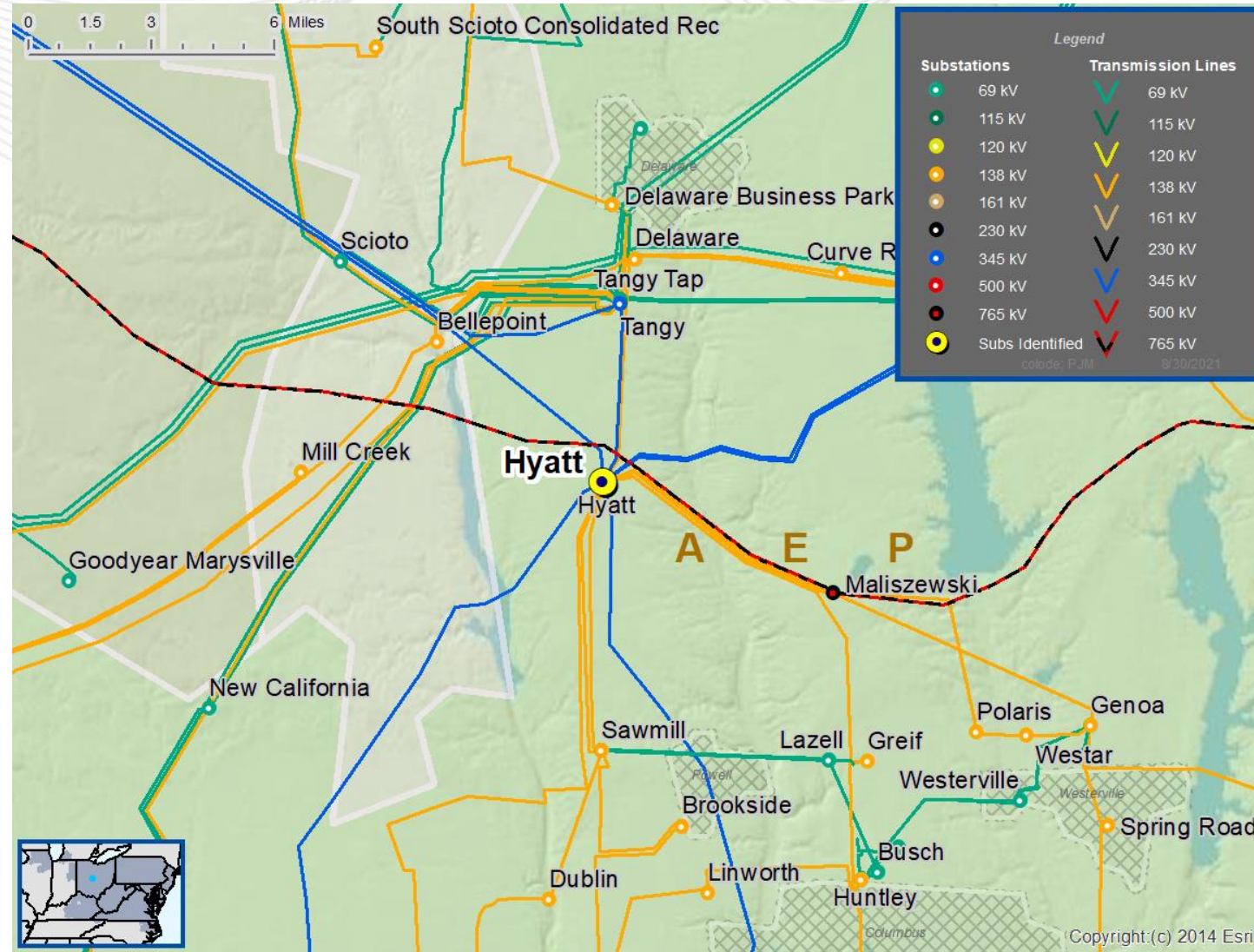
Replace the one (1) Hyatt 138kV breaker “AB1(101N)” with 3000A, 63 kA interrupting breaker (**B3337**)

**Estimated Cost:** \$0.48M

**Required In-Service:** 6/1/2026

**Projected In-Service:** 9/1/2025

**Previously Presented:** 9/17/2021





# DLC Transmission Zone: Baseline Cheswick 138kV Breaker “Z-53 LF\_3” Replacement

**Process Stage:** Recommended Solution

**Criteria:** Over Duty Breaker

**Additional Benefits:** N/A

**Assumption Reference:** 2026 RTEP Assumption

**Model Used for Analysis:** 2026 short circuit model

**Proposal Window Exclusion:** Below 200 kV

**Problem Statement:** Flowgate SC-1

**Cheswick 138kV Substation:**

In 2026 RTEP short circuit model, One (1) Cheswick 138kV breaker is over duty: “Z-53 LF\_3”

**Recommended Solution:**

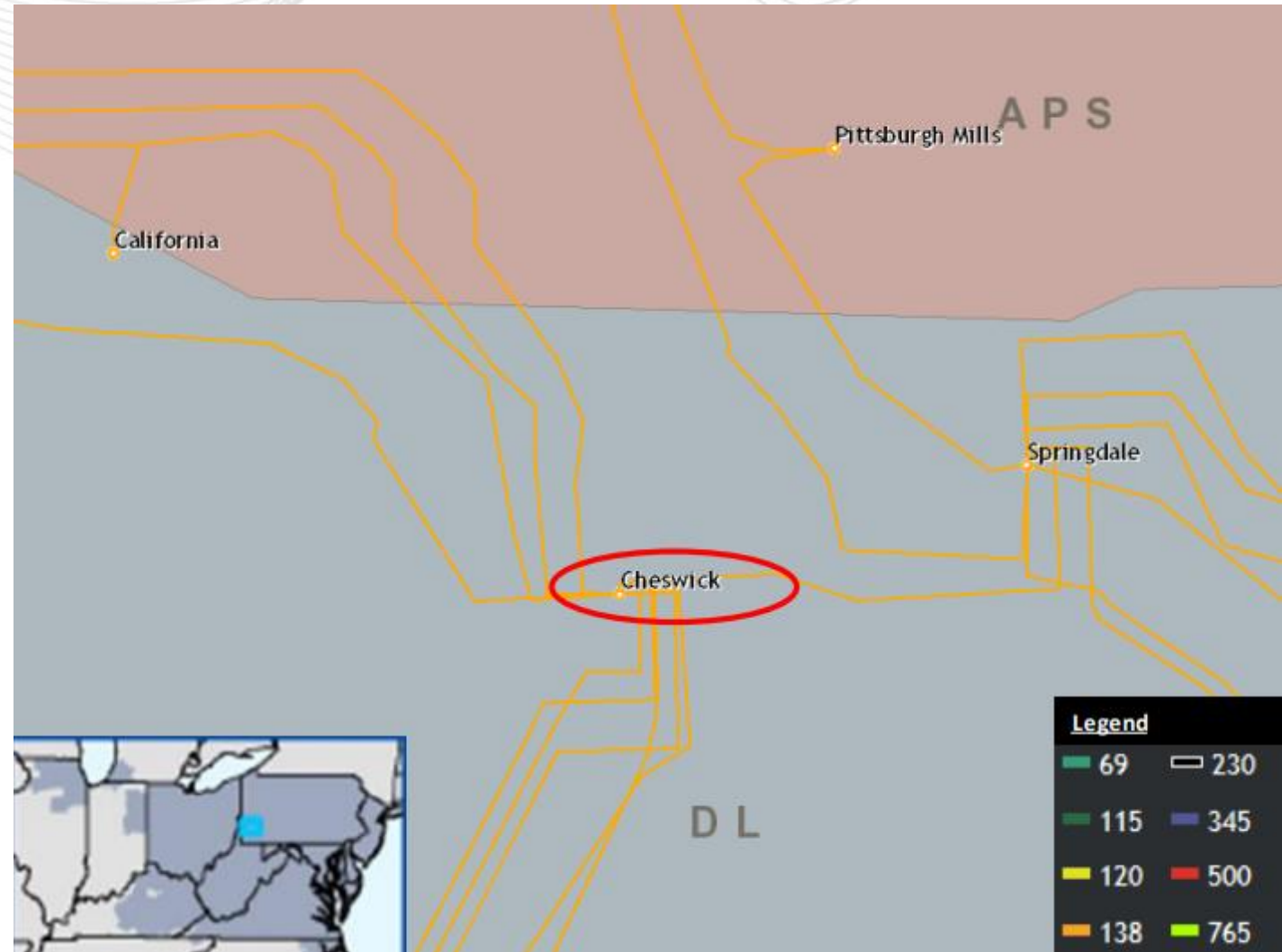
Replace one (1) Cheswick 138kV breaker with a 3000A, 63kA breaker: “Z-53 LF\_3” . (B3340)

**Estimated Cost:** \$0.35 M

**Required In-Service:** 6/1/2026

**Projected In-Service:** 6/1/2026

**Previously Presented:** 9/17/2021



# First Review

## Baseline Reliability Projects

**Process Stage:** First Review

**Criteria:** AEP 715 Criteria

**Assumption Reference:** 2026 RTEP assumption

**Model Used for Analysis:** 2026 RTEP cases

**Proposal Window Exclusion:** Below 200 kV Exclusion

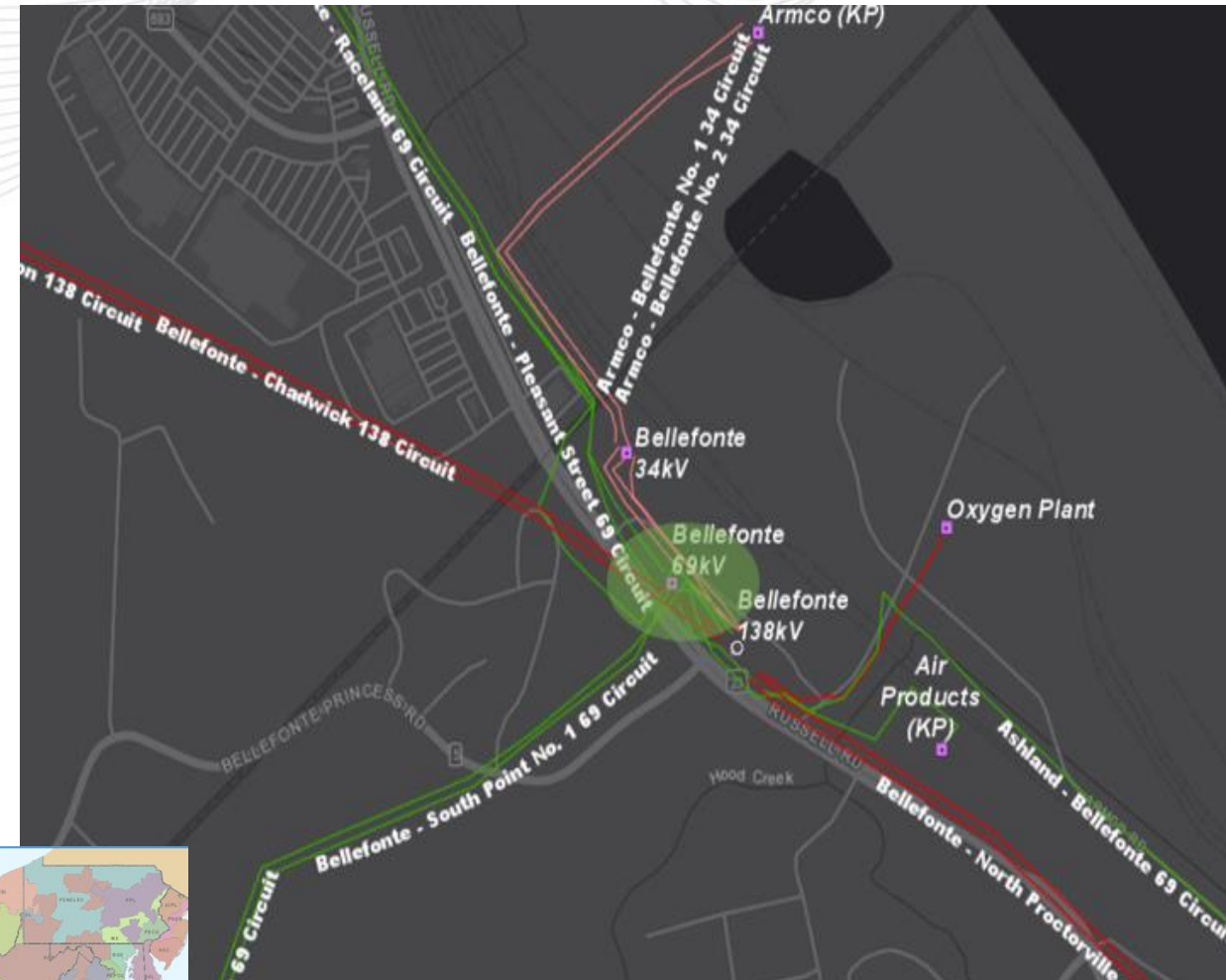
**Problem Statement:**

FG: AEP-T29, AEP-T30, AEP-T31, AEP-T32

In 2026 Summer RTEP case, the 69kV risers between 69kV Bus #2 and 69kV winding of TR#3 are overloaded for multiple N-1-1 contingencies.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05 BELLF2 - 05BELLEFNT 138/69 kV	143/168/182/200







# AEP Transmission Zone: Baseline Monterey 69 kV Switch Replacements

**Process Stage:** First Review

**Criteria:** AEP 715 Criteria

**Assumption Reference:** 2026 RTEP assumption

**Model Used for Analysis:** 2026 RTEP Summer case

**Proposal Window Exclusion:** Below 200 kV Exclusion and Substation equipment exclusion

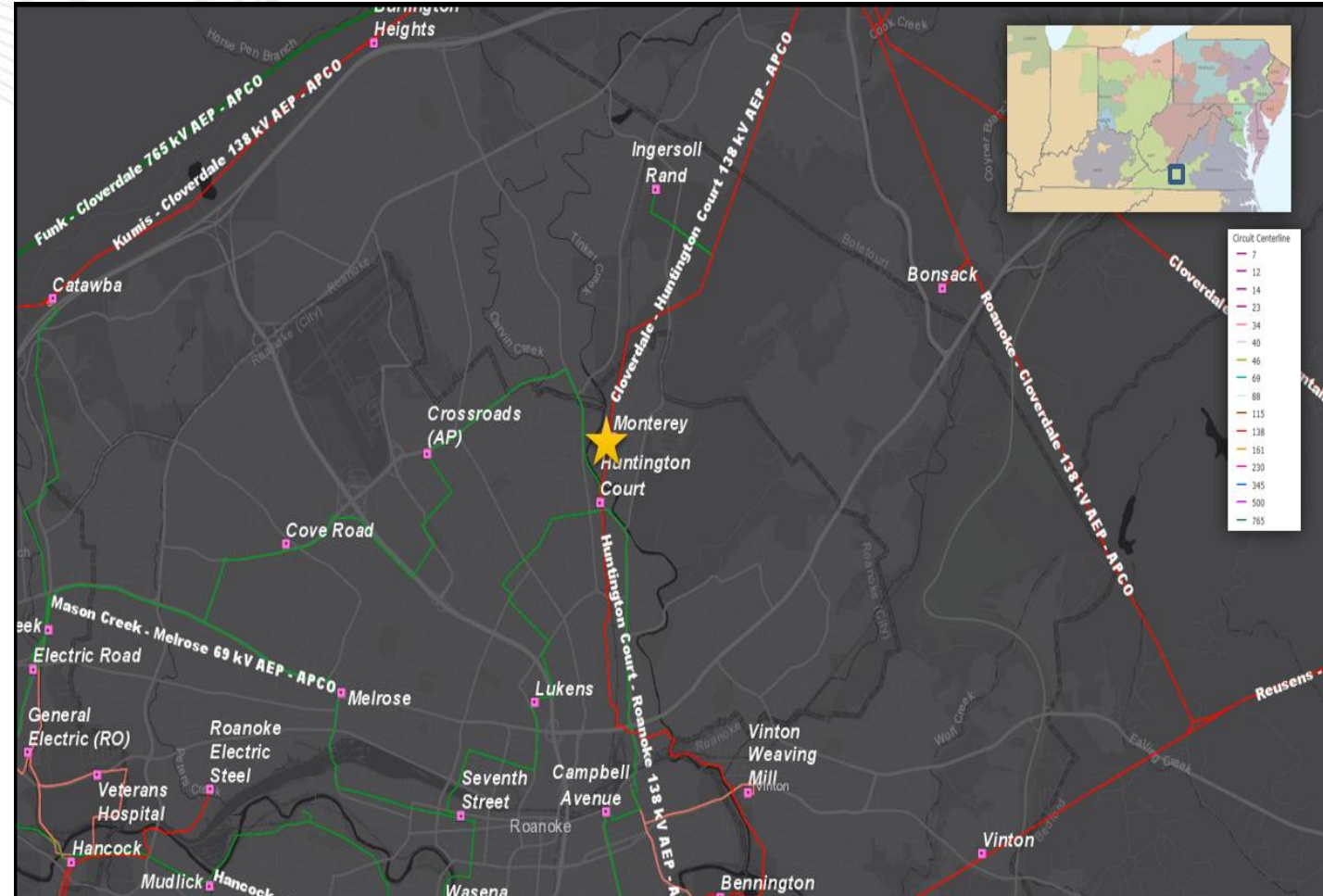
**Problem Statement:**

FG: AEP-T35, AEP-T36

In 2026 RTEP Summer case, the Monterey-Huntington Court 69 kV line section caused by an N-1-1 contingency.

**Existing Facility Rating:**

Branch	Ratings (SN/SE/WN/WE)
05MONTERAV - 05HUNTCRT2 69kV	82/90/107/113





# AEP Transmission Zone: Baseline Monterey 69 kV Switch Replacements

## Proposed Solution:

Replace the 69 kV, in-line switches at Monterey 69kV Substation.

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

**Distribution Estimated Cost:** \$0.22M

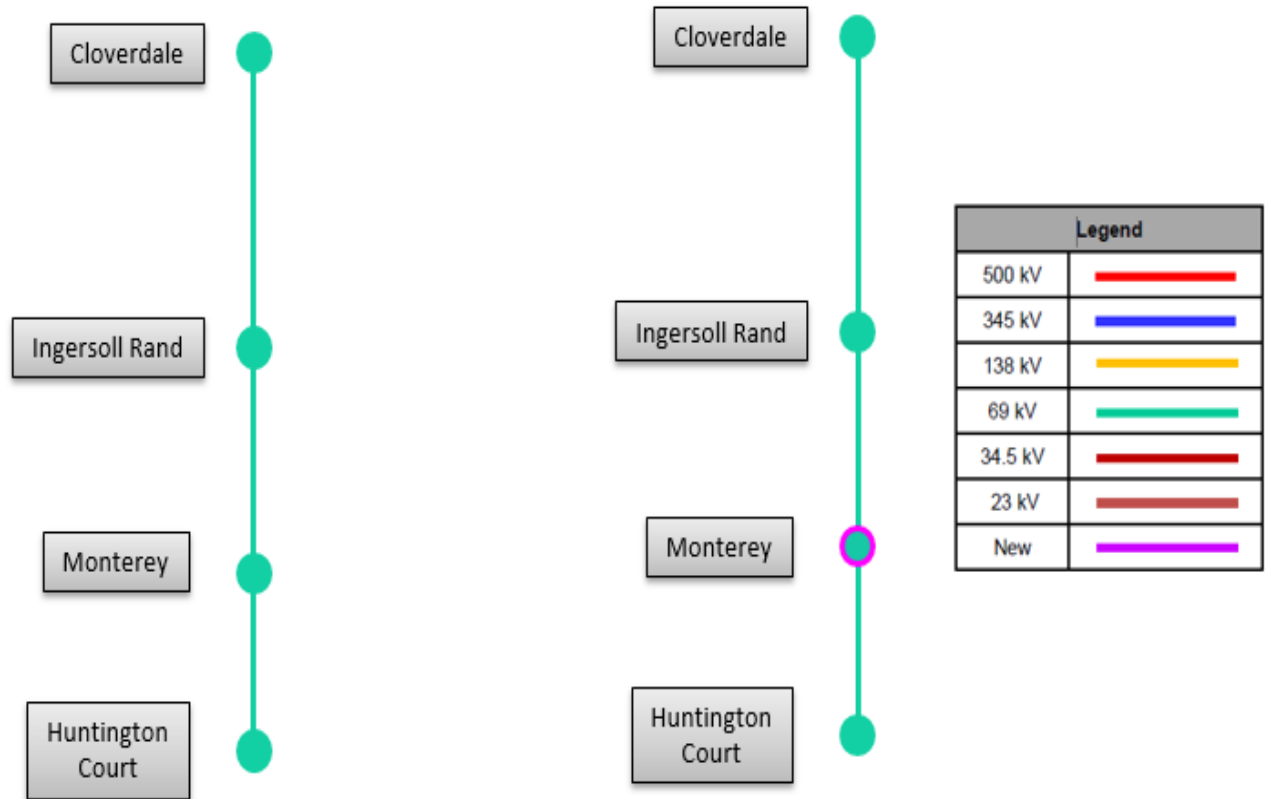
**Preliminary Facility Rating:**

Branch	Ratings (SN/SE/WN/WE)
05MONTERAV - 05HUNTCRT2 69kV	125/125/158/158

**Alternatives:** No cost effective alternative identified.

**Required IS date:** 6/1/2026

**Projected IS date:** 6/1/2026





# AEP Transmission Zone: Baseline 47th Street Upgrades

**Process Stage:** First Review

**Criteria:** AEP 715 Criteria

**Assumption Reference:** 2026 RTEP assumption

**Model Used for Analysis:** 2026 RTEP cases

**Proposal Window Exclusion:** Below 200 kV Exclusion

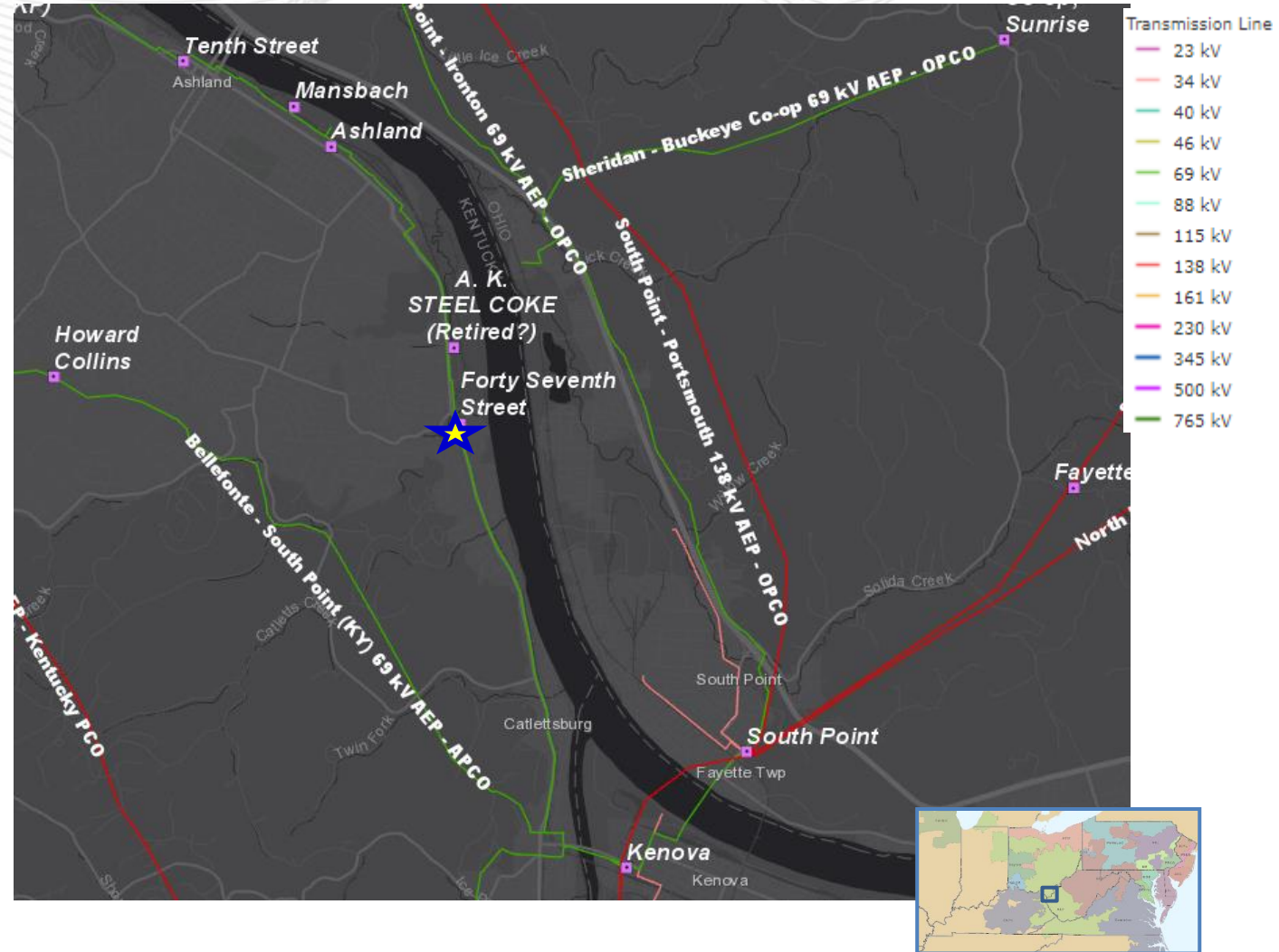
**Problem Statement:**

FG: AEP-T37, AEP-T38

In 2026 RTEP Summer case, the Kenova - 47th street line section is overloaded for an N-1-1 contingency.

**Existing Facility Rating:**

Branch	Ratings (SN/SE/WN/WE)
0547TH ST - 05KENOVA H 69kV	79/90/100/109







# AEP Transmission Zone: Baseline 47th Street Upgrades

## Proposed Solution:

Replace MOAB W, MOAB Y, line and bus side jumpers of both W and Y at 47<sup>th</sup> Street 69kV station. Upgrade the 69kV Strain bus between MOABs W and Y to 795 KCM AAC. Change the connectors on the tap to MOAB X1 to accommodate the larger 795 KCM AAC.

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

**Distribution Estimated Cost:** \$0.22M

**Preliminary Facility Rating:**

Branch	Ratings (SN/SE/WN/WE)
0547TH ST - 05KENOVA H 69kV	102/102/129/129

**Alternatives:** No cost effective alternative identified.

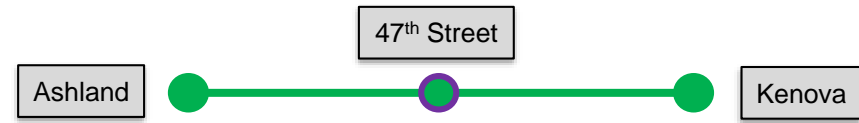
**Required IS date:** 6/1/2026

**Projected IS date:** 6/1/2026

## System Electrical Diagram (Existing):



## System Electrical Diagram (Proposed):



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
46 kV	
New	

**Process Stage:** First Review

**Criteria:** AEP 715 Criteria

**Assumption Reference:** 2026 RTEP assumption

**Model Used for Analysis:** 2026 RTEP cases

**Proposal Window Exclusion:** Below 200 kV Exclusion & Substation Equipment Exclusion

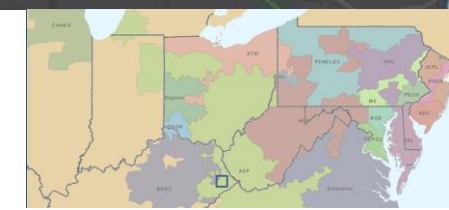
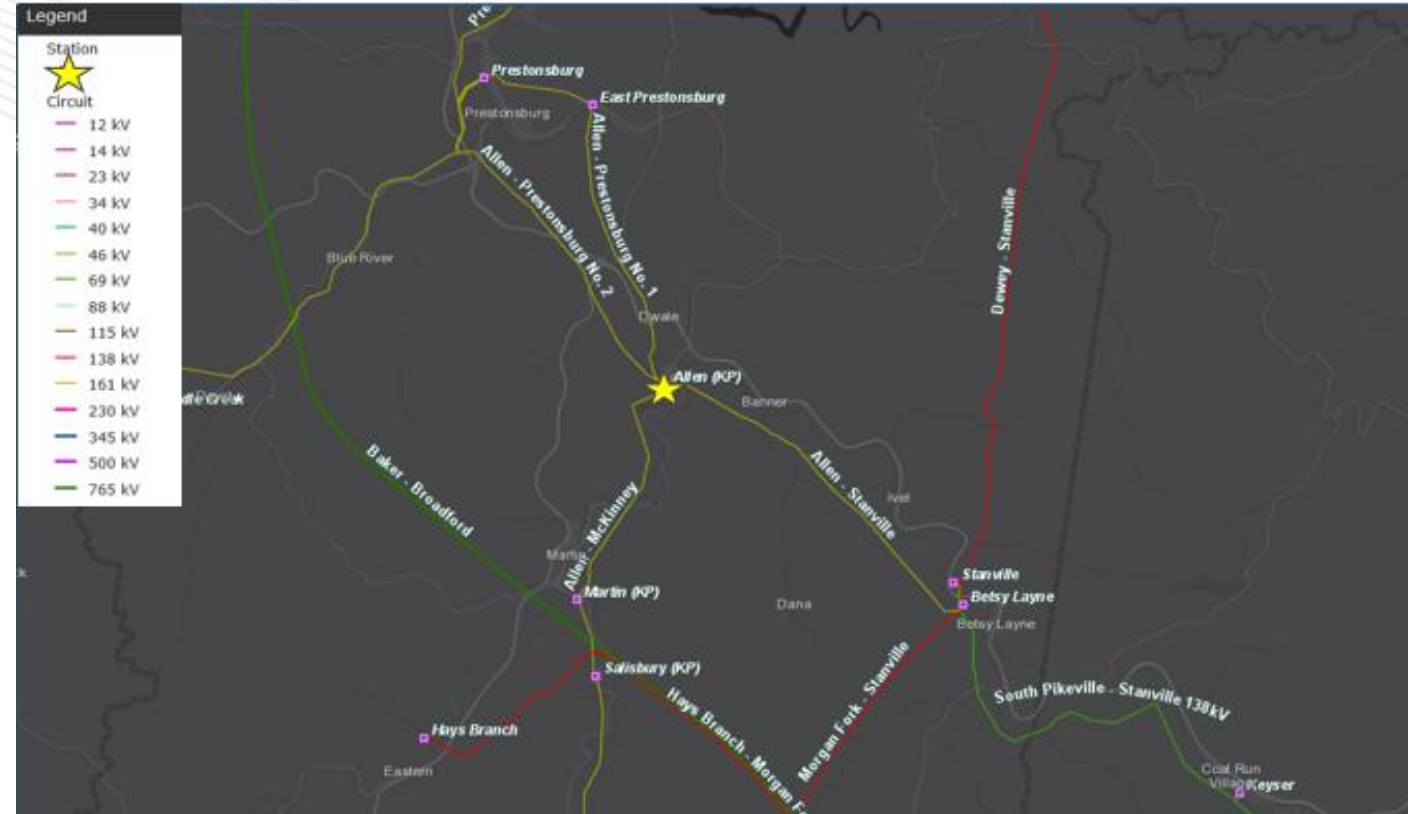
**Problem Statement:**

FG: AEP-T66, AEP-T67, AEP-T68, AEP-T69

In 2026 RTEP winter case, the Stanville - Allen line section is overloaded for multiple N-1-1 contingency pairs.

**Existing Facility Rating:**

Branch	Ratings (SN/SE/WN/WE)
05ALLEN- 05STANVILLE 46kV	47/47/47/47
05ALLEN- 05EPRESTNS 46kV	45/58/60/69



## Proposed Solution: Conversion of S2405

**Allen Substation:** Rebuild Allen Station to the northwest of its current footprint utilizing a standard air-insulated substation with equipment raised by 7' concrete platforms and control house raised by a 10' platform to mitigate flooding concerns. Install five 69 kV 3000A 40 kA circuit breakers in a ring bus (operated at 46kV) configuration with a 13.2 MVAR capacitor bank. Existing Allen station will be retired (S2405.1) Estimated Cost: \$10.55 M (Does not include the distribution cost) Distribution Scope of Work: Install 69/46kV-12kV 20 MVA transformer along with 2-12kV breakers on 7' concrete platforms.

**Allen – East Prestonsburg:** A 0.20 mile segment of this 46 kV line will be relocated to the new station. (SN/SE/WN/WE: 53/61/67/73MVA). (S2405.2) Estimated Cost: \$0.33 M

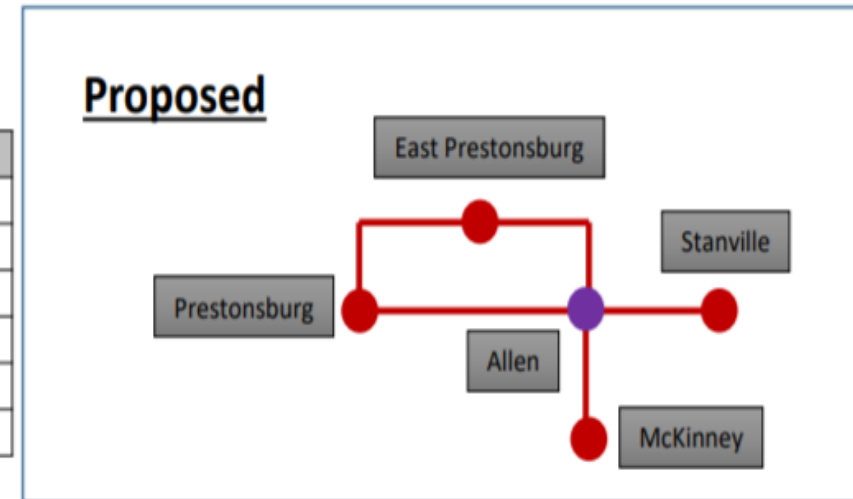
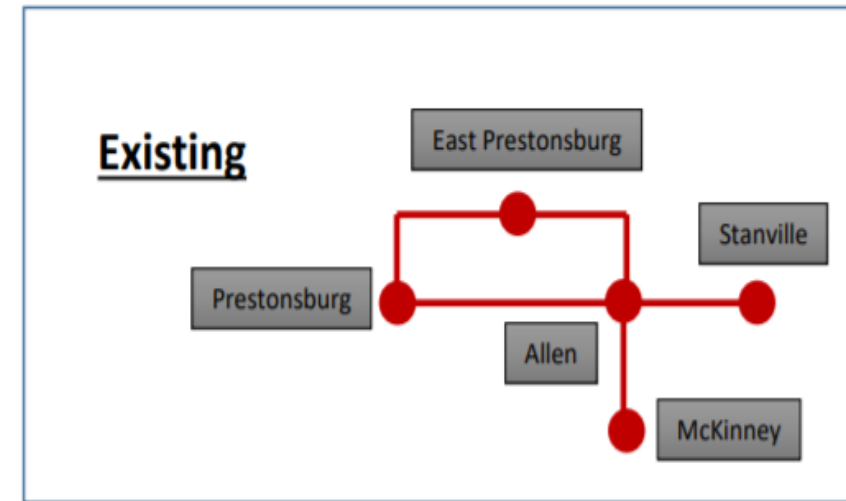
**McKinney – Allen:** The new line extension will walk around the south and east sides of the existing Allen Station to the new Allen Station being built in the clear. A short segment of new single circuit 69kV line and a short segment of new double circuit 69kV line (both operated at 46 kV) will be added to the line to tie into the new Allen Station bays. (S2405.3) Estimated Cost: \$1.95 M

**Stanville – Allen:** A segment of this line will have to be relocated to the new station (SN/SE/WN/WE: 50/50/63/63MVA). (S2405.4) Estimated Cost: \$0.17 M

**Allen – Prestonsburg:** 0.25 mile segment of this existing single circuit will be relocated. The relocated line segment will require construction of one custom self-supporting double circuit dead end structure and single circuit suspension structure. A short segment of new double circuit 69kV line (energized at 46 kV) will be added to tie into the new Allen Station bays which will carry Allen – Prestonsburg 46kV and Allen – East Prestonsburg 46kV lines. A temporary 0.15 mile section double circuit line will be constructed to keep Allen – Prestonsburg and Allen – East Prestonsburg 46kV lines energized during construction. (S2405.5) Estimated Cost: \$2.66 M

**Remote End** Remote end work will be required at Prestonsburg, Stanville, and McKinney stations. (S2405.6) Estimated Transmission Cost: \$0.34 M

**Total Transmission Estimated Cost: \$16M**



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
46 kV	
New	

## Preliminary Facility Rating:

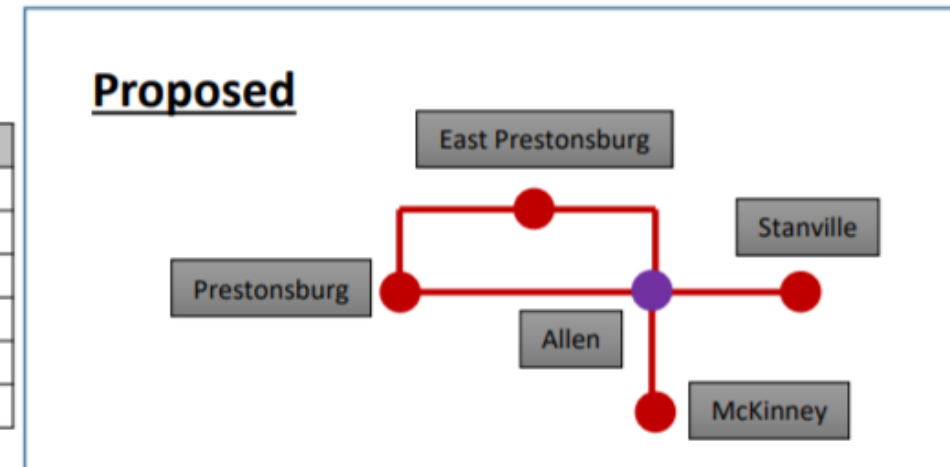
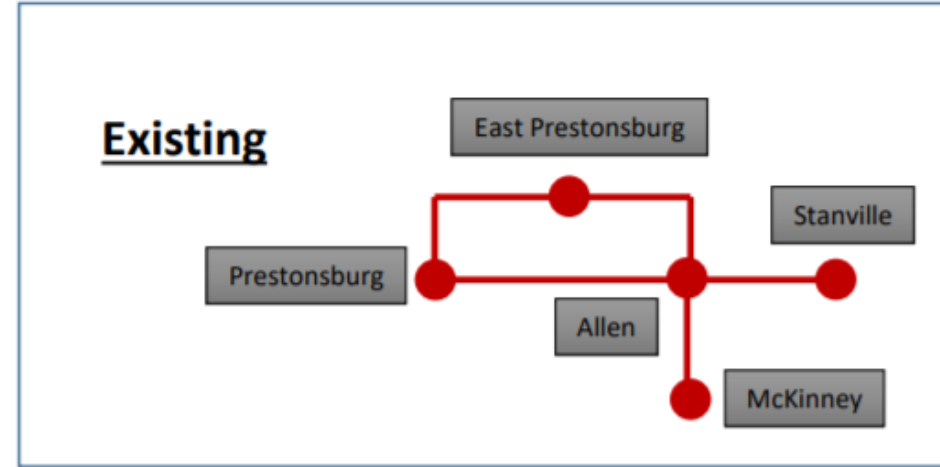
Branch	Ratings (SN/SE/WN/WE)
05ALLEN- 05STANVILLE 46kV	50/50/63/63
05ALLEN- 05EPRESTNS 46kV	53/61/67/73

**Ancillary Benefits:** The proposed conversion of the s2405 to baseline does not add any cost to the RTEP. S2405 address issues identified in AEP-2019-AP025.

**Alternatives:** Replace the existing bus and riser conductor in the current Allen station. Considering the timing of the supplemental project can support the required in service date, the additional work in the existing substation would be unnecessary.

**Required IS date:** 12/1/2026

**Projected IS date:** 12/31/2023



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
46 kV	
New	

**Process Stage:** First Review

**Criteria:** AEP 715 Criteria

**Assumption Reference:** 2026 RTEP assumption

**Model Used for Analysis:** 2026 RTEP cases

**Proposal Window Exclusion:** Below 200 kV Exclusion

**Problem Statement:**

FG: AEP-VD10, AEP-VD11, AEP-VD12, AEP-VD13, AEP-VD14

In 2026 RTEP Summer case, voltage drop violations have been identified at Slate, Mills, Lattaville, and Mill (SCP) 69kV stations for multiple N-1-1 contingency pairs.

**Proposed Solution:**

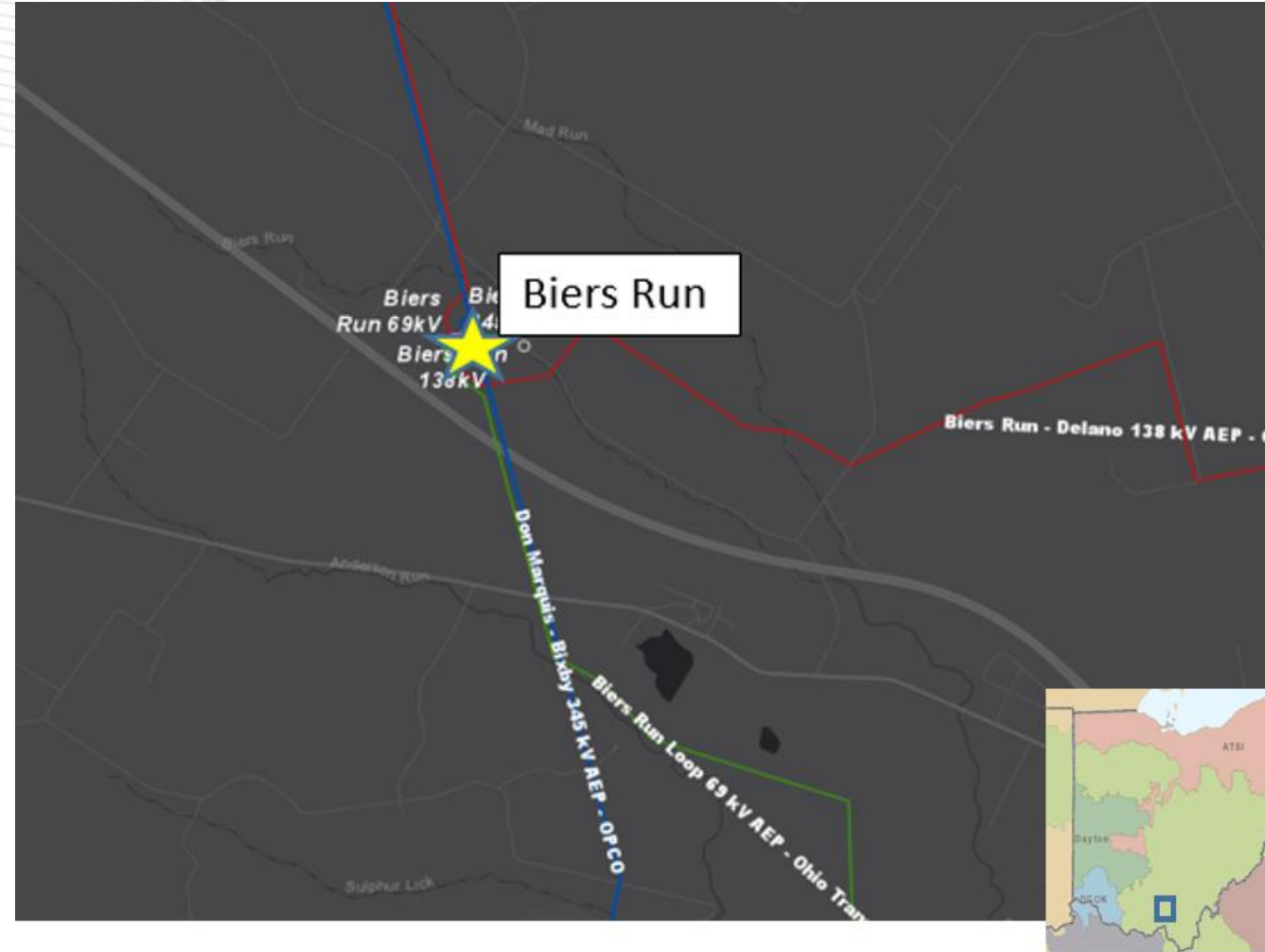
Install a 69 kV 14.4 MVAR capacitor at Biers Run station.

**Transmission Estimated Cost:** \$0.85 M

**Alternatives:** No cost effective alternative identified.

**Required IS date:** 6/1/2026

**Projected IS date:** 9/1/2025





# AEP Transmission Zone: Baseline North Van Wert Sw. - Van Wert 69 kV Rebuild

**Process Stage:** First Review

**Criteria:** AEP 715 Criteria

**Assumption Reference:** 2026 RTEP assumption

**Model Used for Analysis:** 2026 RTEP cases

**Proposal Window Exclusion:** Below 200 kV Exclusion

**Problem Statement:**

FG: AEP-T59, AEP-T60, AEP-T61, AEP-T62

In 2026 RTEP Summer case, 2.3 miles of existing 4/0 Cu conductor on N. Van Wert Sw - Van Wert 69 kV line is overloaded for multiple N-1-1 contingency pairs.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05VAN WERT - 05N.VANWRTSS 69KV	54/54/76/76





# AEP Transmission Zone: Baseline North Van Wert Sw. - Van Wert 69 kV Rebuild

**Proposed Solution:**

Rebuild approximately 2.3 miles of the existing North Van Wert Sw - Van Wert 69 kV line utilizing 556 ACSR conductor.

**Transmission Estimated Cost:** \$6.2M

**Preliminary Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05VAN WERT - 05N.VANWRTSS 69KV	82/90/107/113

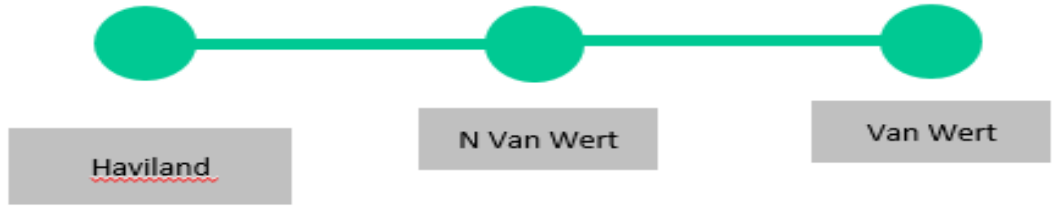
**Ancillary Benefits:** Project rebuilds a portion of the Van Wert - Haviland line that was originally constructed in in the 1920s and is primarily comprised of wood poles. The conductor being replaced as a part of this proposal dates back to the 1920's. There have been numerous customer speculation load requests in this area that would require this line rebuild if the alternative was chosen.

**Alternatives:** Install a second 138/69 kV transformer at North Delphos station along with associated sectionalizing. Estimated Cost: \$3.0M; This proposal was not chosen as it would not address the deteriorating infrastructure concerns on the North Van Wert Sw. - Van Wert line section.

**Required IS date:** 6/1/2026

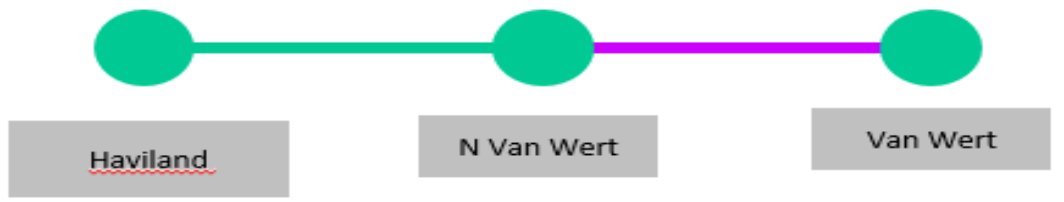
**Projected IS date:** 9/1/2025

**Existing:**



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

**Proposed:**



**Process Stage:** First Review

**Criteria:** AEP 715 Criteria

**Assumption Reference:** 2026 RTEP assumption

**Model Used for Analysis:** 2026 RTEP cases

**Proposal Window Exclusion:** Below 200 kV Exclusion

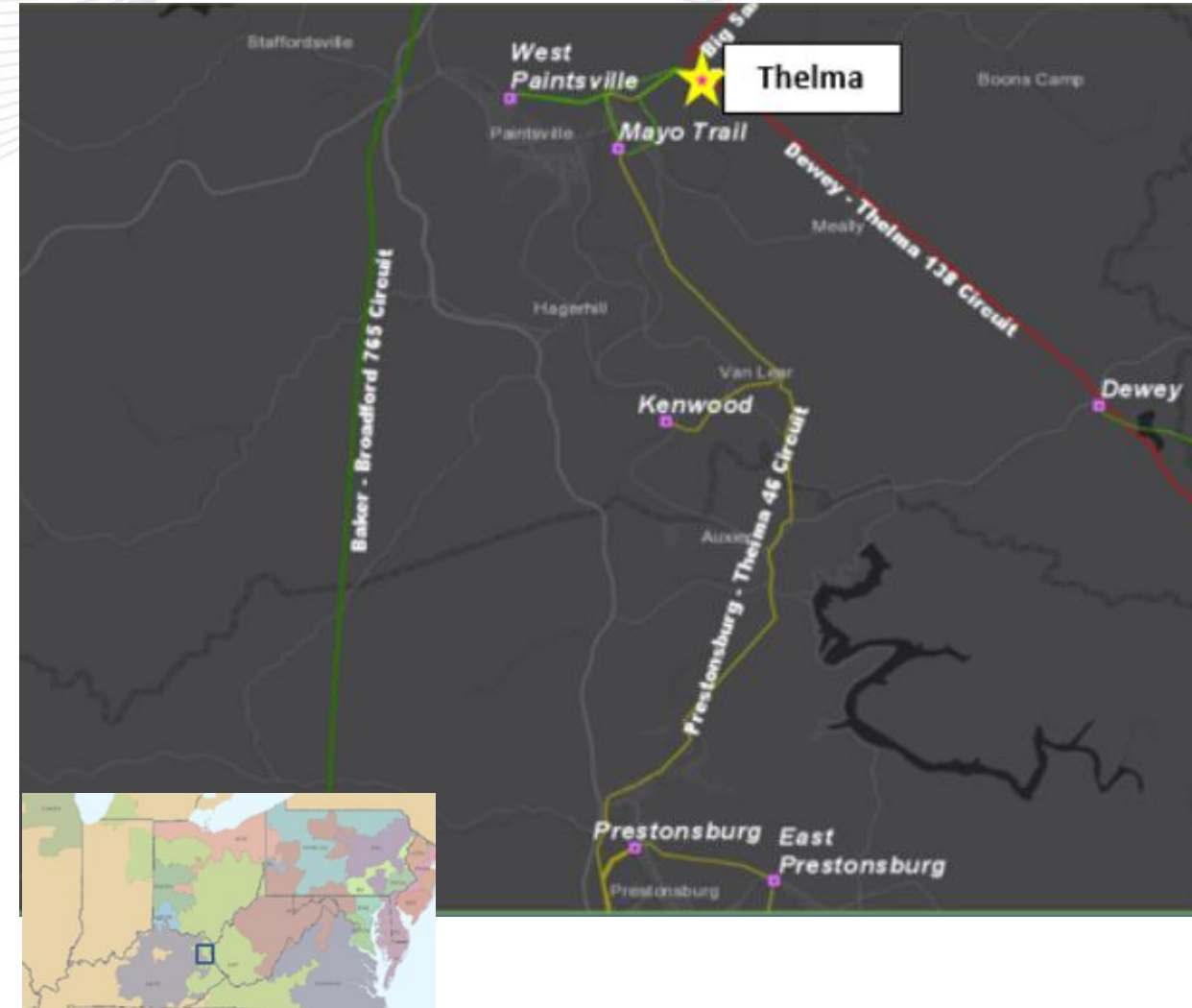
**Problem Statement:**

FG: AEP-T70, AEP-T71, AEP-T72

In 2026 RTEP Winter case, the 46kV winding of the Thelma TR#1 is overload for multiple N-1-1 contingency pairs.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05THELMAEQ – 05THELMA 999/138KV	84/92/84/92
05THELMAEQ – 05THELM1 999/69KV	84/92/84/92
05THELMAEQ – 05THELMA 999/46KV	53/58/53/58







# AEP Transmission Zone: Baseline Thelma Transformer Replacement

## Proposed Solution:

Replace Thelma Transformer #1 with a 138/69/46kV 130/130/90 MVA transformer and replace 46kV risers and relaying towards Kenwood substation. Existing TR#1 to be used as spare.

**Transmission Estimated Cost:** \$3.54M

## Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05THELMAEQ – 05THELMA 999/138KV	130/130/130/130
05THELMAEQ – 05THELM1 999/69KV	130/130/130/130
05THELMAEQ – 05THELMA 999/46KV	90/90/90/90

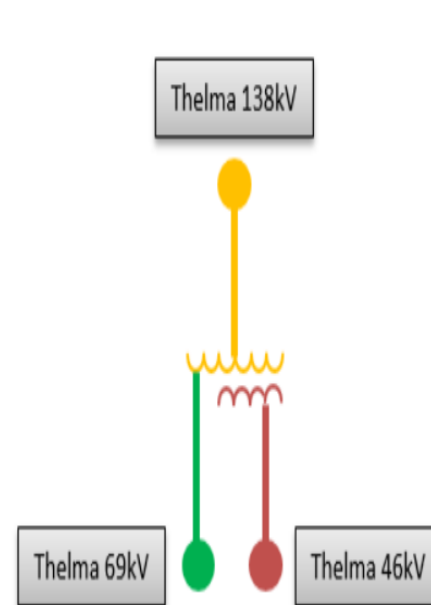
**Alternatives:** Alternative #1: At Stanville Substation, Install 90 MVA 138/46 redundant Transformer along with 138kV CS and 46kV CB on Stanville Bus #1. At Allen substation, add the 6th breaker in the 46kV ring bus and new line exit for new Stanville – Allen circuit. Install new ~4 mi 46kV circuit (rated at 69kV) from the new Stanville redundant transformer to Allen substation. This work will establish two feeds from Allen to Stanville. Estimated cost: \$20-25M

Alternative #2: Install new ~4 mi 46kv line from Morgan Fork to McKinney. Expand the 46kV box bay at McKinney station to install new 46kV breaker for the new line 46kV line from Morgan Fork substation. At Morgan Fork substation, install 138/69/46kV transformer and line exit for the new McKinney line. Install 138kV CS and 69kV transformer CB. Estimated cost: \$20-25M

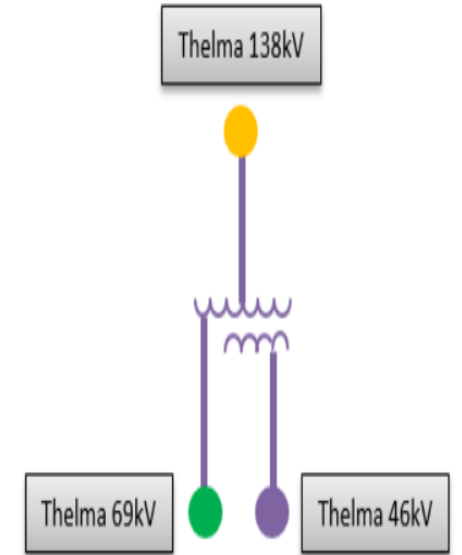
**Required IS date:** 12/1/2026

**Projected IS date:** 10/1/2025

Project System Electrical Diagram (existing)



Project System Electrical Diagram (Proposed)



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
46 kV	
New	



# AEP Transmission Zone: Baseline Prestonsburg - Thelma 46kV Rebuild

**Process Stage:** First Review

**Criteria:** AEP 715 Criteria

**Assumption Reference:** 2026 RTEP assumption

**Model Used for Analysis:** 2026 RTEP cases

**Proposal Window Exclusion:** Below 200 kV Exclusion

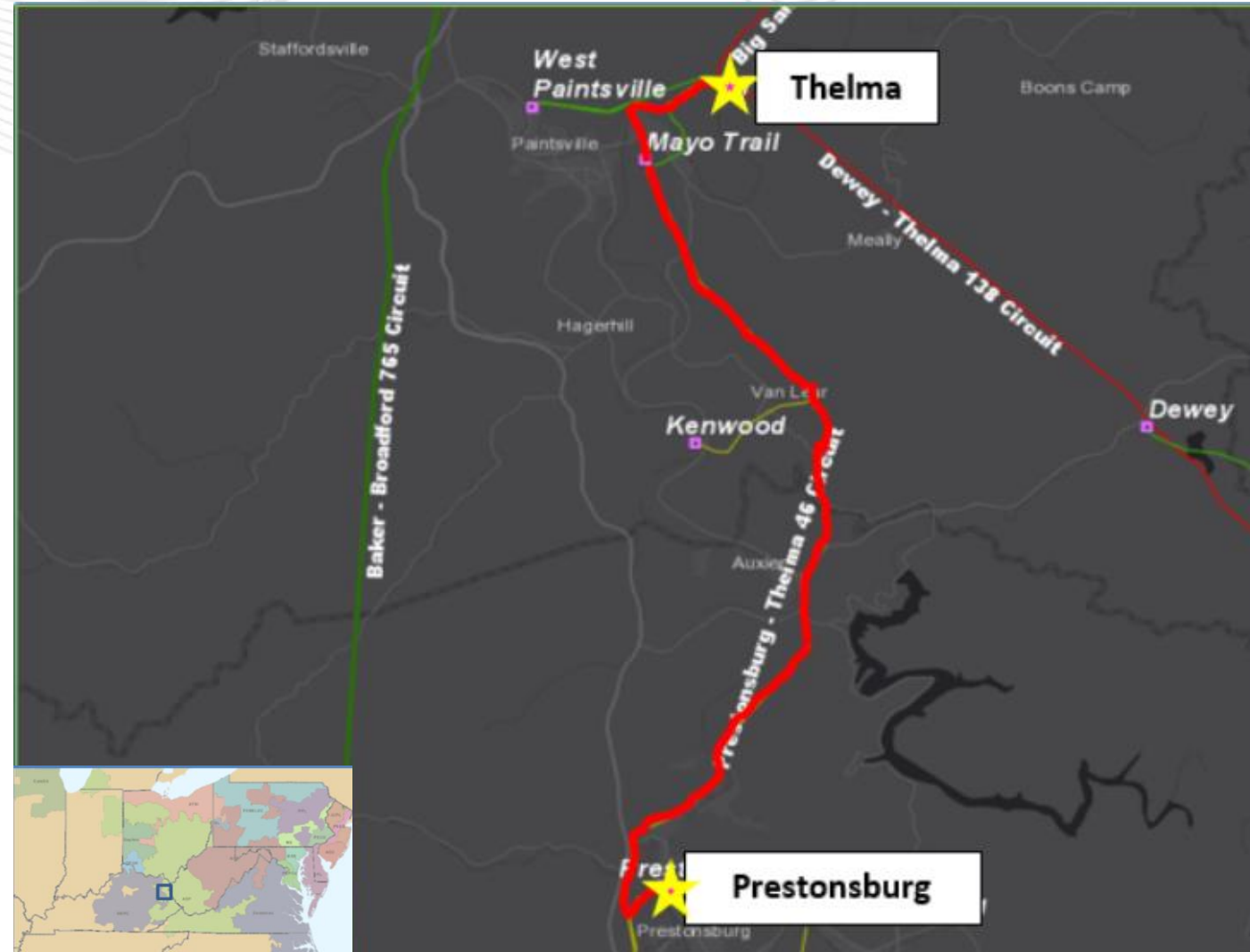
**Problem Statement:**

FG: AEP-VM10, AEP-VM11, AEP-VM12, AEP-VM13, AEP-VM14, AEP-VM15, AEP-VM16, AEP-VM17, AEP-VM18, AEP-VM19, AEP-VM20, AEP-VM21, AEP-VM22, AEP-VM23, AEP-VM24, AEP-VM25, AEP-VM26, AEP-VM27, AEP-VM28, AEP-VM29, AEP-VM30, AEP-VM31, AEP-VM32, AEP-VM33, AEP-VM34, AEP-VM35, AEP-VM36, AEP-VM37, AEP-VM38, AEP-VM39, AEP-VM40, AEP-VM41, AEP-VD15, AEP-VD16, AEP-VD17, AEP-VD18, AEP-VD19, AEP-VD20, AEP-VD21, AEP-VD22, AEP-VD23, AEP-VD24, AEP-VD25, AEP-VD26, AEP-VD27, AEP-VD28, AEP-VD29, AEP-VD30, AEP-VD31, AEP-VD32, AEP-VD33, AEP-VD34, AEP-VD35, AEP-VD36, AEP-VD37, AEP-VD38, AEP-VD39, AEP-VD40, AEP-VD41, AEP-VD42, AEP-VD43, AEP-VD44, AEP-VD45, AEP-VD46

In 2026 RTEP Winter case, voltage magnitude and voltage drop violations at McKinney, Salsbury, Allen, East Prestonsburg, Prestonsburg, Middle Creek, Kenwood 46kV buses are identified for multiple N-1-1 contingency pairs.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05Thelma – 05KENWDTAP 46KV	50/50/63/63





# AEP Transmission Zone: Baseline Prestonsburg - Thelma 46kV Rebuild

## Proposed Solution:

Rebuild Prestonsburg - Thelma 46kV circuit, approximately 14 miles. Retire Jenny Wiley SS.

**Transmission Estimated Cost:** \$33.01M

## Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05Thelma – 05KENWDTAP 46KV	68/85/86/101
05PRESTNSB– 05KENWDTAP 46KV	68/85/86/101

**Ancillary Benefits:** The proposed solution also completely addresses the identified needs in AEP-2018-AP022.

**Alternatives:** Alternative #1: At Stanville Substation, Install 90 MVA 138/46 redundant Transformer along with 138kV CS and 46kV CB on Stanville Bus #1. At Allen substation, add the 6th breaker in the 46kV ring bus and new line exit for new Stanville – Allen circuit. Install new ~4 mi 46kV circuit (rated at 69kV) from the new Stanville redundant transformer to Allen substation. This work will establish two feeds from Allen to Stanville. Estimated cost: \$20-25M

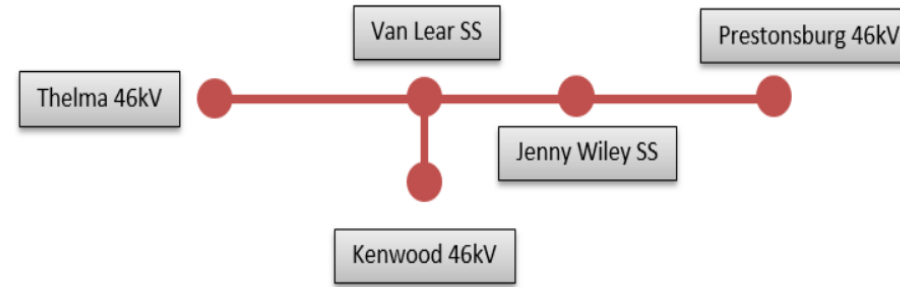
Alternative #2: Install new ~4 mi 46kv line from Morgan Fork to McKinney. Expand the 46kV box bay at McKinney station to install new 46kV breaker for the new line 46kV line from Morgan Fork substation. At Morgan Fork substation, install 138/69/46kV transformer and line exit for the new McKinney line. Install 138kV CS and 69kV transformer CB. Estimated cost: \$20-25M

Alternative #3: Add a capacitor bank in the area. Estimated Cost: \$4M

**Required IS date:** 12/1/2026

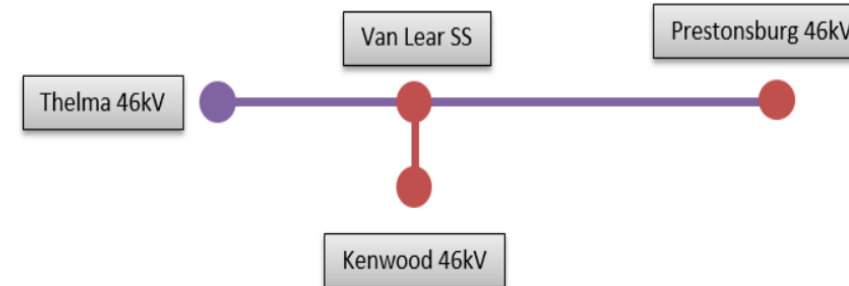
**Projected IS date:** 10/1/2025

## Project System Electrical Diagram (existing)



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
46 kV	
New	

## Project System Electrical Diagram (Proposed)





# AEP Transmission Zone: Baseline Oertels Corner - North Portsmouth 69 kV Rebuild

**Process Stage:** First Review

**Criteria:** AEP 715 Criteria

**Assumption Reference:** 2026 RTEP assumption

**Model Used for Analysis:** 2026 RTEP cases

**Proposal Window Exclusion:** Below 200 kV Exclusion

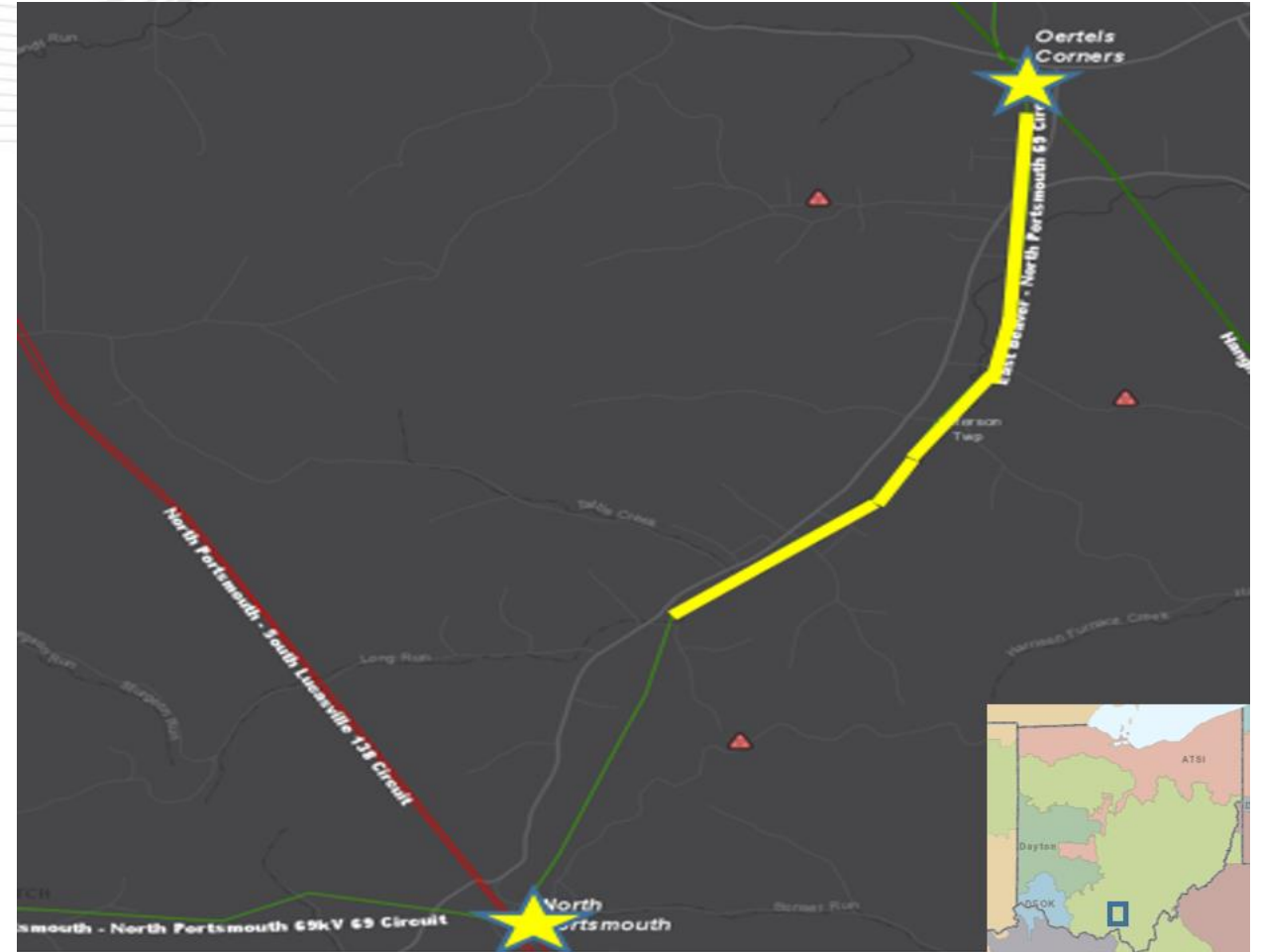
**Problem Statement:**

FG: AEP-T64, AEP-T65

In 2026 RTEP Summer case, the Oertels Corner - North Portsmouth 69 kV line is overloaded for an N-1-1 contingency pair.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05N PORTSM – 05ORTELCRN 69KV	34/34/42/42





# AEP Transmission Zone: Baseline Oertels Corner - North Portsmouth 69 kV Rebuild

## Proposed Solution:

Rebuild approximately 3.1 miles of the overloaded conductor on the existing Oertels Corner - North Portsmouth 69 kV line utilizing 556 ACSR .

**Transmission Estimated Cost:** \$8.0 M

## Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05N PORTSM – 05ORTELCRN 69KV	44/44/56/56

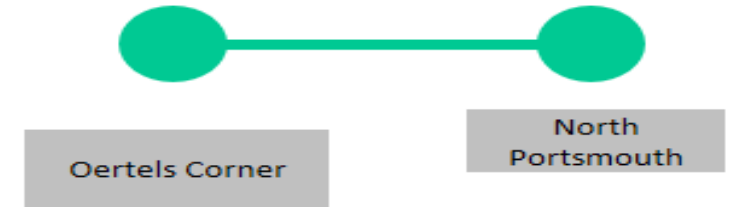
**Ancillary Benefits:** Project rebuilds a portion of the North Portsmouth - Oertels Corners line that was originally constructed in in the 1940s and is primarily comprised of wood poles. The conductor being replaced as a part of this proposal dates back to the 1940's. There are currently 21 open conditions on this line. There have been 11 momentary and 4 permanent outages (2.1M CMI) over the last 5 years (2015-2020).

**Alternatives:** None.

**Required IS date:** 6/1/2026

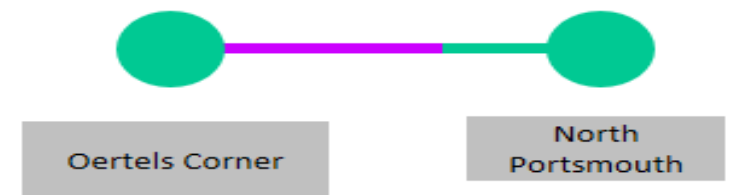
**Projected IS date:** 10/1/2025

## Existing:



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

## Proposed:





# ComEd Transmission Zone: Baseline Line 0108 LaSalle-Mazon 138 kV

**Process Stage:** First Review

**Criteria:** Generator Deliverability

**Assumption Reference:** 2026 RTEP assumption

**Model Used for Analysis:** 2026 Light Load RTEP case

**Proposal Window Exclusion:** Below 200 kV Exclusion

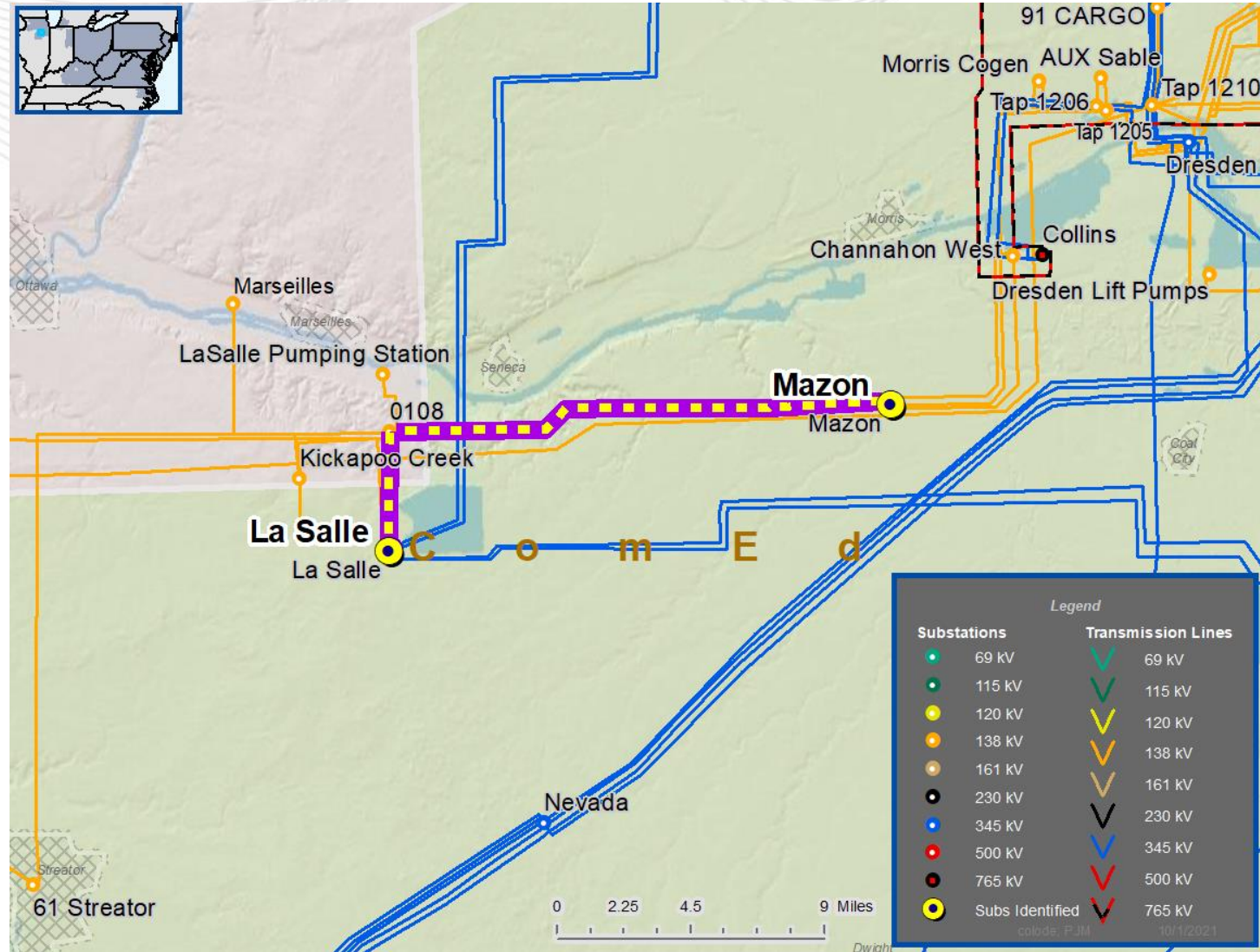
**Problem Statement:**

FG: GD-LL36

In 2026 Light Load RTEP case, the LaSalle-Mazon 138 kV line is overloaded for an N-2 outage.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
LASCO STA; B-MAZON ; B 138 kV	173/223/213/253
MAZON ; R-4CORBIN 138 kV	173/223/213/253





# ComEd Transmission Zone: Baseline Line 0108 LaSalle-Mazon 138 kV

## Proposed Solution:

Rebuild a 13 mile section of 138 kV line 0108 between LaSalle and Mazon with 1113 ACSR or higher rated conductor.

**Total Estimated Cost:** \$42.06 M

## Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
LASCO STA; B-MAZON ; B 138 kV	351/442/421/472
MAZON ; R-4CORBIN 138 kV	210/223/252/262

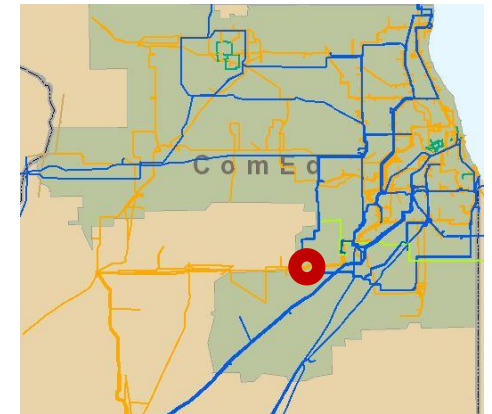
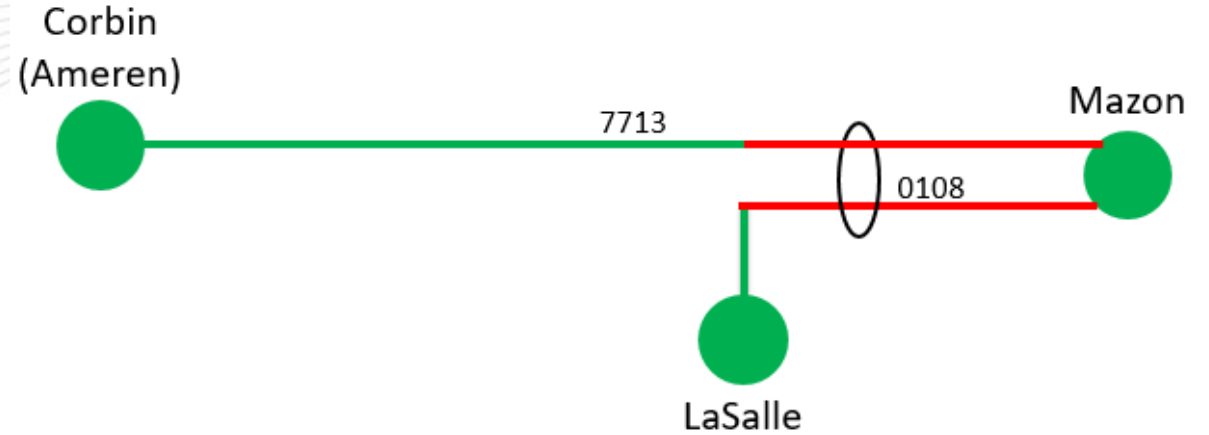
**Alternatives:** None

## Ancillary Benefits:

Conductor and towers that are 94 years old will be replaced. A portion of line 7713 from Oglesby (future Corbin) to Mazon which shares these double circuit towers will be reconducted due to the rebuild, replacing all of the 94 year old 300 cu conductor on that line.

**Required IS date:** 11/1/2026

**Projected IS date:** 12/31/2024





# ATSI Transmission Zone: Baseline Abbe-Johnson #2 69 kV line upgrade

**Process Stage:** First Review

**Criteria:** First Energy 715 Criteria

**Assumption Reference:** 2026 RTEP assumption

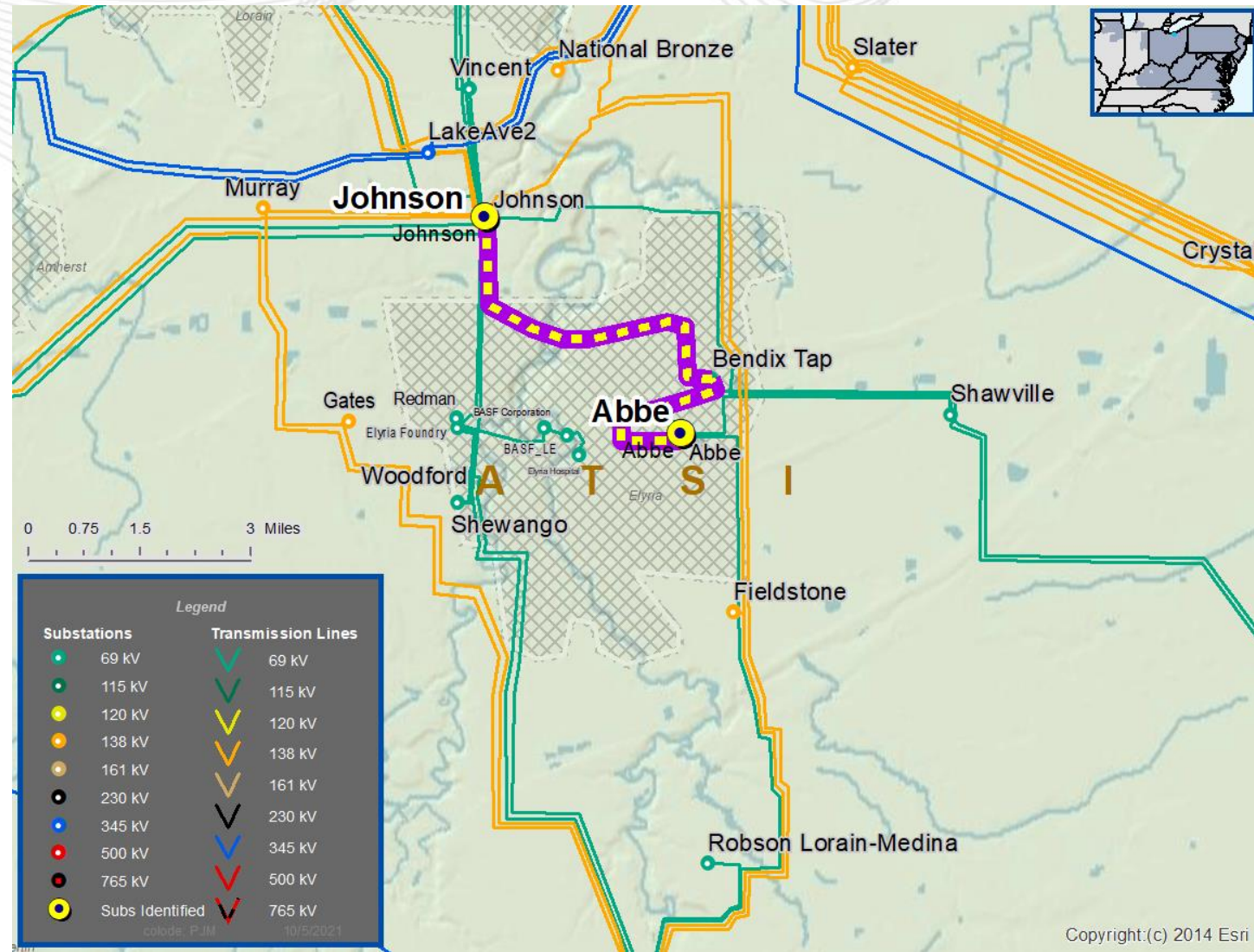
**Model Used for Analysis:** 2026 Summer RTEP case

**Proposal Window Exclusion:** Below 200 kV Exclusion

**Problem Statement:**

FG: ATSI-T1, ATSI-T2 and ATSI-T3

In 2026 Summer RTEP case, multiple segments along the Abbe – Johnson # 2 69 kV line are overloaded due to due to N-1.







# ATSI Transmission Zone: Baseline Abbe-Johnson #2 69 kV line upgrade

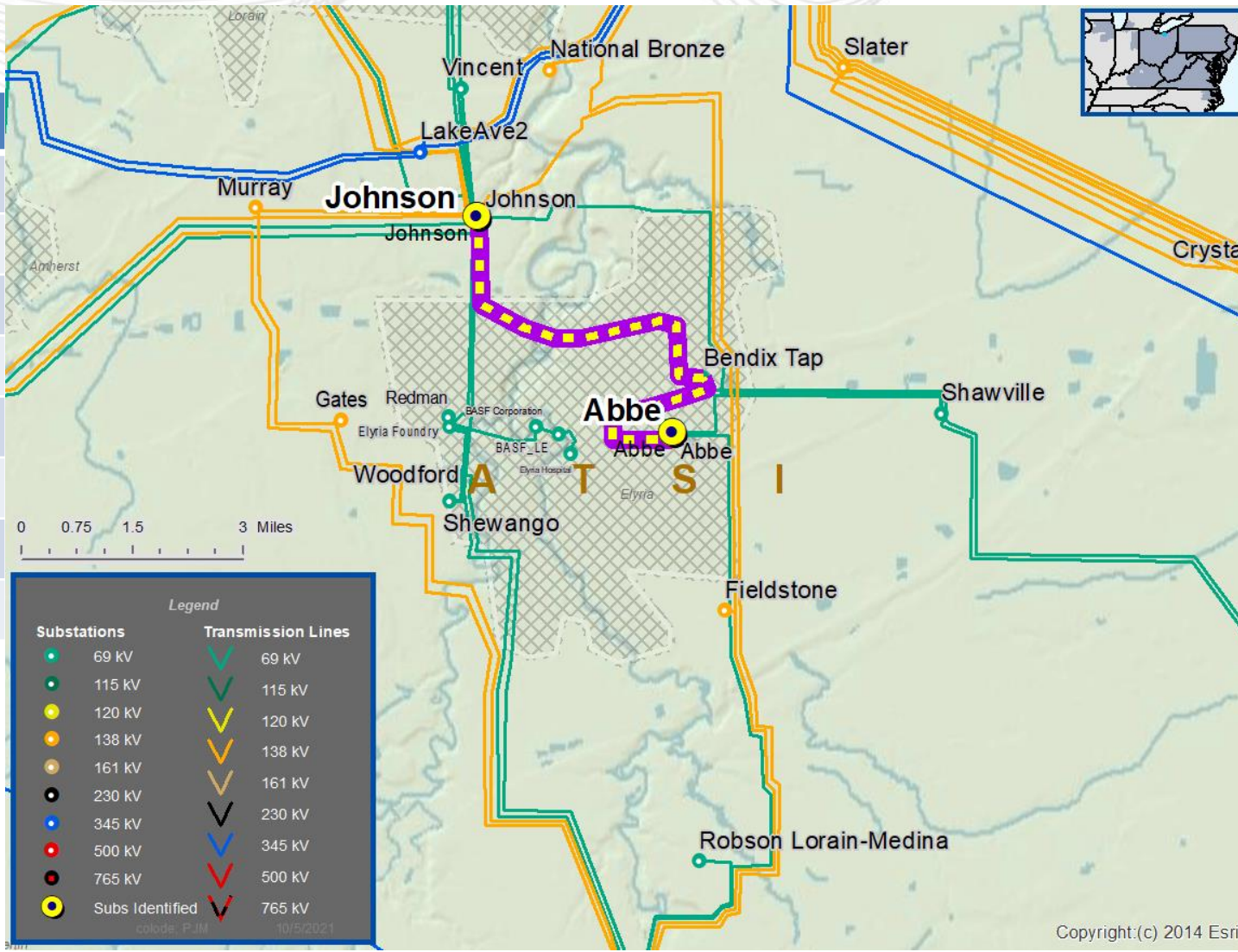
## Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Abbe to Abex	76/92/87/111
Abex to Winckles	76/92/87/111
Winckles to Elyria Hospital	76/92/87/111
Elyria Hospital to Engle	80/96/90/114
Engle to BASF	76/92/87/111
BASF to Woodford	76/92/87/111
Woodford to Redman	76/92/87/111
Redman to Johnson	76/92/87/111

## Recommended Solution:

Rebuild the Abbe-Johnson #2 69 kV line (5.75 miles). Upgrade switches and disconnects.

**Total Estimated Cost: \$13.2 M**



## Preliminary Facility Rating:

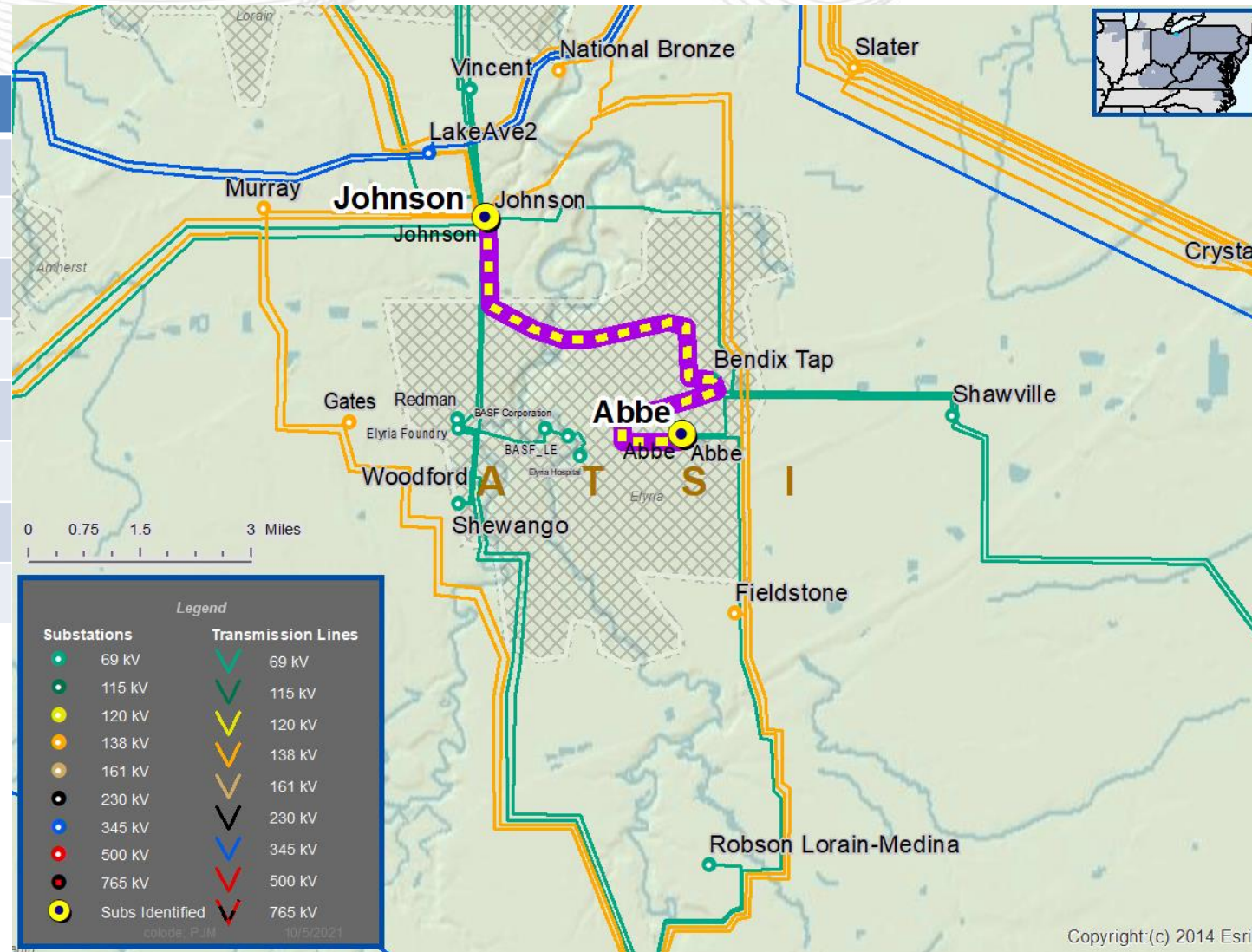
Branch	SN/SE/WN/WE (MVA)
Abbe to Abex	111/134/125/159
Abex to Winckles	111/134/125/159
Winckles to Elyria Hospital	111/134/125/159
Elyria Hospital to Engle	111/134/125/159
Engle to BASF	111/134/125/159
BASF to Woodford	111/134/125/159
Woodford to Redman	111/134/125/159
Redman to Johnson	111/134/125/159

**Alternatives:** None

**Ancillary Benefits:** Capacity addition due to increase ratings.

**Required IS date:** 06/01/2026

**Projected IS date:** 06/01/2026



**Process Stage:** First Review

**Criteria:** First Energy 715 Criteria

**Assumption Reference:** 2026 RTEP assumption

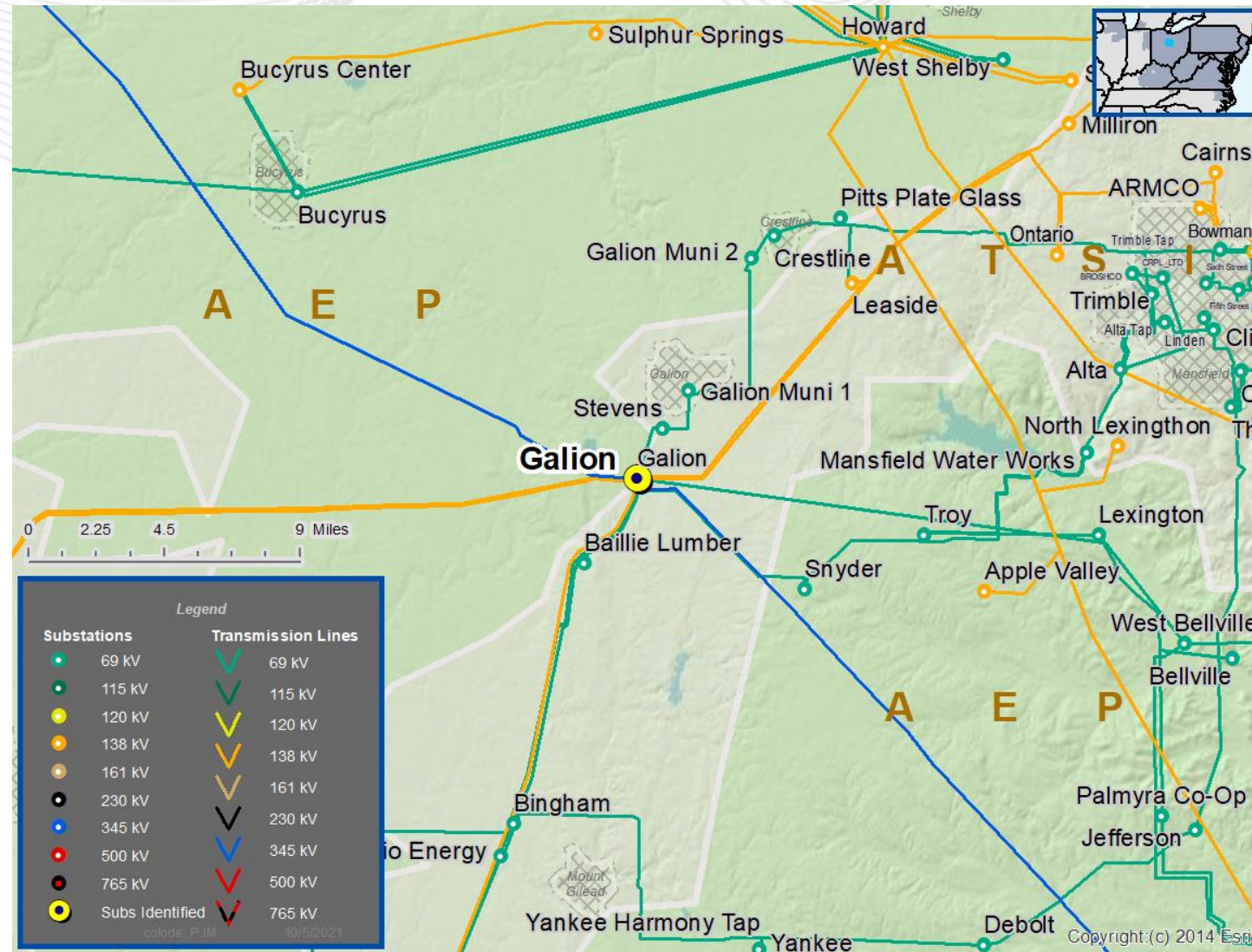
**Model Used for Analysis:** 2026 Light Load RTEP case

**Proposal Window Exclusion:** Below 200 kV Exclusion

**Problem Statement:**

FG: ATSI-VM1

In 2026 Light Load RTEP case, high voltage is observed at Galion 69 kV substation due to N-1.



**Recommended Solution:**

Expand 138 kV substation; Install 100 MVar reactor, associated breaker and relaying

**Total Estimated Cost:** \$1.70 M

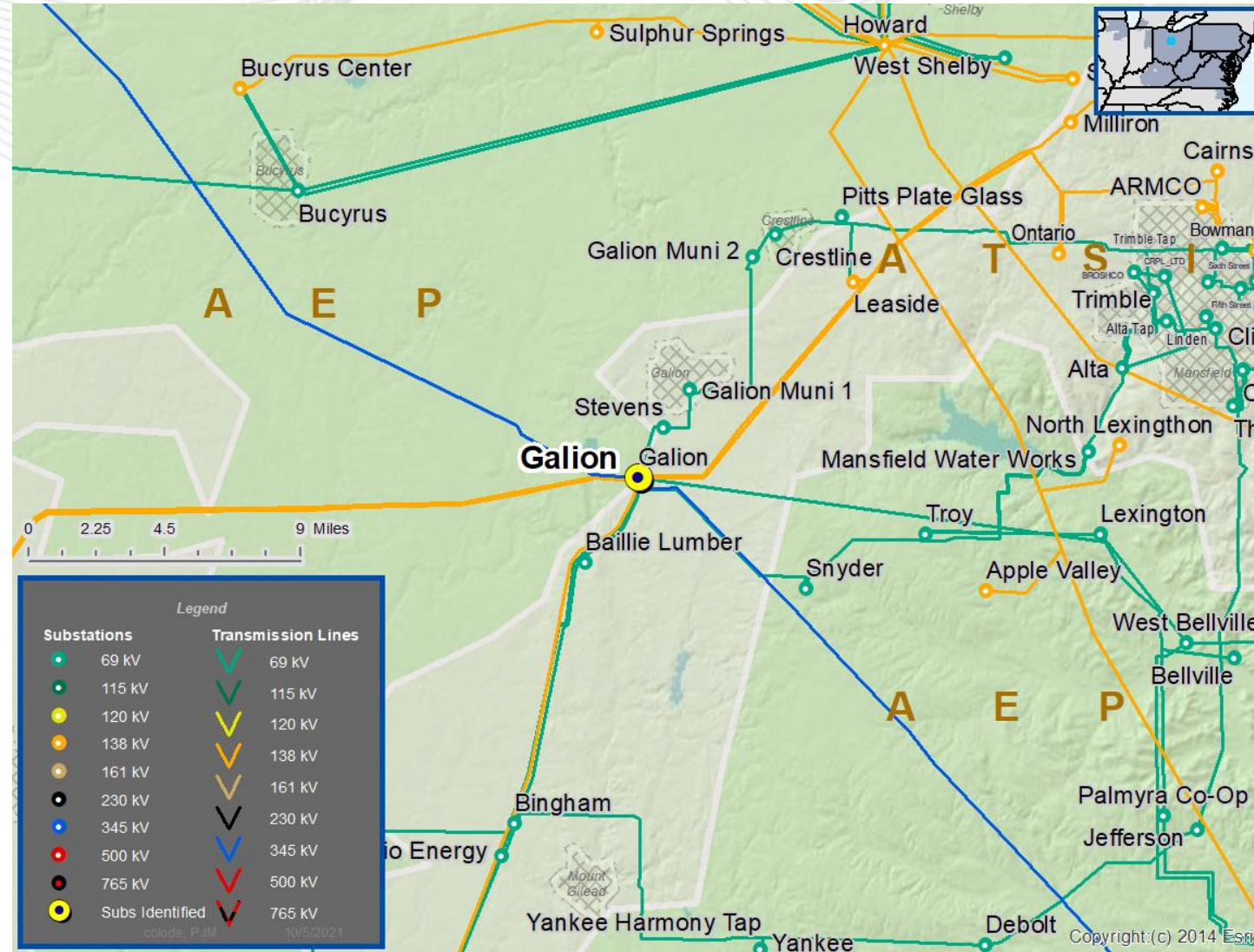
**Alternatives:** None

**Ancillary Benefits:**

Voltage reduction across all regional 69 kV, which might experience additional high voltages under less-than-light-load conditions

**Required IS date:** 06/01/2026

**Projected IS date:** 06/01/2026



**Process Stage:** First Review

**Criteria:** First Energy 715 Criteria

**Assumption Reference:** 2026 RTEP assumption

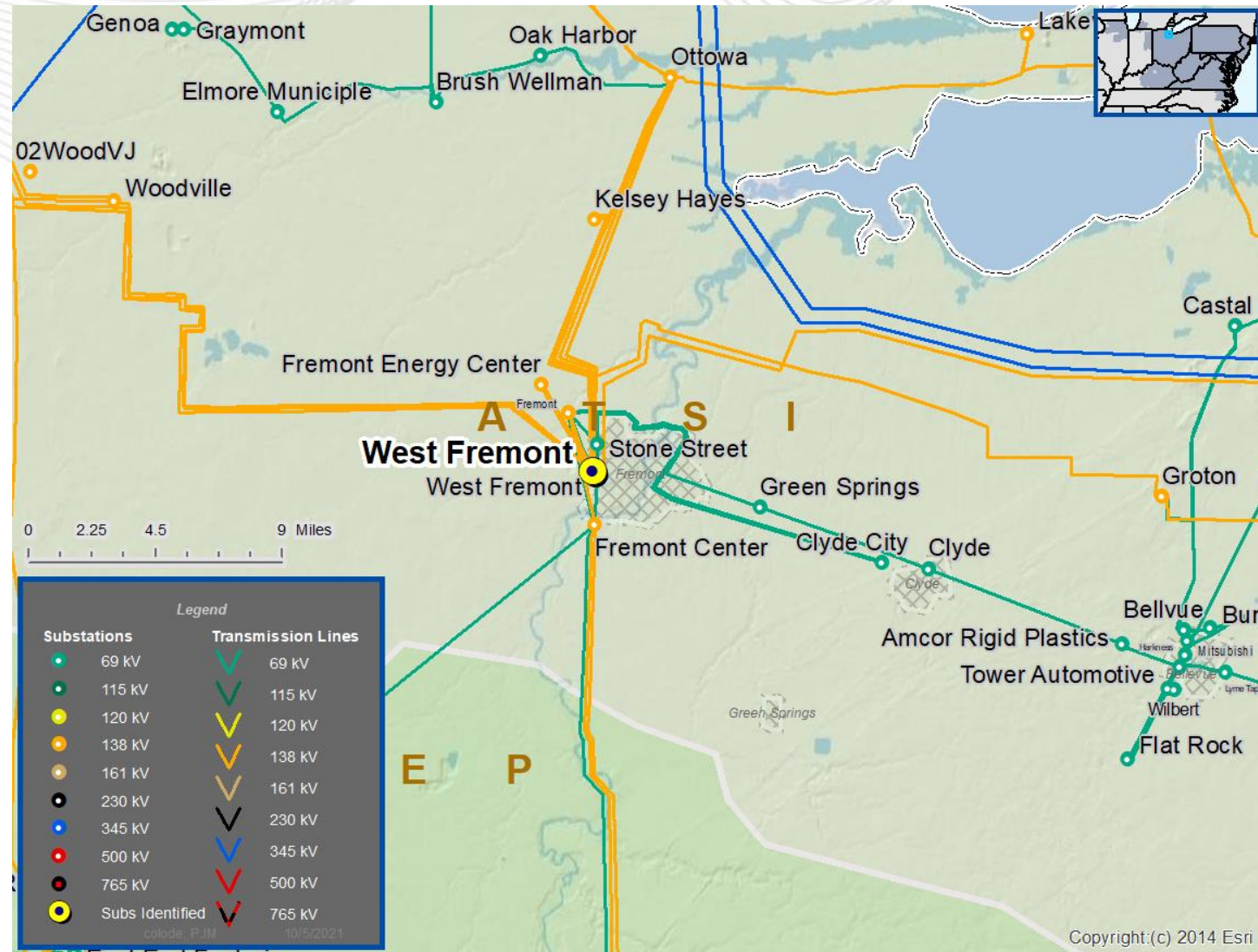
**Model Used for Analysis:** 2026 Light Load RTEP case

**Proposal Window Exclusion:** Below 200 kV Exclusion

**Problem Statement:**

FG: ATSI-VM2

In 2026 Light Load RTEP case, high voltage is observed at West Fremont 69 kV substation due to N-1.



**Recommended Solution:**

Replace West Fremont 138/69 kV TR2 with a transformer having additional high-side taps

**Total Estimated Cost: \$2.9 M**

**Alternatives:**

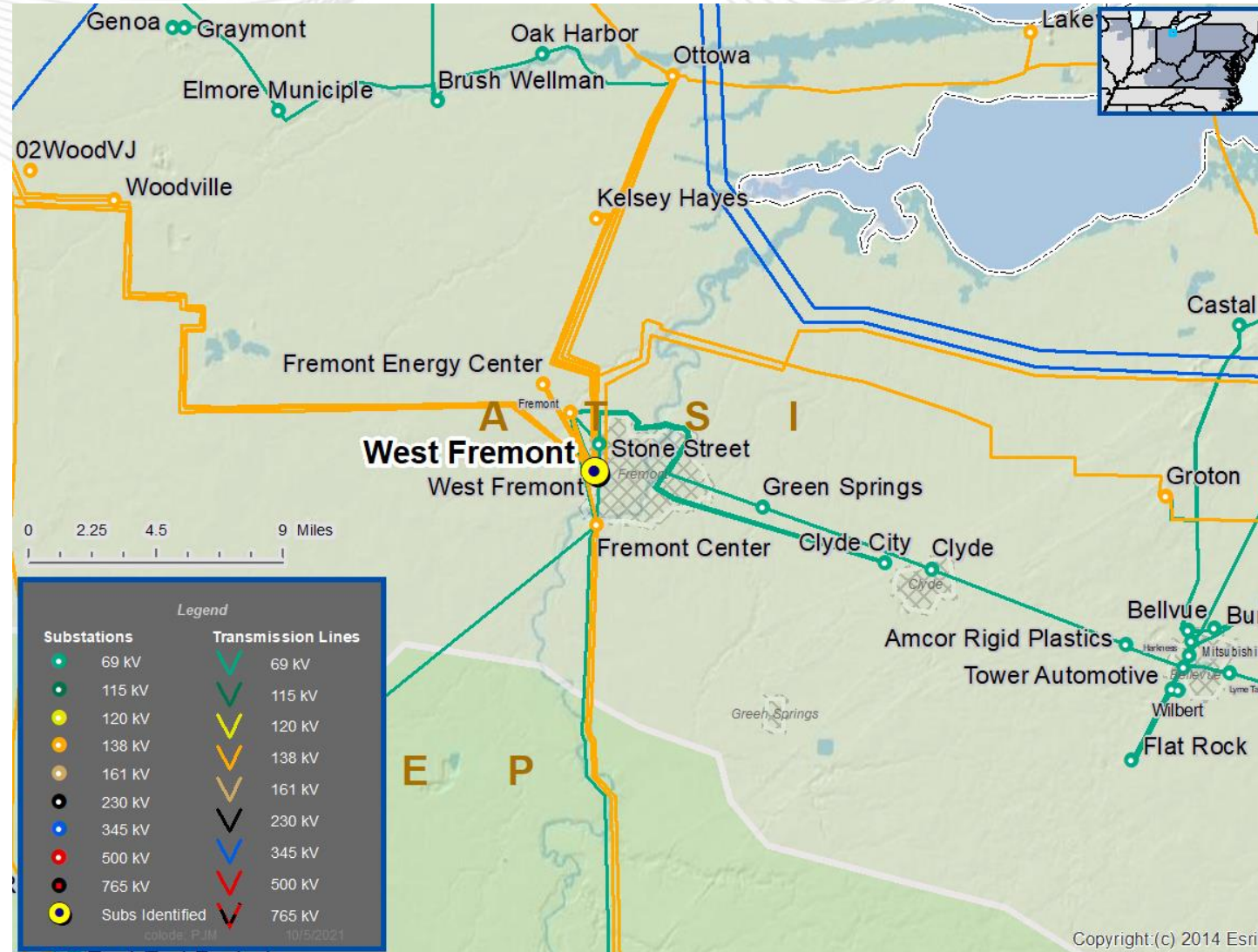
1. Install 100 MVAR reactor at West Fremont
2. Install 100 MVAR reactor at Ottawa

**Ancillary Benefits:**

By allowing for a high side tap of 145, the transformer will be able to reduce the high voltage in the area is experiencing.

**Required IS date: 06/01/2026**

**Projected IS date: 06/01/2026**



**Process Stage:** First Review

**Criteria:** RTEP Summer N-1-1 Thermal

**Assumption Reference:** 2026 RTEP assumption

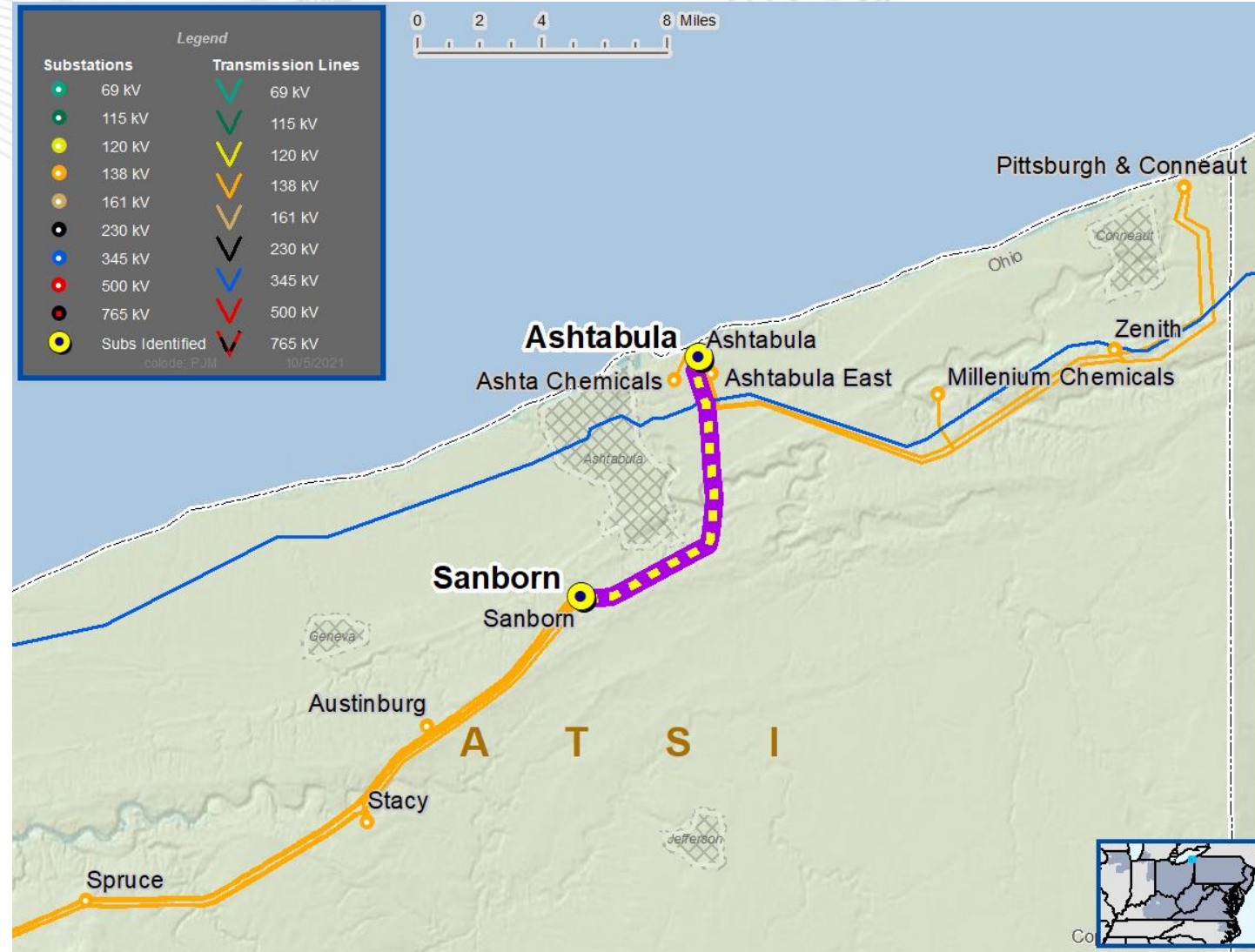
**Model Used for Analysis:** 2026 Summer RTEP case

**Proposal Window Exclusion:** Below 200 kV Exclusion

**Problem Statement:**

FG: N2-ST3

In 2026 Summer RTEP case, Ashtabula to Sanborn Q3 138 kV line is overloaded due to N-1-1.



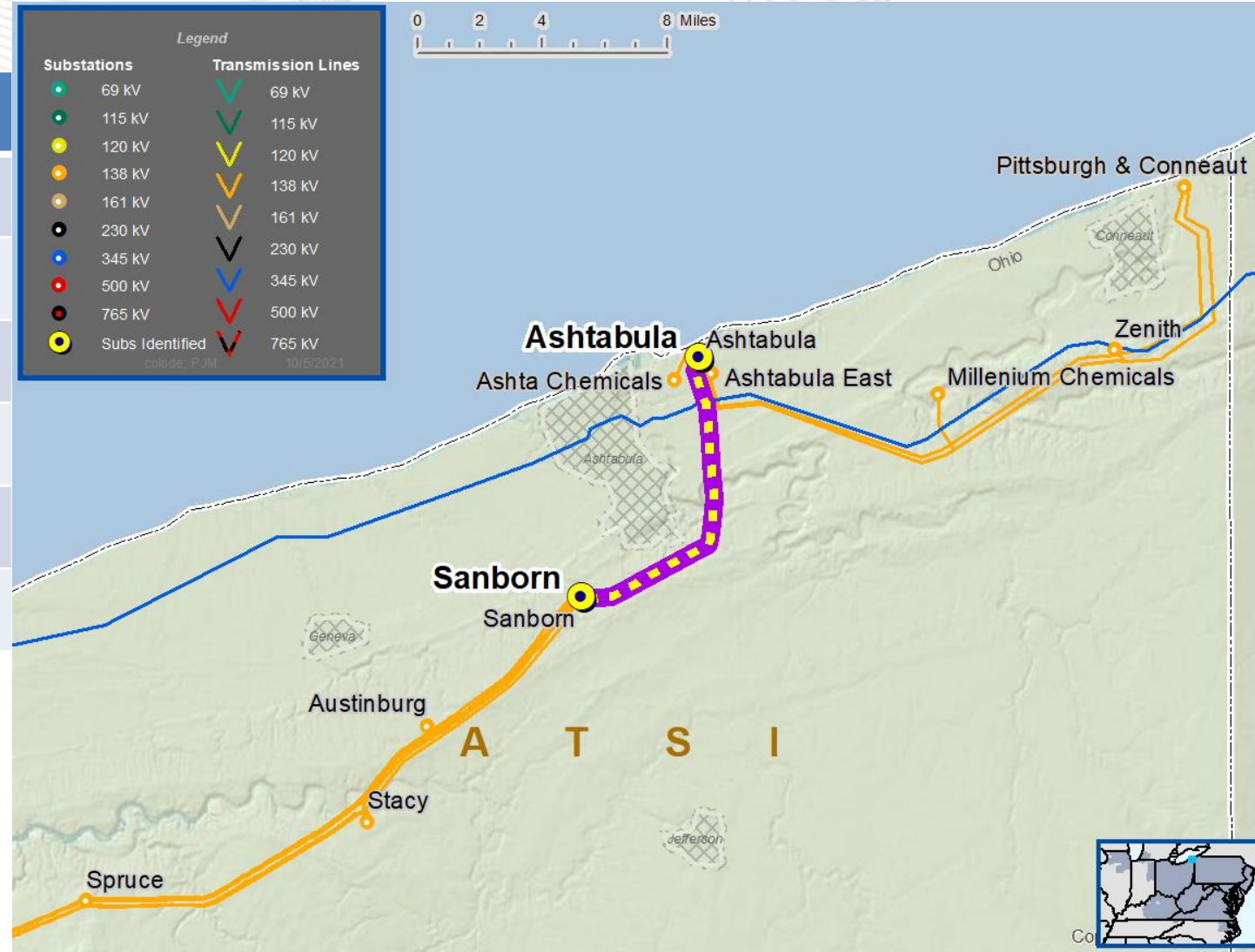
### Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Ashtabula to Sanborn Q2	103/132/147/167
Sanborn to Austinburg Q2	103/132/147/167
Ashtabula to Sanborn Q3	103/132/147/167
Sanborn to Stacy Q3	103/132/147/167
Ashtabula to Sanborn Q4	103/132/147/167
Sanborn to Spruce Q4	103/132/147/167

### Recommended Solution:

At Sanborn, replace limiting substation conductors on Ashtabula 138 kV exit to make transmission line conductor the limiting element

**Total Estimated Cost: \$0.3 M**





## Preliminary Facility Rating:

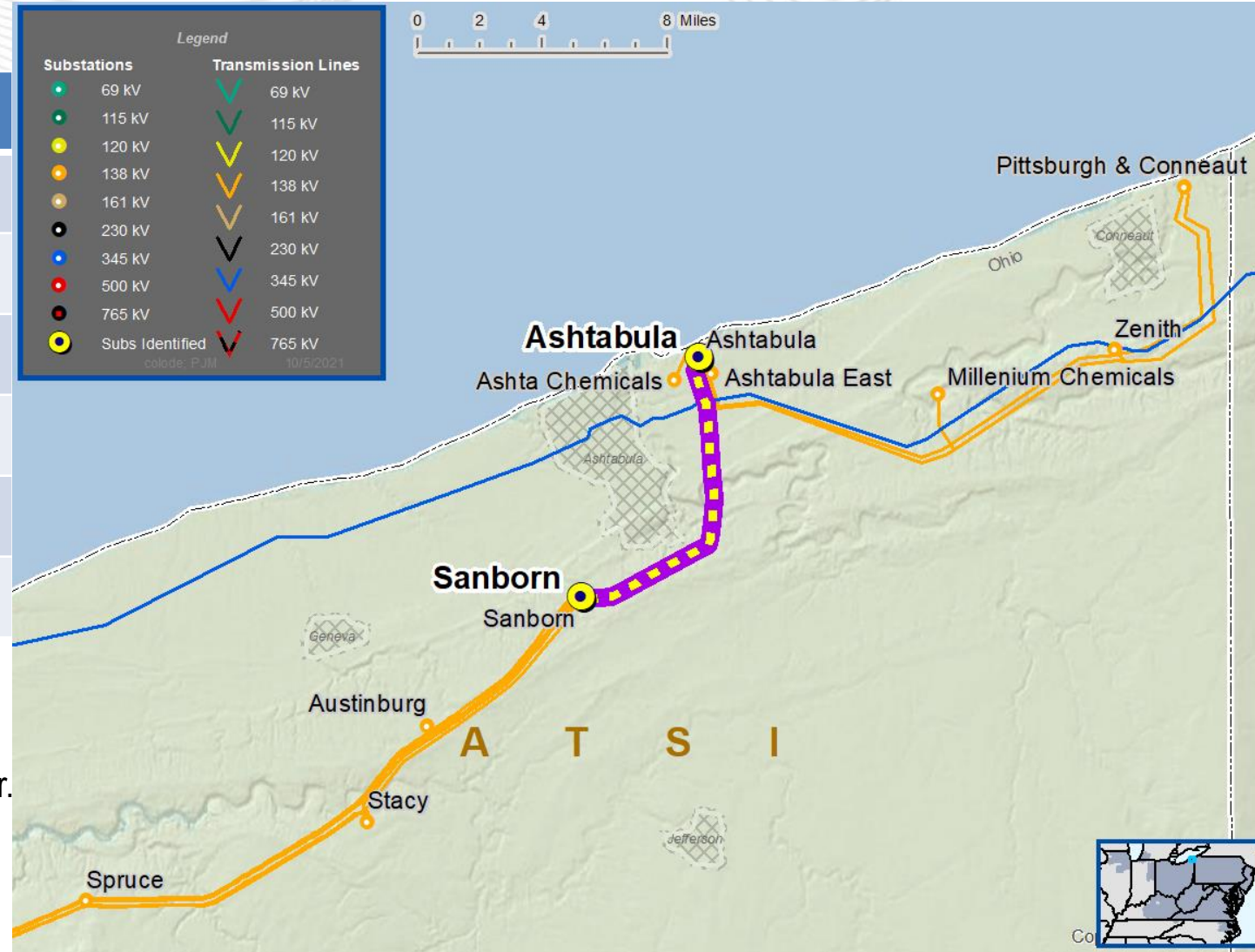
Branch	SN/SE/WN/WE (MVA)
Ashtabula to Sanborn Q2	148/151/166/166
Sanborn to Austinburg Q2	148/151/166/166
Ashtabula to Sanborn Q3	148/151/166/166
Sanborn to Stacy Q3	148/151/166/166
Ashtabula to Sanborn Q4	148/151/166/166
Sanborn to Spruce Q4	148/151/166/166

**Alternatives:** None

**Ancillary Benefits:** Upgrading the limiting terminal equipment will increase the ratings on the line segment and no overload will occur.

**Required IS date:** 12/31/2022

**Projected IS date:** 12/31/2022



- V1 – 10/11/2021 – Original slides posted
- V2 – 10/15/2021 – Slide #18, Updated the proposal window exclusion
  - Slide #27, Updated the ancillary benefit