SRRTEP Committee: Western
EKPC Supplemental Projects

October 20, 2023

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

EKPC Transmission Zone M-3 Process
Hickory Plains

Need Number: EKPC-2023-010

Process Stage: Need Meeting – October 20, 2023

Supplemental Project Driver:

Customer Service

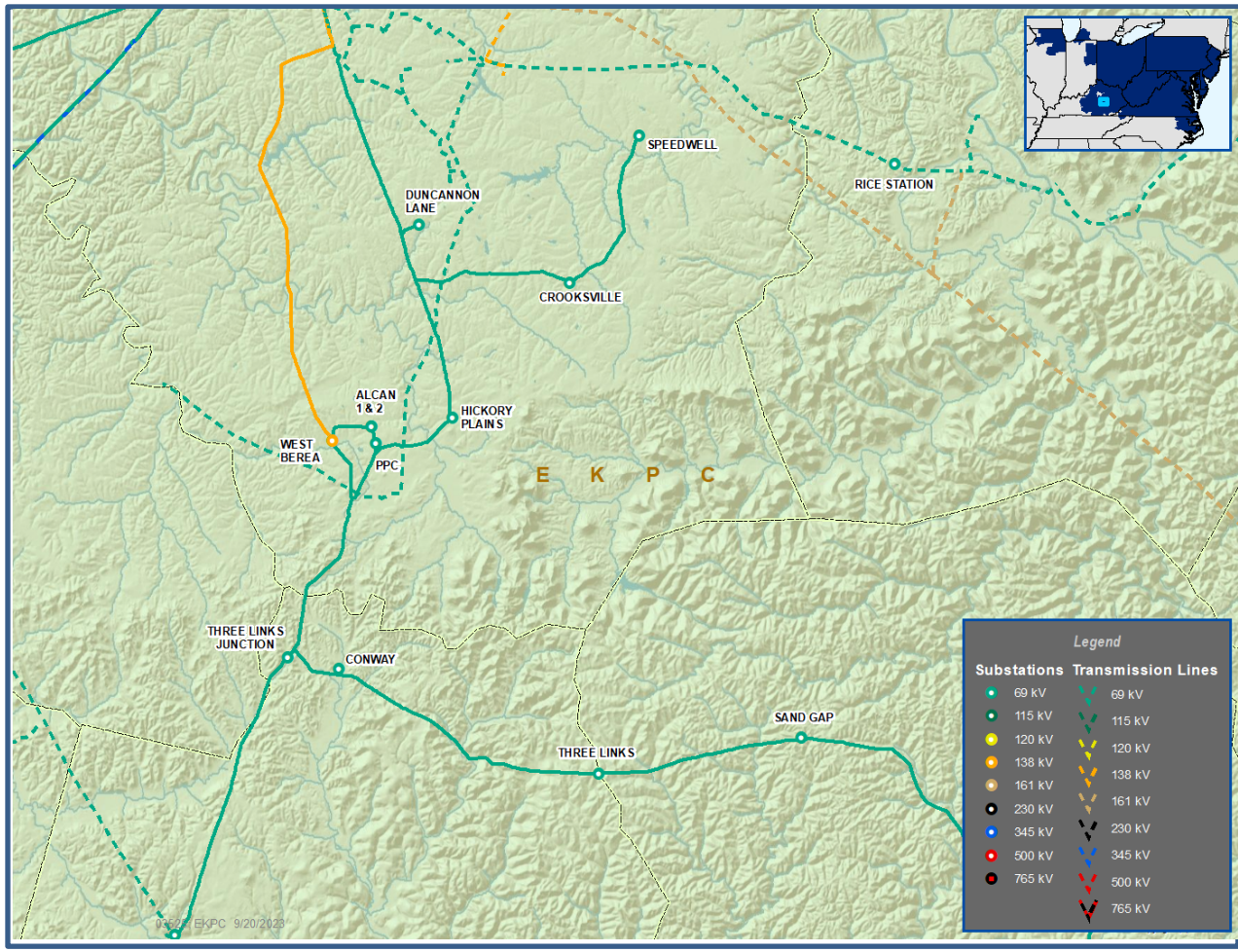
Specific Assumption Reference:

EKPC Assumptions Presentation Slide 15

Problem Statement:

The Hickory Plains distribution substation currently serves the highest numbers of customers of any distribution substation on EKPC system. Base on load forecast and steady growth in the area, the Hickory Plains 25 MVA distribution transformer is forecasted to overload in 2025/26 winter. Additionally due to the load growth, the distribution system forecasts feeder overloads and voltage constraints. Alternatives will be developed to address the transformer loading and distribution system issues.

Model: N/A



EKPC Transmission Zone M-3 Process
North Springfield-Loretto

Need Number: EKPC-2023-011

Process Stage: Need Meeting – October 20, 2023

Supplemental Project Driver:
Equipment Material Condition, Performance and Risk

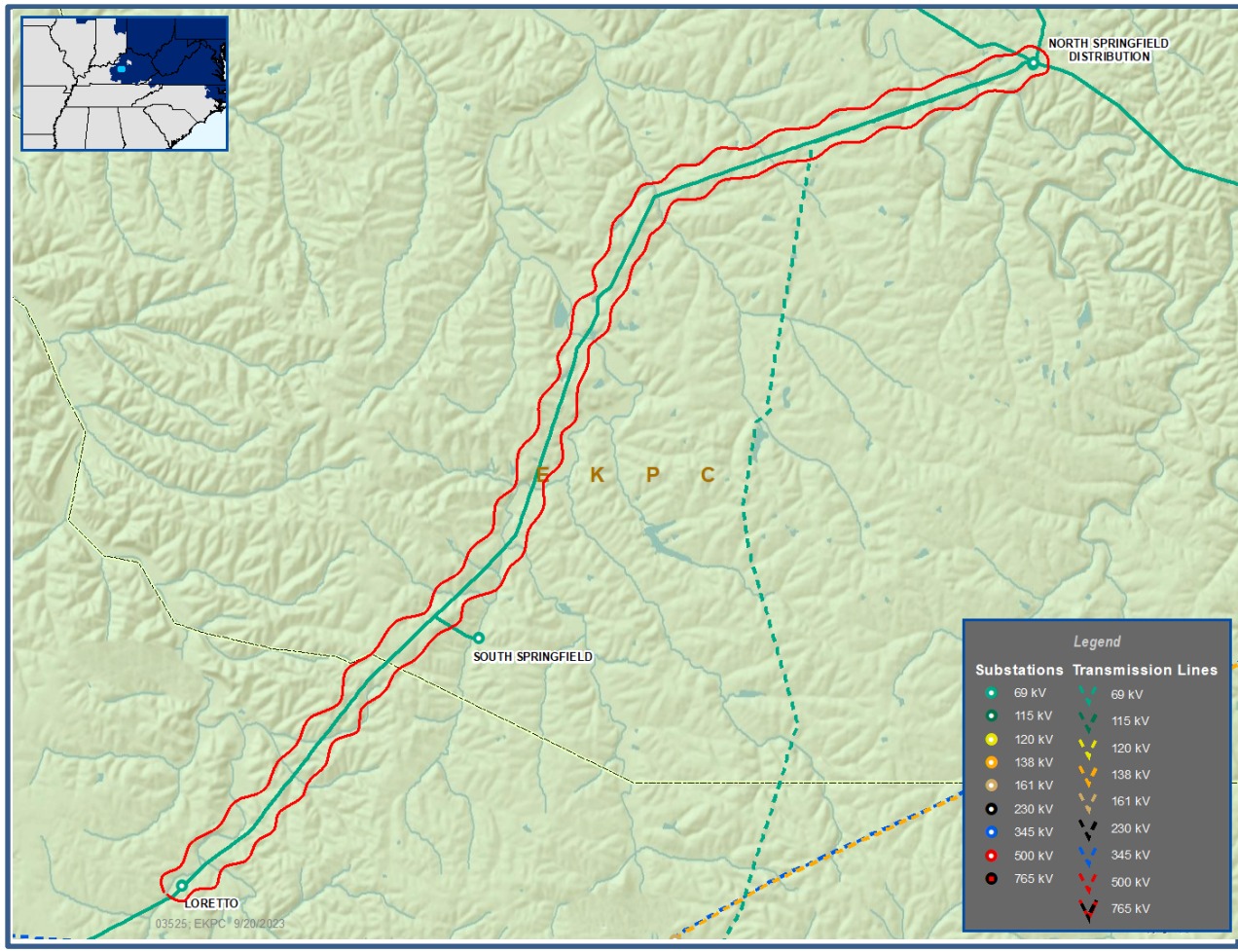
Specific Assumption Reference:
EKPC Assumptions Presentation Slide 13

Problem Statement:

The 14.11 mile, Springfield-Loretto 69 KV line section is 1952 vintage wood pole construction with 4/0 conductor. This line section is expected to have condition issues such as, conductor steel core and static wire deterioration including rusting, pitting and possible broken strands. These condition issues have been exhibited by other 4/0 conductors with similar age and environmental conditions. There are currently 17 open work orders associated with structure issues such as degraded poles and insulator issues.

The EKPC Reliability team has concluded, that this line is at or near end of life and should be addressed due to the condition.

Model: N/A



EKPC Transmission Zone M-3 Process
Snow Tap-North Albany

Need Number: EKPC-2023-012

Process Stage: Need Meeting – October 20, 2023

Supplemental Project Driver:
Equipment Material Condition, Performance and Risk

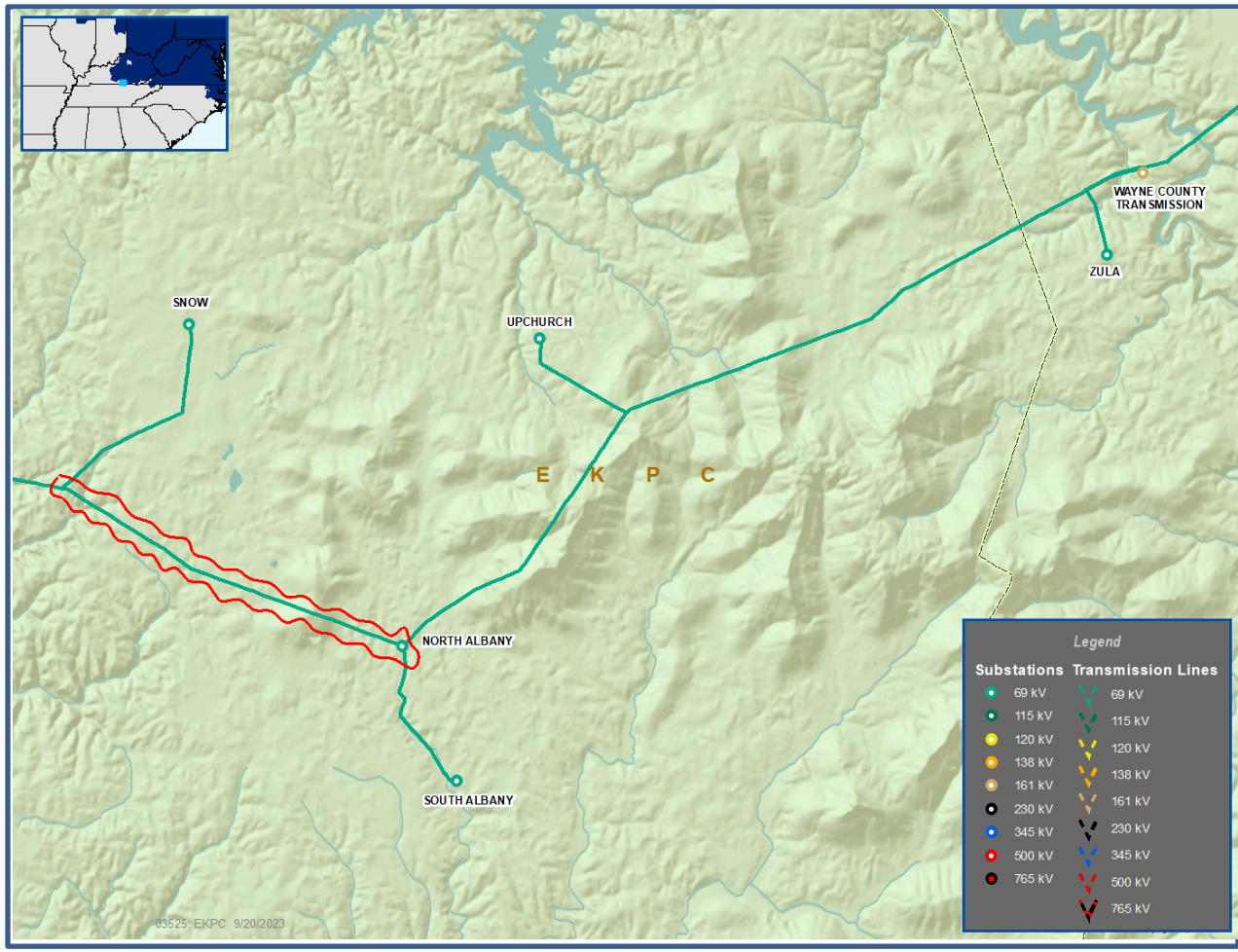
Specific Assumption Reference:
EKPC Assumptions Presentation Slide 13

Problem Statement:

The 4.4 mile, 69 kV Snow Tap-North Albany line section is 1954 vintage wood pole construction with 4/0 conductor. This line section is expected to have condition issues such as conductor steel core and static wire deterioration including rusting, pitting and possible broken strands. These condition issues have been exhibited by other 4/0 lines with similar age and environmental conditions. There are currently 12 open work orders associated with structure issues such as degraded poles.

The EKPC Reliability team has concluded, that this line is at or near end of life and should be addressed due to the condition.

Model: N/A



EKPC Transmission Zone M-3 Process
Shepherdsville & Brooks

Need Number: EKPC-2023-013

Process Stage: Need Meeting – October 20, 2023

Supplemental Project Driver:

Customer Service

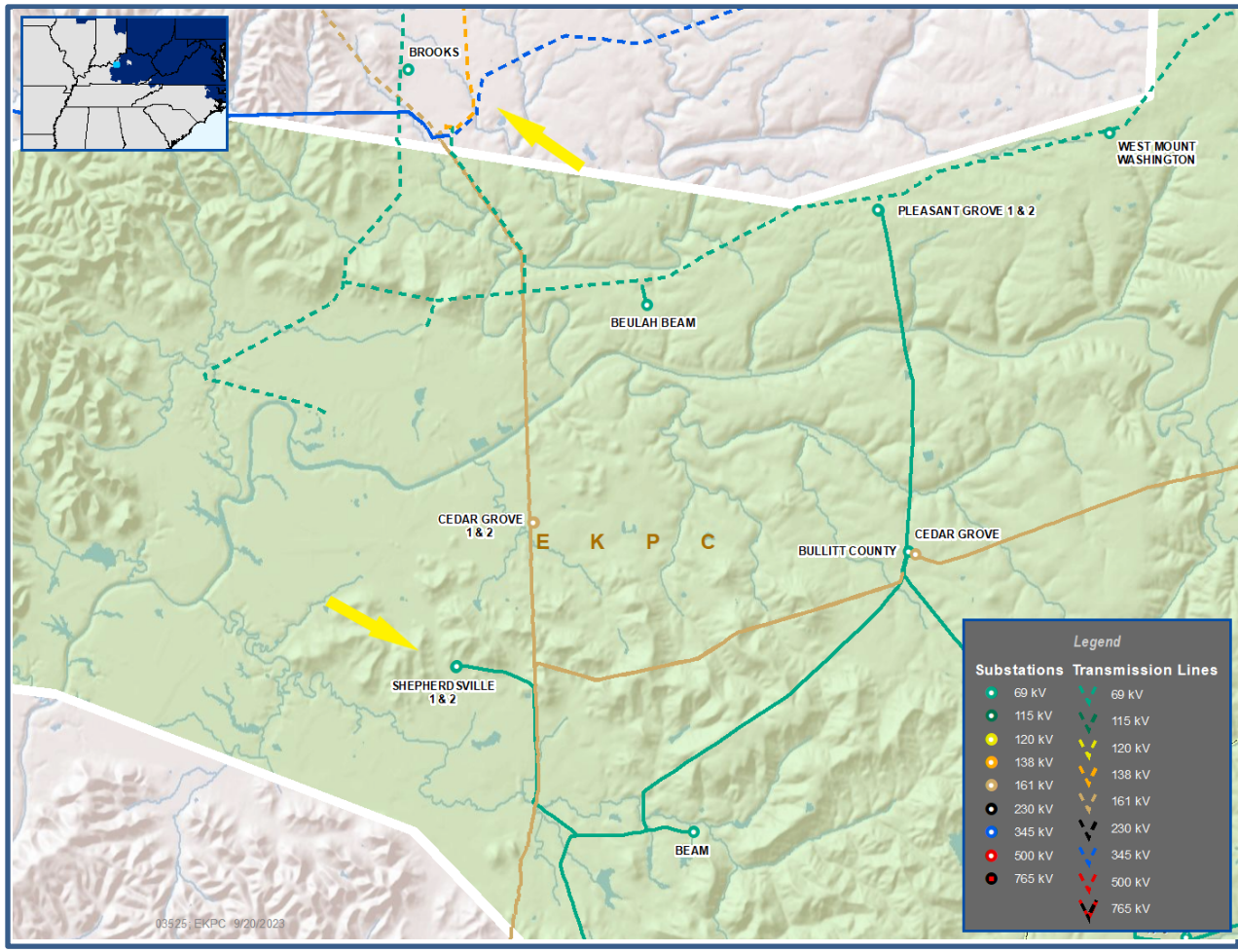
Specific Assumption Reference:

EKPC Assumptions Presentation Slide 15

Problem Statement:

Based on load forecast, the Brooks 69-12.5 kV, 15/20/25 MVA distribution transformer and the Shepherdsville #2 69-12.5 kV, 11.2/14 MVA distribution transformers are forecasted to overload during the upcoming summer peak periods. Additionally in 2022 summer, the Shepherdsville #2 transformer experienced actual loading greater than its summer rating. Alternatives will be developed to address these transformer loading issues.

Model: N/A



EKPC Transmission Zone M-3 Process
Lebanon

Need Number: EKPC-2023-014

Process Stage: Need Meeting – October 20, 2023

Supplemental Project Driver:
Customer Service

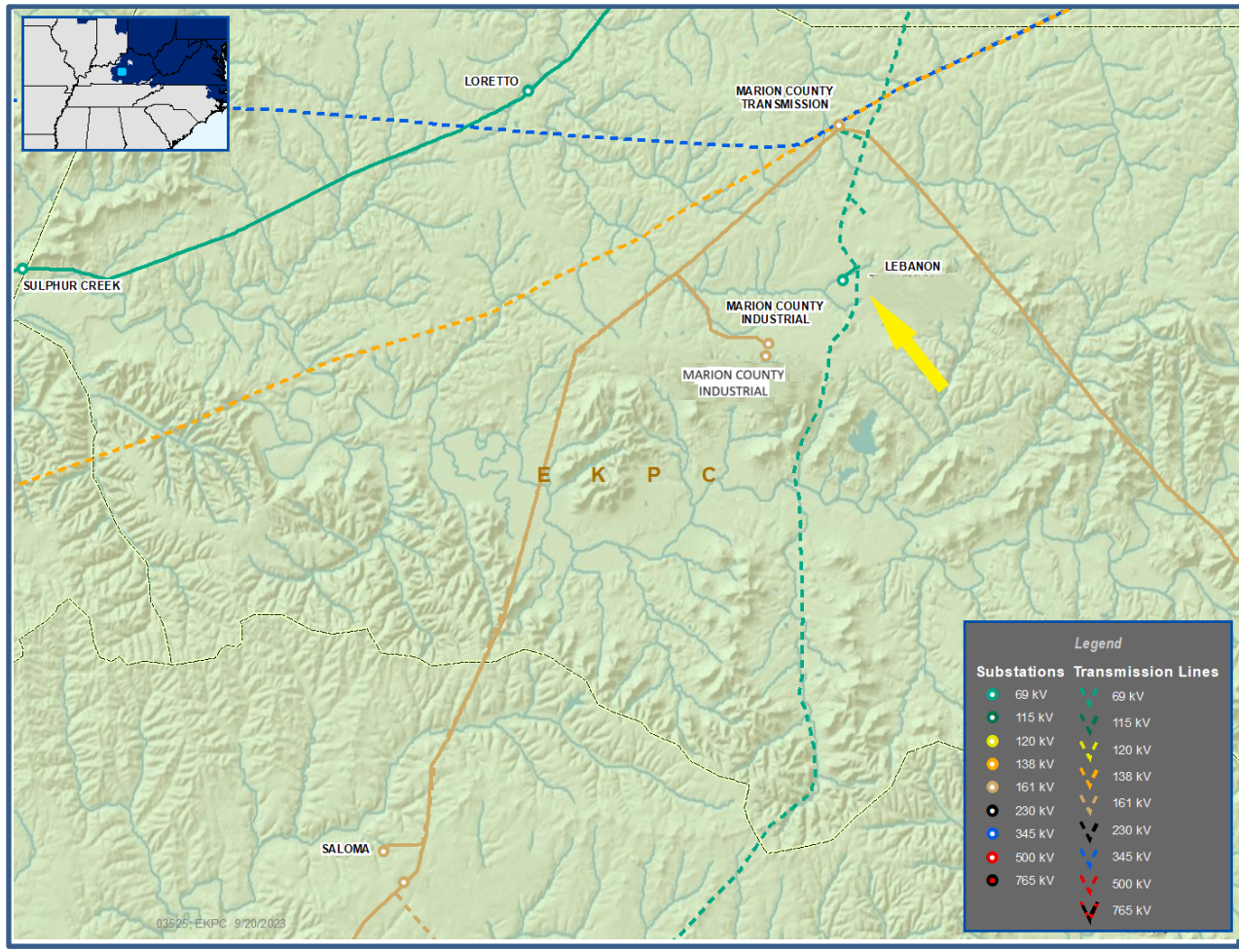
Specific Assumption Reference:
EKPC Assumptions Presentation Slide 15

Problem Statement:

The Lebanon distribution substation is located in Lebanon, KY and is served from the LG&E/KU 69 KV transmission system. Base on load forecast, the Lebanon 69-25 kV, 11.2/14 MVA distribution transformer is forecasted to overload in 2026/27 winter. Additionally, the distribution circuits in the area are experiencing high loading issues. Load transfers to a nearby substation has been utilized historically to reduce loading but have been exhausted due to the distribution circuit loading in the area.

Alternatives will be developed to address the transformer loading and distribution system issues in the area.

Model: N/A



EKPC Transmission Zone M-3 Process
KU Fawkes-West Berea

Need Number: EKPC-2023-015

Process Stage: Need Meeting – October 20, 2023

Supplemental Project Driver:
Equipment Material Condition, Performance and Risk
Operational Flexibility and Efficiency & Infrastructure Resilience

Specific Assumption Reference:
EKPC Assumptions Presentation Slide 13, 14 & 16

Problem Statement:

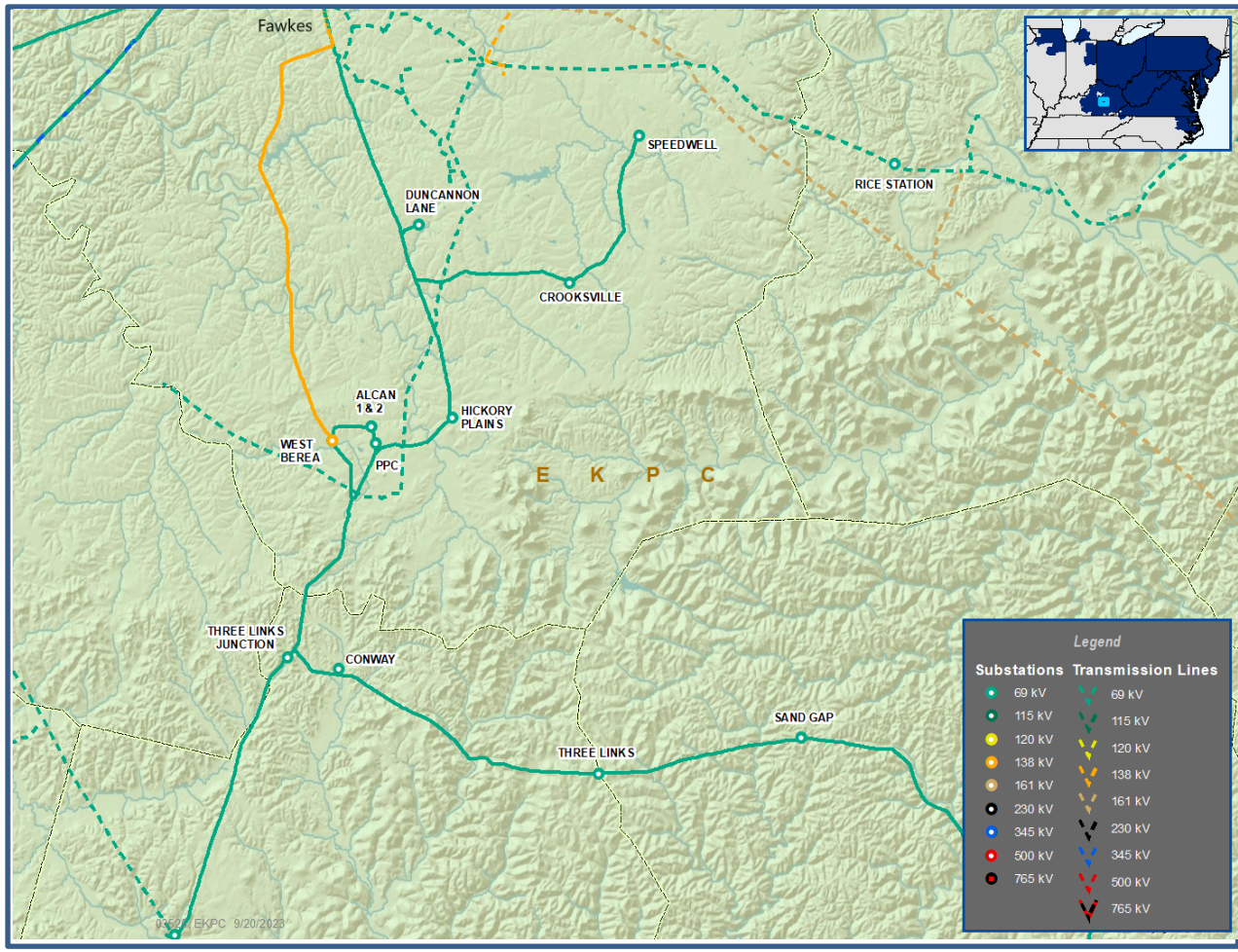
The 20.5 mile (not including tap lines), KU Fawkes-West Berea 69 KV transmission circuit currently serves nearly 6,000 customers including several industrial customers via 7 distribution substation.

This circuit currently has 16.3 miles of transmission and tap lines with reliability concerns, including wood pole deterioration, multiple identified structural loading issues as well as many recurring maintenance activities related to leaning structures/poles and cross arms failures. There are currently 66 open work orders associated with structure issues such as degraded poles.

The 9.1 mile, Speedwell 69 KV tap line creates system protection issues resulting in slow operations for faults near the Speedwell distribution substation. This does not adhere to EKPC's setting criteria which leads to sequential tripping and remote coordination issues.

Alternatives are being evaluated to address all issues listed above.

Model: N/A



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

EKPC Transmission Zone M-3 Process
Fayette-Baker Lane

Need Number: EKPC-2023-004

Process Stage: Solutions Meeting – October 20, 2023

Previously Presented:

Need Meeting – September 15, 2023

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk

Operational Flexibility and Efficiency & Infrastructure Resilience

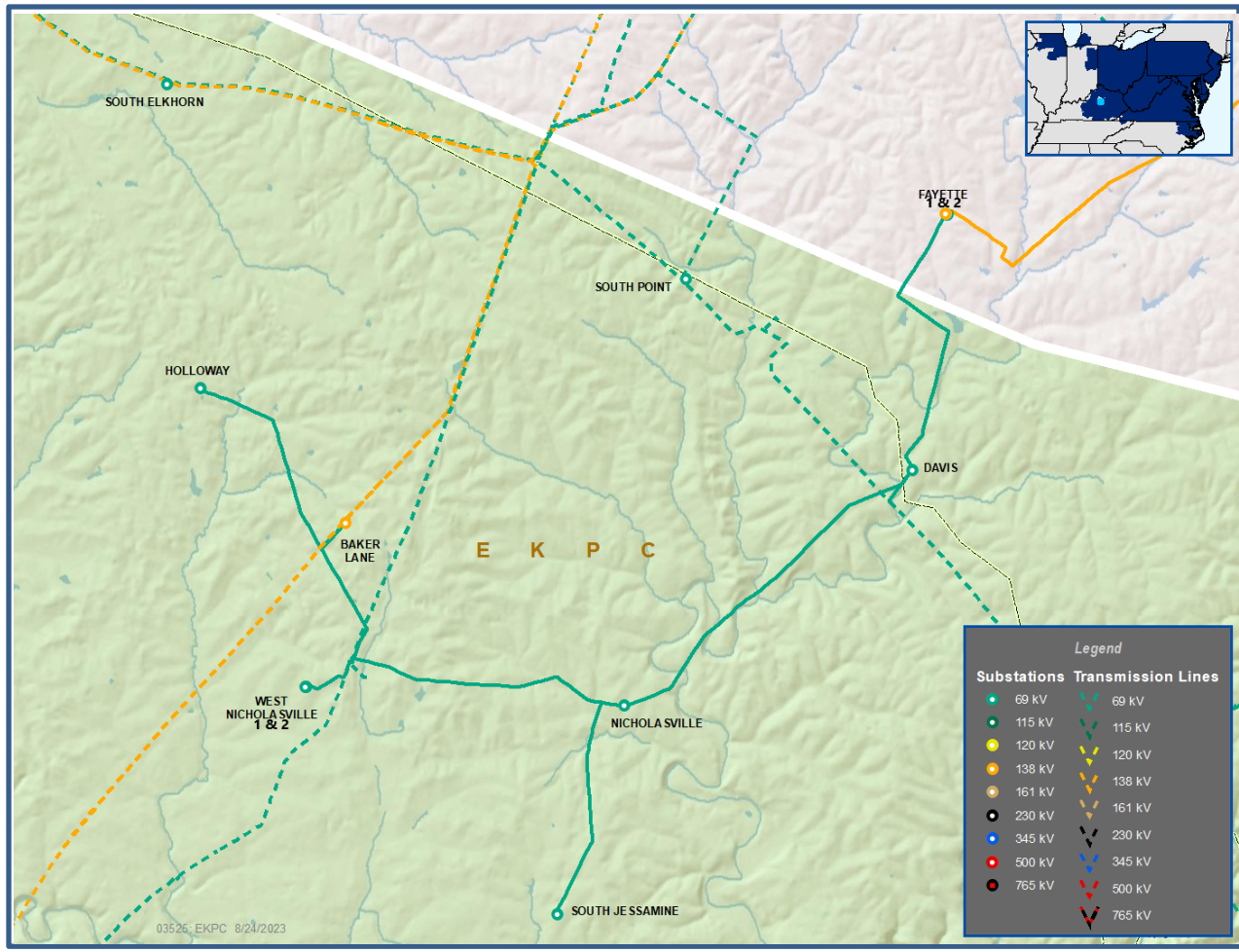
Specific Assumption Reference:

EKPC Assumptions Presentation Slides 13, 14 & 16

Problem Statement:

The 12 mile, Fayette-Baker Lane 69 KV transmission line is 1966 to 1989 vintage wood pole construction with sections of 266.8 and 556.5 conductor. This line currently serves 8 distribution substation with 15,864 customers, which is the highest number of customers of any circuit on EKPC's system. This line section exhibits wood deterioration and overloaded structures. This combination creates a high risk for structure failures. Additionally, the makeup of this 12 mile circuit with the long tap lines for South Jessamine and Holloway substations, this creates system protection issues with the 69 KV relays reaching into the 138 KV system during certain outages. The EKPC Reliability team is evaluating alternatives to address these aging infrastructure and structure overload issues, system protection issues and to reduce the number of distribution substations between breakers.

Model: N/A



EKPC Transmission Zone M-3 Process
Fayette-Baker Lane

Need Number: EKPC-2023-004

Process Stage: Solutions Meeting – October 20, 2023

Proposed Solution:

Rebuild the 12 mile, Fayette-Baker Lane 69 KV circuit using 556.5 conductor and steel pole construction. Expand the scope of a current project to rebuild the Nicholasville distribution substation to include a new 69 KV double bay switching station and control building.

Transmission Cost: $17.5M

Distribution Cost: $4.5M

Ancillary Benefits:

- Reduces cost by expanding scope of an existing project versus doing as a separate project.

Alternatives Considered:

- No feasible alternatives

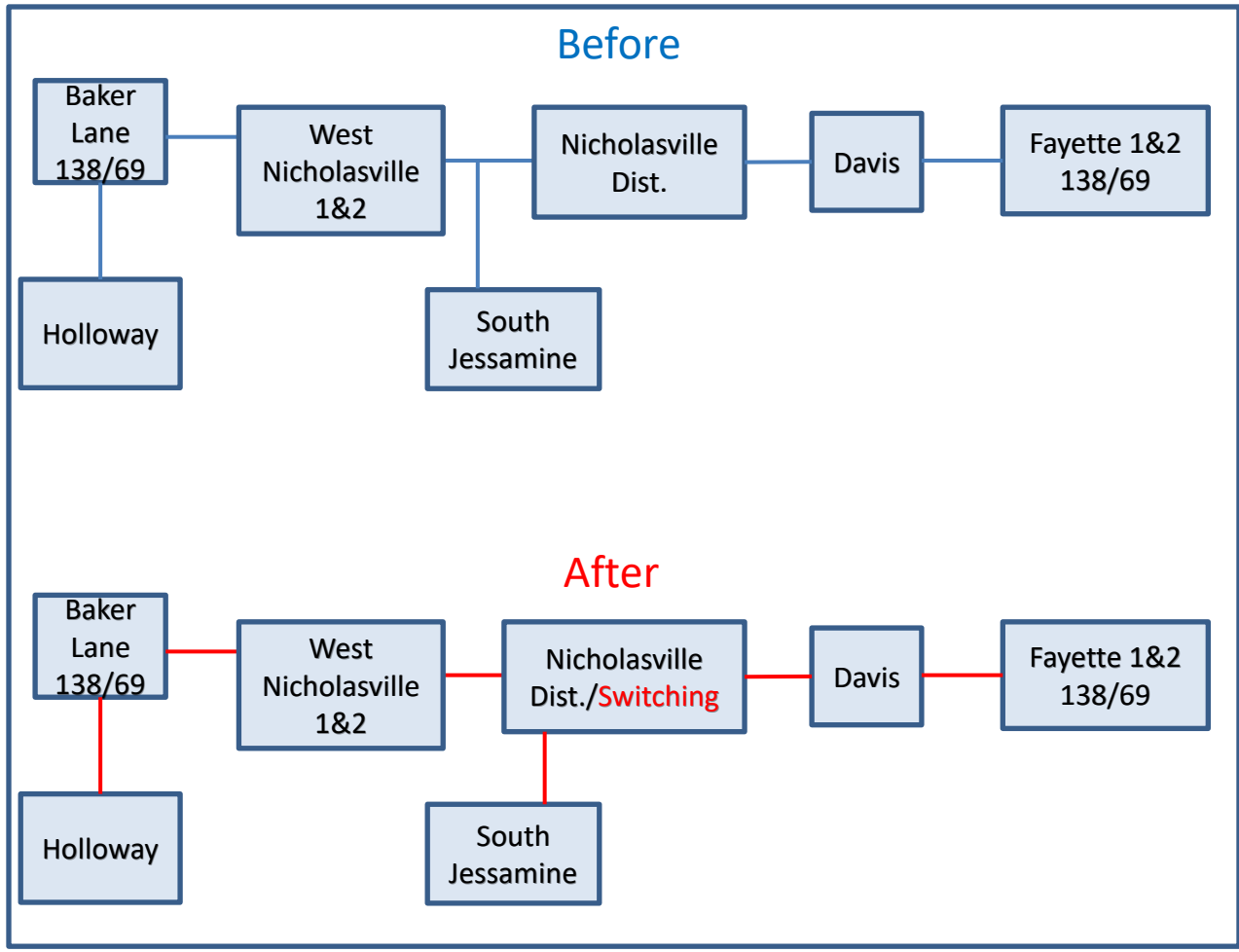
Projected In-Service:

Breaker station: 4/15/2024

T-Line rebuilds: 12/2025 – 12/2029

Project Status: Engineering

Model: N/A



EKPC Transmission Zone M-3 Process
North Lebanon

Need Number: EKPC-2023-005

Process Stage: Solutions Meeting – October 20, 2023

Previously Presented: Need Meeting – September 15, 2023

Supplemental Project Driver:

Customer Service

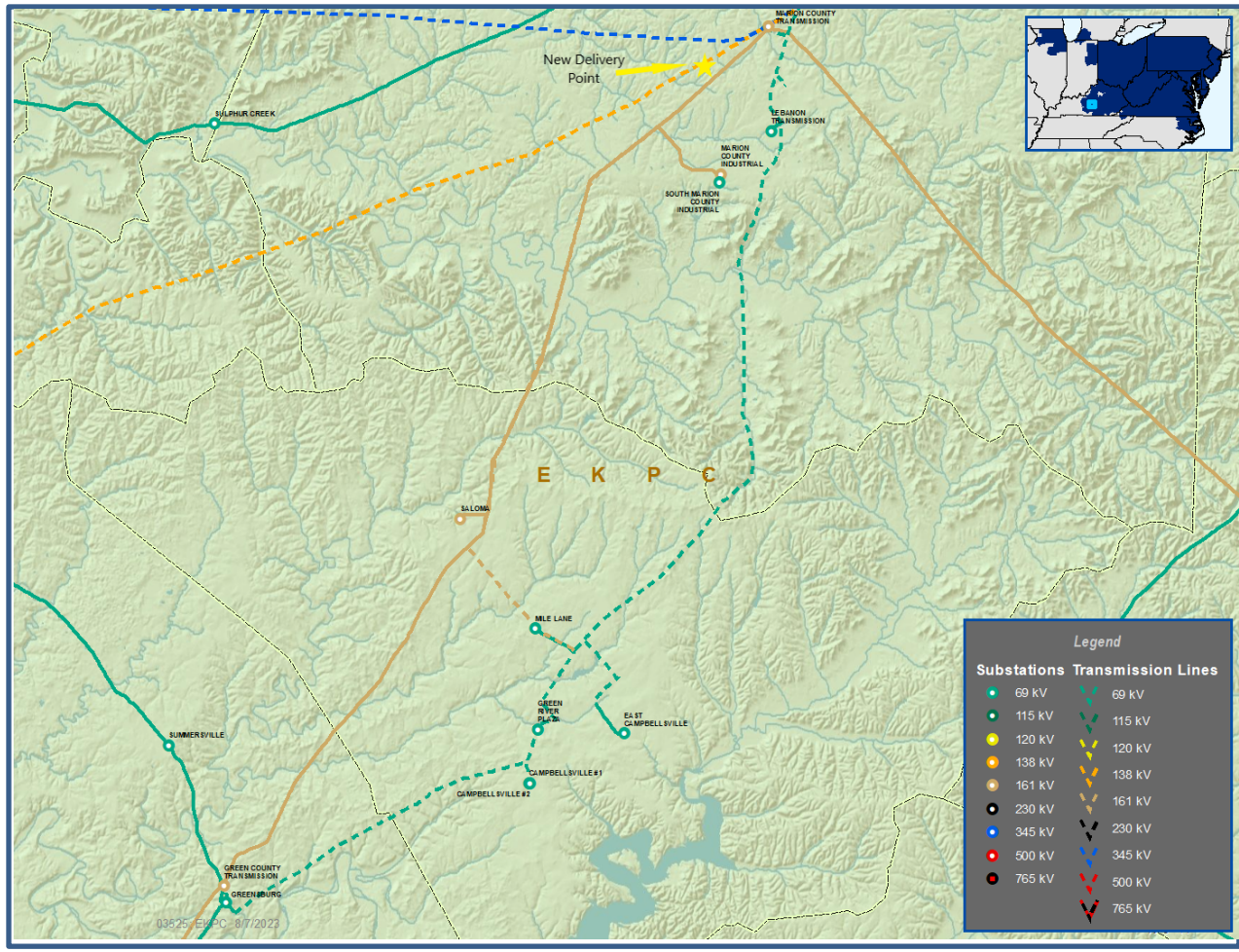
Specific Assumption Reference:

EKPC Assumptions Presentation Slide 15

Problem Statement:

A new customer has requested a delivery point for a peak demand of 18 MW by 4/1/2024. The new delivery point is located in Lebanon, KY approximately 2 mile southwest of the EKPC's Marion County substation. The existing distribution infrastructure is not capable of serving this request.

Model: N/A



EKPC Transmission Zone M-3 Process
North Lebanon

Need Number: EKPC-2023-005

Process Stage: Solutions Meeting – October 20, 2023

Proposed Solution:

Construct a new 161-13.8 KV distribution substation and associated 0.25 mile 161 KV double circuit tap line. This new delivery point will tap the existing EKPC Marion County-Green County 161 KV transmission circuit approximately 2 mile southwest of the Marion County substation.

Transmission Cost: $9.46K

Distribution Cost: $8.15M

Ancillary Benefits:

- None

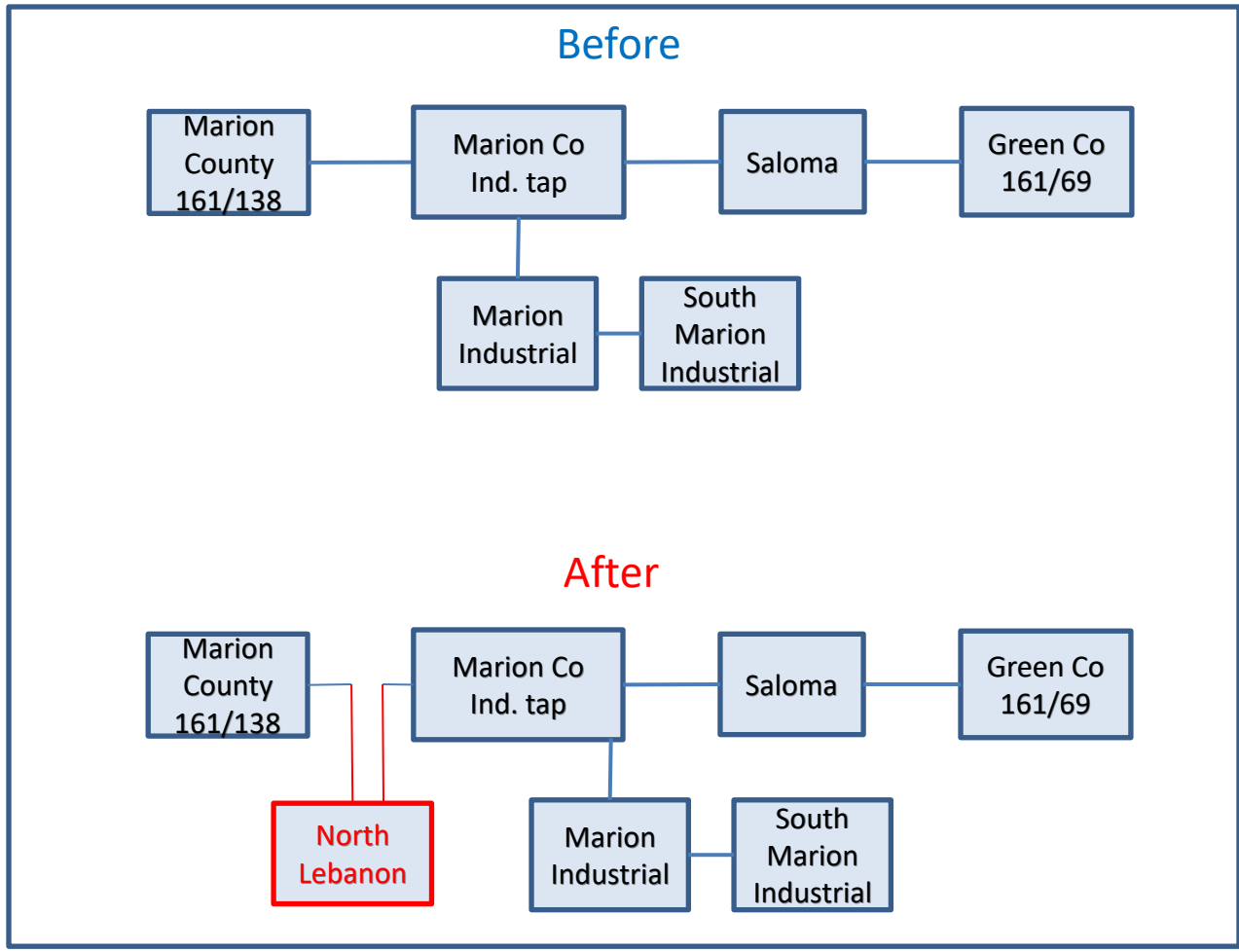
Alternatives Considered:

- No feasible alternatives

Projected In-Service: 4/1/2024

Project Status: Engineering

Model: N/A



EKPC Transmission Zone M-3 Process
Gordon Lane

Need Number: EKPC-2023-006

Process Stage: Solutions Meeting – October 20, 2023

Previously Presented: Need Meeting – September 15, 2023

Supplemental Project Driver:

Customer Service

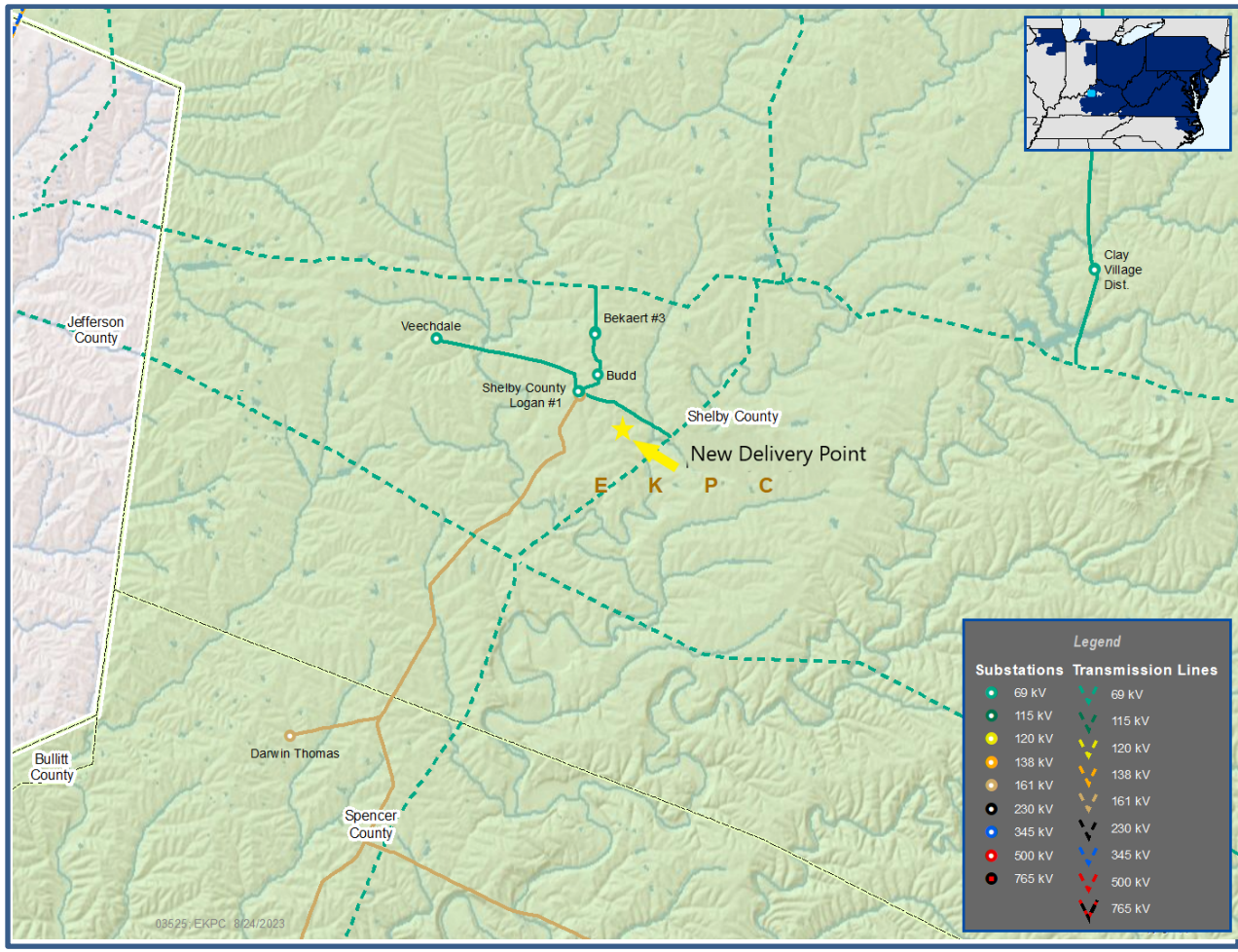
Specific Assumption Reference:

EKPC Assumptions Presentation Slide 15

Problem Statement:

A new customer has requested a delivery point for a peak demand of 9 MW by 9/1/2024. The new delivery point is located in Shelbyville, KY approximately 1.5 mile southeast of the EKPC's Shelby County substation. The existing distribution infrastructure is not capable of serving this request.

Model: N/A



EKPC Transmission Zone M-3 Process
Gordon Lane

Need Number: EKPC-2023-006

Process Stage: Solutions Meeting – October 20, 2023

Proposed Solution:

Construct a new 69-26.4 KV, 18/24/30 MVA distribution substation and associated 1.4 mile 69 KV tap line. The tap line will be constructed using 556.5 conductor and steel pole construction. This new station will be served from the EKPC Shelby County substation.

Transmission Cost: $0.0M

Distribution Cost: $6.3M

Ancillary Benefits:

- None

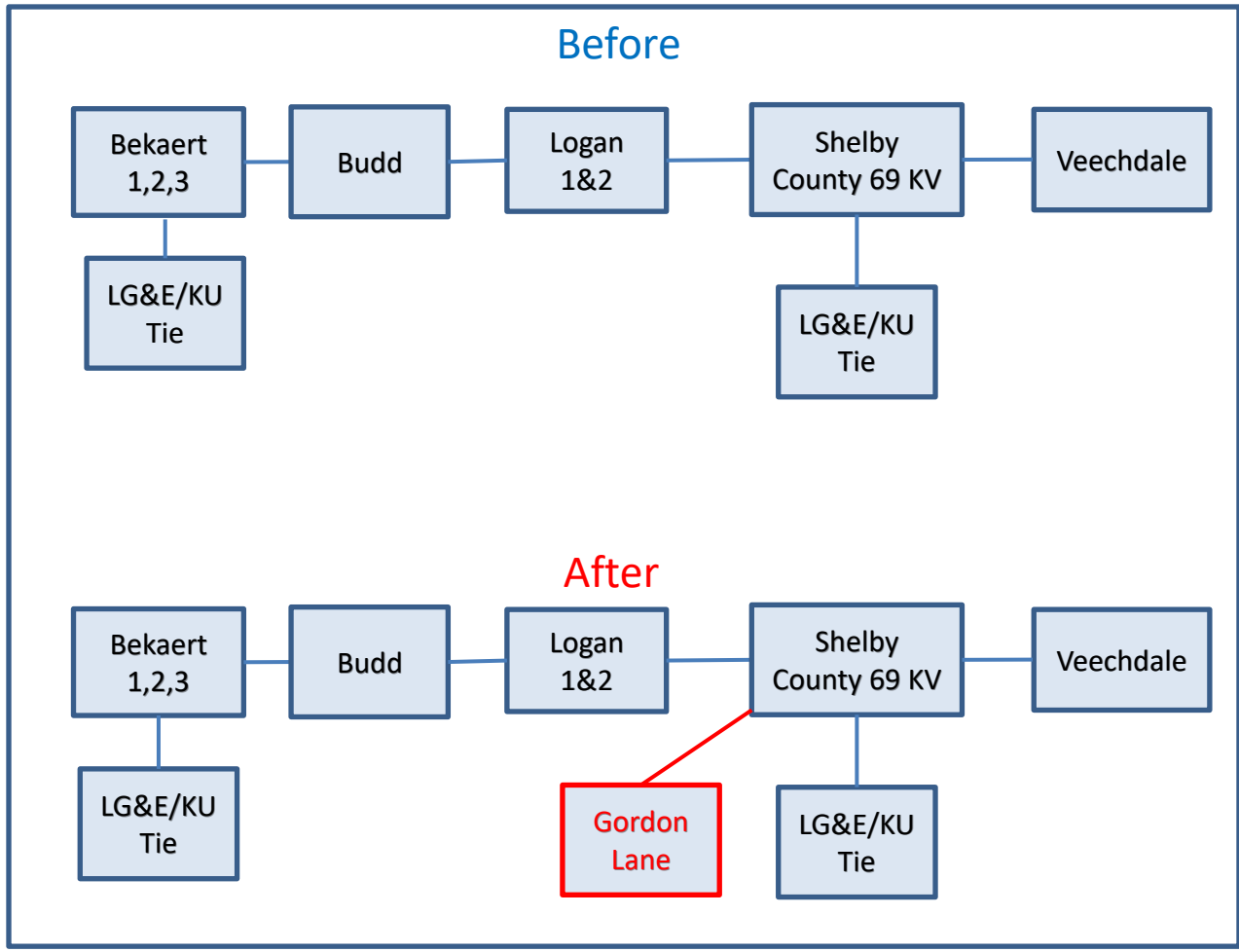
Alternatives Considered:

- No feasible alternatives

Projected In-Service: 4/1/2024

Project Status: Engineering

Model: N/A



EKPC Transmission Zone M-3 Process
Clay Village-New Castle

Need Number: EKPC-2023-008

Process Stage: Solutions Meeting – October 20, 2023

Previously Presented: Need Meeting – September 15, 2023

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk

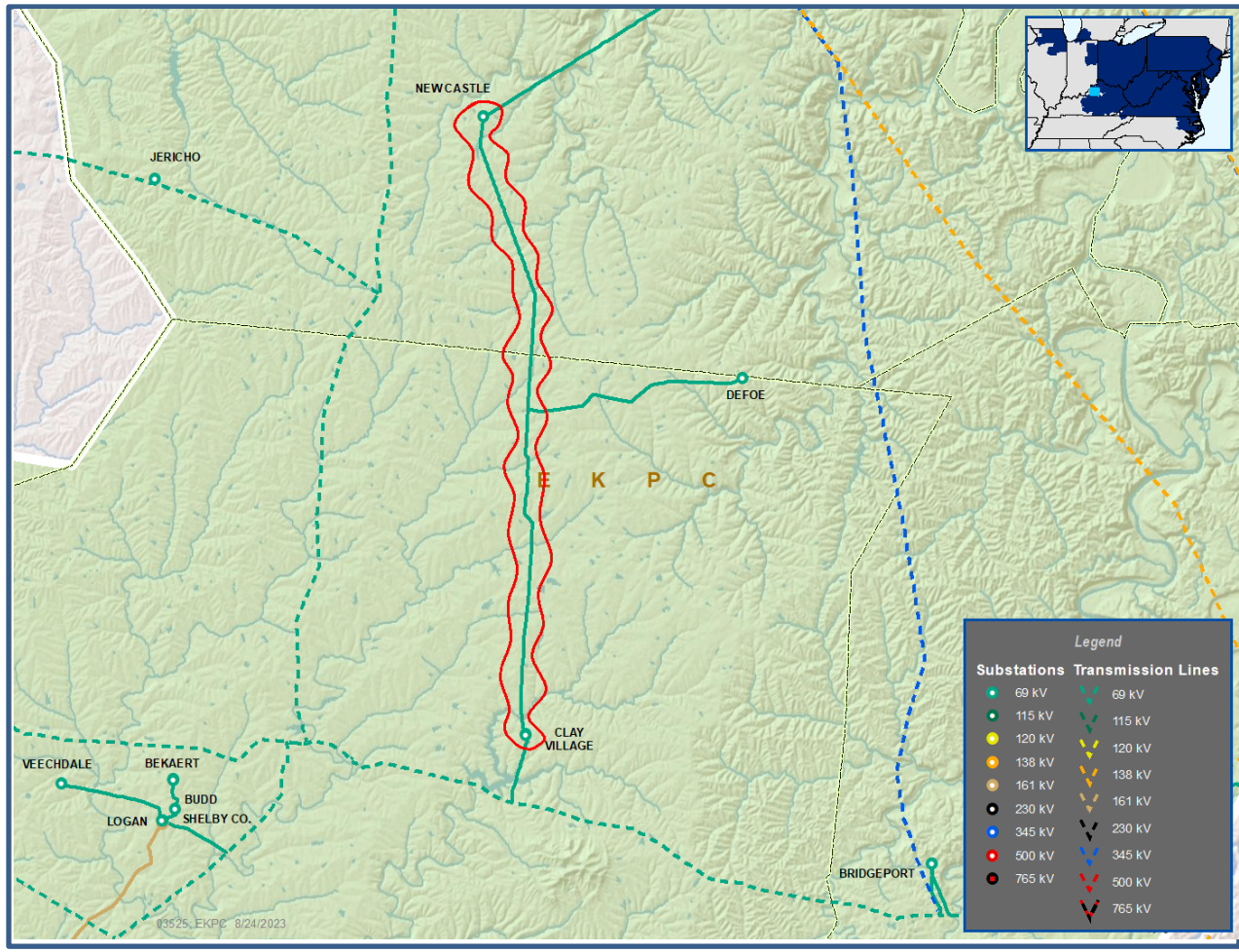
Specific Assumption Reference:

EKPC Assumptions Presentation Slide 13

Problem Statement:

The 14.29 mile, Clay Village-New Castle 69 KV is 1954 vintage wood pole construction with 1/0 conductor. This line section is expected to have condition issues such as conductor steel core and static wire deterioration, rust, pitting and possible broken strands. These condition issues have been exhibited by other 1/0 lines with similar age and environmental conditions. There are currently 36 open work orders with 17 being structure issues such as degraded poles, or cross arm issues. Based on this information, the EKPC Reliability team has concluded that this line is at or near end of life and should be addressed due to the condition.

Model: N/A



EKPC Transmission Zone M-3 Process
Clay Village-New Castle

Need Number: EKPC-2023-008

Process Stage: Solutions Meeting – October 20, 2023

Proposed Solution:

Rebuild the 14.29 mile, Clay Village-New Castle 69 KV line using 556.5 conductor and steel pole construction.

Transmission Cost: $10.77M

Distribution Cost: $0.0M

Ancillary Benefits:

- Supports future load growth in the area.

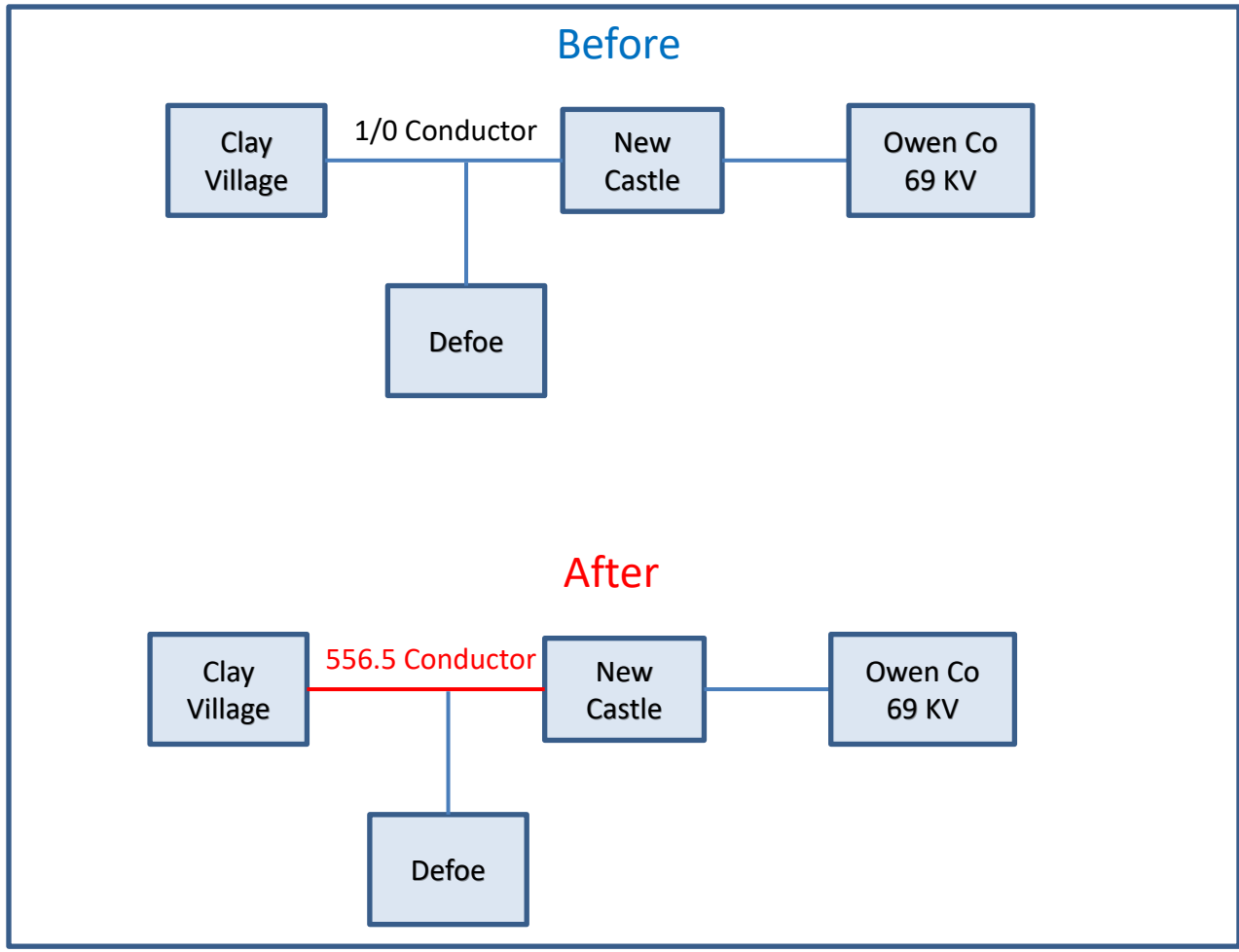
Alternatives Considered:

- Replace/repair as need, deemed not a feasible alternative.

Projected In-Service: 5/1/2025

Project Status: Engineering

Model: N/A



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

10/10/2023 – V1 – Original version posted to pjm.com