



17 North Second Street
12th Floor
Harrisburg, PA 17101-1601
717-731-1970 Main
717-731-1985 Main Fax
www.postschell.com

Christopher T. Wright

cwright@postschell.com
717-612-6013 Direct
717-731-1985 Direct Fax
File #: 165206

April 28, 2017

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
2017 APR 28 PM 3:19
PA PUB
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 Approximately 0.9 Miles of the Hosensack-Wescosville #3 230 kV Transmission Line in Lower Milford Township, Lehigh County, Pennsylvania - Docket No. A-2017-

Dear Secretary Chiavetta:

Enclosed for filing is the Letter of Notification of PPL Electric Utilities Corporation in the above-referenced proceeding. A CD containing a copy of the Letter of Notification and Attachments in Support of the Letter of Notification is also enclosed.

As indicated on the Certificate of Service, copies of the Letter of Notification 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 September 2017 to support an in-service date of November 2018.

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

Rosemary Chiavetta, Secretary
April 28, 2017
Page 2

Respectfully submitted,



Christopher T. Wright

CTW/jl
Enclosures

cc: Certificate of Service
Office of Consumer Advocate
Office of Small Business, Advocate
Bureau of Investigation &, Enforcement
Robert F. Young
Paul T. Diskin
Yasmin Snowberger
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-2017-_____
for Approval to Rebuild Approximately :
0.9 miles of the Hosensack-Wescosville :
#3 230 kV Transmission Line in Lower :
Milford Township, Lehigh County, :
Pennsylvania :

RECEIVED
2017 APR 28 PM 3:21
PA PUC
SECRETARY'S BUREAU

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 approximately 0.9-mile segment of the existing Hosensack-Wescosville #3 230 kV Transmission Line in Lower Milford Township, Lehigh County, Pennsylvania (the “Project”). As explained below, the 0.9-mile segment of the existing Hosensack-Wescosville #3 230 kV Transmission Line has exceeded its useful life and must be rebuilt in order to continue to provide reliable service into the future. In addition, the Project is necessary to complete the communication path between the Hosensack 23-69 kV Substation and Wescosville 500-230-138-69 kV Substation. The entire Project is located within the existing right-of-way or on property owned in fee by PPL Electric.

Subject to the Commission’s approval, construction is scheduled to begin in September 2017 to support the in-service date of November 2018. 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:

Kimberly A. Klock (ID #89716)
Amy E. Hirakis (ID #310094)
PPL Services Corporation
Two North Ninth Street
Allentown, PA 18101
Voice: 610-774-5696
Fax: 610-774-6726
E-mail: kklock@pplweb.com
E-mail: aehirakis@pplweb.com

David B. MacGregor (I.D. # 28804)
Christopher T. Wright (I.D. # 203412)
Post & Schell, P.C.
17 North Second Street
12th Floor
Harrisburg, PA 17101-1601
Voice: 717-731-1970
Fax: 717-731-1985
E-mail: dmacgregor@postschell.com
E-mail: cwright@postschell.com

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 kilovolts ("kV") or higher, approximately 417 substations with a capacity of 10 megavolt amperes ("MVA") 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's 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. EXISTING SYSTEM

8. The existing Hosensack-Wescosville #3 230 kV Transmission Line is a single-circuit 230 kV line that extends approximately 9.8 miles from the Hosensack 230-69 kV Substation located in Lower Milford Township, Lehigh County, Pennsylvania to the Wescosville 500-230-138-69 kV Substation located in Upper Macungie Township, Lehigh County, Pennsylvania.

9. From the Hosensack 230-69 kV Substation, the Hosensack-Wescosville #3 230 kV Transmission Line extends approximately 0.9 miles to a tap point. This segment of the line was originally constructed in the 1960s, and consists of three existing lattice tower structures and one 3-pole lattice angle structure.

10. From the tap point, the Hosensack-Wescosville #3 230 kV Transmission Line continues approximately 8.9 miles to the Wescosville 500-230-138-69 kV Substation. This 8.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line was rebuilt in 2015.¹

¹ See Letter of Notification of PPL Electric Utilities Corporation, filed pursuant to 52 Pa. Code Chapter 57.72, for approval of the reconstruction of the Hosensack-Wescosville 230 kV Transmission Line in Upper

As part of the rebuild, PPL Electric installed fiber communication cable along this 8.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line.

11. A description of the existing Hosensack-Wescosville #3 230 kV Transmission Line is provided in Attachment 1 to this Letter of Notification. A map and one-line diagram of the existing system are provided in Attachment 1 to this Letter of Notification.

B. NEED FOR THE PROJECT

12. The 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line between the Hosensack 230-69 kV Substation and the tap point has been in service since the 1960s when the Hosensack 230-69 kV Substation was built. The existing conductors and lattice structures do not meet current design or height standards.

13. PPL Electric has analyzed this 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line. Based on this analysis, PPL Electric concluded that the conductors, hardware, splices, and tower structures along this 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line have reached the end of their useful lives and should be rehabilitated or replaced in order to continue to provide safe and reliable service to the customers served from the Hosensack 230-69 kV Substation and Wescosville 500-230-138-69 kV Substation.

14. As explained above, PPL Electric previously rebuilt approximately 8.9 miles of the 9.8-mile Hosensack-Wescosville #3 230 kV Transmission Line in 2015, which included the installation of fiber communication cable. In order to complete the communication path needed between the Hosensack 23-69 kV Substation and Wescosville 500-230-138-69 kV Substation, fiber communication cable must be installed on the remaining 0.9-mile segment of the

Hosensack-Wescosville #3 230 kV Transmission Line. However, PPL Electric analyzed the existing lattice structures along this 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line and determined that they cannot accommodate the additional load of the fiber communication cable.

15. The need for this Project is further explained in Attachment 1 to this Letter of Notification.

C. THE PROPOSED PROJECT

16. PPL Electric evaluated whether to rehabilitate or replace the 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line. However, because the existing lattice structures are unable to accommodate the additional load of the needed fiber communication cable, PPL Electric concluded that rebuilding the line would be the most prudent option.

17. PPL Electric proposes to rebuild the 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line from the Hosensack 230-69 kV Substation to the tap point with the 8.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line rebuilt in 2015.

18. The 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line will be rebuilt and operated as a single-circuit 230 kV line.

19. The entire Project will be located within the existing right-of-way for the Hosensack-Wescosville #3 230 kV Transmission Line, and on property owned in fee by PPL Electric. A map and of the Hosensack-Wescosville #3 230 kV Transmission Line right-of-way is provided in Figure 1-2 to Attachment 1 and Figure 3-1 to Attachment 3.

20. The 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line currently consists of one 230 kV circuit supported by three existing lattice tower structures and one 3-pole lattice angle structure. Two of the existing structures will be replaced with new

self-weathering steel monopole structures, and the other two existing structures will be replaced by new self-weathering steel 3-pole structures. The new structures will be located generally within the same vicinity as the existing tower structures. No new poles will be placed on any property that currently does not have an existing pole. Figure 3-1 of Attachment 3 depicts the locations of existing structures and proposed new structures.

21. The existing, outdated structures range in height from 88 to 120 feet in height. The new monopoles will range between 150 and 165 feet in height, and the new 3-pole structures will range in between 77 to 115 feet in height. All new poles will be self-supported, either direct embedded or on concrete caisson foundations.

22. Depictions of the type of monopoles used for this Project are provided in Attachment 2 to this Letter of Notification.

23. The rebuilt 230 kV design will utilize three power conductors and one overhead ground wire. The new conductors will be consistent and compatible with the remaining 8.9 miles of the Hosensack-Wescosville #3 230 kV Transmission Line rebuilt in 2015. A detailed engineering description of the rebuilt line is provided in Attachment 2 to this Letter of Notification.

24. The proposed rebuild of the 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line will bring the line into compliance with current design standards. The rebuild of the transmission line will also increase the lightning protection of the line and reduce the frequency of momentary outages experienced by customers.

25. Importantly, the proposed rebuild of the 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line will complete the communication path needed

between the Hosensack 230-69 kV Substation and the Wescosville 500-230-138-69 kV Substation.

26. The total estimated cost of the proposed Project is \$500,000.²

27. Upon Commission approval, the Project has a scheduled construction start date of September 2017 to support the in-service date of November 2017.

III. HEALTH AND SAFETY

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

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

30. The closest airport is the Bally Spring Farm, which is located 6.3 miles southwest of the Project area. 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 other existing facilities near the Hosensack 230-69 kV Substation. However, PPL Electric will file all required documentation with the Federal Aviation Administration and the Pennsylvania Department of Transportation, Bureau of Aviation.

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 field 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.

31. As explained in Attachment 2 to this Letter of Notification, PPL Electric's Magnetic Field Management Program has been developed to reduce magnetic fields on new and rebuilt transmission lines when it can be done at low or no cost and consistent with functional requirements. To reduce the potential for exposure to magnetic fields, the 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line will be rebuilt with clearances that are higher than the NESC standards.

IV. DESCRIPTION OF RIGHT-OF-WAY

32. The entire Project will be rebuilt within the existing right-of-way for the Hosensack-Wescosville #3 230 kV Transmission Line, and on property owned in fee by PPL Electric.

33. As explained in Attachment 3, the existing right-of-way for the 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line is 450 feet in width. PPL Electric has designed the rebuilt segment of the Hosensack-Wescosville #3 230 kV Transmission Line to fit within the existing right-of-way and to meet NESC standards.

34. The existing right-of-way is sufficient to accommodate the construction, operation, and maintenance of the rebuilt segment of the Hosensack-Wescosville #3 230 kV Transmission Line. Therefore, no additional rights-of-way are required for the construction and operation of these new transmission lines.

35. As explained above, new structures will be located generally within the same vicinity as the existing tower structures. No new poles will be placed on any property that currently does not have an existing pole.

36. An aerial plot plan, including the location of the existing and proposed structures, is provided in Figure 3-1 of Attachment 3 to this Letter of Notification.

37. 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 and in close proximity to existing transmission facilities. Where practical, PPL Electric will use previously established access roads for construction to further reduce interference with existing land uses.

38. 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 Transmission Vegetation Management LA-79827*" to mitigate any impacts.

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

40. The Project area contains no national parks, state parks, state-owned land, or local parks.

41. Two existing structures are located on preserved farmlands. These existing lattice structures will be replaced with new steel monopoles that will be constructed in the same general locations as the existing structures. Further, the new monopoles will have a smaller footprint than the existing lattice structures, which will minimize any incremental impact to these preserved farmlands.

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

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

44. Due to the limited impact of the proposed Project, no coordination with the Pennsylvania Historical and Museum Commission ("PHMC") is required.

45. The proposed Project will span three streams. The rebuilt transmission lines will span these streams, which will minimize any impacts.

46. The Project will span seven wetland sites. It is anticipated the Project will have no impacts on streams or wetlands because the entire Project will be built within the existing right-of-way, and because the new tower structures will be located to avoid impacts to wetland and streams. PPL Electric will obtain all necessary permits from the United States Army Corps of Engineers ("USACE") or the Pennsylvania Department of Environmental Protection ("PADEP"), and will comply with all of the terms and conditions placed on any permits required.

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

48. PPL Electric completed a Pennsylvania Natural Diversity Inventory records review. Based on this review, the Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, and the Pennsylvania Game Commission reported that the Project will not impact any threatened and endangered species, or special concern species and resources located within the Project area as explained in Attachment 3.

49. The U.S. Fish and Wildlife Service noted that the proposed Project is located within the known range of the federally threatened bog turtle. Phase I and Phase II bog turtle surveys were conducted, and no bog turtles were found. Based on the results of these surveys, the U.S. Fish and Wildlife Service has concluded that the Project will have no impact to the bog turtle.

50. PPL Electric will obtain all permits necessary from applicable state and federal agencies, and will comply with all of the terms and conditions placed on any permits required.

V. NOTICE

51. PPL Electric has provided information regarding the Project to representatives of Lower Milford Township and Lehigh County. These entities have not objected to the proposed Project.

52. 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).

53. 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

54. 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).

55. As explained above, PPL Electric herein seeks Commission approval to rebuild a 0.9-mile segment of the existing Hosensack-Wescosville #3 230 kV Transmission Line entirely within the existing right-of-way and on property owned in fee by PPL Electric. PPL Electric submits that this proposed Project qualifies for use of a Letter of Notification because it is less than 2 miles.

56. 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 rebuild of approximately 0.9 miles of the existing Hosensack-Wescosville #3 230 kV Transmission Line in Lower Milford Township, Lehigh County, Pennsylvania, as explained above and in the Attachments hereto.

Respectfully submitted,

Kimberly A. Klock (ID #89716)
Amy E. Hirakis (ID #310094)
PPL Services Corporation
Two North Ninth Street
Allentown, PA 18101
Voice: 610-774-5696
Fax: 610-774-6726
E-mail: kklock@pplweb.com
E-mail: aehirakis@pplweb.com


David B. MacGregor (I.D. # 28804)
Christopher T. Wright (I.D. # 203412)
Post & Schell, P.C.
17 North Second Street
12th Floor
Harrisburg, PA 17101-1601
Voice: 717-731-1970
Fax: 717-731-1985
E-mail: dmacgregor@postschell.com
E-mail: cwright@postschell.com

Date: April 28, 2017

Attorneys for PPL Electric Utilities Corporation

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: 4/25/17

Stephanie Raymond

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing **Letter of Notification** 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

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

PA Department of Transportation
Commonwealth Keystone Building
400 North Street, 8th Floor
Harrisburg, PA 17120
Attn: William J. Cressler, Chief Counsel

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

PA Department of Conservation and Natural
Resources
Rachel Carson State Office Building
PO Box 8767
400 Market Street
Harrisburg, PA 17105-8767
Attn: Rebecca Bowen

PA Game Commission
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
Attn: Olivia Mowery

PA Fish and Boat Commission
450 Robinson Lane
Bellefonte, PA 16823-9620
Attn: Christopher A. Urban

U.S. Army Corps of Engineers
Philadelphia District
Regulatory Branch
Wanamaker Building, 100 Penn Square East
Philadelphia, PA 19107-3390

U.S. Fish and Wildlife Service
315 South Allen Street, Suite 322
State College, PA 16801-4850
Attn: Kim Faulds

Lehigh County Conservation District
4184 Dorney Park Rd,
Allentown, PA 18104

Lehigh County Planning Commission
961 Marcon Boulevard - Suite 310
Allentown, PA 18109

Lower Milford Township
Board of Supervisors
7607 Chestnut Hill Church Road
Coopersburg, PA 18036
Attn: Donna Wright

Lower Milford Township
Planning Commission
7607 Chestnut Hill Church Road
Coopersburg, PA 18036
Attn: Lois Gadek

Jeffrey L. & Deborah L. Dershem
7632 Kings Highway
Zionsville, PA 18092-2500

Linda R. Fetzer
4524 Scout Road
Zionsville, PA 18092-8092

Date: April 28, 2017



Christopher I. Wright



Before the
Pennsylvania Public Utility Commission

**HOSENSACK-WESCOSVILLE #3
230 kV REBUILD**

**ATTACHMENTS IN SUPPORT OF THE
LETTER OF NOTIFICATION**

PA PUC
SECRETARY'S BUREAU

2017 APR 28 PM 3: 21

RECEIVED

Application Docket No. _____

Submitted by: PPL Electric Utilities Corp.

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- Figure 1-2:** Existing System Map
- Figure 1-3:** Proposed 230 kV Configuration
- Figure 1-4:** Proposed System Map

1.0 INTRODUCTION

PPL Electric Utilities Corporation (“PPL Electric”) is requesting Pennsylvania Public Utility Commission (“PUC” or the “Commission”) approval to rebuild a 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line in Lower Milford Township, Lehigh County (the “Project”). As explained below, this segment of the existing Hosensack-Wescosville #3 230 kV Transmission Line has reached an age and condition that the facilities must be replaced in order to provide safe and reliable service into the future. The Project is part of PPL Electric's Asset Optimization Strategy, and involves rebuilding the lines to meet all current design and lightning protection standards. In addition, the Project is needed to complete the fiber communication path between the Hosensack 230-69 kV Substation and the Wescosville 500-230-138-69 kV Substation. The modernization of the line will help ensure reliable service to customers in the Lehigh County area.

Subject to the Commission's approval, construction is scheduled to begin in September 2017, to support the Project's scheduled in-service date of November 2017. The estimated costs to site, design, and construct the Project is approximately \$500,000.¹

2.0 TRANSMISSION SYSTEM PLANNING PROCESS

The nation's interconnected transmission grid serves as the backbone for the safe and reliable delivery of large amounts of electricity from generating stations over substantial distances to customers served by transmission and local distribution systems. It is critically important that this interconnected transmission system (transmission grid) be planned and designed to be highly reliable so that reliable electric service can be provided under peak and all loading conditions

¹ 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 field 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.

and when certain elements of the system are out of service (system contingencies) due to planned or unplanned outages.

System Planning is the process that assures that the transmission system can supply electricity to all customer loads in a manner that is reliable and economical. This System Planning process assures that both the Bulk Electric System (“BES”)² and non-Bulk Electric System (“non-BES”)³ are planned and constructed so that:

- They are able to accommodate forecasted system flows during summer and winter peak load;
- They can adequately serve each customer’s need with regard to capacity, voltage and reliability for all load levels throughout the daily load cycle;
- They can sustain probable contingencies and disturbances with minimal customer service interruptions; and
- They are in conformance with North American Electric Reliability Corporation (“NERC”), PJM Interconnection, LLC (“PJM”), and the Transmission Owner’s reliability criteria for all normal and emergency operating conditions.

PJM is a FERC-approved Regional Transmission Organization (“RTO”) charged with ensuring the reliability of the electric transmission system under its functional control (100 kV and above), and coordinating the movement of electricity in all or parts of thirteen states and the District of Columbia, including most of Pennsylvania. In order to ensure reliable transmission service, PJM prepares an annual Regional Transmission Expansion Plan (“RTEP”)⁴ to identify

² Bulk Electric System (“BES”) – Includes transmission facilities operated at voltages of 100 kV or higher.

³ Non-Bulk Electrical System (“non-BES”) – Includes transmission facilities operated at voltages less than 100 kV.

⁴ PJM’s RTEP process is currently set forth in Schedule 6 of PJM’s Amended and Restated Operating Agreement (“Schedule 6”). Schedule 6 governs the process by which PJM’s members rely on PJM to prepare an annual regional plan for the enhancement and expansion of the transmission facilities to ensure long-term, reliable electric service consistent with established reliability criteria. In addition, Schedule 6 addresses the procedures used to develop the RTEP, the review and approval process for the RTEP, the obligation of transmission owners to build transmission upgrades included in the RTEP, and the process by which interregional transmission upgrades will be developed.

system reinforcements that are required to, among other things, meet the NERC Reliability Standards, PJM reliability planning criteria, and Transmission Owner reliability criteria.

PJM conducts RTEP studies in conjunction with its Transmission Owners and applies NERC, regional, and Transmission Owner reliability criteria to specific conditions on the transmission system. PJM's RTEP is an annual process that encompasses a comprehensive series of detailed analyses to ensure power continues to flow reliably to customers under stringent reliability criteria set by NERC. PJM's manual 14B⁵ outlines the RTEP process and reliability criteria use for this process. As mentioned in manual 14B, every year PJM perform various reliability tests such as Baseline Thermal, Baseline Voltage, Load Deliverability, Generation deliverability and Baseline stability to ensure safe reliable operation of the electric grid. When the studies show an inability of the transmission system to meet specific reliability criteria under these conditions, PJM opens an RTEP Window in accordance with FERC Order 1000⁶ to identify the optimal solution to resolve the criteria violation.

PPL Electric, as a Transmission Owner and member of PJM, undertakes an independent analysis of both its BES transmission facilities, and its non-BES transmission facilities in concert with the PJM RTEP process. PPL Electric identifies all conditions where the future system does not meet the NERC criteria, PJM reliability criteria, or PPL Electric Transmission Owner criteria. In this way, PPL Electric actively participates in the PJM RTEP process, and through this participation PPL Electric provides results of its independent studies to PJM for consideration and inclusion in the PJM RTEP.

Alternatives that can mitigate violations to the reliability criteria are developed and analyzed to ensure that the PPL Electric transmission system meets the reliability criteria. Estimated costs and lead times to implement the reinforcements are prepared. PPL Electric then proposes solutions to PJM through an RTEP window. If the project is awarded to PPL Electric, it then becomes a baseline RTEP project.

⁵ PJM Manual 14B is available at <http://www.pjm.com/~media/documents/manuals/m14b.ashx>

⁶ <http://www.ferc.gov/industries/electric/indus-act/trans-plan.asp>

PPL Electric's Transmission Owner criteria address thermal, voltage, short circuit, and stability limits specific to the PPL Electric zone and also ensure compliance with NERC and PJM reliability criteria. These criteria ensure adequate and appropriate levels of electric service to PPL Electric customers in accordance with good utility practices.

In addition to NERC, PJM, and Transmission Owner criteria-based projects, PPL Electric also initiates projects based on the Transmission System Development Standards. These projects address local load growth, provide load restoration flexibility, improve operational performance, and replace poor performing transmission assets in order to provide an advanced level of reliability on the local system. PPL Electric's Transmission System Development Standards also consider transmission needs to support the development of the distribution system. When the distribution system needs to either expand existing distribution substations with new transformation or install new distribution substations to support local load growth on the distribution system, new transmission facilities are required to accommodate that expansion.

PPL Electric has developed an Asset Optimization Strategy that is incorporated into the Transmission System Development Standards. A significant portion of the system infrastructure is either approaching the end of or has exceeded its expected or useful life. The Asset Optimization Strategy was developed to systematically identify and modernize these aging facilities. The measures used to identify and prioritize the equipment and lines that qualify for this work include, but are not limited to, age, condition, operational issues, maintainability of the equipment, criticality of the equipment or line, line loading, and circuit performance. Once equipment has been identified and assessed under the above measures, it will be put into the Capital Budget for replacement under the Asset Optimization Strategy.

3.0 DEFINITION OF THE PROBLEM

3.1 Description of Existing System

The existing Hosensack-Wescosville #3 230 kV Transmission Line extends approximately 9.8 miles from the Hosensack 230-69 kV Substation located in Lower Milford Township, Lehigh

County to the Wescosville 500-230-138-69 kV Substation located in Upper Macungie Township, Lehigh County.

From the Hosensack 230-69 kV Substation, the Hosensack-Wescosville #3 230 kV Transmission Line extends approximately 0.9 miles to a tap point. From the tap point, the Hosensack-Wescosville #3 230 kV Transmission Line continues approximately 8.9 miles to the Wescosville 500-230-138-69 kV Substation. This 8.9 mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line was rebuilt in 2015.⁷

A one-line diagram and map of the existing system are provided in **Figures 1-1** and **1-2**, respectively.

3.2 Need for the Project

As stated above, PPL Electric rebuilt approximately 8.9 miles of the Hosensack-Wescosville #3 230 kV Transmission Line in 2015. PPL Electric has determined that the remaining 0.9 miles of Hosensack-Wescosville #3 230 kV Transmission Line has reached an age and condition that the facilities must be replaced in order to provide safe and reliable service into the future. PPL Electric analyzed the 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line and found deterioration of the structural components, foundations, insulators, line hardware, shield wire, grounding, and signage. Based on this analysis, PPL Electric concluded that the conductors, hardware, splices, and tower structures along the 0.9-mile segment of the existing Hosensack-Wescosville #3 230 kV Transmission Line are nearing the end of their useful lives and should be replaced.

Along with the transmission facilities being near the end of their useful life, PPL Electric identified the need for communication between the Hosensack 23-69 kV Substation and

⁷ Letter of Notification of PPL Electric Utilities Corporation filed pursuant to 52 Pa. Code Chapter 57.72, for approval of the reconstruction of the Hosensack-Wescosville 230 kV Transmission Line in Upper Macungie, Lower Macungie, Upper Milford and Lower Milford Townships, Lehigh County, Pennsylvania, Docket No. A-2011-2237599 (Order entered Aug. 25, 2011).

Wescosville 500-230-138-69 kV Substation. In 2015, PPL Electric rebuilt approximately 8.9 mile of the 9.8-mile Hosensack-Wescosville #3 230 kV Transmission Line, which rebuild included the installation of fiber communication cable. In order to complete the communication path between the Hosensack 23-69 kV Substation and Wescosville 500-230-138-69 kV Substation, fiber communication cable must be installed on the remaining 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line. However, PPL Electric determined that the existing structures along the 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line cannot accommodate the additional load of the fiber communication cable. As a result, PPL Electric determined that new transmission structures would need to be installed on the 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line in order to complete the communication path between the two substations.

4.0 PROPOSED SOLUTION

PPL Electric proposes to rebuild the 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line from the Hosensack 230-69 kV Substation to the tap point with the segment of the line that was previously rebuilt in 2015. The 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line will be designed and rebuilt for single-circuit 230 kV operation.

The existing lattice structures will be removed and replaced with modern steel monopole structures that can accommodate the additional load of the fiber communication cable. This will allow for the completion of the fiber path between the Hosensack 23-69 kV Substation and Wescosville 500-230-138-69 kV Substation. In addition, the existing conductor will be removed and replaced with a modern conductor that is consistent and compatible with the remaining 8.9 miles of the Hosensack-Wescosville #3 230 kV Transmission Line rebuilt in 2015.

The proposed rebuild of the 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line will bring the line into compliance with current design standards. This will include an increase in vertical ground clearance, an increase in phase spacing for galloping loop consideration, and installation of steel monopole structures for optimal structure longevity. The

rebuild of the transmission line will also increase the lightning protection of the line and reduce the frequency of momentary outages experienced by customers through an increase in Critical Impulse Flash Over (“CIFO”) level,⁸ installation of dual optical ground wire (“OPGW”) shielding cables, and a decrease in footing impedances.

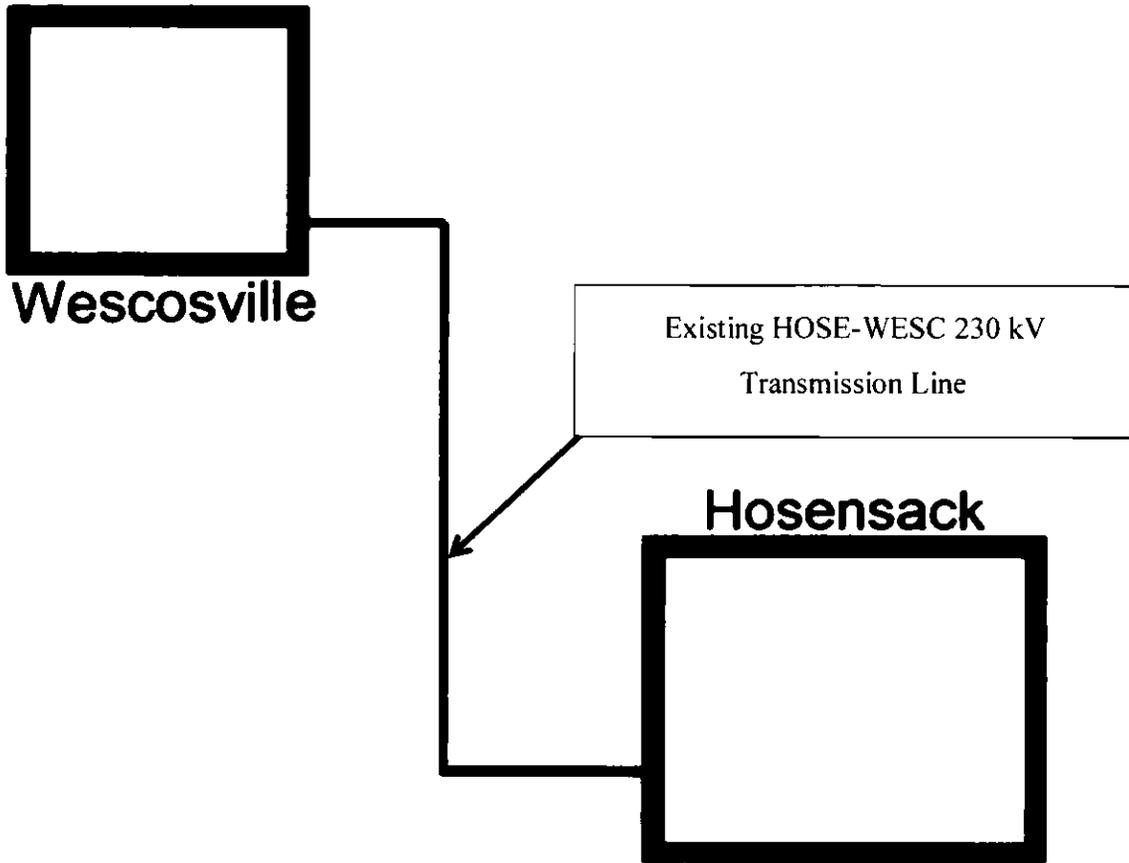
For all of the foregoing reasons, this Project is necessary to enable PPL Electric to continue to provide reliable service now and into the future and, therefore, PPL Electric requests approval of the Commission to complete this “Project.”

A one-line diagram and map of the proposed system are provided as **Figure 1-3** and **Figure 1-4**, respectively.

An engineering description is provided in **Attachment 2** and a description of the right-of-way is provided in **Attachment 3**.

⁸ CIFO is a measure of the insulation level of a line as it relates to the protection level of an insulator to the impulse voltage across an insulator during a lightning strike.

Figure 1-1: Existing One-Line Diagram



LEGEND



- Substation Symbol



- Transmission Line Symbol

Figure 1-2: Existing System Map

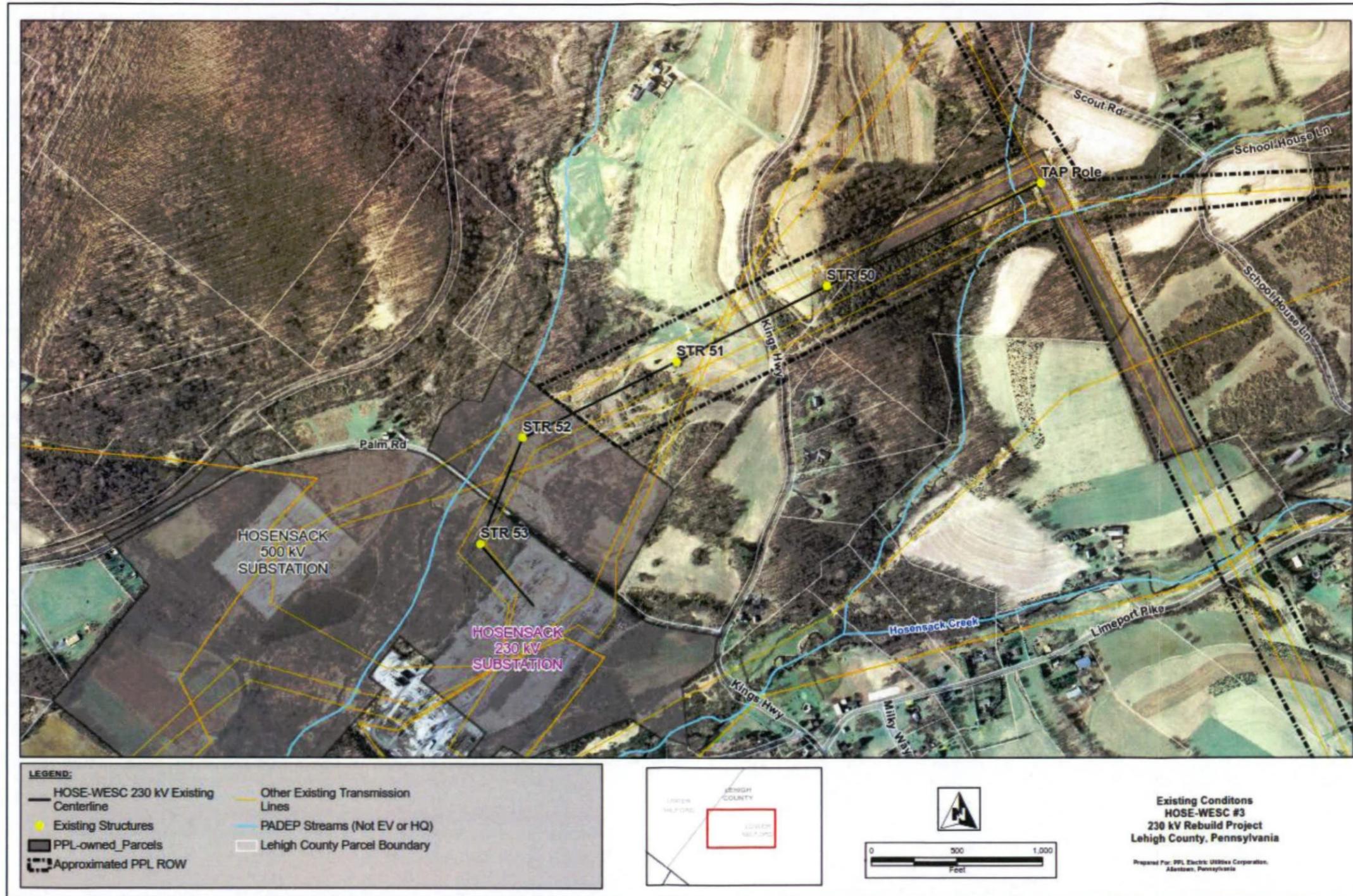
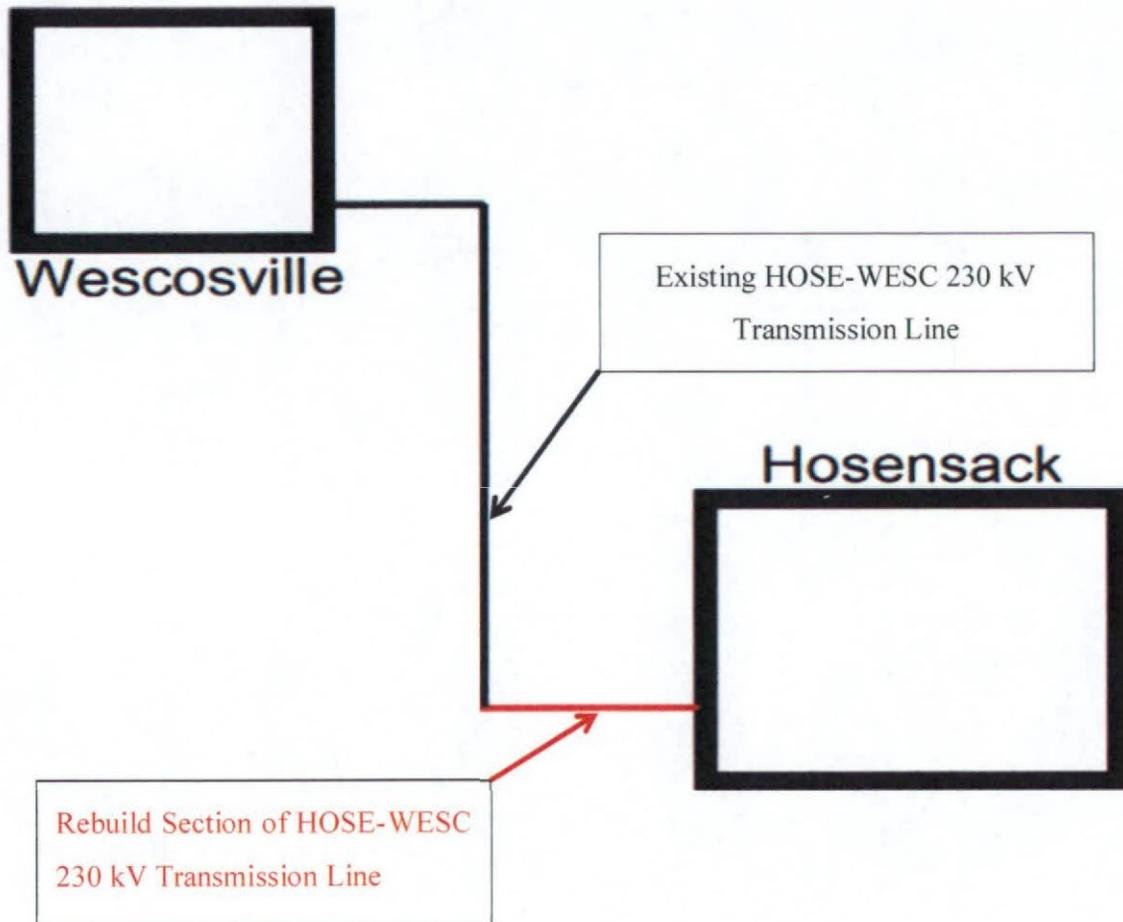


Figure 1-3: Proposed One-Line Diagram



LEGEND



- Substation Symbol



- Transmission Line Symbol



- Transmission Line Rebuild Section Symbol

Figure 1-4: Proposed System Map

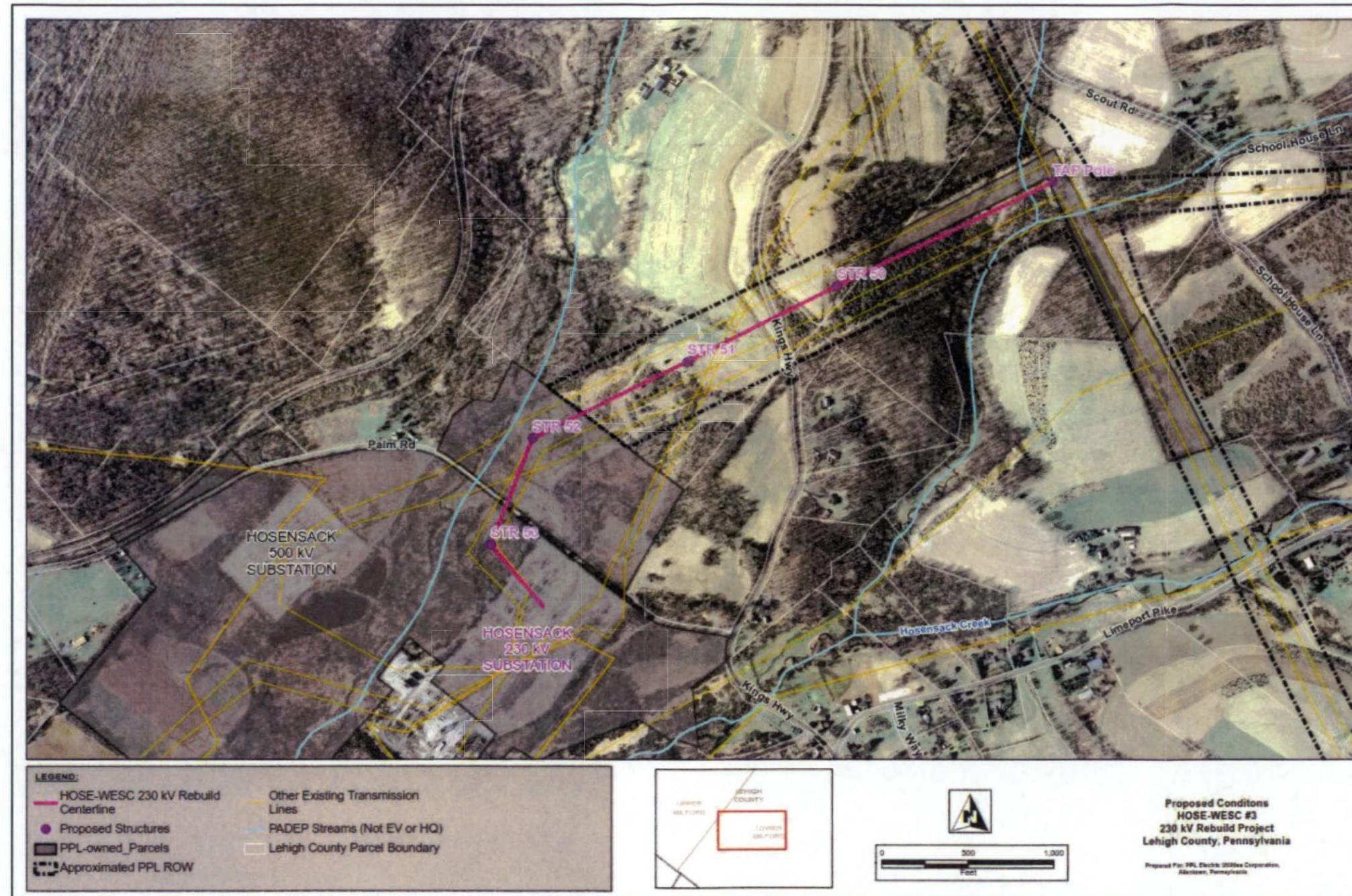


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1.0 INTRODUCTION

PPL Electric Utilities Corporation (“PPL Electric”) is requesting Pennsylvania Public Utility Commission (“PUC” or the “Commission”) approval to rebuild a 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line in Lower Milford Township, Lehigh County (the “Project”). As explained in **Attachment 1**, the Project is part of PPL Electric's Asset Optimization Strategy, and involves rebuilding the Hosensack-Wescosville #3 230 kV Transmission Line to meet all current design and lightning protection standards. In addition, this Project is necessary to complete a needed fiber communication path between the Hosensack 230-69 kV Substation and the Wescosville 500-230-138-69 kV Substation. The modernization of the line will help ensure reliable service to customers in the Lehigh County area.

2.0 DESCRIPTION OF THE PROPOSED 230 kV LINE AND STRUCTURES

As explained in **Attachment 1**, PPL Electric proposes to rebuild the 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line from the Hosensack 230-69 kV Substation to the tap point with the segment of the line that was previously rebuilt in 2015. The 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line will be designed and rebuilt for single-circuit 230 kV operation.

The 0.9-miles segment currently consists of one 230 kV circuit supported by three (3) existing lattice tower structures and one 3-pole lattice angle structure. Two of the existing lattice towers will be replaced by new steel monopole structures that will range in height from 150 feet to 165 feet (**Figure 2-1**). The remaining lattice tower and 3-pole lattice angle structure will both be replaced with new steel 3-pole structures that range in height from 77 feet to 115 feet (**Figure 2-2 and Figure 2-3**). All new monopoles will be self-supported and either direct embedded or on concrete caisson foundations.

The new monopole structures will be located generally within the same vicinity as the existing tower structures. No new structures will be placed on property that currently does not have an existing structure. **Figure 3-1** of **Attachment 3** depicts the locations of existing structures and proposed new structures.

The rebuilt segment of the Hosensack-Wescosville #3 230 kV Transmission Line will utilize three power conductors and one overhead ground wire. The power conductors will be 795 kcmil,¹ 30/19 stranding, aluminum conductor steel reinforced (“ACSR”) conductors. The overhead ground wire will be a 0.752-inch-diameter Optical Ground Wire.

The rebuilt 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line will be designed to meet and/or exceed all current PPL Electric and National Electric Safety Code (“NESC”) standards. Design specifications and safety rules practiced by PPL Electric are included in **Attachment 4**.

The designed minimum conductor clearances and conductor thermal ratings are set forth in **Table 2-1** and **Table 2-2** below.

TABLE 2-1: DESIGN MINIMUM CONDUCTOR CLEARANCES*

Condition	Design Clearance-to-Ground
Normal load; Average Weather (16°C ambient temperature)	44.6 feet
Predicted Extreme Thermal Load (140°C conductor temperature)	40.8 feet
Predicted PPL Extreme Wind Load (100mph, 16°C)	45.5 feet
Predicted Extreme Weather Conditions (1 inch ice, 8psf wind, -18°C)	45.3 feet
*Clearances based on a maximum tension of 13,200 pounds at .5 inch ice, 0° F, 4# wind and a ruling span of 1175 feet (Span from STR #52 to STR #53).	

*Based on 795 kcmil 30/19 stranding ACSR “MALLARD”

¹ A kcmil is a thousand circular mils. A circular mil is the cross-sectional area of a wire 1 mil in diameter, where 1 kcmil = 0.5067 square millimeters.

TABLE 2-2: ACSR CONDUCTOR THERMAL RATING*

Condition	Ambient Temperature °C	Wind Speed ft/sec	Rating (Amps)
Summer Normal	35	0	1058
Winter Normal	10	0	1220
Summer Emergency	35	2.533	1350
Winter Emergency	10	2.533	1521

*Based on 795 kcmil 30/19 stranding ACSR "MALLARD" (284°F) 140°C Maximum Conductor

3.0 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 with ground clearance that is five feet higher than NESC standards and reverses phasing of new double-circuit lines where it is feasible to do so at low or no cost.

Because the rebuilt 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line will be a single-circuit, it cannot be reverse phased. However, the Project will be designed with structures that have a ground clearance that is nine and a half (9.5) feet higher than the minimum clearance required by NESC standards.

FIGURE 2-1: Typical Steel Monopole/Lattice Tower ROW Cross-Section

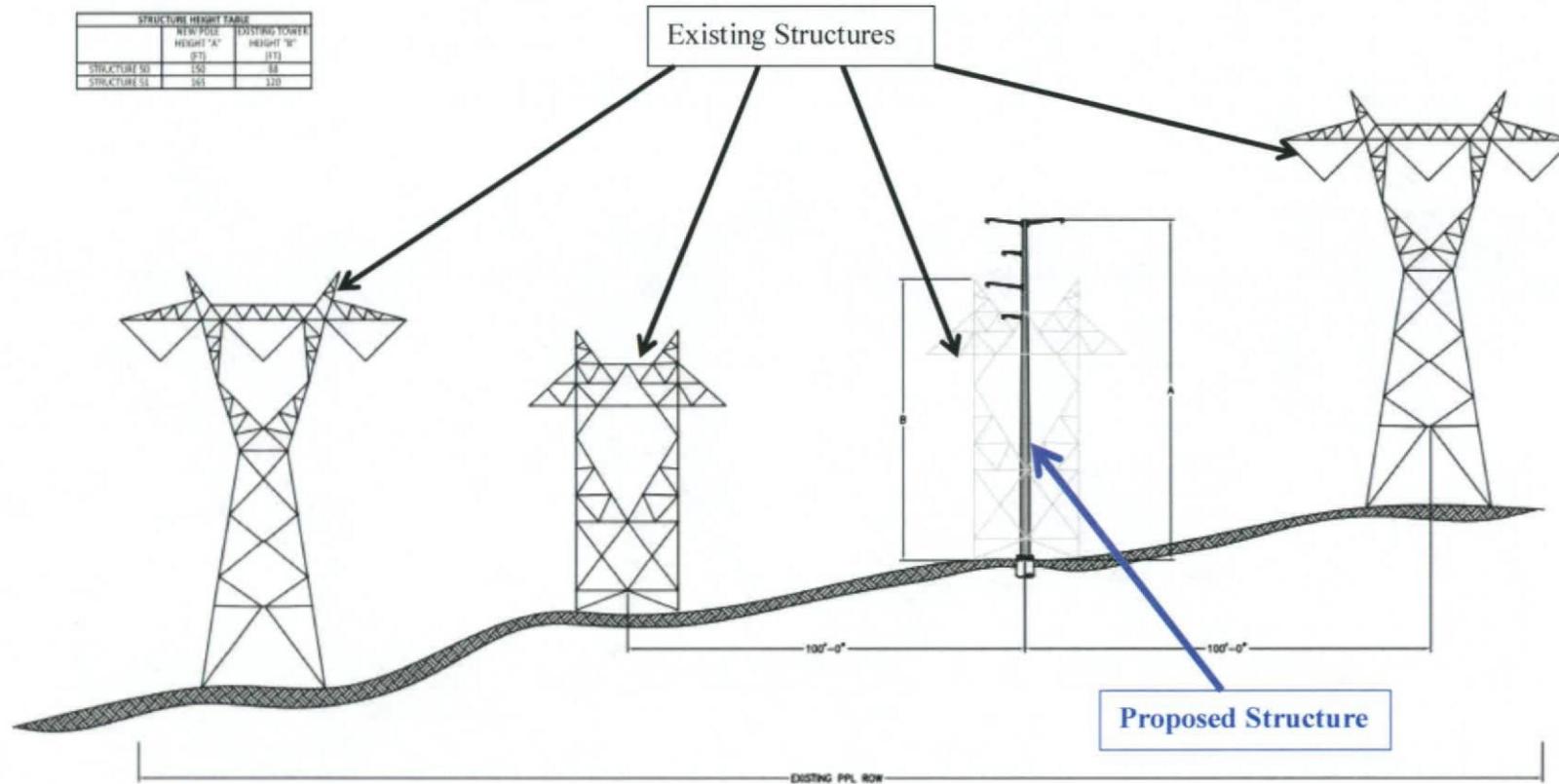


FIGURE 2-2: Typical Steel Three Pole/Lattice Tower ROW Cross-Section

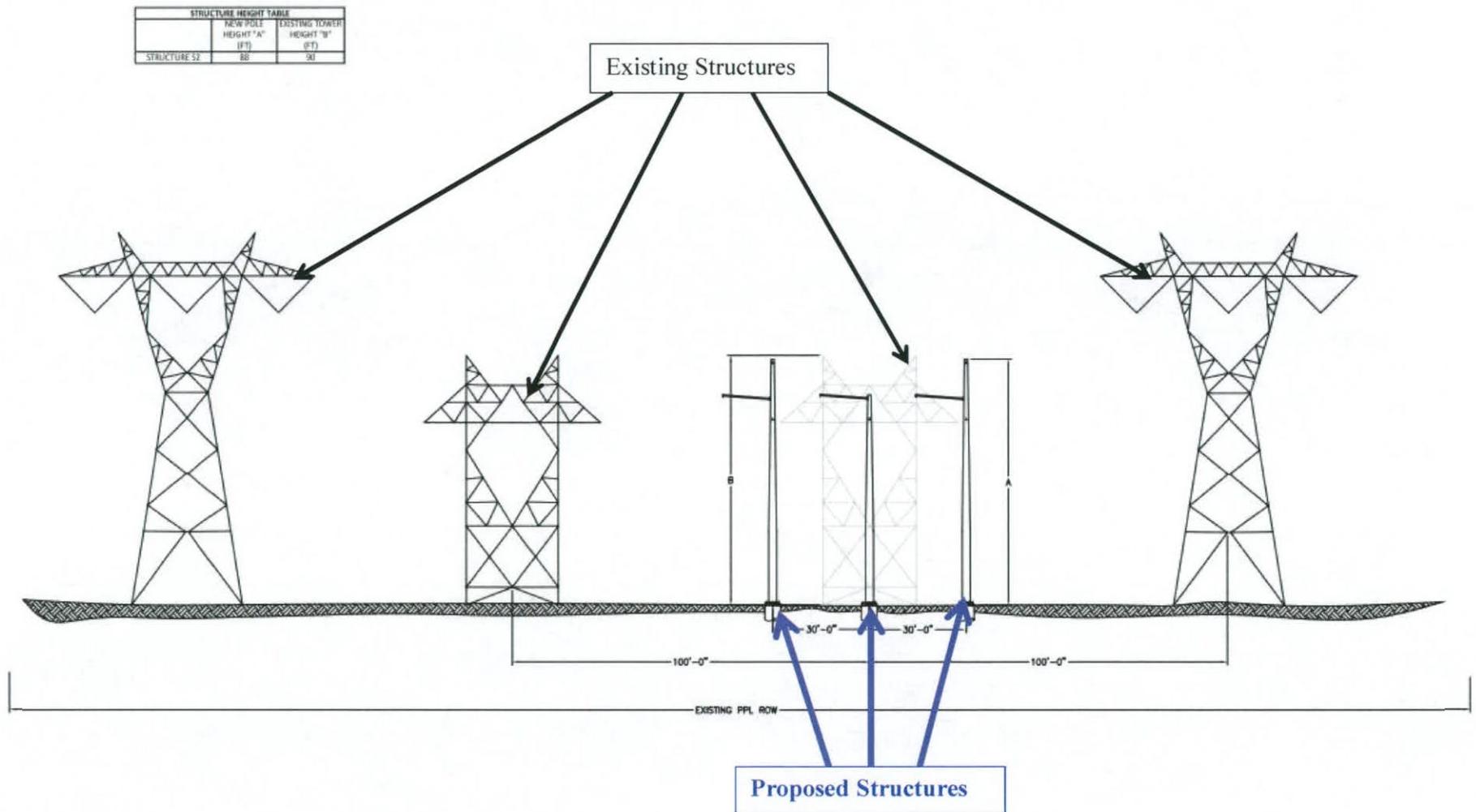


FIGURE 2-3: Typical Steel Three Pole/Three Pole Lattice Tower ROW Cross-Section

STRUCTURE HEIGHT TABLE		
	NEW POLE HEIGHT "A" (FT)	EXISTING POLE HEIGHT "B" (FT)
STRUCTURE 53	110	110

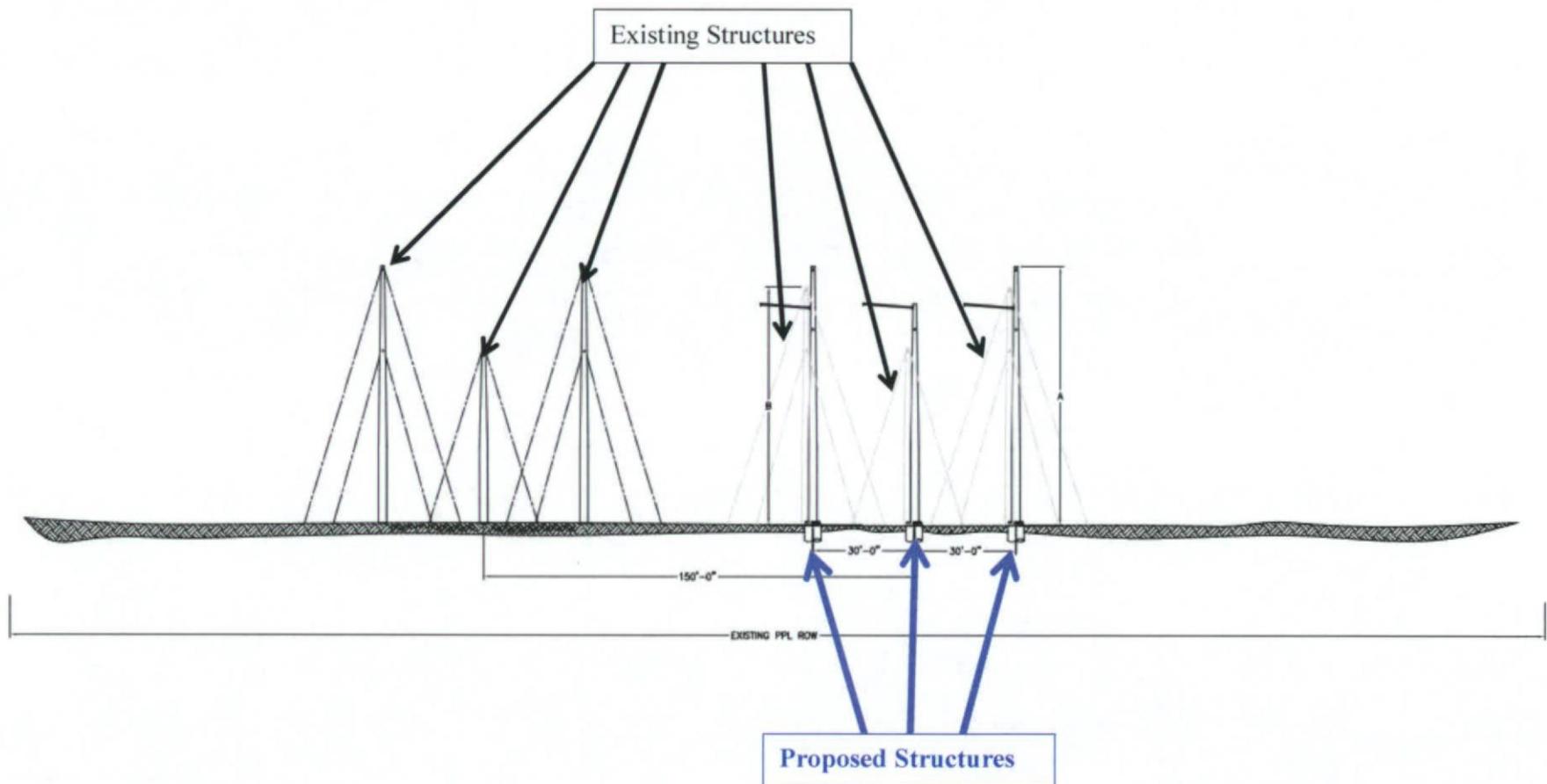


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Figure 3-1 - Aerial Map of the Project

1.0 INTRODUCTION

PPL Electric Utilities Corporation (“PPL Electric”) is requesting Pennsylvania Public Utility Commission (“PUC” or the “Commission”) approval to rebuild a 0.9-mile segment of the Hosensack-Wescosville #3 230 kV Transmission Line in Lower Milford Township, Lehigh County (the “Project”). As explained in **Attachment 1**, the Project is part of PPL Electric’s Asset Optimization Strategy, and involves rebuilding the Hosensack-Wescosville #3 230 kV Transmission Line to meet all current design and lightning protection standards. In addition, this Project is necessary to complete a needed fiber communication path between the Hosensack 230-69 kV Substation and the Wescosville 500-230-138-69 kV Substation. The modernization of the line will help ensure reliable service to customers in the Lehigh County area.

As explained in **Attachment 2**, the Project will involve the installation of four new transmission line structures that will include the following:

- Two single steel monopole structures; and
- Two three (3) steel pole angle structures.

The entire Project will be constructed within the existing right-of-way and on property owned in fee by PPL Electric. A detailed map of the 230 kV transmission alignment and structure locations is provided in **Figure 3-1**.

2.0 DESCRIPTION OF THE RIGHT-OF-WAY

The proposed Project is located in Lehigh County, Pennsylvania and extends approximately 0.9-miles northeast from the Hosensack 230-69 kV Substation in Lower Milford Township as shown in **Figure 3-1**. The right-of-way for the Project is further described below:

- From the Hosensack 230-69 kV Substation, the new 230 kV line will extend northwest approximately 900 feet to a new three (3) pole structure (Structure 53 in **Figure 3-1**). The new structure will be located entirely on PPL Electric’s substation property.

- Turning to the northeast, the line will traverse approximately 780 feet to another new three-pole structure (Structure 52 in **Figure 3-1**) that will be located entirely within PPL Electric’s existing 450-foot right-of-way for the Hosensack-Wescosville #3 230 kV Transmission Line.
- The line then angles farther toward the east and extends for approximately 3,380 feet via two (2) new monopole structures (Structures 51 and 50 in **Figure 3-1**) to tie into an existing three-pole tap structure (labeled as Tap Pole in **Figure 3-1**). The two new monopole structures are located within PPL Electric’s existing 450-foot right-of-way for the Hosensack-Wescosville #3 230 kV Transmission Line. The existing three-pole tap structure is located on PPL Electric property

The four new structures will be located in close proximity to existing structures, and have heights similar to other existing structures in the Project area. A network of existing access roads will be utilized for rebuilding the 230 kV structures.

3.0 LAND USE

Evaluation of existing land uses in the Project area focused on the existing 450-foot wide right-of-way, as well as within a 0.25 mile (1,320 feet) buffer around the right-of-way. This broader area was reviewed to provide a sense of the landscape in which the Project is located. Land uses were determined based on review of the 2011 National Land Cover Data (“NLCD”).

Assessment of the data shows that forest areas are the dominant land use, accounting for over 35% of the review area, with deciduous forest being the primary component. Agricultural areas account for 20% of the land use, with the primary component being cultivated crops. Shrub/scrub areas account for 15% of the study area, while woody wetlands account for 10% of the study area. Medium to high density development, primarily the substation footprint, is noted across 10% of the review area. The remaining 10% of the review area consists of patches of barren land, developed open space, and herbaceous grassland.

Impacts to land use are anticipated to be minimal because the proposed Project will be constructed entirely within the existing right-of-way and on PPL Electric-owned property. This Project will be accessed through use of the surrounding state and secondary roads, but most of the construction will

occur within the existing right-of-way. Four existing access roads will be utilized to reach existing and proposed pole locations. Two of these existing access roads will require minimal upgrades.

State and Conserved Lands

During evaluation for State-owned lands, no impacts were identified along the right-of-way. The National Conservation Easement Database was utilized to identify two (2) farm parcels preserved through the Lehigh County Farmland Preservation Program that are presently crossed by the Project right-of-way. Two existing structures are located on these preserved farmlands. The proposed structures will be constructed in the same general locations as the existing structures, and will take up a smaller footprint than what currently exists. As such, no additional permanent soil disturbance is anticipated for this activity.

Airports

The Lehigh Valley International Airport is located approximately 12.6 miles northeast of the review area. In addition, Bally Spring Farm, a small local airport, is located 6.3 miles southwest of the study area. 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 four new structures will be a similar height as the existing facilities. However, PPL Electric will file any required documentation with the Federal Aviation Administration and the Pennsylvania Department of Transportation, Bureau of Aviation.

Cultural Resources

Due to the limited impact of the proposed Project, no coordination with the Pennsylvania Historical and Museum Commission (“PHMC”) is required for the construction of the new 230 kV line.

4.0 ENVIRONMENTAL FACTORS

Environmental factors reviewed for the Project included unique natural features, soils, waterways, wetlands, 100-year floodplains, vegetation, and threatened and endangered species.

Unique Natural Features

No unique geological, scenic, or natural areas are located within the Project review area.

Soils

Erosion and sedimentation control plans will be developed and implemented for the Project that will minimize the displacement of soils. These plans will require prior approval from the local county conservation district. National Pollutant Discharge Elimination System (“NPDES”) permits will also be required from the Pennsylvania Department of Environmental Protection (“PADEP”) as needed. Any conditions of the NPDES permit will be adhered to as part of the construction process. As such impacts to local soil resources are anticipated to be minimal.

Waterways

The existing Hosensack-Wescosville #3 230 kV Transmission Line spans three (3) mapped waterways as it extends from the Hosensack 230-69 kV Substation in the southwest to the tap pole (PPL Grid Number 62814S41939) in the northeast.

The three (3) perennial unnamed tributaries to the Hosensack Creek have a PADEP designated classification of Cold Water Fishes (“CWF”), which is an anti-degradation special protection classification for surface waters having quality which supports propagation of fish, shellfish, and wildlife. These streams also have a PADEP designated classification of Migratory Fisheries (“MF”), which is an anti-degradation special protection classification for surface waters which provide habitat for the passage, maintenance and propagation of anadromous and catadromous fishes and other fishes which move to or from flowing waters to complete their life cycles in other waters. Additionally, two of these tributaries are also classified as Wild Trout (Natural Reproduction) Streams, since they flow into a portion of the Hosensack Creek that is classified as Class A Wild Trout Waters.

One unnamed tributary to the Hosensack Creek is currently spanned by the existing Hosensack-Wescosville #3 230 kV Transmission Line and will also be spanned by the rebuilt line. No permanent impacts to this stream is anticipated since no culverts or bridges will be required and the wires spanning the unnamed tributary to the Hosensack Creek is considered a waived activity under 25 Pa. Code § 105.12.(3). Construction activities will also be conducted using a state approved erosion and sedimentation control plan to minimize the effects of storm water runoff.

Project activities will require the temporary crossing of one of these tributaries to access structures during construction. PPL Electric will obtain any approvals and permits necessary for the construction of the Project, and will comply with any conditions placed on those permits.

Wetlands

Based on review of the U.S. Fish and Wildlife Service's ("USFWS") National Wetlands Inventory ("NWI"), the existing Hosensack-Wescosville #3 230 kV Transmission Line right-of-way crosses several wetland systems. These systems are characterized as palustrine emergent ("PEM"), and palustrine scrub-shrub ("PSS") wetlands.

The NWI only provides a general overview of the potential wetlands that may be located within an area. For federal and state permitting purposes, the wetlands and waterways within the Project area were delineated, surveyed, and illustrated according to regulatory standards. Seven (7) wetlands were field identified within the Project right-of-way. These wetlands are classified as PEM, PSS and palustrine forested ("PFO") wetlands.

PADEP Chapter 105 (Dam Safety and Waterway Management) regulations stipulate that wetlands located in or along the floodplain of a wild trout stream or waters listed as Exceptional Value ("EV") and the floodplain of streams tributary thereto, be considered EV wetlands (25 Pa. Code § 105.17 1(iii)). Of the wetlands identified within the right-of-way of this Project, one (1) is located within the floodplain of Wild Trout Waters (unnamed tributaries to Hosensack Creek) and is therefore classified as an EV wetland.

PPL Electric will avoid impacts to wetlands and streams where possible. PPL Electric will obtain all necessary permits from the PADEP and the United States Army Corps of Engineers and will comply with all of the terms and conditions placed on those permits.

100-year Floodplains

The National Flood Hazard Layer ("NFHL") for Pennsylvania was obtained through the Pennsylvania Spatial Data Access ("PASDA") database and analyzed for 100-year floodplains within the Project area and surrounding landscape. The NFHL data incorporates all Flood Insurance Rate Map ("FIRM") databases published by the Federal Emergency Management Agency

("FEMA"), and any Letters of Map Revision ("LOMRs") that have been issued against those databases since their publication date.

The existing Hosensack-Wescosville #3 230 kV Transmission Line spans the 100-year floodplain associated with one (1) stream along the alignment. Presently, two (2) existing structures proposed for replacement are located within the FEMA 100-year floodplain. Coordination with PADEP regarding this potential impact will be conducted during the permitting phase of the Project.

Vegetation

Vegetative cover bordering the northern and central sections of the Project right-of-way has been influenced by agricultural and rural residential development. Sections of the natural forested cover in these sections have been removed for conversion to farms and pastures. The Project right-of-way consists of herbaceous and scrub shrub uplands and wetlands, and is generally maintained in this fashion.

Limited vegetation management will be required to modify the existing Hosensack-Wescosville #3 230 kV right-of-way for rebuild. The existing right-of-way is currently maintained in accordance with PPL Electric's Vegetation Management Program. Only minimal vegetation removal is anticipated because the Project is being completed primarily within existing PPL Electric right-of-way, which is currently cleared of trees for safety and maintenance reasons, or in an adjacent easement area that is located on agricultural lands. In areas where vegetation management is required, PPL Electric will apply its "*Specifications for Transmission Vegetation Management LA-79827*" to minimize any potential impacts.

Natural Areas Inventory

The *Natural Areas Inventory for Lehigh County*, prepared by the Pennsylvania Natural Heritage Program ("PNHP"), did not identify any Natural Heritage Sites within the Project area. The Project review area is within the Watershed Supporting Landscape of the Hosensack Creek Watershed. This watershed is ranked regionally as having wetlands and riparian zones which support a sensitive species of concern.

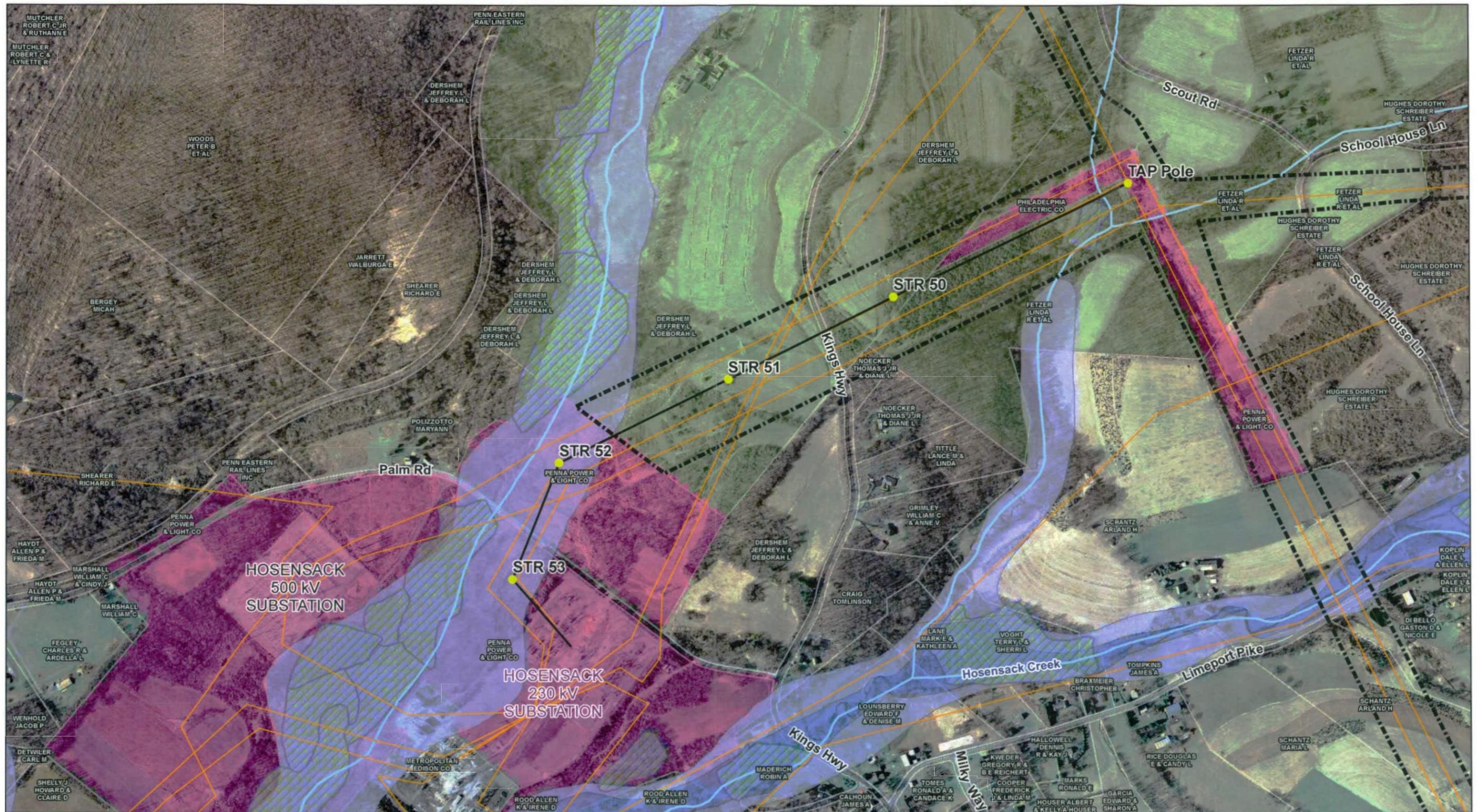
Threatened and Endangered Species

Review of the threatened and endangered species that may be encountered within and along the Hosensack-Wescosville #3 230 kV right-of-way includes evaluation of the natural areas identified in the Project area, as well as the Project related Pennsylvania Natural Diversity Inventory (“PNDI”) responses provided by federal and state agencies that have protective jurisdiction over the surrounding animals, plants, and ecological communities.

A Project Environmental Review of the PNDI database was conducted for the Project area (PNDI #20151110538733). The PNDI results indicated a Potential Impact with the USFWS. The Pennsylvania Game Commission (“PGC”), the Pennsylvania Fish and Boat Commission (“PFBC”), and the Pennsylvania Department of Conservation and Natural Resources (“DCNR”) responded that there was no known impact to species under their jurisdiction, and no further review by their agency was required.

The USFWS noted that the proposed Project is located within the known range of the federally threatened Bog Turtle (*Clemmys muhlenbergii*). Based on further coordination with USFWS, PPL Electric conducted a Phase I habitat assessment of the wetlands within the Project area, which concluded that potential bog turtle habitat does exist in two (2) wetlands. A Phase II Survey was subsequently conducted, and no bog turtles were found within the wetlands. The USFWS provided correspondence concurring with the findings of the Phase II survey. PPL Electric notes that work will be conducted within these wetlands. According to the USFWS correspondence, no impact to the bog turtle will occur due to the proposed work.

FIGURES



LEGEND:

HOSE-WESC 230 kV Existing Centerline	PADEP Streams (Not EV or HQ)	Conservation Lands
Existing Structures	NWI Wetland	PPL-owned_Parcel
Approximated PPL ROW	100 year flood areas	Lehigh County Parcel Boundary
Other Existing Transmission Lines	100 Year Floodplain	
	Floodway	

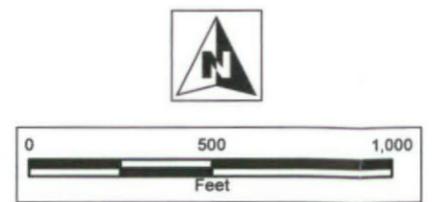
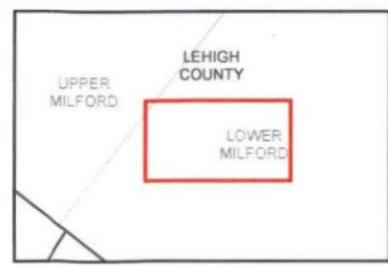


FIGURE 3.1
Aerial Map of the Project
HOSE-WESC #3
230 kV Rebuild Project
Lehigh County, Pennsylvania

Prepared For: PPL Electric Utilities Corporation,
 Allentown, Pennsylvania

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Table 4-1: 230 kV Vertical Clearance to Ground

1.0 DESIGN CONSIDERATIONS

The new 230 kV transmission line will be designed according to, and generally exceed, all NESC minimum standards. The 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 has developed design specifications and safety rules which meet or surpass all requirements specified by the NESC.

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 Electric 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 Electric designs all of its transmission lines for Grade B construction. The use of Grade B design and construction specifies enhancements such as increased safety factors.

Another example is the design parameters utilized to account for ice and wind loadings on the wires and structure. The conductor sags and tensions along with the structure loading used in line designs are the result of various ice and wind combinations. PPL transmission lines are designed to exceed NESC requirements including up to 1.5" of radial ice and in excess of 100 mph wind loads. This means that PPL Electric lines are designed to operate safely and reliably during inclement weather even more severe than assumed by the NESC. In addition, PPL Electric transmission lines are

designed with more clearance to the ground than required by the NESC. **Table 4-1** compares PPL Electric and NESC ground clearances for 230 kV lines.

TABLE 4-1: 230 kV Vertical Clearance to Ground

Surface Underneath Conductors	NESC Standard Clearance	Project Specific Clearance
Roads, streets, alleys	23 Ft.	33 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	23 Ft.	33 Ft.
Spaces accessible to pedestrians only	19 Ft.	33 Ft.
Railroad tracks	31 Ft.	35 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.

2.0 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 patrols as needed. A number of helicopter patrols are performed on all lines annually depending on voltage level. 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.

3.0 PERSONNEL SAFETY RULES

Overall PPL Electric designs and constructs projects with high regards to public safety and follows or exceeds all codes and requirements.

The following are a few of the PPL Electric safety rules that demonstrate the Company's concern for employee and contractor 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 or contractors 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 lineman 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.
- 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.
- 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.

4.0 MAGNETIC FIELD MANAGEMENT PLAN

PPL Electric's Magnetic Field Management Program is applied to new and reconstructed transmission line projects. In order to lower magnetic field exposures, the program generally prescribes the use of a line design that provides ground clearances of five feet higher than the required minimum NESC ground clearance and reverses phasing of new double circuit lines where it is feasible to do so at low or no cost. The implementation of additional modifications will be

considered, provided those modifications can be made at low or no cost and will not interfere with the operation of the line.

Due to the use of existing structures along the length of this project, PPL Electric will maintain a ground clearance that is typically three feet or more higher than the required NESC minimum ground clearance. PPL Electric may conduct both electric field and magnetic field analysis to identify the optimal phasing for the second circuit to reduce these affects as well as confirm all anticipated EMF values are consistent with PJM identified limits.