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File #: 166393

December 12, 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

Re: Letter of Notification of PPL Electric Utilities Corporation, Filed Pursuant to 52 Pa. Code Chapter 57 Subchapter G, for Approval to Site and Construct Approximately 0.4 Miles of New 230 kV Transmission Lines to Interconnect the Palooka 230-69 kV Substation in Bear Creek Township, Luzerne 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 as soon as practical in order to support the in-service date of May 2019.

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

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, for Approval to Site and Construct Approximately 0.4 Miles of New 230 kV Transmission Lines to Interconnect the Palooka 230-69 kV Substation in Bear Creek Township, Luzerne County, Pennsylvania	:	Docket No. A-2017-_____

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 site and construct two new double-circuit 230 kV connecting lines that will each extend approximately 1,100 feet to interconnect the new Palooka 230-69 kV Substation with the existing 230 kV transmission system (the "Project"). The proposed Project is required to reduce the potential for and duration of outages, retire aging transmission facilities, and improve the 69 kV system serving Luzerne County. The entire Project is located on PPL Electric-owned property for the new Palooka 230-69 kV substation. The proposed Project is located in the Bear Creek Township, Luzerne 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 as soon as practical in order to support the in-service date of May 2019. 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 417 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'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 Susquehanna 230-69 kV Substation and Jenkins 230-69 kV Substation are regional substations that supply power to customers in Luzerne County.

9. The Jenkins 230-69 kV Substation is supplied by three 230 kV transmission lines, including the Susquehanna-Jenkins 230 kV Transmission Line.[1] Between the Susquehanna Substation and the Jenkins Substation, the Susquehanna-Jenkins 230 kV Transmission Line and

[1] The Jenkins 230-69 kV Substation is also supplied by the Mountain-Jenkins 230 kV Transmission Line and the Jenkins-Stanton 230 kV Transmission Line.

Susquehanna-Acahela 230 kV Transmission Line occupy common double-circuit tower structures.[2]

10. The Jenkins 230-69 kV Substation supplies the double-circuit Harwood-Jenkins #1 & #2 69 kV Transmission Line, which extends approximately 40 miles between the Jenkins 230-69 kV Substation in Plains Township, Luzerne County and the Harwood 230-69 kV Substation in Hazle Township, Luzerne County. The Harwood-Jenkins #1 & #2 69 kV Transmission Line serves customers located in parts of the Wilkes-Barre and Hazleton areas.

11. The Jenkins 230-69 kV Substation also supplies the Jenkins-Plymouth 69 kV Transmission Line, which extends approximately 18.5 miles between the Jenkins 230-69 kV Substation in Plains Township, Luzerne County to the Plymouth 69 kV Substation in Plymouth Borough, Luzerne County. The Jenkins-Plymouth 69 kV Transmission Line serves customers located in central Luzerne County.

12. These lines are described in Attachment 1 to this Letter of Notification. One-line diagrams and a map of the existing system are provided in the Necessity Statement included as Attachment 1 to this Letter of Notification.

B. NEED FOR THE PROJECT

13. The existing 40-mile, double-circuit Harwood-Jenkins #1 & #2 69 kV Transmission Line currently experiences a high momentary outage rate due to the long line exposure and high number of customers at risk of impact per outage event. The Harwood-Jenkins #1 & #2 69 kV Transmission Line is on PPL Electric's transmission worst performing circuits list, which accounts for historical performance.

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[2] *See Letter of Notification of PPL Electric Utilities Corporation, Filed Pursuant to 52 Pa. Code Chapter 57 Subchapter G, for Approval to Rebuild Approximately 24.4 Miles of the Existing Susquehanna-Jenkins 230 kV Transmission Line Located in Luzerne County, Pennsylvania*, Docket No. A-2016-2526304 (April 7, 2016).

14. The single-circuit Jenkins-Plymouth 69 kV Transmission Line facilities have reached the end of their useful life. The existing conductor, connectors, and wood structures do not meet current design or height standards.

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

C. THE PROPOSED PROJECT

16. To address these reliability issues summarized above, PPL Electric proposes to construct the Palooka 230-69 kV Substation in Bear Creek Township, Luzerne County, Pennsylvania.

17. The new Palooka 230-69 kV Substation will provide a new 230 kV backbone source for the south/west portion of Scranton/Wilkes-Barre metropolitan area. The new Palooka 230-69 kV Substation will improve the reliability of the 69 kV network in the Wilkes-Barre area, and parts of the Hazleton area.

18. The new Palooka 230-69 kV Substation will break the double-circuit Harwood-Jenkins #1 & #2 69 kV Transmission Lines, and form the new Harwood-Palooka #1 & #2 and Palooka-Jenkins #1 & #2 69 kV Transmission Lines. These new, shorter 69 kV lines will reduce the number of transmission line miles per line, which will reduce the likelihood of customers experiencing an outage on a given line as well as reduce the number of customers affected by a line outage as further explained in Attachment 1 to this Letter of Notification.

19. Additionally, the new Palooka 230-69 kV Substation, and the new shorter 69 kV lines, will allow the load currently supplied by the aging Jenkins-Plymouth 69 kV Transmission Line to be supplied by the new Palooka-Jenkins #1 & #2 and new Palooka-Harwood #1 & #2 circuits. As a result, an 8.25 mile section of the aging Jenkins-Plymouth 69 kV line between the Jenkins and Palooka Substations can be retired and the need to rebuild the line can be avoided.

20. The new Palooka 230-69 kV Substation will be located adjacent to the existing right-of-way for the Susquehanna-Jenkins 230 kV Transmission Line and Susquehanna-Acahela 230 kV Transmission Line, which occupy common double-circuit tower structures in this area.

21. In order to interconnect the new Palooka 230-69 kV Substation with the 230 kV system, PPL Electric herein proposes to construct two new double circuit 230 kV connecting lines that will each extend approximately 1,100 feet (or a total of approximately 2,200 feet) from the new Palooka 230-69 kV Substation to interconnect with the existing Susquehanna-Jenkins 230 kV Transmission Line and Susquehanna-Acahela 230 kV Transmission Line. The two new double-circuit 230 kV connecting lines will be located entirely on PPL Electric's property for the Palooka 230-69 kV Substation

22. Each new double-circuit 230 kV connecting line will require two new monopole structures (four in total), with an average height of 160 feet. All new poles will be self-supported, either direct embedded or on concrete caisson foundations. Depictions of the type of monopoles used for this Project are provided in Attachment 2 to this Letter of Notification.

23. The 230 kV design will utilize three power conductors and one overhead ground wire per circuit. The power conductors will be 1590 kcmil[3] 54/19 ACSR[4] Falcon[5] conductors. The overhead ground wires will be 144 count single mode fiber optical ground wires.

24. A detailed engineering description is provided in Attachment 2 to this Letter of Notification.

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[3] The term "kcmil" stands for thousand circular mils. 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 on thousandth (0.001) of an inch.

[4] "ACSR" stands for aluminum conductor steel reinforced.

[5] Falcon is the technical term for a 1590 kcmil 54/19 ACSR conductor as defined in the American Society for Testing and Materials.

25. The total estimated cost of the proposed Project is $2.5 million.[6]

26. Subject to the Commission's approval, construction will begin as soon as practical to support the in-service date of May 2019.

III. HEALTH AND SAFETY

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

28. 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 of PPL Electric's design criteria and safety practices are provided in Attachment 4 to this Letter of Notification.

29. 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.

30. The Project will be designed with structures that have a ground clearance higher than NESC standards, and the new 230 kV double-circuits will use reverse phasing. These measures will reduce the potential for exposure to magnetic fields.

IV. DESCRIPTION OF PROJECT AREA

31. As explained above, the proposed new double-circuit 230 kV connecting lines and monopole structures will be located entirely on PPL Electric's property for the Palooka 230-69 kV Substation.

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[6] 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.

32. No additional rights-of-way or other property rights are needed for the construction of the proposed new 230 kV connecting lines.

33. An aerial plot plan is provided in Attachment 3 to this Letter of Notification.

34. Land use impacts are anticipated to be minimal due to the fact that the Project will be constructed entirely on PPL Electric-owned property, 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.

35. The existing rights-of-way have previously has been cleared of vegetation; however, the vegetation management will be required at the PPL Electric-owned Palooka Substation property in order to construct the new substation and 230 kV connecting lines. 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.

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

37. The closest airport is the Wilkes-Barre/Scranton International Airport, which is located approximately 10.5 miles northeast 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 existing facilities. However, PPL Electric will file all required documentation with the Federal Aviation Administration and the Pennsylvania Department of Transportation, Bureau of Aviation.

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

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

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

41. PPL Electric will coordinate with the Pennsylvania Historical and Museum Commission ("PHMC") to ensure that the Project will have no adverse impacts to cultural and archaeological resources.

42. The proposed Project will not span any waterways or wetlands. 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.

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 completed a Pennsylvania Natural Diversity Inventory records review. Based on this review, no threatened and endangered species, or special concern species and resources located within the Project area as explained in Attachment 3. PPL Electric will continue to consult with the jurisdictional agencies regarding potential impacts to protected species.

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

V. NOTICE

46. PPL Electric has provided information regarding the Project to representatives of Bear Creek Township and Luzerne County. 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. As explained above, PPL Electric herein seeks Commission approval to site and construct two new 230 kV lines to connect the new Palooka 230-69 kV Substation with the 230 kV system. Each new 230 kV connecting line will extend approximately 1,100 feet, or in total approximately 0.4 miles. Further, both new 230 kV connecting lines will be located entirely on PPL Electric's property for the Palooka 230-69 kV Substation.

51. PPL Electric submits that this proposed Project qualifies for use of a Letter of Notification because the proposed 230 kV connecting lines have a combined total route of 0.4 miles, *i.e.*, less than 2.0 miles.

52. 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 siting and construction of the two new 230 kV connecting lines needed to interconnect the proposed new Palooka 230-69 kV Substation with the existing 230 kV transmission system in Bear Creek Township, Luzerne County, Pennsylvania, as explained above and in the Attachments hereto.

Respectfully submitted,

Kimberly A. Klock (I.D. #89716)
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Attorneys for PPL Electric Utilities Corporation

Date: December 12, 2017

VERIFICATION

I, STEPHANIE R. 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: 12/11/17

Before the
Pennsylvania Public Utility Commission

PALOOKA SUBSTATION 230 kV LINE EXTENSION PROJECT

ATTACHMENTS IN SUPPORT OF THE
LETTER OF NOTIFICATION

Application Docket No. _____

Submitted by: PPL Electric Utilities Corporation

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List of Tables

List of Figures

1.0 INTRODUCTION

PPL Electric Utilities Corporation ("PPL Electric") is requesting Pennsylvania Public Utility Commission ("PUC" or "the Commission") approval for the construction of 230 kV transmission lines needed to interconnect the new Palooka 230-69 kV Substation to the existing 230 kV system (the "Project"). As described below, to interconnect the new Palooka 230-69 kV Substation located in Bear Creek Township, Luzerne County to the 230 kV system, PPL Electric proposes to construct two new 1,100 foot connection lines from the Substation to the existing Susquehanna-Jenkins 230 kV Transmission Line and Susquehanna-Acahela 230 kV Transmission Line. As explained below the Project is needed to reinforce the 69 kV system serving Luzerne County.

The estimated cost of the Project is approximately $2.5 million.[1] This cost includes the siting, design, and construction of the new double-circuit 230 kV transmission lines. Subject to the Commission's approval, construction is scheduled to begin as soon as practical in order to support the scheduled in-service date of May 2019.

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 estimate 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 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 Federal Energy Regulatory Commission ("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 system reinforcements that are required to, among other

[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

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 14B[5] 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 of operation of 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 1000[6] to solicit bids and approve solutions to resolve the criteria violation.

PPL Electric, as a Transmission Owner and member of PJM, undertakes an independent analysis of both its BES[7] transmission facilities, and its non-BES[8] 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

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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.

[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

[7] Bulk Electric System (BES) - Includes transmission facilities operated at voltages of 100 kV or higher.

[8] Non-Bulk Electrical System (non-BES) - Includes transmission facilities operated at voltages less than 100 kV.

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.

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 these criteria, PPL Electric plans the system according to its own Transmission System Development Standards.

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, 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.

Projects created to support PPL Electric's Transmission System Development Standards are presented to PJM stakeholders at either a Transmission Expansion Advisory Committee (TEAC) or Sub-Regional RTEP meeting and are assigned a Supplemental project number in the RTEP. PJM incorporates these projects into the power flow model which they use to perform various reliability analyses for the RTEP.

As explained below, the proposed Project is necessary to maintain the reliability of the transmission system serving Luzerne County according to PPL Electric Transmission System Development Standards. The proposed Project has been presented at a PJM Mid-Atlantic Sub-Regional RTEP stakeholder meeting on December 8, 2014 and has been included in the PJM RTEP as supplemental project s0860.

3.0 DEFINITION OF THE PROBLEM

3.1 Existing System

Presently customers in central Luzerne County receive their electric bulk power supply through 230 kV transmission lines. The 230 kV transmission lines provide power to two regional 230-69 kV transmission substations, the Susquehanna 230-69 kV Substation and the Jenkins 230-69 kV Substation. The Susquehanna 230-69 kV Substation and Jenkins 230-69 kV Substation are regional substations that supply power to several 69 kV transmission lines, which in turn supply various 69-12 kV distribution substations in Luzerne County. These 69-12 kV substations supply power to commercial facilities and residential homes in Luzerne County.

The Susquehanna 230-69 kV Substation and Jenkins 230-69 kV Substation were previously connected by the single-circuit Susquehanna–Jenkins 230 kV Transmission Line. PPL Electric is presently rebuilding this single-circuit as a double-circuit 230 kV transmission line as previously approved by the Commission on April 7, 2016. *See Letter of Notification of PPL*

Electric Utilities Corporation, Filed Pursuant to 52 Pa. Code Chapter 57 Subchapter G, for Approval to Rebuild Approximately 24.4 Miles of the Existing Susquehanna-Jenkins 230 kV Transmission Line Located in Luzerne County, Pennsylvania, Docket No. A-2016-2526304 (April 7, 2016). One of the rebuilt circuits is referred to as the Susquehanna-Jenkins 230 kV Transmission Line, which extends from the Susquehanna Substation to the Jenkins Substation. The other rebuilt circuit is referred to as the Susquehanna-Acahela 230 kV Transmission Line, which extends from the Susquehanna Substation to the Acahela Substation. Between the Susquehanna Substation and the Jenkins Substation, the Susquehanna-Jenkins 230 kV Transmission Line and Susquehanna-Acahela 230 kV Transmission Line occupy common double-circuit tower structures.

The double-circuit Harwood-Jenkins #1 & #2 69 kV Transmission Line is supplied by the Jenkins 230-69 kV Substation and Harwood 230-69 kV Substation. The Harwood-Jenkins #1 & #2 69 kV Transmission Line extends approximately 40 miles (with some normally open points) between the Jenkins 230-69 kV Substation in Plains Township, Luzerne County and the Harwood 230-69 kV Substation in Hazle Township, Luzerne County. The Harwood-Jenkins #1 & #2 69 kV Transmission Line serves customers located in parts of the Wilkes-Barre and Hazleton areas.

The existing single-circuit Jenkins-Plymouth 69 kV Transmission Line is also supplied by the Jenkins 230-69 kV Substation. The Jenkins-Plymouth 69 kV Transmission Line extends approximately 18.5 miles between the Jenkins 230-69 kV Substation in Plains Township, Luzerne County to the Plymouth 69 kV Substation in Plymouth Borough, Luzerne County. The Jenkins-Plymouth 69 kV Transmission Line serves customers located in central Luzerne County.

One-line diagrams of the existing 230 kV and 69 kV systems are provided as **Figure 1-1a** and **Figure 1-1b**, respectively. A map of the existing system alignment is provided as **Figure 1-2**.

3.2 Project Needs

The existing 40-mile, double-circuit Harwood-Jenkins #1 & #2 69 kV Transmission Line experiences a high momentary outage rate (outages less than 5 minutes in duration) due to the long line exposure and high number of customers at risk of impact per outage event. Longer lines have a higher probability of lightning strikes, tree contacts, bird contacts, and structure/insulator failures. This double-circuit line has experienced a total of 78 momentary outages in the past 10 years, which is nearly three times higher than expected for a 69 kV circuit over a 10 year period. The Harwood-Jenkins #1 & #2 Transmission Line was in the top 10 circuits on PPL Electric's transmission worst performing circuits list for 2015 and 2016. These two circuits are presently the worst two performing circuits on the transmission worst performing circuits list.

The single-circuit Jenkins-Plymouth 69 kV Transmission Line is comprised of approximately 12 lattice towers that were installed in 1924 and 128 vintage wood transmission structures that were installed between 1927 and 1968. These structures have reached the end of their useful life and must be replaced in order to continue to provide safe and reliable service to customers. Additionally, the conductor and connectors on the Jenkins-Plymouth 69 kV Transmission Line are approaching the end of their useful life. This line has seen increased maintenance costs in recent years, which will continue to rise until the infrastructure that is at or near the end of its useful life is replaced or remediated. Overall, more than 50% of the assets (both structures and conductors) on the Jenkins-Plymouth 69 kV Transmission Line must be replaced and the remaining sections of line require remediation.

4.0 PROPOSED SOLUTION

To resolve the reliability issues explained above, PPL Electric proposes to construct the Palooka 230-69 kV Substation in Bear Creek Township, Luzerne County, Pennsylvania. The new

Palooka 230-69 kV Substation will provide a new 230 kV backbone source for the south/west portion of Scranton/Wilkes-Barre metropolitan area and surrounding areas.

The new Palooka 230-69 kV Substation will be located adjacent to the existing right of way for the Susquehanna-Jenkins 230 kV Transmission Line and Susquehanna-Acahela 230 kV Transmission Line, which occupy common double-circuit tower structures in this area. The new Palooka 230-69 kV Substation will be interconnected to the 230 kV system by construction of two new double circuit 230 kV connecting lines that will each extend approximately 1,100 feet (or a total of approximately 2,200 feet of new 230 kV line) from the new Palooka 230-69 kV Substation to interconnect with the existing Susquehanna-Jenkins 230 kV Transmission Line and Susquehanna-Acahela 230 kV Transmission Line. Upon completion, one 230 kV double circuit will be designated as the Susquehanna-Palooka #1 & #2 230 kV Transmission Lines, and the other 230 kV circuits will be designated as the Palooka-Jenkins and Palooka-Acahela 230 kV Transmission Lines.

The new Palooka 230-69 kV Substation will split the double-circuit Harwood-Jenkins #1 & #2 69 kV Transmission Line, and form the new Harwood-Palooka #1 & #2 and Palooka-Jenkins #1 & #2 69 kV Transmission Lines. As explained in **Table 1-1** below, these new 69 kV lines will reduce the number of miles per circuit, which will reduce the likelihood of customers experiencing an outage on a given line and reduce the total number of customers affected by a line outage.

Additionally, since the Palooka 230-69 kV Substation splits the Harwood-Jenkins #1 & #2 69 kV circuits, each new circuit will have additional load carrying ability. As a result, the loads that are currently carried by the Jenkins-Plymouth 69 kV Transmission Line, which has reached the end of its useful life as explained above, can be carried by the new Palooka-Jenkins #1 & #2 and new Harwood-Palooka #1 & #2 69 kV Transmission Lines. As a result, an 8.25 mile section of the

aging Jenkins-Plymouth 69 kV Transmission Line between the Jenkins and Palooka Substations can be retired, which will avoid the need to rebuild the line at an estimated cost of $16.5 million.

Table 1-1 below illustrates the circuit lengths before and after the Palooka Project. This table shows that the average circuit length is decreased from 23.7 miles to 15.4 miles, a 35% decrease. As explained earlier, shorter circuit lengths will improve customer reliability by reducing exposure.

Table 1-1 - Line Exposure Before and After Proposed Project

BEFORE		
Line Name	**Circuit Miles**	**Average Circuit Miles**
Harwood-Jenkins #1	26.2	23.7
Harwood-Jenkins #2	26.5	
Jenkins-Plymouth	18.5	
AFTER		
Line Name	**Circuit Miles**	**Average Circuit Miles**
Harwood-Palooka #1	17.0	15.4
Harwood-Palooka #2	17.7	
Palooka-Jenkins #1	14.6	
Palooka-Jenkins #2	12.4	

The metrics used to quantify the effects of permanent and momentary outages are System Average Interruption Frequency Index (SAIFI) and Momentary Average Interruption Frequency Index (MAIFI) respectively. Reliability improvements for customers that were served by the existing Harwood-Jenkins #1 & #2 and Jenkins-Plymouth 69 kV Transmission Lines are projected to see a 14% SAIFI decrease and a 42% MAIFI decrease after the Project is completed. These improvements are the result of splitting the 69 kV circuits and switching a large number of customers from long-length circuits to shorter circuits. This also reduces the average customer's circuit length exposure, which improves overall customer reliability.

A one-line diagram of the proposed 230 kV and 69 kV systems are provided in **Figure 1-3a** and **Figure 1-3b** respectively. A map of the proposed system alignment is provided in **Figure 1-4**.

Figure 1-1a: Existing 230 kV One Line Diagram

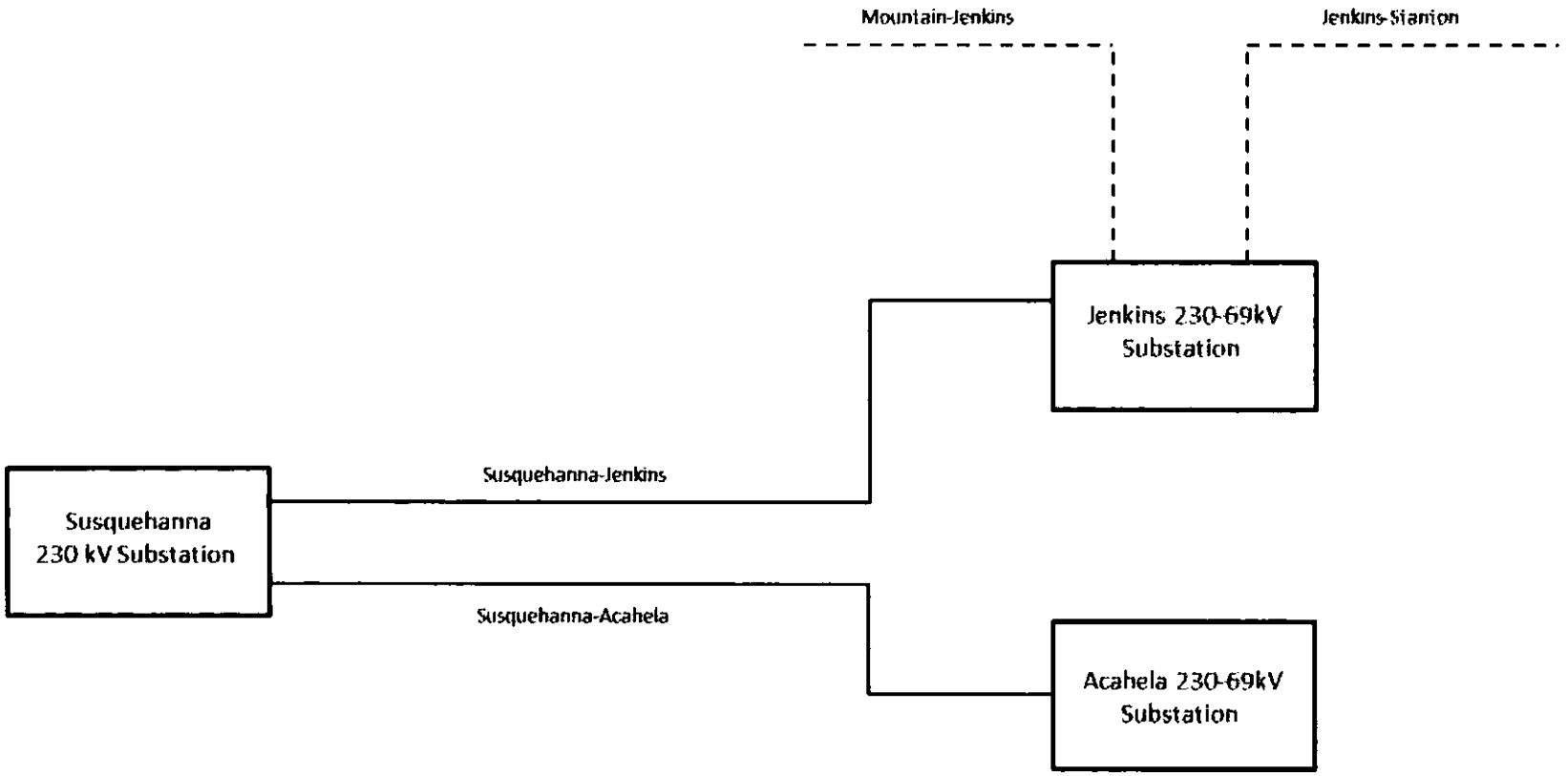


Figure 1-1b: Existing 69 kV One Line Diagram

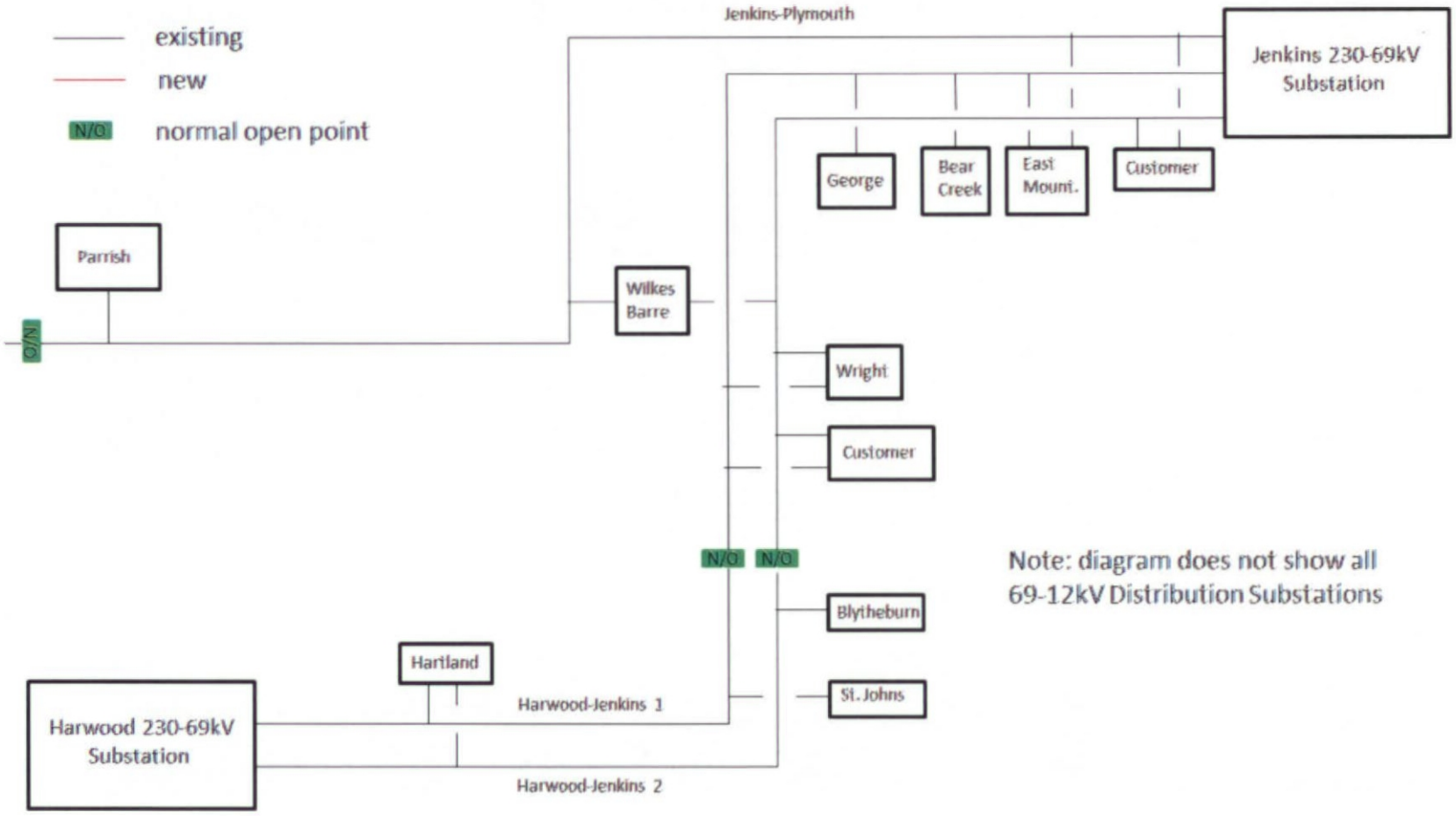


Figure 1-2: Existing System Map

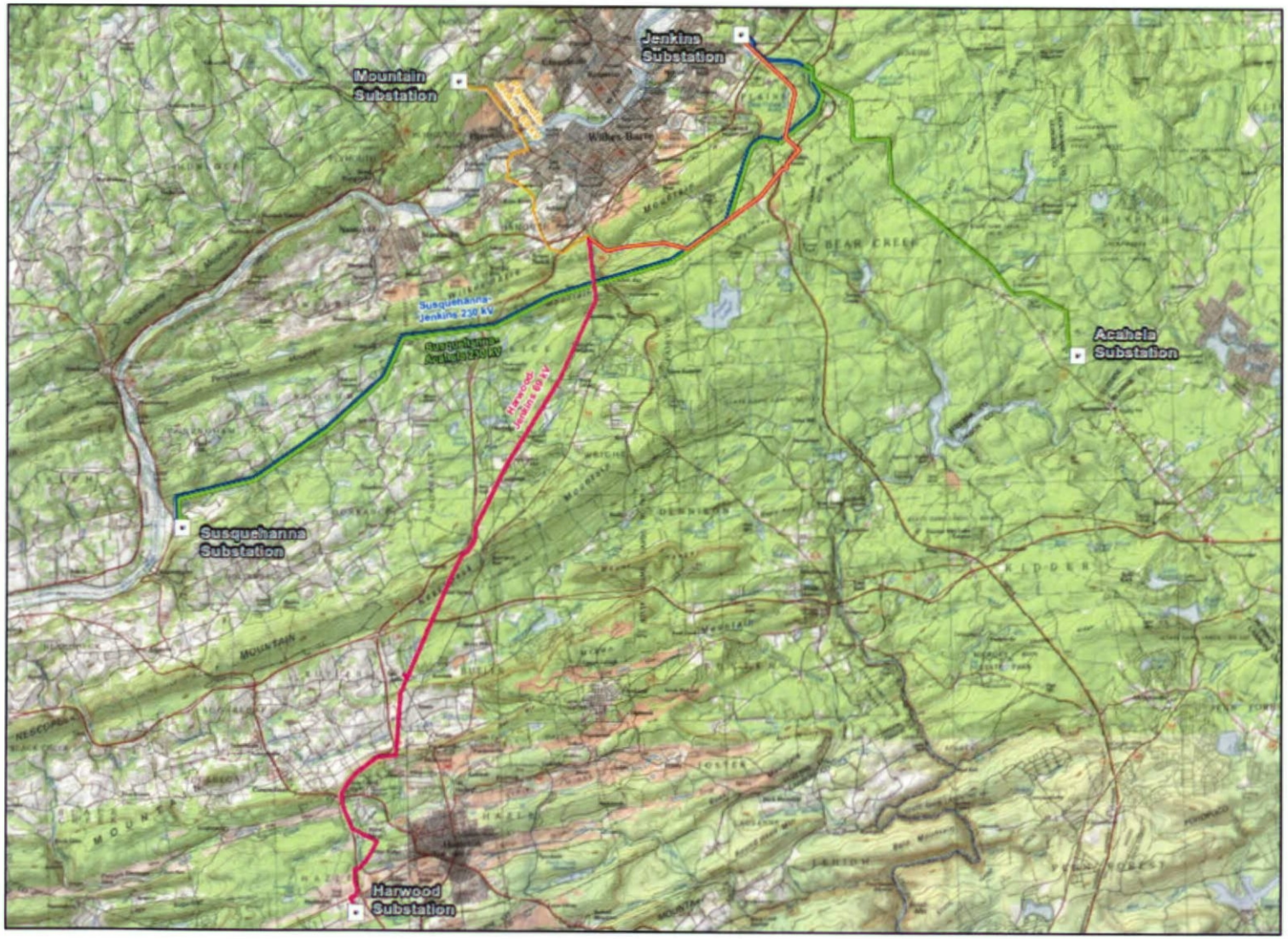


Figure 1-3a: Proposed 230 kV One Line Diagram

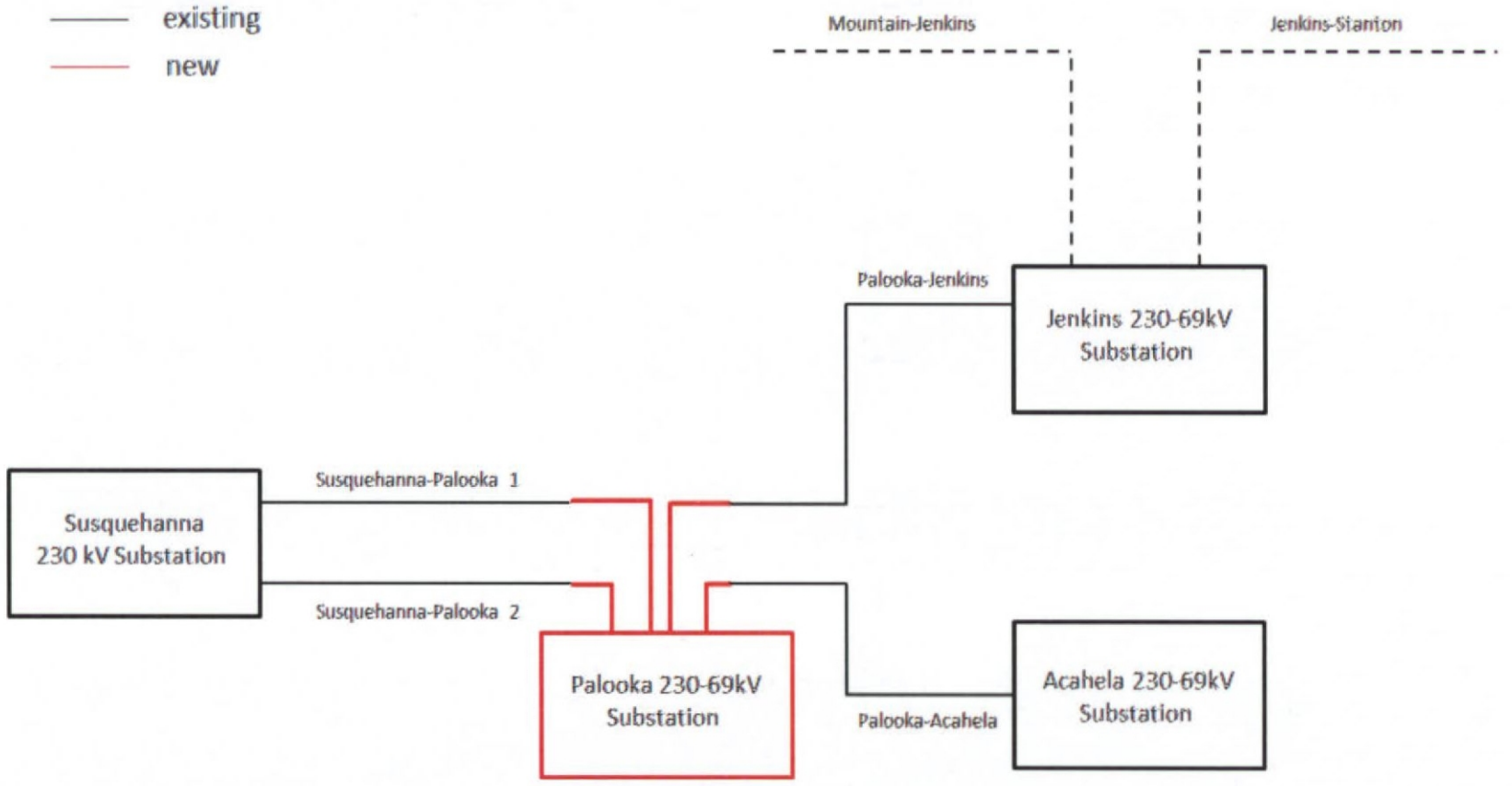


Figure 1-3b: Proposed 69 kV One Line Diagram

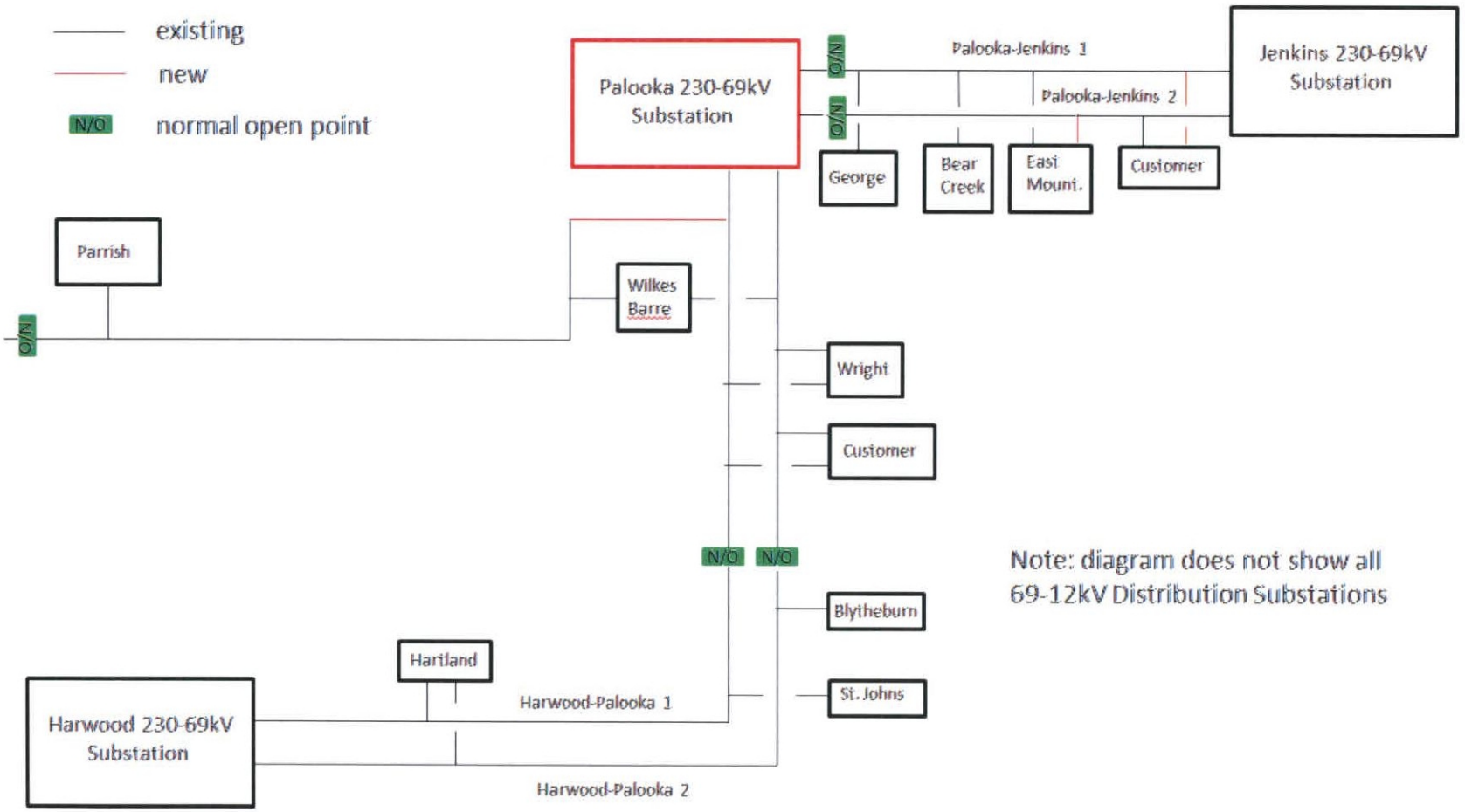
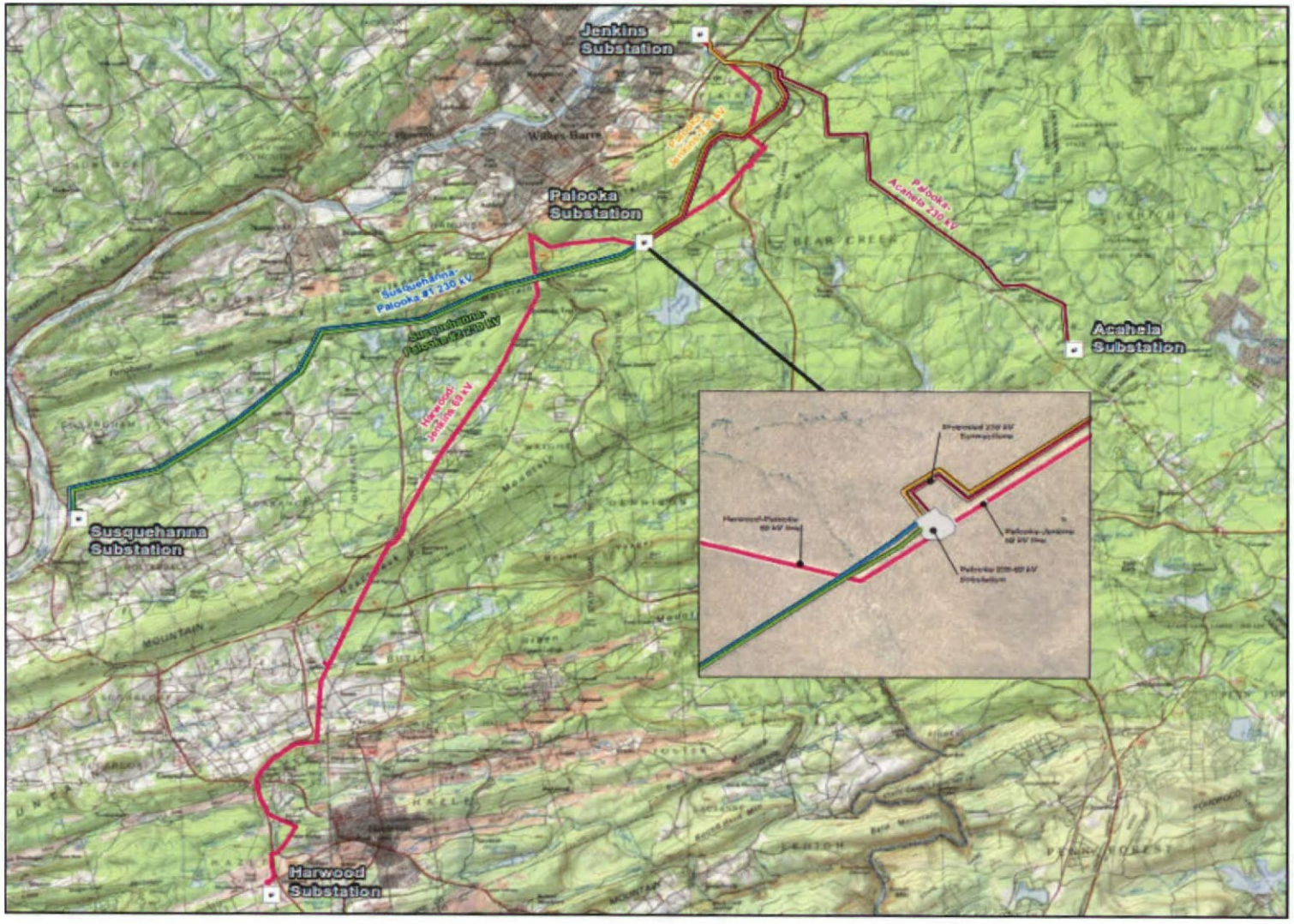


Figure 1-4: Proposed System Map



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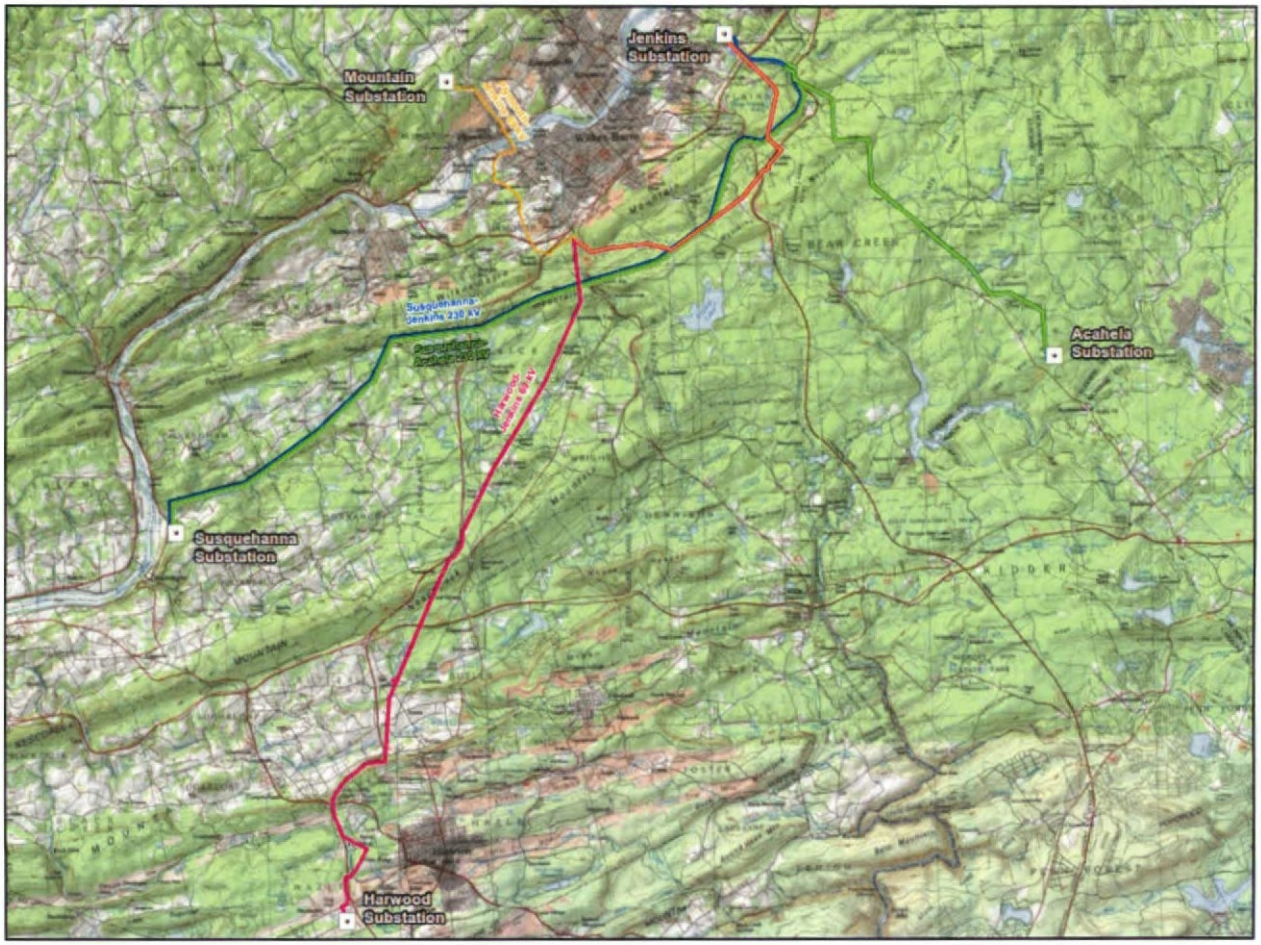
1.0 DESCRIPTION OF THE PROPOSED 230 kV LINES

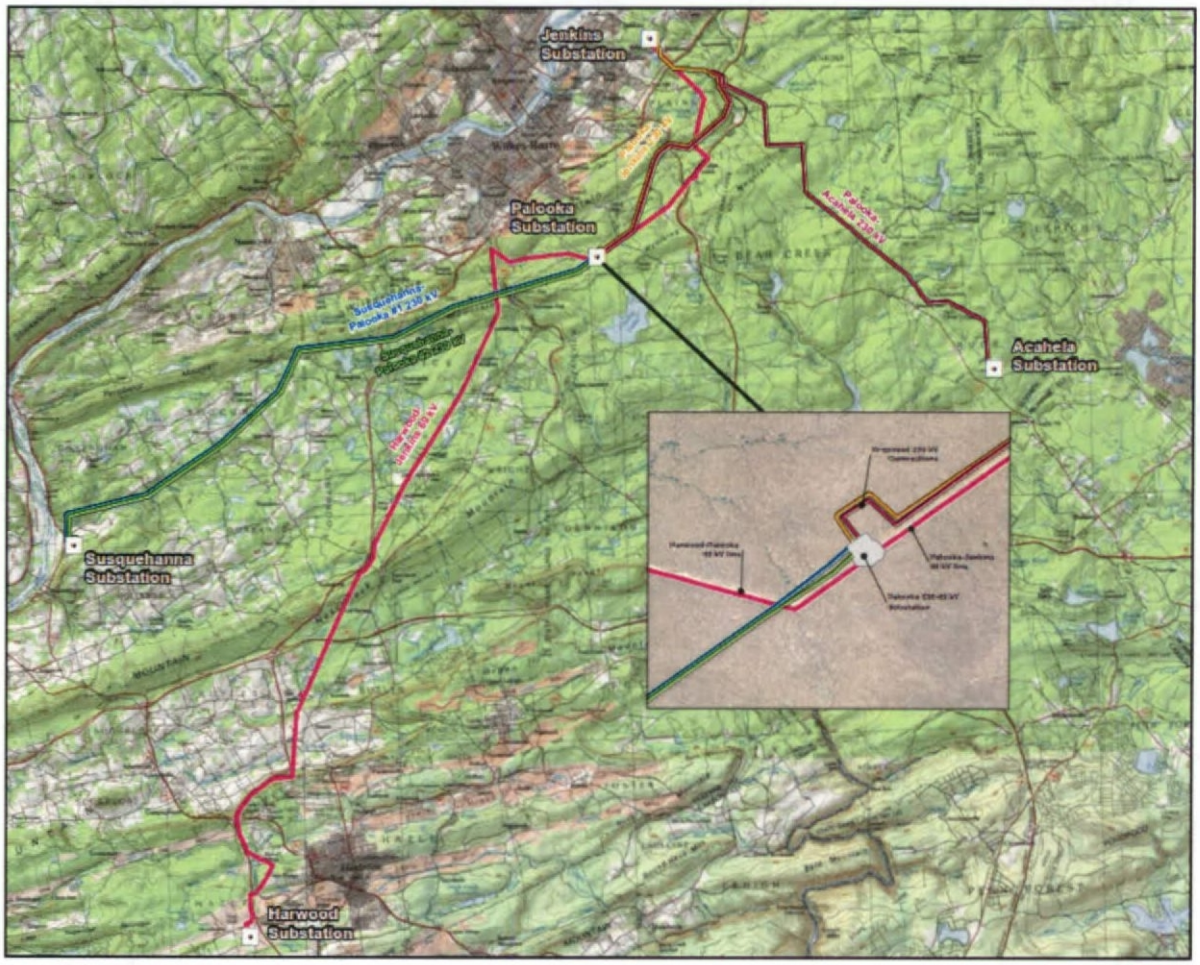
As explained in **Attachment 1**, PPL Electric Utilities Corporation ("PPL Electric") is requesting Pennsylvania Public Utility Commission ("PUC" or "the Commission") approval for the construction of 230 kV transmission lines needed to interconnect the new Palooka 230-69 kV Substation to the existing 230 kV system (the "Project"). The new Palooka 230-69 kV Substation will be located adjacent to the existing right-of-way for the Susquehanna-Jenkins 230 kV Transmission Line and Susquehanna-Acahela 230 kV Transmission Line, which occupy common double-circuit structures in this area. **Figure 2-1** below shows the existing Susquehanna-Jenkins 230 kV Transmission Line, the Susquehanna-Acahela 230 kV Transmission Line, and the 69 kV lines extending between Harwood and Jenkins Substations.

FIGURE 2-1: Existing 69 kV and 230 kV Lines



The new Palooka 230-69 kV Substation will be supplied by the existing Susquehanna-Jenkins 230 kV Transmission Line and Susquehanna-Acahela 230 kV Transmission Line. PPL Electric proposes to construct two new double-circuit 230 kV connecting lines that will each extend approximately 1,100 feet from the new Palooka 230-69 kV Substation to the existing Susquehanna-Jenkins 230 kV Transmission Line and Susquehanna-Acahela 230 kV Transmission Line. **Figure 2-2** below shows the proposed new double-circuit 230 kV connecting lines. The new double-circuit 230 kV connecting lines will be located entirely on PPL Electric's property for the Palooka 230-69 kV Substation as shown in **Figure 3-1**.

FIGURE 2-2: Proposed New 230 kV Lines and Palooka Substation



The two new double-circuit 230 kV connecting lines will each require two new monopole structures, a total of four poles, with an average height of 160 feet. All new poles will be self-supported on concrete caisson foundations. Depictions of the type of monopoles used for this Project are provided in **Figure 2-3**.

The 230 kV design will utilize three power conductors and one overhead ground wire per circuit. The power conductors will be 1590 kcmil[1] 54/19 ACSR[2] "Falcon".[3] The overhead ground wires will be 144 count single mode fiber optical ground wires.

The new 230 kV connecting lines will each be designed to meet, and generally exceed, National Electrical Safety Code ("NESC") minimum standards. Design specifications and safety rules practiced by PPL Electric are included in **Attachment 4**. The new 230 kV connecting lines will generally be designed with a conductor to ground clearance of 32 feet, which occurs at a maximum conductor temperature of 125° C. 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	Double-Line Design Clearance-to-Ground
Normal load; average weather (16°C ambient temperature)	39.0 feet
Predicted extreme thermal load (125°C conductor temperature)	32.0 feet
Predicted PPL Extreme wind load (100 mph, 16°C)	38.4 feet
Predicted extreme weather conditions (1inch ice, 8 lbs. wind, -18°C)	37.6 feet
*Clearances based on a maximum tension of 21,900 pounds at 1 inch ice, 0° F, 8# wind and a ruling span of 1100 feet.	

*Based on 1590 kcmil 54/19 stranding ACSR "Falcon"

[1] kcmil stands for thousand circular mils. 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 on thousandth (0.001) of an inch.
[2] ACSR stands for aluminum conductor steel reinforced.
[3] Falcon is the technical term for a 1590 kcmil 54/19 ACSR conductor as defined in the American Society for Testing and Materials.

TABLE 2-2: Conductor Thermal Rating**

Condition	Ambient Temperature °C	Wind Speed ft/sec	Ampacity Amps
Summer Normal	35	0	1788
Winter Normal	10	0	2010
Summer Emergency	35	2.533	2172
Winter Emergency	10	2.533	2399

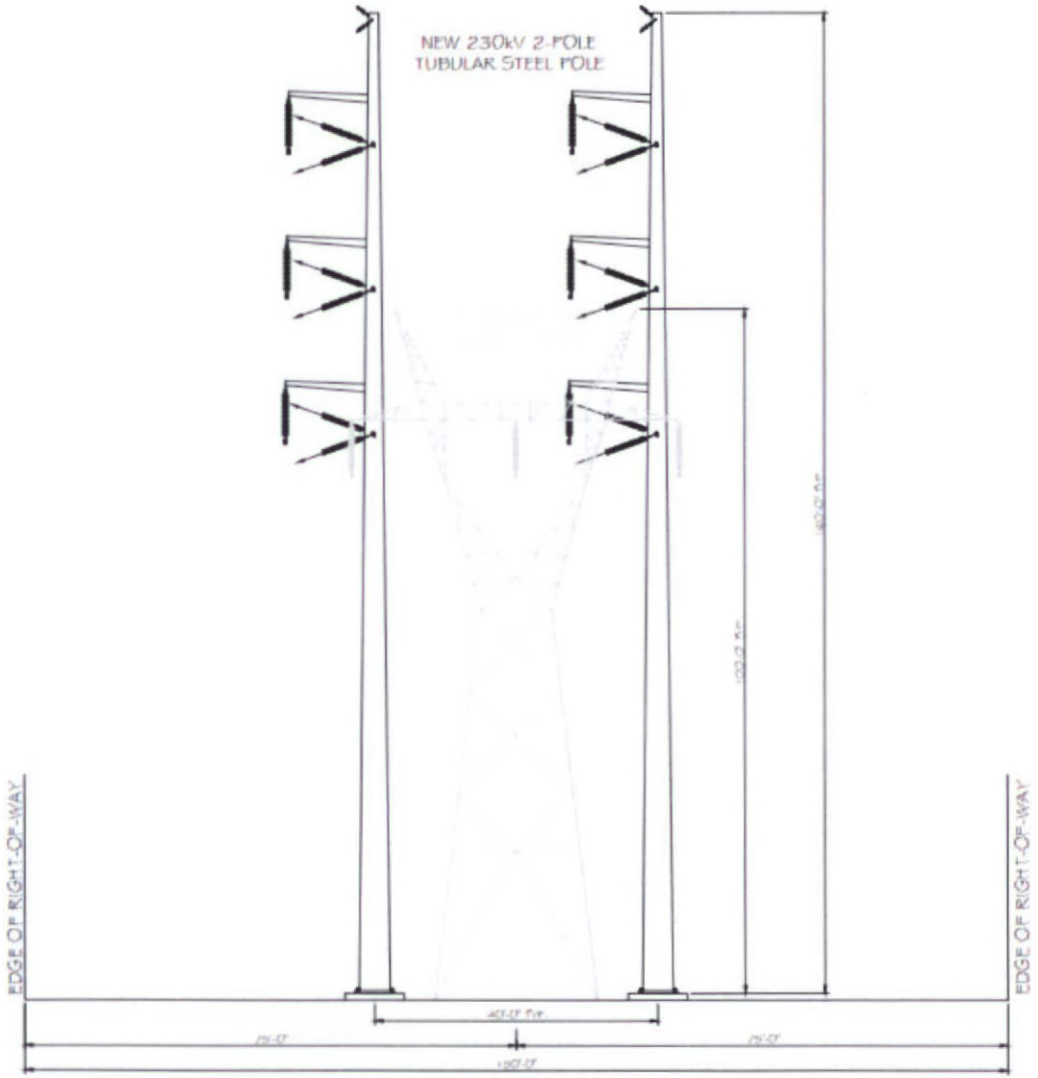
**Based on 1590 kcmil 54/19 stranding ACSR "Falcon" (257°F) 125°C maximum conductor

2.0 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 efforts 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. To reduce magnetic field exposures, the Magnetic Field Management Program generally prescribes the use of a line design with ground clearance higher than required by the NESC standards and reverses phasing of new double-circuit lines where it is feasible to do so at low or no cost.

The new 230 kV connecting lines will be designed with structures that have a ground clearance that is higher than required by the NESC standards. The new 230 kV connecting lines will be a double-circuit that will use reverse phasing. These measures will further reduce the potential for exposure to magnetic fields.

FIGURE 2-3: Typical 230 kV ROW Cross-Section:



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1.0 DESCRIPTION OF PROJECT AREA

As explained in **Attachment 1**, PPL Electric Utilities Corporation ("PPL Electric") is requesting Pennsylvania Public Utility Commission ("PUC" or "the Commission") approval for the construction of 230 kV transmission lines needed to interconnect the new Palooka 230-69 kV Substation to the existing 230 kV system (the "Project"). The Project will involve constructing two new double-circuit 230 kV connecting lines that will each extend approximately 1,100 feet to connect the existing Susquehanna-Jenkins 230 kV Transmission Line and Susquehanna-Acahela 230 kV Transmission Line to the new Palooka 230-69 kV Substation in Bear Creek Township, Luzerne County.

As explained in **Attachment 2**, the two new double-circuit 230 kV connecting lines will each require the construction of four new double-circuit monopole structures. The new double-circuit 230 kV connecting lines and monopole structures will be located on PPL Electric's property for the new Palooka 230-69 kV Substation as shown on **Figure 3-1** below. No additional rights-of-way or other property rights are needed for the construction of the proposed new 230 kV connecting lines.

The Palooka Substation property currently is undeveloped and composed primarily of upland forest. The existing right-of-way for the Susquehanna-Jenkins and Susquehanna-Acahela 230 kV Transmission Lines, which occupy common double-circuit tower structures in this area, has previously been cleared of vegetation and consists primarily of a mosaic of mixed shrubbery and meadow.

2.0 LAND USE

PPL Electric evaluated and reviewed the land uses within 0.25 mile (1,320 feet) of the Project area. 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 forested land is the dominant land use accounting for over 80% of the review area. The remaining 20% consists of the open shrub and grass dominated by the existing 230 kV transmission line right-of-way for the Susquehanna-Jenkins and Susquehanna-Acahela 230 kV Transmission Lines. However, the existing right-of-way has previously been cleared of vegetation. Impacts to the forested land use are anticipated at the Palooka Substation property in order to accommodate the new substation and 230 kV transmission and connecting lines.

This Project will be constructed using surrounding state and secondary roads. Where possible, PPL Electric will also use and update previously established access roads that are associated with the surrounding existing 230 kV and 69 kV right-of-ways for construction to further reduce interference with existing land uses.

Airports

The closest airport to the Project area is the Wilkes-Barre/Scranton International Airport, which is located approximately 10.5 miles northeast of the proposed Palooka Substation. 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 the Federal Aviation Administration and the Pennsylvania Department of Transportation, Bureau of Aviation.

Conserved Lands

The proposed Project will not affect any state lands, national parks, state parks, local parks, recreational areas or natural landmarks. None of these features are located within the Project area. The Crystal Lake Tract of the Pinchot State Forest is a Conserved Land to the south and

west of the proposed Project. State Game Lands #292 is located to the northeast of the Project, across Laurel Run Road. Neither of these properties will be affected by the proposed Project.

Cultural Resources

PPL Electric is in the initial stage of coordination with the Pennsylvania Historical and Museum Commission ("PHMC") for the construction of the new 230 kV connecting lines. This coordination will be required for the permits necessary to construct the Project and will be conducted in the near future. PPL Electric will perform any reviews and field survey/sampling work required by the PHMC to avoid, minimize, and mitigate impacts to archaeological or historic architectural resources that may be located within the Project area.

3.0 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

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

Soils

Erosion and Sedimentation ("E&S") 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 proposed 230 kV connecting lines will not span any waterways. However, the Project is located in close proximity to the Pine Creek watershed. Pine Creek has a PADEP Chapter 93 Designated Stream Classification of Cold Water Fishes ("CWF") – Migratory Fishes ("MF"), which is not an anti-degradation special protection classification water. Pine Creek is also designated by the Pennsylvania Fish and Boat Commission ("PFBC") as a Wild Trout (Natural Reproduction) Stream. The proposed 230 kV connecting lines will not span Pine Creek; however, an E&S control plan will be developed to address stormwater control in this watershed. As such, impacts to the Pine Creek watershed, if any, are anticipated to be minimal.

Wetlands

Based on review of the U.S. Fish and Wildlife Service's ("USFWS") National Wetlands Inventory ("NWI"), the proposed 230 kV connecting lines will not cross any wetland systems. 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 will be delineated, surveyed, and illustrated according to regulatory standards. This information will be used to minimize wetland impacts where feasible. PPL Electric will avoid impacts to wetlands where possible by aerially spanning these features.

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 proposed 230 kV connecting lines will not be located within or span over any FEMA 100-year floodplains along the alignment.

Vegetation

Vegetative cover in the Project area consists of a dense deciduous forest. An existing cleared right-of-way for the Susquehanna-Jenkins and Susquehanna-Acahela 230 kV Transmission Lines, which occupy common double-circuit tower structures in this area, runs through the Project area. Forested areas to the south and west have been preserved through the Commonwealth as the Crystal Lake Tract of the Pinchot State Forest. Low-density residential development runs along the northeast, adjacent to Laurel Run Road.

Although the existing right-of-way for the Susquehanna-Jenkins and Susquehanna-Acahela 230 kV Transmission Lines has previously been cleared of vegetation, vegetation management will be required at the Palooka Substation property in order to construct the new substation and double-circuit 230 kV connecting lines. In areas where vegetation management is required, PPL Electric will apply its "*Specifications for Transmission Vegetation Management LA-79827*" to minimize any potential impacts.

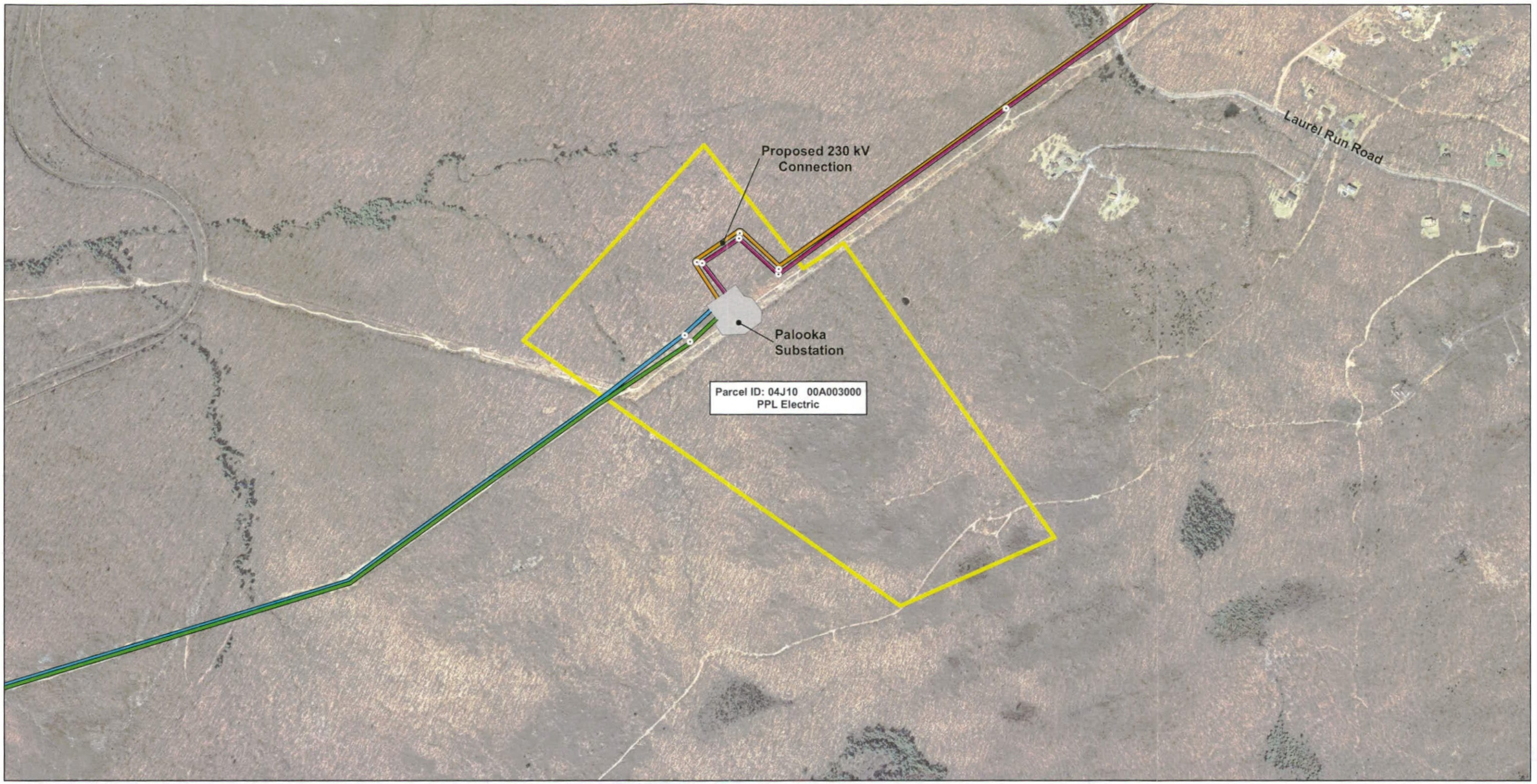
Threatened and Endangered Species

Review of the threatened and endangered species that may be encountered within the Project area includes evaluation of the Project related responses provided by federal and state agencies that have protective jurisdiction over the surrounding animals, plants, and ecological communities.

An on-line Pennsylvania Natural Diversity Inventory ("PNDI") Project Environmental Review was performed for the Project that evaluates the databases of the USFWS, PFBC, Pennsylvania Game Commission ("PGC"), and the Pennsylvania Department of Conservation and Natural Resources ("DCNR"). The PNDI concluded that no species of concern under the jurisdiction of the USFWS, PFBC, PGC, or DCNR are located in the vicinity of the Project.

PPL Electric will continue to consult with the jurisdictional agencies regarding potential impacts to protected species. PPL Electric will obtain all approvals and permits necessary for the construction of the Project, and will comply with any conditions placed on those permits.

FIGURE



Legend

- New Transmission Structures
- Palooka - Acahela 230 kV Transmission Line
- Palooka - Jenkins 230 kV Transmission Line
- Susquehanna - Palooka #1 230 kV Transmission Line
- Susquehanna - Palooka #2 230 kV Transmission Line
- Parcel Boundary

Notes

1. Existing Transmission Lines were digitized using aerial imagery with the KMZ received from PPL in February 2014 as a guide.
2. Parcel boundary surveyed by PPL was provided in July 2016.
3. Palooka Substation footprint and 230 kV connecting lines provided by POWER engineering in July 2017.

NAD 1983 State Plane
Pennsylvania North FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

References:
Imagery Basemap (ESRI)

0 750 1,500 Feet

1 inch = 750 feet

AECOM

Figure 3-1: Aerial Map of the Project
Palooka Substation 230 kV Extension

Bear Creek Township,
Luzerne County, Pennsylvania

PPL Electric Utilities
Allentown, Pennsylvania

Prepared By: NAB	Checked By: DY
Job: 60414821	Date: 11/27/2017

Document Path: S:\Projects\IMS\PPL\SUGARNOTCH\Phase11\Figure 3-1 Palooka Substation.mxd

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1.0 DESIGN CONSIDERATIONS

PPL Electric's new and rebuilt transmission lines 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 are designed to maintain public safety. PPL Electric's transmission line design standards meet or surpass the NESC clearances and loading requirements.

For example, the NESC specifies strength and loading rules based on three different "grades of construction" for conductors and supporting structures:

- Grade B – This grade of construction provides the highest margin of safety and is required when the pole supports spans that cross limited access highways, railroads, and waterways.
- Grade C – This grade of construction is most common and provides a basic margin of safety. It is often utilized for the typical power and joint-use distribution pole.
- Grade N – This is the lowest grade of construction and is most often used for emergency and temporary construction.

PPL Electric designs all of its transmission lines for Grade B construction. The use of Grade B design and construction translates to higher levels of structural reliability and safety to withstand the environmental conditions of ice and/or wind loading, which provides a higher margin of safety.

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 Electric's transmission lines are designed to exceed NESC requirements by accounting for additional load cases due to various ice and wind loading conditions not required by NESC. This means that PPL Electric lines are designed to operate safely and reliably during extreme inclement weather. In addition, where practicable, PPL Electric transmission lines are designed with more clearance to the ground than required by the NESC. The tables below compare PPL Electric's general conductor to ground design and the NESC minimum ground clearances for lines of various voltages.

TABLE 4-1: 69 kV Vertical Clearance to Ground

Surface Underneath Conductors	NESC Standard Clearance	PPL Conductor Clearances
Roads, streets, alleys	19.2 Ft.	30 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	19.2 Ft.	30 Ft.
Spaces accessible to pedestrians only	15.2 Ft.	30 Ft.
Railroad tracks	27.2 Ft.	31.5 Ft.

TABLE 4-2: 138 kV Vertical Clearance to Ground

Surface Underneath Conductors	NESC Standard Clearance	PPL Conductor Clearances
Roads, streets, alleys	20.6 Ft.	31 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	20.6 Ft.	31 Ft.
Spaces accessible to pedestrians only	16.6 Ft.	31 Ft.
Railroad tracks	28.6 Ft.	35 Ft.

TABLE 4-3: 230 kV Vertical Clearance to Ground

Surface Underneath Conductors	NESC Standard Clearance	PPL Conductor Clearances
Roads, streets, alleys	22.4 Ft.	33 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	22.4 Ft.	33 Ft.
Spaces accessible to pedestrians only	18.4 Ft.	33 Ft.
Railroad tracks	30.4 Ft.	35 Ft.

TABLE 4-4: 500 kV Vertical Clearance to Ground

Surface Underneath Conductors	NESC Standard Clearance	PPL Conductor Clearances
Roads, streets, alleys	28.4 Ft.	40 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	28.4 Ft.	40 Ft.
Spaces accessible to pedestrians only	24.4 Ft.	40 Ft.
Railroad tracks	36.4 Ft.	53 Ft.

A relay protection system is also used on PPL Electric's transmission lines to protect the public safety, as well as the equipment on 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. Helicopter patrols are performed on all lines on a predetermined frequency, depending on voltage level. The two-man helicopter crew

flies parallel 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 both public and employee safety, and follows or exceeds all codes and requirements. The following are a few, but not all, of the PPL Electric safety rules that demonstrate the Company's dedication to 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 higher than the required minimum NESC ground clearance and reverse phasing of new double circuit lines where it is feasible to do so at low or no cost. The implementation of additional modifications to reduce magnetic field levels, are considered, provided those modifications can be made at low or no cost and will not interfere with the operation of the line.

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: Jason Sharp, Acting Chief Counsel

PA Historical and Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building
400 North Street, 2nd Floor
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

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

PA Fish and Boat Commission
595 E. Rolling Ridge Drive
Bellefonte, PA 16823-9620
Attn: Christopher A. Urban

U.S. Army Corps of Engineers
Baltimore District
City Crescent Building
10 South Howard Street
Baltimore, MD 21201
Attn: Planning Division

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

Luzerne County Conservation District
325 Smiths Pond Road
Shavertown, PA 18708

Luzerne County Planning Commission
Penn Place
20 N. Pennsylvania Avenue
Wilkes-Barre, PA 18711

Bear Creek Township
Board of Supervisors
3333 Bear Creek Boulevard
Bear Creek Township, PA 18702
Attn: Gary M. Zingaretti

Date: December 12, 2017

Christopher T. Wright

First Class Mail

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To: Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor North
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