



Reliability Analysis Update

Wenzheng Qiu & Hamad Ahmed
Sub Regional RTEP Committee - PJM West
November 17, 2023

Recommended Solution Baseline Reliability Projects



AEP Transmission Zone: Baseline Abert – Reusens 69kV Rebuild

Process Stage: Recommended Solution

Criteria: AEP 715 Criteria

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 RTEP cases

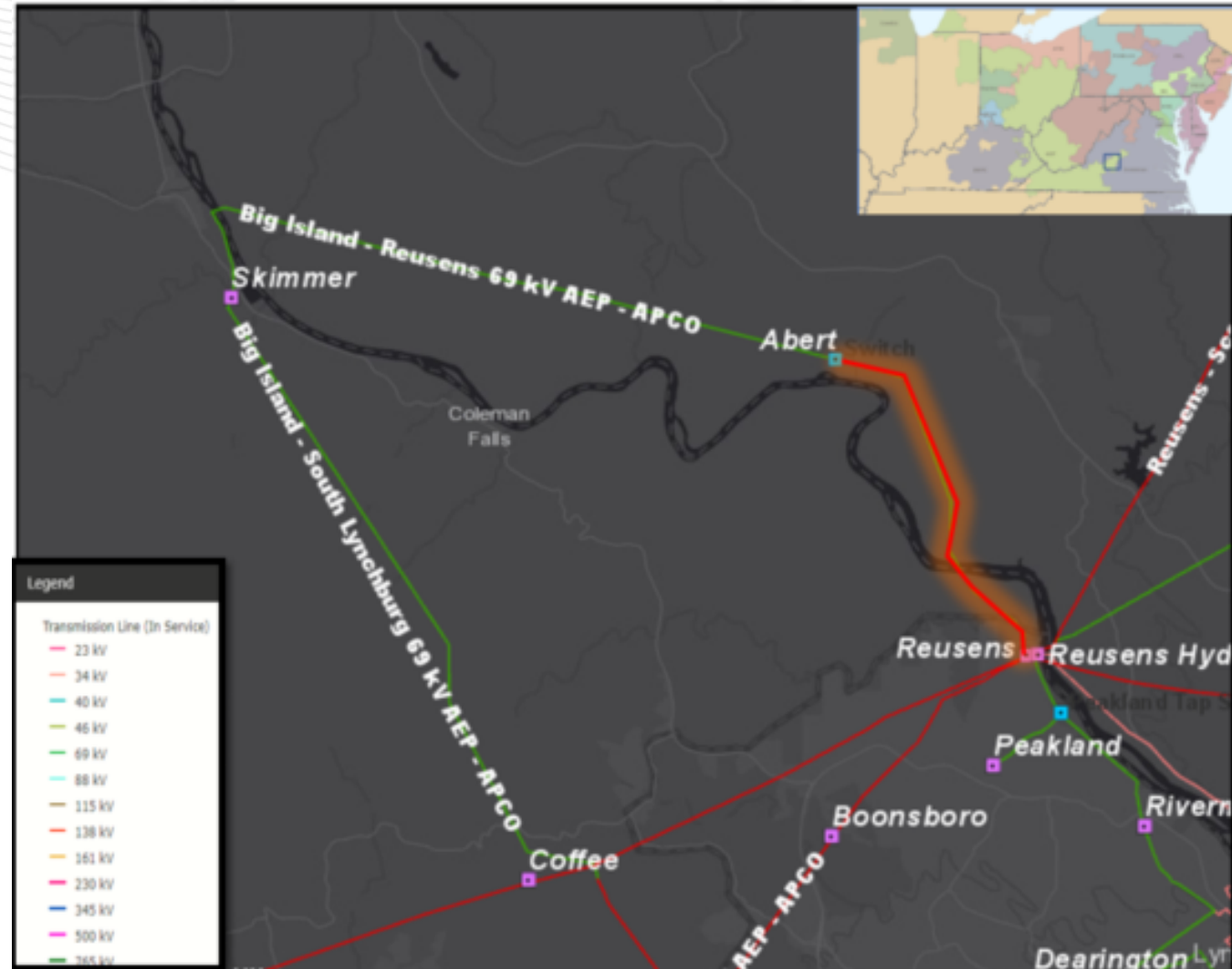
Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023W1-AEP-T15, 2023W1-AEP-T16

In 2028 RTEP summer case, the Abert-Reusens 69 kV line is overloaded for N-1-1 outages .

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Abert - Reusens (69)	49/49/61/61





AEP Transmission Zone: Baseline Abert – Reusens 69kV Rebuild

Recommended Solution: Rebuild ~4.5 miles of 69 kV line between Abert and Reusens Substations. Update Line Settings at Reusens and Skimmer. (B3786)

Total Estimated Cost: \$14.4 M

Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Abert - Reusens 69kV line	82/90/107/113

Ancillary Benefits: Addresses 1970s era wood pole structures that are starting to exhibit signs of deterioration and rotting along this corridor.

Required In-Service: 06/01/2028

Projected In-Service: 06/01/2028

Previously Presented: 10/20/2023

Existing



Proposed



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



AEP Transmission Zone: Baseline Canal Street 138kV Breaker 5 Replacement

Process Stage: Recommended Solution

Criteria: Short Circuit

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 Short Circuit RTEP case

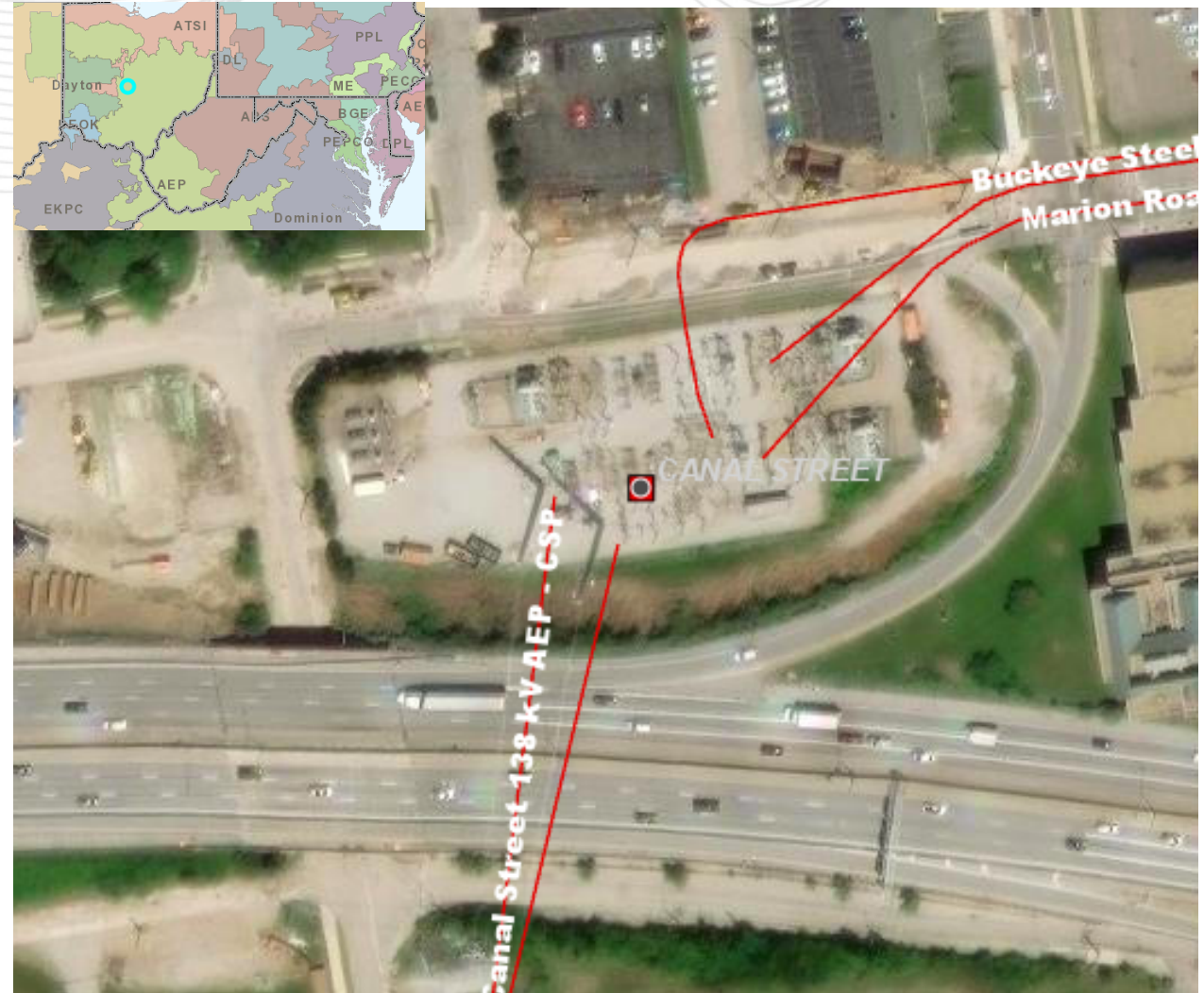
Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023W1-SC-2

In 2028 RTEP short circuit case, Canal street 138 kV breaker 5 has been identified as overdutied.

Existing Facility Rating:

Breaker	Capacity (KA)
Canal Street 138kV Breaker 5	40





AEP Transmission Zone: Baseline Canal Street 138kV Breaker 5 Replacement

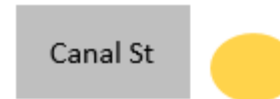
Recommended Solution: Replace 138kV breaker 5 at Canal St station with a new 3000A 63kA breaker. (B3784)

Total Estimated Cost: \$0.5 M

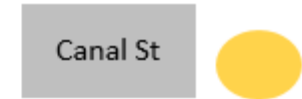
Existing Facility Rating:

Breaker	Capacity (KA)
Canal Street 138kV Breaker 5	63

Existing:



Proposed:



Required In-Service: 06/01/2028

Projected In-Service: 4/30/2025

Previously Presented: 10/20/2023

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



AEP Transmission Zone: Baseline Coalton Relay Upgrades

Process Stage: Recommended Solution

Criteria: AEP 715 Criteria

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 RTEP cases

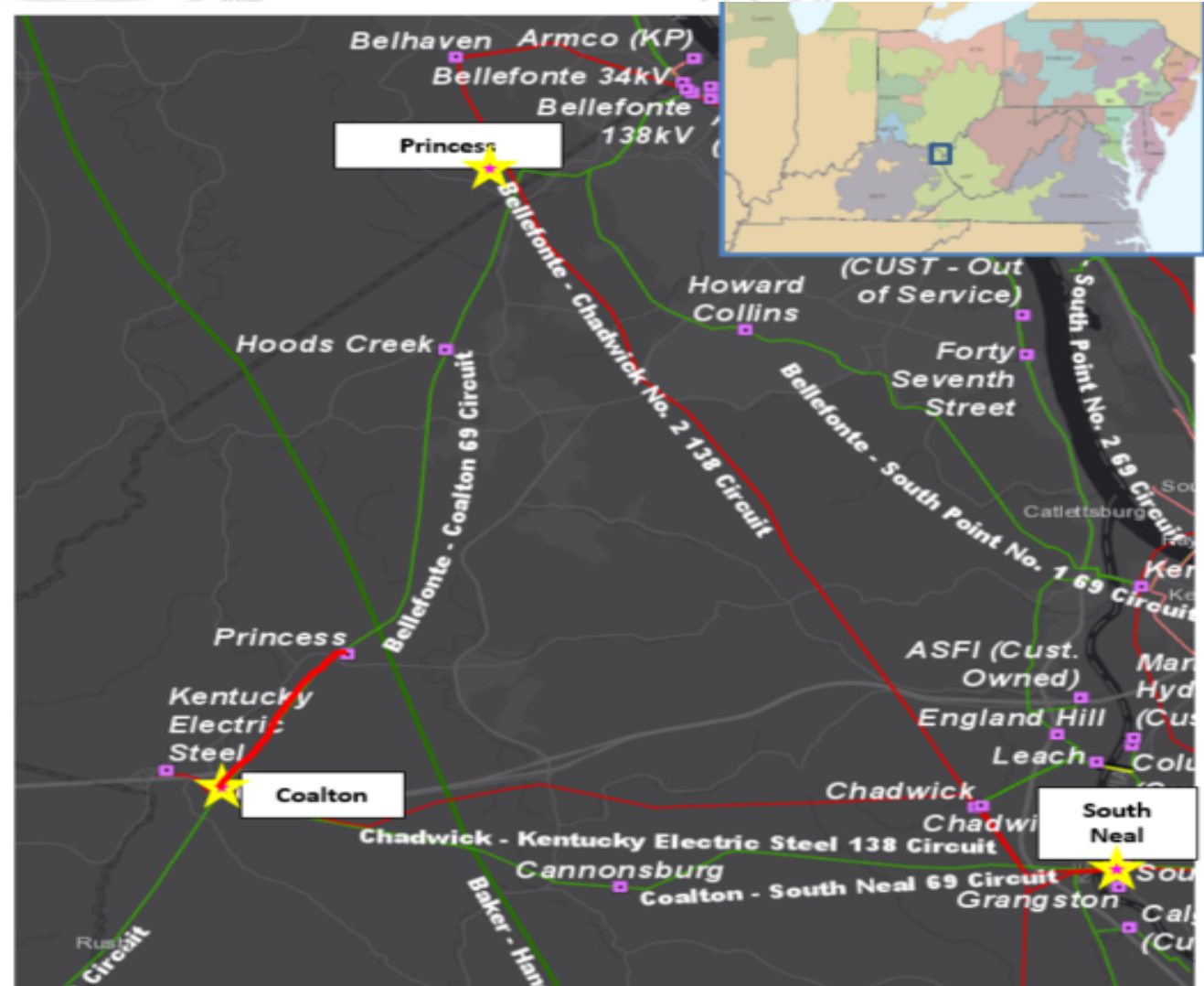
Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023-W1-AEP-T19, 2023-W1-AEP-T20, 2023-W1-AEP-T21, 2023-W1-AEP-T22

In 2028 RTEP winter case, the Coalton - Princess 69 kV line is overloaded for multiple common mode contingencies.

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Coalton - Princess 69kV line	64/64/64/64





AEP Transmission Zone: Baseline Coalton Relay Upgrades

Recommended Solution: Install a CCVT on 3 phase stand and remove the single phase existing CCVT on the 69kV Coalton to Bellefonte line exit. The existing CCVT is mounted to lattice on a single phase CCVT stand, which will be replaced with the 3 phase CCVT stand. The line riser between line disconnect and line take off is being replaced. This remote end work changes the MLSE of the line section between Coalton - Princess 69kV line section. **(B3787)**

Total Estimated Cost: \$0.0 M

Preliminary Facility Rating:

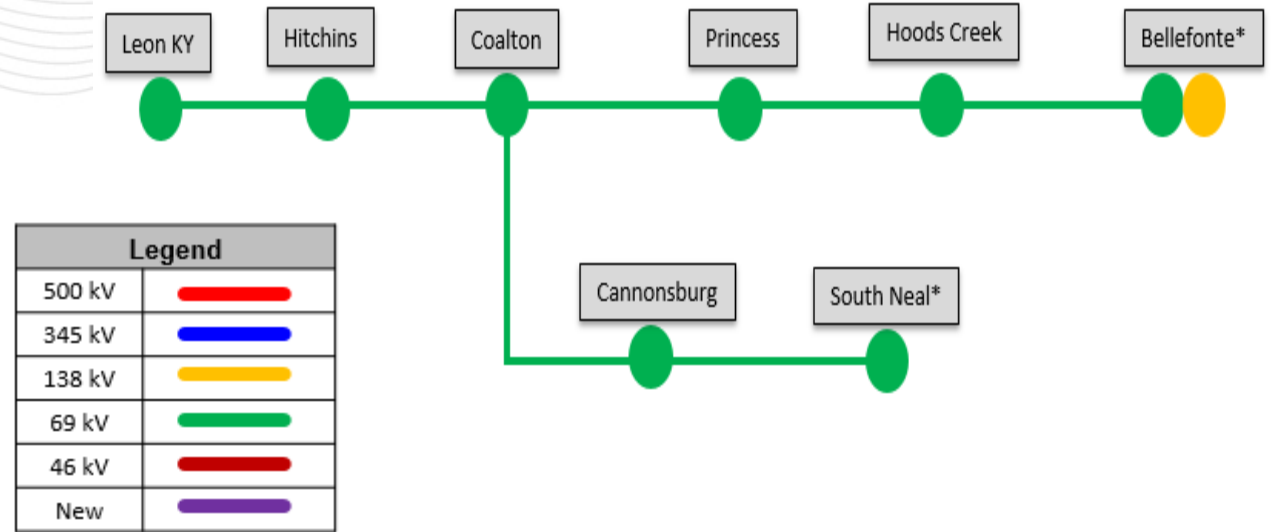
Branch	SN/SE/WN/WE (MVA)
Coalton - Princess 69kV line	79/92/100/109

Required In-Service: 12/1/2028

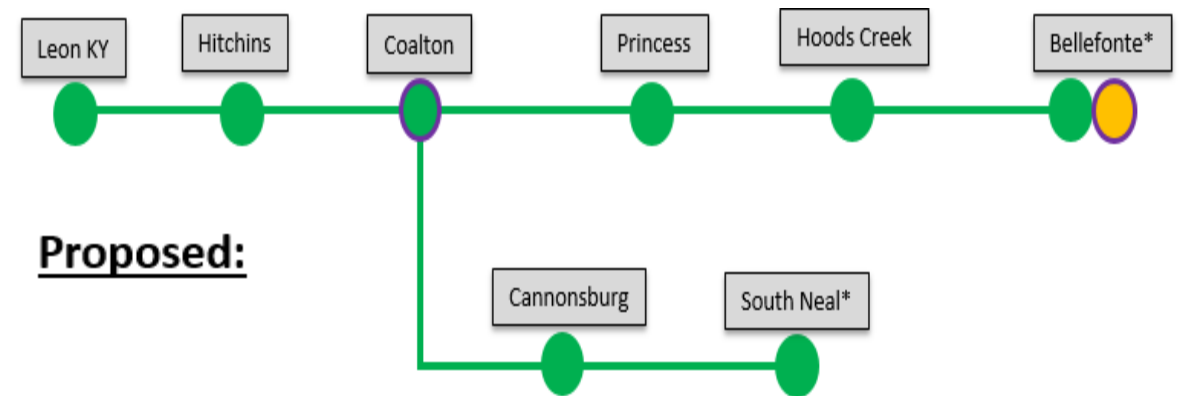
Projected In-Service: 6/1/2026

Previously Presented: 10/20/2023

Existing:



Proposed:





AEP Transmission Zone: Baseline Chemical – Washington Street 46kV Rebuild

Process Stage: Recommended Solution

Criteria: AEP 715 Criteria

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 RTEP cases

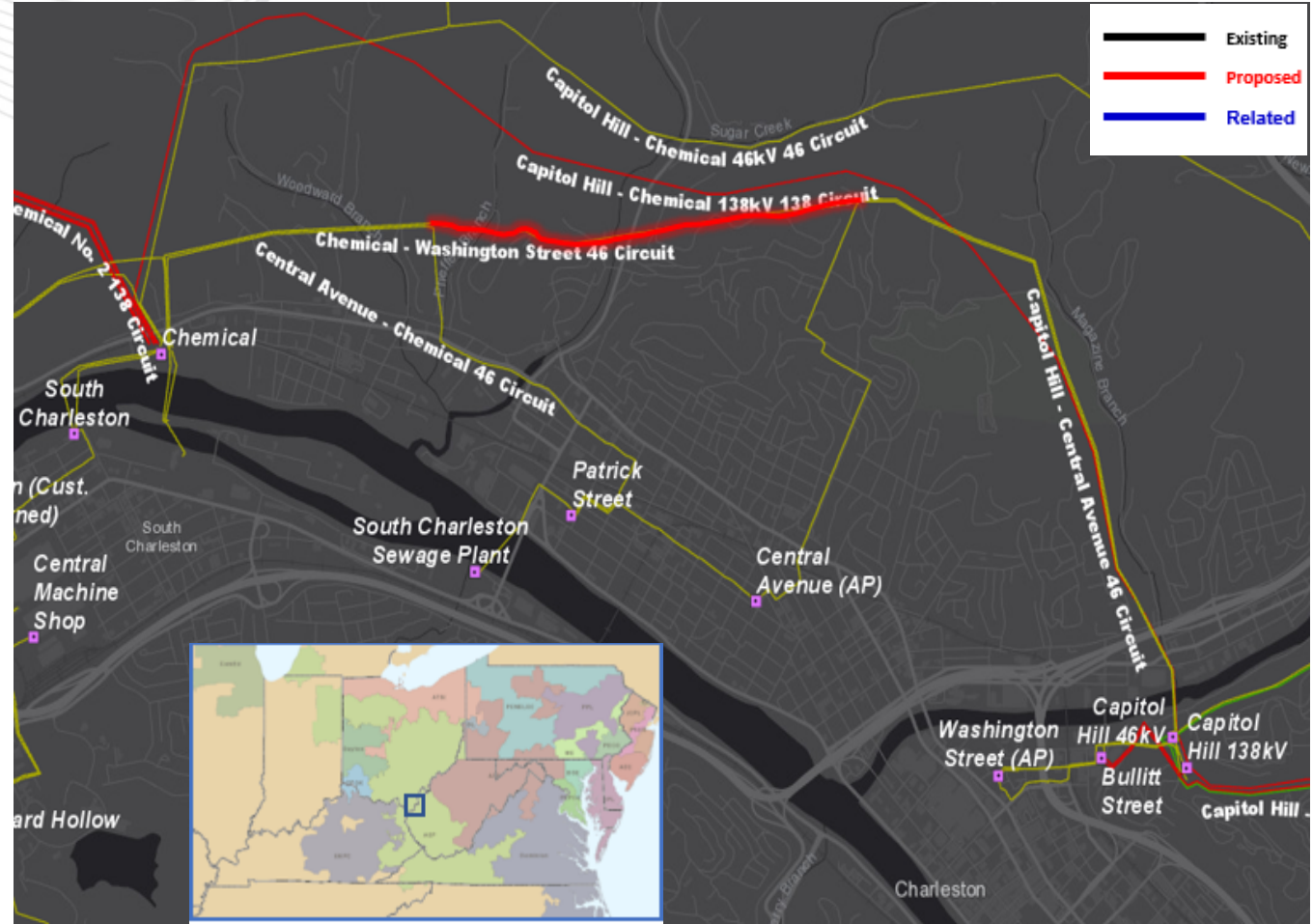
Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023-W1-AEP-T17, 2023-W1-AEP-T18

In 2028 RTEP Summer case, the Chemical – Washington Street 46 kV line is overloaded for an N-1-1 contingency pair.

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Chemical - Washington Street 138kV line	36/36/46/50





AEP Transmission Zone: Baseline Chemical – Washington Street 46kV Rebuild

Recommended Solution: Rebuild approximately 1.7 miles of line on the Chemical - Washington Street 46 kV circuit. (B3836)

Total Estimated Cost: \$7.6 M

Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Chemical - Washington Street 138kV line	46/83/46/84

Required In-Service: 6/1/2028

Projected In-Service: 6/1/2028

Previously Presented: 10/20/2023

Existing:

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



Proposed:





AEP Transmission Zone: Baseline West Huntington 34.5kV Breaker Replacement

Process Stage: Recommended Solution

Criteria: AEP 715 Criteria

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 RTEP Short Circuit case

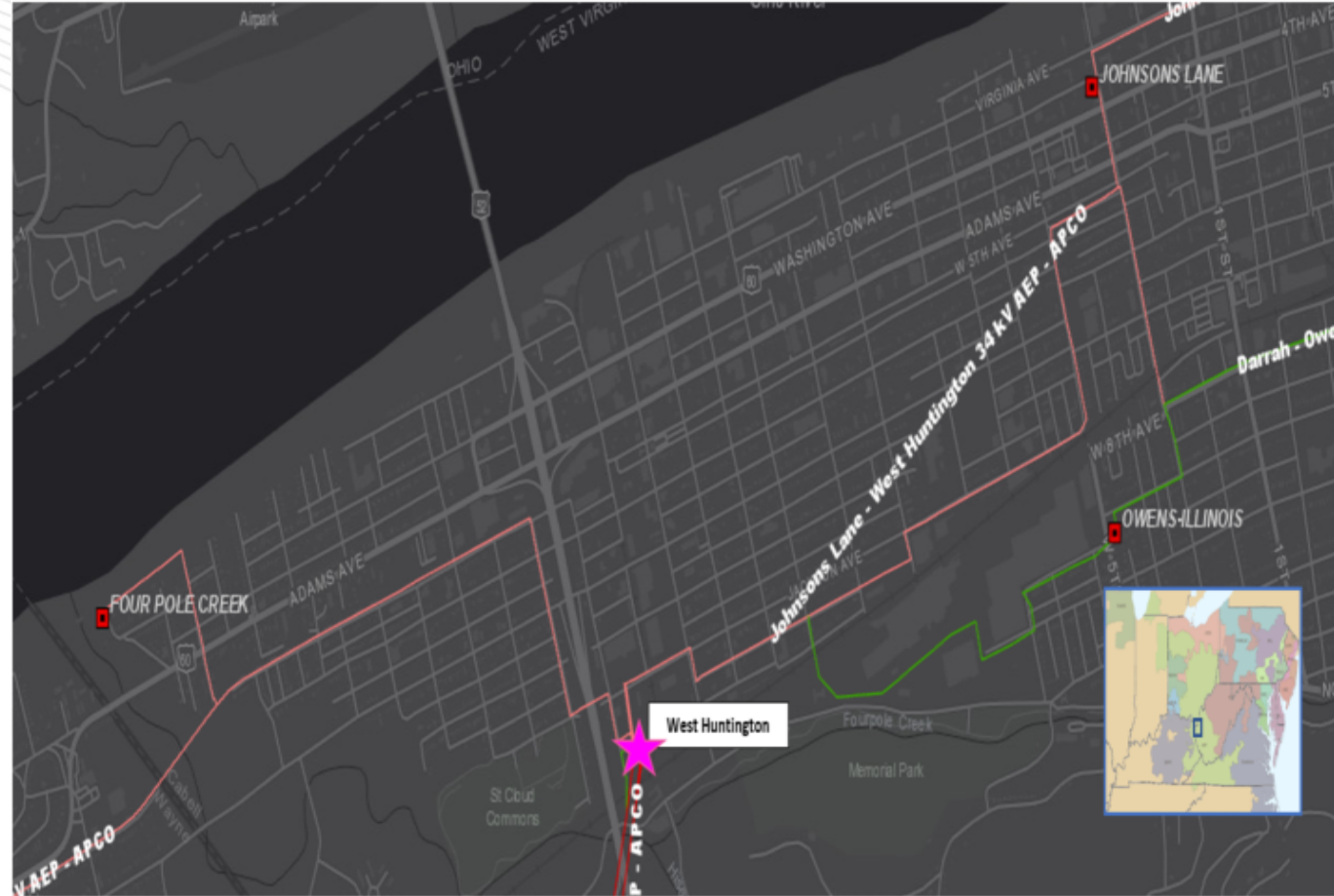
Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023-W1-AEP-SC1

In 2028 RTEP Short Circuit case, the 34.5KV Breaker B at West Huntington station is overdutied .

Existing Facility Rating:

Breaker	Capacity (KA)
West Huntington 34.5kV breaker B	25





AEP Transmission Zone: Baseline West Huntington 34.5kV Breaker Replacement

Recommended Solution: Replace existing 34.5 kV, 25 kA circuit breaker B at West Huntington Station with new 69 kV, 40 kA circuit breaker. (B3837)

Total Estimated Cost: \$0.365 M

Breaker	Capacity (KA)
West Huntington 34.5kV breaker B	40

Required In-Service: 06/01/2028

Projected In-Service: 12/1/2027

Previously Presented: 10/20/2023

Existing:

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

East Huntington



Proposed:

East Huntington





AEP Transmission Zone: Baseline Timken 138kV Breaker Replacement

Process Stage: Recommended Solution

Criteria: Short Circuit

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 RTEP Short Circuit case

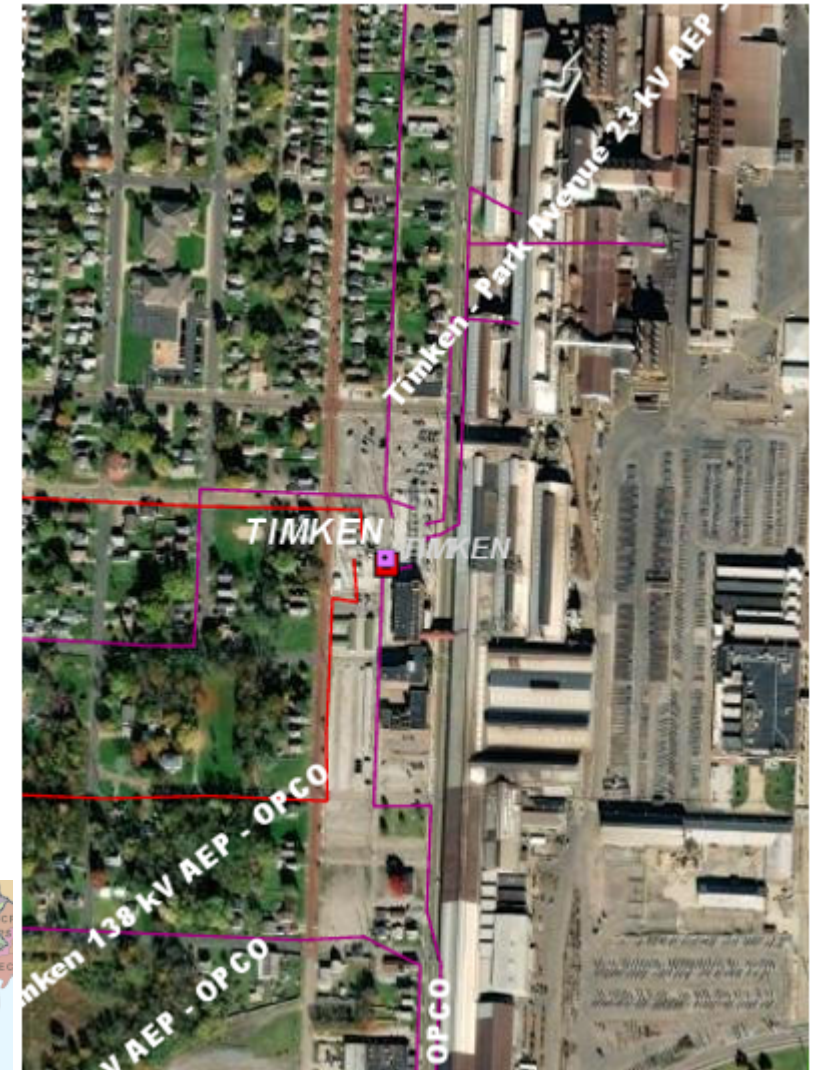
Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023-W1-SC-8, 2023-W1-SC-9

In 2028 RTEP Short Circuit case, 138 kV breakers A and B at Timken station are overdutied.

Existing Facility Rating:

Breaker	Capacity (KA)
Timken 138kV Breaker A	18
Timken 138kV Breaker B	18





AEP Transmission Zone: Baseline Timken 138kV Breaker Replacement

Recommended Solution: Replace the 138kV breakers A and B at Timken Station with 40 kA breakers (B3838)

Total Estimated Cost: \$1.2 M

Preliminary Facility Rating:

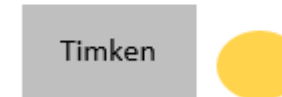
Breaker	Capacity (KA)
Timken 138kV Breaker A	40
Timken 138kV Breaker B	40

Required In-Service: 06/01/2028

Projected In-Service: 06/01/2028

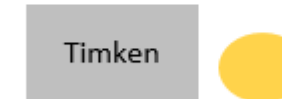
Previously Presented: 10/20/2023

Existing:



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

Proposed:



Process Stage: Recommended Solution

Criteria: AEP 715 Criteria

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 RTEP Short Circuit case

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023W1-AEP-SC6

In 2028 RTEP Short Circuit case, 69 kV breakers C at Haviland station are overdutied

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Haviland - Latty Junction Switch 69kV	68/73/90/98

Breaker	Capacity (KA)
Haviland 69kV Breaker C	9





AEP Transmission Zone: Baseline Haviland 69kV Breaker Replacement

Recommended Solution: Replace 69kV breaker C at Haviland Station with a 40 kA breaker (**B3839**)

Total Estimated Cost: \$0.4 M

Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Haviland - Latty Junction Switch 69kV	68/86/90/103

Breaker	Capacity (KA)
Haviland 69kV Breaker C	40

Required In-Service: 06/01/2028

Projected In-Service: 06/01/2028

Previously Presented: 10/20/2023

Existing:



Proposed:



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



AEP Transmission Zone: Baseline 24th Street Retirement

Process Stage: Recommended Solution

Criteria: AEP 715 Criteria

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 RTEP cases

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023-W1-AEP-T1, 2023-W1-AEP-T10, 2023-W1-AEP-T11, 2023-W1-AEP-T12, 2023-W1-AEP-T13, 2023-W1-AEP-T14, 2023-W1-AEP-T2, 2023-W1-AEP-T3, 2023-W1-AEP-T4, 2023-W1-AEP-T5, 2023-W1-AEP-T6, 2023-W1-AEP-T7, 2023-W1-AEP-T8, 2023-W1-AEP-T9

In 2028 RTEP Summer case, the 26th Street - 24th Street - BASF Tap line is overloaded for multiple N-1-1 contingencies.

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
East Huntington - 26th Street 34.5kV	25/25/31/31





AEP Transmission Zone: Baseline 24th Street Retirement

Recommended Solution: Replace Structures 382-66 and 382-63 on Darrah - East Huntington 34.5 kV line to bypass 24th Street station. Retire structures 1 through 5 on Twenty Fourth Street 34.5 kV Extension. Retire 24th Street Station. Remove conductors from BASF Tap to BASF. (**B3840**)

Total Estimated Cost: \$1.8 M

Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
East Huntington - 26th Street 34.5kV	56/56/70/70

Ancillary Benefits: This proposal retires an obsolete station and lines that are no longer serving load. Addresses asset conditions on 2 structures of the Darrah - East Huntington 34.5 kV line. 23rd St and BASF are electrically disconnected from the system.

Required In-Service: 06/01/2028

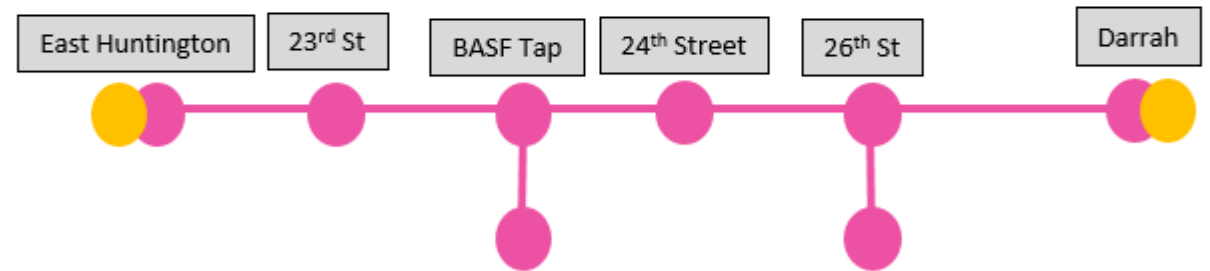
Projected In-Service: 04/01/2024

Previously Presented: 10/20/2023

Existing:

*as depicted in the model today

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



Proposed:





AEP Transmission Zone: Baseline West Clark – Ohio University UG Line Rebuild

Process Stage: Recommended Solution

Criteria: AEP 715 Criteria

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 RTEP cases

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023-W1-AEP-T23, 2023-W1-AEP-T24, 2023-W1-AEP-T25, 2023-W1-AEP-T26, 2023-W1-AEP-T27, 2023-W1-AEP-T28, 2023-W1-AEP-T29, 2023-W1-AEP-T30

In 2028 RTEP Summer case, the underground conductor section of the Ohio University-West Clark 69 kV line is overloaded under N-1-1 for multiple N-1-1 contingencies.

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
West Clark - Ohio University 69KV	60/67/62/68





AEP Transmission Zone: Baseline West Clark – Ohio University UG Line Rebuild

Recommended Solution: Rebuild the underground portion of the Ohio University-West Clark 69 kV line, approximately 0.65 miles.
(B3843)

Total Estimated Cost: \$4.6 M

Preliminary Facility Rating:

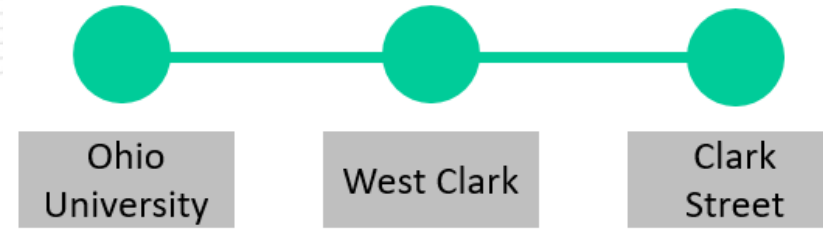
Branch	SN/SE/WN/WE (MVA)
West Clark - Ohio University 69kV	102/142/104/151

Required In-Service: 06/01/2028

Projected In-Service: 06/01/2028

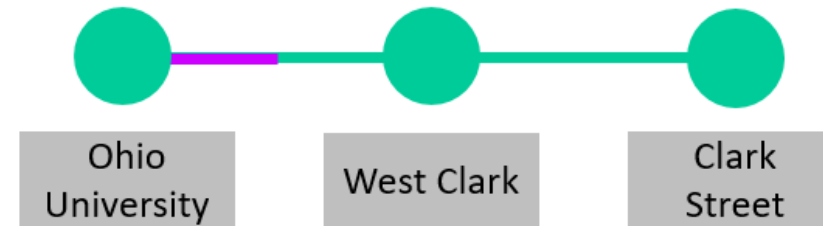
Previously Presented: 10/20/2023

Existing:



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

Proposed:



Process Stage: Recommended Solution

Criteria: FERC 715

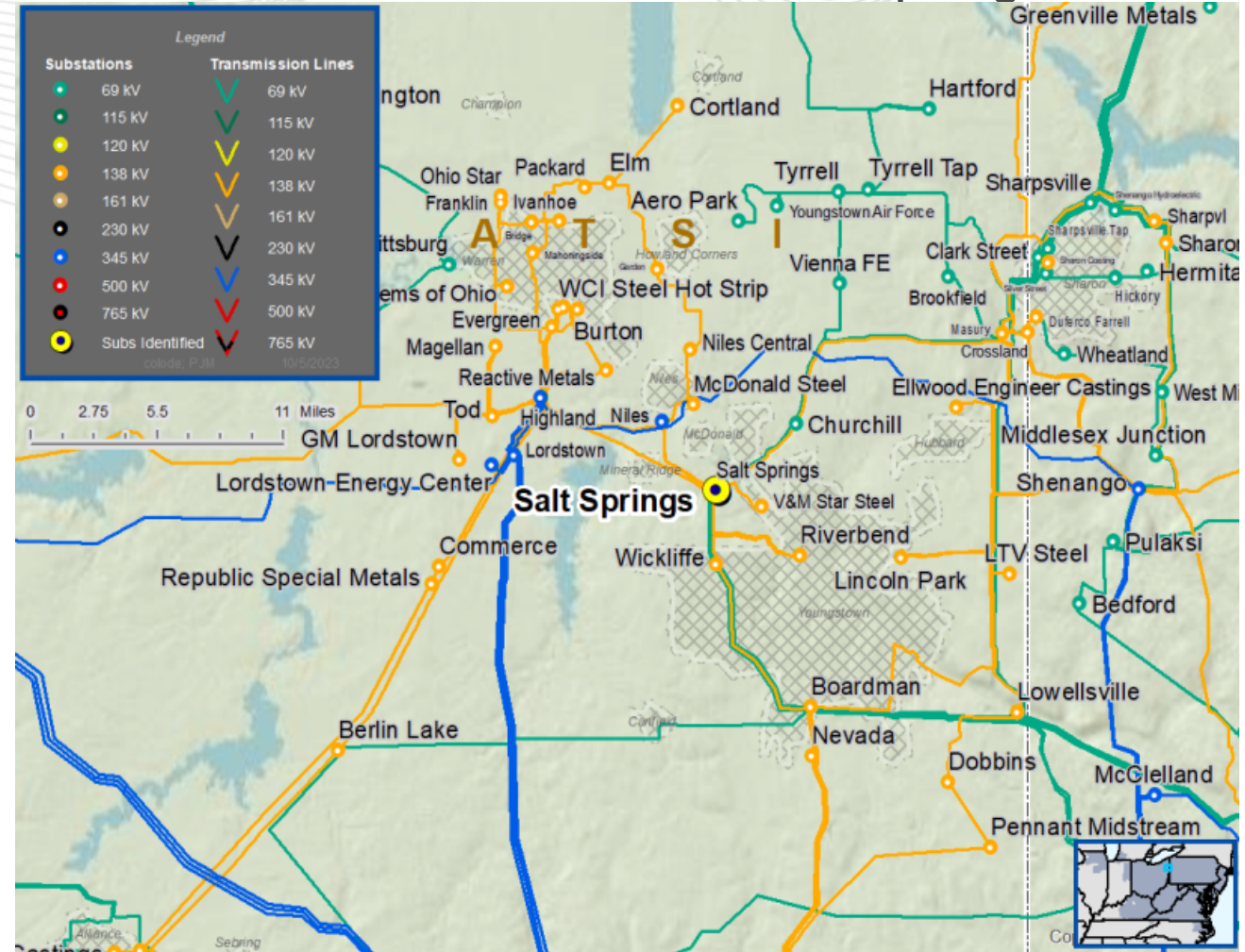
Assumption Reference: 2028 RTEP assumption

Model Used for Analysis: 2028 Light Load RTEP case

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: 2023W1-ATSI-VM1 to 2023W1-ATSI-VM7

In 2028 RTEP Light Load case, high voltage is observed in several buses around Salt Spring 69 kV for N-1 event



Recommended Solution: A 69 kV, 60 MVAR Shunt Reactor will be installed at the Salt Springs Substation. The reactor terminal will be connected to the existing 69 kV bus and an independent-pole operation, 1200 A circuit breaker will be installed for reactor switching. (b3789)

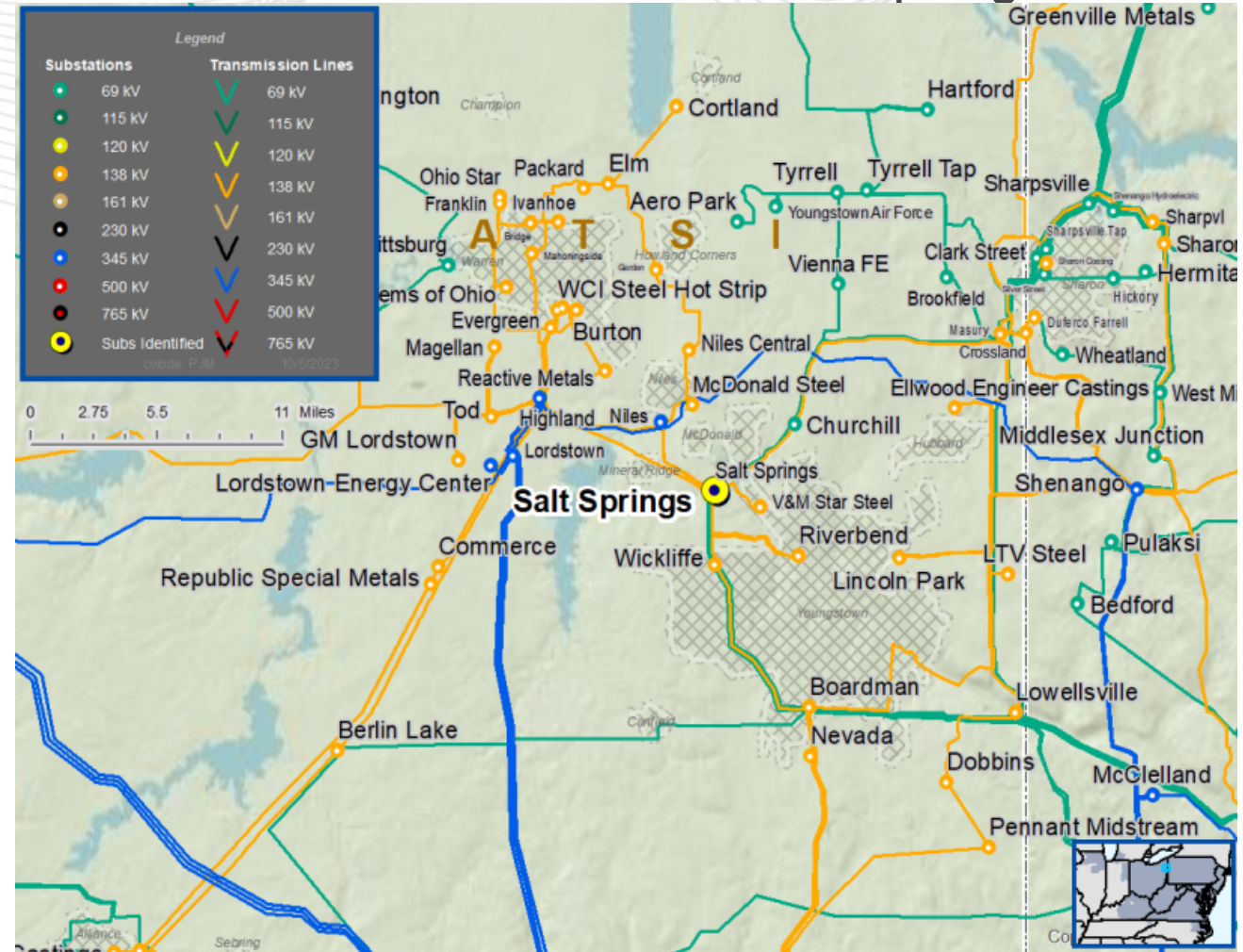
Total Estimated Cost: \$5.45 M

Alternatives: Reactor installations were evaluated at other locations but Salt Springs provided the most benefit.

Ancillary Benefits: N/A

Projected In-Service: 06/01/2028

Required In-Service: 06/01/2028



SME/Presenter:

Wenzheng Qiu;

Wenzheng.Qiu@pjm.com

Hamad Ahmed;

Hamad.Ahmed@pjm.com

SRRTEP-W Reliability Analysis Update



Member Hotline

(610) 666 – 8980

(866) 400 – 8980

custsvc@pjm.com

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- V1 – 11/13/2023 – Original slides posted
- V2 – 11/21/2023 – Slide #6, corrected Baseline ID from B3874 to B3784