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File #: 140066

October 24, 2014

VIA HAND DELIVERY

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor North
P.O. Box 3265
Harrisburg, PA 17105-3265

RECEIVED
2014 OCT 24 PM 3:28
PA PUC
SECRETARY'S BUREAU

**Re: Letter of Notification of PPL Electric Utilities Corporation, Filed Pursuant to 52 Pa. Code Chapter 57, Subchapter G, for Approval to Rebuild 1.6 Miles of the Existing Wescosville - Macungie #1 69 kV Tap in Lower Macungie and Upper Milford Townships, Lehigh County, Pennsylvania
Docket No. A-2014-**

Dear Secretary Chiavetta:

Enclosed for filing are an original and six (6) copies of the Letter of Notification of PPL Electric Utilities Corporation together with seven (7) copies of the accompanying attachments which are contained in a separately-bound volume in the above-referenced proceeding. Also enclosed is a CD containing copies of the Letter of Notification and attachments.

As indicated on the Certificate of Service, copies of the Letter of Notification and accompanying exhibits and appendices are being served by certified mail, return receipt requested upon the involved governmental agencies, municipalities and property owners.

Subject to Commission approval, construction is scheduled to begin in May 2015 to support an in-service date of December 2015.

If you have any questions concerning this matter, please contact me at the address or telephone numbers provided above.

Rosemary Chiavetta; Secretary
October 24, 2014
Page 2

Respectfully submitted,



Christopher T. Wright

CTW/jl
Enclosures

cc: Certificate of Service
Robert F. Young
Paul T. Diskin
Nicholas Okoro
Kimberly Hafner

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Letter of Notification of PPL Electric :
Utilities Corporation, Filed Pursuant to :
52 Pa. Code Chapter 57 Subchapter G, : Docket No. A-2014-_____
for Approval to Rebuild 1.6 Miles of :
the Existing Wescosville – Macungie :
#1 69 kV Tap In Lower Macungie and :
Upper Milford Townships, Lehigh :
County, Pennsylvania. :

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LETTER OF NOTIFICATION

TO THE PENNSYLVANIA PUBLIC UTILITY COMMISSION:

PPL Electric Utilities Corporation (“PPL Electric”) hereby files, pursuant to 52 Pa. Code § 57.72(d), this Letter of Notification to request approval from the Pennsylvania Public Utility Commission (“Commission”) to rebuild 1.6 miles of the existing Wescosville-Macungie #1 69 kV Tap (“Macungie Tap”) to provide an alternate electrical source to the customers served by both the Emmaus and Macungie 69-12 kV Substations, which will improve operating flexibility and allow customer load to be restored more quickly after a facility outage (the “Project”). The proposed Project is located in Lower Macungie and Upper Milford Townships, Lehigh County, Pennsylvania. PPL Electric has provided information regarding this Project to these political subdivisions, which have not objected to the Project.

Subject to the Commission’s approval, construction is scheduled to begin in in May 2015 to support the in-service date of December 2015. In support thereof, PPL Electric states as follows:

I. INTRODUCTION

1. This Letter of Notification is filed by PPL Electric, a public utility that provides electric distribution, transmission, and provider of last resort services in Pennsylvania subject to the regulatory jurisdiction of the Commission.

2. PPL Electric's address is PPL Electric Utilities Corporation, Two North Ninth Street, Allentown, Pennsylvania 18101.

3. PPL Electric's attorneys are:

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PPL Electric's attorneys are authorized to receive all notices and communications regarding this Letter of Notification.

4. PPL Electric furnishes electric service to approximately 1.4 million customers throughout its certificated service territory, which includes all or portions of twenty-nine counties and encompasses approximately 10,000 square miles in eastern and central Pennsylvania. PPL Electric is a "public utility" and an "electric distribution company" as defined in Sections 102 and 2803 of the Pennsylvania Public Utility Code, 66 Pa.C.S. §§ 102, 2803.

5. PPL Electric owns approximately 5,000 miles of transmission lines operating at 69 kV (kilovolts) or higher, approximately 375 substations with a capacity of 10 MVA

(megavolt amperes) or more, and approximately 43,000 miles of distribution lines operating at less than 69 kV.

6. This Letter of Notification includes the following accompanying attachments:

- Attachment 1 Necessity Statement.
- Attachment 2 Engineering Description.
- Attachment 3 Description of the Right-of-Way.
- Attachment 4 PPL Electric Design Criteria and Safety Practices.

7. This Letter of Notification and accompanying Attachments, which are incorporated herein by reference, contain all the information required by 52 Pa. Code § 57.72(d)(4).

II. THE PROJECT

A. NEED FOR THE PROJECT

1. Existing System

8. The Emmaus 69-12 kV Substation currently serves approximately 6,700 customers.

9. Presently, the Emmaus 69-12 kV Substation is normally served from the Hosensack 230-69 kV Substation via the double-circuit Emmaus #1 & #2 69 kV Taps off the double-circuit Hosensack – Wescosville #1 and #2 69 kV Transmission Lines. There currently are no alternate sources of supply to the Emmaus 69-12 kV Substation.

10. The Macungie 69-12 kV Substation currently serves approximately 5,700 customers.

11. The Macungie 69-12 kV Substation is served from Wescosville 500-138-69 kV and Hosensack 230-69 kV Substations via the Macungie Tap.

12. The existing Macungie Tap extends approximately 1.8 miles from the Wescosville – Trexlertown #1 138/69 kV Transmission Line to the T2 transformer at the Macungie Substation 69-12 kV Substation, and then proceeds approximately 5 miles from the T1 transformer at the Macungie 69-12 kV Substation to the Hosensack 230-69 kV Substation. The Macungie Tap has a normally a normally open point between the T1 and T2 transformers at the Macungie 6912 kV Substation.¹

13. A description and one-line diagram of the existing system is provided in the Necessity Statement included as Attachment 1 to this Letter of Notification.

2. Need for the Project

14. The customers served from the Emmaus 69-12 kV Substation experienced extended outages for more than 5 days during the Halloween Snow Storm in 2011 and Super Storm Sandy in 2012. These prolonged outages were due to the lack of an alternative source of electric supply as explained above.

15. Similarly, the customers served from the Macungie 69-12 kV Substation were interrupted for extended periods of time due to faults on the double-circuit Emmaus #1 & #2 69 kV Taps during the Halloween Snow Storm in 2011 and Super Storm Sandy in 2012. The Emmaus #1 & #2 69 kV Taps are vulnerable to faults during extreme weather conditions due to the narrow right-of-way, tall trees, and mountainous terrain.

16. The need for this Project is provided in Attachment 1 to this Letter of Notification.

¹ Transmission line facilities are “sectionalized” with electrical switches. When the switch is “closed,” the electric current flows across the switch and the transmission line operates as one single transmission line. When the switch is “open,” the electric current is disrupted and the transmission line is sectionalized at the open point.

B. THE PROPOSED PROJECT

17. To resolve the issues described above, PPL Electric proposes to construct a new Macungie-Emmaus 69 kV transmission line extending approximately 3 miles from the Macungie Tap to the Emmaus 60-12 kV Substation.

18. The new Macungie-Emmaus 69 kV transmission line will provide an alternate source to the Emmaus 69-12 kV Substation. This will allow for faster restoration of power to customers in the event of the failure of either the double-circuit Emmaus #1 and #2 69 kV Taps or the double-circuit Hosensack – Wescosville #1 and #2 69 kV Transmission Lines

19. The new Macungie – Emmaus 69 kV transmission line also will provide an alternate source to the Macungie 69-12 kV Substation in the event that the source to the Macungie T2 transformer is interrupted.

20. In order to accommodate the load that would be transferred through the new Macungie – Emmaus 69 kV transmission line during emergency conditions, the existing 1.6-mile section of the Macungie Tap from the Wescosville-Trexlerstown #1 138/69 kV Transmission line to the T2 transformer at the Macungie 69-12 kV Substation must be rebuilt with a higher capacity conductor. This section of the Macungie Tap currently uses a 3/0 copper conductor, which cannot support the additional load from the Emmaus 69-12 kV Substation that would be transferred through the new Macungie-Emmaus 69 kV line during emergency conditions.

21. A description and one-line diagram of the proposed Project is provided in the Necessity Statement included as Attachment 1 to this Letter of Notification.

22. The existing Macungie Tap currently is supported on 17 wooden H-frame structures with an average height of 60 feet. The existing H-frame structures will be removed and replaced with 19 weathering steel monopoles with an average height of 98 feet. The monopoles will be self-supported on concrete caisson foundations. A depiction of the type of

monopoles used for this Project is provided at the end of Attachment 2 to this Letter of Notification.

23. The rebuilt Macungie Tap will utilize three 138 kV power conductors and two fiber optic ground wires used for lightning protection and for communications between the transmission system facilities. The minimum conductor-to-ground clearance will be 30 feet, which occurs at a maximum conductor temperature of 125° C. An engineering description of the Project is provided in Attachment 2 to this Letter of Notification.

24. The total estimated cost of the proposed Project is \$1.5 million.²

25. Upon Commission approval, the Project has a scheduled construction start date of May 2015 to support the in-service date of December 2015.

III. HEALTH AND SAFETY

26. The proposed Project will not create any unreasonable risk of danger to the public health or safety.

27. The Project will be designed, constructed, operated, and maintained in a manner that meets or surpasses all applicable National Electrical Safety Code (“NESC”) minimum standards and all applicable legal requirements. Descriptions PPL Electric’s design criteria and safety practices are provided in Attachment 4 to this Letter of Notification.

28. Consistent with its Magnetic Field Management Program, PPL Electric will construct the Project for ground clearances that are a minimum of five feet higher than the required NESC minimum ground clearance for 138 kV lines in order to reduce the magnetic field

² The estimated cost for the proposed Project is an order-of-magnitude estimate developed using averages of recent costs for similar projects and without an in-depth analysis of filed investigation. The estimated cost is subject to change as the constructability of the Project, sequence of construction, and other factors that may affect cost are identified and analyzed as the Project progresses.

exposure. A description of PPL Electric's Magnetic Field Management Program is provided in Attachment 2 to this Letter of Notification.

IV. DESCRIPTION OF RIGHT-OF-WAY

29. The existing Macungie Tap will be rebuilt from the tap structure on the Wescosville – Trexlertown #1 138/69 kV Transmission Line located at the intersection of Sauerkraut and Wild Cherry Lanes in Lower Macungie Township. The rebuilt segment of the Macungie Tap continues southeast for approximately 1.6 miles and terminates at the PPL Electric Macungie 69-12 kV Substation located in Upper Milford Township.

30. An aerial plot plan is provided at the end of Attachment 3 to this Letter of Notification.

31. The Project will be constructed entirely within PPL Electric's existing right-of-way, which varies from 50 to 100 feet in width. PPL Electric does not require any additional right-of-way to construct the Project.

32. Although the new structures will increase in height, impacts will be minimal because the Project will be rebuilt within the existing right-of-way in close proximity to the existing structures. In addition, the footprints of the new tower structures will be smaller. Further, no new poles will be placed on any property that currently does not have an existing pole.

33. Land use impacts are anticipated to be minimal due to the fact that the Project will be constructed entirely within the existing right-of-way. Where practical, PPL Electric will use previously established access roads for construction to further reduce interference with existing land uses.

34. The Project area previously has been cleared of vegetation. As a result, limited vegetation management will be required for this project. In areas where vegetation management is required to complete the project, PPL Electric will apply its “Specifications for Initial Clearing and Control of Vegetation On or Adjacent to Electric Line Right-of-Way Through Use of Herbicides, Mechanical and Hand Clearing Techniques” to mitigate any impacts.

35. No communication towers, pipelines, or other utilities will be affected by the proposed Project.

36. PPL Electric does not anticipate any interference with airport operations because of the distance from the Project area, the presence of existing electrical facilities in the Project area, and the similar height of the new facilities and the existing facilities.

37. The Project area contains no state lands, national parks, state parks, or local parks.

38. The Project will not traverse or affect any unique geological, scenic, or natural areas.

39. The Project will not affect any recreational areas or natural landmarks.

40. The Project area was reviewed with the Pennsylvania Historical and Museum Commission (“PHMC”). The PHMC has concluded that the Project will have minimal impacts to cultural and archaeological resources, and that no further archaeological work is necessary for the Project.

41. The Project area contains no wetlands. PPL Electric will avoid impacts to two streams located in the Project area to the maximum extent practical.

42. PPL Electric will obtain all necessary permits from the Pennsylvania Department of Environmental Protection and the United States Army Corps of Engineers and will comply with all of the terms and conditions placed on those permits.

43. PPL Electric will acquire any required soil erosion and sedimentation control permits and will comply with any conditions placed on those permits.

44. PPL Electric has consulted with state and federal agencies to obtain information regarding endangered and threatened species in close proximity to the Project. PPL Electric has reviewed the Pennsylvania Natural Diversity Inventory records under the jurisdiction of the Pennsylvania Department of Conservation and Natural Resources, the Pennsylvania Fish and Boat Commission, and the Pennsylvania Game Commission. Based on this review, these agencies have reported that the Project will not impact any threatened and endangered species and/or special concern species and resources located within the Project area.

45. The Project is located in Lehigh County, which is within the known range of the federally threatened bog turtle (*Clemmys muhlenbergii*). However, based on a field reviews, no wetlands were identified within the Project area and, therefore, no impacts to bog turtles are anticipated. PPL Electric will continue to consult with the U.S. Fish and Wildlife Service to resolve any concerns.

V. NOTICE

46. PPL Electric has provided information regarding the Project to representatives of Lehigh County and Upper Milford and Lower Macungie Townships. These entities have not objected to the proposed Project.

47. Copies of this Letter of Notification will be served on the governmental agencies, municipalities, and other public entities agencies in accordance with 52 Pa. Code § 57.72(d)(3).

48. Copies of this Letter of Notification will be served on the owners of land subject to the right-of-way and easement in accordance with 52 Pa. Code § 57.72(d)(3).

VI. LETTER OF NOTIFICATION

49. PPL Electric is proceeding by means of a Letter of Notification, instead of a full Application, pursuant to the Commission's regulations at 52 Pa. Code § 57.72(d)(1)(vi).

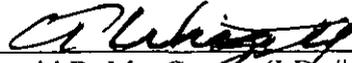
50. The proposed Project qualifies for use of a Letter of Notification because the proposed the rebuilt section of the Macungie Tap will be less than two miles, *i.e.*, 1.6 miles.

51. This Letter of Notification is filed on the date set forth below. As provided in 52 Pa. Code § 57.72(d)(5), the Commission will review and, by order, approve or disapprove this Letter of Notification. If the Commission approves this Letter of Notification, the proposed Project will be constructed as proposed herein without the formal application process set forth at 52 Pa. Code §§ 57.71, *et seq.*

VII. CONCLUSION

WHEREFORE, PPL Electric Utilities Corporation respectfully requests that the Pennsylvania Public Utility Commission approve the to rebuild 1.6 miles of the existing Wescosville-Macungie #1 69 kV Tap in Lower Macungie and Upper Milford Townships, Lehigh County, Pennsylvania, as explained above and in the Attachments hereto.

Respectfully submitted,



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Date: October 24, 2014

Attorneys for PPL Electric Utilities Corporation

ATTACHMENT 1

**ATTACHMENT 1
WESCOSVILLE – MACUNGIE #1 TAP REBUILD PROJECT
NECESSITY STATEMENT**

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ATTACHMENT 1
WESCOSVILLE – MACUNGIE #1 TAP REBUILD PROJECT
NECESSITY STATEMENT

A. INTRODUCTION

PPL Electric Utilities Corporation (PPL Electric) is requesting Pennsylvania Public Utility Commission (PUC) approval to rebuild 1.6 miles of the existing PPL Electric Wescosville – Macungie #1 69 kV Tap (“Macungie Tap”) located in Lower Macungie and Upper Milford townships in Lehigh County. This line rebuild is a necessary part of PPL Electric’s plan to provide an alternate electrical source to the customers served by both the Emmaus and Macungie 69-12 kV Substations, which will improve operating flexibility and allow customer load to be restored more quickly after a facility outage.

The estimated cost to design and rebuild the 1.6-mile-long section of the Macungie Tap is \$1.5 million.¹ Construction is scheduled to begin in May 2015 and expected to be completed by December 2015.

B. EXISTING SYSTEM

The Emmaus 69-12 kV Substation currently serves approximately 6,700 customers. Presently, the Emmaus 69-12 kV Substation is normally served from the Hosensack 230-69 kV Substation via the double-circuit Emmaus #1 & #2 69 kV Taps off the double-circuit Hosensack – Wescosville #1 and #2 69 kV Transmission Lines. There currently are no alternate sources of supply to the Emmaus 69-12 kV Substation.

¹ The estimated cost for the Project is an order-of-magnitude estimate developed using averages of recent costs for similar projects and without an in-depth analysis of filed investigation. The estimated cost is subject to change as the constructability of the project, sequence of construction, and other factors that may affect cost are identified and analyzed as the project progresses.

The Macungie 69-12 kV Substation currently serves approximately 5,700 customers. The Macungie 69-12 kV Substation is served from Wescosville 500-138-69 kV and Hosensack 230-69 kV regional substations via the Macungie Tap.

The Macungie Tap extends approximately 1.8 miles from the Wescosville – Trexlertown #1 138/69 kV Transmission Line to the T2 transformer at the Macungie Substation 69-12 kV Substation, and then proceeds approximately 5 miles from the T1 transformer at the Macungie 69-12 kV Substation to the Hosensack 230-69 kV Substation. The Macungie Tap has a normally open point between the T1 and T2 transformers at the Macungie Substation 69-12 kV Substation.²

The Emmaus and Macungie 69-12 kV Substations are approximately 3 miles apart. Figures 1-1 is a map of the existing transmission facilities in the Project Area, and Figure 1-3 illustrates the functional arrangement of the existing transmission facilities in the Project Area.

C. DEFINITION OF THE PROBLEM

There are approximately 6,700 customers served from the Emmaus 69-12 kV Substation. As explained above, PPL Electric’s double-circuit Hosensack – Wescosville #1 and #2 69 kV Transmission Lines currently are the only source of supply to the Emmaus 69-12 kV Substation. The Hosensack – Wescosville #1 & #2 69 kV Transmission Lines that serve the Emmaus Substation experienced outages for more than 5 days during both the Halloween Snow Storm in 2011 and Super Storm Sandy in 2012.

The customers served from the Emmaus 69-12 kV Substation also were interrupted for extended periods of time due to faults on the double-circuit Emmaus #1 & #2 69 kV Taps during both the above mentioned storms. The narrow right-of-way (ROW), tall trees, and

² Transmission line facilities are “sectionalized” with electrical switches. When the switch is “closed,” the electric current flows across the switch and the transmission line operates as one single transmission line. When the switch is “open,” the electric current is disrupted and the transmission line is sectionalized at the open point.

mountainous terrain have made the double-circuit Emmaus #1 & #2 69 kV Taps vulnerable to failure during extreme weather conditions.

There currently is no alternate transmission source of power for the Emmaus 69-12 kV Substation. Therefore, during a loss of either the double-circuit Hosensack – Wescosville #1 and #2 69 kV Transmission Lines or the double-circuit Emmaus #1 & #2 69 kV Taps, all 6,700 customers served from the Emmaus 69-12 kV Substation will remain *interrupted until repairs are made.*

D. PROPOSED SOLUTION

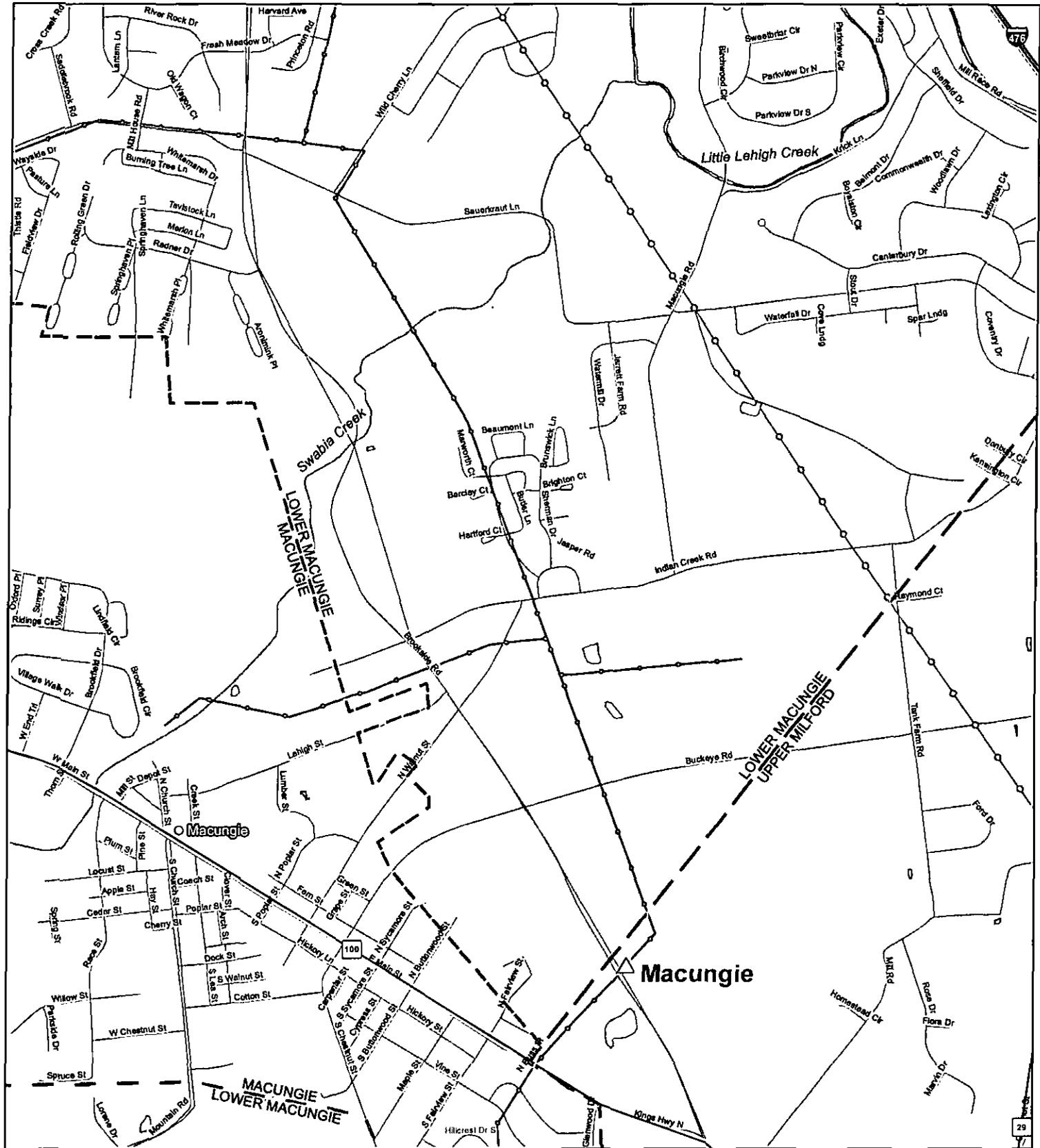
PPL Electric has determined that the best overall solution to improve service reliability to customers served from the Emmaus 69-12 kV Substation is to provide an alternate source of power to the substation. PPL Electric has determined that this can be accomplished by constructing a new 69 kV transmission line extending approximately 3 miles from the Macungie Tap line to the Emmaus 69-12 kV Substation. The new “Macungie – Emmaus 69 kV line” will allow for faster restoration of power to customers served from the Emmaus 69-12 kV Substation in the event of the failure of either the double-circuit Emmaus #1 and #2 69 kV Taps or the double-circuit Hosensack – Wescosville #1 and #2 69 kV Transmission Lines, which currently are the only source of supply to the Emmaus 69-12 kV Substation as described above. The new Macungie – Emmaus 69 kV line also will provide an alternate source to the Macungie 69-12 kV Substation in the event that the source to the Macungie T2 transformer is interrupted. The Macungie – Emmaus 69 kV line will be constructed for 69 kV operation, and therefore, is not subject to PUC approval.

However, in order to accommodate the load that would be transferred through the new Macungie – Emmaus 69 kV line during emergency conditions, the existing 1.6-mile section of Macungie Tap from the Wescosville – Trexlertown #1 138/69 kV Transmission line to the T2 transformer at the Macungie 69-12 kV Substation must be rebuilt with a higher capacity conductor. This section of the Macungie Tap currently uses a 3/0 copper conductor, which cannot support the additional load from the Emmaus

69-12 kV Substation that would be transferred through the new Macungie – Emmaus 69 kV line during emergency conditions. The Macungie Tap will be designed and constructed for 138 kV operation, but will initially operate at 69 kV until load growth in the area increases.

PPL Electric submitted the proposed Project to PJM Interconnection, LLC (PJM) for review and inclusion in its Regional Transmission Expansion Plan (RTEP) in 2013. The Project was presented before stakeholders at the Mid-Atlantic Sub-Regional RTEP meeting on March 2013, and included in the 2013 RTEP Reports as supplemental project s0533. Figure 1-3 provides a map of the proposed transmission facilities in the Project area, and Figure 1-4 illustrates the functional arrangement of the proposed transmission facilities in the Project area.

FIGURE 1-1. MAP OF EXISTING FACILITIES



Legend

- Populated Place
- △ Substation
- ⌓ Municipality
- ▭ Waterbody
- Stream

Existing Transmission

- 230kV
- 69kV
- Interstate Highway
- US Highway
- State Highway
- Local Road

Wescosville - Macungie
Figure 1-1: Map of Existing Facilities

N
 W — E
 S

0 500 1,000 1,500
 Feet

Sources: Pennsylvania Spatial Data Access (PASDA),
 Environmental Systems Research Institute (ESRI),
 United States Geological Survey (USGS),
 United States Fish and Wildlife Service (USFWS)

ppf **Louis Berger**

Projected Coordinate System: PA State Plane, South
 Datum: North American Datum of 1983 (NAD83)
 Projection: Lambert Conformal Conic,
 Linear Unit: Feet,
 Ellipsoid: Geodetic Reference System 80

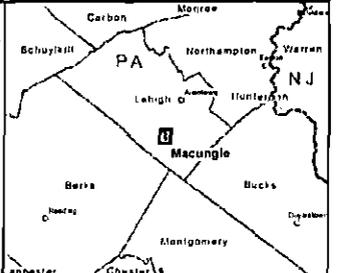
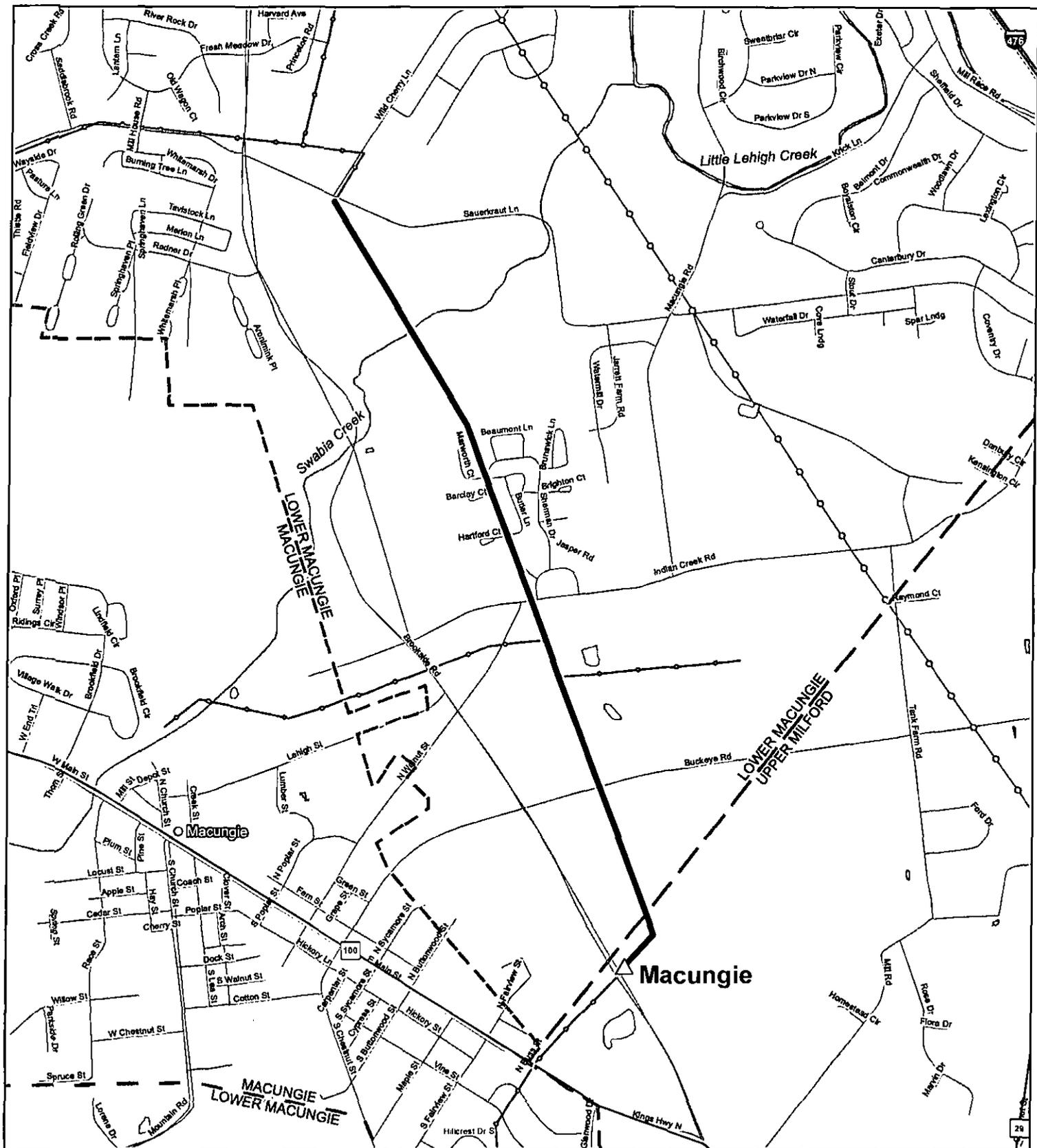


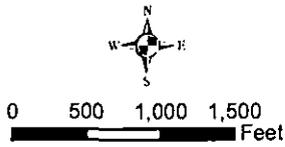
FIGURE 1-2. MAP OF PROPOSED FACILITIES



Legend

○ Populated Place	Existing Transmission
△ Substation	—○— 230kV
Route	—●— 69kV
┌┐ Municipality	▬ Interstate Highway
▭ Waterbody	▬ US Highway
— Stream	▬ State Highway
	▬ Local Road

Wescosville - Macungie
Figure 1-2: Map of Proposed Facilities



Sources: Pennsylvania Spatial Data Access (PASDA),
 Environmental Systems Research Institute (ESRI),
 United States Geological Survey (USGS),
 United States Fish and Wildlife Service (USFWS)



Projected Coordinate System: PA State Plane, South
 Datum: North American Datum of 1983 (NAD83)
 Projection: Lambert Conformal Conic.
 Linear Unit: Feet.
 Ellipsoid: Goodricke Reference System 80

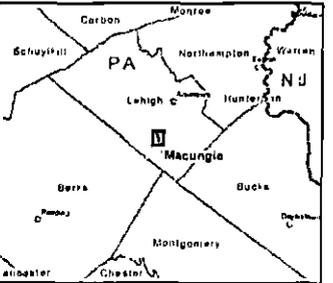


FIGURE 1-3. FUNCTIONAL ARRANGEMENT OF THE EXISTING TRANSMISSION FACILITIES

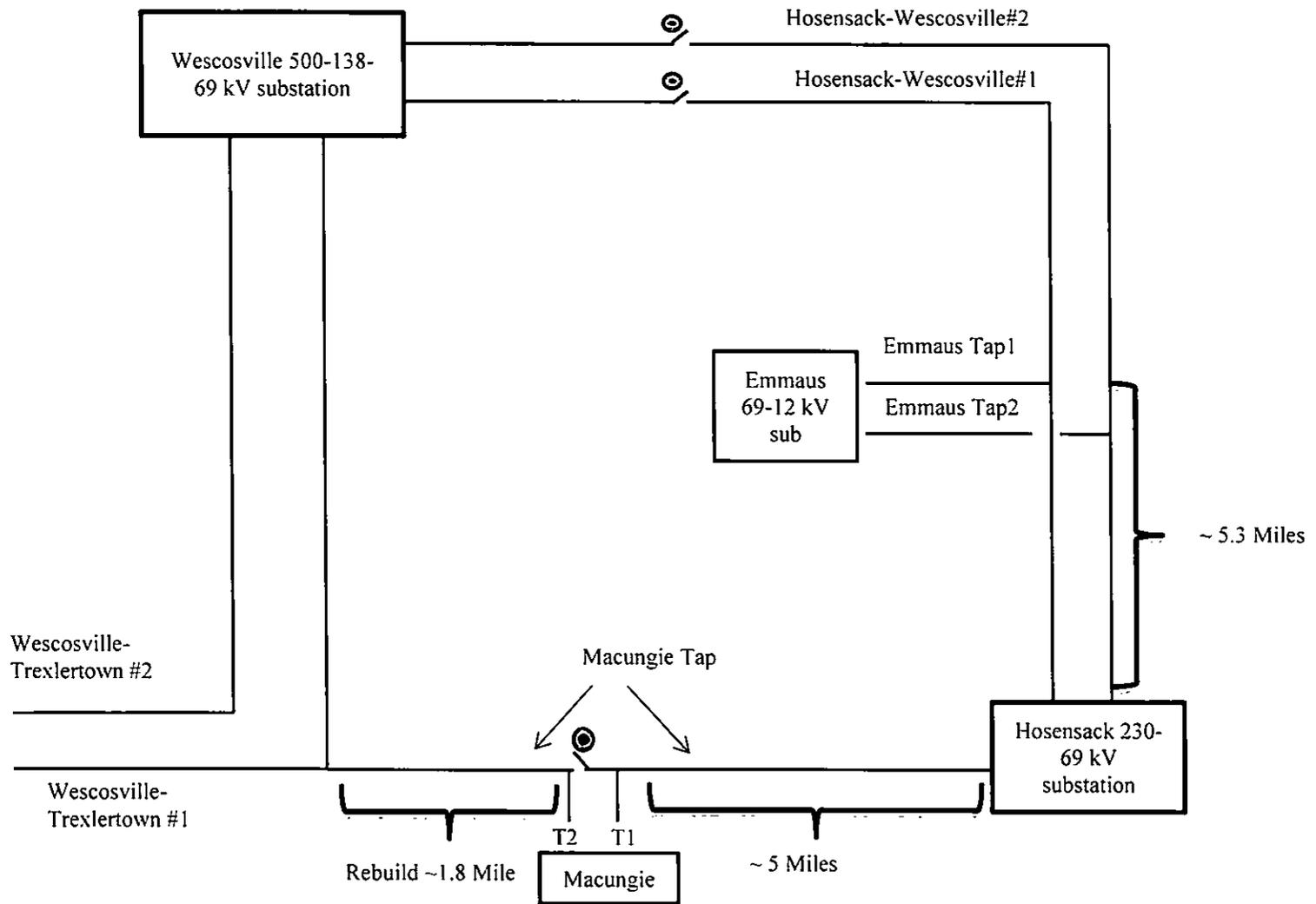
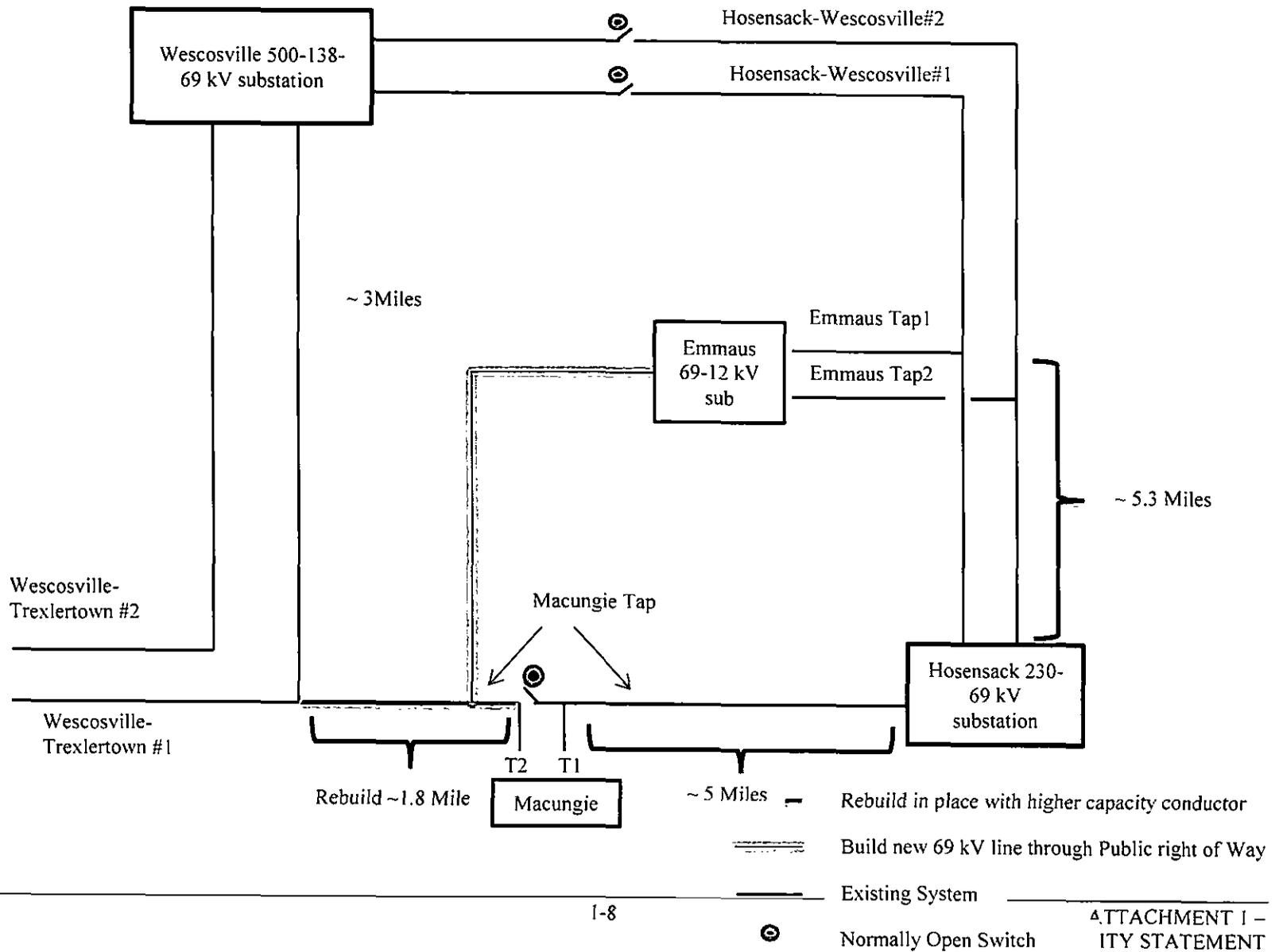


FIGURE 1-4. FUNCTIONAL ARRANGEMENT OF THE PROPOSED TRANSMISSION FACILITIES



ATTACHMENT 2

**ATTACHMENT 2
WESCOSVILLE – MACUNGIE #1 TAP REBUILD PROJECT
ENGINEERING DESCRIPTION**

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ATTACHMENT 2
WESCOSVILLE – MACUNGIE #1 TAP REBUILD PROJECT
ENGINEERING DESCRIPTION

A. DESCRIPTION OF PROPOSED LINE

PPL Electric Utilities (PPL Electric) proposes to rebuild 1.6 miles of existing Wescosville – Macungie #1 138/69 kV Tap (“Macungie Tap”) in order to accommodate electrical load from the proposed construction of the Macungie – Emmaus 69 kV Transmission Line. PPL Electric intends to replace existing H-frame structures along the 1.6 mile section of the Macungie Tap line with steel monopoles with foundations. The modernization of the aging Macungie Tap line will help ensure continuous and reliable service by supporting additional load transfer from the Macungie – Emmaus 69 kV line during emergency conditions.

The existing Macungie Tap currently is strung on 17 wooden H-frame structures, which consist of two poles joined by an arm. The existing H-frame structures will be removed and replaced with weathering steel monopoles. Based on preliminary engineering, there will be 19 new monopoles with an average height of 98 feet. There will be three (3) 556 kcmil,¹ 24/7 stranding, ACSR² power conductors and two (2) 0.567 inch diameter 48 count overhead fiber optic ground wires attached to each structure using steel arms. The proposed structure types are shown in Figures 2-1 through 2-3.

This Project is located in Lower Macungie and Upper Milford townships in Lehigh County, Pennsylvania. An aerial exhibit showing the location of the proposed facilities is provided at the end of Attachment 3.

The proposed line will be designed to comply with National Electrical Safety Code (“NESC”) standards. Design specifications and safety rules practiced by PPL Electric are included in

¹ Kcmil stands for thousand circular mills. Kcmil wire size is the equivalent cross sectional area in thousands of circular mils. A circular mil is the area of a circle with a diameter of one thousandth (.001) of an inch.

² ACSR stands for aluminum conductor steel reinforced.

Attachment 4. The minimum conductor-to-ground clearance will be 30 feet, which occurs at a maximum conductor temperature of 125° C.

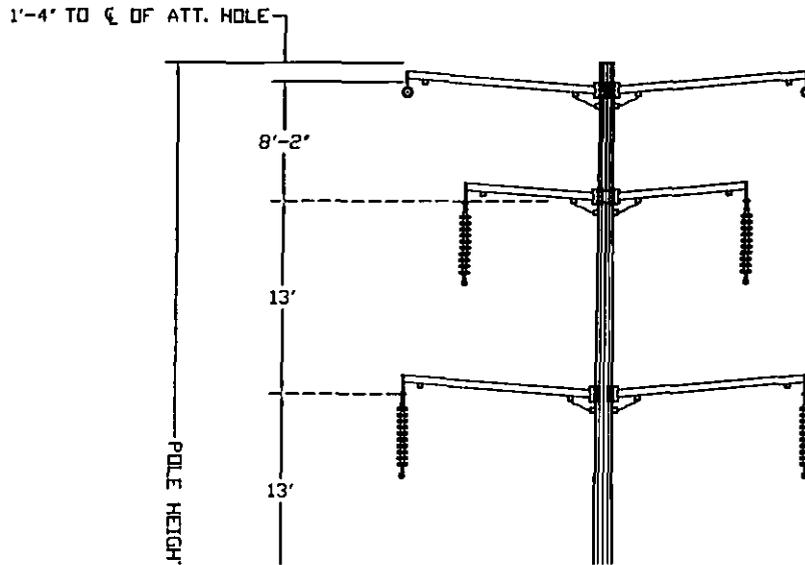
B. MAGNETIC FIELD MANAGEMENT

PPL Electric's Magnetic Field Management Program is applied to new and reconstructed transmission line projects. The company does not believe that the current scientific evidence demonstrates that magnetic fields cause any adverse health effects or pose a health or safety danger to the public. Nevertheless, PPL Electric has determined, as a matter of policy, to design its new and rebuilt transmission lines to reduce magnetic fields when that can be done at low or no cost and consistent with functional requirements. PPL Electric's Magnetic Field Management Program has been developed to implement that policy decision. To reduce magnetic field exposures, the program generally prescribes the use of a line design that provides five feet higher ground clearance than NESC standards and reverse phasing of new double-circuit lines where it is feasible to do so at low or no cost.

Because the 1.6 miles section of the Macungie Tap to be rebuilt will be a single-circuit, reverse phasing will not be possible. Reverse phasing requires a double circuit line. However, pursuant to PPL Electric's Magnetic Field Management Program, the new tower structures will be constructed with five feet higher ground clearances than NESC standards to reduce the potential for exposure to magnetic fields.

FIGURE 2-1

Double-Circuit 138/69 kV Tangent Structure. New tangent structure will have two arms at the top of the pole to support two overhead wires.



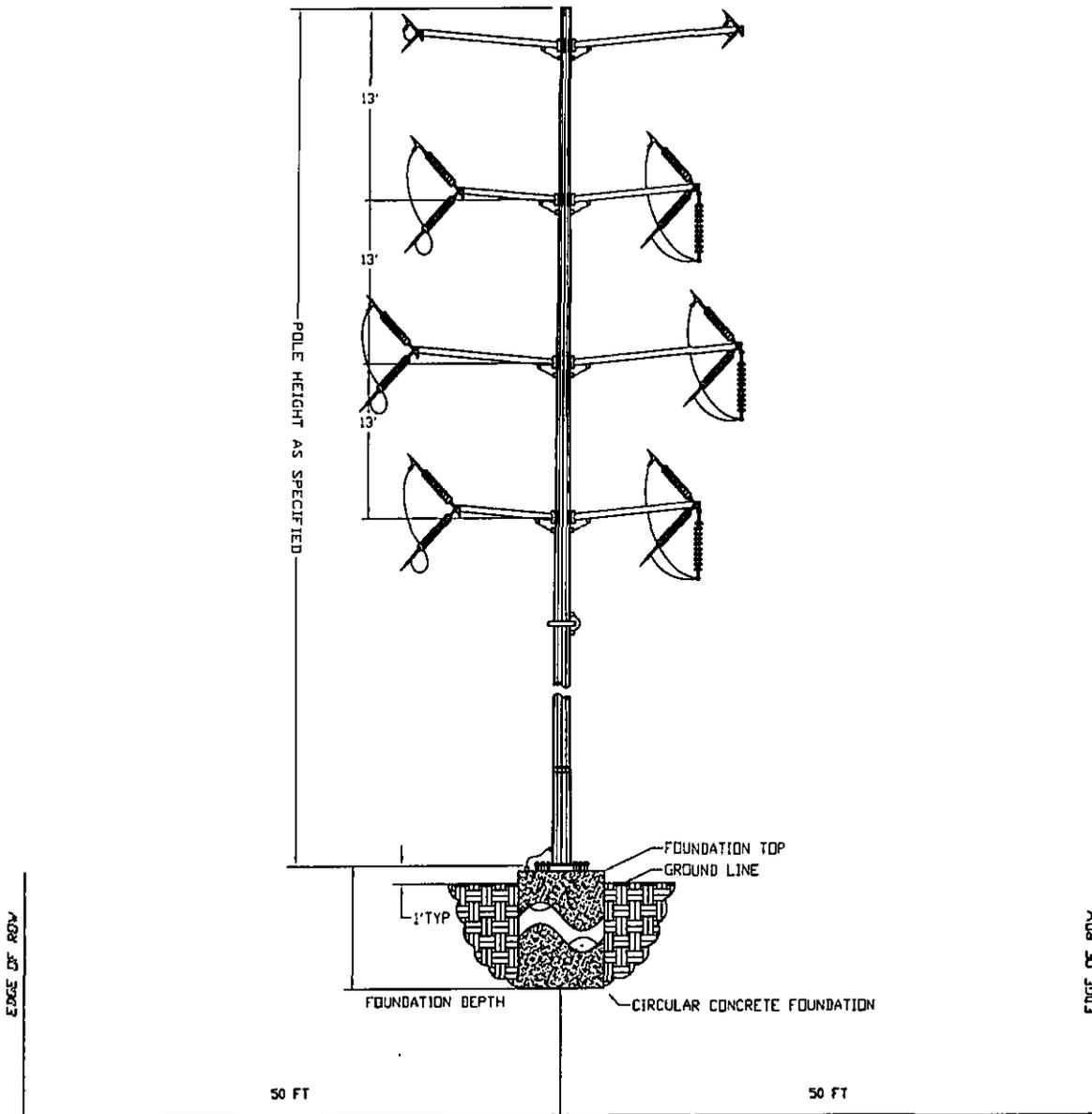
POLE STATISTICS

Height Range: 90-120 feet
Arm Length (Middle): 13 feet
Arm Length (Top & Bottom): 9 feet

Conductor Spacing: 13 feet
Overhead Ground Wire to Top Phase: 13 feet

FIGURE 2-2

Double-Circuit 138/69 kV Cross Section – This figure shows a typical tension angle structure on a concrete foundation. Also depicted is our typical right of way width of 100'.



POLE STATISTICS

Height Range: 90-120 feet Conductor Spacing: 13 feet
Arm Length (Middle): 13 & 16 feet Overhead Ground Wire to Top Phase: 13 feet
Arm Length (Top & Bottom): 9 & 12 feet

FIGURE 2-3
Single-Circuit 138/69 kV Cross Section – This figure shows a typical direct embedded
Switch structures.



Height Range: 80 feet
Conductor Spacing: 9 feet
Overhead Ground Wire to Top Phase: 10 feet

ATTACHMENT 3

**ATTACHMENT 3
WESCOSVILLE – MACUNGIE #1 TAP REBUILD PROJECT
DESCRIPTION OF THE RIGHT-OF-WAY**

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C. ENVIRONMENTAL ASSESSMENT.....	3-2
D. VEGETATION MANAGEMENT.....	3-4

LIST OF FIGURES

AERIAL EXHIBIT.....;.....END OF ATTACHMENT

ATTACHMENT 3
WESCOSVILLE – MACUNGIE #1 TAP REBUILD PROJECT
DESCRIPTION OF THE RIGHT-OF-WAY

A. INTRODUCTION

PPL Electric Utilities Corporation (PPL Electric) proposes to rebuild 1.6 miles of the existing Wescosville – Macungie #1 138/69 kV Tap (“Macungie Tap”) in order to accommodate electrical load from the proposed construction of the Macungie – Emmaus 69 kV Transmission Line. The modernization of the Macungie Tap will help ensure continuous and reliable service by supporting additional load transfer from the Macungie – Emmaus 69 kV line during emergency conditions. The need for the proposed project is described in Attachment 1.

The entire Project is located within Lehigh County, Pennsylvania. The existing line will be rebuilt from a tap structure located at the intersection of Sauerkraut and Wild Cherry Lanes in Lower Macungie Township. The line continues southeast for approximately 1.6 miles and terminates at the PPL Electric Macungie Substation located in Upper Milford Township. Figure 3-1 is an aerial map of the Project that identifies property owners crossed by the Project.

The first 1.5 miles of the Project traverses Lower Macungie Township and the last 0.1 mile traverses Upper Milford Township. PPL Electric has discussed the proposed Project with representatives from Lehigh County and Upper Milford and Lower Macungie Townships, none of which had any objection to the Project.

B. RIGHT OF WAY DESCRIPTION

The Project will be constructed entirely within PPL Electric’s existing right-of-way (ROW), which varies from 50 to 100 feet in width. PPL Electric does not require any additional ROW to construct the Project.

As explained in Attachment 2, the existing wooden H-frame structures will be replaced with new steel monopoles. The replacement of the existing H-frame structures with new steel monopoles will result in structures with smaller footprints within the ROW.

The existing structures average approximately 60 feet in height. The new monopoles will have an average height of 98 feet. Although the new structures will increase in height, impacts will be minimal because the Project will be rebuilt within the existing ROW in close proximity to the existing structures. In addition, the footprints of the new tower structures will be smaller. Further, no new poles will be placed on any property that currently does not have an existing pole. The existing ROW is presently maintained, and will continue to be maintained, in accordance with PPL Electric's Vegetation Management Plan.

C. ENVIRONMENTAL ASSESSMENT

Impacts to land use are anticipated to be minimal because the Project will be constructed entirely within the existing ROW and no additional property will be required to complete the Project. PPL Electric will use and update previously established access roads for construction to the extent practical to further reduce interference with existing land uses.

No nearby communication towers, pipelines, or other utilities will be affected by the proposed Project. The closest airport is the Queen City Airport, a Lehigh-Northampton Airport Authority owned facility, located approximately 4 miles northeast of the Project. PPL Electric does not anticipate any interference with airport operations because the Project is located in an area where there are existing electrical facilities and because the new facilities will be a similar height as the existing facilities. However, PPL Electric will file any required documentation with both the Federal Aviation Administration and the Pennsylvania Department of Transportation, Bureau of Aviation.

PPL Electric reviewed the Pennsylvania Historical and Museum Commission (PHMC) Bureau for Historic Preservation (BHP) Cultural Resources Geographic Information

System (CRGIS) database to determine if listed or eligible historic properties are located in the Project vicinity. Based on this review, no listed or eligible historic properties are located in close proximity to the Project. One listed National Register of Historic Places (NRHP) historic property is located approximately 0.8 miles west of the Project within Macungie Borough. One eligible NRHP historic property is located 0.9 miles northwest of the Macungie Substation and a second eligible NRHP historic property is located approximately 0.5 miles east of the Project. The Project crosses two previously recorded archeological sites. Available data are insufficient to determine whether either site is eligible for the NRHP. Four additional previously recorded archeological sites are located within 500 feet of the Project, all of which have insufficient data necessary to determine whether these sites are eligible for the NRHP. PPL Electric submitted a review letter to the PHMC on August 27, 2014. No response has been received to date. PPL Electric will continue to consult with the PHMC to resolve any concerns.

The Project will not affect any unique geological, scenic, or natural areas. There are no anticipated impacts to these features because the Project is located in an area which contains existing electrical facilities located in the same general location as the existing facilities.

PPL Electric retained an environmental consultant to identify and delineate all wetlands and watercourses within the Project Area. No wetlands were identified within the Project Area. Two streams (Swabia Creek and a tributary to Swabia Creek) were delineated and presently spanned by the existing Wescosville – Macungie #1 138/69 kV Tap line. However, PPL Electric anticipates that the Project will have minimal impacts on these streams because the entire Project will be built within the existing ROW, and no structures will be placed within streams. PPL Electric will obtain all necessary permits from Pennsylvania Department of Environmental Protection and the United States Army Corps of Engineers and will comply with all of the terms and conditions placed on those permits. PPL Electric also will prepare a soil erosion and sedimentation control plan and will obtain a National Pollutant Discharge Elimination System (NPDES) permit, if required, and comply with any conditions of those permits.

PPL Electric conducted an online Pennsylvania Natural Diversity Inventory (PNDI) database review on January 2, 2014¹. Based on this review, the Pennsylvania Game Commission (PGC), Pennsylvania Fish and Boat Commission (PFBC), and the Pennsylvania Department of Conservation and Natural Resources (DCNR) reported that the Project is not expected to impact any threatened and endangered species or special concern species and resources located within the Project area. The U.S. Fish and Wildlife Service (USFWS) indicated further review is required to resolve any potential impacts. Lehigh County is located within the known range of the federally threatened bog turtle (*Clemmys muhlenbergii*). Based on a field review, no wetlands were identified within the Project Area. Therefore, no impacts to bog turtles are anticipated.

D. VEGETATION MANAGEMENT

The Project is being completed in an area that has already been cleared of vegetation for the existing electrical facilities. As a result, limited vegetation management will be required for this Project. In areas where vegetation management is required to complete the Project, PPL Electric will apply its “Specifications for Initial Clearing and Control of Vegetation On or Adjacent to Electric Line Right-of-Way Through Use of Herbicides, Mechanical and Hand Clearing Techniques” to mitigate any impacts.

¹ PNDI Project Search ID: 20140102432579



Legend

- Route
- △ Substation
- ROW
- Existing Transmission
- Municipality Boundary
- Parcel within ROW
- Parcel Boundary

**Wescosville – Macungie
Figure 3-1: Aerial Map**

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS), Lehigh County

ppl **Louis Berger**

Projected Coordinate System: PA State Plane, South Datum: North American Datum of 1983 (NAD83), Projection: Lambert Conformal Cons., Linear Unit: Feet, Ellipsoid: Geodetic Reference System 80

ATTACHMENT 4

ATTACHMENT 4
WESCOSVILLE – MACUNGIE #1 TAP REBUILD PROJECT
PPL DESIGN CRITERIA AND SAFETY PRACTICES

The National Electrical Safety Code (NESC) is a set of rules to safeguard people during the installation, operation, and maintenance of electric power lines. The NESC contains the basic provisions considered necessary for the safety of employees and the public. Although it is not intended as a design specification, its provisions establish minimum design requirements. PPL Electric Utilities Corp. (PPL) has developed design specifications and safety rules which meet or surpass all requirements specified by the NESC.

Engineering Design Criteria and Parameters

The NESC includes loading requirements and clearances for the design, construction, and operation of power lines. The “loads” on conductors and supporting structures are the mechanical forces that develop from the weight of the conductors, the weight of ice on the conductors, plus wind pressure on the conductors and supporting structures. Loading requirements are the loads on the conductors and structures that are anticipated assuming certain ice and wind conditions. Loading requirements always contain “safety factors” to allow for unknown or unanticipated contingencies. The clearances and loading requirements contained in the NESC were developed to ensure public safety and welfare.

PPL transmission line design standards meet or surpass the NESC standards. For example, the relative order of grades of construction for conductors and supporting structures is B, C, and N; Grade B being the highest. According to the NESC standards, construction Grades B, C, or N may be used for transmission lines (except at crossings of railroad tracks and limited access highways where Grade B construction is specified). However, PPL designs all of its transmission lines for Grade B construction. The use of Grade B design and construction specifies enhancements such as larger-minimum crossarm dimensions, larger-minimum conductor size, and increased safety factors.

Another example is the design parameters utilized to account for ice and wind loadings on the overhead ground wire (OHGW) and power conductors. The NESC standard ice and wind design magnitudes for the PPL territory are 0.5 inch thickness of radial ice combined with four pounds per square foot horizontal wind pressure (equivalent to 40-mile per hour wind velocity). The conductor sags and tensions used in line designs are the result of various ice and wind combinations, depending on the elevation at the line location and line design voltage. The conductor sags and tensions used in the design of all PPL transmission lines are at least 0.5-inch ice combined with eight pounds wind pressure (equivalent to 57 miles per hour wind velocity). This means that PPL lines are designed to operate safely and reliably during inclement weather even more severe than assumed by the NESC. In addition, PPL transmission lines are designed with more clearance to the ground than required by the NESC. The tables below compare PPL and NESC ground clearances for lines of various voltages.

138 kV

<u>Surface Underneath Conductors</u>	<u>Vertical Clearance to Ground</u>	
	<u>NESC Standard</u>	<u>PPL Design</u>
Roads, streets, alleys	21 Ft.	30 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	21 Ft.	30 Ft.
Spaces accessible to pedestrians only	17 Ft.	30 Ft.
Railroad tracks	31 Ft.	35 Ft.

230 kV

<u>Surface Underneath Conductors</u>	<u>Vertical Clearance to Ground</u>	
	<u>NESC Standard</u>	<u>PPL Design</u>
Roads, streets, alleys	23 Ft.	32 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	23 Ft.	32 Ft.
Spaces accessible to pedestrians only	19 Ft.	32 Ft.
Railroad tracks	31 Ft.	36 Ft.

500 kV

<u>Surface Underneath Conductors</u>	<u>Vertical Clearance to Ground</u>	
	<u>NESC Standard</u>	<u>PPL Design</u>
Roads, streets, alleys	28 Ft.	53 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	28 Ft.	53 Ft.
Spaces accessible to pedestrians only	24 Ft.	53 Ft.
Railroad tracks	38 Ft.	53 Ft.

A relay protection system is used to protect the public safety and welfare as well as equipment and the transmission system. Relay protection is installed for all transmission lines to automatically de-energize the line in the unlikely event that the line or supporting structure fails and the line contacts the ground.

Periodic Maintenance Program on All Transmission Lines

To ensure continued public safety and integrity of service, a periodic maintenance and inspection program is implemented for every transmission line. The program is administered through the use of helicopter patrols, with supplemental foot and structure climbing patrols. A number of helicopter patrols are performed on all lines annually. The

two-man helicopter crew flies parallel, to the left, and above the line so that the observer can look for signs of line damage or deterioration and observe clearances between vegetation and conductors. The observations are included in a report that is forwarded to the appropriate department for corrective action.

Foot and structure climbing patrol programs for a transmission line begin approximately three to five years after the line is energized, unless a helicopter patrol reports a need for earlier action. The frequency of foot patrols varies from once every year to once every several years depending on line type and age.

An assigned foot patroller checks right-of-way conditions, including access roads, bridges, pole washouts, tower footers, vegetation height and clearance to conductors, pole and tower deterioration and, with the use of binoculars, insulators, and condition of hardware. *Identified problems are included in a report that is forwarded to the appropriate department for corrective action.*

A scheduled line outage is required to perform an overhead patrol because of “hands-on” inspection of hardware. Overhead patrols are conducted on a schedule determined by line age, operating record, and observed general condition. The necessary repairs are also done during the inspection outage.

Personnel Safety Rules

The following are a few of the PPL safety rules that demonstrate the Company's concern for employee safety:

- Work procedures have been developed to allow work to be performed on energized facilities in a safe manner. When lines or apparatus are removed from service to be worked on, the Energy Control Process system is applied. This system provides that a red tag must be physically placed on the control handle of the de-energized equipment. The red tag may be removed only after proper authorization to energize the equipment. Various other tags are used for limited

operations and informational purposes. Employees will not apply or remove a tag or change the status of tagged equipment unless authorized.

- Temporary safety grounds are used on de-energized facilities for employee safety during maintenance, construction, or reconstruction work. Safety grounds are wires connecting the de-energized facility to an electrical ground. If the facility should be energized, the safety grounds will divert the current directly to ground and reduce the likelihood of personal injury. The conductor size and attachment clamps of temporary safety grounds must be capable of conducting anticipated fault currents. Rubber gloves, rubber sleeves, and additional rubber protective equipment are used as required when applying or removing temporary safety grounds to or from the lines or apparatus to be grounded. An approved nonconductive working stick of sufficient length to allow workers to maintain the following required minimum clearances is used to test that the line has been de-energized and to apply temporary safety grounds:

<u>Voltage-kV</u>	<u>Minimum Clearance</u>
138	3'-7"
230	5'-3"
500	11'-3"

Before applying grounds, a test is done to confirm that the line is de-energized. The voltage test device is checked before and after use to assure reliability. When ground pins are used to establish proper ground points, they are driven to a depth of not less than four feet as near vertical as possible.

- Poles or structures are inspected and examined for structural integrity before climbing. If there is any reason to believe that a pole is unsafe, it is stabilized before work is performed. Appropriate safety gear in the form of body belts, safety straps, hard hats, gloves, etc., is worn by linemen during line work activity.

VERIFICATION

I, Stephanie Raymond, being the Vice President – Transmission and Substations at PPL Electric Utilities Corporation, hereby state that the facts above set forth are true and correct to the best of my knowledge, information and belief and that I expect PPL Electric Utilities Corporation to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 relating to unsworn falsification to authorities.

Date: 10/23/14

Stephanie Raymond

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing has been served upon the following persons, in the manner indicated, in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant).

VIA CERTIFIED MAIL RETURN RECEIPT REQUESTED

Pennsylvania Historical and
Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building
400 North Street, 2nd Floor
Harrisburg, PA 17120-0053
Attn: Mr. Douglas C. McLearn, Chief

Pennsylvania Department of Transportation
Honorable Barry Schoch, P.E., Secretary
c/o Office of Chief Counsel
Commonwealth Keystone Building
400 North Street, 9th Floor
Harrisburg, PA 17120
Attn: William J. Cressler

Pennsylvania Department of
Environmental Protection
Market Street State Office Building
P.O. Box 2063
Harrisburg, PA 17105-2063
Attn: Office of Field Operations

Bureau of Investigation & Enforcement
Commonwealth Keystone Building
400 North Street, 2nd Floor West
PO Box 3265
Harrisburg, PA 17105-3265

Office of Consumer Advocate
555 Walnut Street
Forum Place, 5th Floor
Harrisburg, PA 17101-1923

Office of Small Business Advocate
Commerce Building
300 North Second Street, Suite 202
Harrisburg, PA 17101

Lehigh Valley Planning Commission
961 Marcon Boulevard - Suite 310
Allentown, PA 18109
Attn: Mr. Michael Kaiser, AICP

Lehigh County Board of Commissioners
17 South Seventh Street
Allentown, PA 18101-2400
Attn: Mr. Brad Osborne, Chairman

Upper Milford Township Planning
Commission
5671 Chestnut Street
PO Box 210
Old Zionsville, PA 18068
Attn: Mr. Matthew Hunter, Chairman

Upper Milford Township
5671 Chestnut Street
PO Box 210
Old Zionsville, PA 18068
Attn: Mr. George D. DeVault, Supervisor

Lower Macungie Township Planning
Commission
3400 Brookside Road
Macungie, PA 18062
Attn: Mr. Ryan T. Conrad, President

Lower Macungie Township
3400 Brookside Road
Macungie, PA 18062
Attn: Mr. Bruce Fosselman, Township
Supervisor

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SECRETARY'S BUREAU

PPL Electric Utilities Corporation
PPL - Real Estate Taxes (GENTW2)
2 North Ninth Street
Allentown, PA 18101

Buckeye Pipe Line Company LP
C/O Property Tax
PO Box 56169
Houston, TX 77256

Bethany United Methodist Church
1208 Brookside Road
Allentown, PA 18106

Macungie Ambulance Corporation
PO Box 114
Macungie, PA 18062

Pennsylvania Lines LLC
C/O Norfolk Southern Railway Company
110 Frank Road SE
Roanoke, VA 24042

Michael F & Dave J Boyko
10 East Main Street
Macungie, PA 18062

Paul I Stettler
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Macungie, PA 18062

Lower Macungie Township
3400 Brookside Road
Macungie, PA 18062

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Morgantown, PA 19543

3135 Brookside Road LP
70 Sherwood Road
Tenafly, NJ 07670

Date: October 24, 2014



Christopher T. Wright