# TEAC Committee
# AEP Supplemental Project

May 12, 2020

# 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

**Need Number:** AEP-2020-IM017
**Process Stage:** Needs Meeting 05/12/2020
**Supplemental Project Driver:** Equipment Condition/Performance/Risk
**Specific Assumptions Reference:** AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)
**Problem Statement:**

DC Cook 765/345 Station

- 345kV CB N1 Failure
  - The 345kV CB failed internally on phase 2 in March 2020
  - The DC Cook 345kV CB N1 is an HVB362 type SF6 breaker
  - Manufactured in 2002
  - Breaker N1 had 2 fault interruptions since install date of 2003

# 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
# Cameron Customer Service

**Need Number:** AEP-2018-OH032

**Process Stage:** Solutions Meeting 05/12/2020 (2nd Review)

**Previously Presented:** Needs Meeting 1/11/2019, SRRTEP-W Solutions Meeting 02/21/2020, TEAC 3/10/2020

**Supplemental Project Driver:**

Customer Service

**Specific Assumption Reference:**

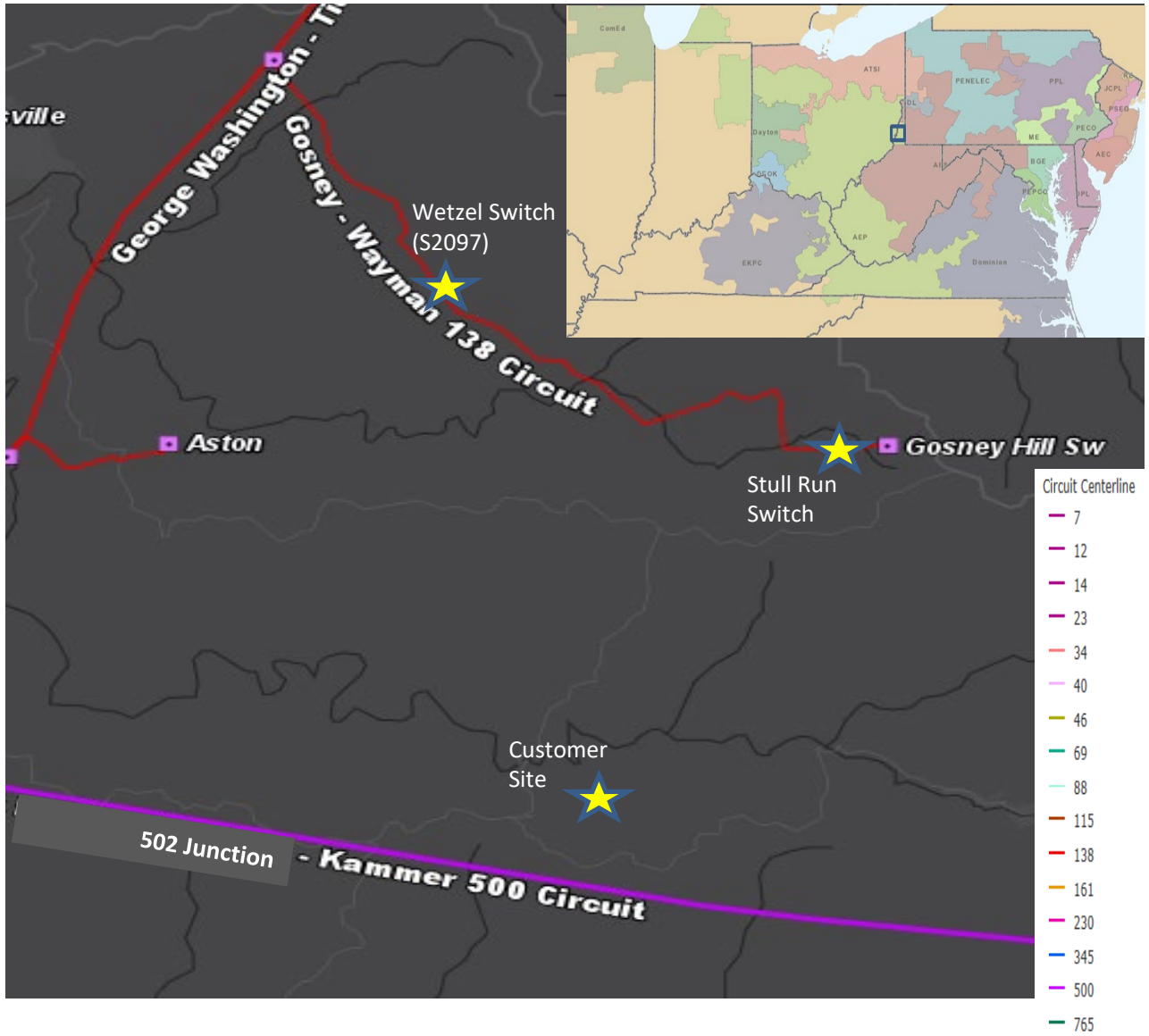
AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 7)

**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, ~~plus the new customer load on S2097 (AEP-2019-OH006),~~ the Wayman-Gosney-Nauvoo Ridge 138kV radial line has an MVA-mile demand of ~~1142~~ 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. After additional DNH study by PJM, a generation deliverability overload was found at Gosney Hill 138kV station on the Gosney Hill-Nauvoo Ridge 138 kV line for loss of the Kammer-Panhandle 500 kV line and the Kammer 765/500 kV transformer ('AEP_P1-3_#8975_05KAMMER 765_200', 'AEP_P1-2_500-1').

**Model:** Summer RTEP 2024



# AEP Transmission Zone M-3 Process
# Cameron Customer Service

**Need Number:** AEP-2018-OH032

**Process Stage:** Solutions Meeting 02/21/2020

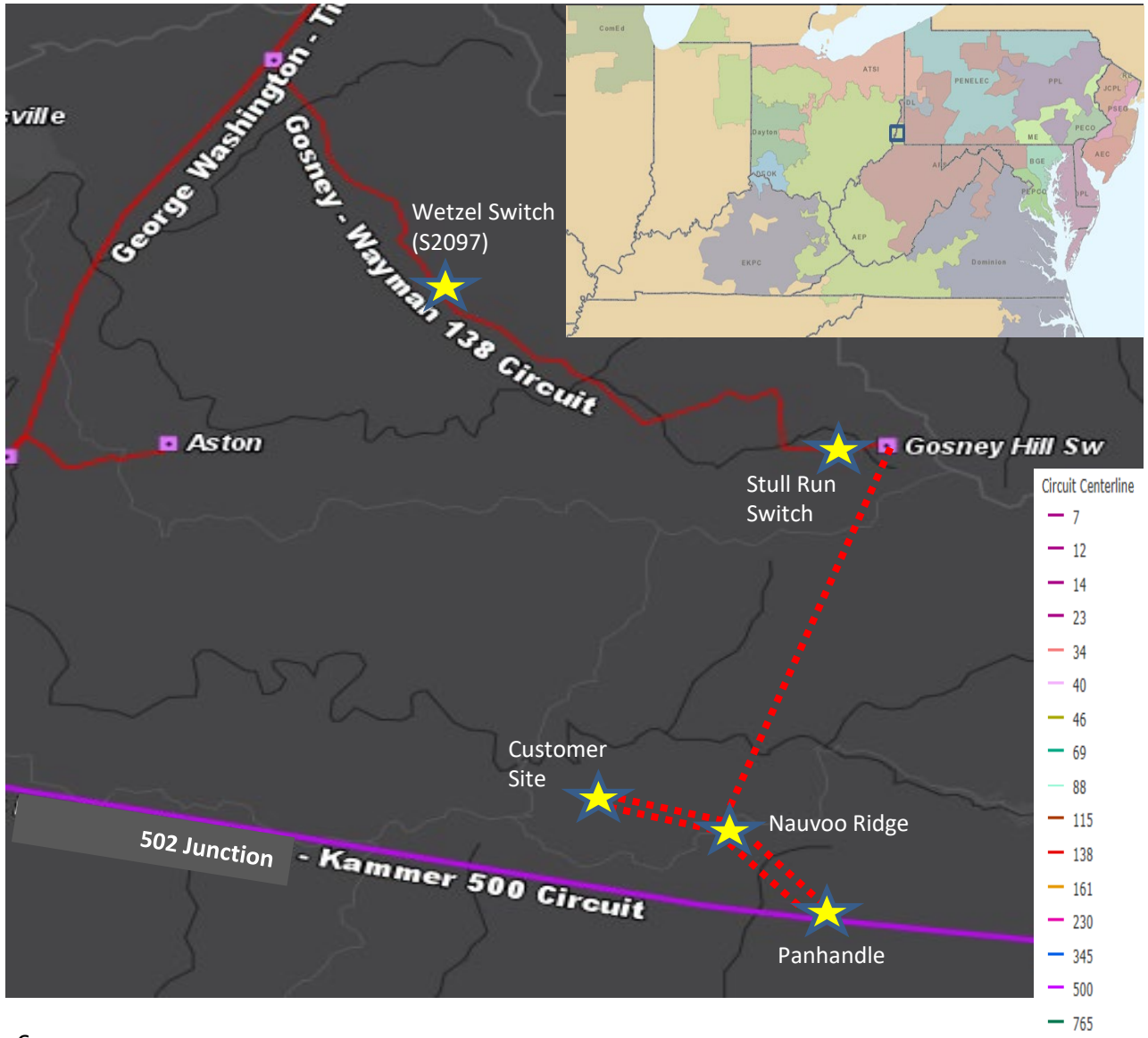
**Proposed Solution:**

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**

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, and a 23 MVAR 138kV cap bank. **Estimated Cost: $16.4 M**

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: ~~$1.0 M~~ $1.3 M**



# AEP Transmission Zone M-3 Process
# Cameron Customer Service

**Need Number:** AEP-2018-OH032

**Process Stage:** Solutions Meeting 02/21/2020

**Proposed Solution Continued:**

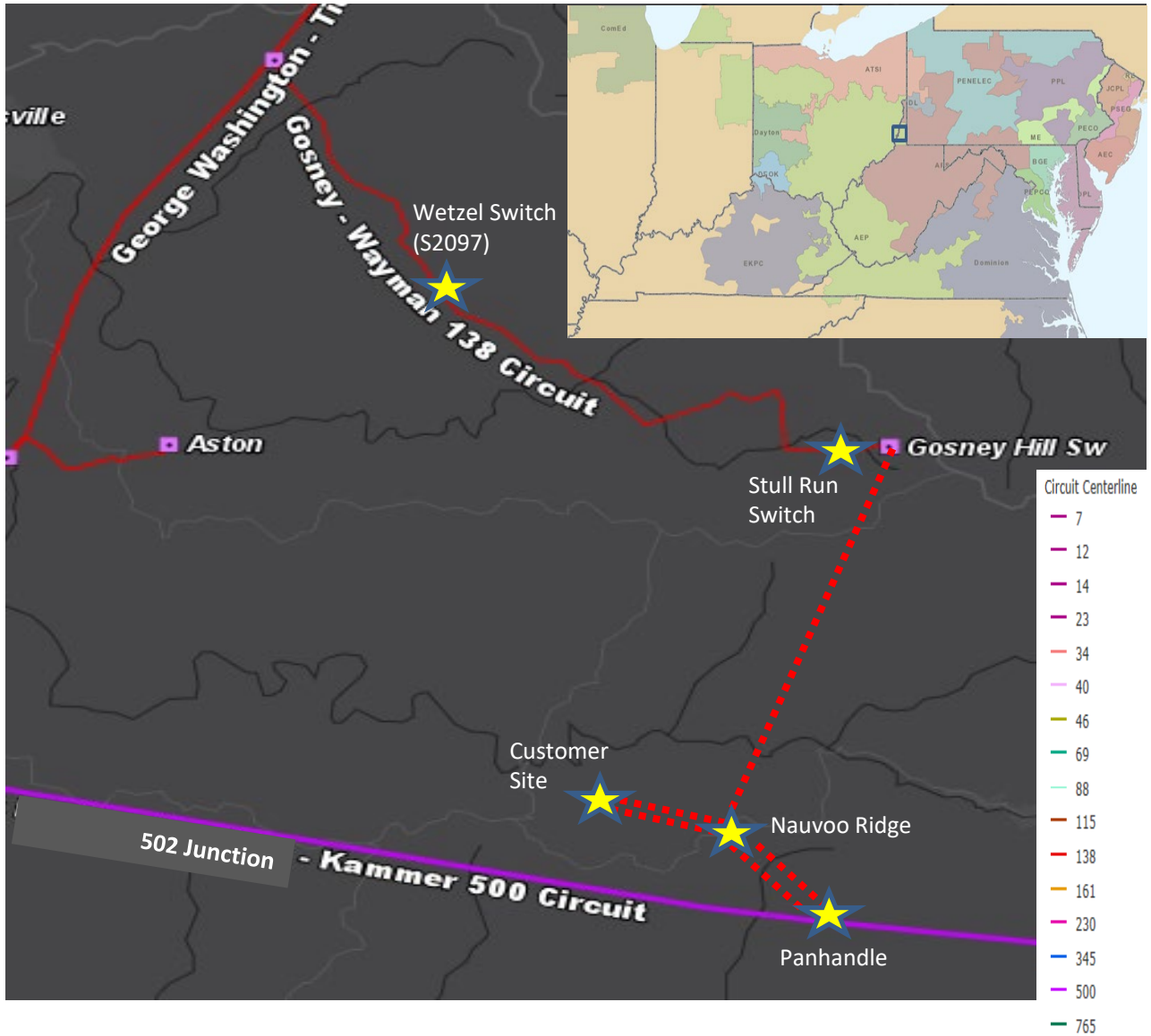
Construct a new 4.7-mile 138kV line south of Gosney Hill station to Nauvoo Ridge. Utilize 1033 ACSR conductor. Acquire new right-of-way. **Estimated Cost: $14.7 M**

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**

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

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

**Total Estimated Transmission Cost:** ~~$68.4 M~~ $68.7 M



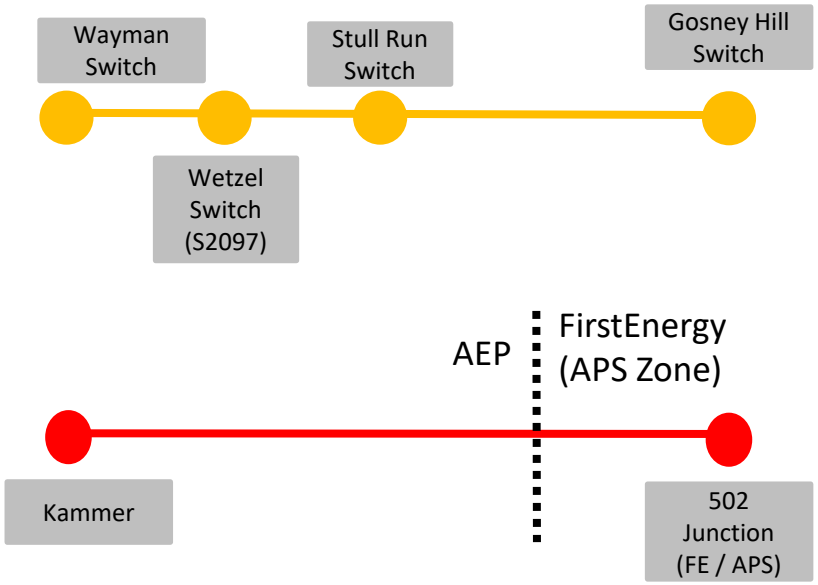
**Need Number:** AEP-2018-OH032

**Process Stage:** TEAC Solutions Meeting 05/12/2020

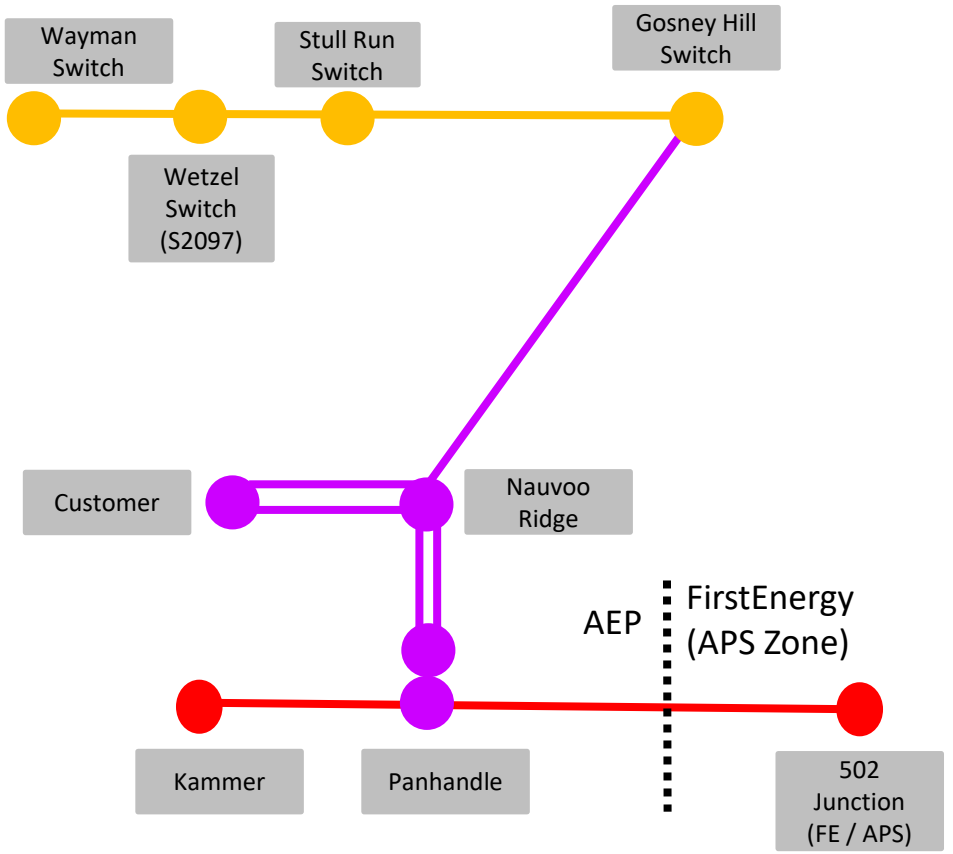
**Proposed Solution:**

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

**Existing:**




**Proposed:**



# AEP Transmission Zone M-3 Process
# Cameron Customer Service

**Need Number:** AEP-2018-OH032

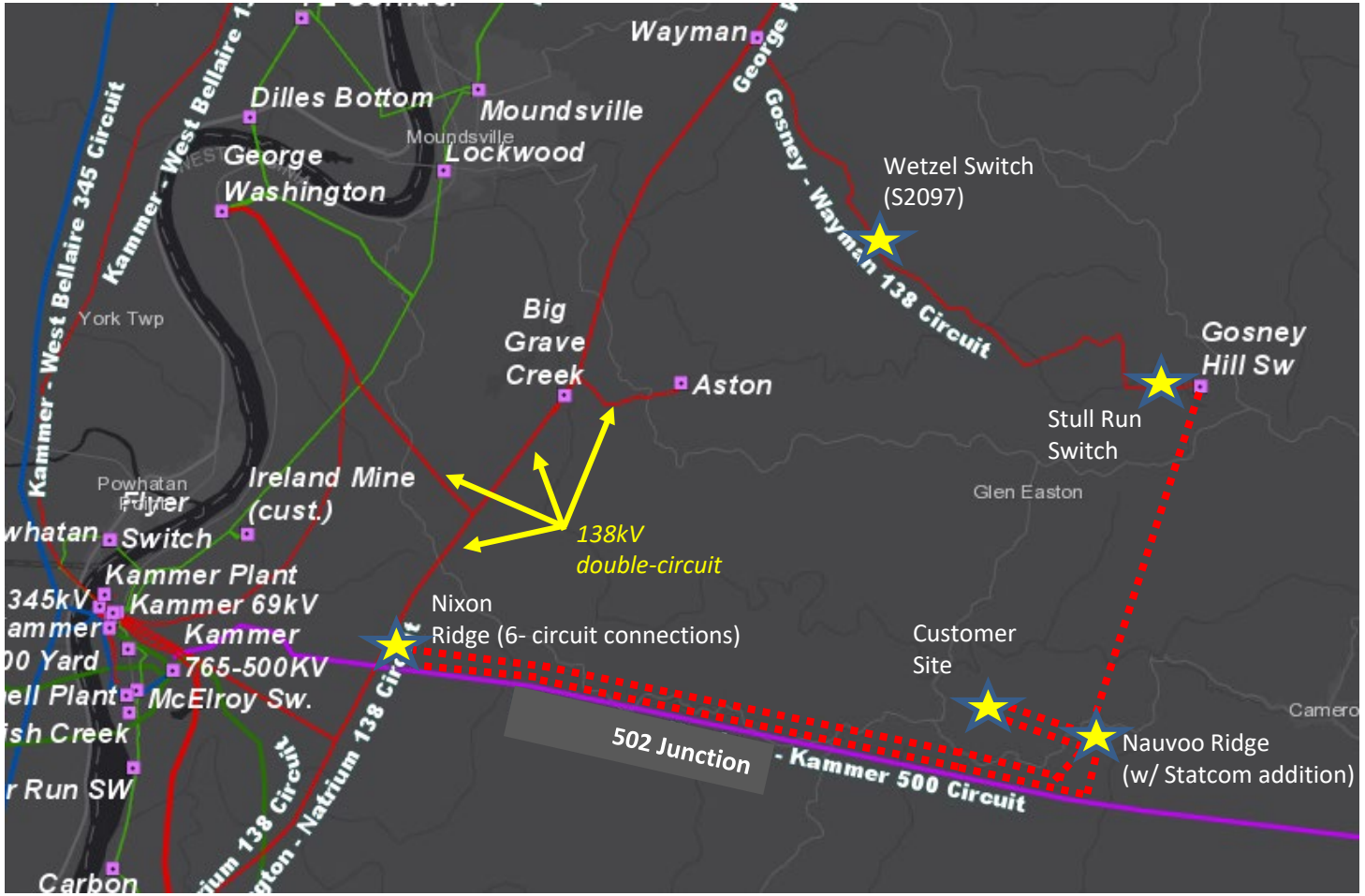
**Process Stage:** TEAC Solutions Meeting 05/12/2020

**Alternatives Considered:**

Construct a new 9-breaker switching station (Nixon Ridge, breaker-and-a-half) at the crossing of the Kammer-502 Junction 500kV line & 138kV double-circuit corridor (3 miles east of Kammer), looping in the Aston-Kammer 138kV & George Washington-Natrium 138kV circuits, plus 2 new circuits to Nauvoo Ridge. Remote-end 138kV protection & RTU updates at Aston, Kammer, George Washington & Natrium stations. Build a 9-mile 138kV double-circuit line from Nixon Ridge east to Nauvoo Ridge. *Keep the remaining scope between Gosney-Nauvoo-New Customer 138kV*. This solution resulted in several violations, as it strains the local 138kV system, as the only EHV sources in the region are at Kammer & West Bellaire. Overloads on Kammer-Nixon Ridge 138kV, near-overload on Kammer-Natrium 138kV (would overload with a pending customer project). In addition, N-1-1 voltage violations of 0.90-0.92 pu in the area; to rectify this, more cap banks could be placed, but due to 6 in the region already, switching conflicts (hunting) would likely arise. To mitigate these violations, this alternate would require a reconductor or rebuild 18 miles of 138kV lines and install a 138kV +/- 75 MVAR Statcom system in the area, for dynamic voltage support. **Total Cost of $120 Million**

**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).

**Project Status:** Engineering (for initial customer service project); Scoping (for 2nd phase)



# 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

4/29/2020 – V1 – Original version posted to pjm.com