

Transmission Expansion Advisory Committee – AEP Supplemental Projects

March 08, 2022

Changes to the existing Supplemental Projects

AEP Transmission Zone Supplement Project S2270 Scope Change

S2270.1-.7 (2020 AEP local plan)

Supplemental Project Driver: Customer Service

Problem Statement: A customer has requested new service west of Cameron, West Virginia. The forecasted peak demand is 30 MW initially, with long-term prospects of 90 MW. With the addition of this customer load, the Wayman-Gosney-Nauvoos Ridge 138kV radial line has an MVA-mile demand of 896, far exceeding AEP's guideline of 75 MVA-miles. The MVA-mile demand that exists today on the Wayman-Gosney Hill 138kV circuit is 313 without any new load additions

Original Project Scope:

Construct a new 500-138kV station (Panhandle), connecting to the Kammer-502 Junction 500kV circuit (~10.3 miles from Kammer, 31.7 miles from 502 Junction). Install a 3-breaker 500kV ring bus; 450 MVA 500-138kV transformer; 3-breaker 138kV ring bus. (S2270.1) Estimated Cost: \$25.0 M

Construct a new 138kV switching station (Nauvoos Ridge) with 8- 138kV breakers in a breaker-and-a-half design. The station will have 1 circuit to Gosney Hill, 2 circuits to the customer's facility, 2 circuits to Panhandle, and a 23 MVAR 138kV cap bank. (S2270.2) Estimated Cost: \$16.4 M

At Gosney Hill, install a new 138kV breaker toward Nauvoos Ridge. Update station protection. Replace the 795 kcmil AAC risers and strain bus with 2000 kcmil AAC risers. (S2270.3) Estimated Cost: \$1.3 M

Construct a new 4.7-mile 138kV line south of Gosney Hill station to Nauvoos Ridge. Utilize 1033 ACSR conductor. Acquire new right-of-way. (S2270.4) Estimated Cost: \$14.7 M

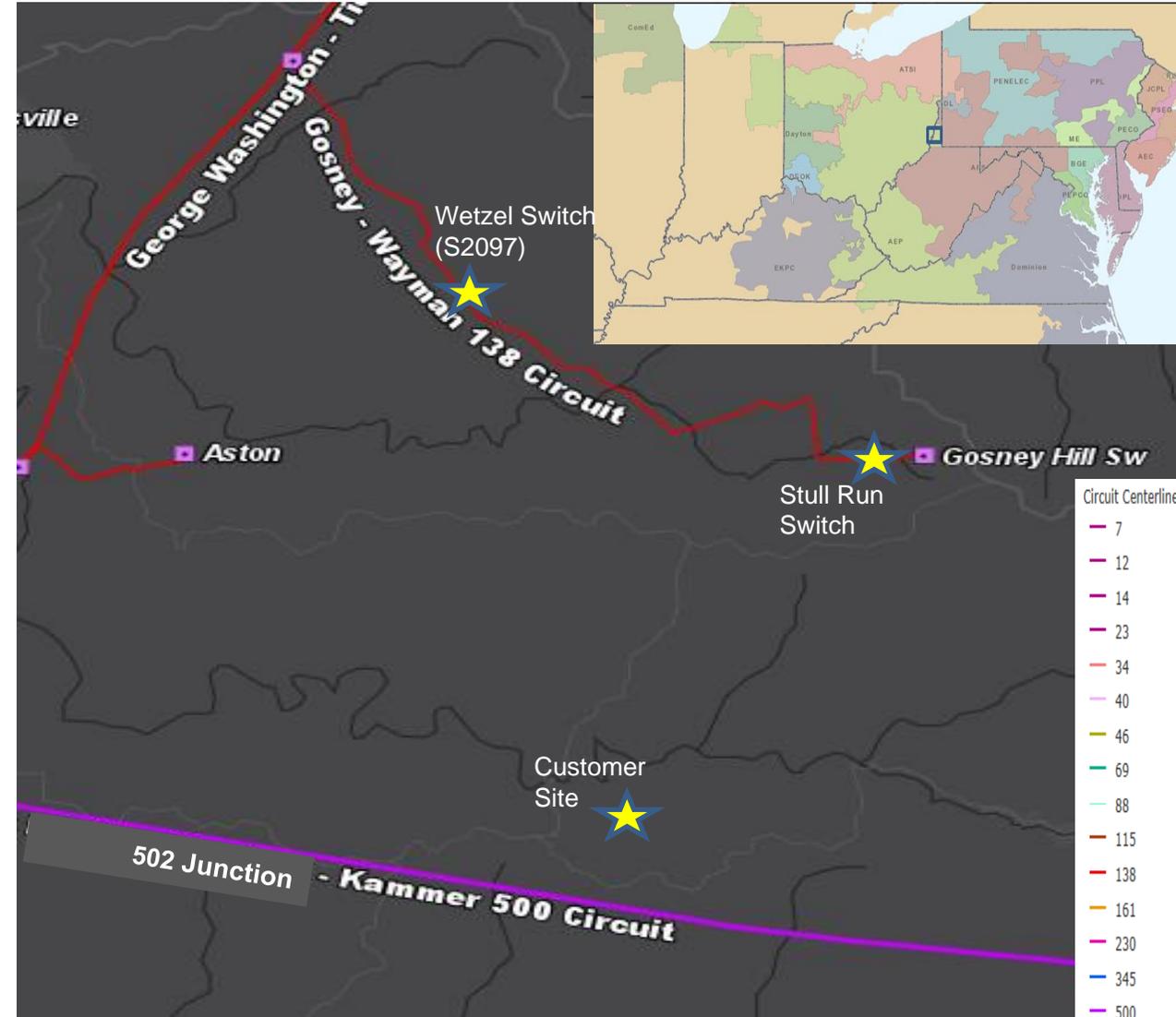
Construct a new 1.3 mile double-circuit 138kV line from Nauvoos Ridge to the customer's substation. Acquire new right-of-way. (S2270.5) Estimated Cost: \$4.8 M

Construct a new 1.5 mile double-circuit 138kV line from Panhandle to Nauvoos Ridge. Utilize 1033 ACSR conductor for each circuit. Acquire new right-of-way. (S2270.6) Estimated Cost: \$5.0 M

Extend the Kammer-502 Junction 500kV transmission line 0.1-mile into Panhandle station (0.2 mile total). (S2270.7) Estimated Cost: \$1.5 M

Original Total Estimated Cost: \$68.7 M

Original Projected In-Service: 7/21/2020 (for initial 138kV service to the customer). 3/1/2022 (for the 2nd phase to construct Panhandle station and complete the 138kV loop).



AEP Transmission Zone Supplement Project S2270 Scope Change

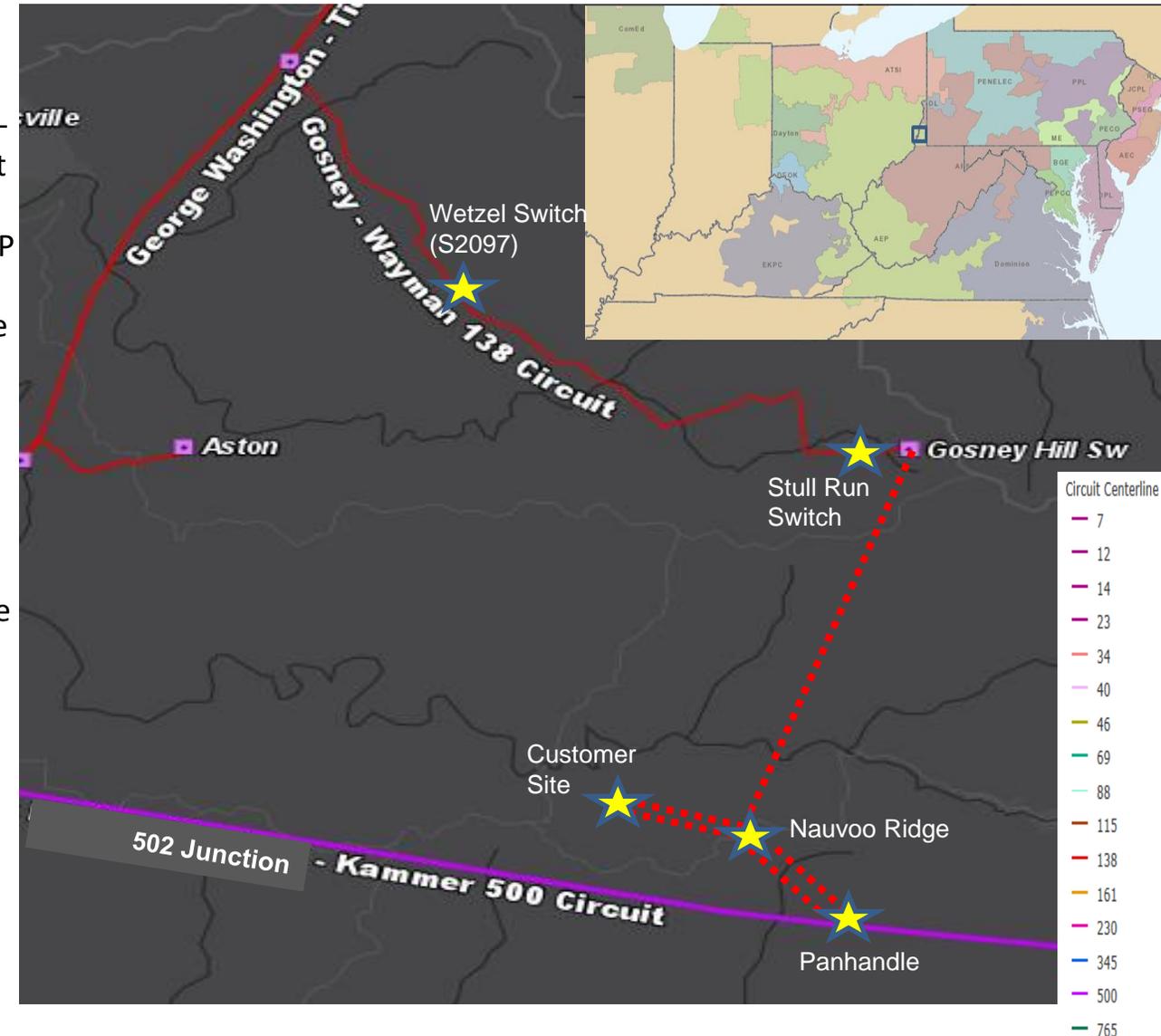
Scope Change Summary:

After further site exploration and preliminary engineering for the Panhandle 500-138kV station, the cost estimates increased significantly, due to the large amount of civil grading scope required, in this very hilly area of West Virginia. The total station cost estimate rose to \$105.5 million for a traditional, open-air design. AEP also evaluated a hybrid GIS station design, which used GIS for the 500kV portion of the station; this cost estimate was \$95.0 million. In addition, the cost estimate to modify the 500kV transmission line increased to over \$4 million. Overall, Panhandle was no longer a cost-effective system upgrade, so alternatives were studied, which are described in the following slides.

Cancel the following Supplemental upgrades:

- S2270.1 – Panhandle 500-138kV station
- S2270.6 – 1.5 mile double-circuit 138kV line from Panhandle to Nauvoov Ridge
- S2270.7 – Modify the Kammer-502 Junction 500kV line to connect to Panhandle station
- On S2270.3 (Gosney Hill), this portion can be cancelled, as it is no longer overloaded: Replace the 795 kcmil AAC risers and strain bus with 2000 kcmil AAC risers.

Note that the Gosney Hill to Nauvoov Ridge 138kV scope is in-service, along with service to the new industrial customer.



AEP Transmission Zone Supplement Project S2270 Scope Change

New Scope:

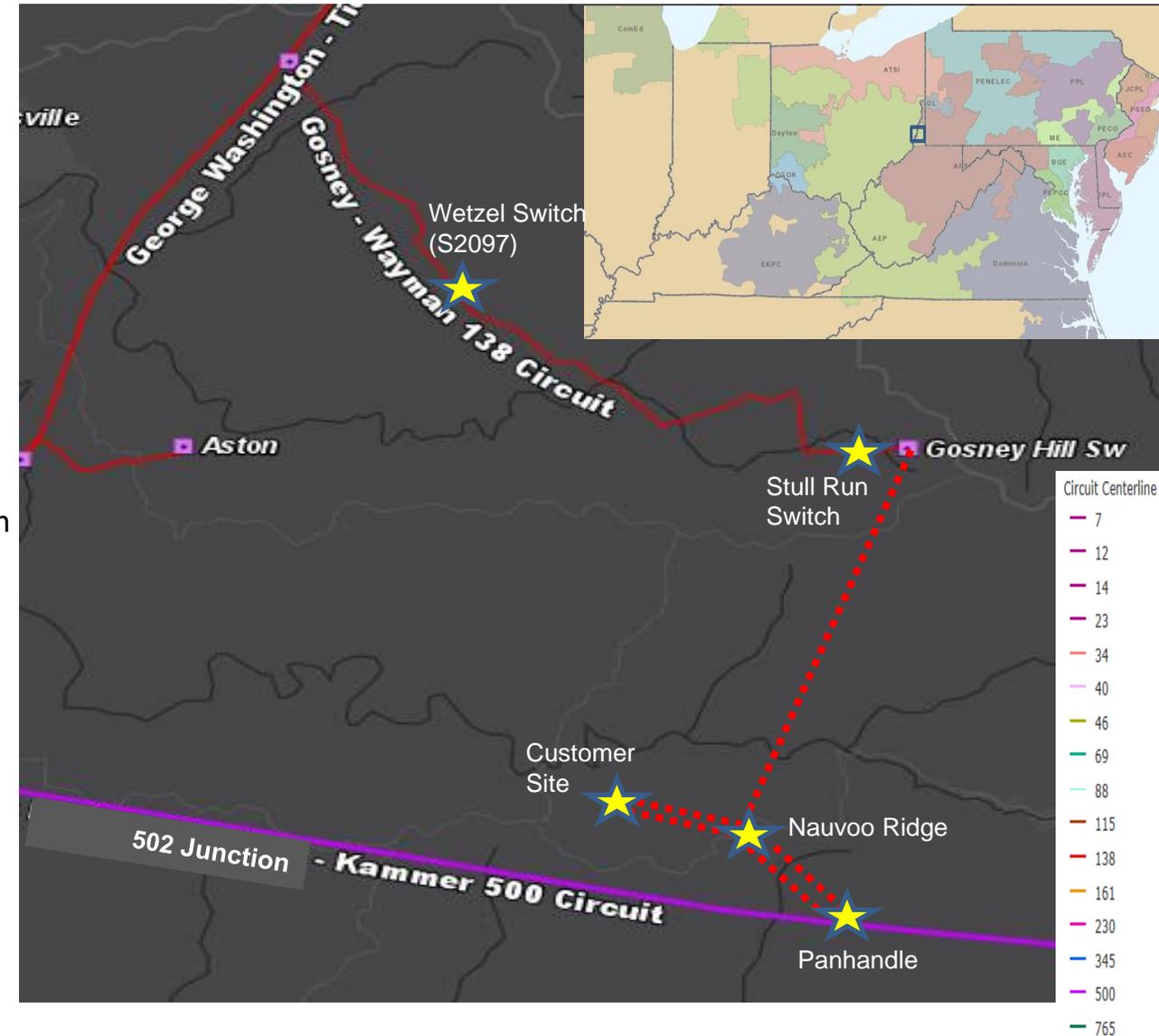
~~Construct a new 500-138kV station (Panhandle), connecting to the Kammer-502 Junction 500kV circuit (~10.3 miles from Kammer, 31.7 miles from 502 Junction). Install a 3-breaker 500kV ring bus; 450 MVA 500-138kV transformer; 3-breaker 138kV ring bus. Estimated Cost: \$25.0 M (s2270.1)~~

Construct a new 138kV switching station (Nauvoo Ridge) with 8- 138kV breakers in a breaker-and-a-half design. The station will have 1 circuit to Gosney Hill, 2 circuits to the customer's facility, ~~2 circuits to Panhandle~~ 1 circuit to George Washington, 1 circuit to Natrium, and a 23 MVAR 138kV cap bank. **Estimated Cost: \$16.4 M-\$15.5 M (s2270.2)**

At Gosney Hill, install a new 138kV breaker toward Nauvoo Ridge. Update station protection. ~~Replace the 795 kcmil AAC risers and strain bus with 2000 kcmil AAC risers.~~ **Estimated Cost: \$1.3 M-\$1.0 M (s2270.3)**

Construct a new 4.7-mile 138kV line south of Gosney Hill station to Nauvoo Ridge. Utilize 1033 ACSR conductor. Acquire new right-of-way. **Estimated Cost: \$14.7 M (s2270.4)**

Construct a new 1.3 mile double-circuit 138kV line from Nauvoo Ridge to the customer's substation. Acquire new right-of-way. **Estimated Cost: \$4.8 M (s2270.5)**



AEP Transmission Zone Supplement Project S2270 Scope Change

~~Construct a new 1.5 mile double-circuit 138kV line from Panhandle to Nauvoe Ridge. Utilize 1033 ACSR conductor for each circuit. Acquire new right-of-way. Estimated Cost: \$5.0 M (s2270.6)~~

~~Extend the Kammer-502 Junction 500kV transmission line 0.1 mile into Panhandle station (0.2 mile total). Estimated Cost: \$1.5 M (s2270.7)~~

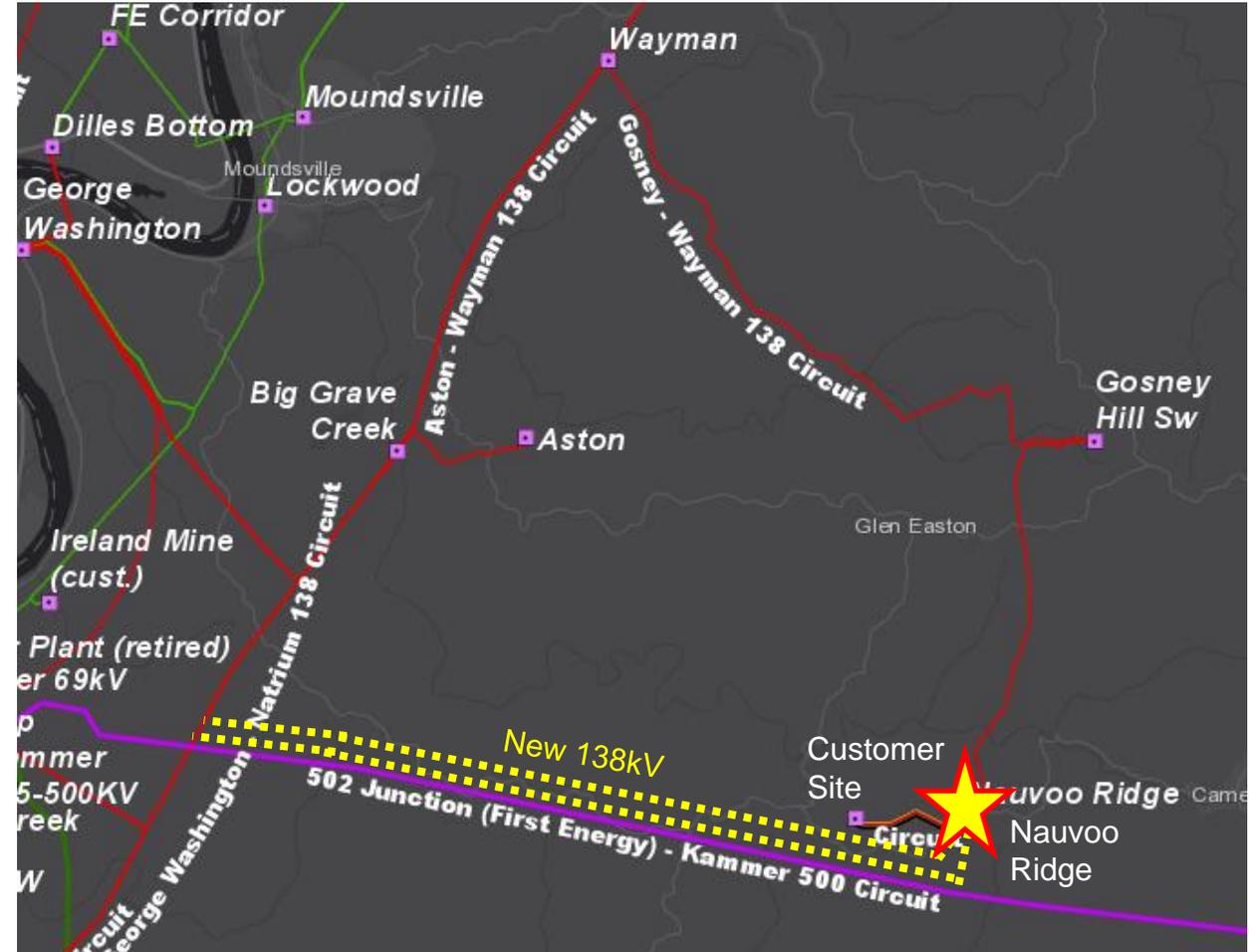
~~Cut into the George Washington-Natrium 138kV circuit and extend an 8.6-mile double-circuit 138kV loop east to Nauvoe Ridge. (S2270.8) \$23.13 M~~

~~Modify the George Washington-Natrium 138kV line, which is part of a double-circuit lattice tower line. (S2270.9) \$0.65 M~~

New Total Estimated Cost: \$59.78 million *(compared to a total of approximately \$137.9 M, if the Panhandle 500-138kV option had proceeded)*

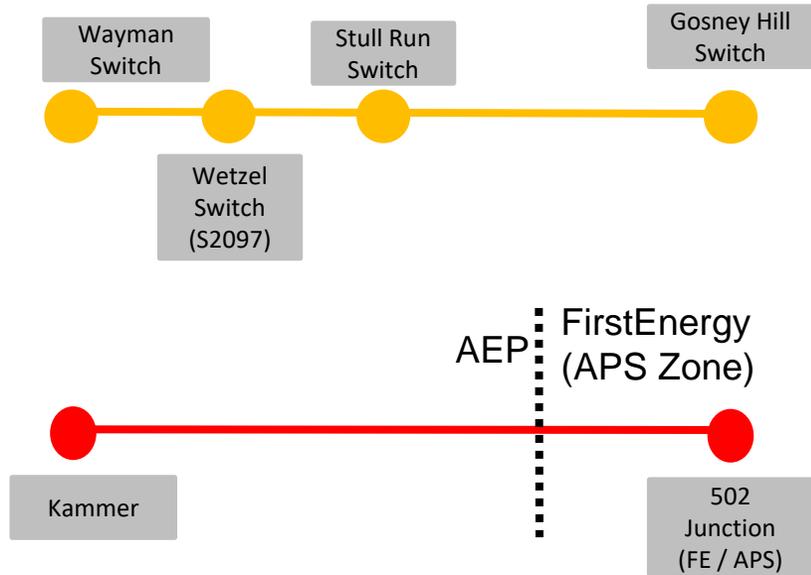
New Project Status: Scoping (new double-circuit 138kV loop to Nauvoe Ridge). In-service (Gosney Hill to Nauvoe Ridge to the customer)

New Projected In-Service Date: 12/1/2023



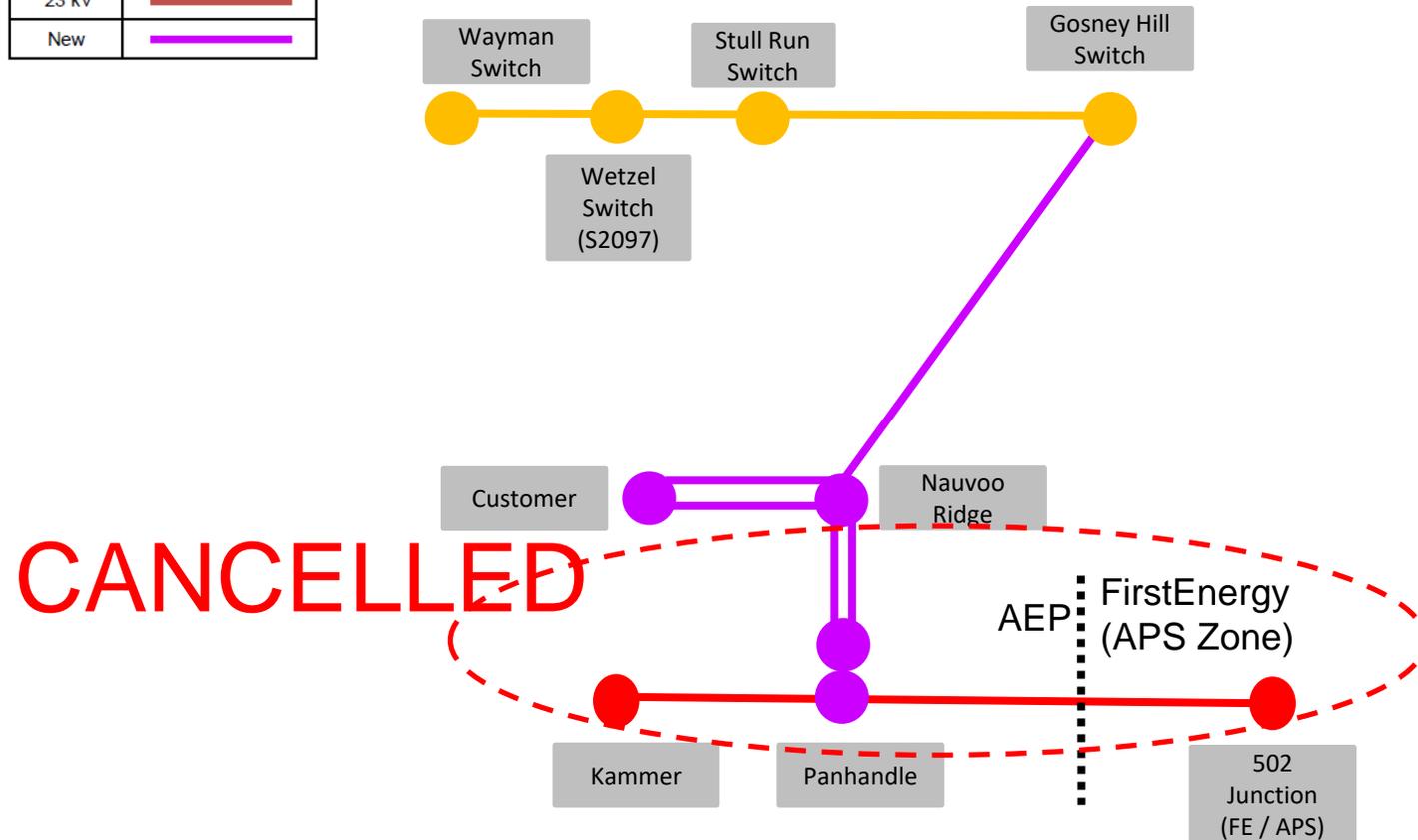
AEP Transmission Zone Supplement Project S2270 Scope Change

Existing:



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

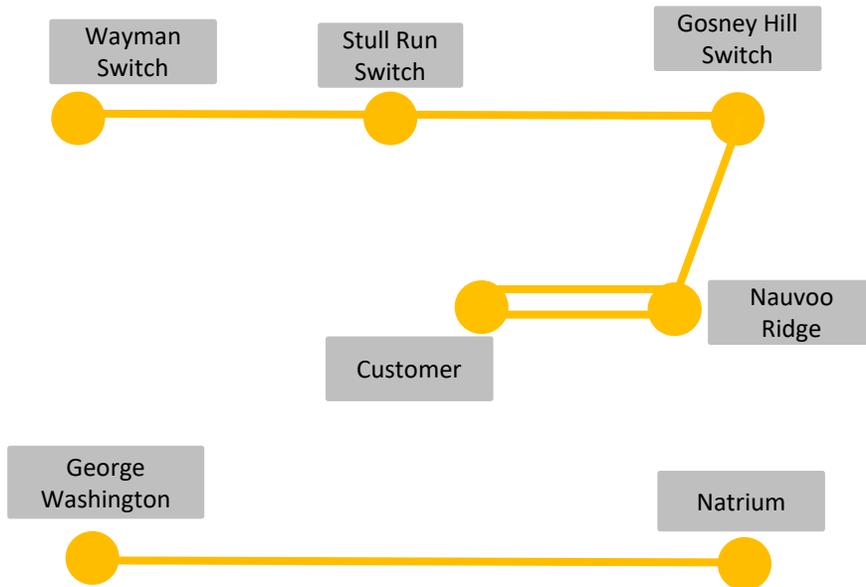
Originally Proposed:



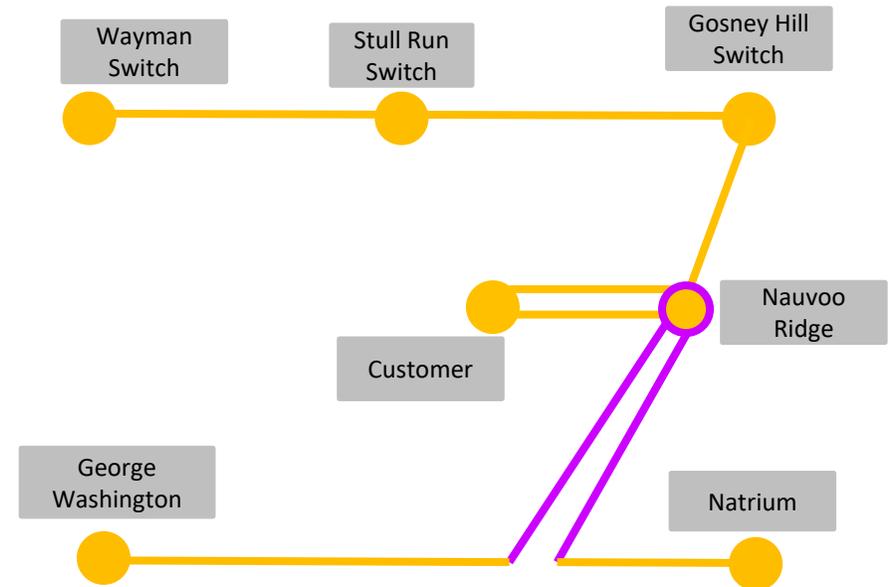
AEP Transmission Zone Supplement Project S2270 Scope Change

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

Existing:



Proposed (After Scope Change):



Questions?



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

02/25/2022 - V1 – Original version posted to pjm.com