Transmission Expansion Advisory Committee
JCPL Supplemental Projects

April 11, 2019

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

JCP&L Transmission Zone

Need Number: JCPL-2019-008 to 021
Process Stage: Need Meeting
Date: 04/11/2019

Project Driver(s):

Equipment Material Condition, Performance and Risk

Operational Flexibility and Efficiency

Specific Assumption Reference(s)

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

Upgrade Relay Schemes

- Relay schemes that have a history of misoperation
- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades
- Bus protection schemes

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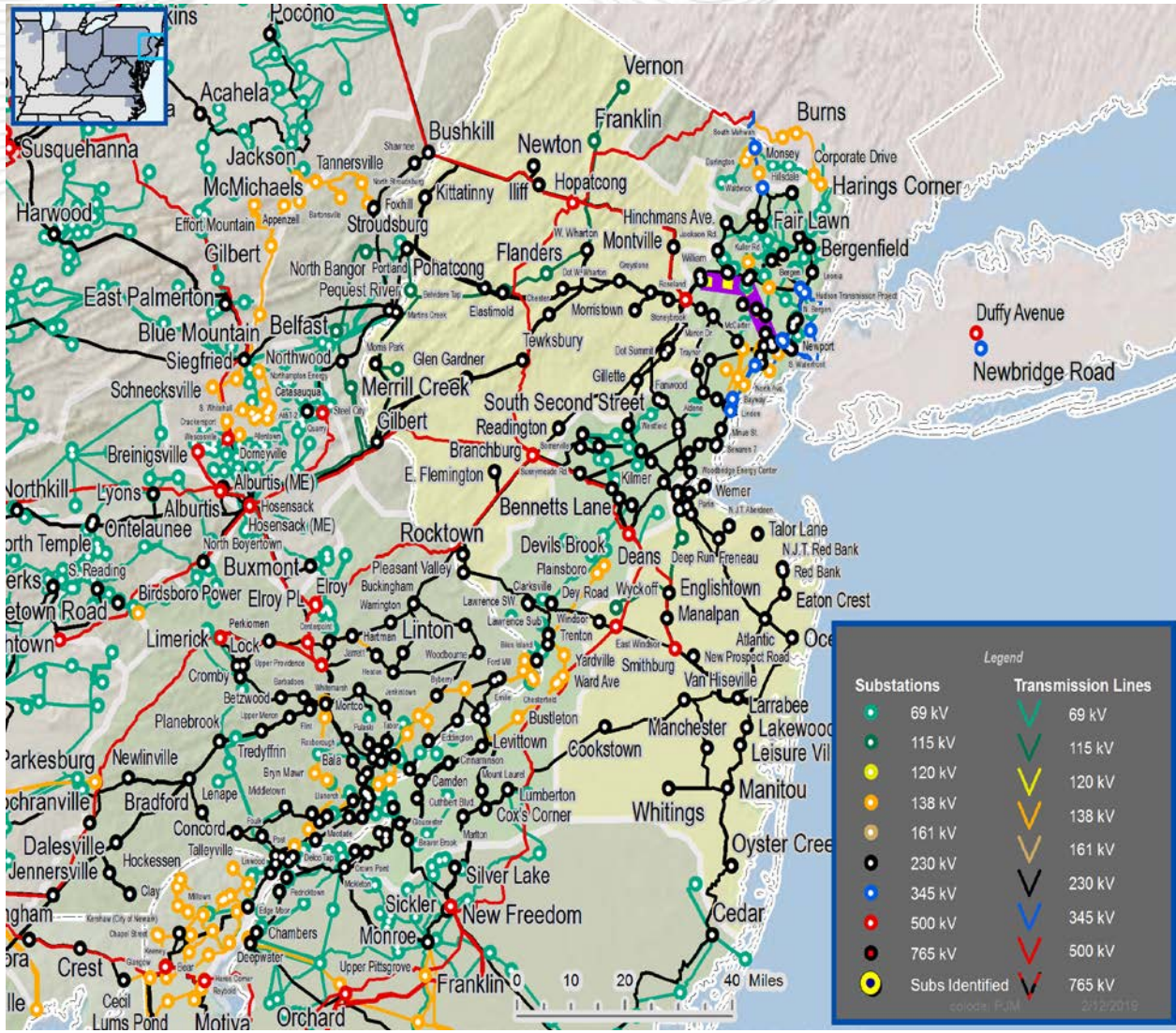

Problem Statement

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
- Proper operation of the protection scheme requires all the separate components perform adequately during a fault.
- In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.
- Transmission line ratings are limited by terminal equipment.

JCPL-2019-	Transmission Line / Substation Locations	Existing Line Rating (SN / SE)	Existing Conductor Rating (SN / SE)	Limiting Terminal Equipment
008	Atlantic – Red Bank (S1033) 230 kV Line	678 / 780	709 / 869	Substation Conductor
009	Atlantic – Eaton Crest – Red Bank (T2020) 230 kV Line	678 / 780	709 / 869	Line Relaying, Line Trap, Substation Conductor
010	Pohatcong – West Wharton 230 kV Line	678 / 813	709 / 869	Line Relaying, Circuit Breaker, Line Trap, Substation Conductor
011	Gillette – Traynor 230 kV Line	678 / 802	843 / 1011	Line Relaying, Circuit Breaker, Line Trap, Substation Conductor
012	Greystone – West Wharton 230 kV Line	678 / 813	709 / 869	Substation Conductor, Current Transformer
013	Raritan River – Werner 230 kV Line	652 / 739	709 / 869	Circuit Breaker, Substation Conductor, Line Relaying, Current Transformer
014	Greystone – Portland 230 kV Line	830 / 1000	910 / 1077	Substation Conductor, Current Transformer
015	Gillette – Traynor 230 kV Line	678 / 813	709 / 869	Substation Conductor

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Problem Statement – Continued from previous slide

JCPL-2019-	Transmission Line / Substation Locations	Existing MVA Line Rating (SN / SE)	Existing MVA Conductor Rating (SN / SE)	Limiting Terminal Equipment
017	Atlantic – Smithburg 230 kV Line	678 / 813	709 / 869	Substation Conductor
019	Chester – Glen Gardner 230 kV Line	650 / 817	709 / 869	Substation Conductor
020	Gilbert – Glen Gardner 230 kV Line	815 / 923	1136 / 1311	Wave Trap, Line Relaying, Current Transformer, Breaker and Terminal Switches, Line Metering
021	Chester – West Wharton 230 kV Line	650 / 817	709 / 869	Substation Conductor

JCP&L Transmission Zone

Need Number: JCPL-2019-008

Problem Statement

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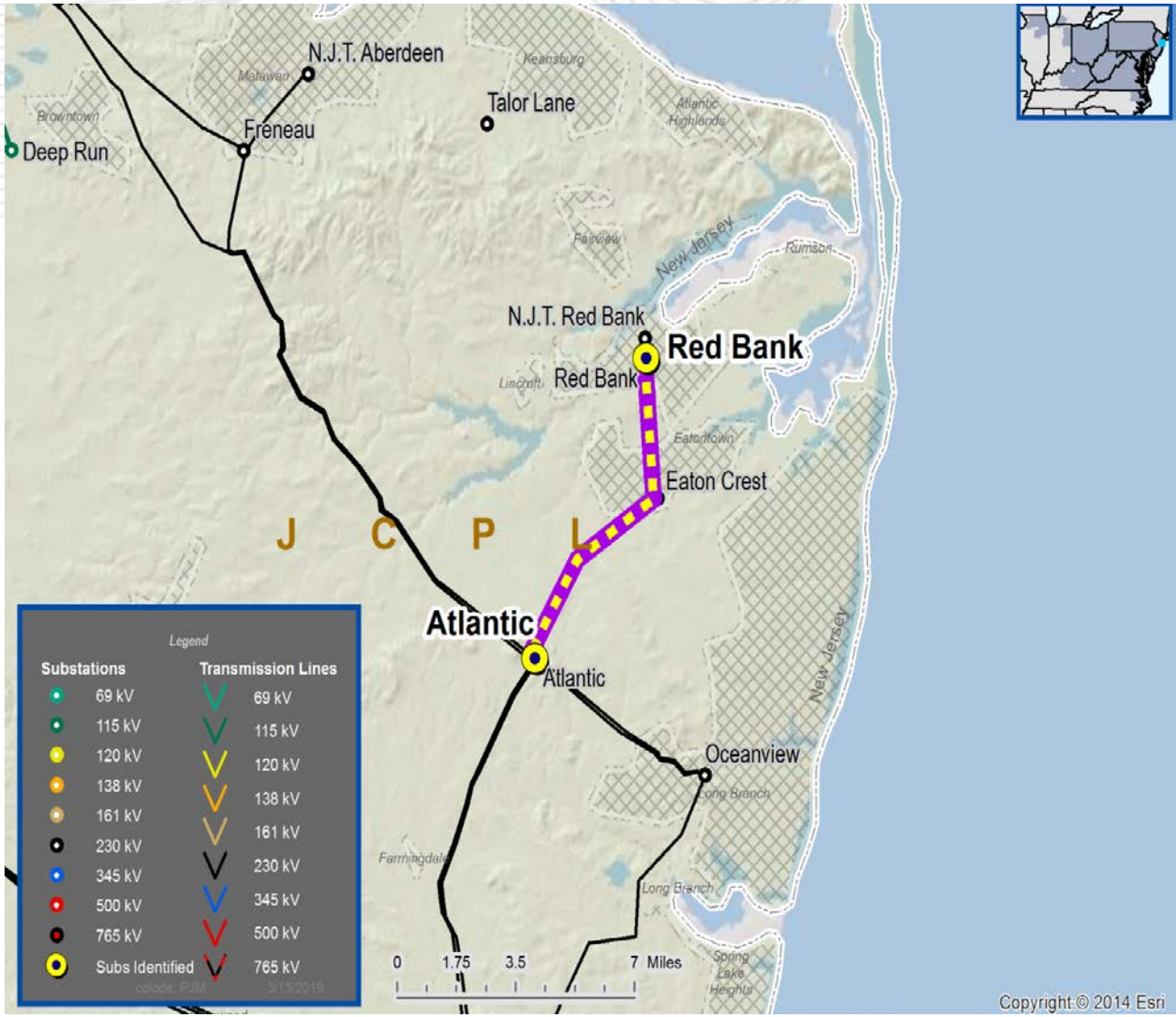

JCP&L Transmission Zone

Need Number: JCPL-2019-009

Problem Statement

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
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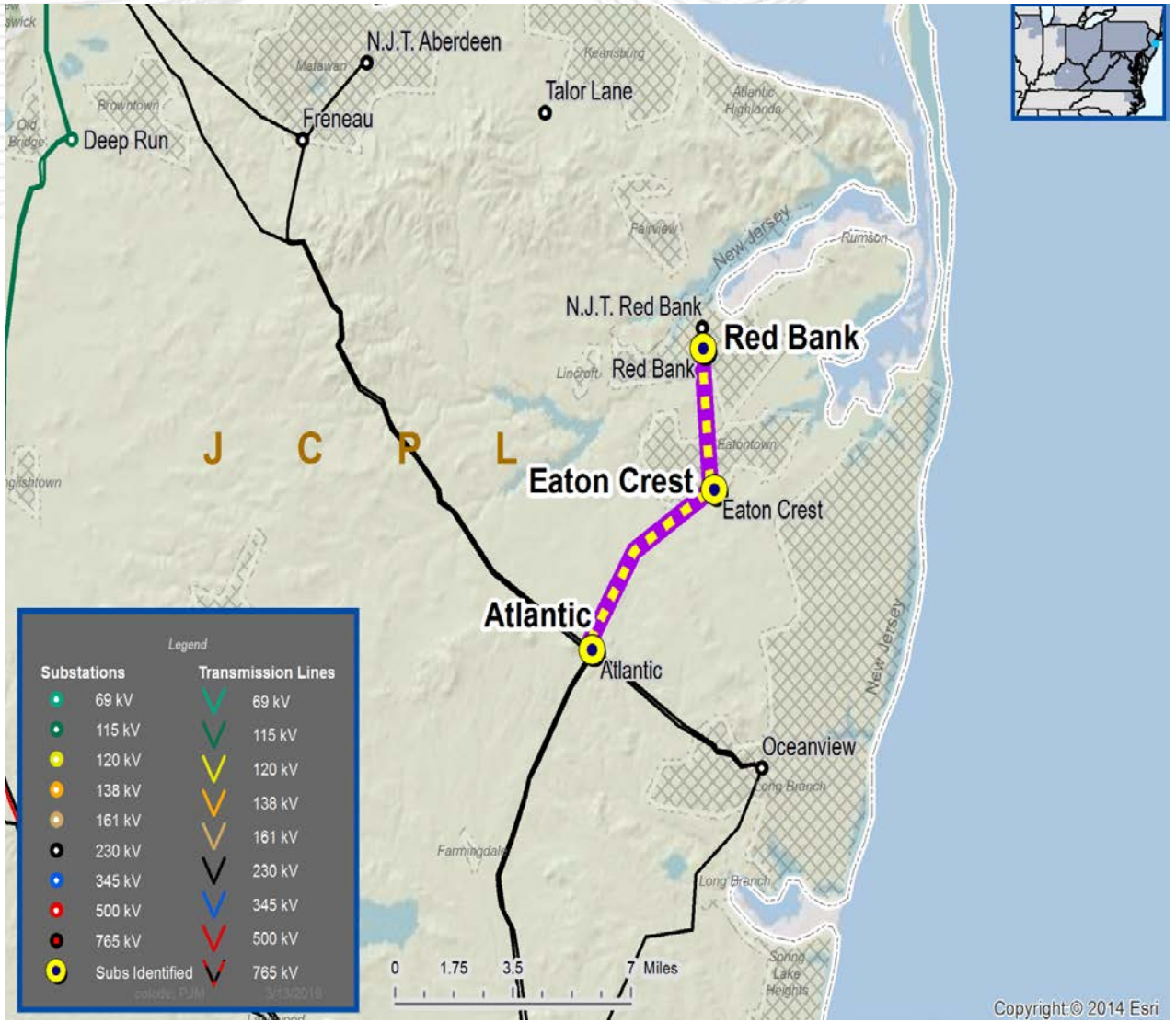

JCP&L Transmission Zone

Need Number: JCPL-2019-010

Problem Statement

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
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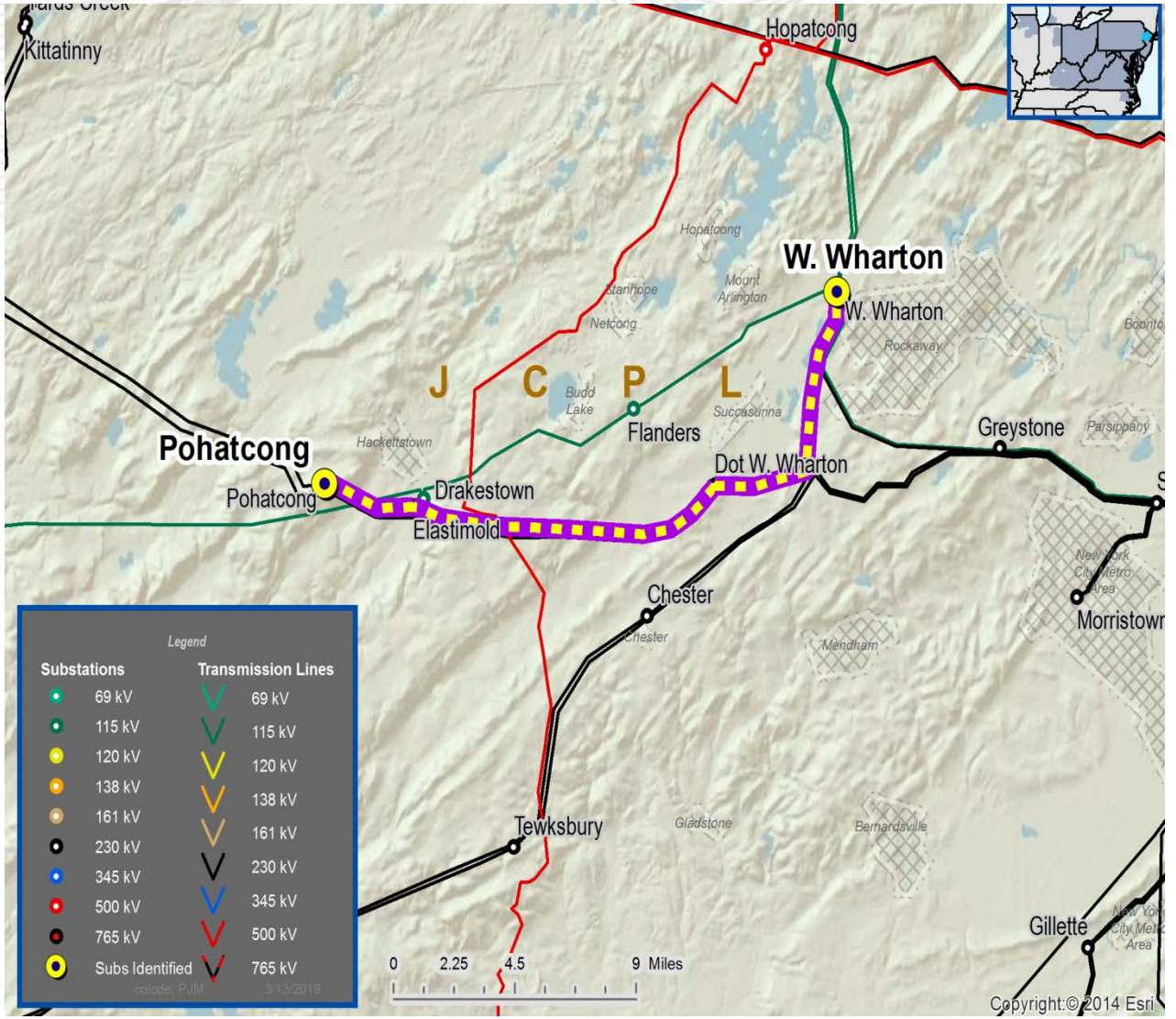
- Transmission line ratings are limited by terminal equipment.



JCP&L Transmission Zone

Need Number: JCPL-2019-011

Problem Statement

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
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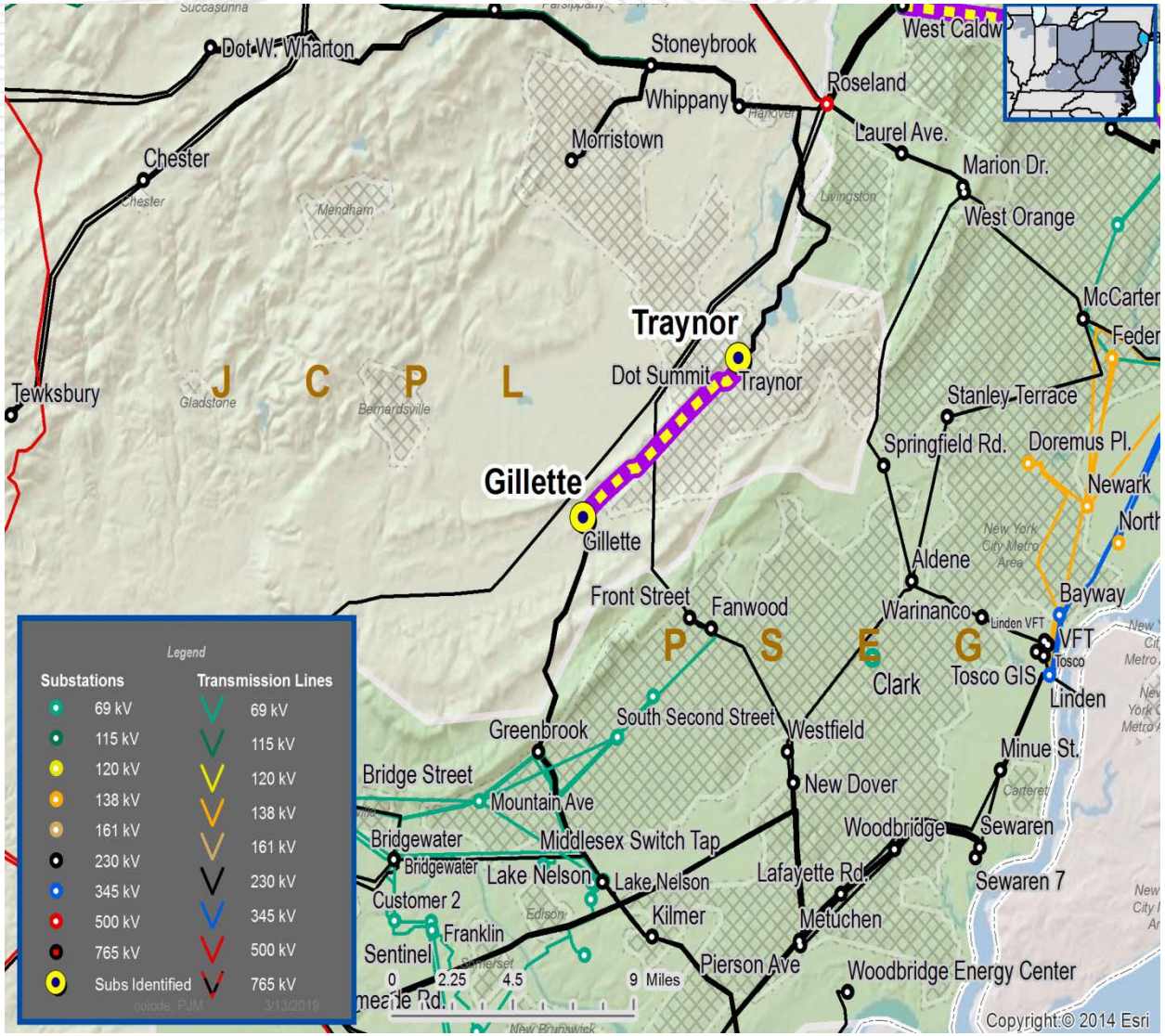

JCP&L Transmission Zone

Need Number: JCPL-2019-012

Problem Statement

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
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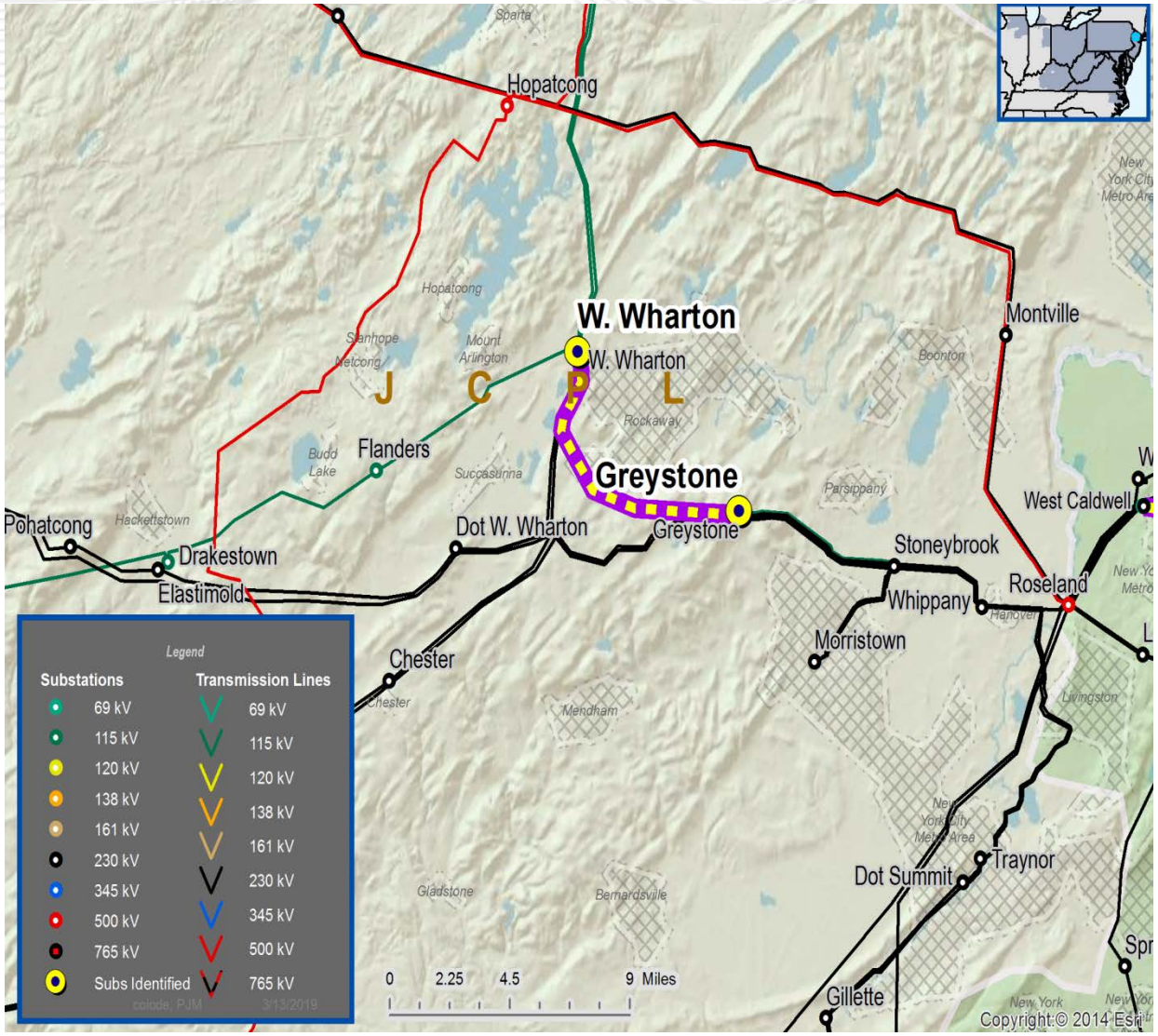

JCP&L Transmission Zone

Need Number: JCPL-2019-013

Problem Statement

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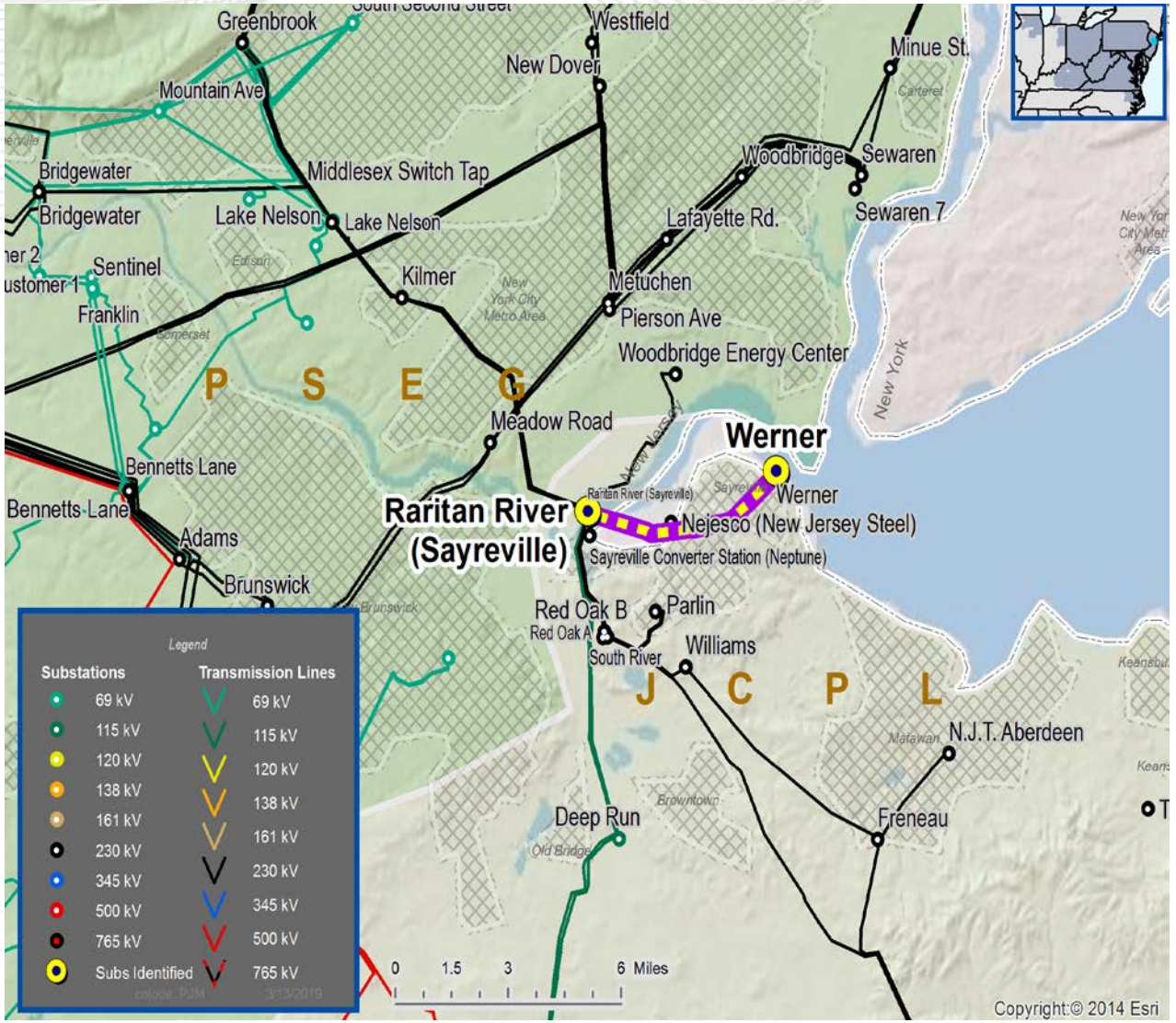
- Transmission line ratings are limited by terminal equipment.



JCP&L Transmission Zone

Need Number: JCPL-2019-014

Problem Statement

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
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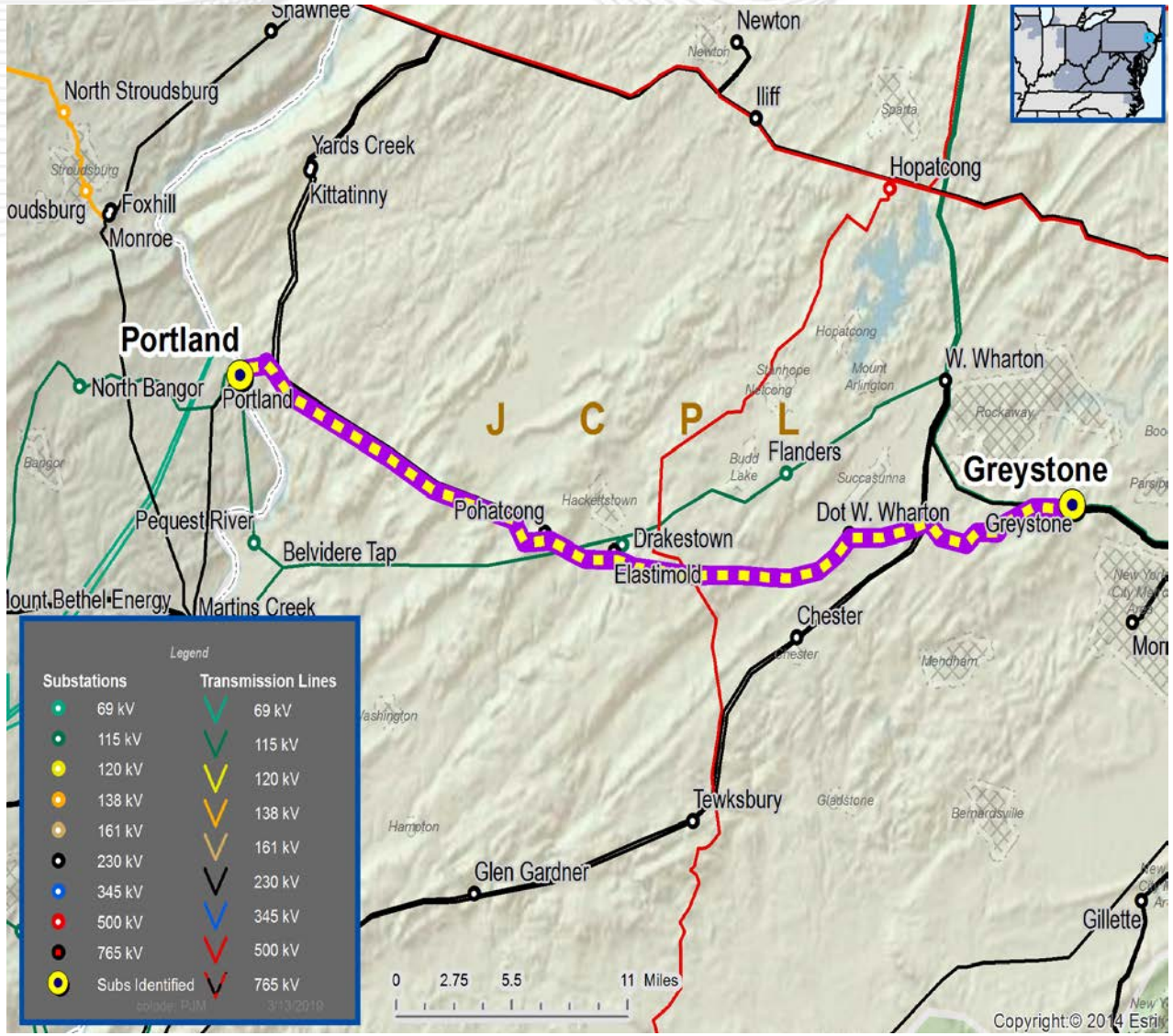

JCP&L Transmission Zone

Need Number: JCPL-2019-015

Problem Statement

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
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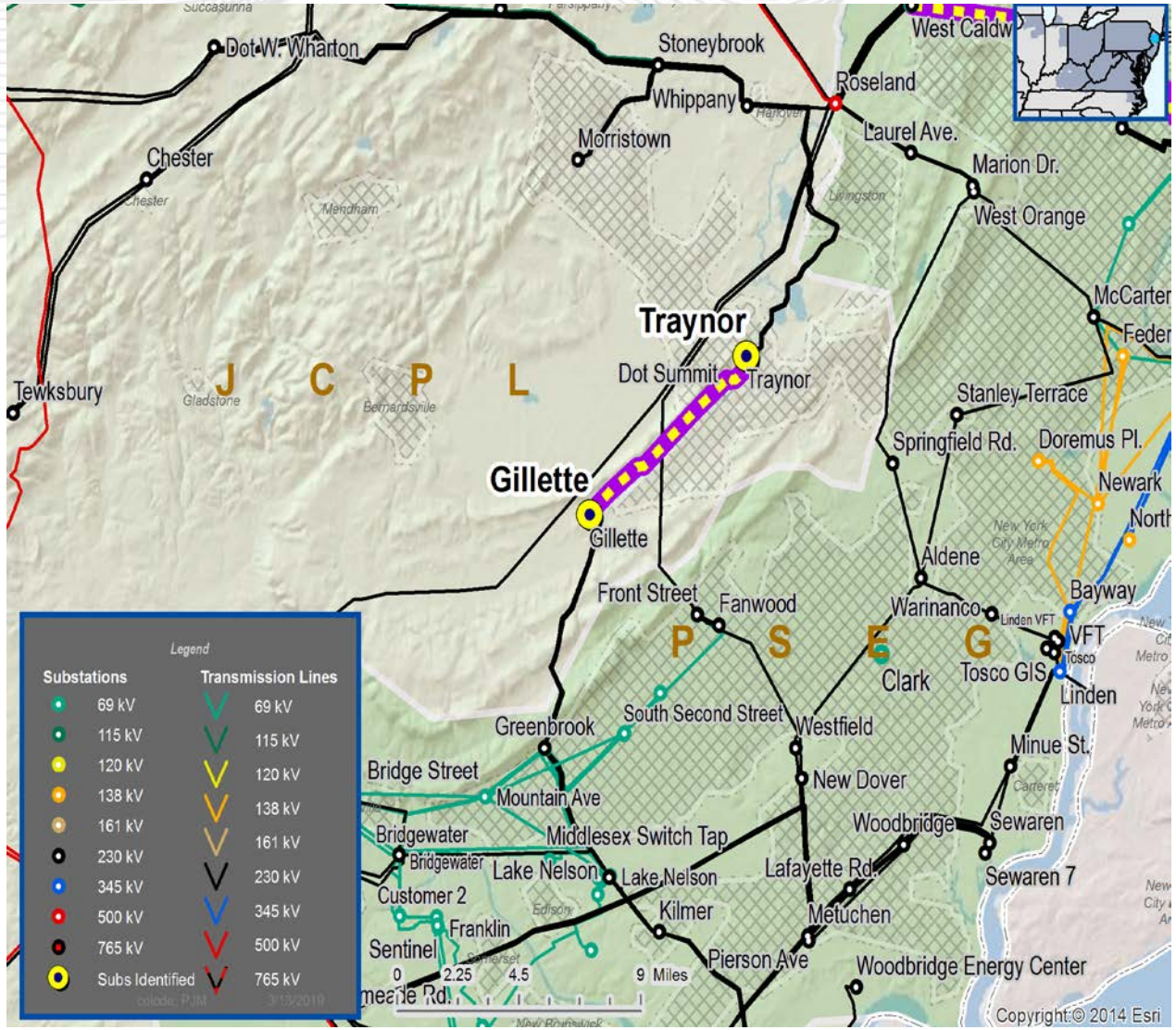
- Transmission line ratings are limited by terminal equipment.



JCP&L Transmission Zone

Need Number: JCPL-2019-017

Problem Statement

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
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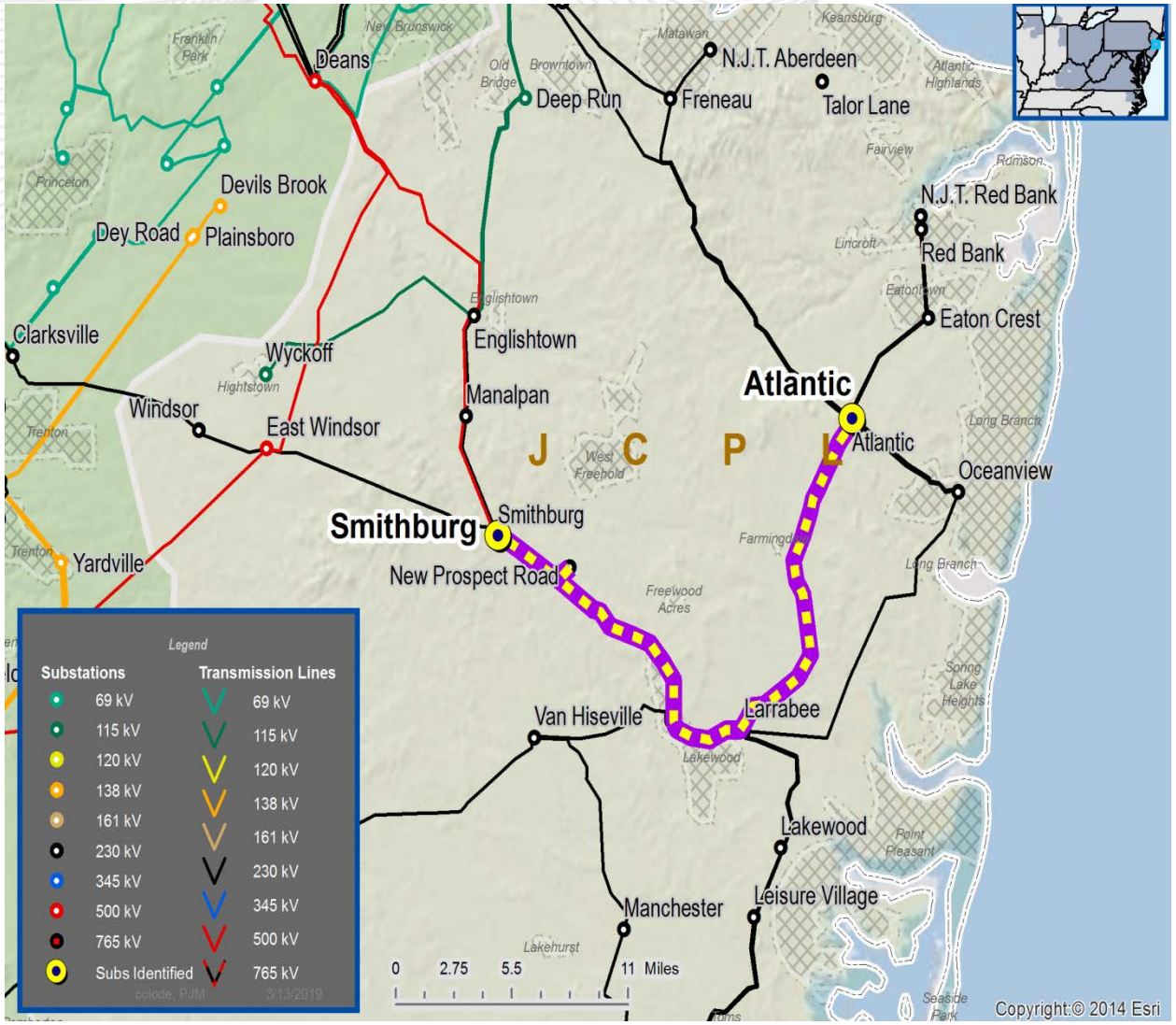
- Transmission line ratings are limited by terminal equipment.



JCP&L Transmission Zone

Need Number: JCPL-2019-019

Problem Statement

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
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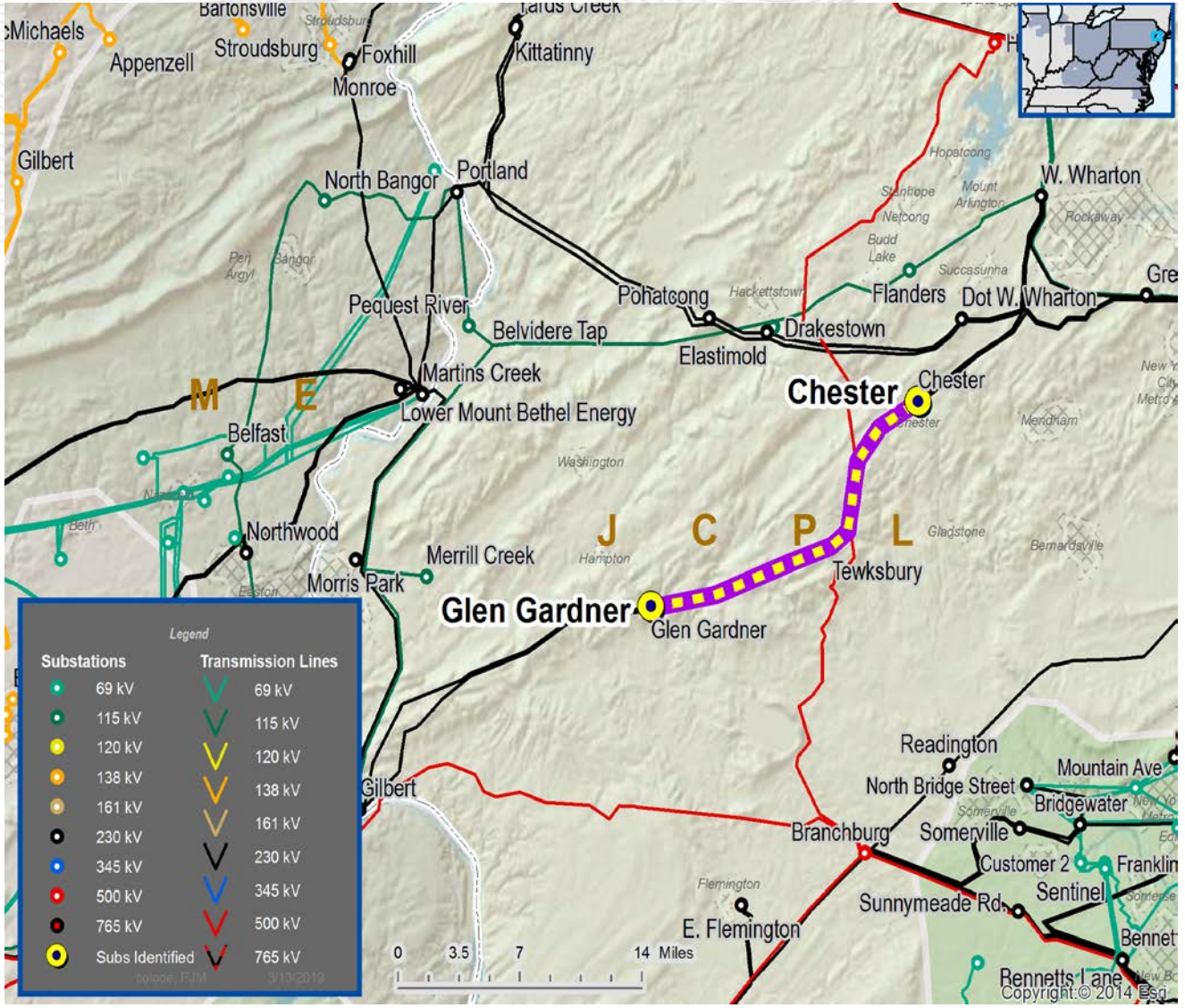

JCP&L Transmission Zone

Need Number: JCPL-2019-020

Problem Statement

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
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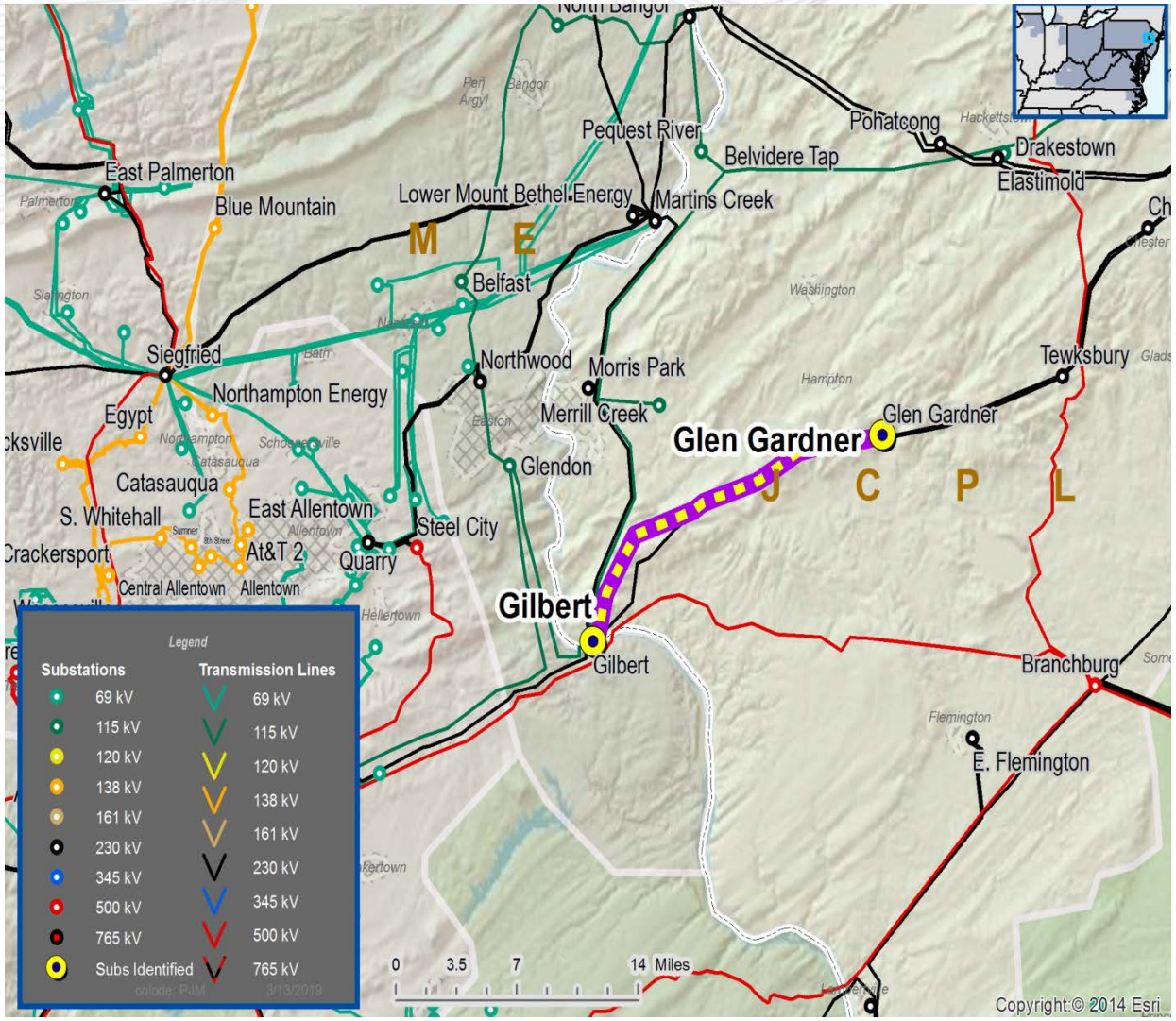
- Transmission line ratings are limited by terminal equipment.



JCP&L Transmission Zone

Need Number: JCPL-2019-021

Problem Statement

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
- Proper operation of the protection scheme requires all the separate components perform adequately during a fault.
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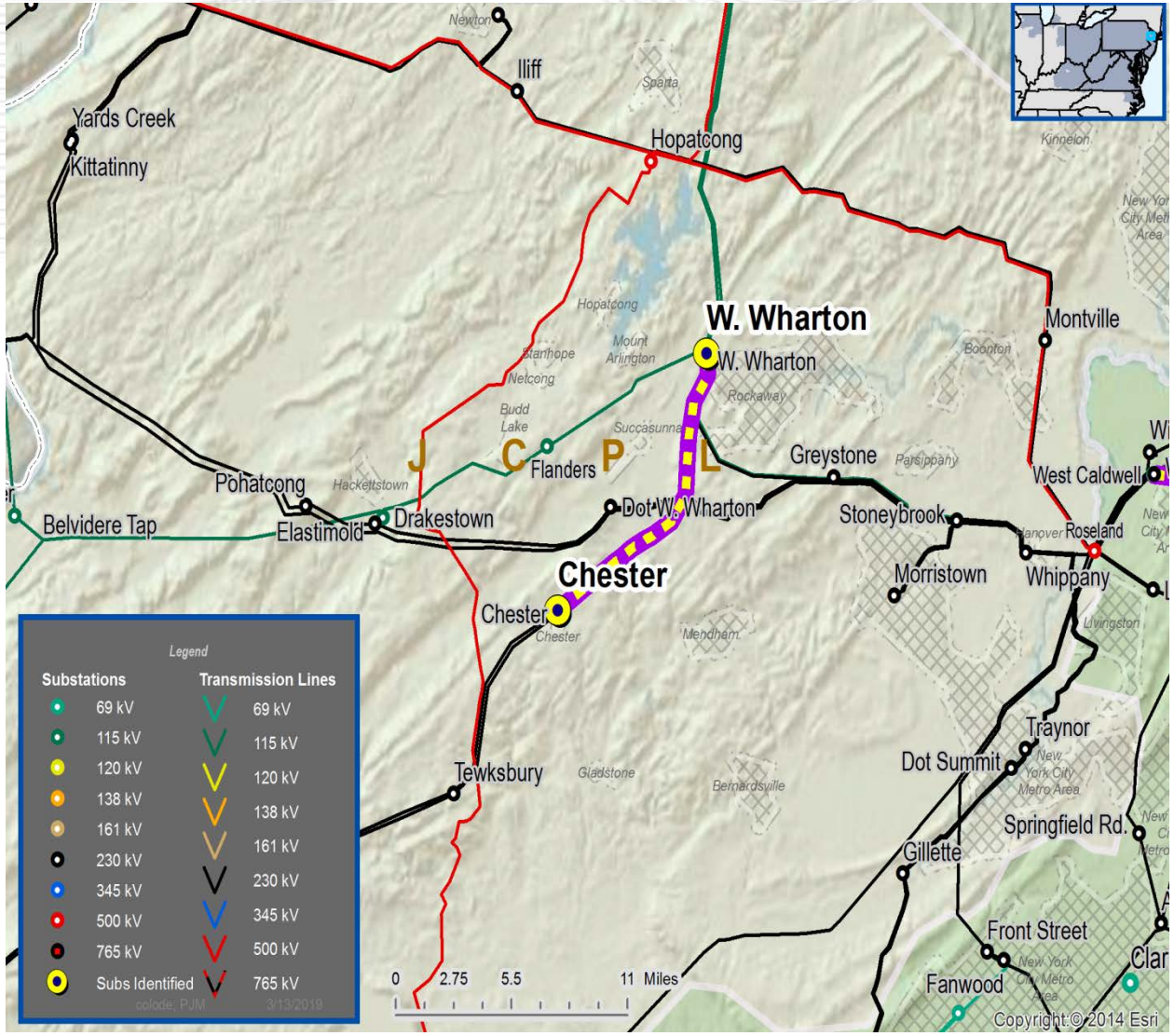


JCP&L Transmission Zone

Need Number: JCPL-2019-028

Process Stage: Need Meeting

Date: 04/11/2019

Project Driver(s):

Equipment Material Condition, Operational Flexibility and Efficiency

Specific Assumption Reference(s)

System Performance Projects Global Factors

- Past system reliability and performance

Permanent Reactive Device Installations

- Reactive device with multiple trips in recent years
- Reactive device to reduce high voltage

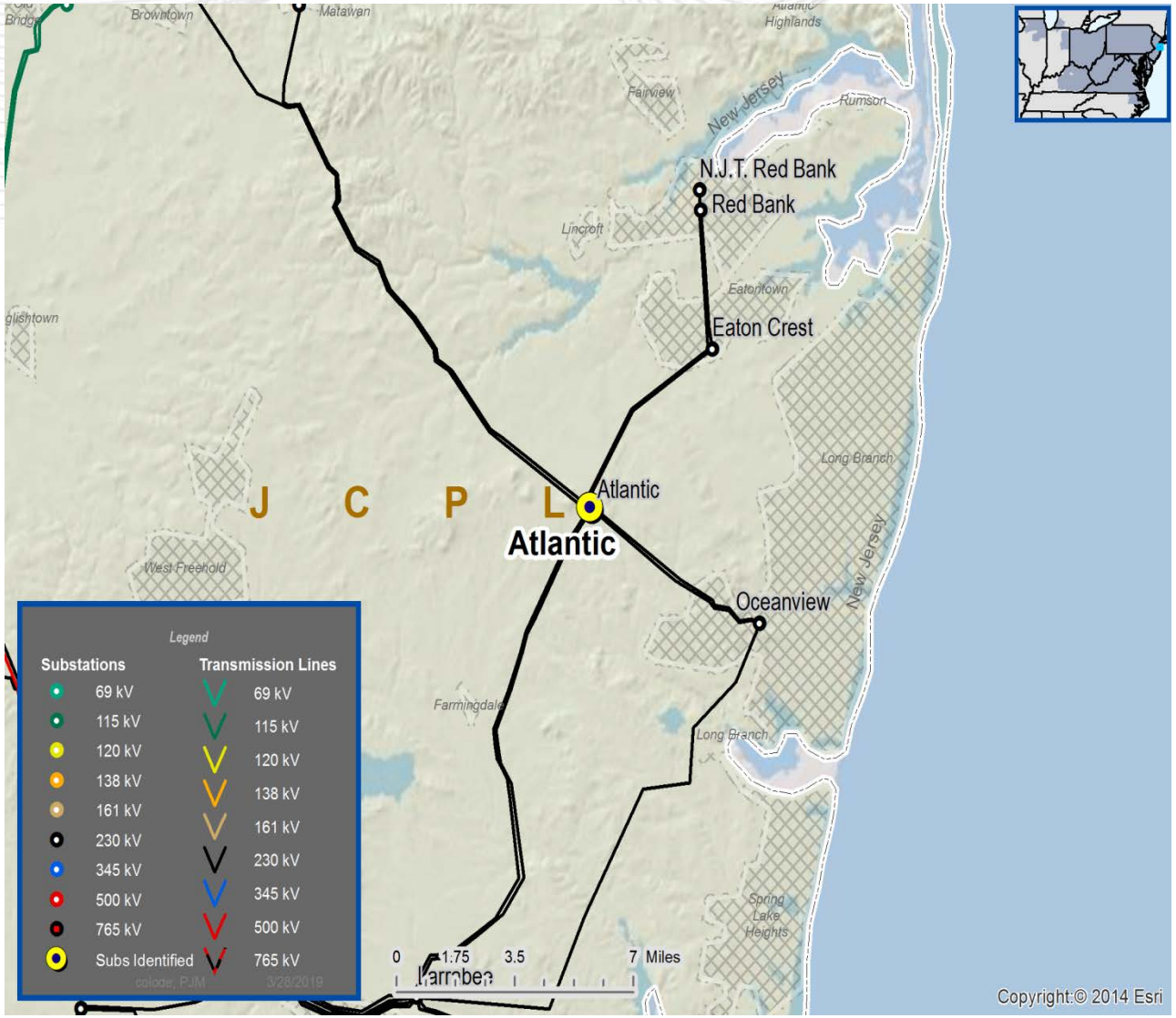
Substation Condition Rebuild/Replacement

- Reactive power support system

Problem Statement

The Atlantic SVC has an increasing trend of outages and failures increasing maintenance needs.

High voltage on the 230 kV system has been observed at Atlantic substation with either the SVC in-service or out-of-service. The 230 kV voltage at Atlantic substation with the SVC in-service has been measured as high as 1.06 per unit. With the SVC out-of-service the measured system voltage was as high as 1.07 per unit.



Questions?

Appendix

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

4/1/2019 – V1 – Original version posted to pjm.com