Subregional RTEP Committee – Mid-Atlantic
FirstEnergy Supplemental Projects

May 16, 2024

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

Penelec Transmission Zone M-3 Process
Saxton – Shade Gap 115 kV K1 Line

Need Number: PN-2024-016

Process Stage: Need Meeting 05/16/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Global Factors

- System reliability/performance

Line Condition Rebuild/Replacement

- Age/condition of insulators, conductor, and transmission line structures.

Problem Statement:

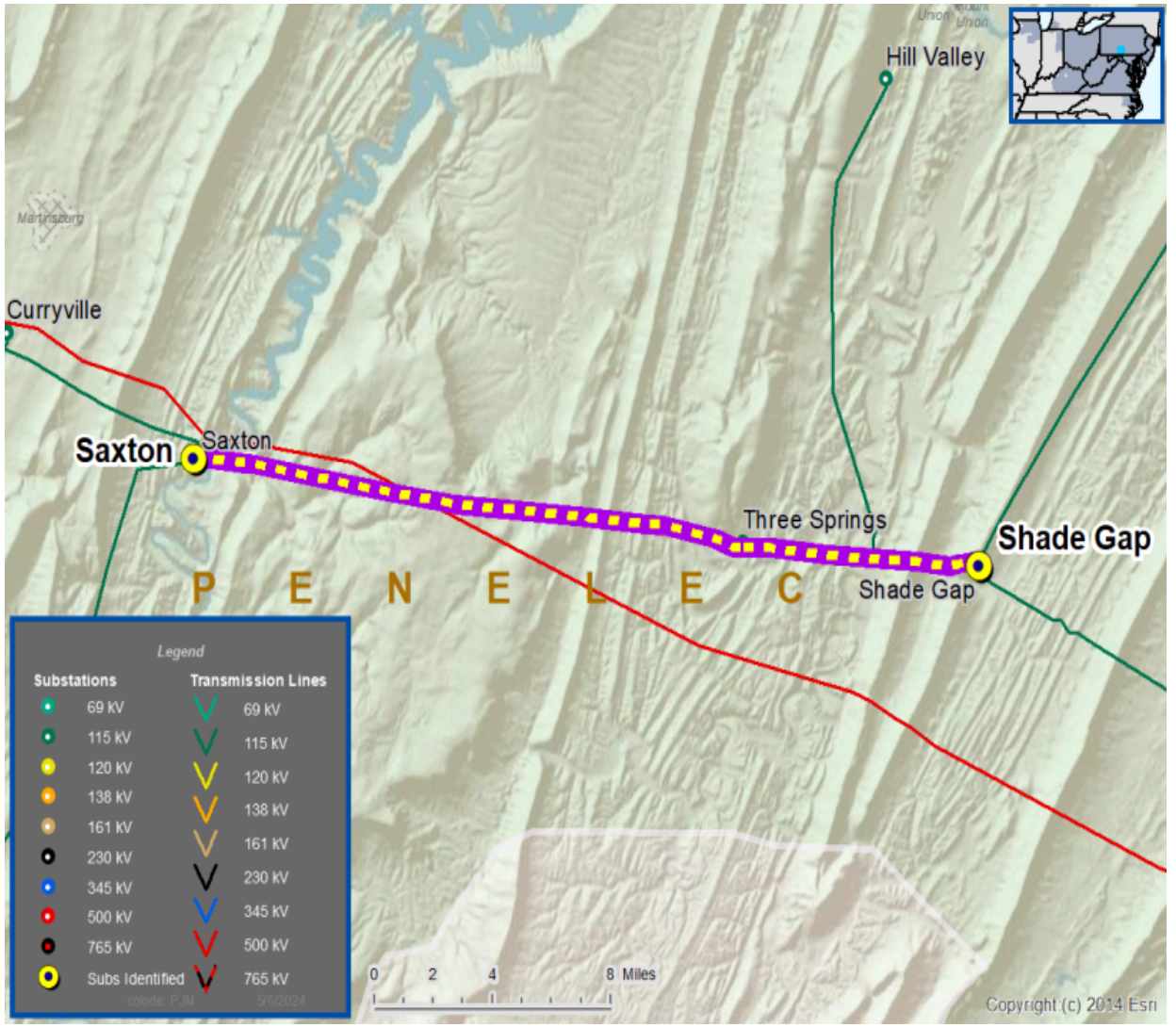
The Saxton – Shade Gap 115 kV K1 line was constructed approximately 61 years ago and is approaching end of life. It is 19.03 miles long with 167 lattice structures and two wood pole H-Frame transmission line structures.

Recent inspections show the line is exhibiting deterioration.

- Lattice structures were originally designed for 46 kV transmission line.
- 33 repairs required due to flashed, worn, or deteriorated insulator strings.

There have been ten unscheduled sustained outages in the last five years attributed to line equipment failures or potential phase to phase contact.

- Existing Transmission Line Ratings:
  - 137 / 140 / 154 / 154 MVA (SN/SE/WN/WE)



Penelec Transmission Zone M-3 Process
Carlisle Pike – Gardners 115 kV 976 Line

Need Number: PN-2024-017

Process Stage: Need Meeting 05/16/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Global Factors

- System reliability/performance
- Substation/Line equipment limits

Line Condition Rebuild/Replacement

- Age/condition of wood pole transmission line structures

Problem Statement:

The Carlisle Pike – Gardners 115 kV 976 Line was constructed approximately 69 years ago. The original poles were replaced in 1970. The conductor is original to the 1955 construction. The Penelec portion of this line is 7.55 miles long with 71 wood H-frame transmission line structures.

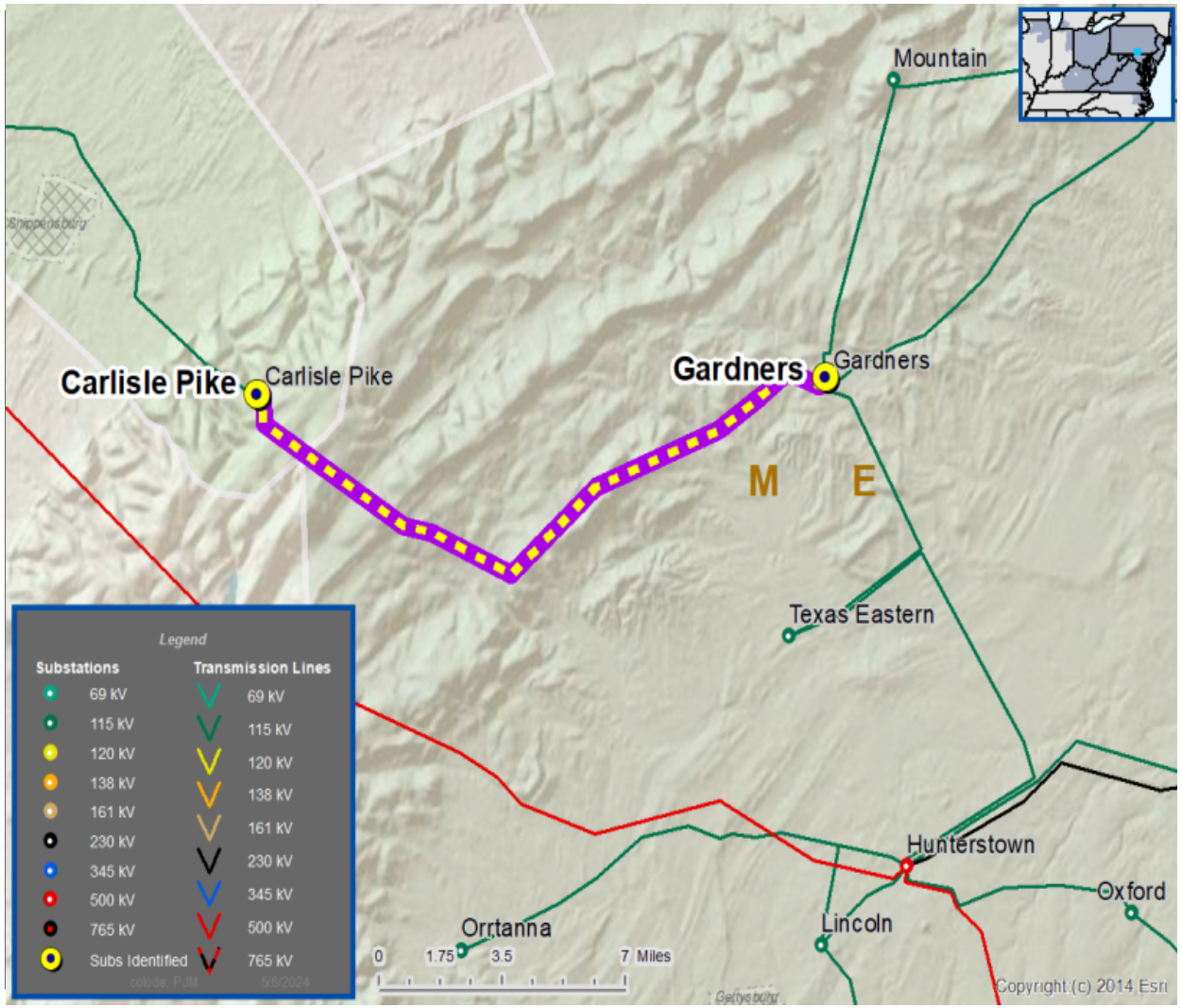
The Penelec portion of this line is exhibiting deterioration. Inspection findings include:

- 16 structures are Phase-Raised.
- 18 structures failed sound test.
- 54 structures are 54 years old.

There have been three unscheduled sustained outages in the last five years, two attributed to line equipment.

The line is limited by terminal equipment.

- Existing Transmission Line Ratings:
  - 86 / 110 / 122 / 137 MVA (SN/SE/WN/WE)



Penelec Transmission Zone M-3 Process
Corry East – Warren 115 kV WD1 Line

Need Number: PN-2024-018

Process Stage: Need Meeting 05/16/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Global Factors

- System reliability/performance

Line Condition Rebuild/Replacement

- Age/condition of wood pole transmission line structures

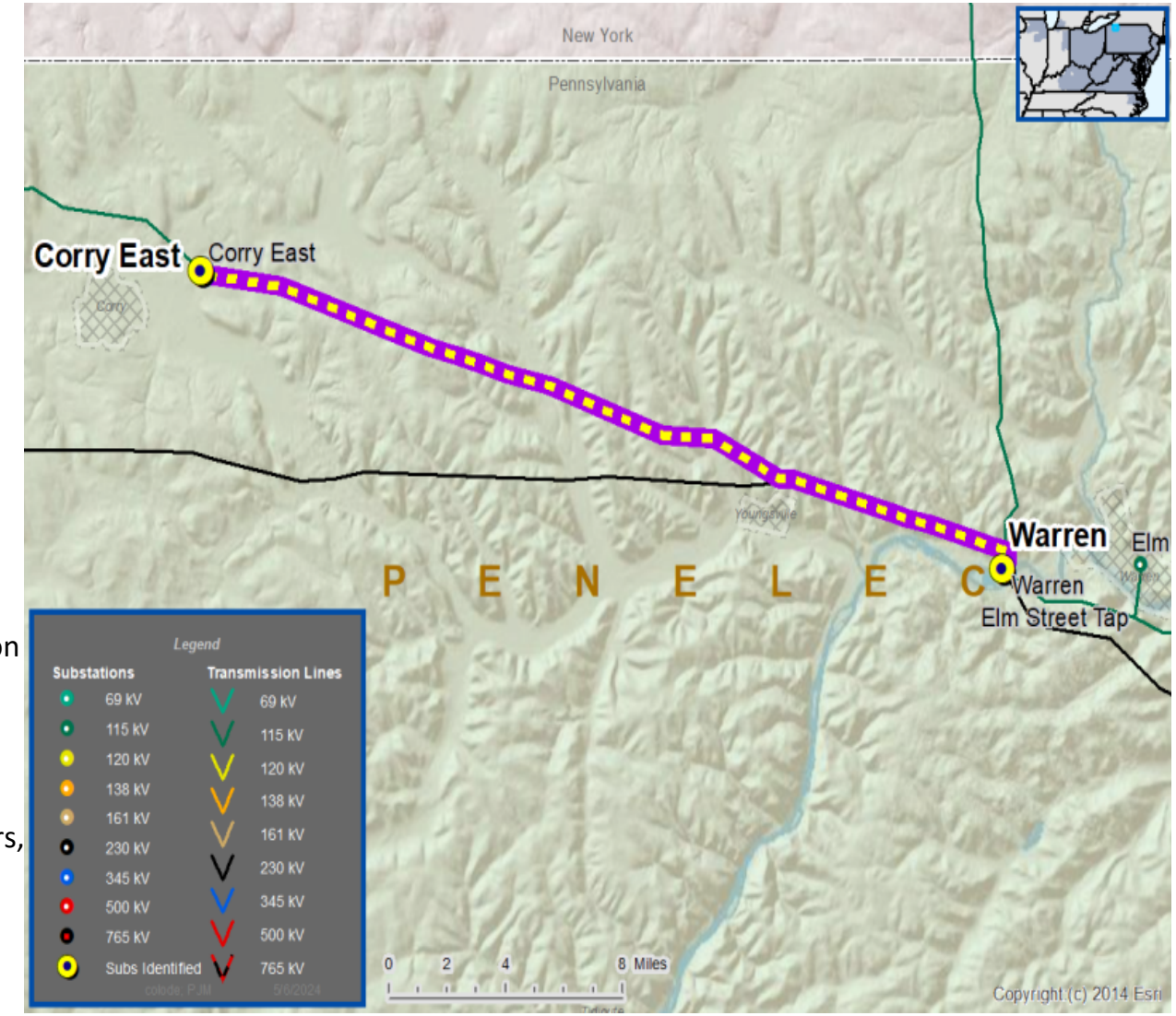
Problem Statement:

The Corry East – Warren 115 kV WD1 Line was originally constructed approximately 67 years ago and was rebuilt in 1981. It is 21.6 miles long with 172 wood H-Frame transmission line structures.

Per recent inspections, the line is exhibiting deterioration resulting. Inspection findings include:

- 39 structures are Phase-Raised.
- 38 require repair due to deteriorated wood poles.

- There have been two unscheduled sustained outages in the last five years, one occurring due to a broken cross-arm.
- Existing Transmission Line Ratings:
  - 202 / 245 / 228 / 290 MVA (SN/SE/WN/WE)



Penelec Transmission Zone M-3 Process
Corry East – Four Mile Junction 115 kV Line

Need Number: PN-2024-019

Process Stage: Need Meeting 05/16/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Global Factors

- System reliability/performance

Line Condition Rebuild/Replacement

- Age/condition of wood pole H-Frame transmission line structures

Problem Statement:

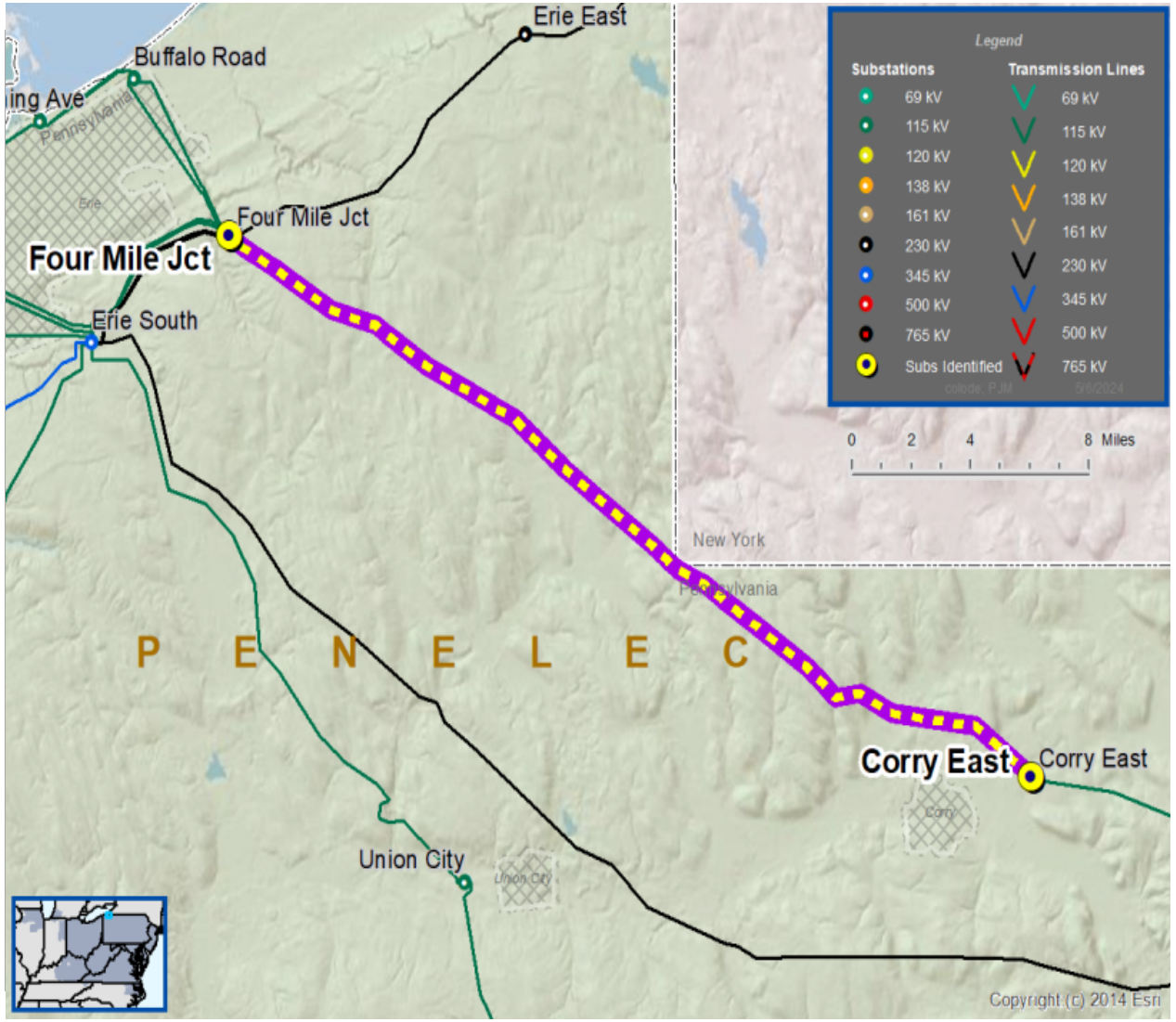
The Corry East – Four Mile Junction 115 kV Line was constructed approximately 56 years ago and is approaching end of life. It is 24.4 miles long with 198 wood H-Frame transmission line structures.

Per recent inspections, the line is exhibiting deterioration. Inspection findings include:

- 68 structures are phase-raised.
- 87 structures require repair for rotten, cracked, or deteriorated wood poles or hardware.
- 84 Structures failed sound test.

In the last five years, this line has incurred six unscheduled sustained outages, three were attributed to line equipment.

- Existing Transmission Line Ratings:
  - 199 / 241 / 225 / 285 MVA (SN/SE/WN/WE)



Penelec Transmission Zone M-3 Process
Geneva – Morgan Street 115 kV Line Customer Connection

Need Number: PN-2024-020

Process Stage: Need Meeting – 5/16/2024

Project Driver(s):

Customer Service

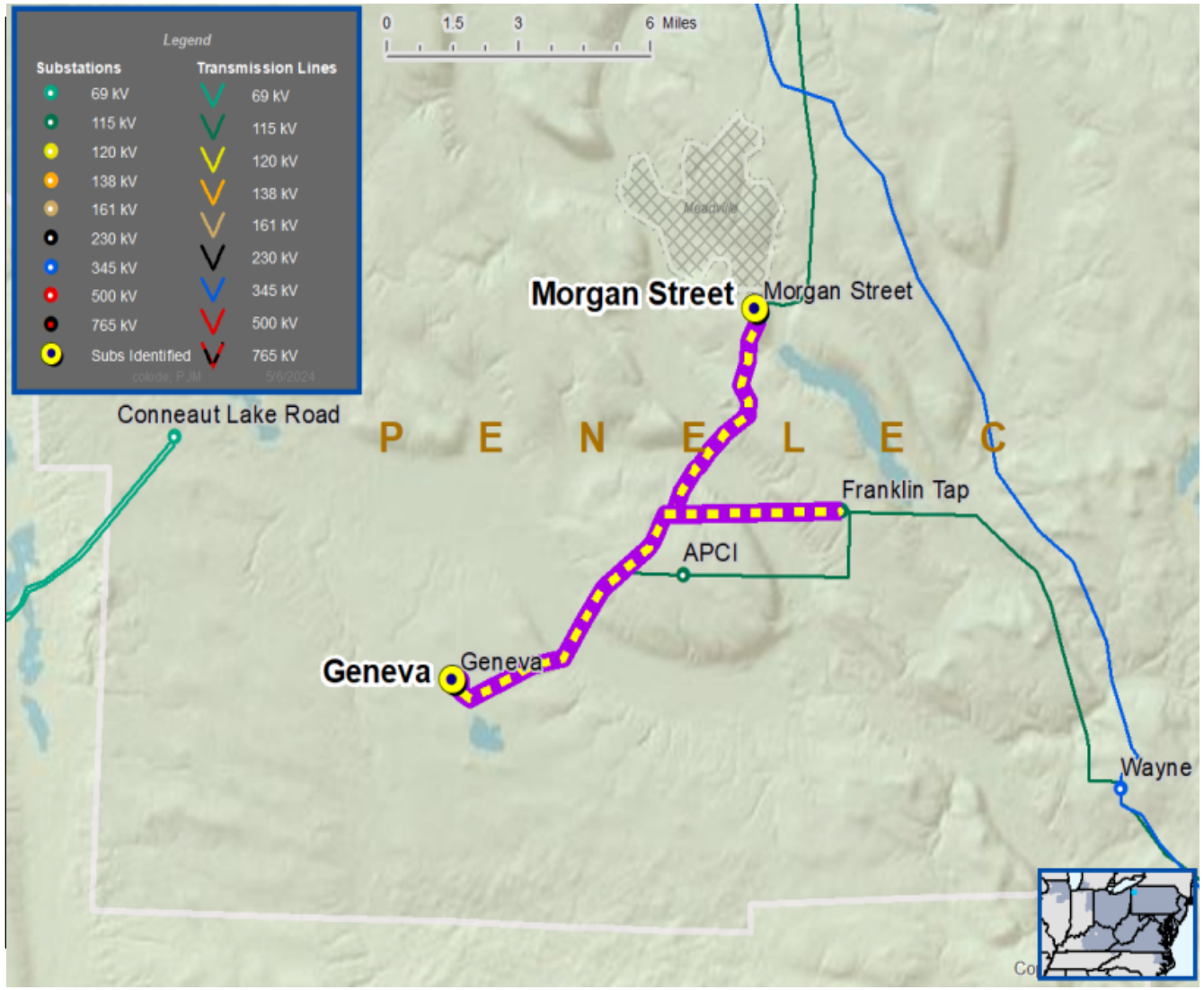
Specific Assumption Reference(s)

New customer connection request will be evaluated per FirstEnergy's "Requirements for Transmission Connected Facilities" document and "Transmission Planning Criteria" document.

Problem Statement

New Customer Connection – A retail customer requested 115 kV service for load of approximately 31 MVA near the Geneva – Morgan Street 115 kV Line. The service request location is approximately one mile from Geneva Substation.

Requested in-service date is 05/31/2025



Penelec Transmission Zone M-3 Process
Glory – Nanty Glo – Spangler 46 kV Line

Need Number: PN-2024-022

Process Stage: Need Meeting – 05/16/2024

Project Driver:

Operational Flexibility and Efficiency

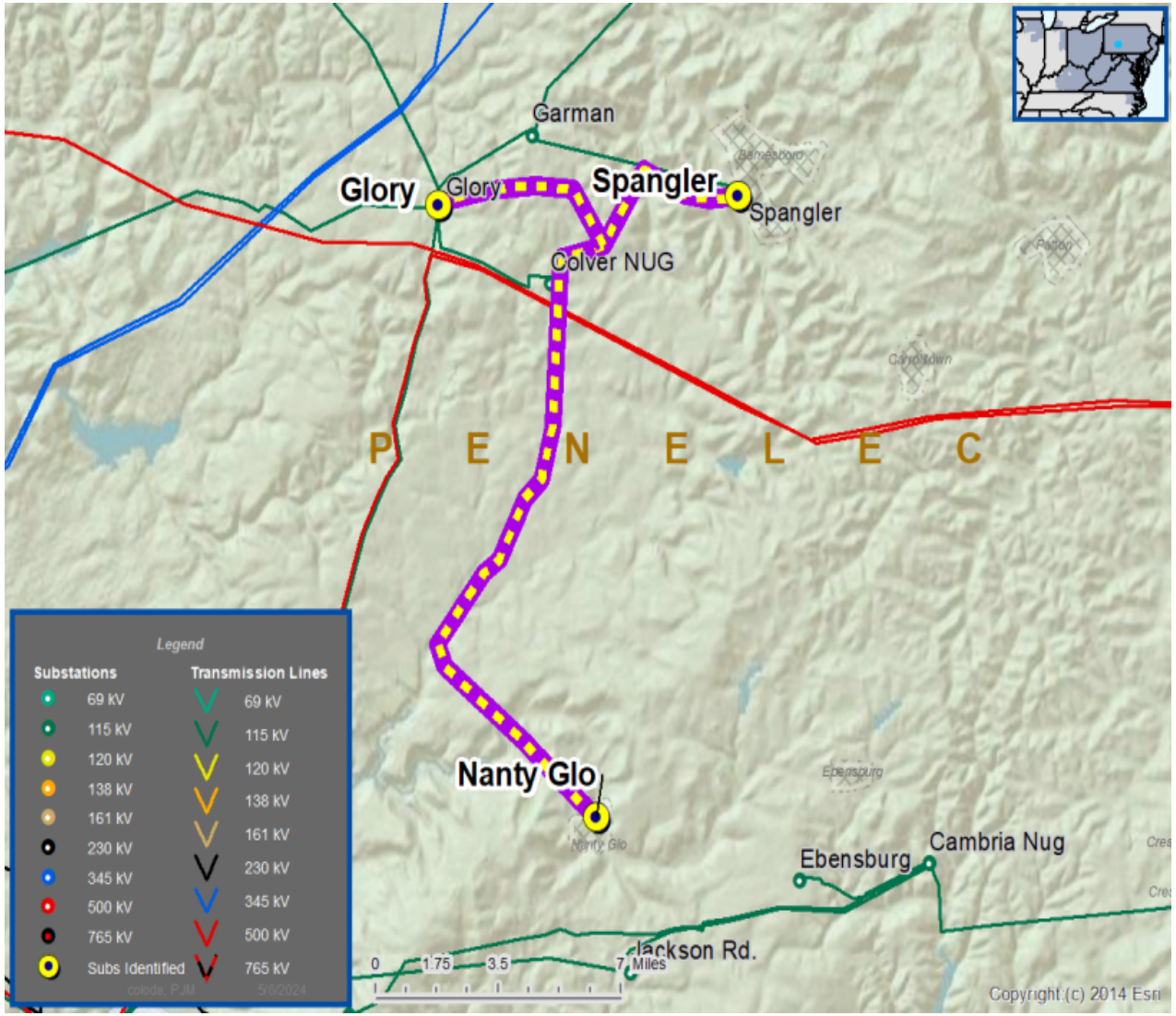
Specific Assumption Reference:

System Performance Projects

- Add/Expand Bus Configuration
- Load at risk in planning and operational scenarios
- Reduce the amount of exposed potential local load loss during contingency conditions

Problem Statement:
The Glory – Nanty Glo – Spangler 46 kV Line has over 23 miles of line exposure. A fault on this line will outage over 1,000 customers and multiple substations, including two rural electric cooperatives.

An outage on the Glory – Nanty Glo – Spangler 46 kV Line results in the loss of over 11 MW.



Penelec Transmission Zone M-3 Process
Lewistown Area

Need Number: PN-2024-023

Process Stage: Need Meeting – 05/16/2024

Project Driver:

Operational Flexibility and Efficiency

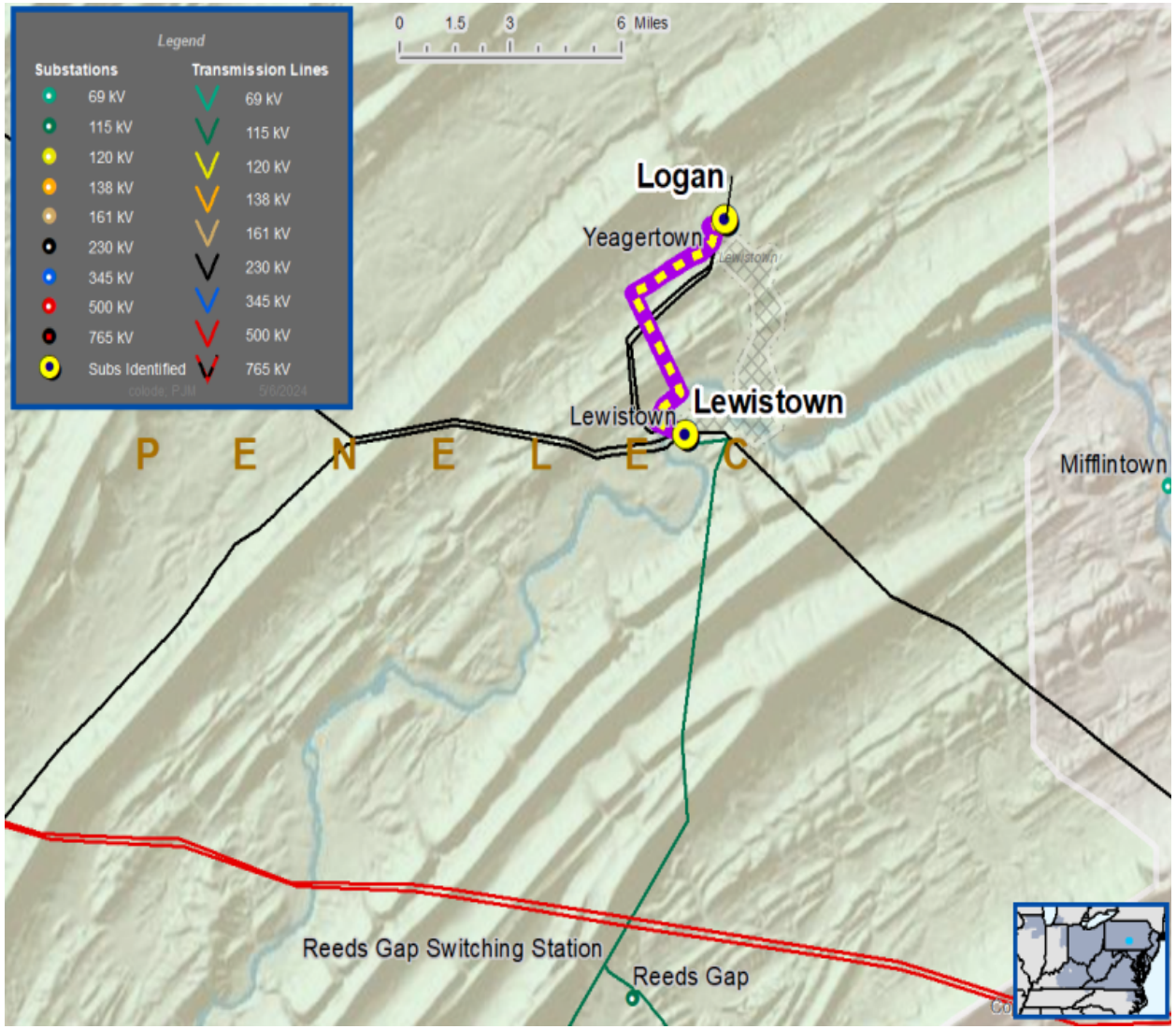
Specific Assumption Reference:

System Performance Projects

- Add/expand bus configuration
- Load at risk in planning and operational scenarios
- Reduce the amount of exposed potential local load loss during contingency conditions
- Reconductor/rebuild transmission lines with three or more terminals

Problem Statement:

There are two three-terminal lines with normally open points between Lewistown Substation and Logan Substation on the 46 kV system in Penelec. These lines have a combined exposure of over 20 miles. Upon multiple N-1-1 losses on these lines, several substations will experience an outage. 3,575 customers and 12 MW of load are at risk due to this configuration.



Change in Scope

Penelec Transmission Zone M-3 Process
Collinsville Substation – s1922 Scope Change

s1922: Originally presented in 04/26/2019 and 05/31/2019 SRRTEP Mid-Atlantic meetings

Changes are marked in red

Supplemental Project Driver:

Operational Flexibility and Efficiency

Specific Assumption References:

System Performance Projects

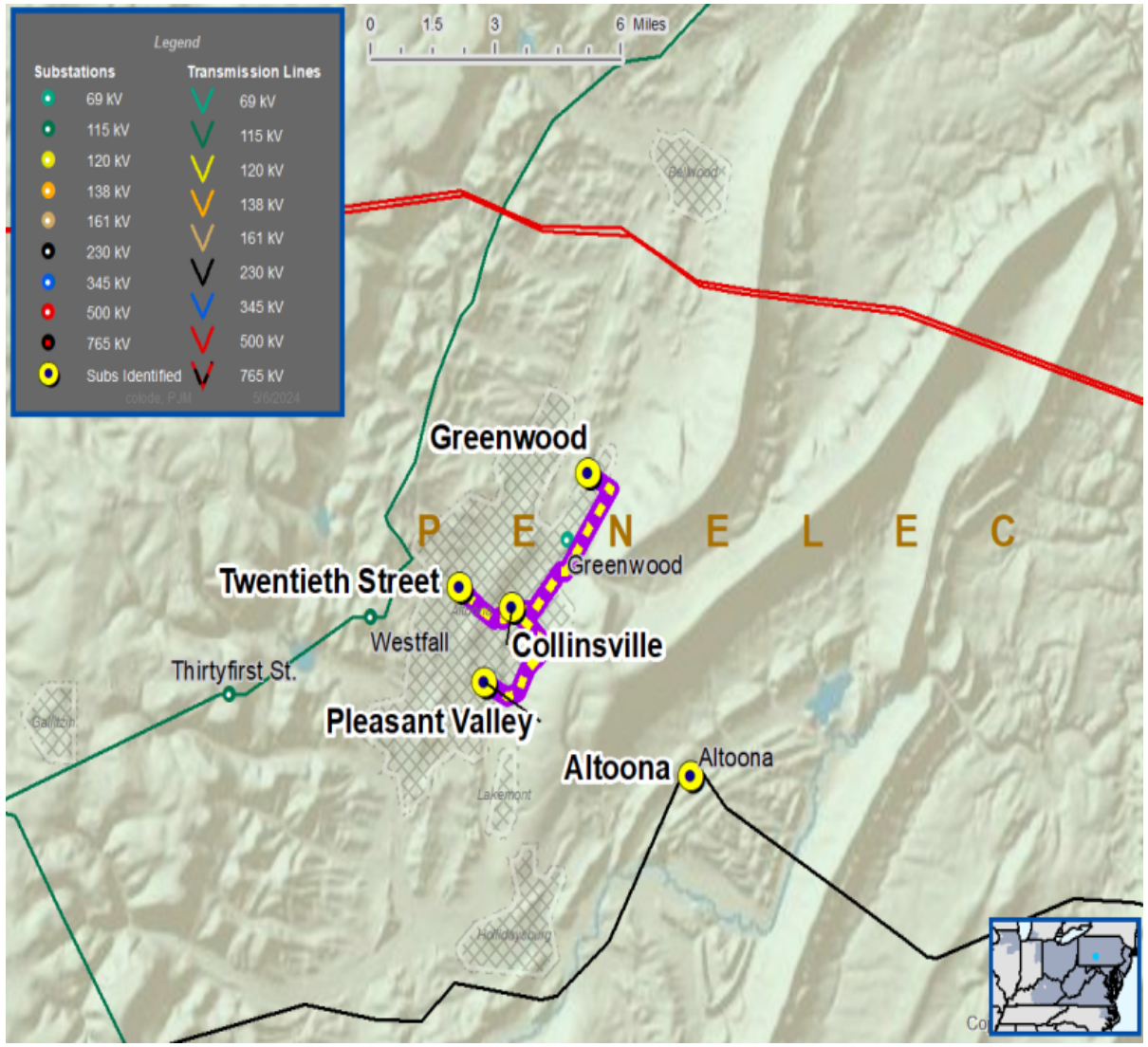
- Reliability of Non-Bulk Electric System (Non-BES) Facilities
- Load and/or customers at risk on single transmission lines

Add/Expand Bus Configuration

- Loss of substation bus adversely affects transmission system performance
- Eliminate simultaneous outages to multiple networked elements

Problem Statement:

Loss of the substation bus at Collinsville substation interrupts ~22 MW of load and 3,290 customers and opens the network connecting sources into the Altoona 46 kV load pocket.



Penelec Transmission Zone M-3 Process
Collinsville Substation – s1922 Scope Change

Proposed Solution:

- Convert Collinsville substation into a six-breaker 46 kV ring bus.
- Cut and connect the Altoona – Collinsville F 46 kV and Collinsville – Pleasant Valley 46 kV lines. The converted Collinsville 46 kV Substation to include terminals for 20th Street, Greenwood, Altoona AG, and Altoona G 46 kV lines along with terminals for two 46-12.5 kV transformers and a 46 kV capacitor.

Transmission Line Rating:

- Altoona – Pleasant Valley 46 kV Line:
  - Before Proposed Solution (Altoona – Collinsville F 46 kV and Collinsville – Pleasant Valley 46 kV Lines): N/A
  - After Proposed Solution: 81/98/91/116 MVA (SN/SE/WN/WE)
- Collinsville – Greenwood 46 kV Line:
  - Before Proposed Solution: 38/48/48/48 MVA (SN/SE)
  - After Proposed Solution: 67/81/75/95 MVA (SN/SE/WN/WE)

Alternatives Considered:

- Construct a new 46 kV breaker-and-a-half substation to replace the existing Collinsville Substation. This design was eliminated due to geographic limitations.

Estimated Project Cost: $17.6M

Projected In-Service: 10/12/2025

Status: Engineering

Model: 2023 RTEP model for 2028 Summer (50/50)