Subregional RTEP Committee
Mid-Atlantic Area

September 12, 2008

JCPL N-2 Baseline Upgrades

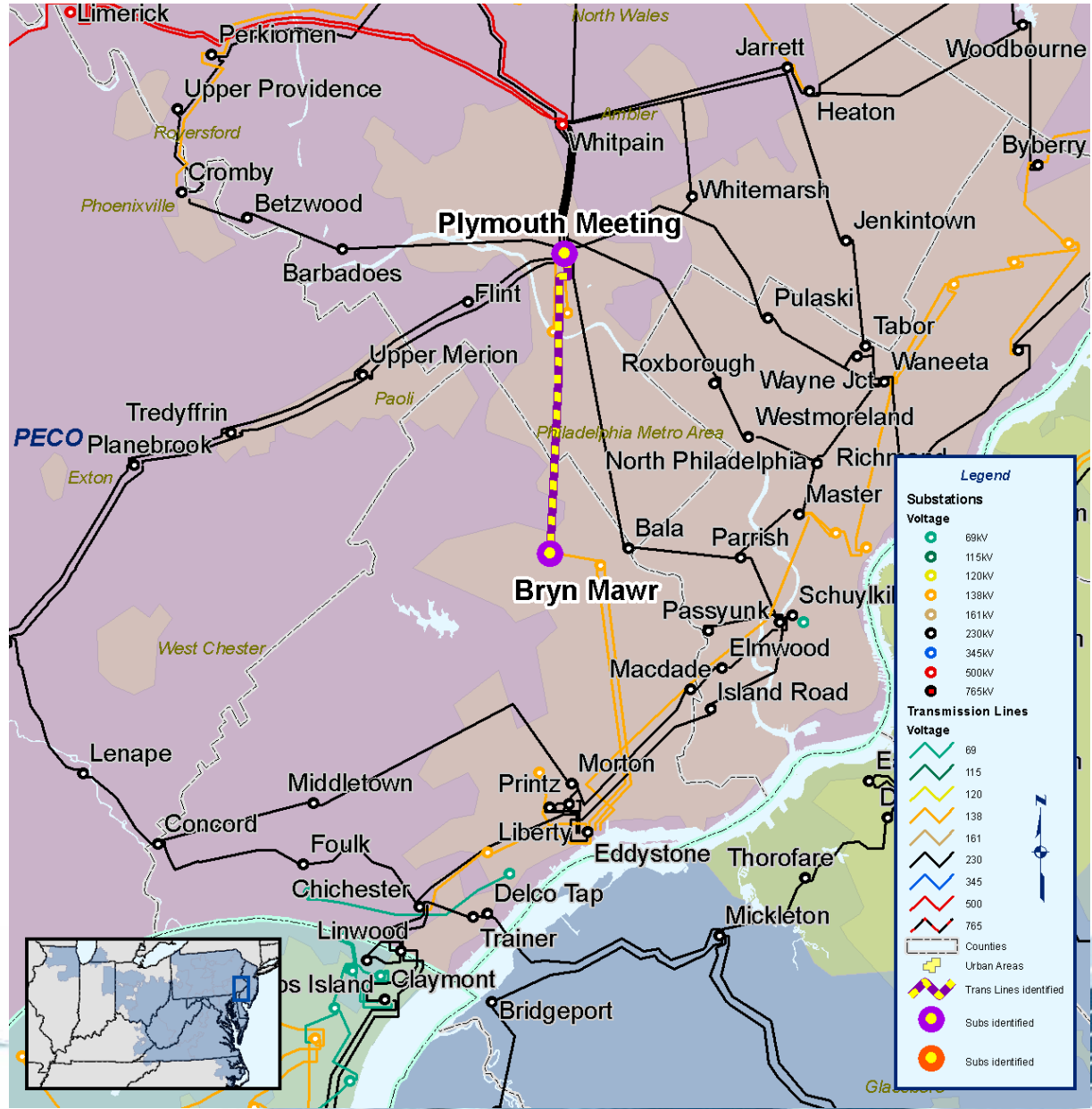
JCPL N-2 Baseline Upgrades

- Werner – Raritan River 115 kV line / loss of Smithburg-Englishtown 230 kV line + loss of Raritan River 230/115 kV transformer
- Werner 230/115 kV transformer / loss of Smithburg-Englishtown 230 kV line + loss of Raritan River 230/115 kV transformer
- Add a 2nd Raritan River 230/115 kV transformer
- Estimated Project Cost: ???
- Expected IS Date: 6/01/2013

PECO N-2 Baseline Upgrades

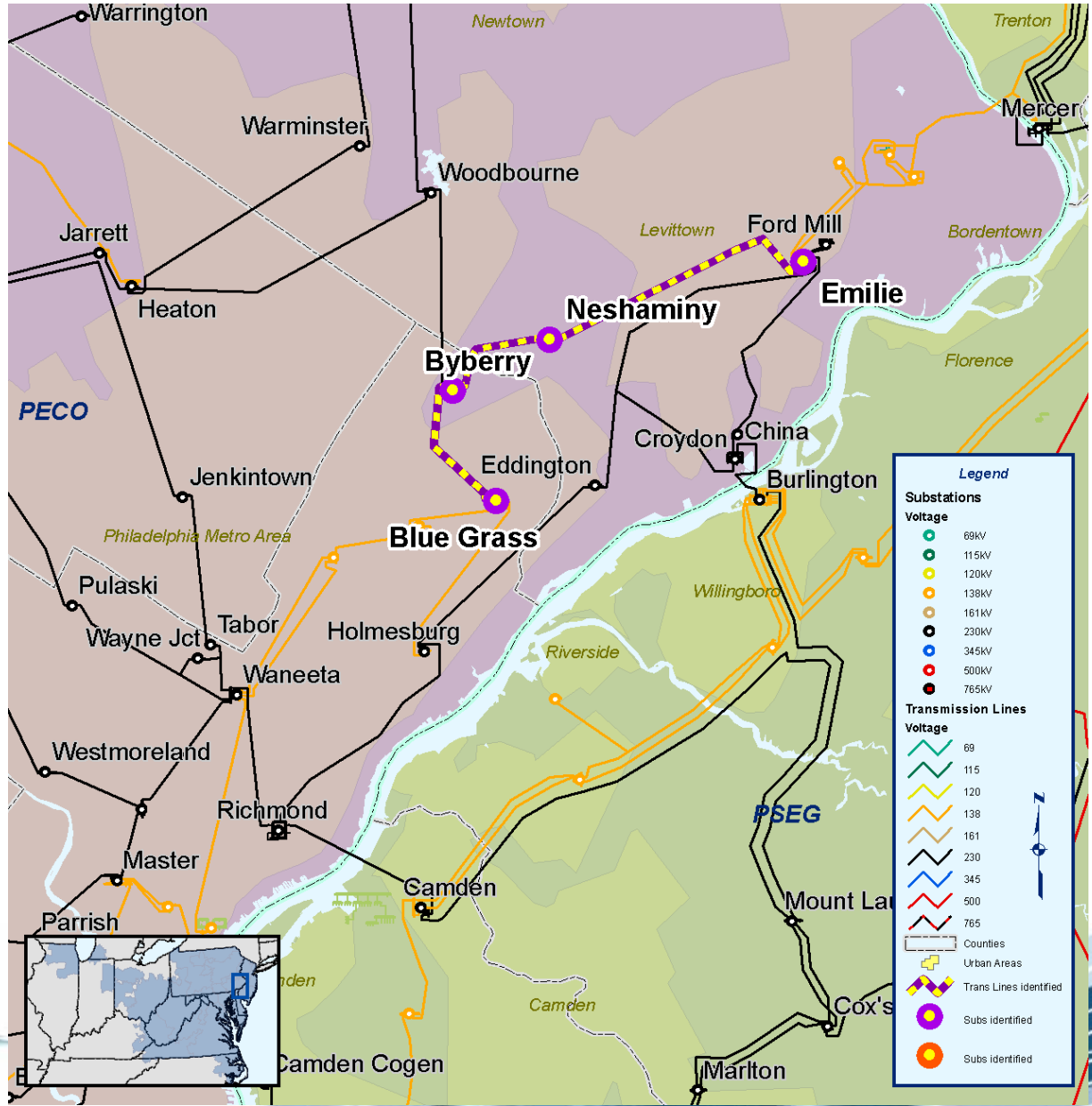
PECO N-2 Baseline Upgrades

- Bryn Mawr – Plymouth Meeting 138 kV line / loss of Llanerch - Eddystone CKT 130-42 138 kV line + basecase
- Bryn Mawr – Plymouth Meeting 138 kV line / loss of Llanerch – Eddystone CKT 130-42 138 kV line + loss of loss of Llanerch – Eddystone CKT 130-45 138 kV line
- Rebuild Bryn Mawr – Plymouth Meeting 138 kV line
- Estimated Project Cost: $12.5 M
- Expected IS Date: 6/01/2013



PECO N-2 Baseline Upgrades

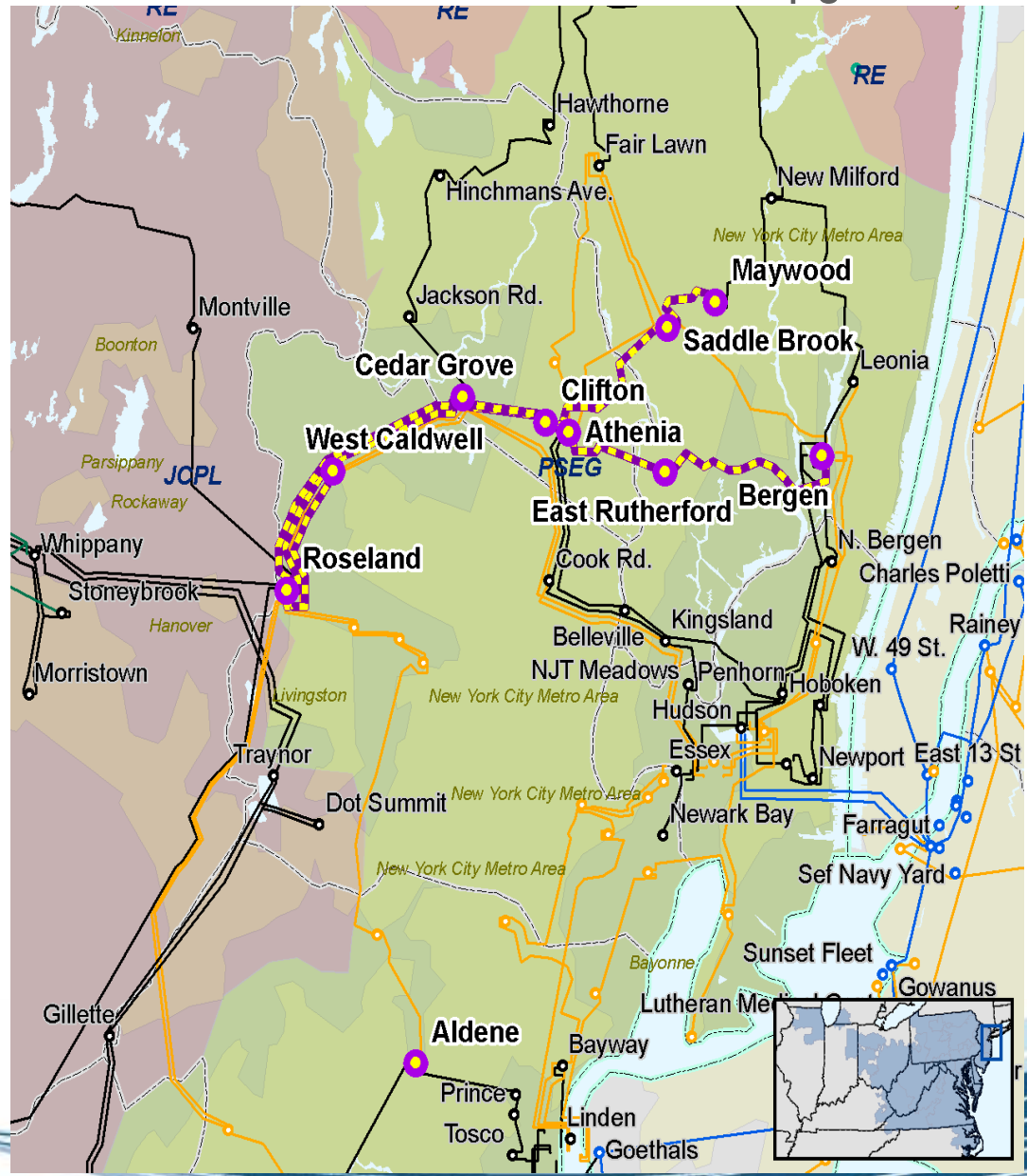
- Bluegrass – Byberry 138 kV line / loss of Woodbourne – Byberry 230 kV line + loss of Neshaminy – Emilie 138 kV line
- Switching Procedure: If the Woodbourne - Byberry 230 kV line were to occur first, then open the low side of Neshaminy #17 transformer so that all of the load (94 MVA) at Neshaminy will be dropped when the Neshaminy - Emilie 138 kV line contingency occurs
- Switching Procedure : If the Neshaminy - Emilie 138 kV line contingency were to occur first, then open the Byberry 17-18, 18-19 and 20-21 bus ties so that 85 MVA of Byberry load will be dropped when the Woodbourne – Byberry 230 kV line contingency occurs
- Estimated Project Cost: $0 M
- Expected IS Date: 6/01/2013



PS N-2 Baseline Upgrades

PS N-2 Baseline Upgrades

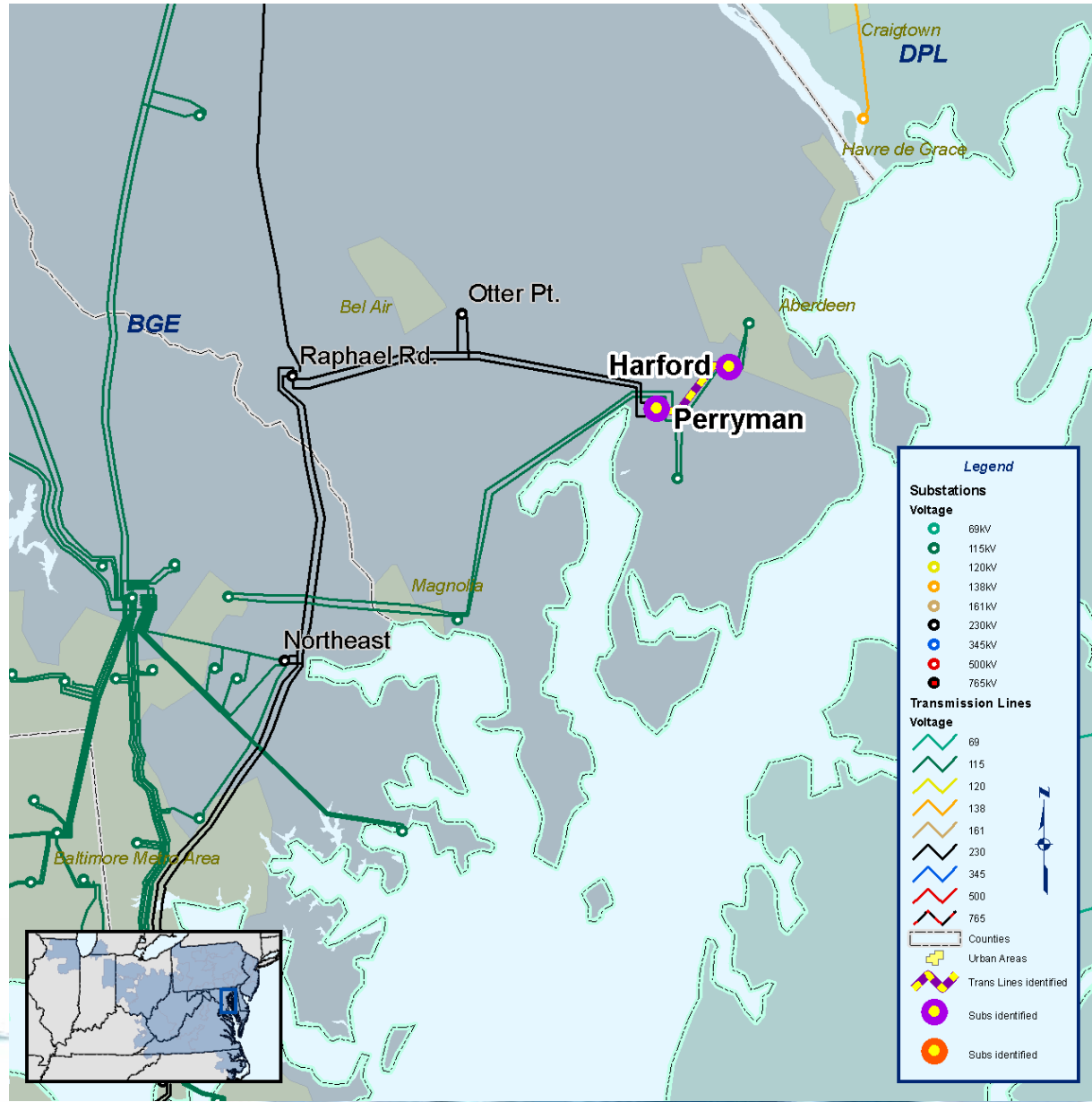
- There were a number of 2013 N-2 violations in the PS zone
- All of them were 230 kV except for two that involved subregional facilities
- East Rutherford – Bergen DMY Tap 138 kV line / loss of East Rutherford – Athenia 138 kV line + basecase
- Aldene 230/138 kV transformer / loss of Roseland – West Orange T 138 kV + basecase
- All of these are resolved by either the 230 kV or 500 kV upgrades that have been discussed at previous TEAC meetings



BGE N-1 Baseline Upgrades

BGE N-1 Baseline Upgrades

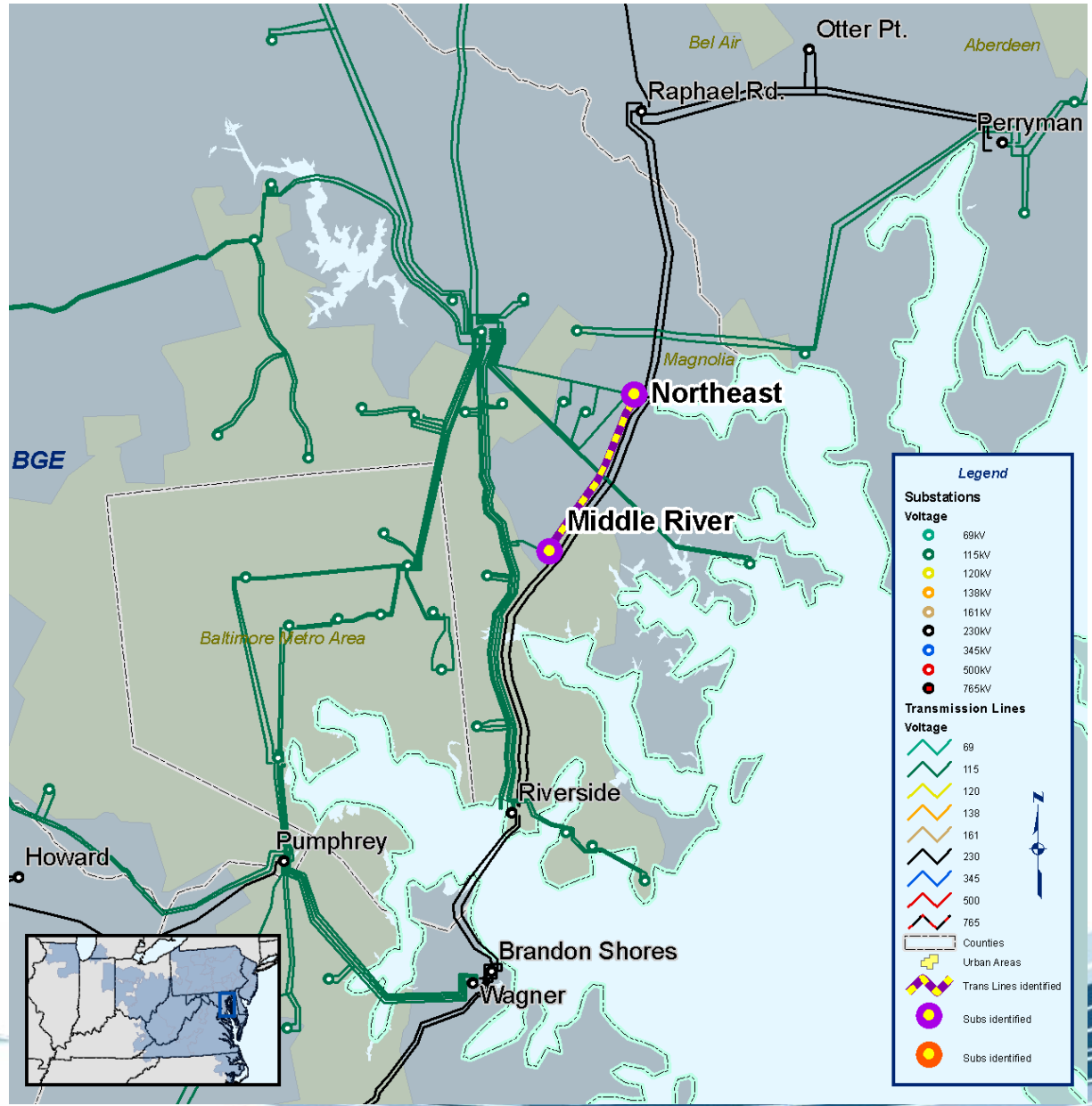
- Harford - Perryman 110615-A 115 kV line / loss of Harford - Perryman 110616-A 115 kV line
- Harford - Perryman 110616-A 115 kV line / loss of Harford - Perryman 110615-A 115 kV line
- Rebuild both Harford - Perryman 115 kV lines 110615-A & 110616-A
- Estimated Project Cost: $8.0 M
- Expected IS Date: 6/01/2013



BGE N-2 Baseline Upgrades

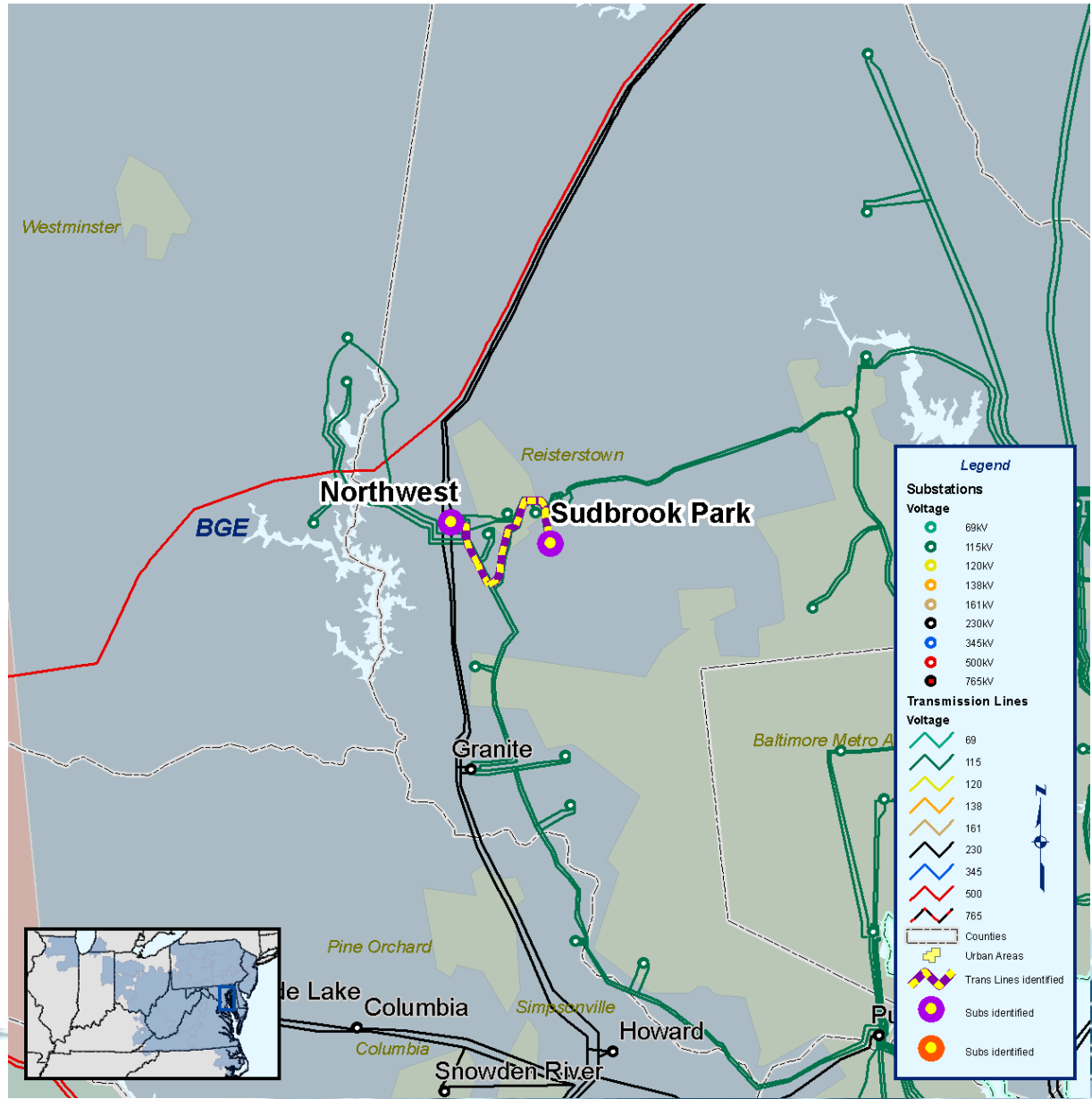
BGE N-2 Baseline Upgrades

- Middle River – Chesaco Park 115 kV line / loss of Middle River - Northeast 115 kV line + Basecase
- Still working through upgrade plan to resolve this violation.
- Expected IS Date: 6/01/2013



BGE N-2 Baseline Upgrades

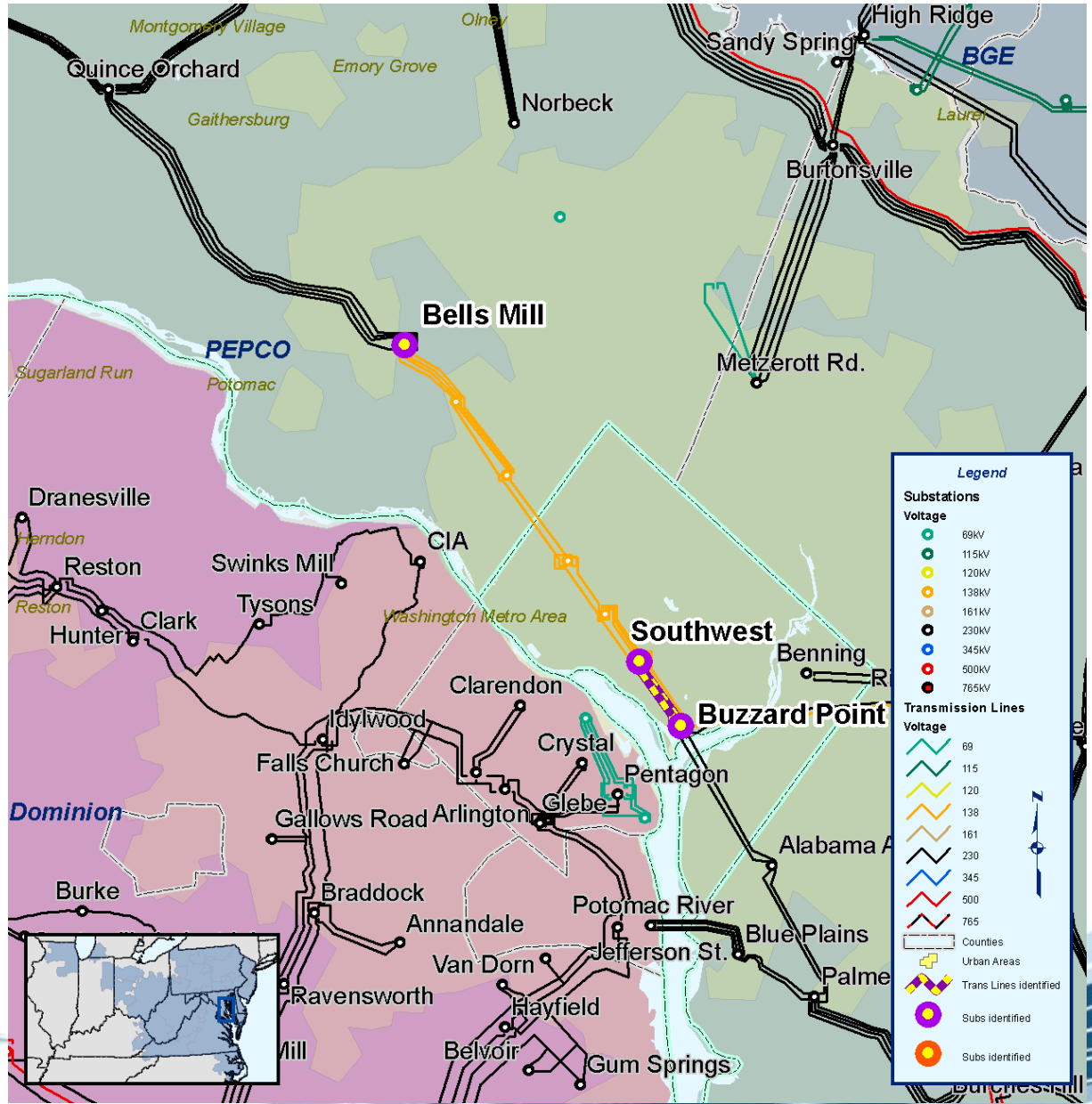
- Gwynnbrook - Sudbrook 110579-E 115 kV line / loss of Northwest – Sudbrook 110578 115 kV line + Basecase
- Still working through upgrade plan to resolve this violation.
- Expected IS Date: 6/01/2013



PEPCO N-2 Baseline Upgrades

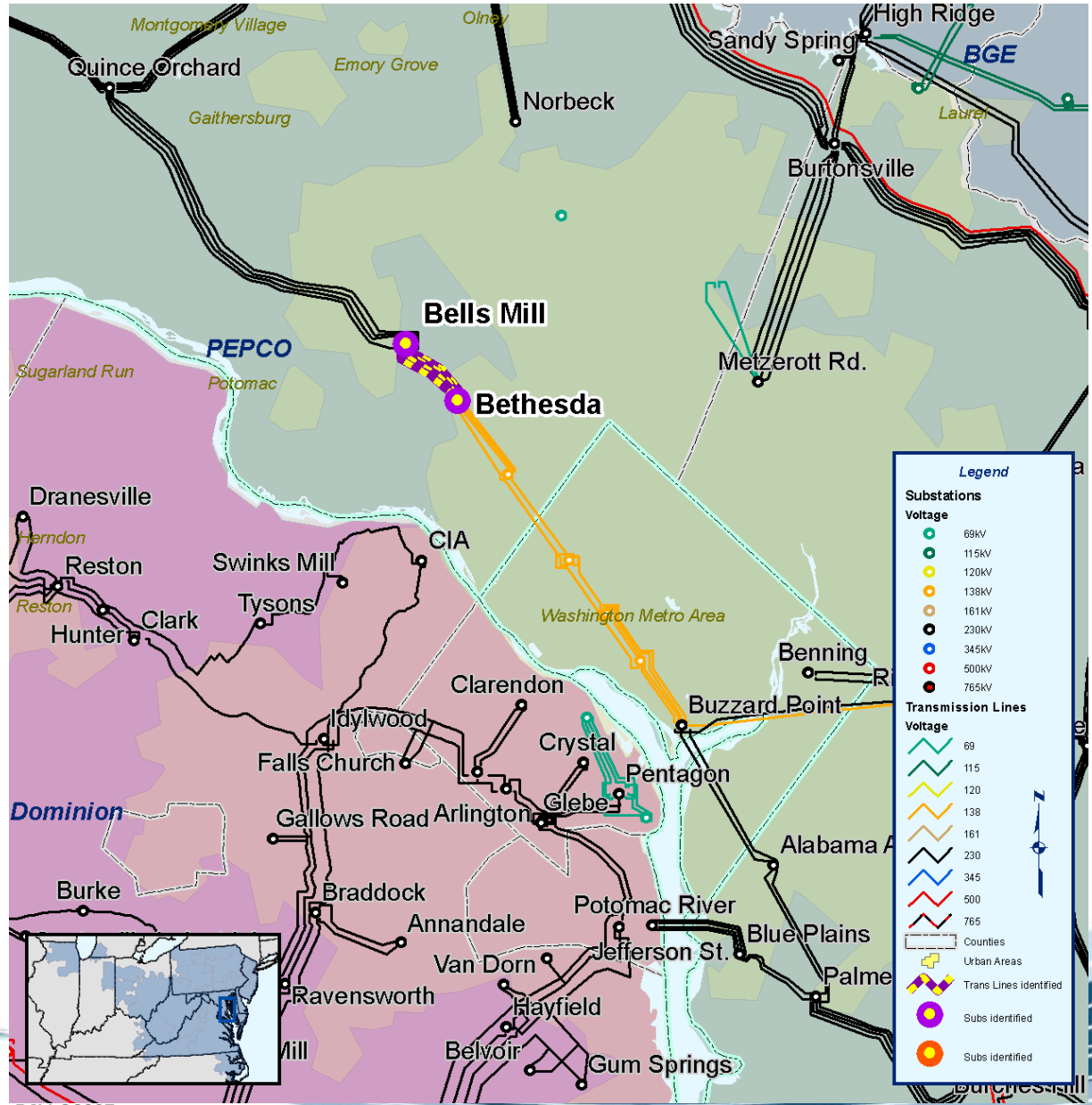
PEPCO N-2 Issue

- Bells Mill Road 031 230/138 kV transformer / loss of Bells Mill Road 028 230 kV bus + loss of Bells Mill Road 029 230 kV bus
- Bells Mill Road 030 230/138 kV transformer / loss of Bells Mill Road 028 230 kV bus + loss of Bells Mill Road 029 230 kV bus
- Buzzard Point – Southwest #1 138 kV line / loss of Bells Mill Road 028 230 kV bus + loss of Buzzard Point – Southwest #2 138 kV line
- Buzzard Point – Southwest #2 138 kV line / loss of Bells Mill Road 028 230 kV bus + loss of Buzzard Point – Southwest #1 138 kV line



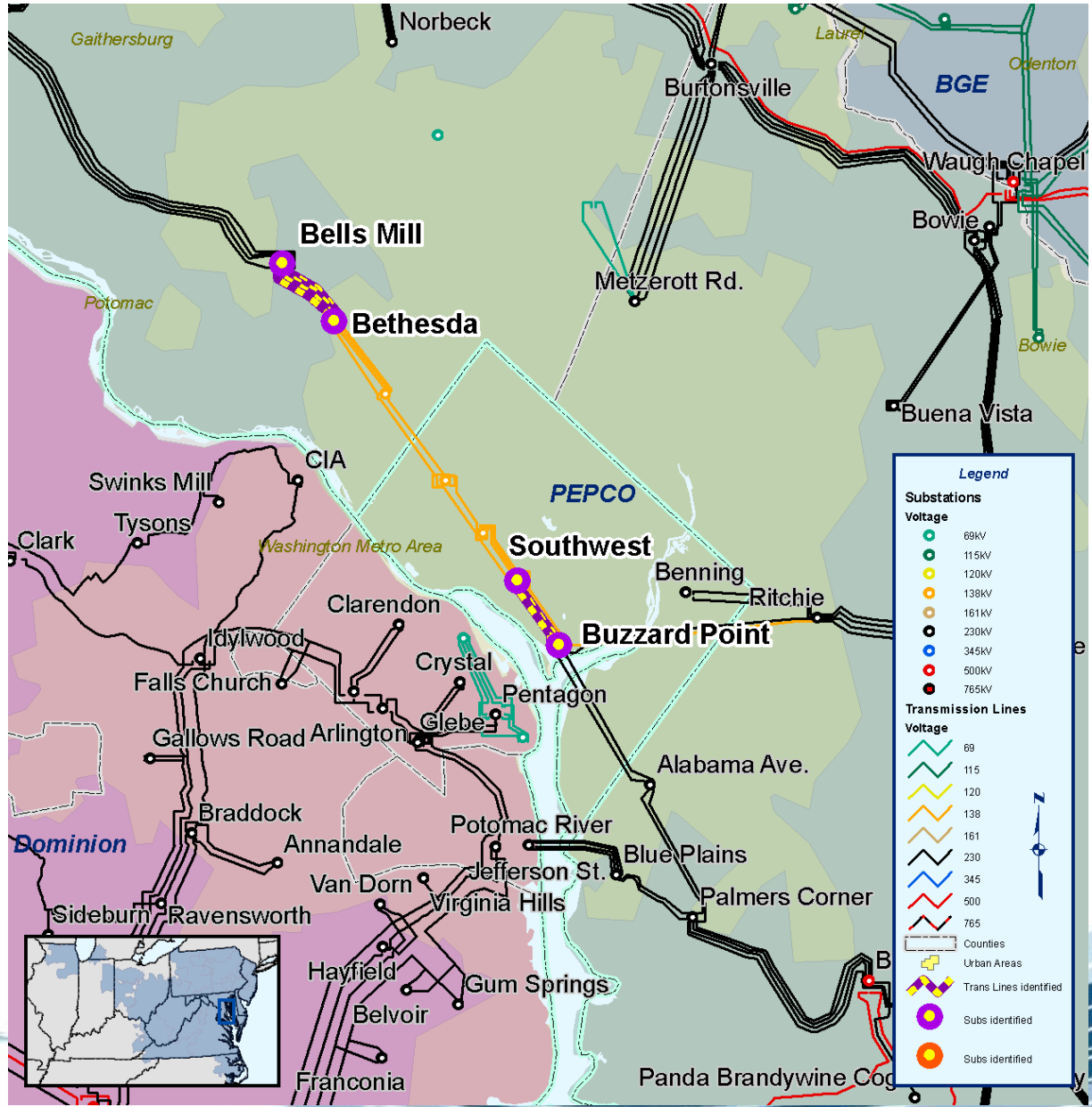
PEPCO N-2 Issues

- Bells Mill Road – Bethesda T5 138 kV line / loss of Bells Mill Road – Bethesda T8 138 kV line + loss of Bethesda T6 138 kV bus
- Bells Mill Road – Bethesda T6 138 kV line / loss of Bells Mill Road – Bethesda T8 138 kV line + loss of Bethesda T5 138 kV bus
- Bells Mill Road – Bethesda T7 138 kV line / loss of Vann – O Street 138 kV line + basecase
- Bells Mill Road – Bethesda T8 138 kV line / loss of Bells Mill Road – Bethesda T5 138 kV line + loss of Bethesda T6 138 kV bus



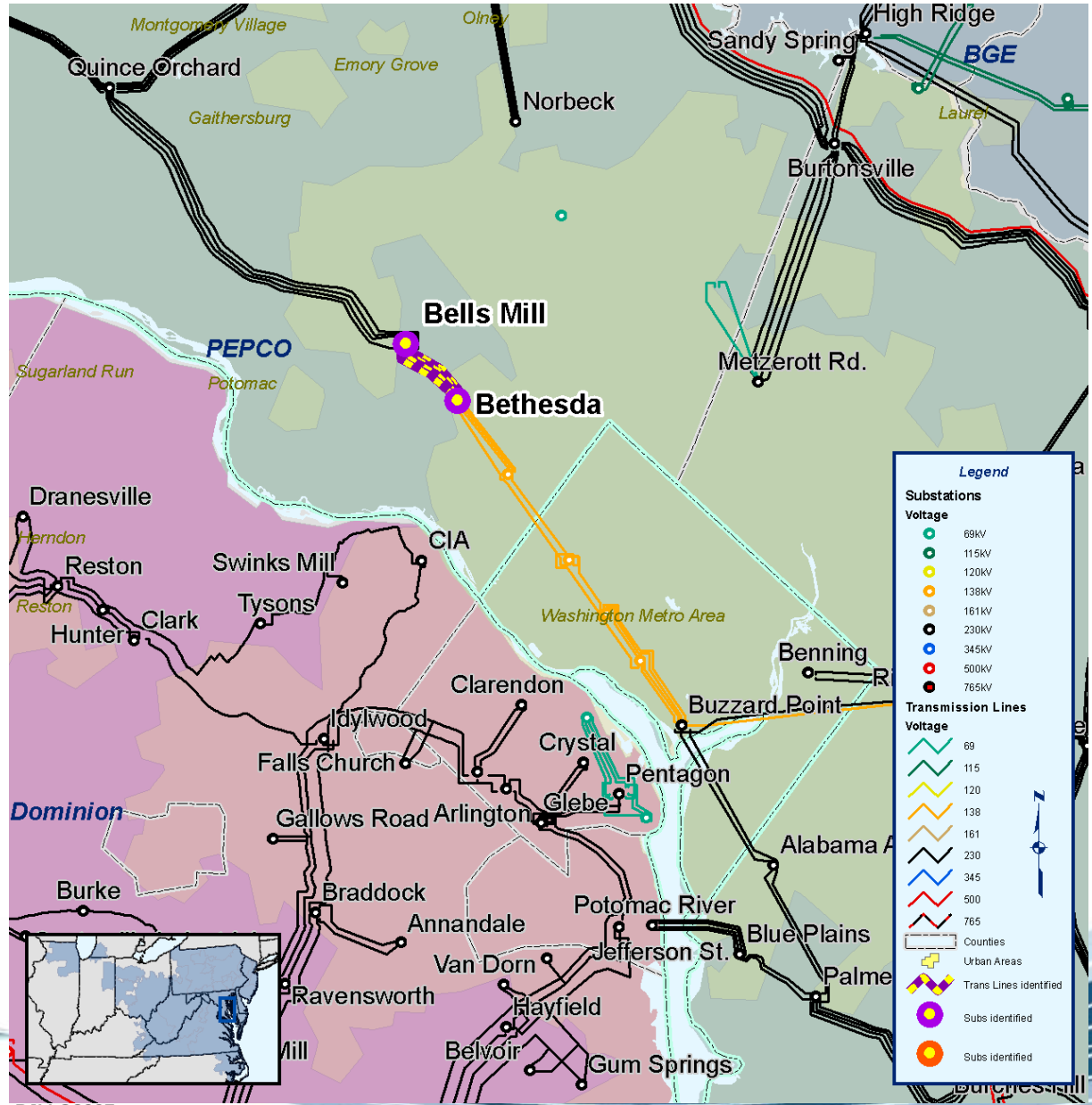
PEPCO N-2 Baseline Upgrades

- The following upgrades address the previous 8 violations:
- Add Slow Oil Circulation to the 4, Bells Mill Road – Bethesda 138 kV lines
- Add Slow Oil Circulation to the 2, Buzzard Point – Southwest 138 kV lines
- Increasing the thermal ratings of these 6 lines allows greater adjustment of the O Street Phase Shifters
- Estimated Project Cost: $6.0 M
- Expected IS Date: 6/01/2013



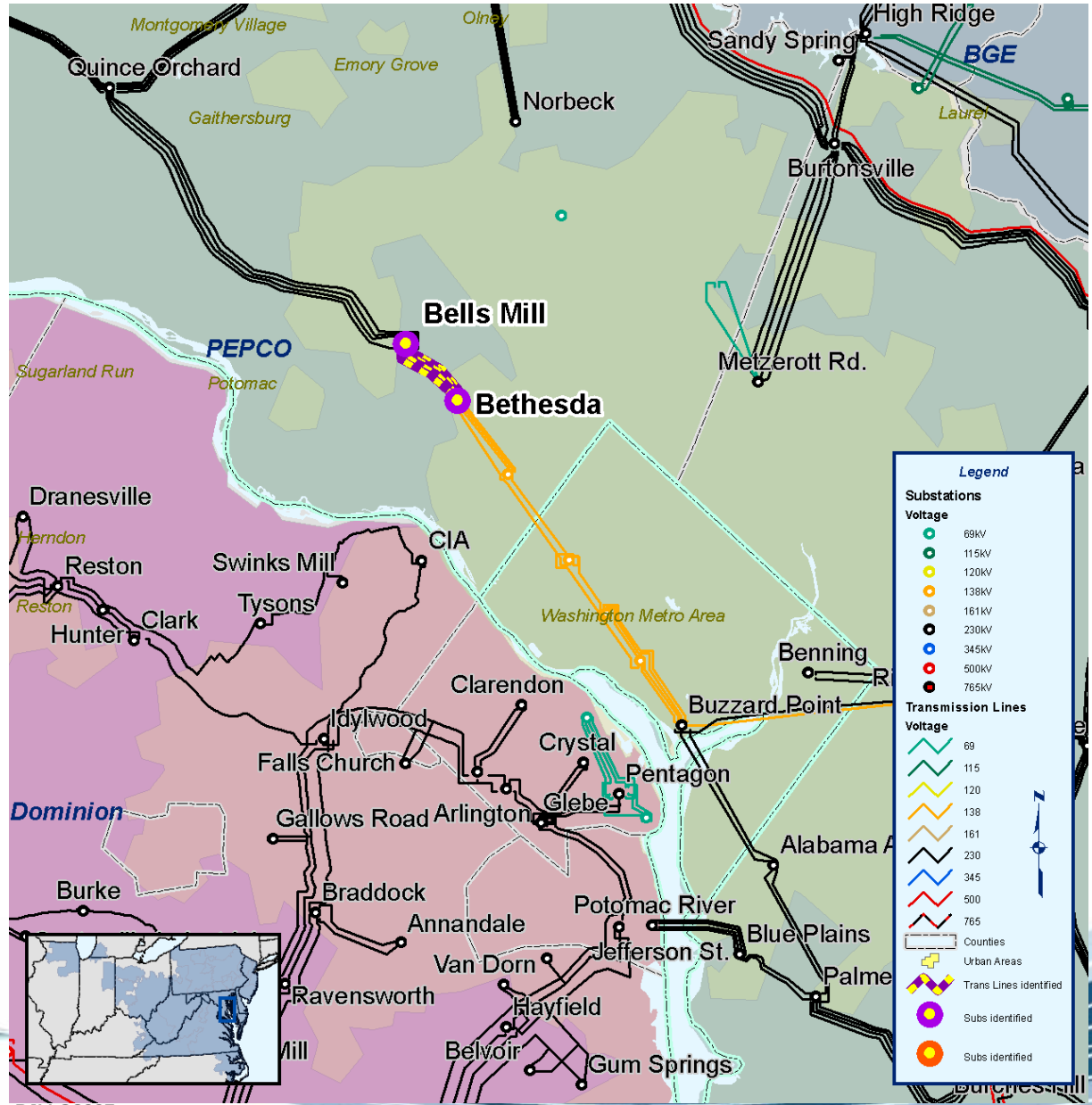
PEPCO N-2 Baseline Upgrades

- Bells Mill Road 031 230/138 kV transformer / loss of Bells Mill Road 028 230 kV bus + loss of Bells Mill Road 029 230 kV bus
- Bells Mill Road 030 230/138 kV transformer / loss of Bells Mill Road 028 230 kV bus + loss of Bells Mill Road 029 230 kV bus
- In addition to the Slow Oil Circulation upgrades and Phase Shifter adjustments, the following upgrade is needed to relieve these transformer overloads:
- Implement an SPS to automatically shed load on the 34 kV Bells Mill Road bus for this N-2 condition.



PEPCO N-2 Baseline Upgrades

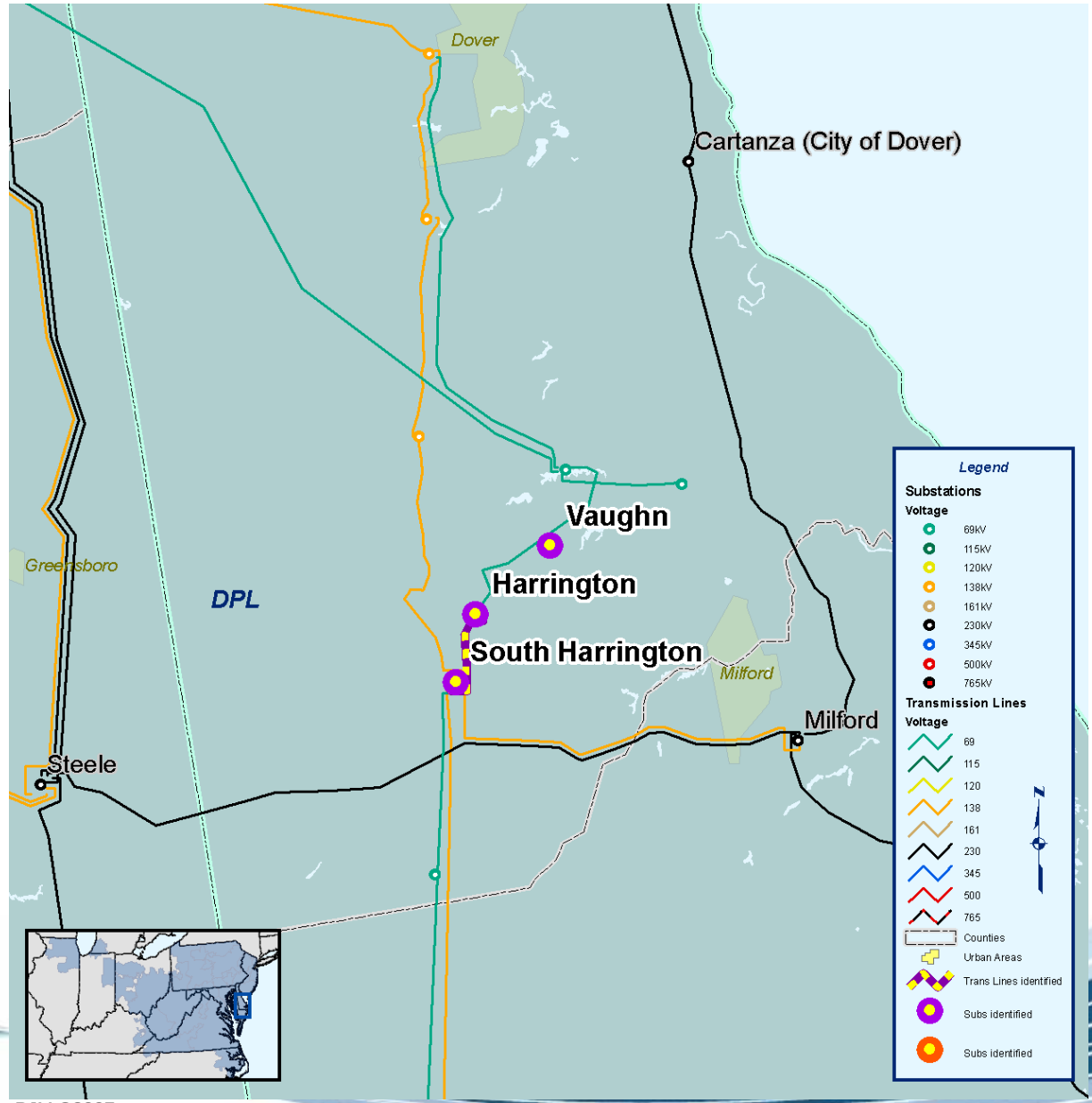
- The SPS will be in effect for years 2013 & 2014 until a 3rd Bells Mill 230/34 kV transformer is placed in-service in 2015.
- Cost Estimate: $0
- Expected IS Date: 6/01/2013



DPL N-1 Baseline Upgrades

DPL N-1 Baseline Upgrades

- Vaugh – Wells 69 kV line / loss of Harrington – South Harrington 69 kV line
- Rebuild Vaugh – Wells 69 kV line
- Estimated Project Cost: $1.6 M
- Expected IS Date: 6/01/2013

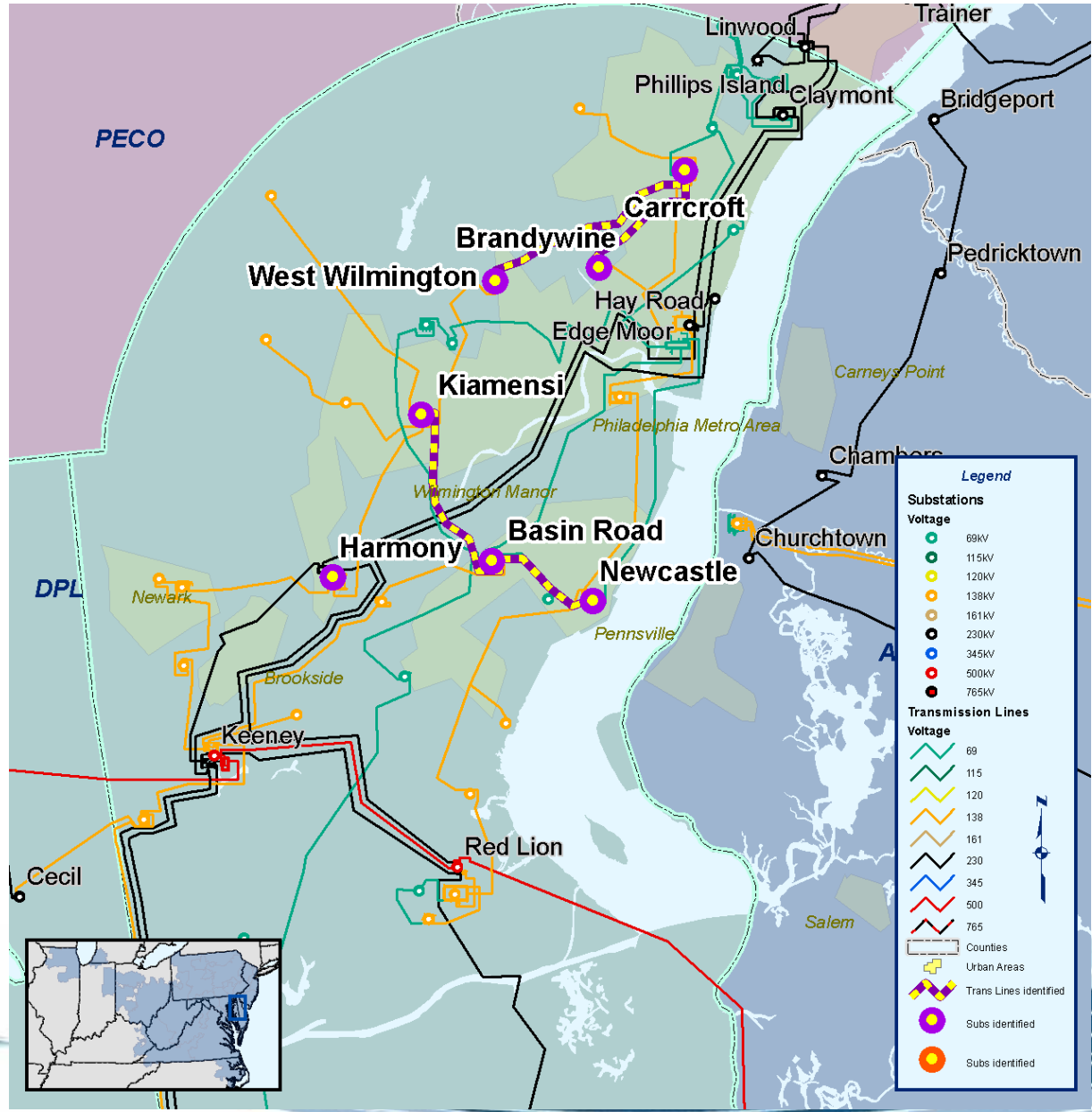


DPL N-2 Baseline Upgrades

DPL N-2 Baseline Upgrades

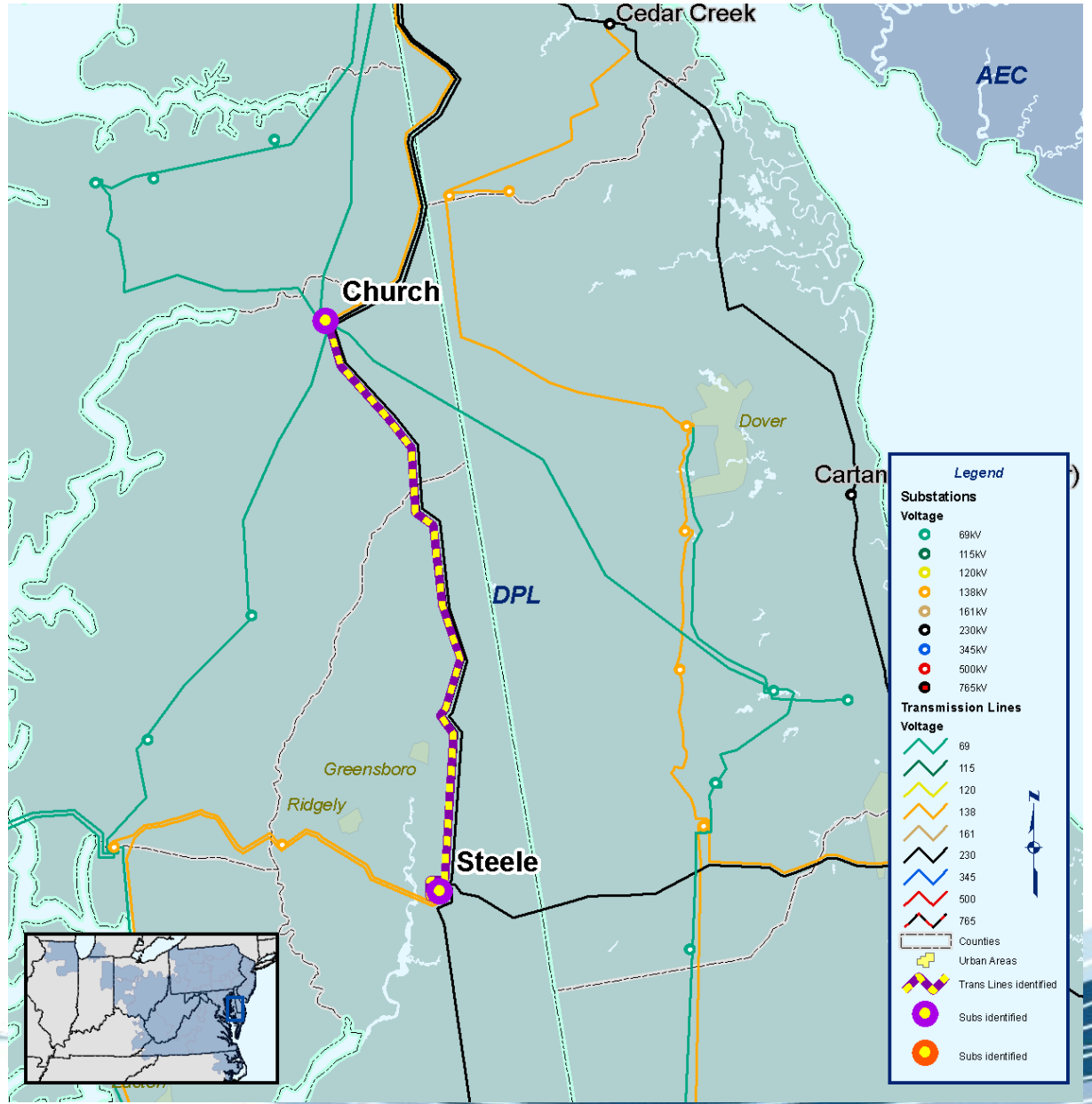
- Basin Road – Kiamensi 138 kV line / loss of Carrcroft – Edgemoor 138 kV line + loss of Harmony 230/138 kV transformer
- Brandywine – West Wilm 138 kV line / loss of Harmony 230/138 kV transformer + loss of Basin Road – Kiamensi 138 kV line
- Carrcroft - Brandywine 138 kV line / loss of Harmony 230/138 kV transformer + loss of Basin Road – Kiamensi 138 kV line
- Basin Road - Newcastle 138 kV line / loss of Harmony 230/138 kV transformer + loss of Keeney 230/138 kV transformer
- Add 2nd 230/138 kV transformer at Harmony
- Estimated Project Cost: $7.5M

• Expected IS Date: 6/01/2013



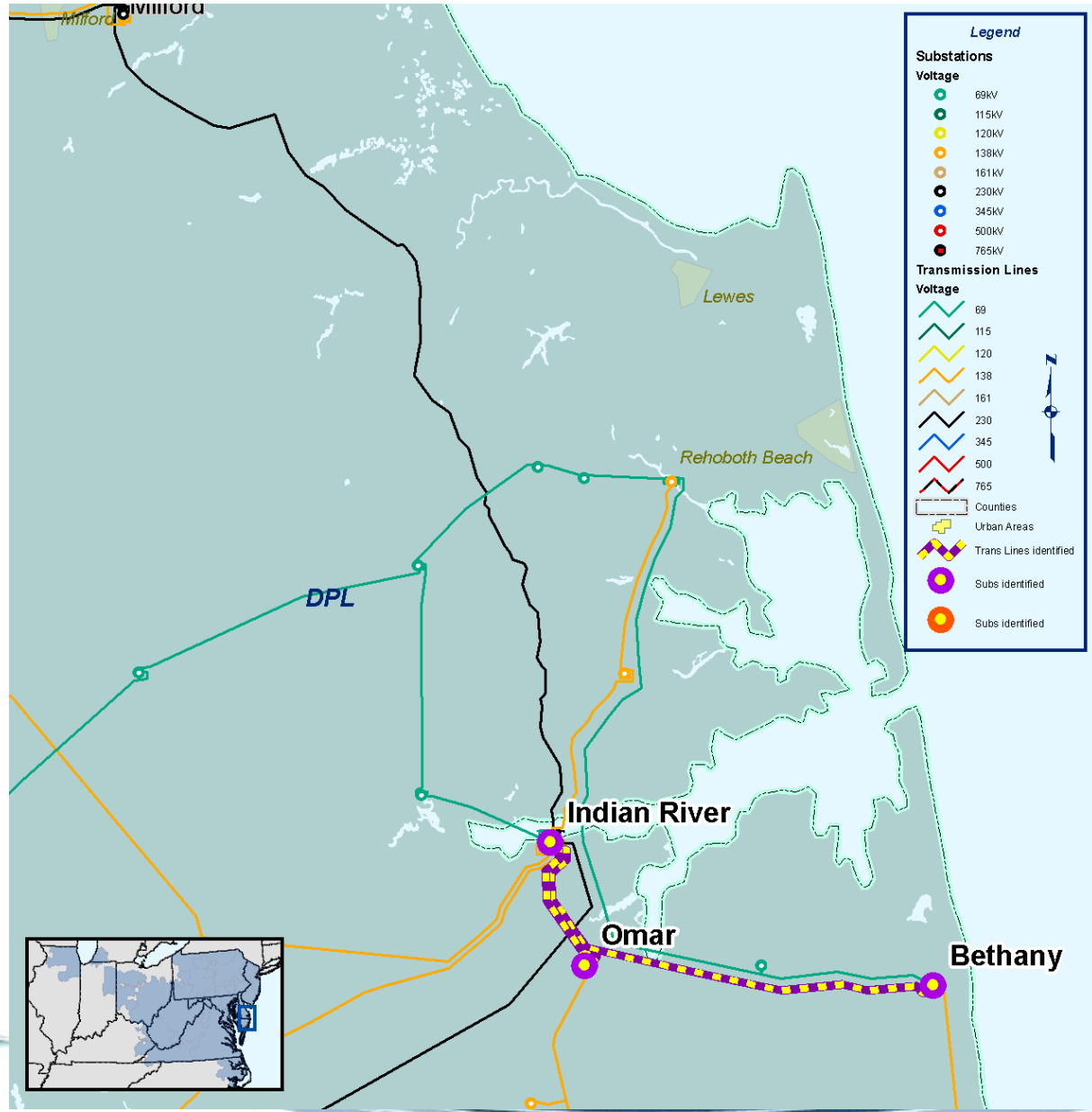
DPL N-2 Baseline Upgrades

- Oil City – Steele 138 kV line / loss of Glasgow – Mount Pleasant 138 kV line + loss of Lums - Reybold 138 kV line
- Oil City – Church 138 kV line / loss of Glasgow – Mount Pleasant 138 kV line + loss of Lums - Reybold 138 kV line
- Rebuild Church – Steele 138 kV line
- Estimated Project Cost: $20 M
- Expected IS Date: 6/01/2013



DPL N-2 Baseline Upgrades

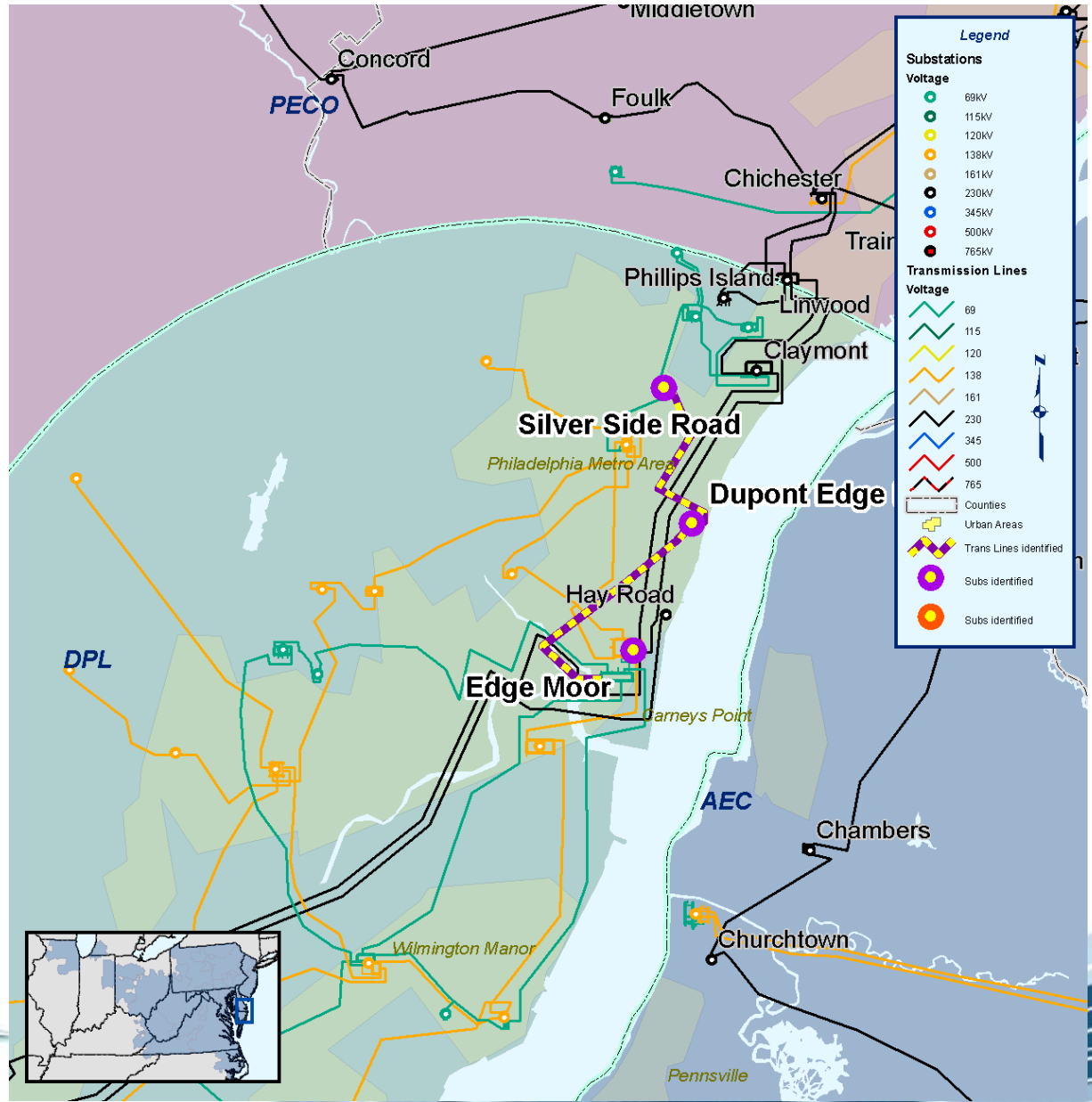
- Indian River - Omar 138 kV line / loss of Frankford- Bishop 138 kV line + loss of Indian River – Robinson 138 kV line
- Bethany - Omar 138 kV line / loss of Frankford- Bishop 138 kV line + loss of Indian River – Robinson 138 kV line
- Rebuild Indian River – Omar - Bethany 138 kV line
- Estimated Project Cost: $9.6 M
- Expected IS Date: 6/01/2013



DPL N-2 Baseline Upgrades

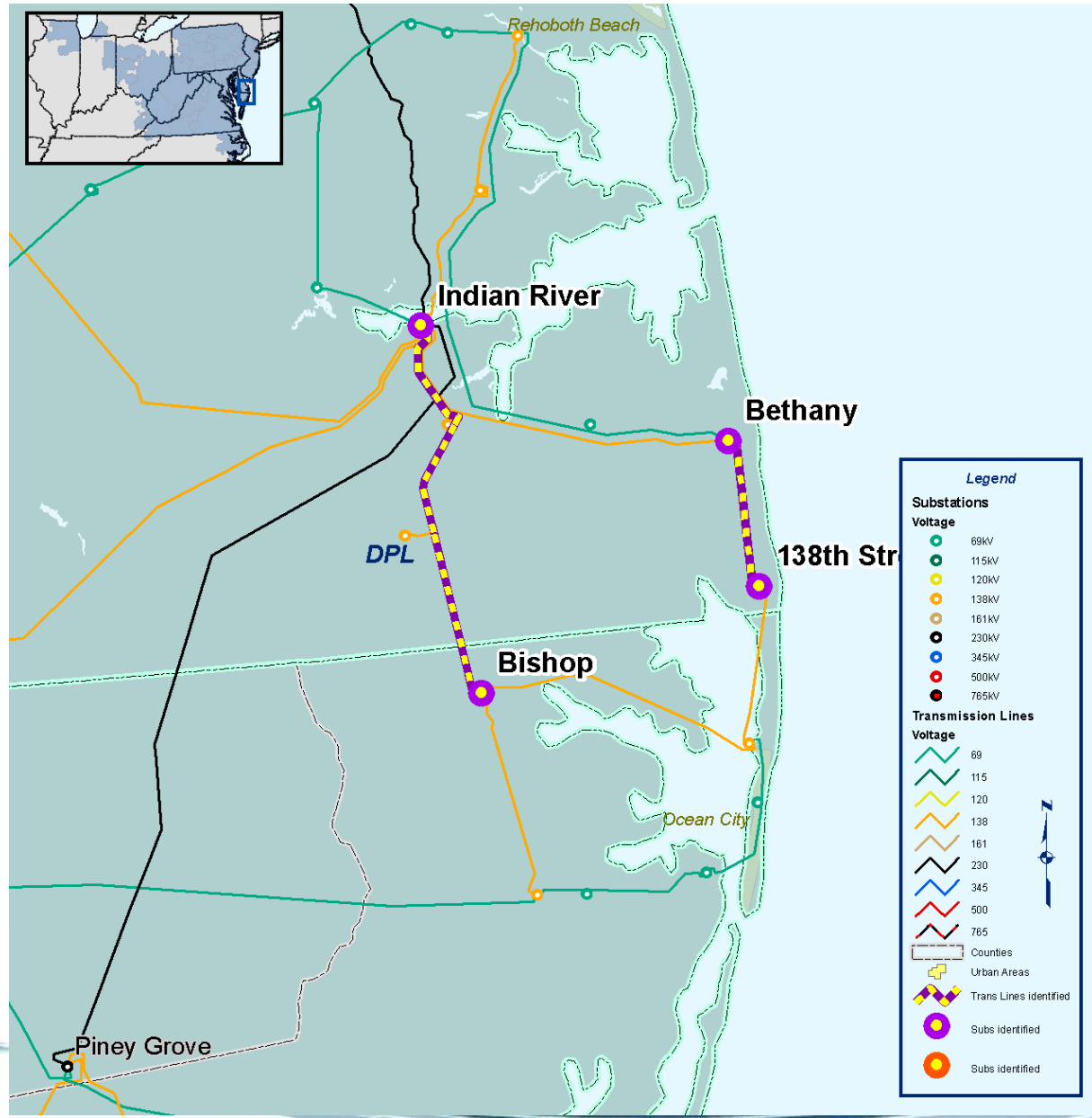
- Dumpont Edgemoor - Edgemoor 69 kV line / loss of Kiamensi - Silverbrook 138 kV line + loss of Carrcroft - Edgemoor 138 kV line
- Dumpont Edgemoor - Silverside 69 kV line / loss of Kiamensi - Silverbrook 138 kV line + loss of Carrcroft - Edgemoor 138 kV line
- Rebuild Dupont Edgemoor – Edgemoor – Silverside 69 kV line
- Estimated Project Cost: $5.0 M

• Expected IS Date: 6/01/2013



DPL N-2 Baseline Upgrades

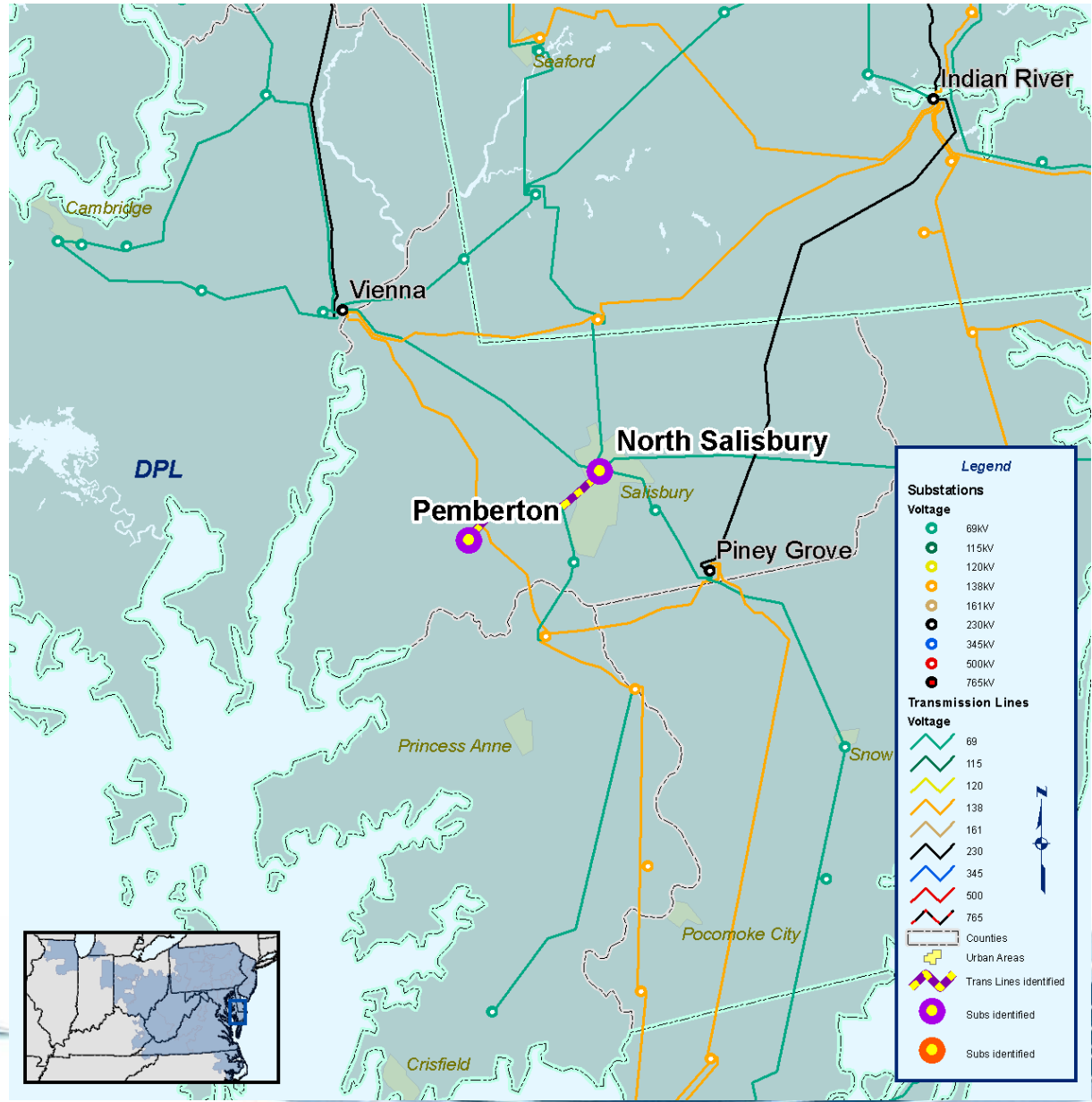
- Numerous 69 kV overloads involving 2 sets of contingencies related by the loss of Bethany – 138th Street 138 kV line + loss of either one of the two 138 kV lines out of Bishop
- Build a new Indian River – Bishop 138 kV line
- Estimated Project Cost: $18 M
- Expected IS Date: 6/01/2013



DPL N-2 Baseline Upgrades

- North Salisbury - Pemberton 69 kV line / loss of Oak Hall - Pocomoke 138 kV line + loss of Loretto 230/138 kV transformer
- Fruitland - Pemberton 69 kV line / loss of Oak Hall - Pocomoke 138 kV line + loss of Loretto 230/138 kV transformer
- Add a 2nd Loretto 230/138 kV transformer
- Estimated Project Cost: $4.5 M

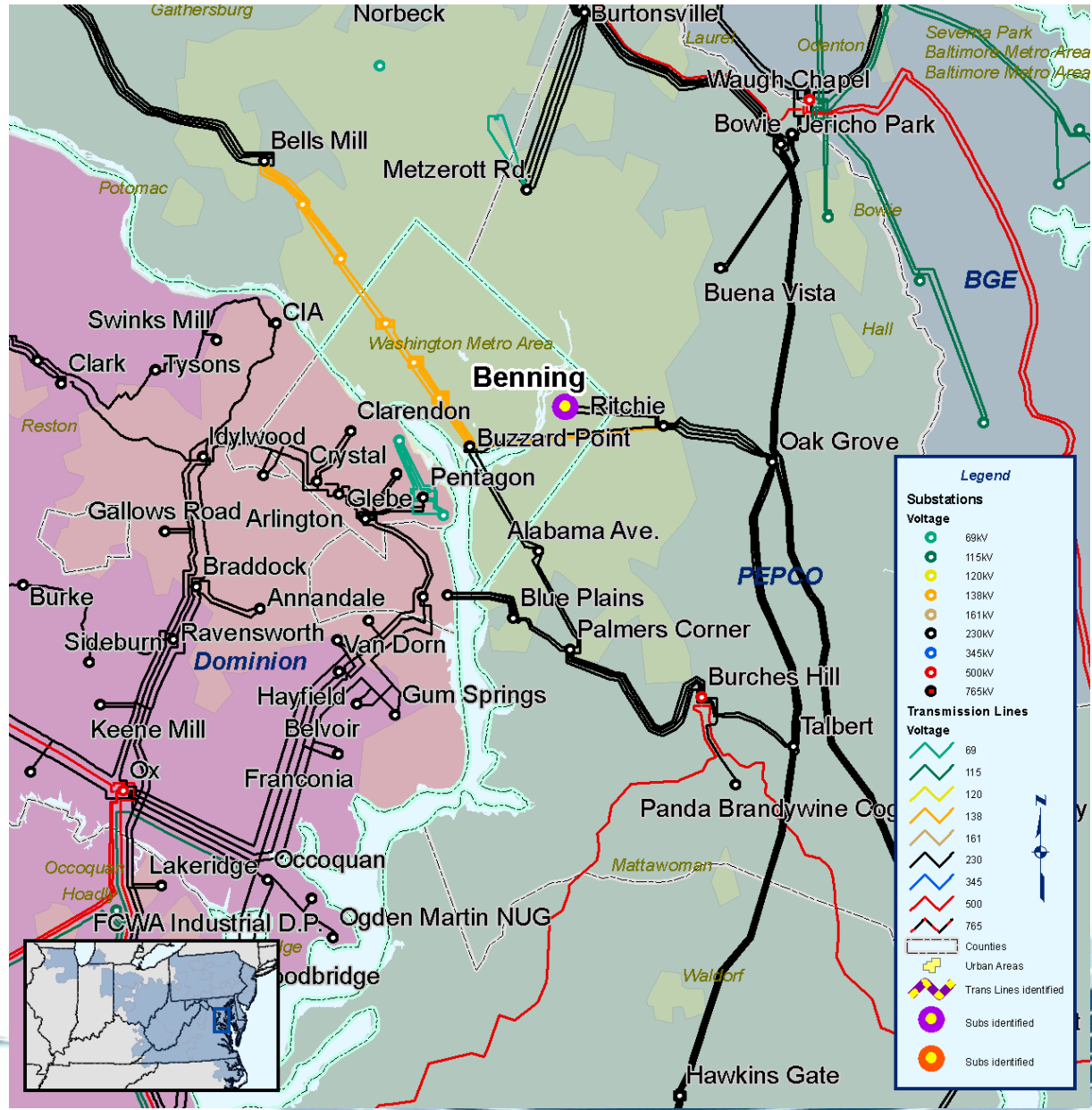
• Expected IS Date: 6/01/2013



PEPCO Supplemental Projects

PEPCO Supplemental Projects

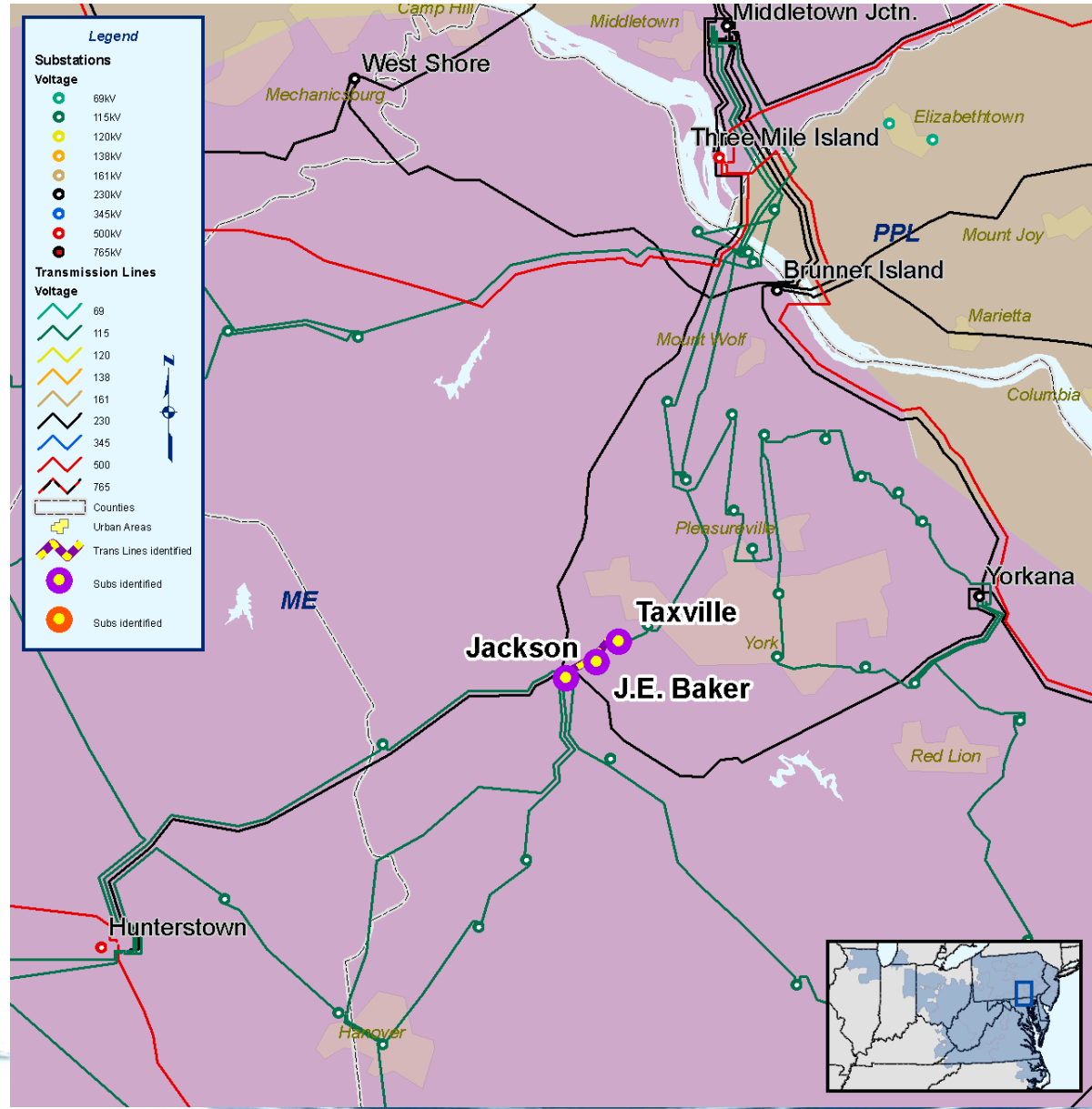
- Install 2, 50 MVAR capacitor banks on the Benning 69 kV bus
- Benning 69 kV bus is no a PJM Tariff facility
- Driver – Benning & Buzzard retirements
- IS Date: 6/01/2012



First Energy Baseline Projects

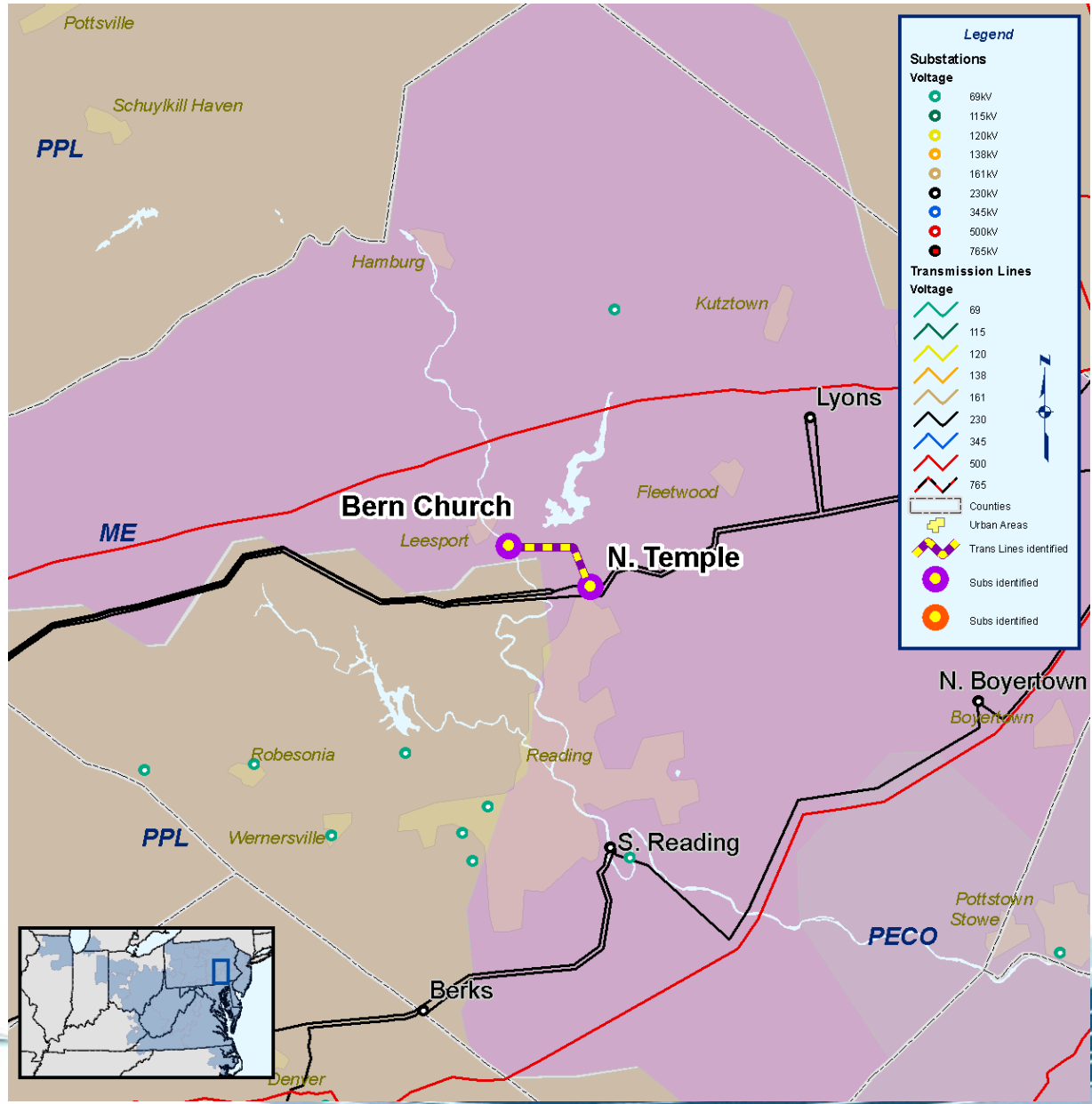
ME Baseline Upgrades

- Jackson-JE Baker Tap-Taxville 115 kV line / loss of the Yorkana 115 kV bus
- Reconductor Jackson-JE Baker Tap-Taxville 115 kV line
- Estimated Project Cost: $1.19 M
- Expected IS Date: 5/29/09



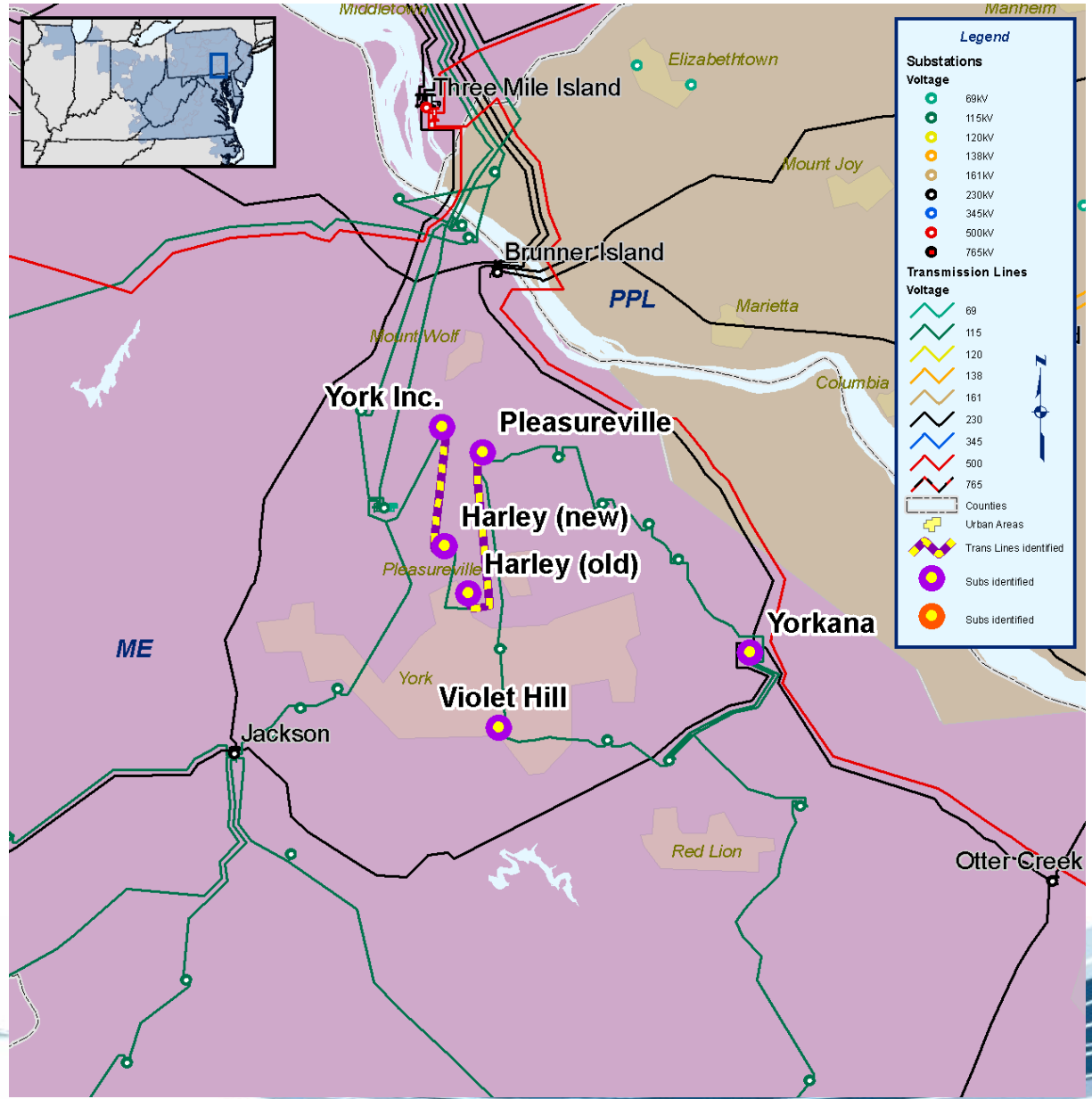
ME Baseline Upgrades

- Low voltage in Bern Church 69 kV area / loss of the North Temple-Berkley 69 kV line
- Install 20 MVAR capacitor at Bern Church 69 kV bus
- Estimated Project Cost: $0.403 M
- Expected IS Date: 5/29/09



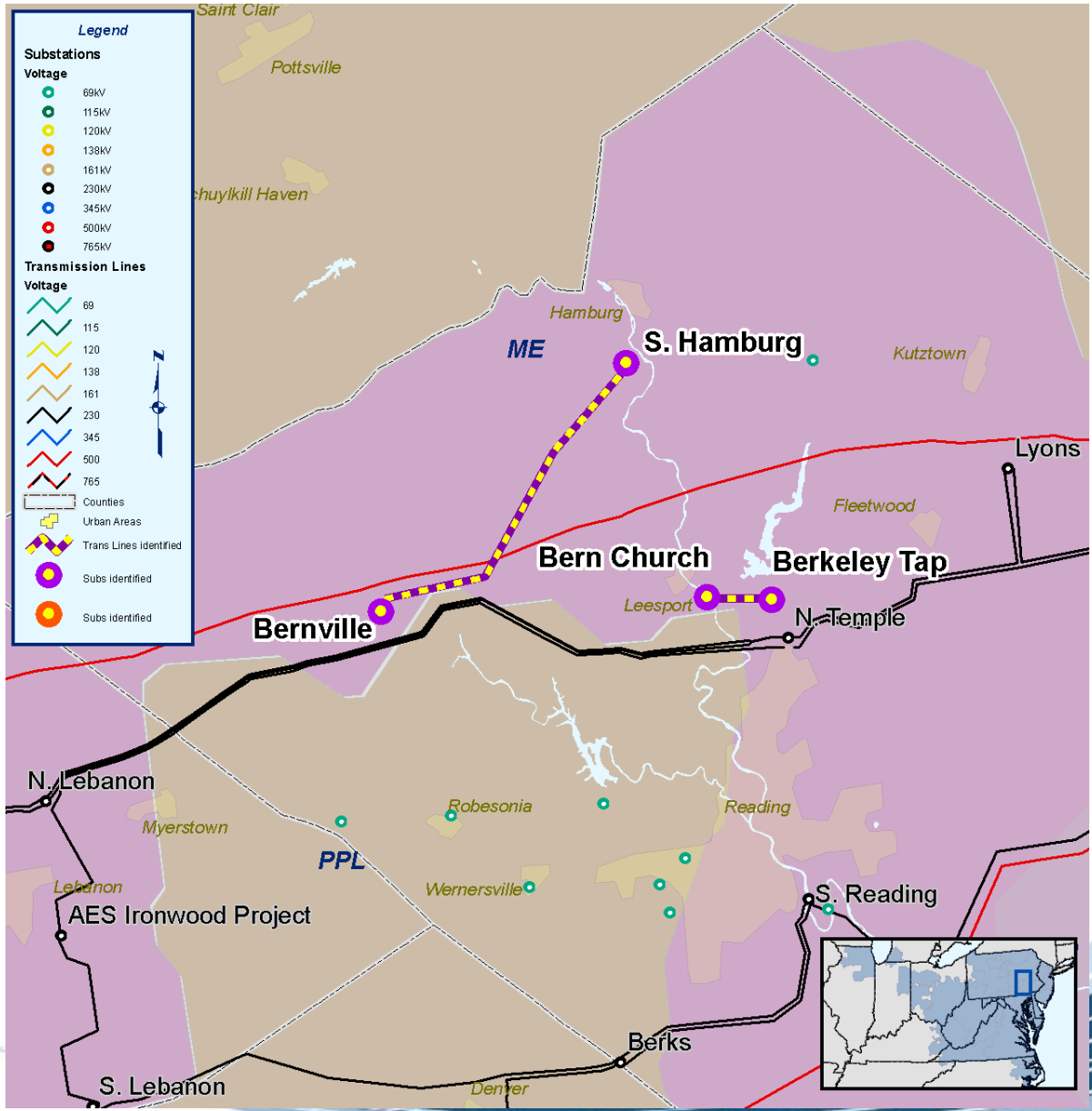
ME Baseline Upgrades

- Harley Davidson-Pleasureville 115 kV line / loss of the Yorkana 115 kV bus
- York Incinerator-Harley Davidson 115 kV line / loss of the Yorkana 115 kV bus
- Undervoltage at Violet Hill 115/69 kV station/ loss of the Yorkana 115 kV bus
- Install Bus Tie circuit breaker on Yorkana 115 kV bus
- Estimated Project Cost: $0.953 M
- Expected IS Date: 5/01/09



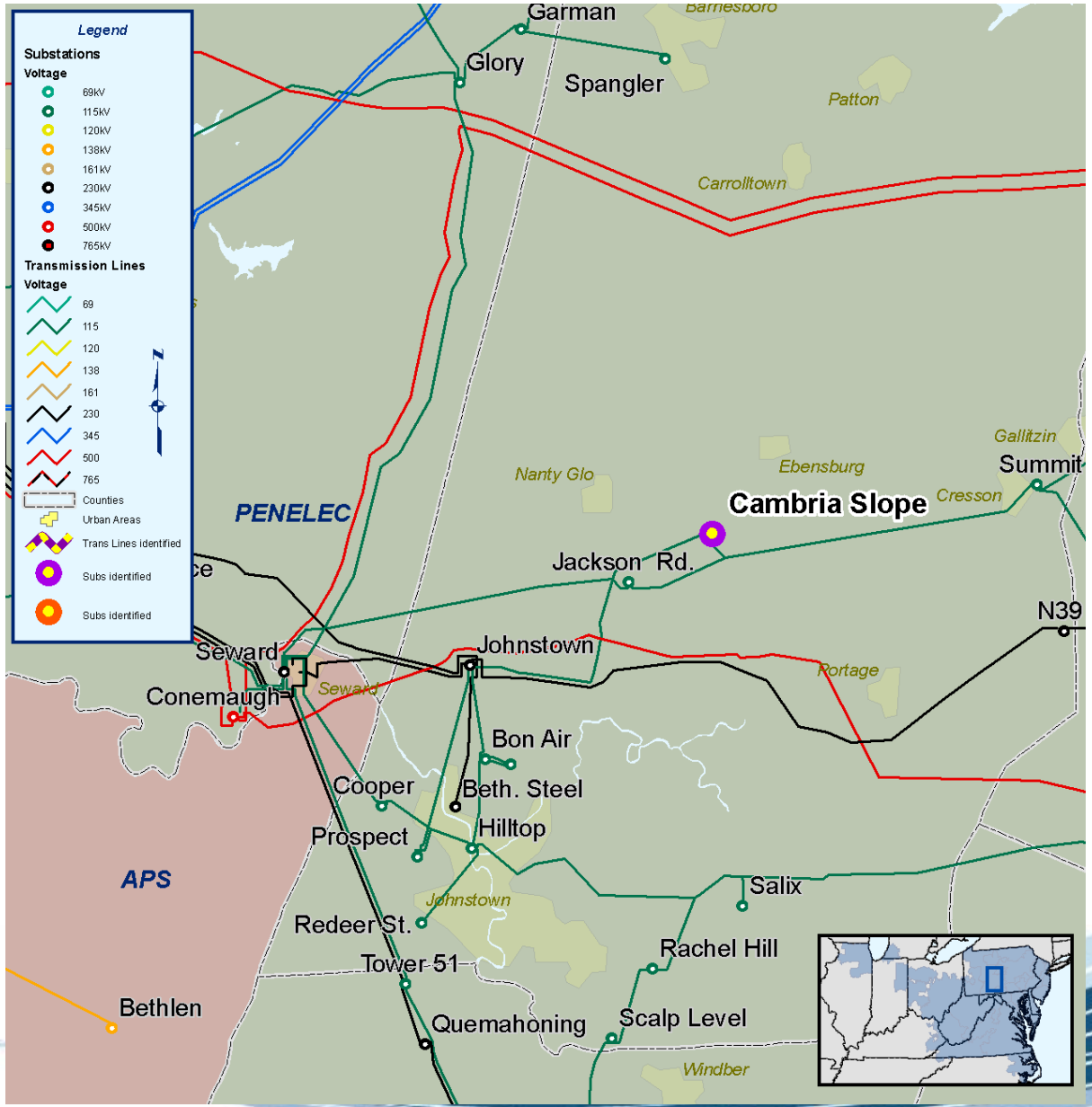
ME Baseline Upgrades

- North Temple 230/69 kV transformer #4 / loss of North Temple 230/69 kV transformer #6
- Berkeley Tap-Bern Church 69 kV line / loss of North Temple-Royal Green 69 kV line
- Bernville-South Hamburg 69 kV line / loss of North Temple-Berkeley Tap 69 kV line
- Construct a 230 kV Bernville station by tapping the North Temple-North Lebanon 230 kV line
- Install a 230/69 kV transformer at existing Bernville 69 kV station
- Estimated Project Cost: $5.73 M
- Expected IS Date: 5/01/2010



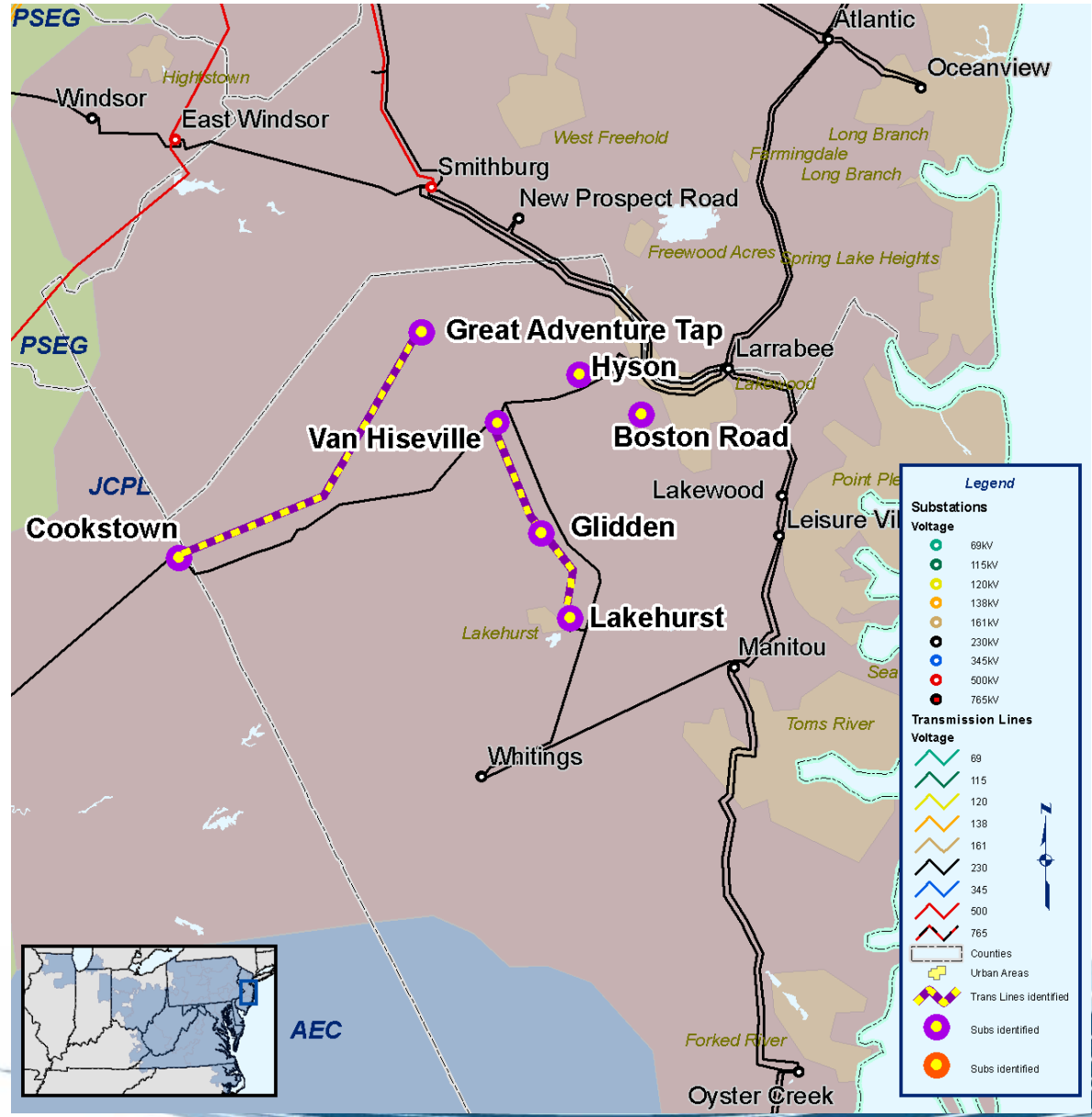
PN Baseline Upgrades

- Cambria Slope 115/46 kV transformer / fault on the Wilmore Junction 115 kV 3-terminal line + failure of Cambria Slope SPS
- Various other 46 kV overloads
- Reconfigure the Cambria Slope and Wilmore Junction 115 kV stations to eliminate the Wilmore Junction 115 kV 3-terminal line
- Estimated Project Cost: $1.28 M
- Expected IS Date: 5/30/09



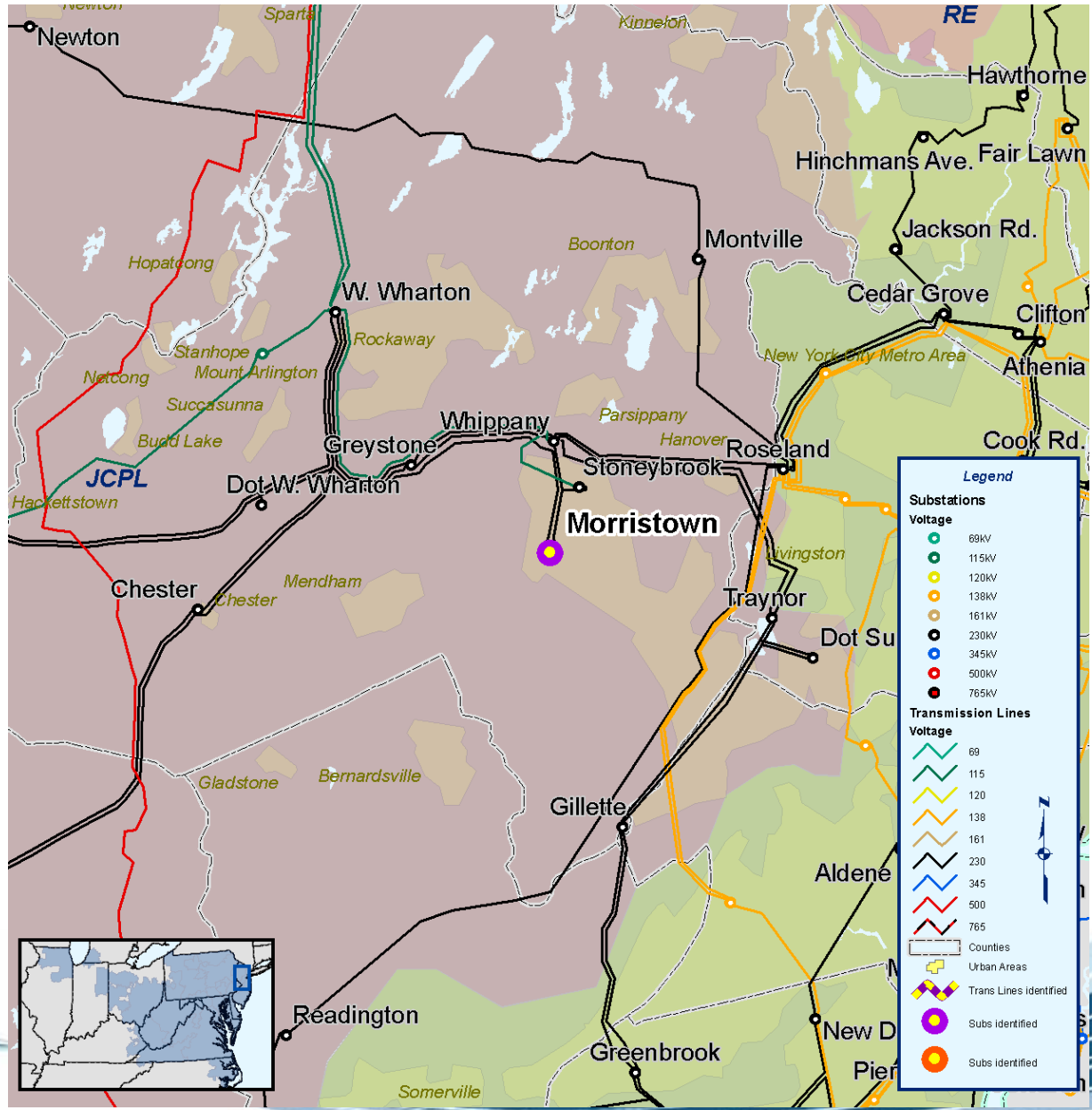
JC Baseline Upgrades

- Lakehurst-Glidden-Van Hiseville 34.5 kV line / loss of Cookstown end of V22 34.5 kV circuit
- Cookstown-Great Adventure Tap 34.5 kV line / loss of Lakehurst end of V22 34.5 kV circuit
- Voltage collapse / loss of Larrabee end of U73 34.5 kV circuit
- Construct Boston Road 34.5 kV station
- Construct Hyson 34.5 kV station
- Add 7.2 MVAR capacitor at Boston Road 34.5 kV
- Estimated Project Cost: $5.81 M
- Expected IS Date: 6/01/2009



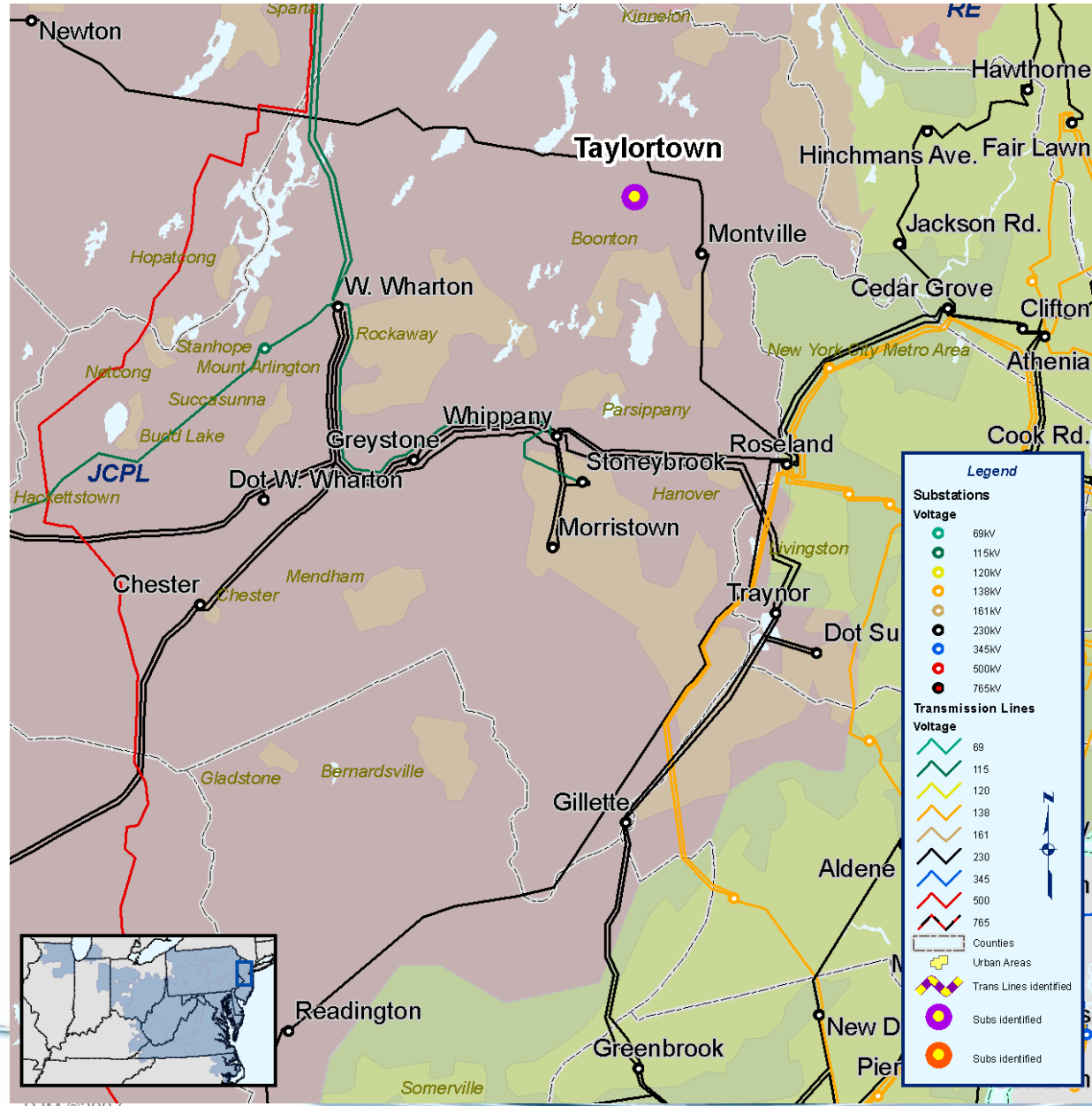
JC Baseline Upgrades

- Morristown 230/34.5 kV transformer #6 / loss of Morristown 230/34.5 kV transformer #5
- Morristown 230/34.5 kV transformer #5 / loss of Morristown 230/34.5 kV transformer #6
- Morristown 230/34.5 kV transformer #5 / loss of Morristown-Stoney Brook-Whippany 230 kV line
- Shift load off of 34.5 kV bus and add Morristown 230/13.2 kV transformer
- Estimated Project Cost: $1.47 M
- Expected IS Date: 6/01/2009



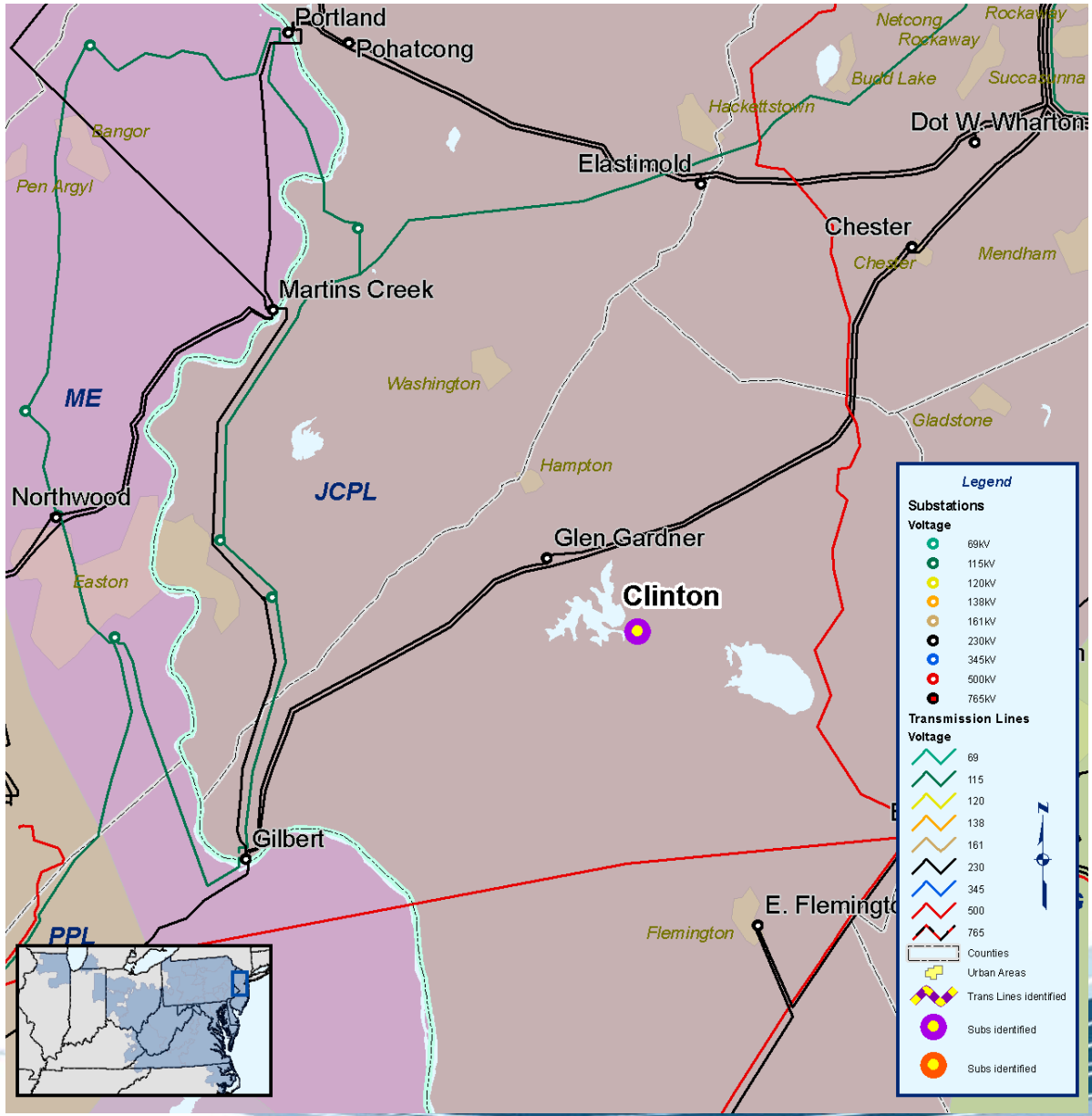
JC Baseline Upgrades

- Low voltage at Taylortown 34.5 kV bus / loss of Montville-Taylortown 34.5 kV line
- Add 6.6 MVAR capacitor at Taylortown 34.5 kV
- Estimated Project Cost: $0.400 M
- Expected IS Date: 5/20/2009



JC Baseline Upgrades

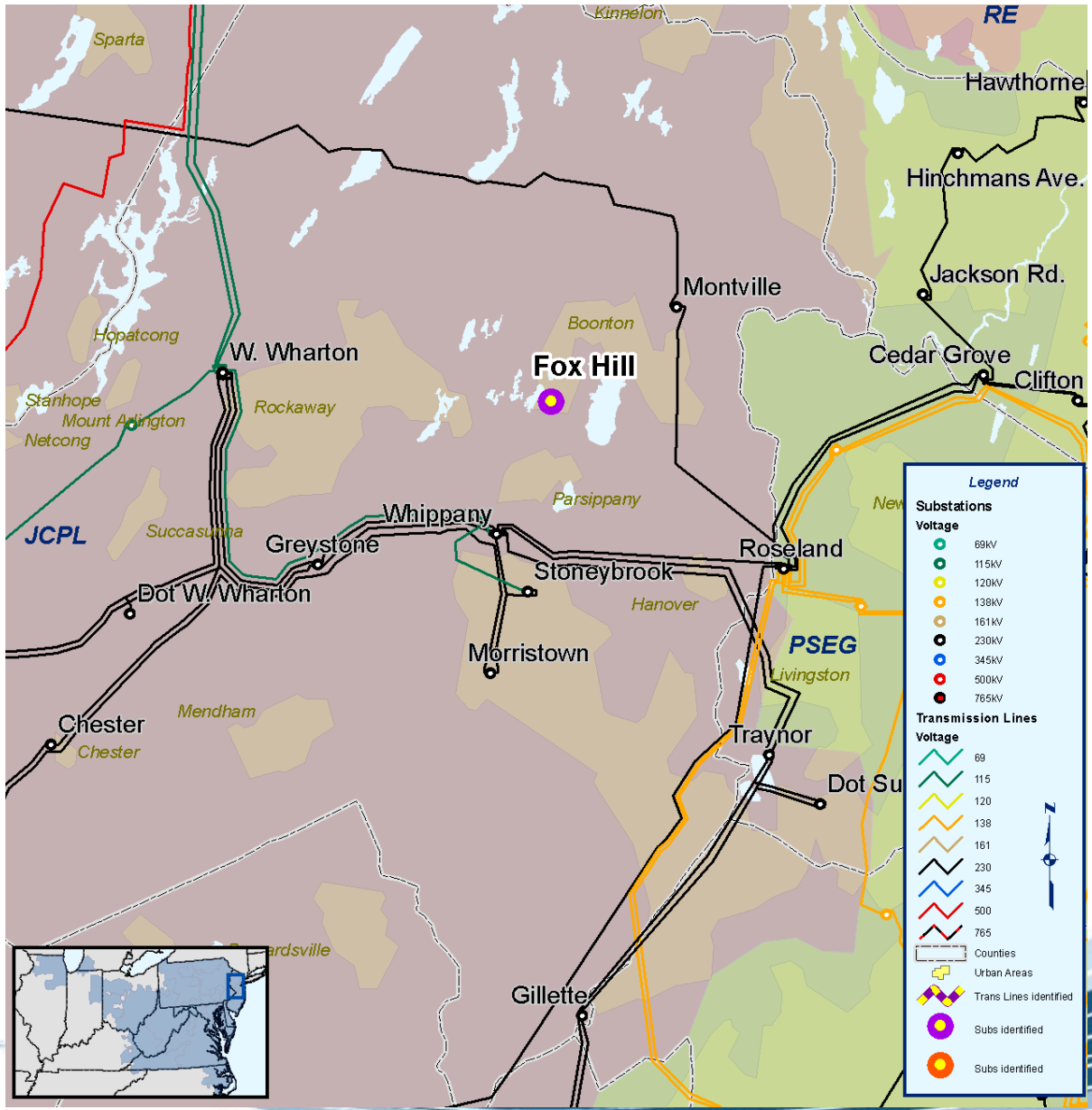
- Low voltage at Clinton 34.5 kV bus / loss of Glen Gardner-Clinton 34.5 kV line
- Add 7.2 MVAR capacitor at Clinton 34.5 kV
- Estimated Project Cost: $0.400 M
- Expected IS Date: 5/28/2009



FE Supplemental Projects

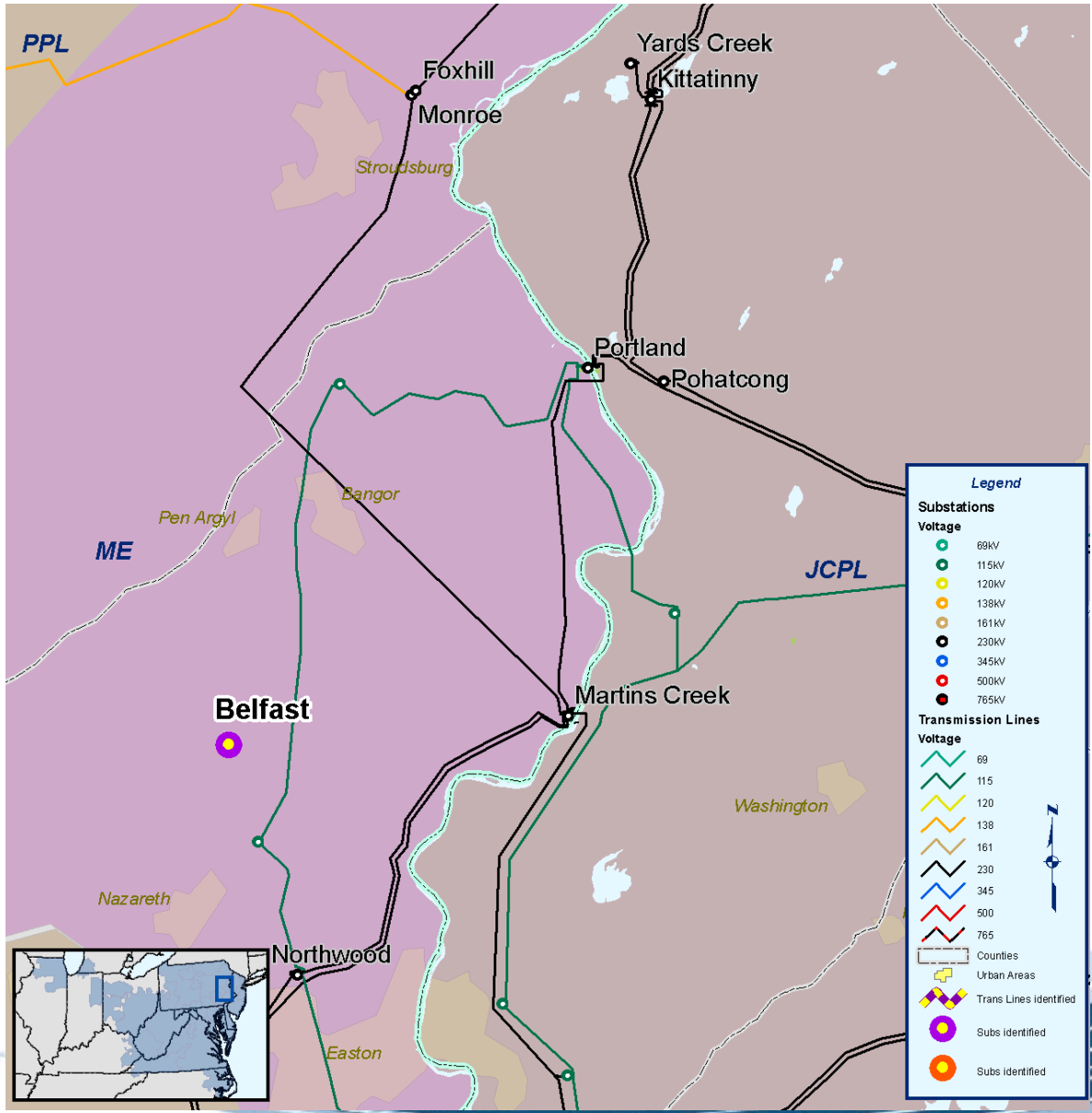
ME Supplemental Projects

- Add 230/34.5 kV transformer at Fox Hill
- Driver – local distribution planning criteria
- Fox Hill 34.5 kV is not a Tariff facility
- IS Date: 6/1/2009



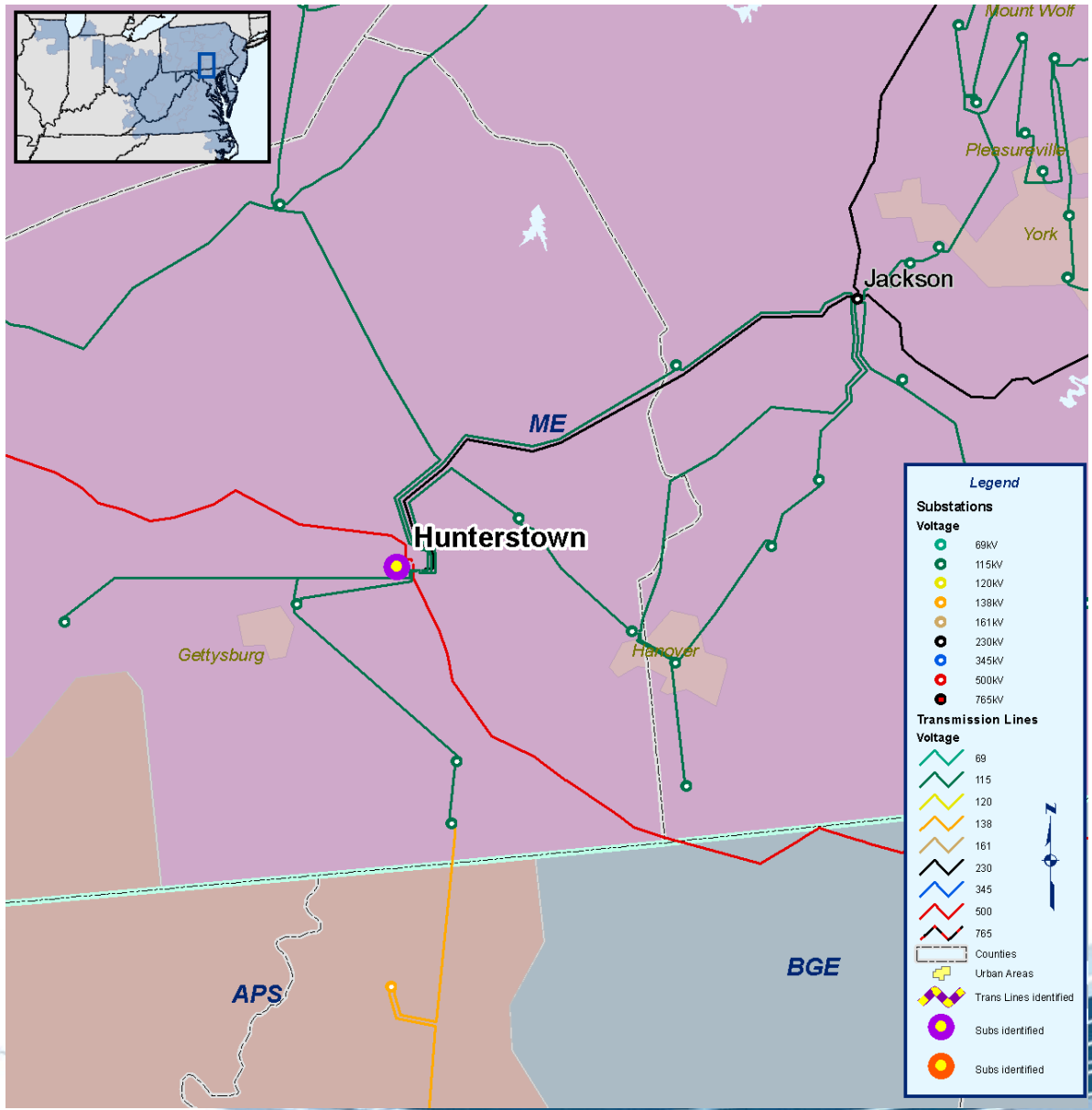
ME Supplemental Projects

- Replace 115/34.5 kV transformer #2 at Belfast
- Driver – local distribution planning criteria
- Belfast 34.5 kV is not a Tariff facility
- IS Date: 5/1/2009



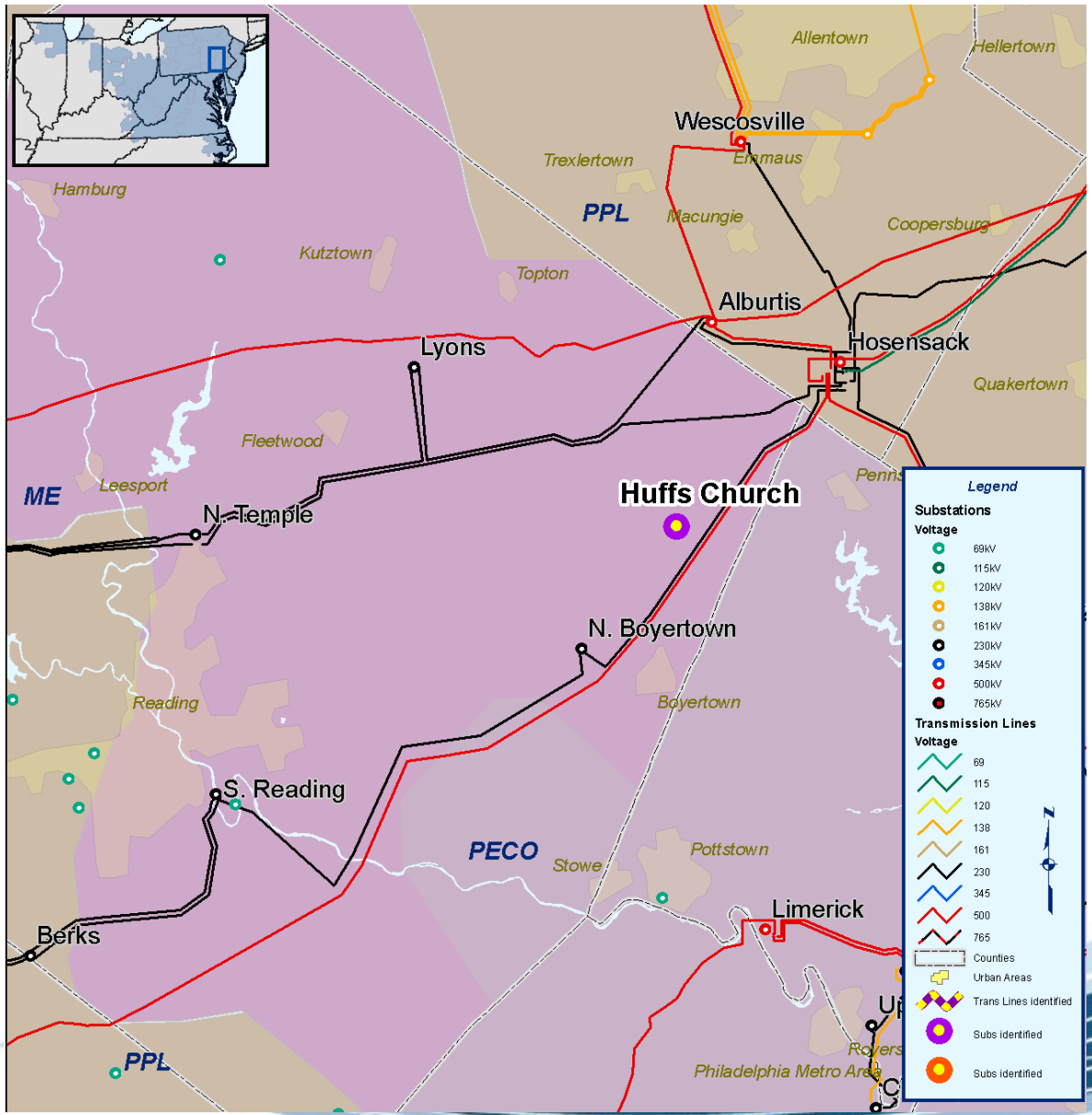
ME Supplemental Projects

- Purchase a 230/115 kV spare transformer for Hunterstown
- IS Date: 3/1/2009



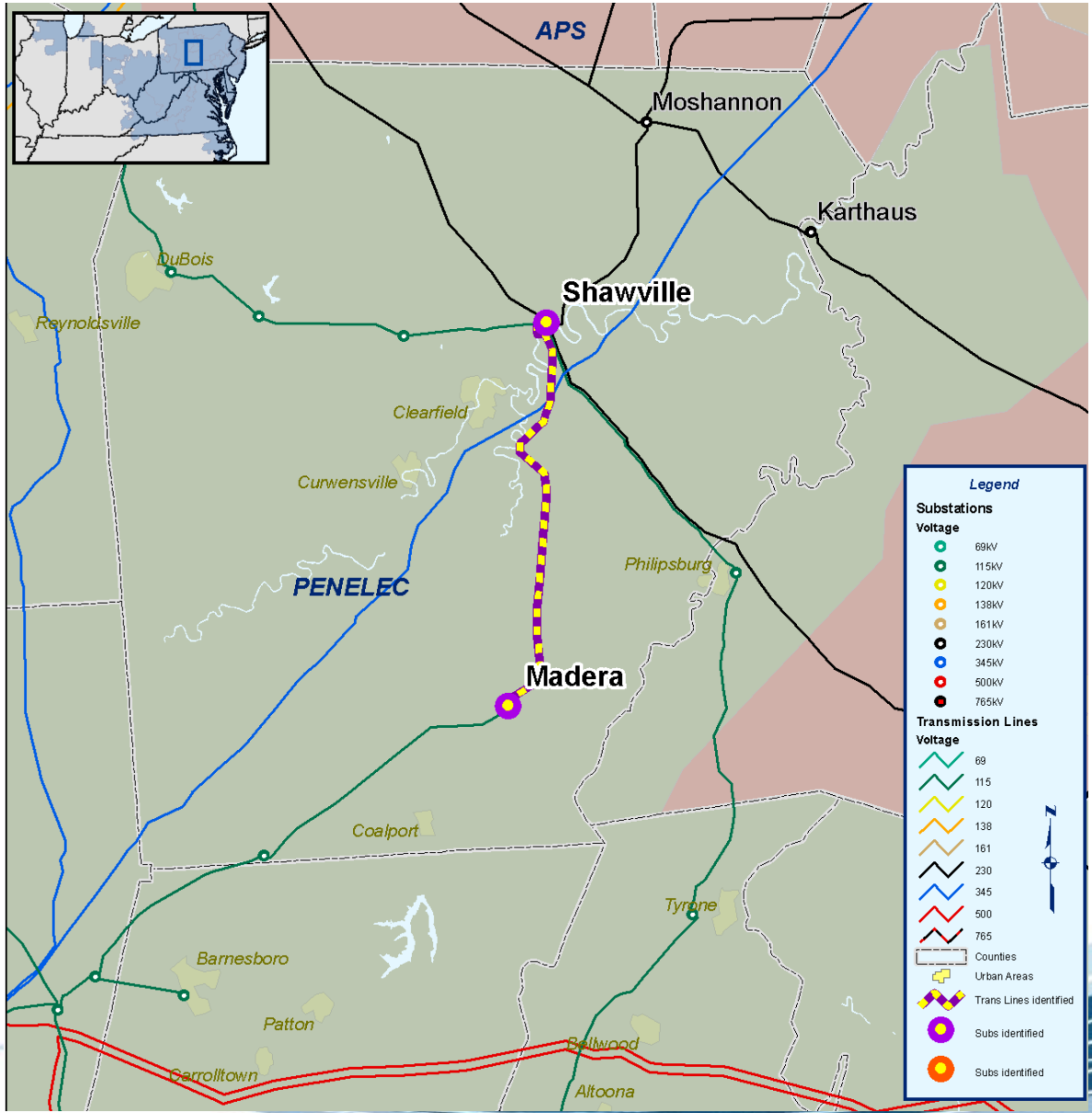
ME Supplemental Projects

- Modify Huffs Church 69/13.2 kV substation
- Driver – local distribution planning criteria
- Huffs Church 13.2 kV is not a Tariff facility
- IS Date: 5/1/2009



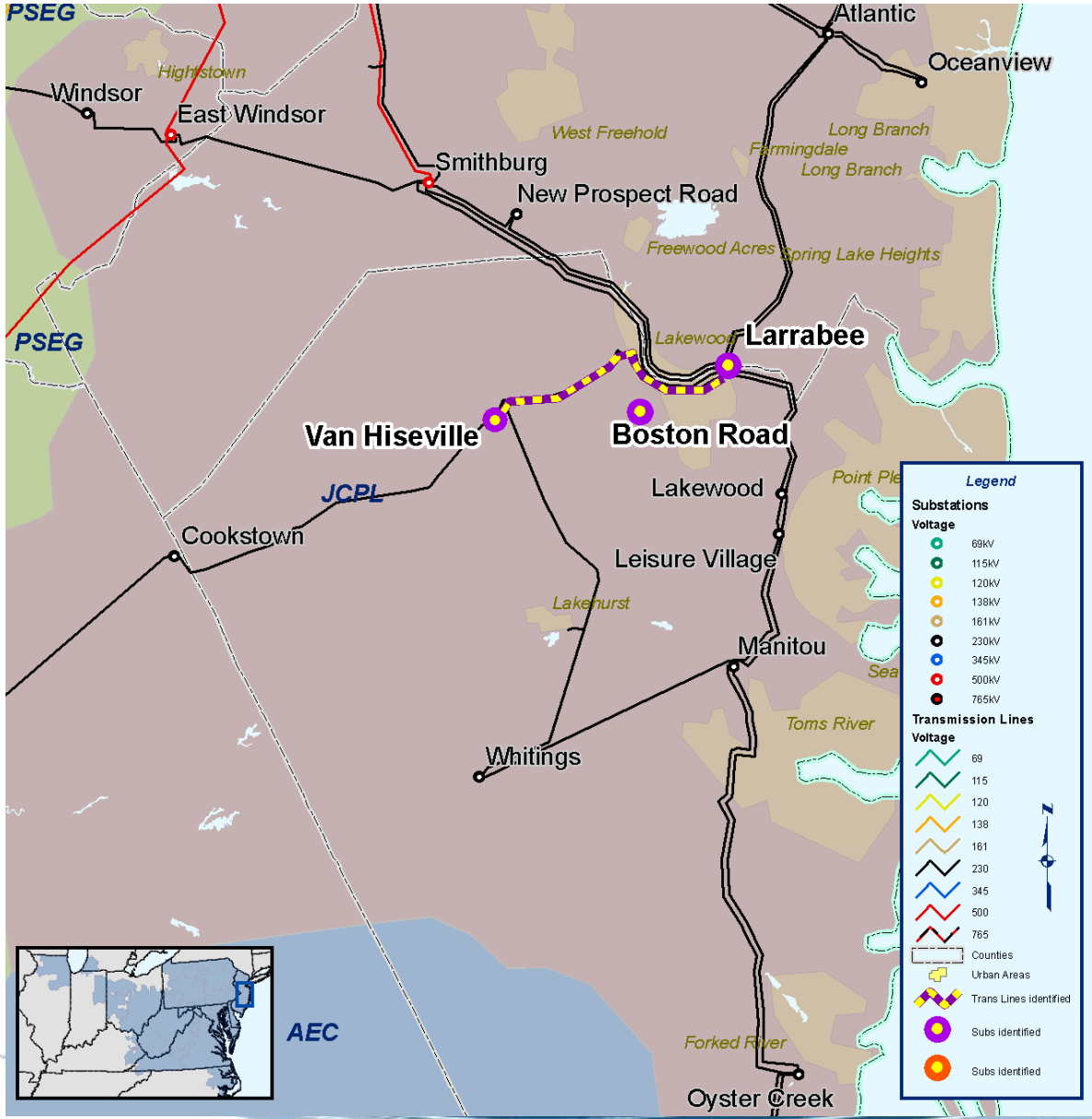
PN Supplemental Projects

- Tap Shawville-Madera 115 kV line and construct 3.8 mile 115 kV line
- Driver – serve load connection
- IS Date: 12/31/2009



JC Supplemental Projects

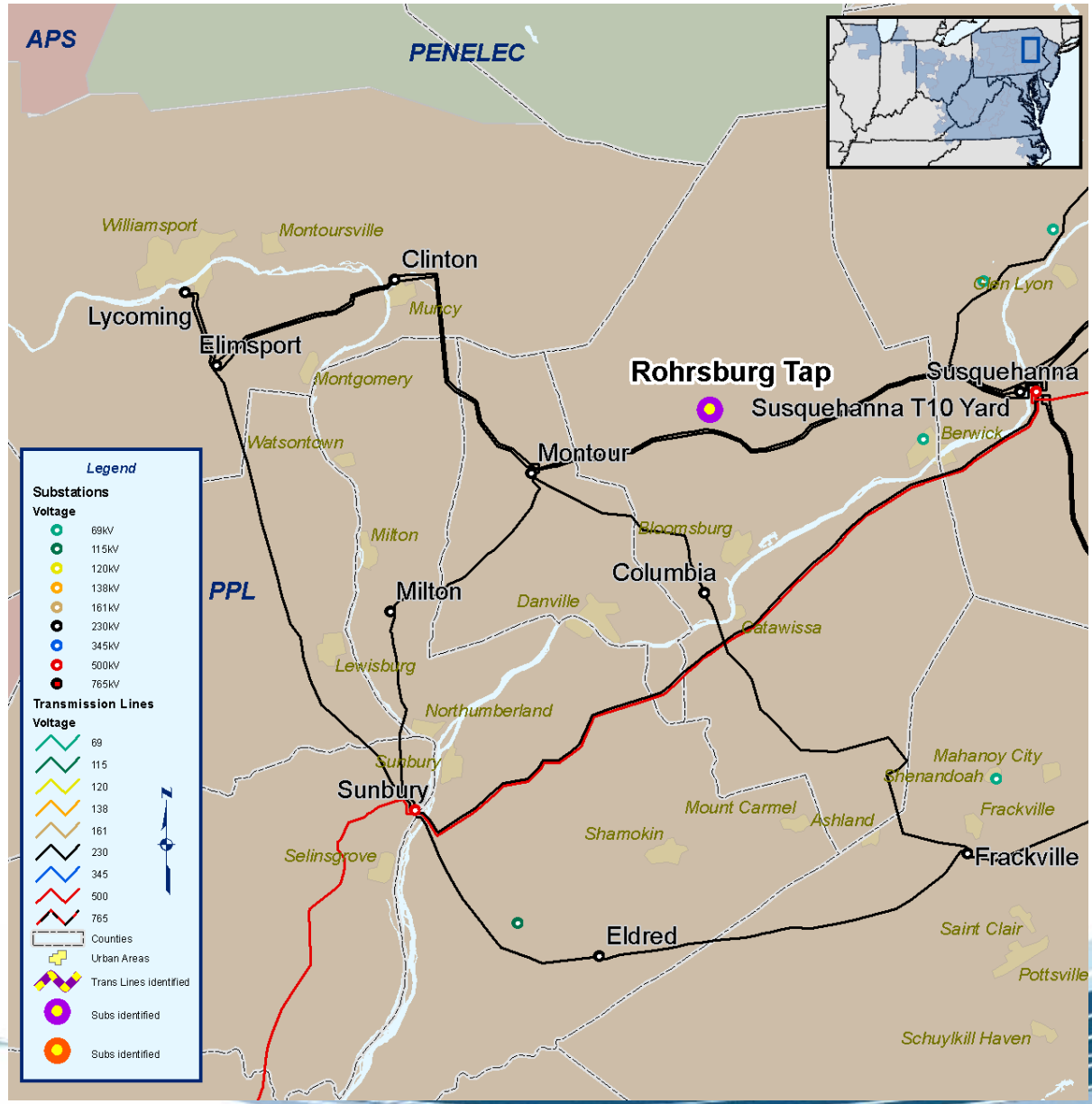
- Construct a 230 kV Boston Road station by tapping the Larrabee-Van Hiseville Tap 230 kV line
- Install a 230/12.5 kV transformer at Boston Road
- Driver – local distribution planning criteria
- IS Date: 6/01/2009



PPL Baseline Projects

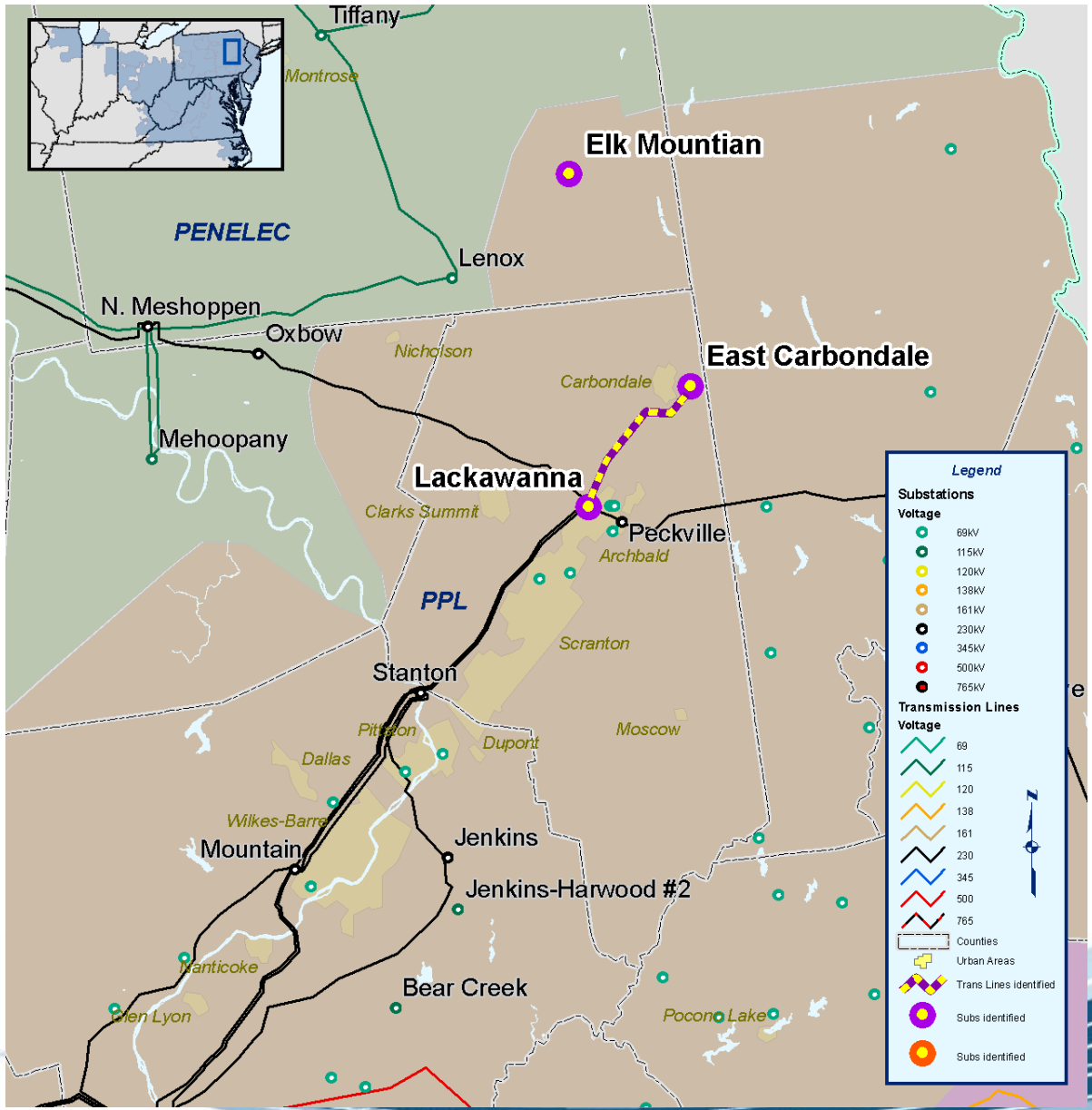
PPL Baseline Upgrades

- More than 30 MW load loss / loss of the Rohrsburg Tap 69 kV bus
- Exceeds PPL guidelines for maximum allowable load loss
- New Derry-Millville 69 kV line
- Estimated Project Cost: $9.35 M
- Expected IS Date: 11/01/2010



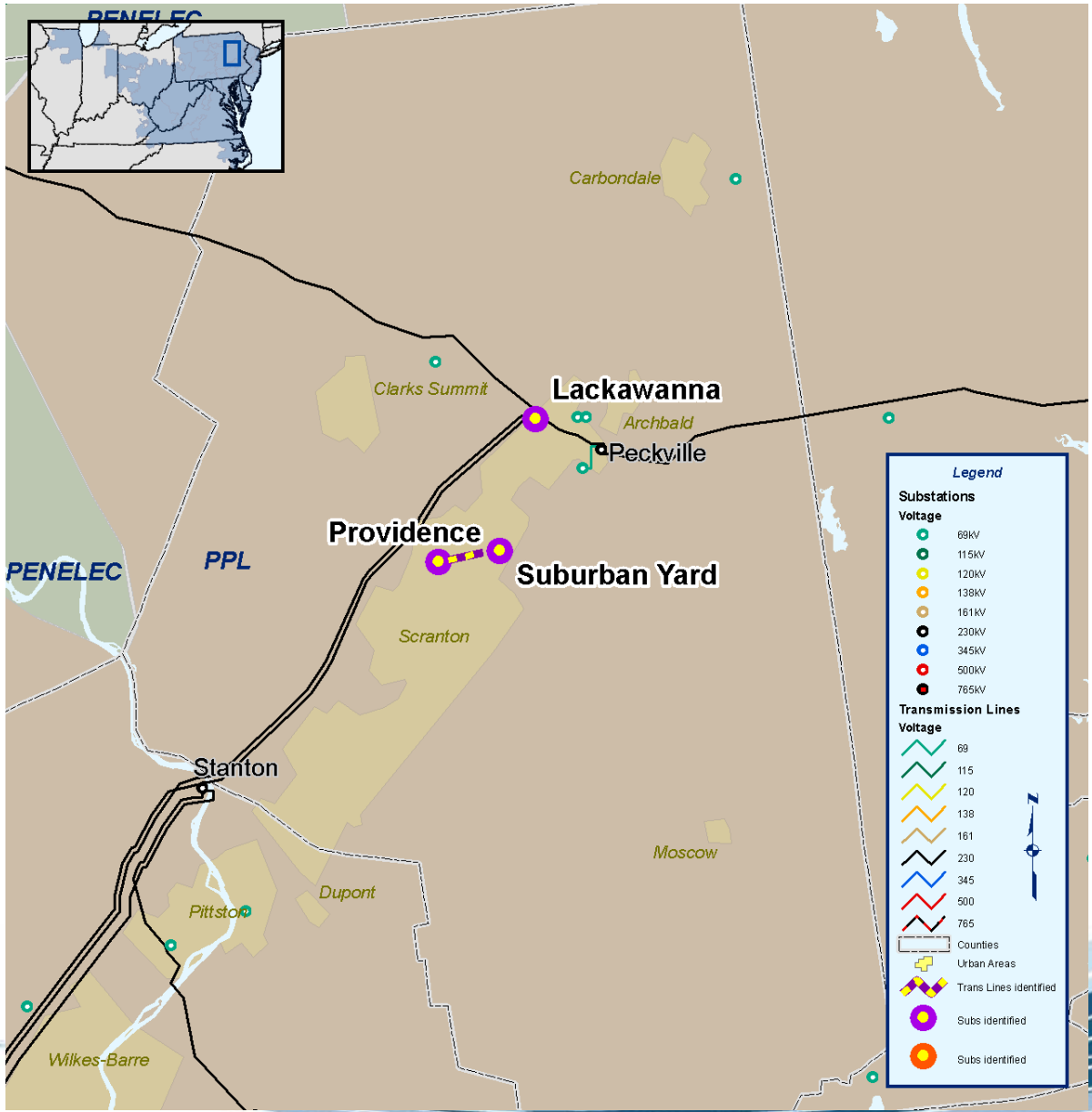
PPL Baseline Upgrades

- Greenfield, Tinker, Elk Mountain 69 kV buses undervoltage / loss of Lackawanna-East Carbondale 69 kV line
- Rebuild Lackawanna-Edella 69 kV line to double circuit
- Estimated Project Cost: $5.09 M
- Expected IS Date: 11/01/2009



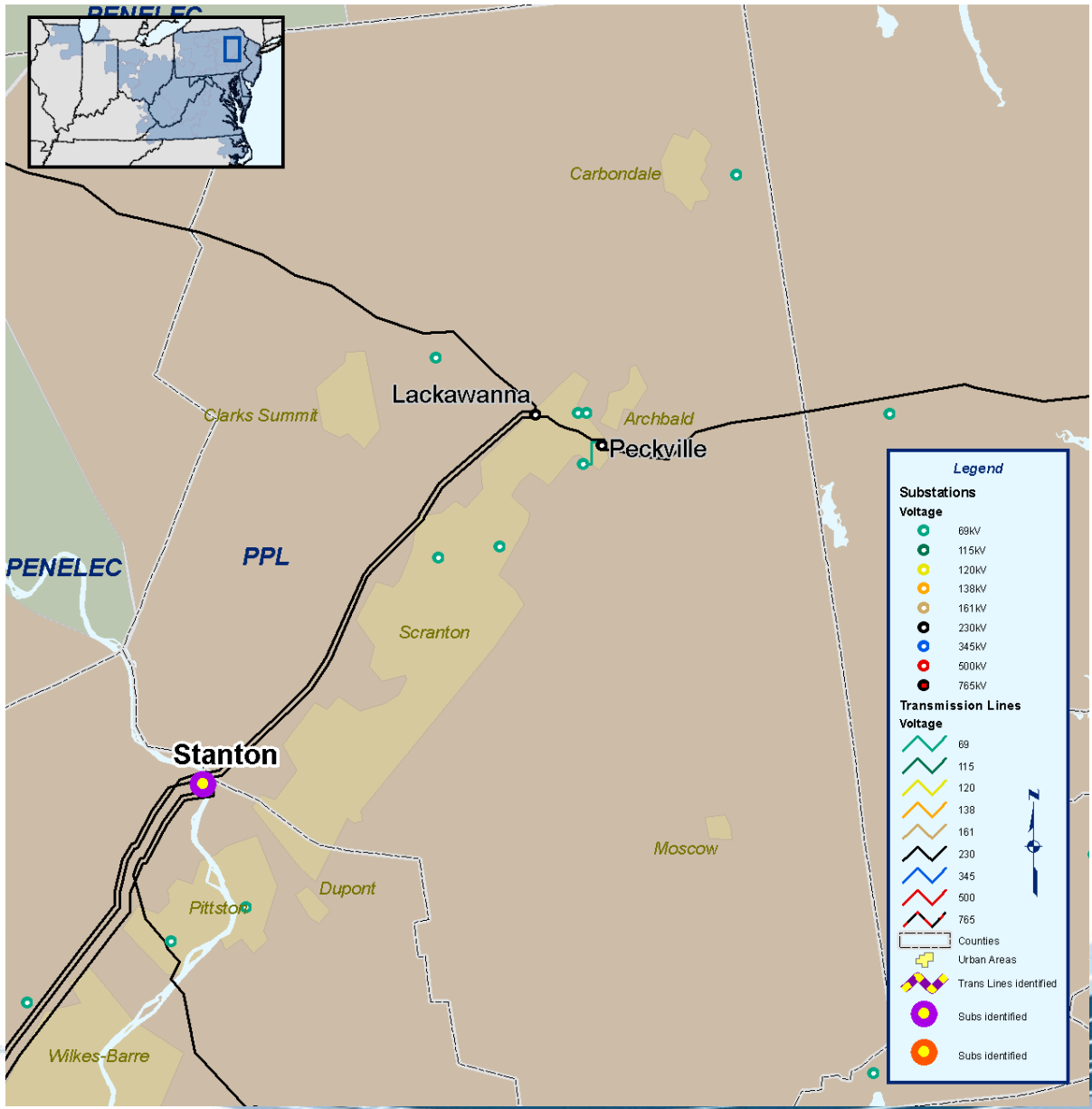
PPL Baseline Upgrades

- Lackawanna-Scranton #1 69 kV line / basecase
- Reconductor Suburban-Providence #1 69 kV line & Re-sectionalize the Suburban 69 kV lines
- Estimated Project Cost: $1.05 M
- Reconductor Suburban Taps #1 and #2 69 kV line portions
- Estimated Project Cost: $3.84 M
- Expected IS Date: 11/01/2012



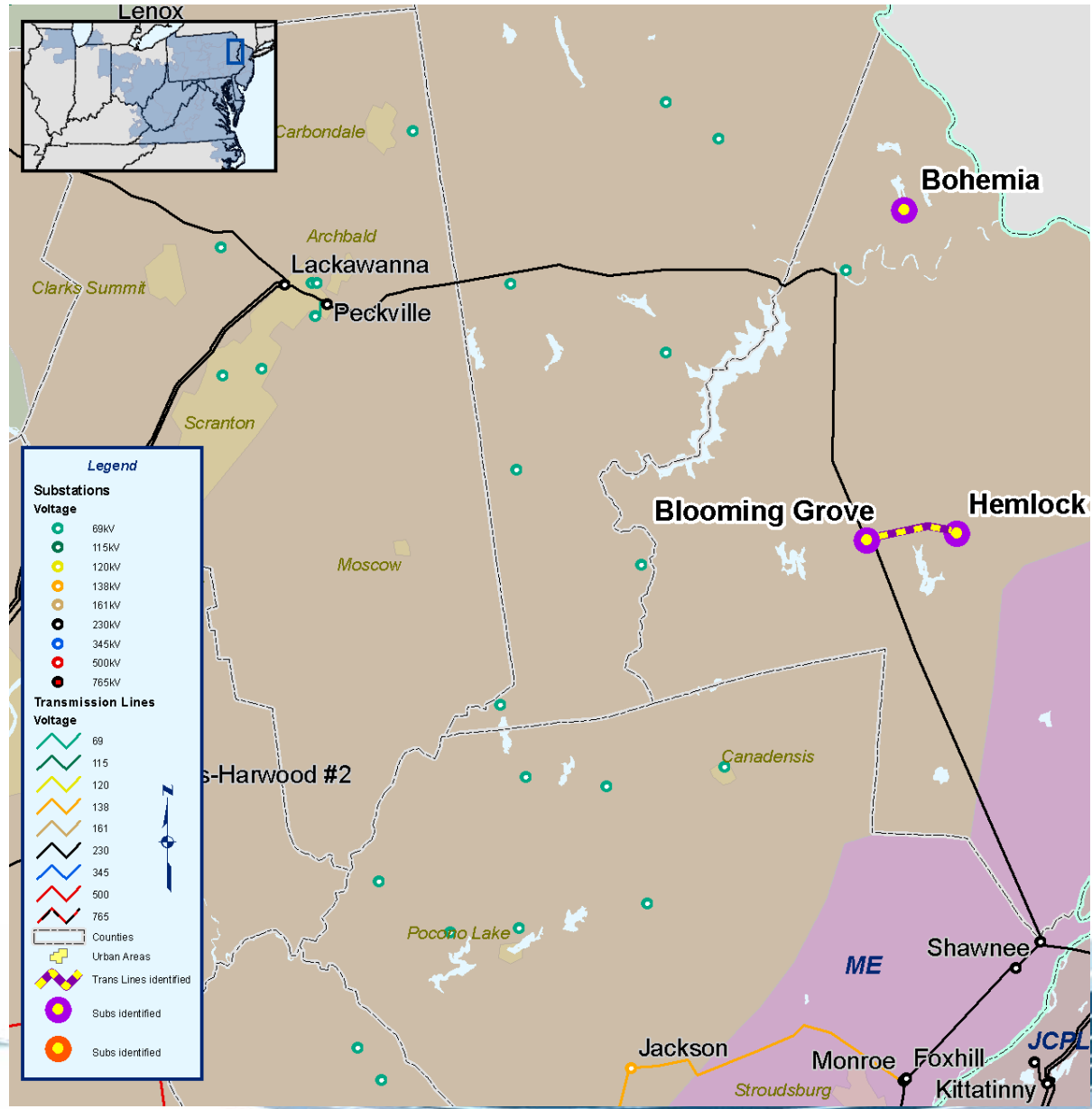
PPL Baseline Upgrades

- All 3 Stanton 230/69 kV transformers / loss of DCTL Stanton-Lackawanna and Mountain-Lackawanna 230 kV lines
- Add a 4th 230/69 kV transformer at Stanton
- Estimated Project Cost: $5.90 M
- Expected IS Date: 11/01/2011



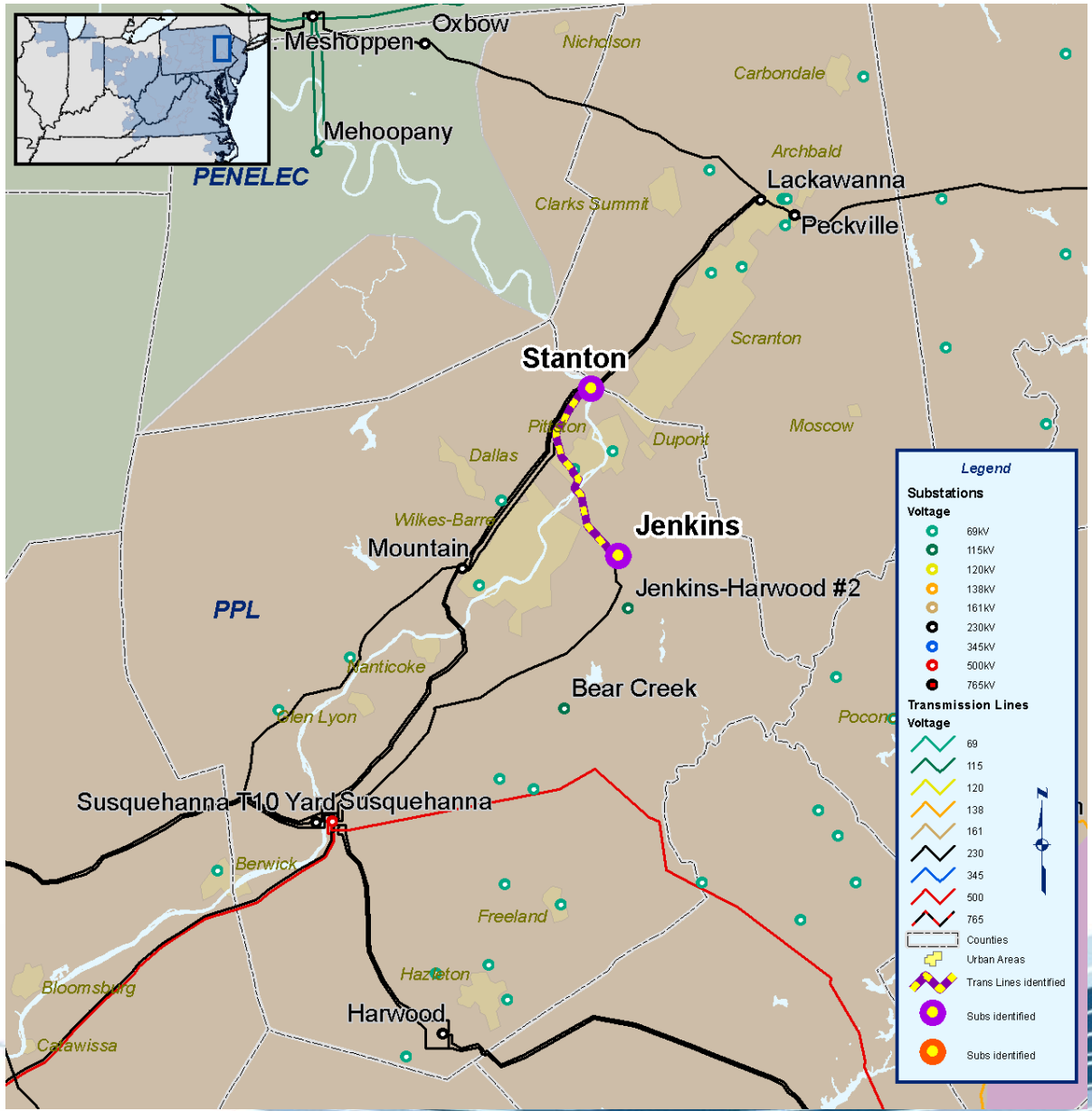
PPL Baseline Upgrades

- More than 30 MW load loss / loss of the Blooming Grove-Hemlock 69 kV line
- Exceeds PPL guidelines for maximum allowable load loss
- Construct Bohemia-Twin Lakes 69 kV line
- Install 10.8 MVAR capacitor bank near Bohemia 69 kV station
- Estimated Project Cost: $18.35 M
- Expected IS Date: 11/01/2013



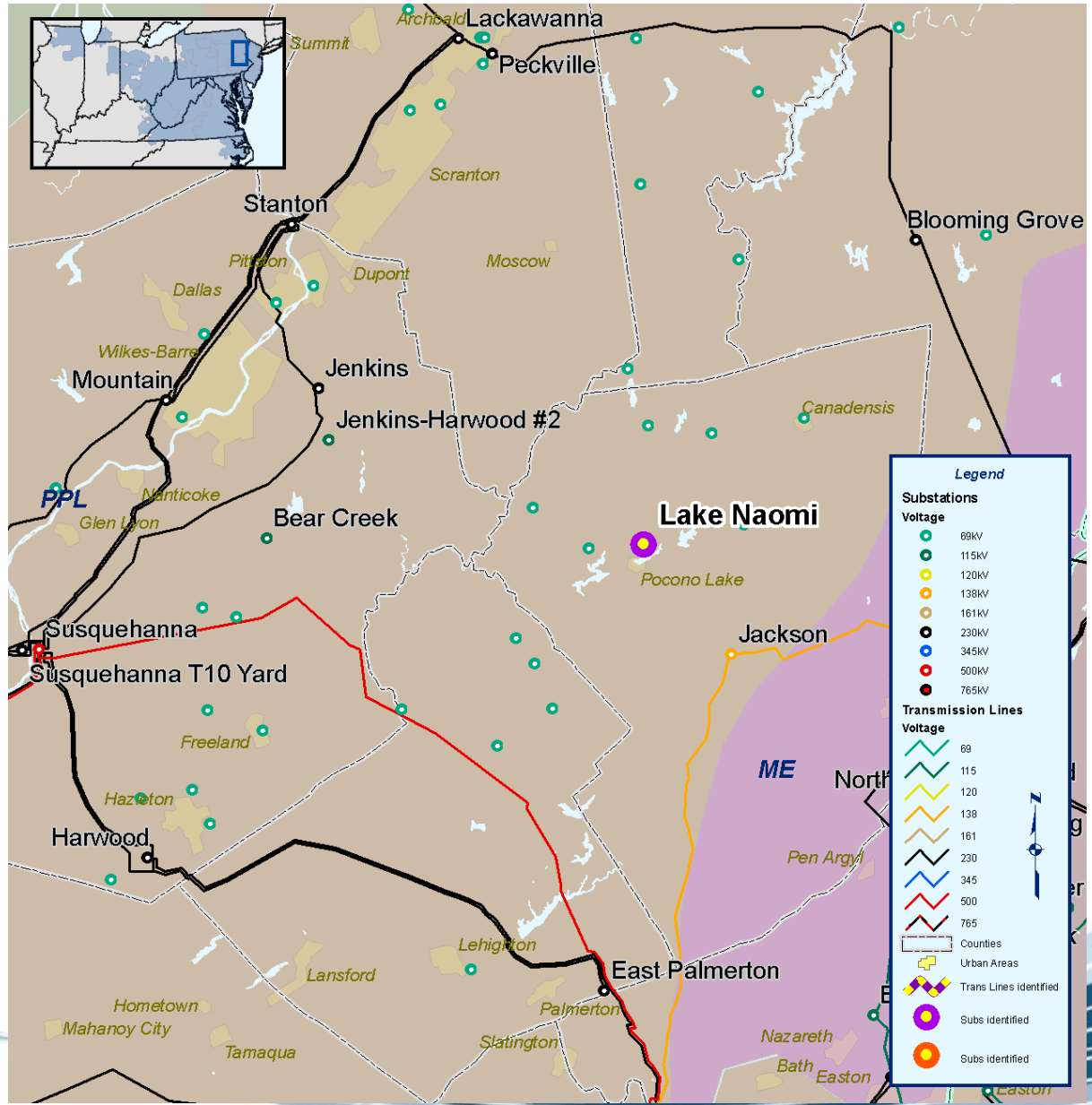
PPL Baseline Upgrades

- Jenkins-Scranton 69 kV lines #1 and #2 / basecase
- Reconductor Stanton-Old Forge 69 kV line & Re-sectionalize the Jenkins-Scranton #1 and #2 69 kV lines
- Estimated Project Cost: $5.29 M
- Expected IS Date: 5/01/2012



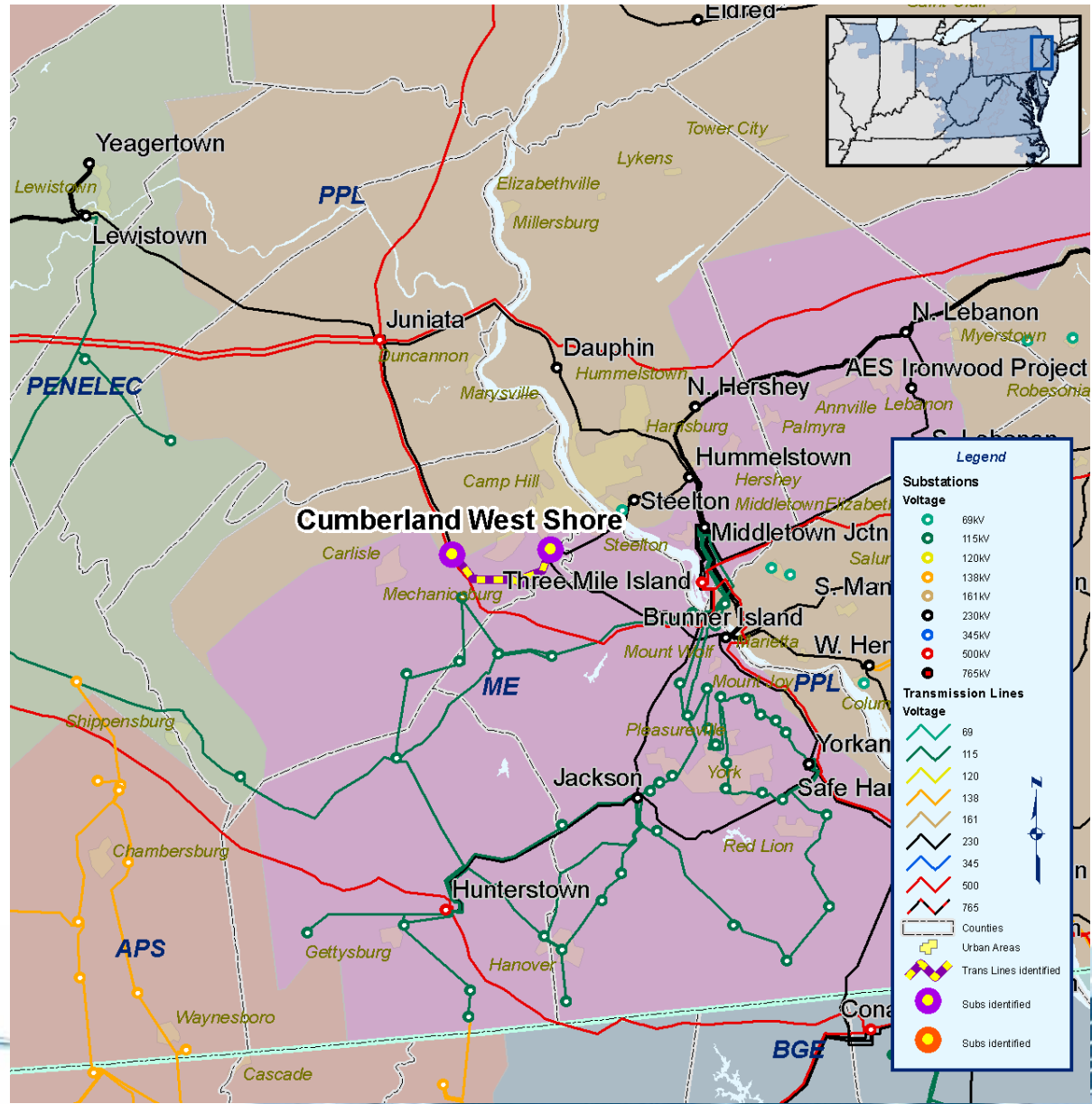
PPL Baseline Upgrades

- More than 30 MW load loss / loss of the Lake Naomi 69 kV Tap
- Exceeds PPL guidelines for maximum allowable load loss
- New Double Circuit 69 kV Line from Jackson to Lake Naomi Tap
- Estimated Project Cost: $7.33 M
- Expected IS Date: 11/01/2013



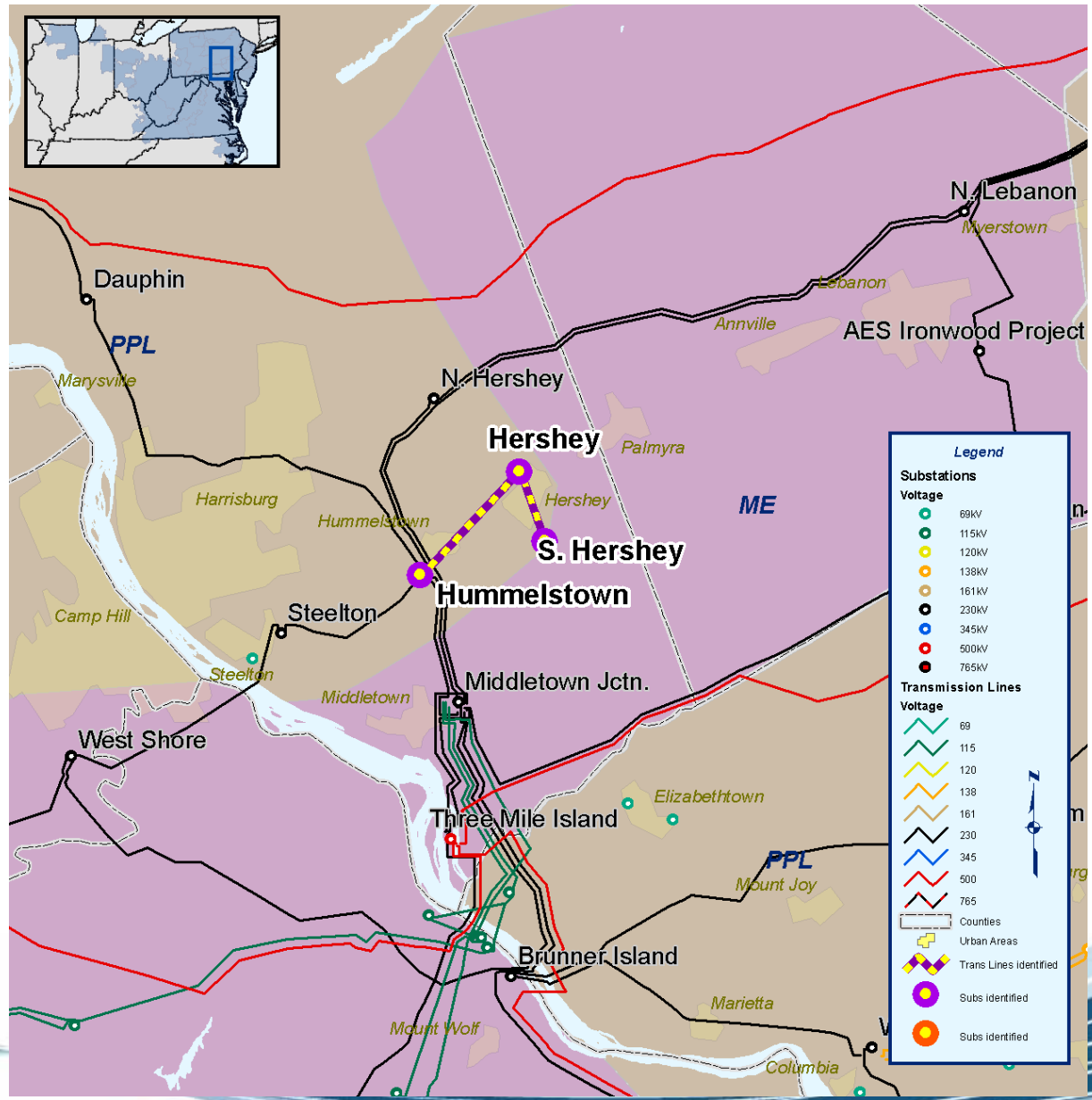
PPL Baseline Upgrades

- More than 45 MW load loss / loss of double circuit Cumberland-West Carlisle #1 and #2 69 kV lines
- Exceeds PPL guidelines for maximum allowable load loss
- Install New Double Circuit 69 kV Line between Carlisle and West Carlisle Substations
- Estimated Project Cost: $8.11 M
- Expected IS Date: 11/01/2012



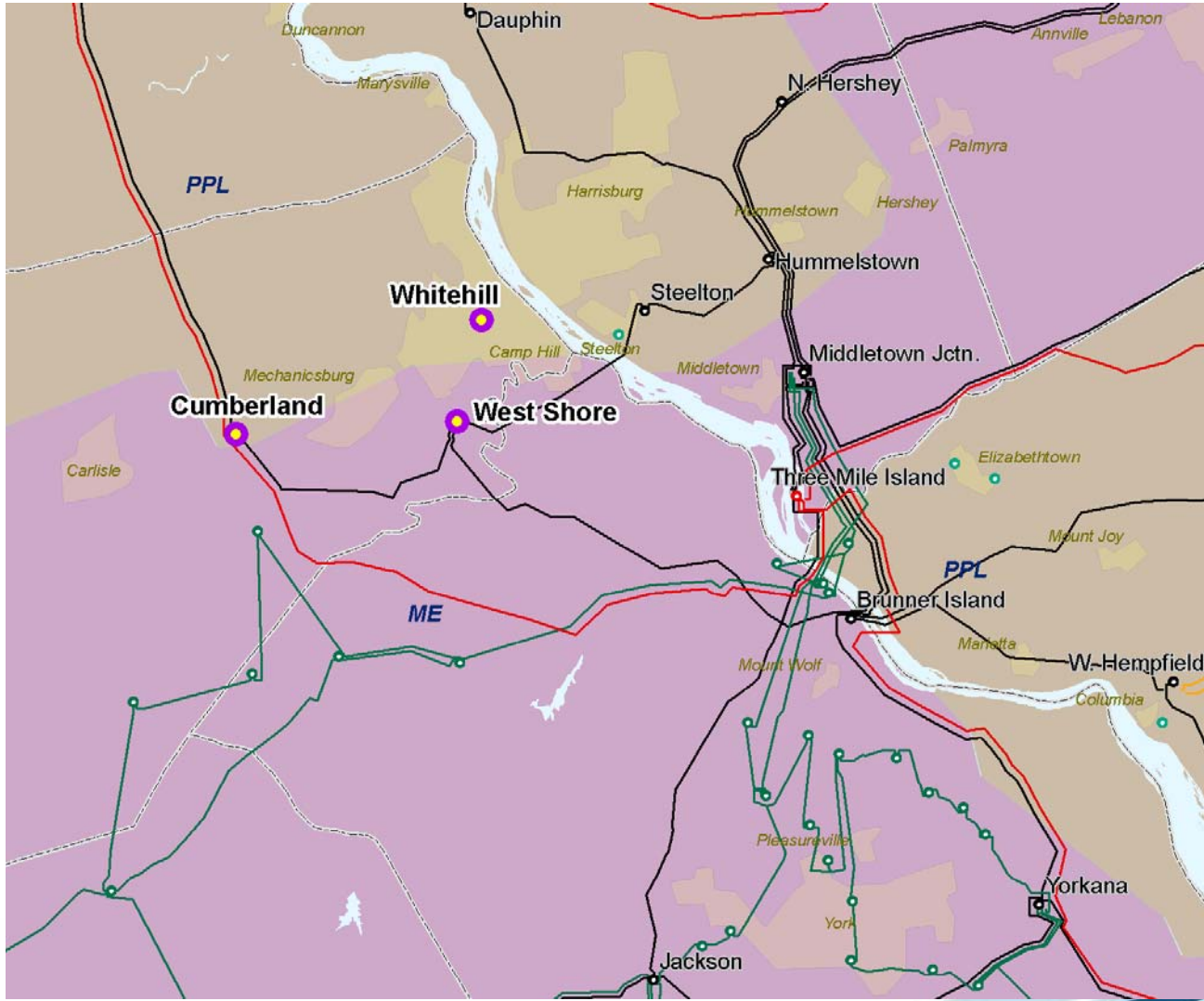
PPL Baseline Upgrades

- More than 45 MW load loss / loss of double circuit Hummelstown-Hershey and South Hershey-Hershey 69 kV lines
- Exceeds PPL guidelines for maximum allowable load loss
- Install 3rd 69 kV Line from Reese's Tap to Hershey Substation
- Estimated Project Cost: $9.75 M
- Expected IS Date: 5/01/2012



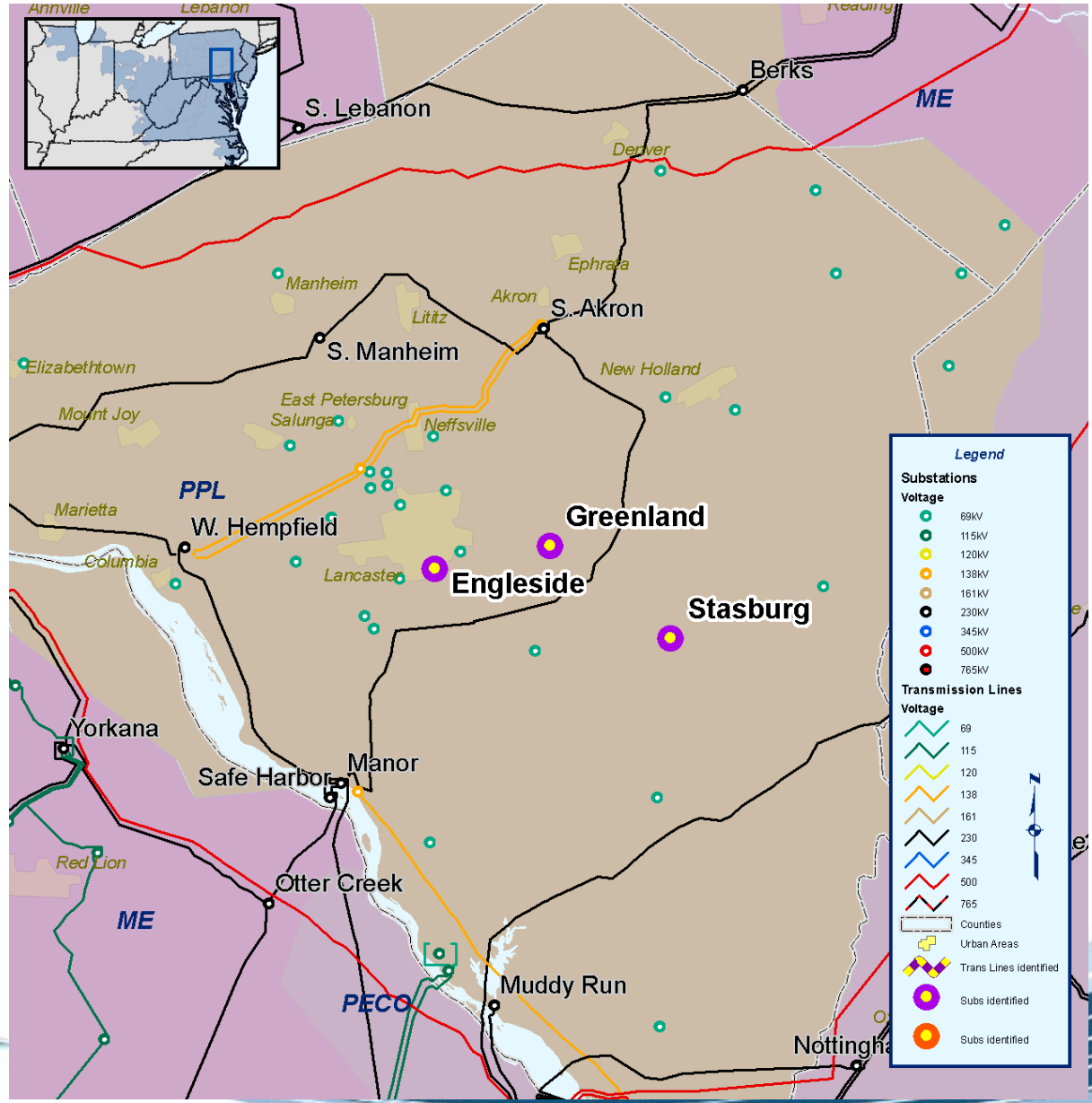
PPL Baseline Upgrades

- More than 45 MW load loss / loss of double circuit outage of the Whitehill 69 kV Taps
- Exceeds PPL guidelines for maximum allowable load loss
- New 69 kV Line: from a tap of the West Shore-Cumberland #1 69 kV Line to Whitehill Substation
- Estimated Project Cost: $3.49 M
- Expected IS Date: 11/01/2013



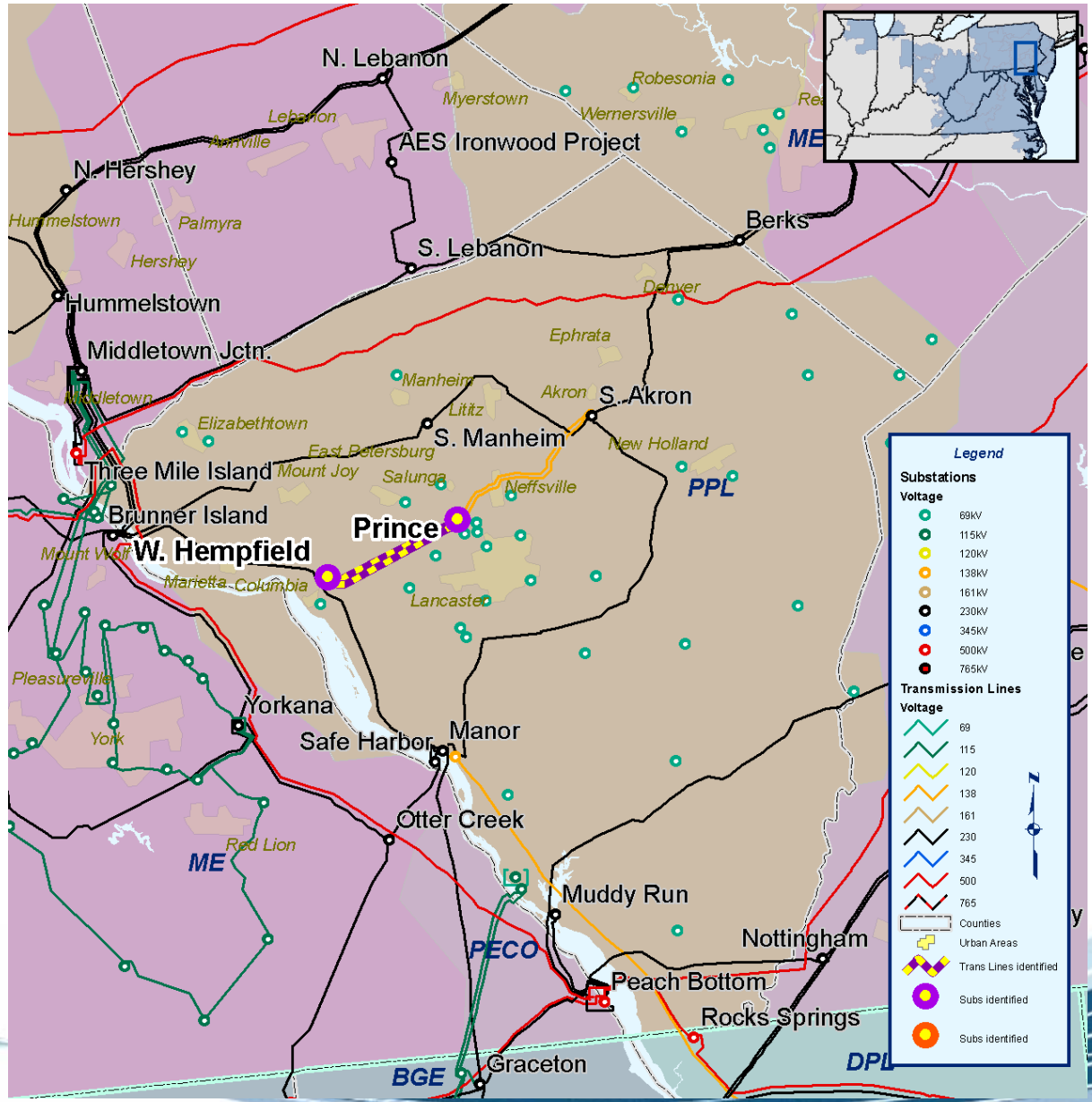
PPL Baseline Upgrades

- More than 50 MW load loss / double-circuit outage on the 69kV Greenland Tap
- Exceeds PPL guidelines for maximum allowable load loss
- Construct a 69 kV Line Between Strassburg Tap and the Millwood-Engleside #1 69kV Line
- Estimated Project Cost: $1.32 M
- Expected IS Date: 11/01/2009



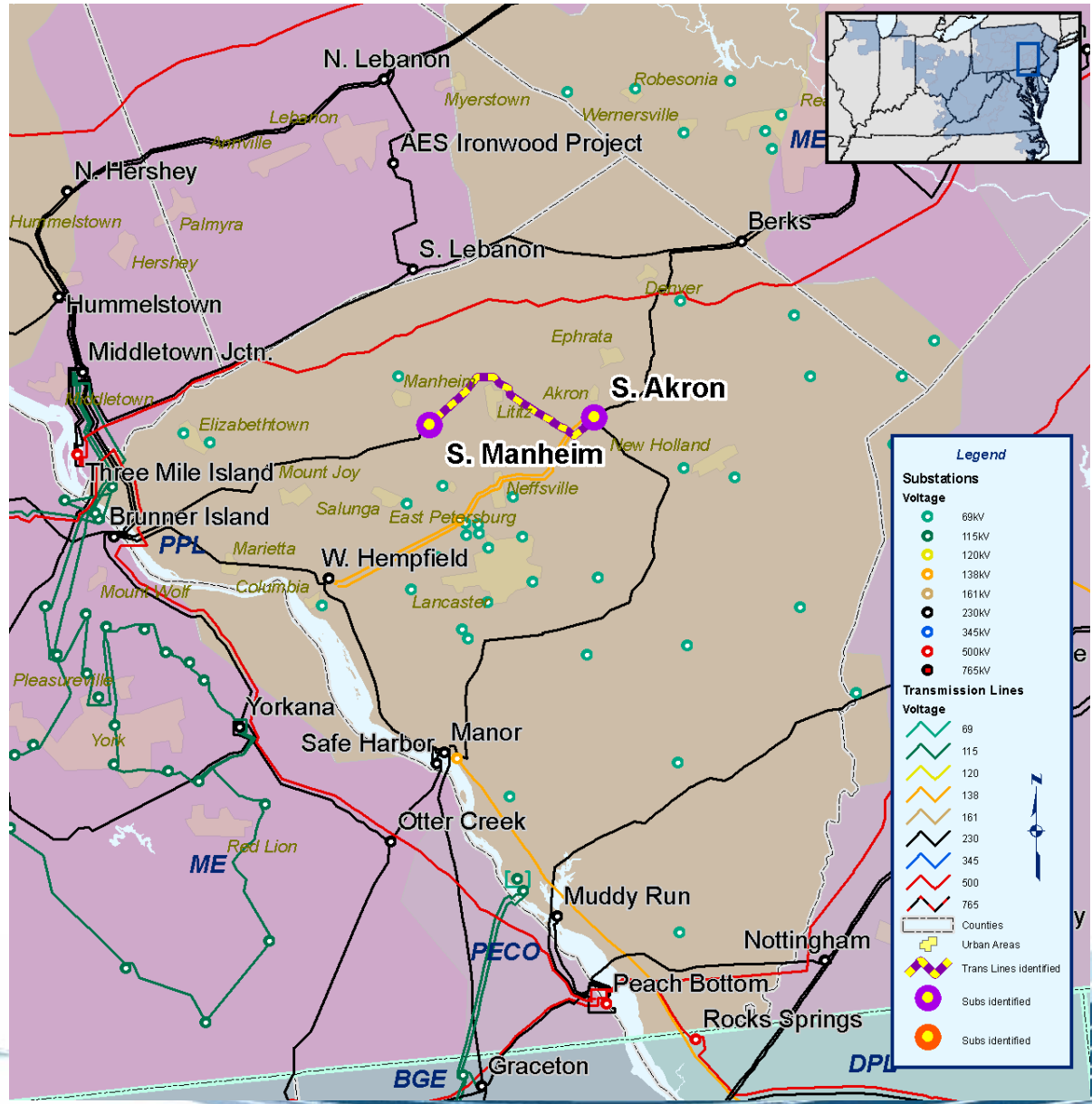
PPL Baseline Upgrades

- More than 70 MW load loss / double-circuit outage on the 69kV Dillersville Tap
- Exceeds PPL guidelines for maximum allowable load loss
- Construct a new 138kV Double Circuit Line between Dillersville Tap and the West Hempfield - Prince 138kV Line
- Estimated Project Cost: $0.545 M
- Expected IS Date: 5/01/2010
- Prepare Roseville Tap for 138 kV Conversion
- Estimated Project Cost: $0.107 M
- Expected IS Date: 11/01/2010



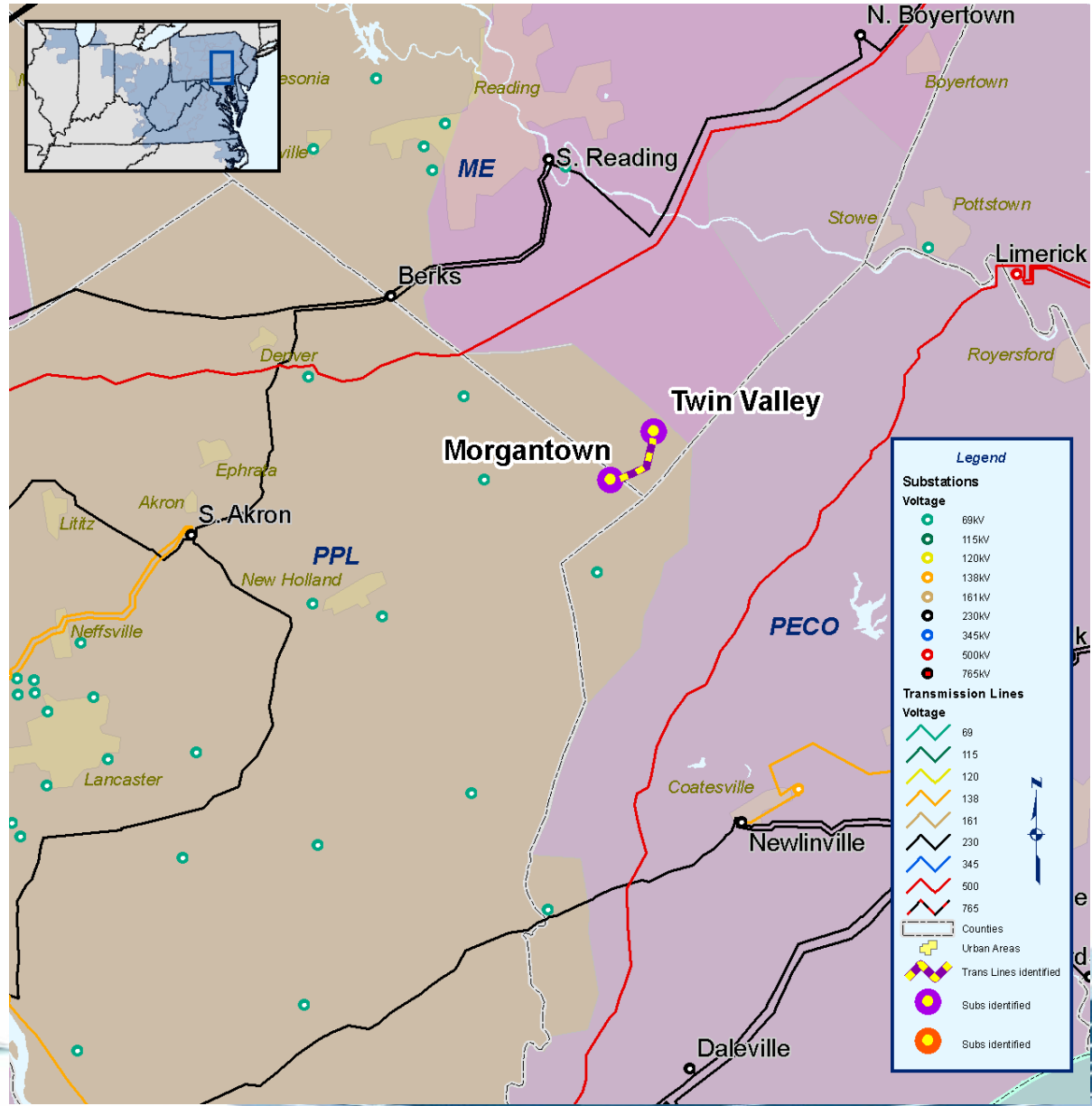
PPL Baseline Upgrades

- More than 70 MW load loss / double-circuit outage on the 69kV Dillersville Tap
- Exceeds PPL guidelines for maximum allowable load loss
- Transfer South Akron-South Manheim #1 & #2 lines from the South Akron 69kV Yard to the South Akron 138 kV Yard
- Estimated Project Cost: $3.01 M
- Expected IS Date: 11/01/2012
- Install Switches on South Akron-South Manheim #1 & #2 138 kV Lines
- Estimated Project Cost: $2.04 M
- Expected IS Date: 11/01/2013



PPL Baseline Upgrades

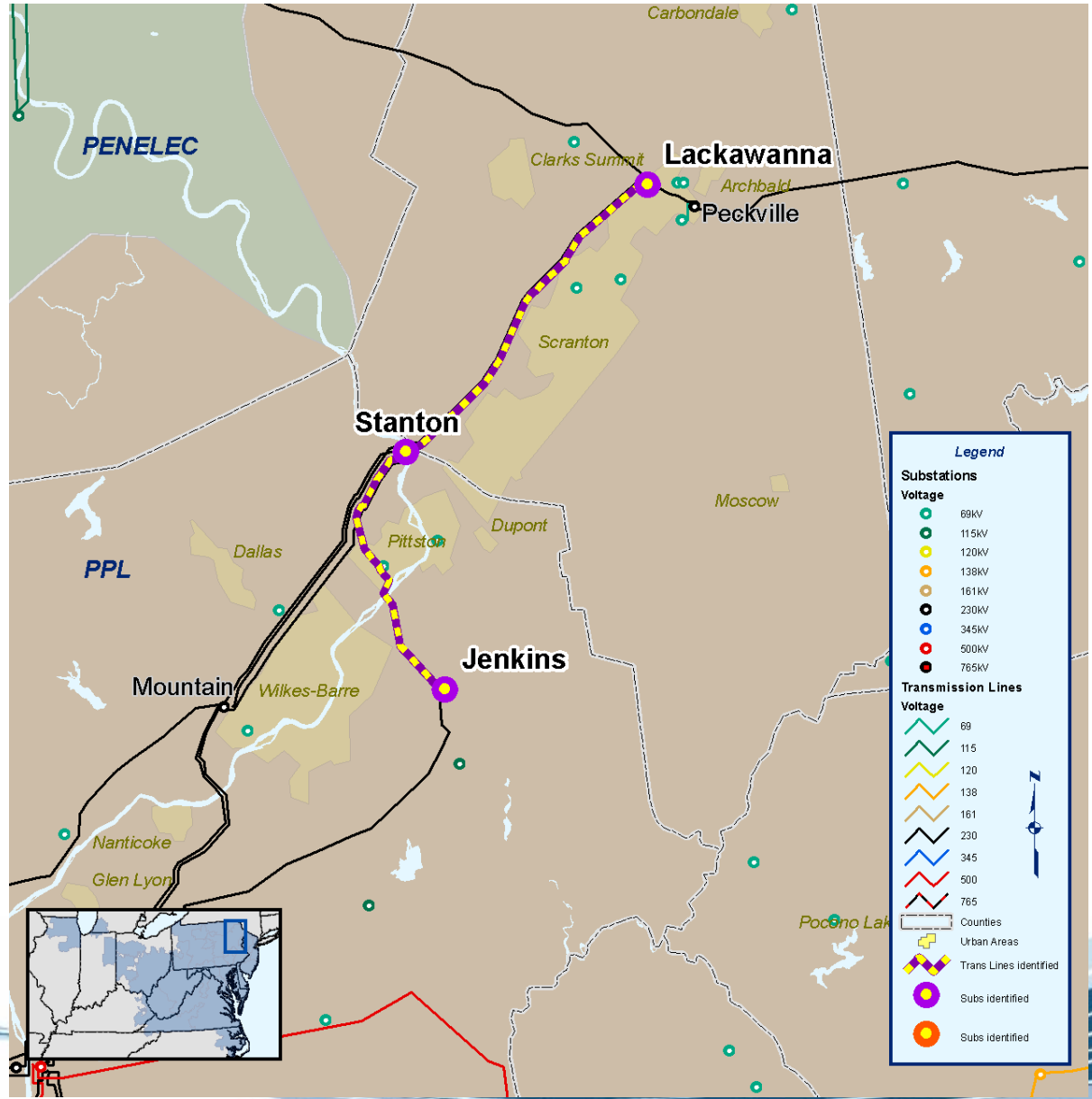
- 33 MVA load loss / loss of the Morgantown-Twin Valley 69 kV line
- Exceeds PPL guidelines for maximum allowable load loss
- Add 2nd 69 kV Circuit from Morgantown to Twin Valley
- Estimated Project Cost: $0.731 M
- Expected IS Date: 11/01/2009



PPL Supplemental Projects

PPL Supplemental Projects

- Low voltage along Scranton-Jenkins 69 kV lines and Scranton-Lackawanna 69 kV lines when abnormal switching is done during unplanned line maintenance
- Install 2, 10.8 MVAR capacitor banks at Minooka 69 kV station
- IS Date: 11/1/2011



PPL Supplemental Projects

- Flory Mill Substation: New 138 kV Tap off South Akron-West Hempfield #3 & #4 138 kV Lines to New Customer-Owned Substation
- IS Date: 11/1/2013