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November 24, 2021

VIA ELECTRONIC FILING

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 Of The Rebuild Of The Double-Circuit Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines Connecting The Manor 230-69 kV Substation And The Millwood 230-69 kV Substation In Conestoga Township, Manor Township, And Pequea Township, Lancaster County, Pennsylvania
Docket No. A-2021

Dear Secretary Chiavetta:

Attached for filing is the Letter of Notification of PPL Electric Utilities Corporation in the above-referenced proceeding. 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. Construction of the project contemplated by this Letter of Notification is scheduled to begin in May 2023 with an anticipated in-service date of December 2023.

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

The associated $350.00 filing fee has been paid by Post & Schell, P.C. as of the time of filing.

Respectfully submitted,

Garrett P. Lent

GPL/dmc
Attachments

cc: Renardo Hicks, Esquire
Paul T. Diskin
Jordan Van Order
Certificate of Service

CERTIFICATE OF SERVICE

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

VIA CERTIFIED MAIL: RETURN RECEIPT REQUESTED

Pennsylvania Bureau of Investigation and Enforcement
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
2nd Floor, Room-N201
Harrisburg, Pennsylvania 17120
Attn: Richard Kanaskie

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

Pennsylvania Department of Transportation
Keystone Building
400 North Street, Fifth Floor
Harrisburg, Pennsylvania 17120
Attn: Jason D. Sharp, Chief Counsel

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

Pennsylvania Department of Conservation and Natural Resources
Rachel Carson State Office Building
400 Market Street
Harrisburg, Pennsylvania 17105-8767
Attn: Rebecca Bowen, Ecological Services Section Chief

Pennsylvania Game Commission
2001 Elmerton Avenue
Harrisburg, Pennsylvania 17110-9797
Attn: Peter Sussenbach, Director, Bureau of Wildlife Habitat Management

Pennsylvania Fish and Boat Commission
450 Robinson Lane
Bellefonte, Pennsylvania 16823-9620
Attn: Christopher A. Urban, Chief, Natural Diversity Section

Pennsylvania Office of Consumer Advocate
555 Walnut Street
5th Floor Forum Place
Harrisburg, Pennsylvania 17101-1923
Attn: Christine M. Hoover

Pennsylvania Office of Small Business Advocate
555 Walnut Street
1st Floor Forum Place
Harrisburg, Pennsylvania 17101
Attn: Steven C. Gray

U.S. Army Corps of Engineers
Baltimore District Corporate Communication Office
2 Hopkins Plaza
Baltimore, Maryland 21201
Attn: Planning Division

U.S. Fish and Wildlife Service
Pennsylvania Field Office
110 Radnor Rd, Suite 101
State College, Pennsylvania 16801
Attn: Lesa Lindsay

Lancaster County Conservation District
1383 Arcadia Road, Room 200
Lancaster, Pennsylvania 17601
ATTN: Christopher Thompson, District Manager

Lancaster County Planning Commission
150 North Queen Street, Suite #320
Lancaster, Pennsylvania 17603
ATTN: Alice Yoder, Chairperson

Conestoga Township
3959 Main Street
Conestoga, Pennsylvania 17516
ATTN: William Rankin, Supervisor

Manor Township
950 West Fairway Drive
Lancaster, Pennsylvania 17603
ATTN: J. Ryan Strohecker, Township Manager

Pequea Township
1028 Millwood Road
Willow Street, Pennsylvania 17584
ATTN: Henry D. Lehman, Chairperson

Richard J. Abbiati
506 Waverly Road
Wyckoff, NJ 07481-1229

Adnan Brkic And Maria F. Kuzio
20 Buck Run Road
Conestoga, Pa 17516-9578

Brian W. And Amelia L. Burton
30 Grandview Lane
Conestoga, PA 17516-9686

Donald L. And Christine A. Connelly
90 Buck Run Road
Conestoga, PA 17516-9578

George K. And Amanda M. Gesner
22 Grandview Lane
Conestoga, PA 17516-9686

Richard D. And Rose A. Kendig
1055 Stone Hill Road
Conestoga, PA 17516-9652

Erik M. And Tracy S. Lagaza
28 Crestview Drive
Akron, PA 17501-1108

Steven Orpnech And Alexis H. Le
28 Grandview Lane
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James N. Reiff And Allison S. Kapalka
42 Buck Run Road
Conestoga, PA 17516-9578

George A. Bard
121 Shenks Ferry Road
Conestoga, PA 17516-9403

Gary D. And Fay A. Broderick
110 Shenks Ferry Road
Conestoga, PA 17516-9403

Michael S. And Wanda J. Connelly
88 Buck Run Road
Conestoga, PA 17516-9578

Christian L. And Annie G. Fisher
6580 River Road
Conestoga, PA 17516-9596

Donald E. And Rae Ann M. Henry
26 Buck Run Road
Conestoga, PA 17516-9578

Brian D. And Vicki R. Knisely
6664 River Road
Conestoga, PA 17516-9749

Jolinda A. Murillo And Jose Santiago
6612 River Road
Conestoga, PA 17516-9749

Scott M. And Judy A. Phillips
18 Grandview Land
Conestoga, PA 17516-9686

James D. Schwebel
120 Corry Avenue
Lancaster, PA 17601-3934

Amtrak
c/o Jonathan Devries
30th Street Station
2955 Market Street, Box 64
Philadelphia, PA 19104

Paul H. And Brenda Souders
72 Shenks Ferry Road
Conestoga, PA 17516-9404

Safe Harbor Water Power Company
C/O Paul Brenton
200 Donald Lynch Boulevard, Suite 300
Marlborough, MA 01752

Date: November 24, 2021

Garrett P. Lent

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 Of The Rebuild Of The Double-Circuit Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines Connecting The Manor 230-69 kV Substation And The Millwood 230-69 kV Substation In Conestoga Township, Manor Township, And Pequea Township, Lancaster County, Pennsylvania	:	Docket No. A-2021-_____

LETTER OF NOTIFICATION

TO THE PENNSYLVANIA PUBLIC UTILITY COMMISSION:

PPL Electric Utilities Corporation ("PPL Electric") hereby files this Letter of Notification pursuant to Section 57.72(d)(1)(i) of the Pennsylvania Public Utility Commission's ("Commission") regulations, 52 Pa. Code § 57.72(d)(1)(i), to rebuild the existing double-circuit Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines connecting the Manor 230-69 kV Substation ("Manor Substation") and the Millwood 230-69 kV Substation ("Millwood Substation") in Conestoga Township, Manor Township, and Pequea Township, Lancaster County, Pennsylvania (collectively the "Manor-Millwood Project," the "Lines" or the "Project").

The proposed Project will address reliability, asset health and safety concerns related to the deteriorated condition of the COR-TEN® lattice towners of PPL Electric's existing Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines. The Project contemplates the replacement and rebuilding of these existing COR-TEN® lattice towers to address structural reliability concerns associated with the experience of "pack-out rust" in many of the joints of the

subject lattice towers. The experience of "pack-out rust" in the joints of the subject towers has accelerated asset health concerns and accelerated the rate at which the subject towers were expected to reach end-of-life.

This project will be constructed in Conestoga Township, Manor Township, and Pequea Township, all in Lancaster County, Pennsylvania. PPL Electric has provided information regarding this Project to all identified political subdivisions, and none of them have objected to the Project. Construction of the Project will commence upon the Commission's approval of this filing, with an estimated construction start date of May 2023 with an anticipated in-service date of December 2023. 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 as follows:

PPL Electric Utilities Corporation
Two North Ninth Street
Allentown, Pennsylvania 18101

3. PPL Electric's attorneys are:

Michael J. Shafer (I.D. # 205681)
PPL Services Corporation
Two North Ninth Street
Allentown, PA 18101
Voice: 610-774-2599
Fax: 610-774-4102
E-mail: mjshafer@pplweb.com

David B. MacGregor (I.D. # 28804)
Garrett P. Lent (I.D. #321566)
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: glent@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 kV (kilovolts) or higher, approximately 375 substations with a capacity of 10 MVA (megavolt amperes) or more, and approximately 43,000 miles of distribution lines operating at less than 69 kV.

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

- Attachment 1 Necessity Statement.
- Attachment 2 Engineering Description.
- Attachment 3 Description of Right-of-Way.
- Attachment 4 PPL Electric Design Criteria and Safety Practices.
- Attachment 5 Landowners And Agencies List

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

II. THE PROJECT

A. NEED FOR THE PROJECT

8. PPL Electric has a responsibility to provide transmission assets and maintain them in a manner that is safe, reliable, and resilient to meet the needs of the electric system and the service expectations of its customers. To meet this duty, PPL Electric applies its transmission asset management planning procedure, which includes system performance and condition assessments. These performance and condition assessments identify system needs and prioritize projects based on several variables such as equipment age, condition, maintenance schedule, and impact on system reliability and performance to ensure a reliable electric grid and reasonable service to its customers.

9. As explained in greater detail below and in the Necessity Statement, this Project is necessary to resolve significant asset health condition concerns across the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines associated with the presence of pack-out rust in the existing COR-TEN® steel lattice towers and thereby resolve service reliability and safety risks associated with the potential failure of these structures.

10. The Project as proposed addresses these concerns in a cost-efficient manner, as compared to either a replacement alternative or a remediation and later replacement alternative. In particular, the Project as proposed avoids the substantial uncertainties surrounding potential remediation of the existing COR-TEN® steel lattice towers, avoids redundant inspection and/or additional remediation of these structures, and is the lowest cost alternative. Therefore, and for the reasons more fully explained below, the Commission should approve the Project as proposed.

1. Existing System

11. The Manor Substation and Millwood Substation are connected by the double-circuit Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines. This transmission line system is approximately 5.2 miles long and is supported by 28 COR-TEN® lattice structures. These towers are designed for double-circuit 230 kV operation, but currently one circuit is being operated at 69 kV.[1] The Manor-Millwood 230 kV Transmission Line is one of the circuits on these towers, and the Face Rock-Millwood 69 kV Transmission Line is the other.

12. The double-circuit Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines are in PPL Electric's Lancaster Region and are part of a larger 230 kV transmission network that connects generation in this region to load throughout PPL Electric and the rest of PJM's footprint. This 230 kV network includes the Brunner Island-West Hempfield 230 kV, Brunner Island-South Manheim 230 kV, Millwood-South Akron 230 kV, and South Akron-South Manheim 230 kV Transmission Lines, which all support bulk power flow and feed various 230-69 kV substations in the Lancaster-Harrisburg Regions.

13. This existing transmission line is approximately 5.2 miles long and is supported by 28[2] COR-TEN® double-circuit steel lattice structures.

2. Definition of the Problem

14. The existing # Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines are comprised of 28 weathering-steel COR-TEN® lattice structures spanning approximately 5.2 miles, which were originally constructed in the late 1960s. COR-TEN® lattice towers were

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[1] *See* Attachment 1 – Necessity Statement at 1, fn.2 (providing a detailed description of the current design and operation of the subject transmission lines, and of the proposed design and operation of the subject transmission lines associated with the Project).

[2] As noted in Attachment 2 – Engineering Description, 2 additional existing monopole structures will be rebuilt to accommodate the new ACSS conductor being installed for the Project and the topographic constraints that exist around the Millwood Substation.

commonly installed by the industry during this time because it was believed that the corrosion-resistant properties of weathering-steel would reduce future maintenance needs/costs. These towers had an expected service life of approximately 75 years at the time they were installed.

15. However, in 2013, PPL Electric hired a third-party contractor to perform an assessment of its 230 kV transmission lines under a steel structure capital maintenance program. The assessment identified that 126 of 131 surveyed structures (96%) had one or more structure legs rated Condition C (poor) or Condition D (very poor). Of those 126 structures, 25 had one or more structure legs that were identified as "priority," requiring immediate attention. In order to extend the life of the asset and ensure no failures at the ground line, the 25 structures identified as "priority" received maintenance repairs in 2014, which included post leg, diagonal and base shoe repairs. Protective coating was applied to the remaining 101 COR-TEN® structures that rated Condition C or D but were not identified as "priority." However, these remaining structures face constant asset health concerns due to the presence of pack-out rust.

16. The asset health concerns discovered by the 2013 assessment were heightened by the discovery of pack-out rust in the section joints of the subject COR-TEN® lattice towers. As explained in further detail in Attachment 1 – Necessity Statement, when the presence of pack-out rust becomes too severe, it can deform steel members and connecting hardware. Pack-out rust can also shear off bolts, cause loss of structural integrity, cause members to disconnect from the tower, and even result in tower failure. This now well-known inherent problem with COR-TEN® steel is also being seen in other infrastructure where two pieces of COR-TEN® Steel overlap at joints, such as those present on lattice towers[3] and other steel structures such as steel bridges.

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[3] *See, e.g., Application of Virginia Electric and Power Company d/b/a Dominion Virginia Power For approval and certification of Carson-Rogers Road 500 kV Transmission Line Rebuild under Va. Code § 56-46.1 and the Utility Facilities Act, Va. Code § 56-265.1 et seq.*, Va. SCC Case No. PUE-2016-00078, at pp. 2-3, 9-10 (Hearing Examiner Report dated March 10, 2017) ; *Application of Virginia Electric and Power Company For approval and*

17. PPL Electric further verified the results of the 2013 assessment by contracting with several independent, non-affiliated inspection companies to conduct evaluations of COR-TEN® lattice towers to determine the overall condition of these towers on the PPL Electric Transmission System in 2019. The 2019 evaluations included inspection of 15 randomly selected COR-TEN® lattice towers across the PPL Electric Transmission System by three separate contractors.[4] Review of the three contractor reports revealed that over 90% of the joints at each structure exhibited visible pack-out in the connections. In addition, the review revealed that pack-out and section-loss was most prominent on the lower portions of the towers where there was higher likelihood of moisture build up.

18. Based on the prevalence of the observed deterioration, PPL Electric determined a more thorough and strategic evaluation was required to determine the full extent of the negative asset health impacts associated with COR-TEN® lattice towers. In early 2020, PPL Electric initiated a second more robust evaluation of the COR-TEN® lattice towers to determine the full extent of the deterioration on the transmission system. The details of this analysis are more fully detailed in Attachment 1 – Necessity Statement.

19. The results of the 2020 inspection program again confirmed the severity of deterioration identified during the 2019 inspection program, as follows:

- Over 90% of the joints showed visible pack-out in the connections, which is anticipated to worsen over time.
- The protective patina needed to protect the steel from corrosion did not properly develop at numerous members resulting in section-loss across the entire structure.

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certification of Cunningham-Dooms 500kV Transmission Line Rebuild under Va. Code § 56-46.1 and the Utility Facilities Act, Va. Code § 56-265.1 et seq., Va. SCC Case No. PUE-2016-00020, at pp. 3-4 (Response of Dominion Virginia Power to Staff's Supplemental Filing of March 30, 2017, filed April 13, 2017) (discussing the problems associated with "pack-out" rust on another utility's COR-TEN® lattice tower structures).

[4] Each contractor was asked to inspect 5 structures and prepare an engineering analysis of their condition, proposed remediation approach and estimated costs to remediate the identified structural defects.

- Pack-out damage was typically more prevalent on lower sections of the tower except for some specific attachment points where severe pack-out was observed on higher sections.

- Structural damage was found on several members from pack-out that ruptured bolts and split/deformed members.

20. Finally, in February 2021, PPL Electric contracted RTR Energy Solutions, Inc. ("RTR") to perform a condition assessment of on the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines. The details of the RTR February 2021 Assessment are set forth in Attachment 1 – Necessity Statement. Importantly, half of the 28 structures received a "Severe" condition rating, with significant amounts of pack rust present, visibly bending the flat edge of the joint that was originally bolted. None of the structures received a "Mild" rating. The majority of pack rust observed on each structure was found in the lower sections of the post leg where horizontal and diagonal members are bolted to the post leg. This assessment shows that the asset health conditions observed in the system-wide assessment are being exhibited on the specific structures targeted for replacement by the Project.

21. Based on the results of the inspection programs described above, it is clear that the issue with COR-TEN® lattice towers has accelerated the deterioration of these structures and has brought the assets to the end of their service life much sooner than would have been anticipated. At roughly 50 years of age, the COR-TEN® lattice towers that comprise the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines have exceeded their useful life and can no longer be relied upon to safely operate as designed.

22. Furthermore, these asset health concerns are particularly important as the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines are critical components of PPL Electric's Bulk Transmission System and are required to serve local load to several critical customer facilities.

23. If the Manor-Millwood 230 kV Transmission Line was to fail and the South Akron – Lauschtown #3 & #4 Transmission Lines were to fail, it will put will overload the Brunner Island – South Manheim 230 kV Transmission Line to 100.2% of the Summer Emergency. Furthermore, if the Manor-Millwood 230 kV Transmission Line was to fail and the South Akron – Millwood 230 kV Transmission Line were to fail, the South Akron and Millwood Substations would experience voltage magnitude violations (less than 0.92 PU).

24. Furthermore, as the topic of severe weather patterns becomes increasingly relevant, there is a need to take into consideration how changing weather patterns will impact the reliability of the existing COR-TEN® lattice structures. Over the last 20 years, PPL Electric has seen a trend of increasing storms per year within the PPL Electric service territory. With each storm comes more exposure to extreme precipitation and wind events. If a tower is structurally compromised due to COR-TEN® pack-out and section loss, that wind event creates an increased risk of structural failure. With projected increases of more frequent and intense heat waves over the next century in the Northeast, the occurrence of more severe wind and precipitation events is expected to rise as well. This is evident in the storms associated with Hurricane Ida that hit the Northeast recently, as a storm of that strength would have been rare decades ago. Due to drastic weather pattern changes, it is imperative to re-evaluate the COR-TEN® structures in the safest and most reliable way to protect against the pack rust issue in the joints of the structures and guard the transmission system from catastrophic failures of COR-TEN® towers.

25. At the October 2020 PJM TEAC meeting,[5] PPL Electric presented its plan to address COR-TEN® needs on the 230 kV system. As part of this plan, PPL Electric also shared the need with PJM stakeholders to address COR-TEN® towers on the Manor-Millwood 230

[5] Refer to slides at https://www.pjm.com/~/media/committees-groups/committees/teac/2020/20201006/20201006-item-09-ppl-supplemental.ashx

kV/Face Rock-Millwood 69 kV Transmission Lines (need # PPL-2020-0003). The need # PPL-2020-0003 will be addressed by the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines rebuild under supplemental project s2365, which will be completed at an estimated cost of $14.5 Million.

B. THE PROPOSED PROJECT

26. In order to resolve the identified COR-TEN® lattice tower health condition, PPL Electric proposes to rebuild the existing Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines. All the COR-TEN® lattice structures as well as the conductors at the 28 locations will be replaced.

27. The Project will involve re-arrangement of the Face Rock-Millwood 69 kV Transmission Line resulting in the removal of the 69 kV line from the section extending from the Manor Substation to Structure 8 (38696-S-21653).[6] This section will initially operate as a single-circuit 230 kV line but is designed to operate as a double-circuit 230 kV line. The Face Rock-Millwood 69 kV Transmission Line will remain as the second circuit from Structure 9 (38761-S-21669) to the Millwood Substation. This section will be rebuilt as a double-circuit 230 kV line with the second circuit operating at 69 kV voltage.

28. The proposed Project will address the asset health needs associated with COR-TEN® lattice tower replacement, as well as improve overall reliability, safety, and system resiliency. It will also address the above-identified reliability needs. With respect to the COR-TEN® asset health condition, the Project will immediately and fully resolve the deteriorated condition of the existing structures on a long-term basis by removing the existing COR-TEN® lattice towers and replacing them with steel monopoles. By rebuilding these structures, PPL

[6] *See* footnote 1 *supra* (citing Attachment 1 – Necessity Statement at 1, fn.2.

Electric will resolve the existing COR-TEN® issue and avoid the possibility of the issue worsening and/or recurring with respect to these structures and developing into both a reliability and public safety issue.

29. Importantly, as explained in Attachment 1 – Necessity Statement, the Project as proposed also avoids the additional costs and uncertainties surrounding the alternative remediation solution contemplated PPL Electric. As noted therein, PPL Electric evaluated and rejected the remediation alternative because it carries substantial uncertainties regarding its immediate and long-term effectiveness to address the subject COR-TEN® lattice lowers. There are few, if any, other examples of fully remediating substantially deteriorated COR-TEN® towers which PPL Electric could review to benchmark the effectiveness of this alternative against. Although remediation could potentially extend the life of the structures, it would, at a minimum, require that the remediation work be re-evaluated and potentially repeated every ten years after the initial remediation. In addition, the initial cost of remediation could be substantially greater than anticipated, and the cost of repeated remediation would result in additional O&M expense. The Project as proposed avoids these additional costs and uncertainties and proposes to rebuild the transmission lines in a cost-efficient manner to ensure the continued provision of safe and reliable service.

30. The approximate total cost of the entire Project is approximately $14.5 million. On a total cost of service basis, the Proposed Solution is approximately 87% of the cost of Alternative 1 (i.e., replacing the existing structures) on a 45-year basis and 88% of the cost of Alternative 1 on 75-year basis. In addition, on a total cost of service basis, the Proposed Solution is approximately 91% of the cost of Alternative 2 (i.e., remediating the existing structures) on a 45-year basis and 57% of the cost of Alternative 1 on 75-year basis.

III. HEALTH AND SAFETY

31. The proposed lines will not create any unreasonable risk of danger to public health or safety. The proposed lines 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 the NESC standards, PPL Electric's design criteria, and PPL Electric's safety practices are provided in Attachment 4 to this Letter of Notification.

32. Attachment 4 accompanying this Letter of Notification also explains PPL Electric's standards for Magnetic Field Management. Ground clearances for the proposed Project will be increased between approximately 3.0 and 7.0 feet higher than those required by the NESC standard in order to reduce the magnetic field exposure. The proposed rebuild of the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines will continue to allow for double-circuit operation, which will allow for reverse phasing. A reduction in magnetic field exposure is anticipated due to the higher ground clearances and reverse phasing.

IV. DESCRIPTION OF THE RIGHT-OF-WAY

33. The existing Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines are located in a corridor consisting of an approximately 275-foot-wide existing right-of-way ("ROW"). The Project will be constructed entirely within PPL Electric's existing fee-owned properties and transmission ROW, varying in width from 130 feet to 275 feet wide, or on PPL Electric's Manor and Millwood Substation properties. *See* 52 Pa. Code § 57.72(d)(1)(i). In addition, the facilities associated with the Project will be constructed upon the same structure alignment as the existing facilities. PPL Electric does not require any additional ROW for the

construction of the Project. An aerial map is provided at the end of Attachment 3 to this Letter of Notification, which depicts the proposed line and associated structures.

34. New structures will be located in close proximity to existing structures where it is reasonably practical to do so. Where structures will be relocated, PPL Electric will discuss the proposed structure locations with the respective property owners. Because the new pole locations are generally similar to the original locations, PPL Electric does not anticipate any objections. Further, the Project will involve the same number of poles that currently comprise the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines.

35. As explained in Attachment 2, the existing COR-TEN® lattice tower structures range in height from between approximately 115 and 160 feet with an average structure height of approximately 133 feet and the single-circuit monopoles range in height from between approximately 135 and 145 feet with an average structure height of approximately 140 feet. The proposed double-circuit monopole structures to replace the 28 COR-TEN® lattice towers will range in height between approximately 115 and 165 feet with an average structure height of approximately 131 feet. The proposed single-circuit monopoles will range in height between approximately 140 and 145 feet with an average structure height of approximately 142.5 feet.

36. Two aerial plot plans are provided at the end of Attachment 1 to this Letter of Notification. Figure 1-1 depicts the location of the existing transmission facilities associated with this Project. Figure 1-2 depicts the location of the proposed transmission facilities associated with this Project.

V. LAND USE AND ENVIRONMENTAL EVALUATION

37. As explained above, construction of the proposed Project will take place entirely within existing rights-of-way. Therefore, it is anticipated that the proposed Manor-Millwood Project will have minimal incremental impacts on land use in the area.

38. PPL Electric will use and update previously established access roads for construction to the extent practical to further reduce interference with existing uses and minimize land use impacts. A detailed description of the route of each individual component of the Project can be found in Attachment 3.

39. The Project will not affect any state lands, national parks, local parks, recreational areas or natural landmarks because none of these features are located within the Project Area. Conestoga River Park is located approximately 0.2 miles north of the Manor Substation on the west side of the Conestoga River and Safe Harbor Park is located approximately 0.4 miles northeast of the Manor Substation on the east side of the Conestoga River. Silver Mine Park is located approximately 0.2 miles southeast of the Project where it spans Goods Road and Silver Mine Road. Apollo County Park is located approximately 1 mile west of the Project, on the west side of the Susquehanna River. The next closest conserved properties are State Game Lands #288 and Pequea Creek Recreational Center which are located approximately 0.6 miles south of the Project where it turns east at Structure 6. None of these properties will be affected.

40. PPL Electric conducted an online review of the Project Area and surrounding landscape through the Pennsylvania Historical and Museum Commission ("PHMC") Cultural Resources Geographic Information System ("GIS") site for this area. As described in Attachment 3, several State Historic Preservation Office ("SHPO") listed or eligible properties were found within or close to the Project Area.

41. PPL Electric is in the initial stage of coordination with the PHMC for the modifications being made to the transmission lines. PPL Electric does not anticipate any impacts to these SHPO eligible or listed properties or any other PHMC related properties. 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.

42. No railroads, communications towers or pipelines will be affected by the Project. The Project parallels an existing transmission line within a wide portion of the ROW beginning at Structure 2, located south of the Conestoga River and Amtrak managed Conestoga Substation, and continues for approximately 0.69 miles in a southeast direction to Structure 6. The Project crosses an existing PPL Electric transmission line between Structures 8 and 9. The Project also crosses an existing natural gas pipeline (i.e., the Atlantic Sunrise Pipeline) northeast of Hilltop Drive adjacent to Structure 20. An Amtrak railroad runs along the Susquehanna River approximately 0.13 miles southwest of the Project. Furthermore, PPL Electric does not anticipate any interference with airport operations. However, PPL Electric will comply with any applicable requirements of the Federal Aviation Administration and the Pennsylvania Department of Transportation, Bureau of Aviation.

43. No unique geological, scenic, or natural areas are located within the Project Area, according to the Pennsylvania Department of Conservation and Natural Resources ("PDCNR").

44. Erosion and Sedimentation ("E&S") control plans will be implemented for the Project to minimize the displacement of soils. These plans will require prior approval from the local county conservation districts, each of which will be served with this Letter of Notification. National Pollutant Discharge Elimination System ("NPDES") permits will also be required from

the Pennsylvania Department of Environmental Protection ("PADEP") as needed. During construction, PPL Electric will adhere to all conditions specified in the NPDES permit. Impacts to local soil resources are anticipated to be minimal.

45. The existing transmission lines span four National Hydrography Dataset waterways that will remain in place after the Project construction activities have occurred. The Conestoga River, a south flowing tributary to the Susquehanna River within the Lower Conestoga River Watershed (HUC-020503061107), is crossed by the Project south of the Manor Substation. The Conestoga River has a PADEP Chapter 93 Designated Use Stream Classification of Warm-Water Fishes (WWF), Migratory Fishes (MF). Three additional southeast flowing unnamed tributaries to Pequea Creek are crossed as the Project extends east to northeast along its route toward the Millwood Substation. These waterways are within the Climbers Run-Pequea Creek Watershed (HUC-020503061204) and all have PADEP Chapter 93 Designated Use Stream Classifications of WWF, MF. None of the crossed waterways have a Chapter 93 Existing Use Stream Classification or any special protection Pennsylvania Fish and Boat Commission ("PFBC") classifications. All the waterways are part of the Lower Susquehanna Watershed within the Susquehanna River Basin. An E&S control plan will be developed to address stormwater control in all watershed areas crossed by the Project. 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.

46. PPL Electric also reviewed the U.S. Fish and Wildlife Service's ("USFWS") National Wetlands Inventory ("NWI"). The Project crosses two Riverine (R2UBH) stream habitats, one Palustrine Forested (PFO1A) habitat, one Palustrine Scrub-Shrub (PSS1A) habitat, and two Palustrine Emergent (PEM1C and PEM5A) habitats. No impacts to these NWI features are anticipated by the proposed Project activities.

47. 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 any identified wetland impacts where feasible. Additionally, PPL Electric will avoid impacts to wetlands where possible by aerially spanning these features.

48. In addition, PPL Electric obtained the National Flood Hazard Layer ("NFHL") through the Pennsylvania Spatial Data Access ("PASDA") database and analyzed for 100-year floodplains within the Project Area and surrounding landscape. Based on review of this data, the Project spans the FEMA defined floodway and 100-year floodplain of the Conestoga River and the 100-year floodplain of one of the unnamed tributaries to Pequea Creek. No impacts to any floodplain areas are anticipated by the proposed Project activities.

49. Vegetative cover in the Project Area consists of woodlands, cleared wooded plots, and agricultural fields. The existing ROW areas for the transmission lines were previously cleared of woody vegetation, but some tree clearing is anticipated around work pads and along existing access roads. If vegetation management is required in this specific location, PPL Electric will apply its "Specifications for Transmission Vegetation Management LA-79827" to minimize potential impacts.

50. Based on review of the *Natural Areas Inventory of Lancaster County, Pennsylvania*, published by The Nature Conservancy in 1998, the Project is located within two Pennsylvania Natural Heritage Program identified natural areas: Safe Harbor Woods and Silver Mine Park. Safe Harbor Woods, a wooded habitat that supports potentially rare and threatened plant species, is located at the west end of the Project adjacent to the Manor Substation. Silver

Mine Park is located near the Millwood Substation and is an agricultural landscape that is underlain by limestone bedrock that supports rare cave invertebrates. The area also supports other potentially rare and threatened terrestrial species. Natural areas identified in these documents generally focus on sites that provide habitat conditions for threatened and endangered plant or animal species.

51. PPL Electric completed a Pennsylvania Natural Diversity Inventory ("PNDI") for the Project on November 16, 2020. The PNDI reviews evaluate the databases of the United States Fish and Wildlife Service ("USFWS"), Pennsylvania Fish and Boat Commission ("PFBC"), Pennsylvania Game Commission ("PGC"), and the PDCNR. The PGC reported potential impacts to the Peregrine Falcon (*Falco peregrinus*). The PFBC and USFWS require further review to resolve any potential impacts. PPL Electric will continue to consult the jurisdictional agencies regarding potential impacts to protected species, complete all required surveys, obtain all necessary approvals and permits for Project construction, and comply with all conditions placed on those permits.

VI. NOTICE

52. PPL Electric has reached out to residents located immediately adjacent to PPL Electric's fee owned parcels and owners of properties that are crossed by the Line. Copies of the Letter of Notification will be served upon landowners in accordance with 52 Pa. Code § 57.72(d)(3). A list of the landowners impacted by this project is provided in Attachment 5.

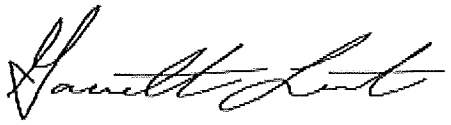
53. PPL Electric has provided information regarding the Project to representatives of Conestoga Township, Manor Township, and Pequea Township, all in Lancaster County, Pennsylvania. These entities have not objected to the proposed Project. Copies of this Letter of Notification will be served on the governmental agencies, municipalities, and other public entities

and organizations in accordance with 52 Pa. Code § 57.72(d)(3). A list of these entities and organizations is also provided in Attachment 5.

VII. CONCLUSION

WHEREFORE, PPL Electric Utilities Corporation respectfully requests that the Pennsylvania Public Utility Commission approve the proposed Manor-Millwood Project located in Conestoga Township, Manor Township, and Pequea Township, in Lancaster County, Pennsylvania that is explained above and in the Attachments hereto.

Respectfully submitted,



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Attachment 1

MANOR-MILLWOOD 230 kV COR-TEN® REBUILD PROJECT

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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 the existing double-circuit Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines connecting the Manor 230-69 kV Substation ("Manor Substation") and the Millwood 230-69 kV Substation ("Millwood Substation") in Lancaster County, Pennsylvania ("Project").[1]

The Project will involve re-arrangement of the Face Rock-Millwood 69 kV Transmission Line resulting in the removal of the 69 kV line from the section extending from the Manor Substation to Structure 8 (38696-S-21653).[2] This section will initially operate as a single-circuit 230 kV line but is designed to operate as a double-circuit 230 kV line. The Face Rock-Millwood 69 kV Transmission Line will remain as the second circuit from Structure 9 (38761-S-21669) to the Millwood Substation. This section will be rebuilt as a double-circuit 230 kV line with the second circuit operating at 69 kV voltage.

The Project is required to address reliability concerns related to the deteriorated condition of the COR-TEN® lattice towers on the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines. In addition, the Project is also required to comply with:

- The Consolidated Transmission Owners Agreement ("TOA") Rate Schedule - FERC No. 42 (FERC ER10-2713-000), which requires transmission systems to "[b]e kept in place and maintained in good operating condition in accordance with Good Utility Practice and principles, guidelines and standards of the applicable Regional Reliability Council and NERC."

[1] For a complete list of municipalities and counties crossed by the Project, please refer to the Letter of Notification, Attachment 5.

[2] The existing COR-TEN® transmission line is built for double circuit operation at 230 kV. One circuit is currently operated at 230 kV and the other circuit is currently operated at 69 kV. PPL Electric notes that approximately 1.3 miles from the Manor Substation, the existing configuration of the line has the 69k V circuit crossing under the 230 kV circuit, then looping around the Manor Substation to connect to the COR-TEN® towers supporting the 230 kV circuit. The Project will involve rebuilding this segment for double circuit 230 kV operation, and eliminate the need to add the second set of conductors on the 230 kV line for 1.3 miles. From the crossing point to the Millwood Substation, the transmission lines will be rebuilt for double circuit 230kV with one side operated at 69kV, which is the same design and operation that exists today.

The Project is necessary for PPL Electric to avoid violating its obligations under the TOA to maintain its transmission facilities in good operating condition and avoid public safety concerns caused by failed assets. The Project is one of several essential PPL Electric projects designed to address a system-wide concern related to the structural reliability of COR-TEN® lattice towers on its bulk transmission system. As explained below, the existence of "pack-out rust"[3] in many of the joints of the subject lattice towers diminishes structural integrity and increases the risk of system failures that could negatively impact public safety. The Project is necessary to avoid these risks, and it provides the best solution to immediately address the identified asset health issues on a long-term basis.

Moreover, in order for PPL Electric's transmission facilities to be considered in good operating condition, they must be maintained in a manner consistent with the standards of the North American Electric Reliability Corporation ("NERC"), Reliability First Corporation, and Good Utility Practice as defined by the TOA.

Subject to the Commission's approval, construction will begin in May 2023 to support an in-service date of December 2023. PPL Electric will continue to own, operate, and maintain the rebuilt 230 kV transmission lines. The total estimated cost of this Project, as described below, is approximately $14.5 million, and the cost for the Project will be paid by PPL Electric.[4]

2.0 BACKGROUND

PPL Electric has a responsibility to provide transmission assets and maintain them in an adequate, efficient, safe, reliable, and reasonable manner to meet the needs of the electric system and the expectations of its customers. To achieve this, PPL Electric applies its Transmission Asset Management Procedure as part of its system performance and condition assessment process.

[3] "Pack-out rust" or "pack rust" is a form of localized corrosion typical of steel components that develops a crevice into an open atmospheric environment, which results in rust packing between conjoined steel components. As described in Attachment 1, pack-out rust accelerates the deterioration of asset health and can result in shearing off bolts, loss of structural integrity, members disconnecting from lattice towers, and tower failure.

[4] The estimated cost was 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.

These performance and condition assessments identify system needs and prioritize projects based on several variables such as equipment age, condition, maintenance schedule, and impact on system reliability and asset performance to ensure a reliable electric grid and service to its customers.

The transmission system is the backbone of the electric grid. Failure to maintain the system in accordance with Good Utility Practice and reliability practices and standards can decrease overall transmission system reliability and increase the risk of customer outages.

3.0 TRANSMISSION SYSTEM PLANNING PROCESS

The nation's interconnected transmission system ("Transmission Grid") serves as the backbone for 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 critical that the Transmission Grid be planned and designed to ensure reliable electric service is provided under all loading conditions or when certain elements of the Transmission Grid are out of service (system contingencies) due to planned or unplanned outages.

Robust transmission planning enables the transmission system to supply electricity to all customer loads in a reliable and economical manner. This system planning process ensures that both the Bulk Electric System ("BES")[5] and non-Bulk Electric System (non-BES)[6] are planned and constructed so that:

- They can accommodate forecasted system flows during summer and winter peak load;
- They can adequately serve each customer's need regarding 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

[5] Includes transmission facilities operated at voltages of 100 kV or higher.
[6] Includes transmission facilities operated at voltages less than 100 kV.

- They are in conformance with 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 Pennsylvania. To ensure reliable transmission service, PJM prepares an annual Regional Transmission Expansion Plan ("RTEP")[7] to identify system reinforcements that are required to, among other things, meet the NERC Reliability Standards, PJM reliability planning criteria, and Transmission Owner reliability criteria.

PPL Electric's Transmission Asset Management Procedure involves identifying system needs and determining the best available solution to address those needs. This process includes asset evaluation, asset condition and system risk assessments, analysis of alternative solutions, and project initiation and scheduling. System needs are identified based on the overarching goals of reducing outage frequency and duration, improving system reliability, decreasing system maintenance cost, and maintaining operational flexibility to ensure safe and reliable electric service of the transmission system and to PPL Electric's customers.

When transmission owning utilities (including PPL Electric) set up PJM as an RTO, they agreed to bind themselves to maintaining their existing transmission systems using Good Utility Practice. The TOA is an agreement among (1) individual Transmission Owners operating within the PJM Region and (2) between the Transmission Owners and PJM. The TOA facilitates the planning and operation of the Transmission Grid within the PJM region and establishes the rights and responsibilities of each party to the TOA. Section 4.6 of the TOA requires that transmission systems "[b]e kept in place and maintained in good operating condition in accordance with Good

[7] 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.

Utility Practice and principles, guidelines and standards of the applicable Regional Reliability Council and NERC." The Project is required to fulfill PPL Electric's obligations under the TOA.

4.0 THE NEED FOR THE PROJECT

4.1 Existing System

The Manor Substation and Millwood Substation are connected by the double-circuit Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines. This transmission line system is approximately 5.2 miles long and is supported by 28 COR-TEN® lattice structures. These towers are designed for double-circuit 230 kV operation, but currently one circuit is being operated at 69 kV. The Manor-Millwood 230 kV Transmission Line is one of the circuits on these towers, and the Face Rock-Millwood 69 kV Transmission Line is the other.

The double-circuit Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines are in PPL Electric's Lancaster Region and are part of a larger 230 kV transmission network that connects generation in this region to load throughout PPL Electric and the rest of PJM's footprint. This 230 kV network includes the Brunner Island-West Hempfield 230 kV, Brunner Island-South Manheim 230 kV, Millwood-South Akron 230 kV, and South Akron-South Manheim 230 kV Transmission Lines, which all support bulk power flow and feed various 230-69 kV substations in the Lancaster-Harrisburg Regions.

A map of the existing system configuration is provided as Figure 1-1.

4.2 Project Need

This Project is needed to address asset health concerns that are being accelerated by increased incidences of pack-out rust associated with COR-TEN® lattice towers. The subject lattice towers had an expected service life of 75 years and were installed in the late 1960s. The subsequent discovery of increased incidences of pack-out rust associated with COR-TEN® lattice towers has accelerated the rate at which these towers were expected to reach end-of-life, and, in some cases, the towers have deteriorated and are continuing to deteriorate beyond the point where they can safely operate as designed and cannot be reasonably or cost effectively remediated.

4.2.1 Asset Health

There are approximately 236 circuit miles containing COR-TEN® lattice structures or approximately 1,284 structures across PPL Electric's Transmission System that it currently anticipates will need to be addressed in order to resolve asset health concerns similar to those identified below.[8]

Originally constructed in 1967, the existing Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines have 28 weathering-steel COR-TEN® lattice structures spanning approximately 5.2 miles. COR-TEN® lattice towers were commonly installed by the industry during this time because it was believed that the corrosion-resistant properties of weathering-steel would reduce future maintenance needs/costs.

In 2013, PPL Electric utilized a third party contractor to perform an assessment of the COR-TEN® lattice structures on its 230 kV transmission lines under a steel structure capital maintenance program. The program evaluated the ground-line of the steel structures, performing minor excavation around the base of the structure and assessing the condition of the steel, and then applying a protective coating to the exposed steel. No joints or members above the base of the structure were included in this assessment. The assessment identified that 126 of 131 COR-TEN® structures (96%) had one or more structure legs rated Condition C (poor) or Condition D (very poor). Of those 126 structures, 25 had one or more structure legs that were identified as "priority", requiring immediate attention. In order to extend the life of the asset and ensure no failures at the ground line, the 25 structures identified as "priority" received maintenance repairs in 2014, which included post leg, diagonal and base shoe repairs. Protective coating was applied to the remaining 101 COR-TEN® structures that rated Condition C or D but were not identified as "priority". However, these remaining structures face constant asset health concerns due to the presence of pack-out rust. Ongoing inspections conducted since 2014 have confirmed that these structures are continuing to degrade.

[8] PPL Electric anticipates that addressing the currently anticipated projects associated with the 230 kV system (approx. 1112 of the identified structures) will cost approximately $562 million in total. However, these estimates are preliminary in nature and subject to change. PPL Electric is also currently evaluating one other transmission line asset that includes 172 COR-TEN® lattice structures, but it has not yet developed a cost estimate for the remediation or replacement of these structures.

These asset health concerns were further heightened by the discovery of pack-out rust in the section joints of the COR-TEN® lattice towers. In particular, the protective surface coating of weathering steel that provides resistance to atmospheric corrosion, known as the patina, did not form properly on the structure joints and members due to moisture trapped between the joints. The trapped moisture prevented completion of the required wetting and drying cycle needed to form the patina. Over time, this has led to the formation of pack-out rust within the joints of connecting tower members and section-loss in the steel members and joints. When the pack rust becomes too severe, it can deform steel members and connecting hardware. It can shear off bolts, cause loss of structural integrity, cause members to disconnect from the tower, and even result in tower failure. PPL Electric is experiencing pack-out rust failures on its transmission line system, which are a leading indicator of ultimate structure failure as outlined above. Over the past few years, PPL Electric has encountered multiple instances of COR-TEN® tower members becoming detached, broken, and deformed/corroded to failure due to severe pack-out rust. Failures of this nature on a transmission tower create emergent safety and reliability concerns which must be proactively addressed.

This now well-known inherent problem with COR-TEN® steel is also being seen in other infrastructure where two pieces of COR-TEN® steel overlap at joints, such as those present on lattice towers[9] and other steel structures such as bridges. The presence of pack-out rust on COR-TEN® structures and its negative impacts on asset health have diminished the expected service life of these structures from 75 to 50 years. As these structures were installed approximately 50 years ago, they have effectively reached end-of-life.[10] No manufacturer's warranty currently exists for remediation of the COR-TEN® lattice towers. After a reasonable investigation, PPL Electric is not aware of whether a manufacturer's warranty was in existence at the time the structures were installed.

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[9] *See, e.g., Application of Virginia Electric and Power Company d/b/a Dominion Virginia Power For approval and certification of Carson-Rogers Road 500 kV Transmission Line Rebuild under Va. Code § 56-46.1 and the Utility Facilities Act, Va. Code § 56-265.1 et seq.*, Va. SCC Case No. PUE-2016-00078, at pp. 2-3, 9-10 (Hearing Examiner Report dated March 10, 2017) ; *Application of Virginia Electric and Power Company For approval and certification of Cunningham-Dooms 500kV Transmission Line Rebuild under Va. Code § 56-46.1 and the Utility Facilities Act, Va. Code § 56-265.1 et seq.*, Va. SCC Case No. PUE-2016-00020, at pp. 3-4 (Response of Dominion Virginia Power to Staff's Supplemental Filing of March 30, 2017, filed April 13, 2017) (discussing the problems associated with "pack-out rust" on another utility's COR-TEN® lattice tower structures).

[10] New steel structures that will be installed under the Project have an anticipated service life of 75 years.

To better understand the heightened asset health concerns associated with COR-TEN® steel, PPL Electric contracted with independent, non-affiliated inspection companies to conduct evaluations of COR-TEN® lattice towers to determine the overall condition of these towers on the PPL Electric Transmission System in 2019. The 2019 evaluations included inspection of 15 randomly selected COR-TEN® lattice towers across the PPL Electric Transmission System by three separate contractors.[11] Review of the three contractor reports revealed that over 90% of the joints at each structure exhibited visible pack-out in the connections. In addition, the review revealed that pack-out and section-loss was most prominent on the lower portions of the towers where there was higher likelihood of moisture build up. The contractors' estimates to remediate each tower ranged from $140,000 to $240,000 per tower depending on the contractor's proposed remediation approach and extent of remediation recommended. For the sake of any analysis associated with the remediation option, a cost of $183,891 per structure was utilized, which is the average of the 3 remediation costs received from contractors.

Based on the prevalence of observed deterioration on the COR-TEN® lattice towers across the PPL Electric Transmission System and the estimated per-tower cost to rehabilitate, PPL Electric determined that a more thorough and strategic evaluation was needed to determine the full extent of the deterioration of COR-TEN® lattice towers across its system.

In early 2020, PPL Electric initiated a second, more robust evaluation of the COR-TEN® lattice towers to determine the full extent of the deterioration on the transmission system. PPL Electric's Data Analytics Team developed a strategic approach that utilized advanced statistical analysis and modeling to comprehensively determine the overall condition of the COR-TEN® lattice towers in a cost-efficient manner. The statistical analysis determined that inspection of 192 randomly selected COR-TEN® towers would provide a statistically significant representation of all 1,284 COR-TEN® towers on the PPL Electric system with a 90% confidence level and 5% confidence interval. To assist with the analysis, PPL Electric contracted with AmpJack, an independent consultant, to complete an inspection of 192 randomly selected COR-TEN® towers and classify the observed condition.

[11] Each contractor was asked to inspect 5 structures and prepare an engineering analysis of their condition, proposed remediation approach and estimated costs to remediate the identified structural defects.

The inspection of 192 randomly selected COR-TEN® towers performed by AmpJack included a field-based visual overhead inspection of each structure from the ground, taking measurements of pack-out at each joint and section-loss at each member on the lower section of each structure, visual observations of pack-out and section loss for the higher sections of the towers, and visual observations of the damage at attachment points. The measured values of each joint and member rated according to guidelines provided by PPL Electric using both the measured and visual observations (A-Good, B-Fair, C-Poor, D-Severe and F-Priority). This approach is consistent with the method used by Osmose, an essential asset inspection service company, in grading steel structure corrosion in applications across the country. The results of the AmpJack overall structure ratings are summarized in Table 1-1 below:

TABLE 1-1: Structure Rating Summary

Overall Structure Rating			
Class	**Condition**	Structure Count	Percent
A	**Good**	0	0.0%
B	**Fair**	0	0.0%
C	**Poor**	95	49.5%
D	**Severe**	88	45.8%
F	**Priority**	9	4.7%

The results of the 2020 inspection program confirmed the severity of deterioration identified during the 2019 inspection program as follows:

- Over 90% of the joints showed visible pack-out in the connections, which is anticipated to worsen over time.
- The protective patina needed to protect the steel from corrosion did not properly develop at numerous members resulting in section-loss across the entire structure.
- Pack-out damage was typically more prevalent on lower sections of the tower except for some specific attachment points where severe pack-out was observed on higher sections.
- Structural damage was found on several members from pack-out that ruptured bolts and split/deformed members.

The accelerated deterioration of the asset health of the COR-TEN® lattice towers that are the subject of the Project revealed by 2019 and 2020 inspection programs has been further corroborated by a recent study prepared by RTR Energy Solutions, Inc. ("RTR") in February 2021. RTR was contracted to perform a condition assessment on the Manor-Milwood 230 kV Transmission Line. The assessment consisted of all 28 COR-TEN® lattice towers on this line. The scope of the assessment included a visual inspection of each selected structure from the ground. Each joint of the structure was reviewed to determine if pack rust was present. The structure condition was noted as either Mild, Moderate or Severe using the following classification:

- **Mild** Condition Rating: <25% of total joints contain pack rust.
- **Moderate** Condition Rating: >25% & <50% of total joints contain pack rust.
- **Severe** Condition Rating: >50% of total joints contain pack rust.

A summary of the results of the inspection are represented in Table 1-2 below:

TABLE 1-2: Structure Condition Rating Summary

Condition	Structure Count
Mild	0
Moderate	13
Severe	15
Total	28

The majority of pack rust observed on each structure was found in the lower sections of the post leg where horizontal and diagonal members are bolted to the post leg. However, pack rust was observed in joints all the way up some towers. Out of the 28 structures assessed, over 50% of the structures were classified as Severe with significant amounts of pack rust present, visibly bending the flat edge of the joint that was originally bolted. This assessment shows that the asset health

conditions observed in the system-wide assessment are being exhibited on the specific structures targeted for replacement by the Project.

Based on the results of the inspection programs described above, it is clear that the poor performance of the protective patina on the COR-TEN® lattice towers has accelerated the deterioration of these structures and has brought the assets to the end of their service life much sooner than would have been anticipated. At roughly 50 years of age, the COR-TEN® lattice towers that comprise the Manor-Milwood 230 kV Transmission Line have exceeded their useful life and can no longer be relied upon to safely operate as designed. The proposed rebuild addresses the safety issues resulting from the presence of pack-out rust (e.g., structures failing due to deteriorated joints at the arms or legs). Possible shearing of bolts, members disconnecting from lattice towers, or complete tower failure pose a major safety risk to both the public and PPL Electric employees. PPL Electric has determined to address these safety risks now, rather than at a later date, in order to avoid these risks increasing.

These asset health concerns are also important as the Manor-Milwood 230 kV Transmission Line is a critical component of PPL Electric's Bulk Transmission System and is required to serve local load to several critical customer facilities. If this transmission line was to fail due to COR-TEN® issues, the following reliability issues would likely occur:

A) Failure of Manor-Milwood 230 kV Transmission Line and:

- Loss of South Akron – Lauschtown #3 & #4 Transmission Lines will overload the Brunner Island – South Manheim 230 kV Transmission Line to 100.2% of the Summer Emergency rating respectively.
- Loss of the South Akron – Millwood 230 kV Transmission Line would result in voltage magnitude violations (less than 0.92 PU) at South Akron and Millwood Substations.

As the topic of severe weather patterns becomes increasingly relevant, there is a need to take into consideration how changing weather patterns will impact the reliability of the existing COR-TEN® lattice structures. Over the last 20 years, PPL Electric has seen a trend of increasing storms per year within the PPL Electric service territory. With each storm comes more exposure to extreme precipitation and wind events. If a tower is structurally compromised due to COR-TEN® packout and section loss, that wind event creates an increased risk of structural failure. With

projected increases of more frequent and intense heat waves over the next century in the Northeast, the occurrence of more severe wind and precipitation events is expected to rise as well. This is evident in the storms associated with Hurricane Ida that hit the Northeast recently, as a storm of that strength would have been rare decades ago. Due to drastic weather pattern changes, it is imperative to re-evaluate the COR-TEN® structures in the safest and most reliable way to protect against the pack rust issue in the joints of the structures and guard the transmission system from catastrophic failures of COR-TEN® towers.

At the October 2020 PJM TEAC meeting,[12] PPL Electric presented its plan to address COR-TEN® needs on the 230 kV system. As part of this plan, PPL Electric also shared the need with PJM stakeholders to address COR-TEN® towers on the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines (need # PPL-2020-0003). The need # PPL-2020-0003 will be addressed by the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Line rebuild under supplemental project s2365, which will be completed at an estimated cost of $14.5 Million.

5.0 ALTERNATIVES

PPL Electric evaluated three potential solutions to address the degrading health of the Manor Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines. The following three alternatives were considered and compared based upon their ability to resolve the asset health conditions identified by PPL Electric and upon a 45-year and 75-year cost of service basis[13]:

[12] Refer to slides at https://www.pjm.com/~/media/committees-groups/committees/teac/2020/20201006/20201006-item-09-ppl-supplemental.ashx

[13] PPL Electric is providing this comparison based upon a 45-year cost of service basis, due to the Commission's routine data requests for a 45-year cost of service analysis in prior LON proceedings. PPL Electric notes that it does not utilize a stand-alone cost of service calculation for individual projects and does not prepare a cost-of-service analysis for rebuild projects in its regular course of business. However, PPL Electric has prepared this line-specific calculation in anticipation of data requests from the Commission. PPL Electric used its current transmission rate for these calculations and notes that it cannot predict what its transmission rate will be in the future. The Company's transmission rate, and the associated calculations, are subject to change. Furthermore, PPL Electric submits that it is reasonable and appropriate to consider the 75-year cost of service for this project, as the expected life of the steel structures at issue is 75 years.

- (1) Alternative 1 – Replace all structures on the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines;

- (2) Alternative 2 – Remediate all structures on the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines; and

- (3) Alternative 3 – Full Rebuild of the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines ("Proposed Solution").

The Proposed Solution is necessary to address the COR-TEN® asset health condition described above. Although PPL Electric evaluated replacement and remediation options, these alternatives present substantial uncertainties regarding their immediate and long-term effectiveness to address the COR-TEN® issue. As explained herein, the health and safety risks associated with the assets' advanced age and degree of deterioration are so great that replacement and remediation would fail to adequately address their poor health conditions. For these reasons, the replacement and remediation alternatives were rejected as neither prudent nor reasonable.

Furthermore, the Proposed Solution is the most cost-effective. To estimate the total cost of each alternative over both a 45-year and 75-year period (the expected service life of a new steel structure), cost-of-service calculations for the revenue requirement were completed on a per-structure basis.[14] A summary of this analysis is presented in Table 1-3 below. Based upon this analysis, PPL Electric determined that Alternative 3 – Full Rebuild most efficiently addresses the asset health conditions of the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines. Therefore, as explained in Section 6.0, PPL Electric has proposed Alternative 3 as the solution in this proceeding.

[14] Because all COR-TEN® lattice structures on the system are of a similar design and vintage, doing the cost of service calculation on a per structure basis allows for a determination of the most cost effective option for any COR-TEN® structure on the system regardless of the total line length. It is assumed that the cost of service calculation could be extrapolated across the total number of structures on a given line with a similar result. The revenue requirement is the total cost that the customers would be charged based on calculations that include a combination of operations and maintenance ("O&M") expense, depreciation, and return on capital.

5.1 Alternative 1 – Structure Replacement

The first alternative considered by PPL Electric to address the poor health condition of the weathering steel COR-TEN® lattice towers on these lines was to replace each of the lattice structures. This alternative would include replacing the existing weathering-steel lattice towers with new standard structures. The estimated replacement cost is approximately $397,859/structure. This option would also require PPL Electric to replace the conductors with new conductors in 2024 when it has reached its end-of-life at an additional $204,141/structure. In addition, there would be ongoing O&M costs for the remainder of the service life of the transmission lines.

5.2 Alternative 2 – Structure Remediation

The second alternative considered by PPL Electric to address the poor health condition of the weathering steel COR-TEN® lattice towers on these lines was to remediate the entire lattice tower line, which would include replacing badly damaged members with galvanized steel members, installing new hardware and spacers, and cleaning pack-out from affected joints. The average estimated cost of remediation is approximately $183,891/structure. This alternative was rejected by PPL Electric due to substantial uncertainties regarding its immediate and long-term effectiveness to address the COR-TEN® issue.[15] Although remediation could extend the life of the structures, it would, at a minimum, require re-evaluation and possible subsequent remediation every 10 years following the initial remediation. Moreover, the health and safety risks associated with the assets' advanced age and degree of deterioration are so great that remediation would fail to adequately address their poor health conditions.

Subsequent remediation work would be treated as an O&M expense. However, after 30 years, the structures will have to be replaced with new structures. Further, remediation would not address all underlying issues, ultimately requiring additional, duplicative projects.

[15] The contractors that provided the cost estimate have never performed a full weathering-steel COR-TEN® lattice tower remediation before. In addition, it is PPL Electric's understanding that complete remediation of COR-TEN® lattice towers has never been undertaken by another electric utility. Given the lack of industry experience with remediation, PPL Electric cannot adequately benchmark the efficacy and costs of this alternative. Rebuilding the subject transmission lines, as proposed by the Project, would avoid these potential unknown risks and costs.

For the reasons stated above, it is not reasonable or prudent to pursue Alternative 2. Remediation would fail to address the underlying COR-TEN® asset health conditions on a long-term basis and is a less cost-efficient option.

5.3 Alternative 3 – Full Rebuild

The third alternative considered by PPL Electric is to fully rebuild the existing Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines. Replacing the existing lattice towers with monopoles will improve performance by increasing clearances and improving lightning performance. The estimated rebuild cost is approximately $519,403/structure[16].

Although the full rebuild cost per structure is higher than the replacement and remediation options, the revenue requirements over both a 45 and 75-year period[17] are lower (as shown in Table 1-3) due to lower O&M expense and fully replacing the affected structures (as opposed to attempting to add more useful life to those structures via remediation), which makes the rebuild a more cost-effective solution. Rebuilds are also less risky than remediation due to factors such as lack of remediation experience, lack of evidence for long-term remediation effectiveness, and risk of returning pack-out rust. The structure replacement option would continue to have ongoing O&M expense with the additional need to return in 2024 to reconductor the line for an additional $204,141/structure. When compared to the remediation or replacement options, the full rebuild option has advantages in both cost-effectiveness and lower risk, making full rebuild the best long-term solution.

[16] The referenced per structure cost all includes the costs of relocating the existing 69 kV lines and re-terminating the lines at the substations. These costs are in addition to the proposed replacement of the existing structures.

[17] The 14.5 million is the total estimated upfront cost of the Project, including design and construction. To evaluate total cost-of-service, the calculation must factor in all lifecycle costs associated with that asset over the analysis window (i.e., 45 years). The Project lifecycle costs include 1) annual depreciation expense over the 45-year window, 2) annual Return on Capital over the 45-year window, and 3) O&M expense for minor repairs at year 45. Those costs will make up the total revenue requirement that is entered annually on the FERC Form 1 formula rate.

TABLE 1-3: Cost of Service of Evaluated Options

Project Scope	45 Year Cost of Service ($M)	75 Year Cost of Service ($M)
Replace Structures on Manor-Millwood 230 kV Transmission Line	$49.0	$58.6
Remediate Structures on Manor-Millwood 230 kV Transmission Line	$46.8	$90.6
Full Rebuild of Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines	$42.6	$51.8

6.0 PROPOSED SOLUTION

To resolve COR-TEN® lattice tower health condition, PPL Electric proposes to rebuild the existing Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines. All the COR-TEN® lattice structures as well as the conductor at the 28 locations will be replaced.

The Proposed Solution will improve overall reliability, safety and system resiliency by resolving the asset health needs associated with COR-TEN® lattice tower replacement. The transmission line rebuild solution was deemed to be the most cost-effective solution to address these needs.

Importantly, the Proposed Solution also avoids excess costs and uncertainties surrounding the remediation solution contemplated in Alternative 2. As noted above, if PPL Electric were to remediate the existing COR-TEN® lattice towers, further routine inspections would be required to identify any new pack-out rust growth requiring additional corrective action. The remediation effort could provide a short-term extension of life, but ultimately these towers will still need to be replaced to permanently address the issue of pack-out rust since structural integrity of the COR-

TEN® steel will become too compromised to remediate. In this regard, Alternative 2 does not represent an alternative that effectively addresses the structural issues associated with the COR-TEN® lattice towers. Moreover, PPL Electric is unaware of another project that has undergone full weathering-steel COR-TEN® lattice tower remediation. As such, the recurring costs of remediation could be even greater than anticipated and are unlikely to successfully mitigate the risk. The Proposed Solution avoids these excess costs and uncertainties, efficiently rebuilds the transmission lines to ensure the continued provision of safe and reliable service, and resolves the additional reliability concerns identified herein.

The approximate cost of the entire transmission line rebuild Project is $14.5 Million.

On a total cost of service basis, the Proposed Solution is approximately 87% of the cost of Alternative 1 (replacing the existing structures) on a 45-year basis and 88% of the cost of Alternative 1 on 75-year basis. In addition, on a total cost of service basis, the Proposed Solution is approximately 91% of the cost of Alternative 2 (remediating the existing structures) on a 45-year basis and 57% of the cost of Alternative 2 on 75-year basis.

A map of the proposed system alignment is provided as Figure 1-2.

Figure 1-1: Existing System Configuration

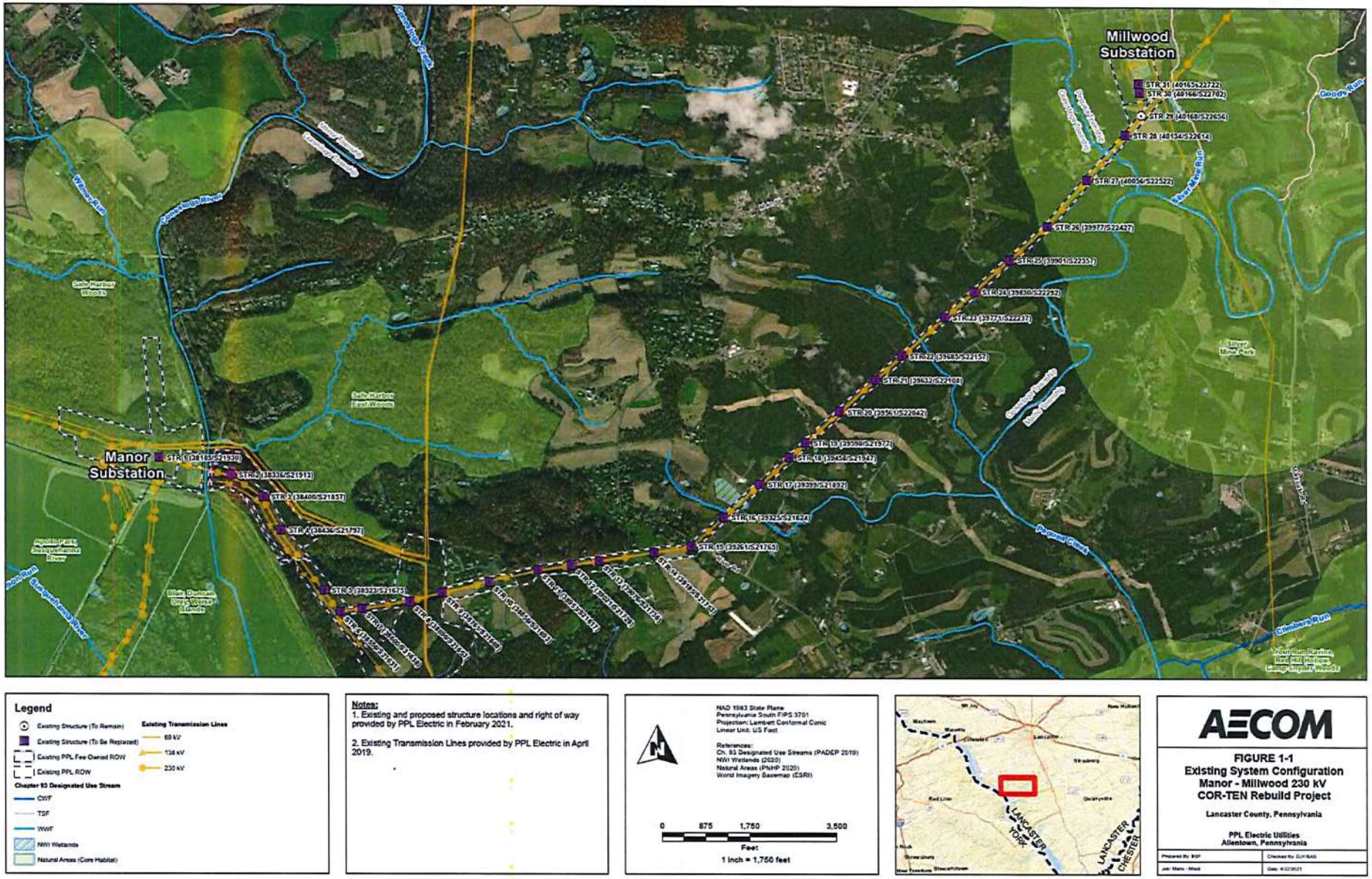
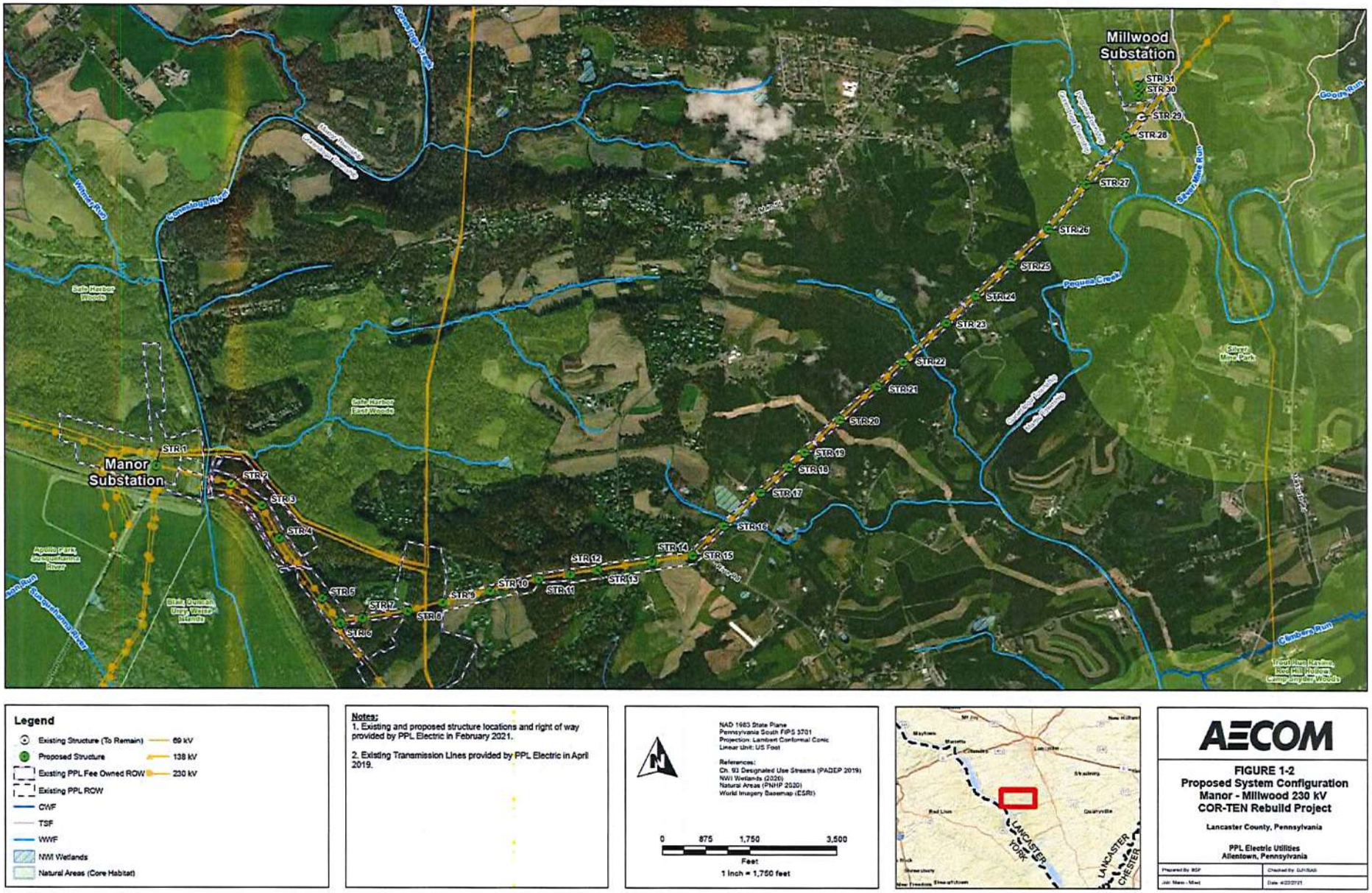


Figure 1-2: Proposed System Configuration



Attachment 2

MANOR-MILLWOOD 230 kV COR-TEN® REBUILD PROJECT

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1.0 INTRODUCTION

As explained in **Attachment 1**, PPL Electric Utilities Corporation ("PPL Electric") is requesting Pennsylvania Public Utility Commission ("PUC" or "the Commission") approval to rebuild the existing double-circuit Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines connecting the Manor 230-69 kV Substation ("Manor Substation") and the Millwood 230-69 kV Substation ("Millwood Substation") in Lancaster County, Pennsylvania ("Project").

The Project will involve re-arrangement of an approximate 1.3-mile section of the Face Rock-Millwood 69 kV Transmission Line resulting in the removal of the 69 kV line from the section of the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines extending from Structure 1 (38186-S-21933) outside the Manor Substation to Structure 8 (38696-S-21653). This section will initially operate as a single-circuit 230 kV line but will be designed to operate as a double-circuit 230 kV line. The Face Rock-Millwood 69 kV Transmission Line will remain as the second circuit from Structure 9 (38761-S-21669) to the Millwood Substation. This section will be rebuilt as a double-circuit 230 kV line with the second circuit operating at 69 kV voltage.

The proposed transmission line system will be designed according to, and generally exceed, all National Electrical Safety Code ("NESC") standards. Design specifications and safety rules adhered to by PPL Electric are included as **Attachment 4**.

2.0 DESCRIPTION OF THE EXISTING AND PROPOSED LINES AND STRUCTURES

Connection between the Manor Substation and Millwood Substation involves a 5.2-mile-long section of the double-circuit Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines. The existing Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines contain six 1033 kcmil[1], 54/7 stranding, "Curlew" ACSR[2] conductor wires, except for a short

[1] A kcmil is a thousand circular mils. A circular mil is the cross-sectional area of a wire one mil in diameter, where 1 kcmil = 0.5067 mm².
[2] ACSR stands for aluminum conductor steel reinforced.

section outside the Millwood Substation where the 69 kV circuit transitions to a 566 kmcil, 24/7 stranding, "Parakeet" ACSR conductor. The arrangement also includes one overhead ground wire ("OHGW") and one 36 count optical ground wire ("OPGW"). All of these wires are supported by a series of transmission line structures that include 28 COR-TEN® double-circuit steel lattice tower structures. At the Millwood Substation, the 230 kV and 69 kV circuits are separated onto single-circuit monopoles. Three single-circuit monopoles are used to support the 230 kV line in this area.

Due to the corrosion and development of pack rust[3] on these COR-TEN® lattice tower structures, PPL Electric proposes to replace them with steel monopole structures. The COR-TEN® lattice tower structures to be replaced extend consecutively between existing tower 38185-S-21930 (Structure 1) located adjacent to the Manor Substation and tower 40134-S-22614 (Structure 28) located near the Millwood Substation. Two of the three existing single-circuit monopole structures used to direct the 230 kV wires around the Millwood Substation (40166-S-22702 (Structure 30) and 40165-S-22722 (Structure 31)) will also be replaced, and each of the three monopoles will be upgraded with the new conductor and guide wires. A detailed map of the Project alignment is provided as **Figure 3-1 in Attachment 3**.

The existing COR-TEN® lattice tower structures range in height from between approximately 115 and 160 feet with an average structure height of approximately 133 feet and the single-circuit monopoles range in height from between approximately 135 and 145 feet with an average structure height of approximately 140 feet. The proposed double-circuit monopole structures to replace the 28 COR-TEN® lattice towers will range in height between approximately 115 and 165 feet with an average structure height of approximately 131 feet. The proposed single-circuit monopoles will range in height between approximately 140 and 145 feet with an average structure height of approximately 142.5 feet. **Table 2-1** provides a summary of the number and heights of the existing and proposed structures.

[3] "Pack-out rust" or "pack rust" is a form a localized corrosion typical of steel components that develop a crevice into an open atmospheric environment, which results in rust packing between conjoined steel components. As described in Attachment 1, pack-out rust accelerates the deterioration of asset health and can result in shearing off bolts, loss of structural integrity, members disconnecting from lattice towers, and tower failure.

Table 2-1: Existing and New Transmission Line Structures

Transmission Line	No. of Existing Structures	Existing Structure Height Range (feet)	Proposed No. of New Structures	Proposed Structure Height Range (feet)	Applicable Framing/ Specifications
MANOR-MILLWOOD 230 kV/ FACE ROCK-MILLWOOD 69 kV	28	115-160	28	115-165	7-009-061 7-009-062 7-009-064
MANOR-MILLWOOD 230 kV	2	135-145	2	140-145	7-009-011 7-009-013
Total	**30**		**30**		

Figures 2-1 through **2-5** depict typical structure types that will be used for the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines, which include the following:

- Install approximately 13 new double-circuit long span suspension structures (**Figure 2-1**).
- Install approximately 4 new double-circuit long span angle suspension structures (**Figure 2-2**).
- Install approximately 11 new double-circuit long span angle tension structures (**Figure 2-3**).
- Install approximately 1 new single-circuit angle suspension structure (**Figure 2-4**).
- Install approximately 1 new single-circuit angle tension structure (**Figure 2-5**).

The proposed monopole structures for the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines will be constructed in generally the same location as the existing COR-TEN® lattice towers. The transmission lines cannot be fully deenergized during the construction process, requiring the new monopoles to be offset approximately 20 feet ahead or behind the COR-TEN® structure locations and approximately 4 feet off center as a safety precaution. PPL Electric has designed the proposed transmission line system so that it fits entirely within the existing right-of-way.

The proposed Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines will consist of six 1590 kcmil, 54/19 stranding, "Falcon" ACSS[4] conductors for the 230 kV and 69 kV circuits except for the short section near the Millwood Substation which will remain as the 566 kcmil, 24/7 stranding, "Parakeet" ACSR conductors for the 69 kV circuit. The existing OHGW and OPGW will be removed and be replaced with two 0.752-inch-diameter dual 48 count OPGW. The minimum conductor-to-ground clearance will be 25.5 feet which occurs at the emergency maximum thermal conductor temperature of 250°C (482°F). The design minimum conductor clearances and conductor thermal ratings for the reconstructed lines are noted in **Tables 2-2 and 2-3**.

Table 2-2: Design for Minimum Conductor Clearance for 1590 kcmil 54/19 Stranding ACSS

Condition	Transmission Double-Circuit Design Clearance-to-Ground
PPL Heavy Ice (1" ice, 32°F / 0°C)	25.5'
Max Operating Temperature (250°C / 482°F)	25.5'
PPL Blowout (15psf, 60°F / 16°C)	25.5'

Table 2-3: Conductor Thermal Rating 1590 kcmil 54/19 Stranding Falcon ACSS – 200°C Normal Maximum Conductor Temperature (250°C Emergency)

Condition	Ambient Temperature (°C)	Wind Speed (Ft./sec)	Ampacity (Amps)
Summer Normal	35	0	2344
Winter Normal	10	0	2506
Summer Emergency	35	2.53	3074
Winter Emergency	10	2.53	3201

[4] ACSS stands for aluminum conductor steel supported

Figure 2-1: Typical 230 kV Long Span Double-Circuit Steel Pole Structure

PPL Electric Utilities	**7-009-061** 230kV Long Span Double Circuit Steel Pole 0° to 1° Suspension Structure	Revision: 0 Effective Date: 3/18/2016 Sheet 1 of 1

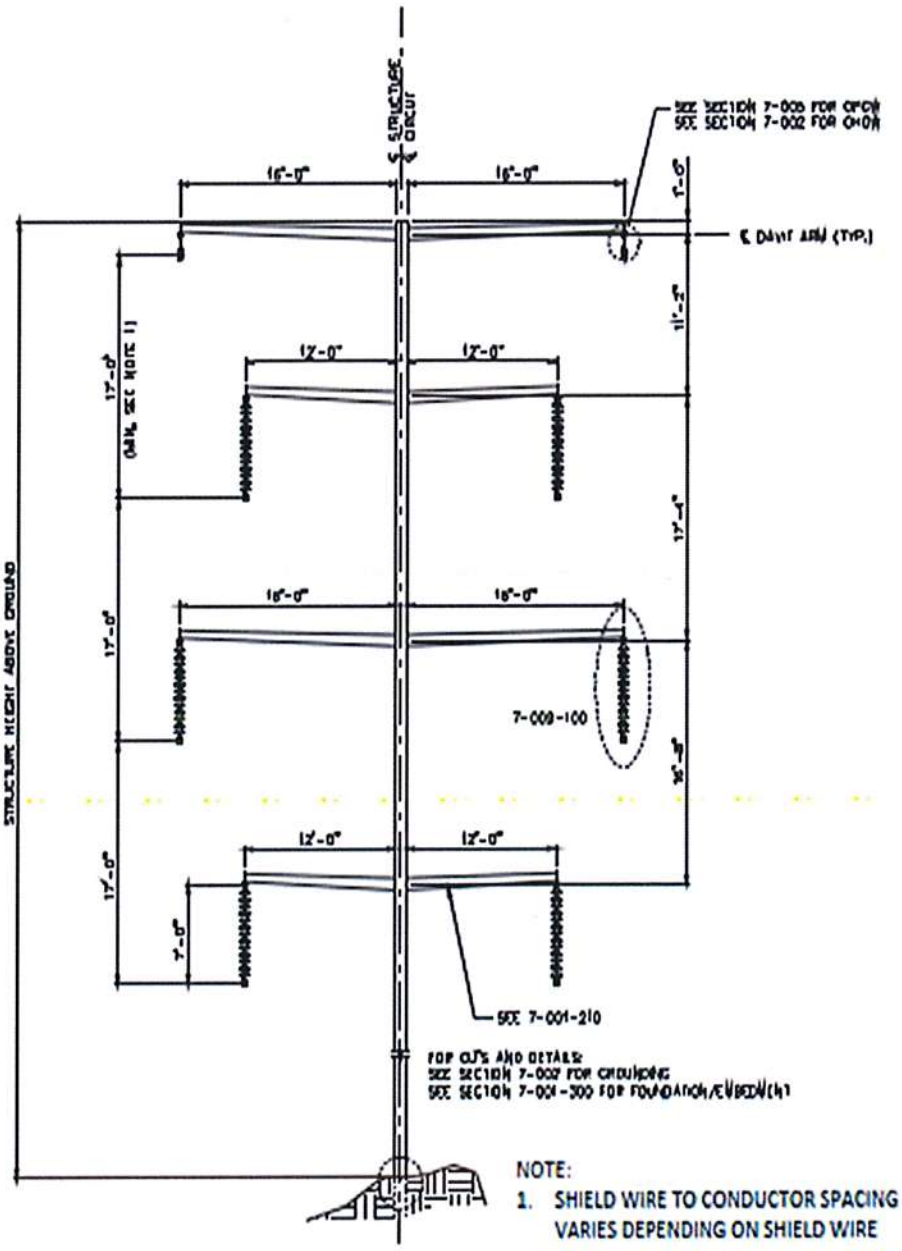


Figure 2-2: Typical 230 kV Long Span Double-Circuit Steel Pole Angle Suspension Structure

PPL Electric Utilities	7-009-062 230kV Long Span Double Circuit Steel Pole 1° to 10° Angle Suspension Structure	Revision: 0 Effective Date: 3/18/2016 Sheet 1 of 1

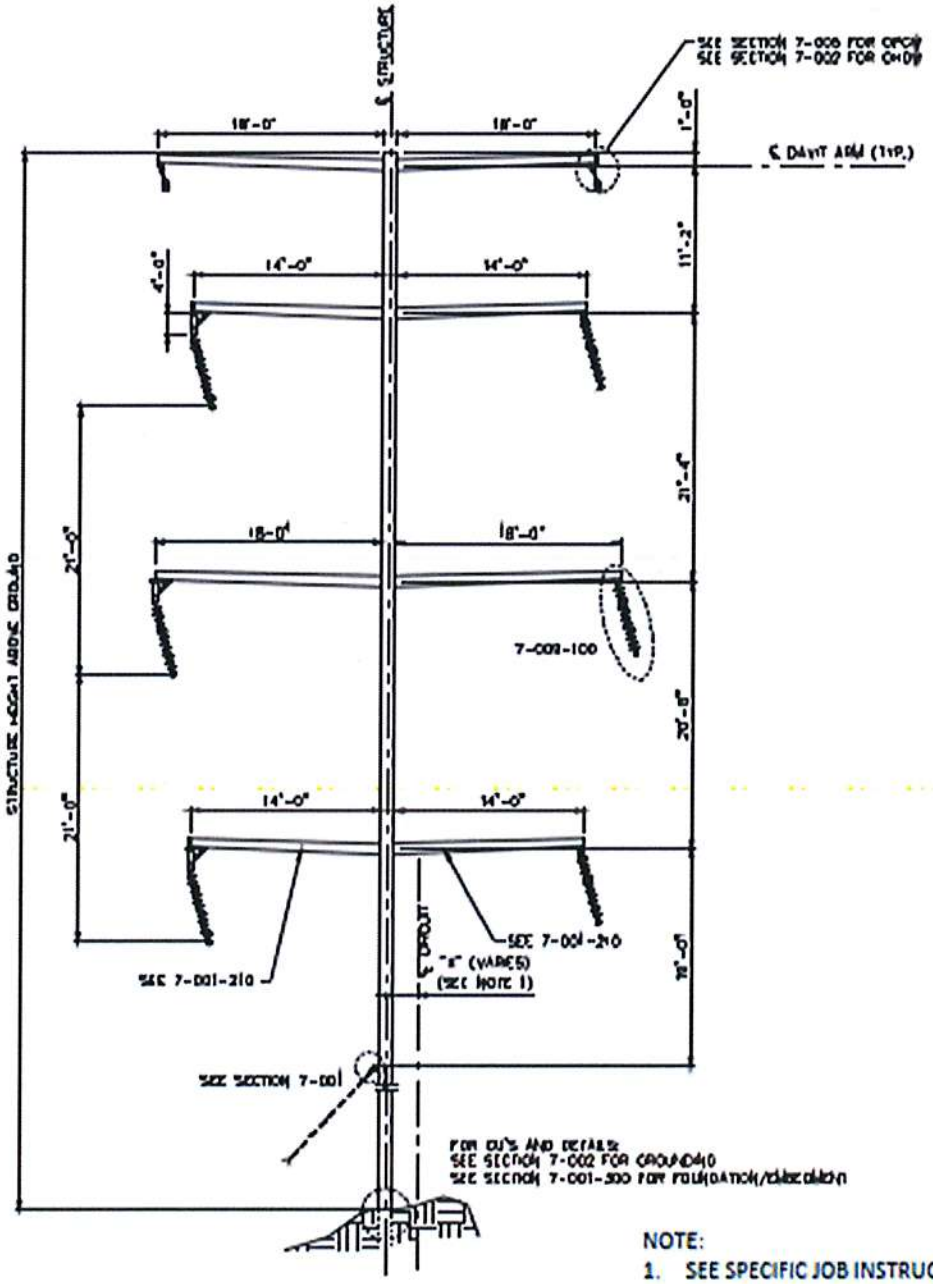


Figure 2-3: Typical 230 kV Long Span Double-Circuit Steel Pole Angle Tension on Arm Structure

PPL Electric Utilities	7-009-064 230kV Long Span Double Circuit Steel Pole 0° To 90° Angle Tension on Arm Structure	Revision: 0 Effective Date: 3/18/2016 Sheet 1 of 1

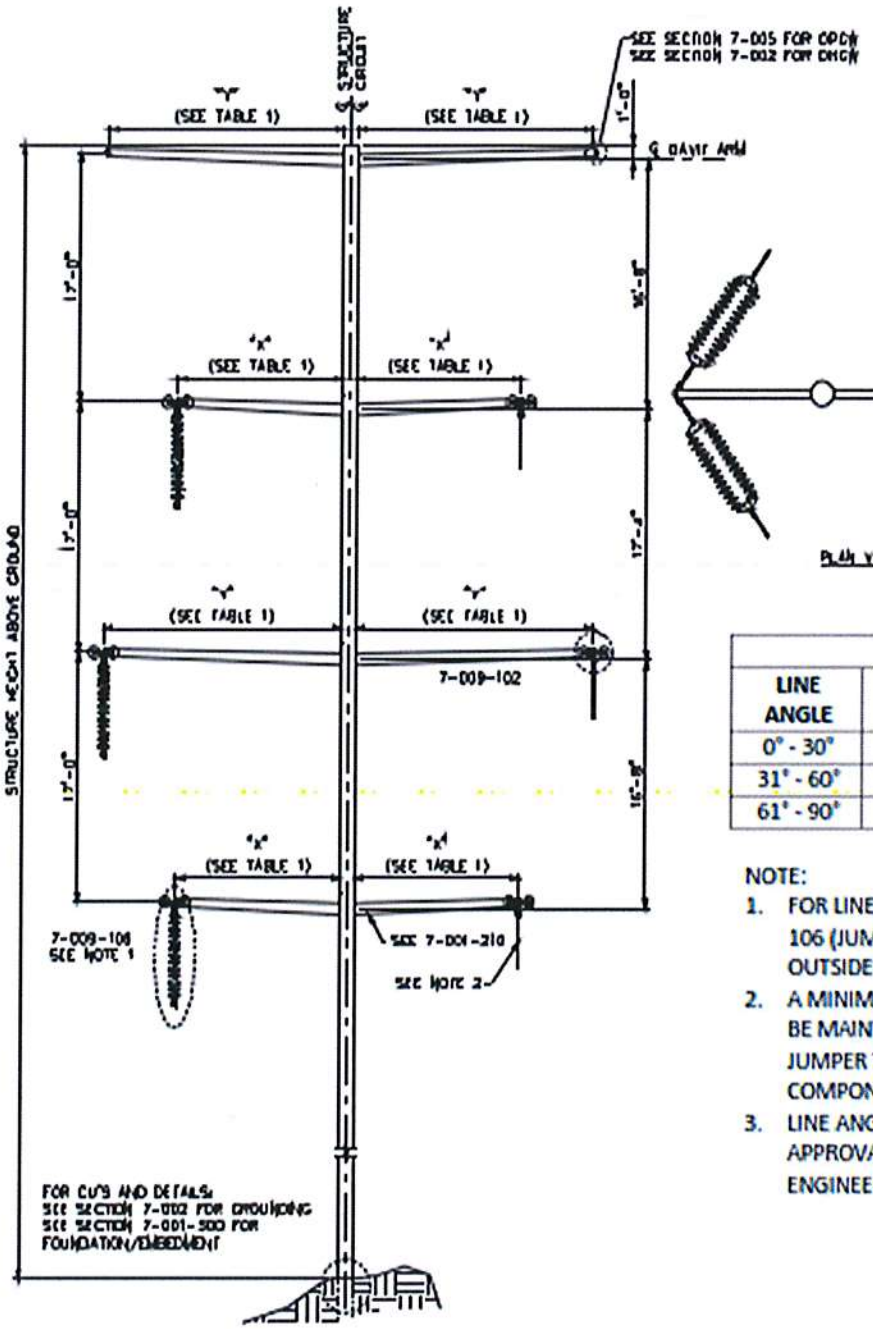


TABLE 1		
LINE ANGLE	DAVIT ARM LENGTH "X"	DAVIT ARM LENGTH "Y"
0° - 30°	12'-0"	16'-0"
31° - 60°	14'-0"	18'-0"
61° - 90°	17'-0"	21'-0"

NOTE:

1. FOR LINE ANGLES OVER 10°INSTALL 7-009-106 (JUMPER SUSPENSION ASSEMBLY) ON OUTSIDE CIRCUIT ONLY.
2. A MINIMUM 86 1/4 INCH CLEARANCE SHALL BE MAINTAINED FROM ANY POINT ON THE JUMPER TO ALL GROUNDED STRUCTURAL COMPONENTS AND HARDWARE.
3. LINE ANGLE MAY EXCEED 90° WITH APPROVAL FROM PPL ENGINEERING/STANDARDS.

Figure 2-4: Typical 230 kV Single-Circuit Steel Pole Angle Suspension Structure

ppl PPL Electric Utilities	**7-009-011** 230kV Single Circuit Steel Pole 0° to 10° Angle Suspension Structure	Revision: 0 Effective Date: 3/18/2016 Sheet 1 of 1

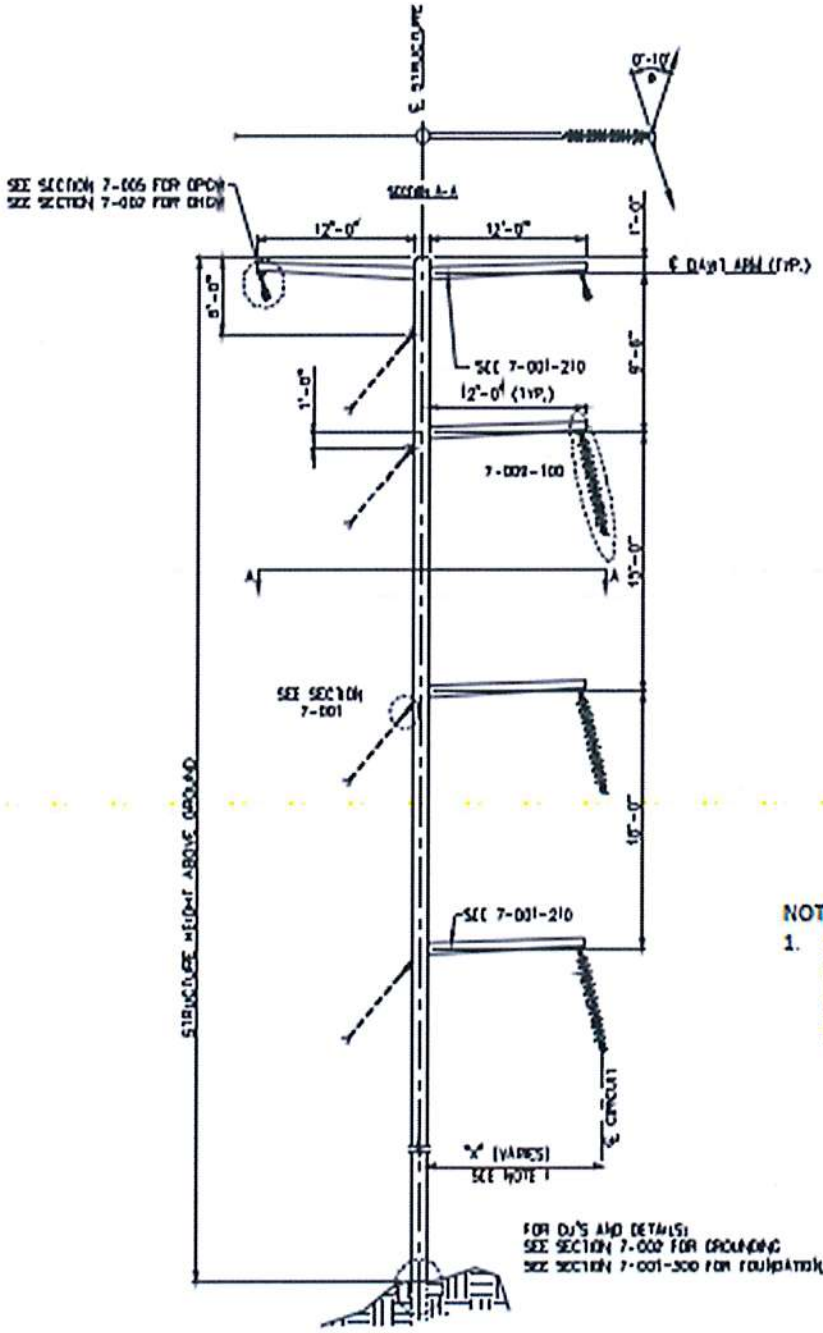
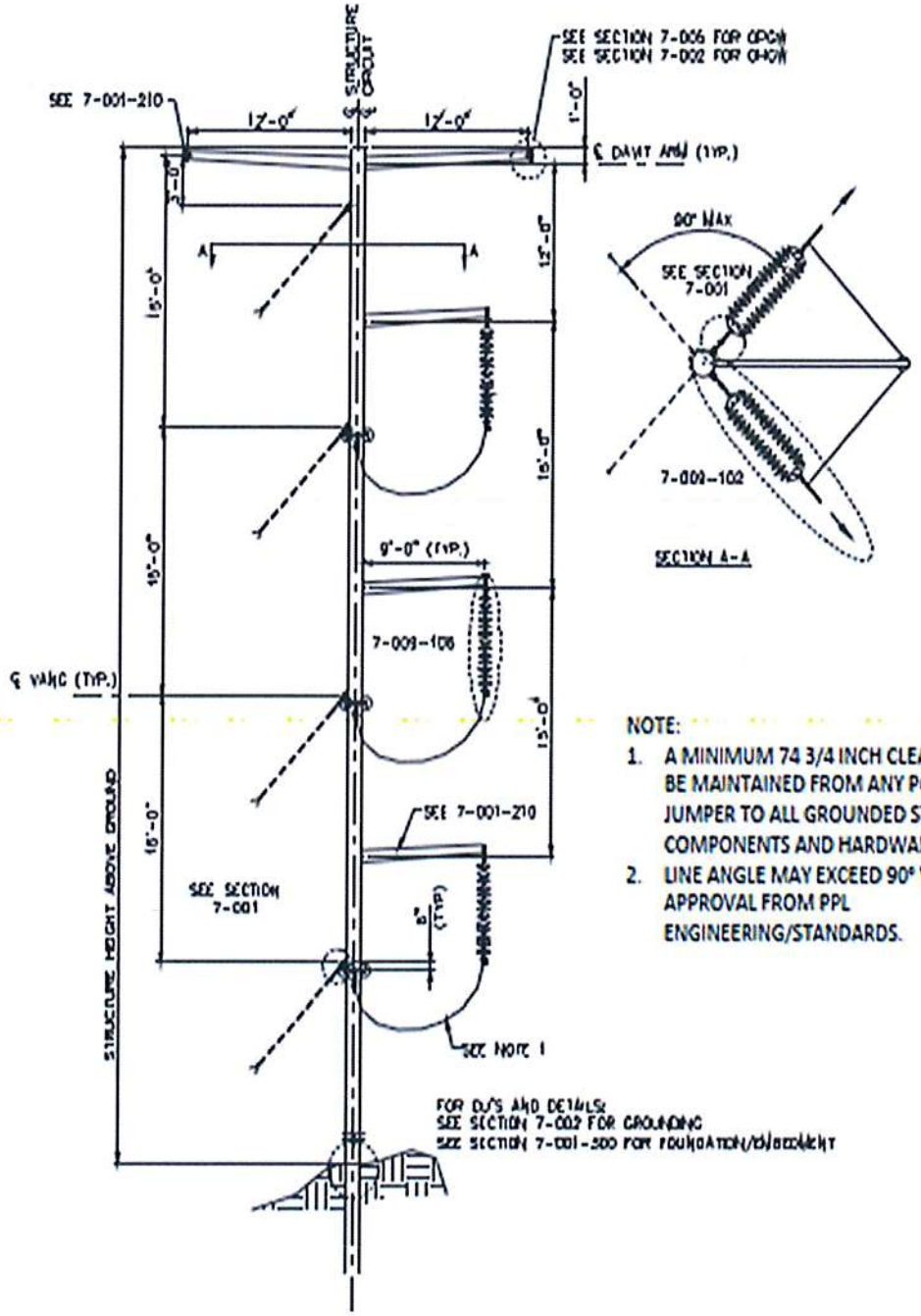


Figure 2-5: Typical 230 kV Single-Circuit Steel Pole Angle Tension Structure

ppl PPL Electric Utilities	7-009-013 230kV Single Circuit Steel Pole 0° to 90° Angle Tension on Pole Structure	Revision: 0 Effective Date: 3/18/2016 Sheet 1 of 1



NOTE:

1. A MINIMUM 74 3/4 INCH CLEARANCE SHALL BE MAINTAINED FROM ANY POINT ON THE JUMPER TO ALL GROUNDED STRUCTURAL COMPONENTS AND HARDWARE.
2. LINE ANGLE MAY EXCEED 90° WITH APPROVAL FROM PPL ENGINEERING/STANDARDS.

Attachment 3

MANOR-MILLWOOD 230 kV COR-TEN® REBUILD PROJECT

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1.0 INTRODUCTION

PPL Electric Utilities ("PPL Electric") is requesting Pennsylvania Public Utility Commission ("PUC" or "the Commission") approval to rebuild approximately 5.2 miles of the existing double-circuit Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines connecting the Manor 230-69 kV Substation ("Manor Substation") and the Millwood 230-69 kV Substation ("Millwood Substation") in Lancaster County, Pennsylvania ("Project").

The Project will involve re-arrangement of the Face Rock-Millwood 69 kV Transmission Line resulting in the removal of the 69 kV line from the section of the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines extending from Structure 1 (38186-S-21933) outside the Manor Substation to Structure 8 (38696-S-21653). This section will initially operate as a single-circuit 230 kV line but will be designed to operate as a double-circuit 230 kV line. The Face Rock-Millwood 69 kV Transmission Line will remain as the second circuit from Structure 9 (38761-S-21669) to the Millwood Substation. This section will be rebuilt as a double-circuit 230 kV line with the second circuit operating at 69 kV voltage.

The rebuilt double-circuit Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines will be constructed on the same structure alignment as the existing transmission lines. The Project will remain on the same PPL Electric fee-owned properties and in the same right-of-way ("ROW") as the existing transmission lines. The existing fee-owned properties and ROW vary in width from 130 feet to 275 feet wide with the wider areas containing another transmission line that parallels the western side of the Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines. The Project will require the replacement of 30 existing structures that will be constructed entirely within the existing ROW, on PPL Electric fee-owned properties, or on PPL Electric's Manor Substation and Millwood Substation properties. A network of existing access roads or temporary roads will be utilized during construction of the rebuilt transmission lines. Detailed maps of the proposed rebuilt double-circuit Manor-Millwood 230 kV/Face Rock-Millwood 69 kV Transmission Lines and associated structures are provided in **Figure 3-1**.

From the Manor Substation located on Observation Site Road, the Project travels in a southeast direction through a wooded area adjacent to the east bank of the Susquehanna River, then turns east and then northeast for several miles through cleared wooded plots and agricultural fields

before entering the Millwood Substation accessed from Run Valley Road. The ROW for the Project is illustrated in **Figure 3-1** and further described below:

- From the Manor Substation, the rebuilt 230 kV line will extend east approximately 0.35 mile (1,871 feet) from Structure 1 and span across the Conestoga River and the Amtrak managed Conestoga Substation to Structure 2, then turn southeast for approximately 0.70 mile (3,685 feet) along a forested bluff that parallels the Susquehanna River to Structure 6 (Sheets 1 and 2, Structures 1 to 6 in **Figure 3-1**). The six COR-TEN® structures along this segment will be replaced with six long span angle tension monopole structures (7-009-064). Structure 1 is located on PPL Electric's Manor Substation property and, aside from a small ROW area maintained by PPL Electric at the Conestoga River crossing, the remaining structures are located entirely on PPL Electric fee-owned properties.
- From Structure 6, the line extends east 1.37 miles (7,216 feet) through cleared wooded plots and agricultural fields to Structure 15 adjacent to River Road (Sheets 2 to 4, Structures 7 to 15 in **Figure 3-1**). The nine COR-TEN® structures along this segment will be replaced with four long span suspension monopole structures (7-009-061), three long span angle suspension monopole structures (7-009-0062), and two long span angle tension monopole structures (7-009-064). Structures 7 to 9 are located entirely on PPL Electric fee-owned properties and the remaining structures are located entirely on ROW maintained by PPL Electric.
- From Structure 15 the line extends northeast for 2.41 miles (12,704 feet) spanning River Road and several streams on its route through wooded areas and agricultural fields to Structure 29 near the Millwood Substation (Sheets 4 to 7, Structures 16 to 29 in **Figure 3-1**). The 13 COR-TEN® structures along this segment will be replaced with nine long span suspension monopole structures (7-009-061), one long span angle suspension monopole structures (7-009-0062), and three long span angle tension monopole structures (7-009-064). Structure 29 is a single-circuit 230 kV monopole that will not be replaced but will be modified with new conductor and guide wires. These structures are located entirely on PPL Electric fee-owned properties.
- At Structure 29, the line pivots north and extends for approximately 0.20 mile (1,045 feet) to Structure 31 before connecting into the Millwood Substation (Sheet 7, Structures 30 and 31 in **Figure 3-1**). These two structures are single-circuit 230 kV monopoles that will be

replaced by single-circuit angle suspension monopole structures (7-009-011) and modified with new conductor and guide wires. These structures are located entirely on PPL Electric's Millwood Substation property.

2.0 LAND USE

PPL Electric evaluated the existing land uses on the PPL Electric owned properties, within the existing ROW, and within 0.25 mile (1,320 feet) of the ROW ("Project Area"). This broader Project Area was reviewed to provide a sense of the landscape in which the Project is located. Land uses were determined based on the 2019 National Land Cover Data.

No nearby railroads or communication towers will be affected by the proposed Project. The Project parallels an existing transmission line within a wide portion of the ROW beginning at Structure 2, located south of the Conestoga River and Amtrak managed Conestoga Substation, and continues for approximately 0.69 miles in a southeast direction to Structure 6. The Project crosses an existing PPL Electric transmission line between Structures 8 and 9. The Project also crosses an existing natural gas pipeline (*i.e.*, the Atlantic Sunrise Pipeline) northeast of Hilltop Drive adjacent to Structure 20. An Amtrak railroad runs along the Susquehanna River approximately 0.13 miles southwest of the Project.

The closest active airports relative to the Project are the Smoketown Airport-S37, which is approximately 8.7 miles northeast, and the Lancaster Airport, located approximately 11.7 miles to the north. PPL Electric does not anticipate any interference with airport operations because the Project is in an area where there are existing electrical facilities. However, PPL Electric will comply with any applicable requirements of the Federal Aviation Administration and the Pennsylvania Department of Transportation, Bureau of Aviation.

Conserved Lands

The proposed Project will not affect any national parks, state parks, local parks, recreational areas, or natural landmarks. None of these features are located within the Project Area. Conestoga River Park is located approximately 0.2 miles north of the Manor Substation on the west side of the

Conestoga River and Safe Harbor Park is located approximately 0.4 miles northeast of the Manor Substation on the east side of the Conestoga River. Silver Mine Park is located approximately 0.2 miles southeast of the Project where it spans Goods Road and Silver Mine Road. Apollo County Park is located approximately 1 mile west of the Project, on the west side of the Susquehanna River. The next closest conserved properties are State Game Lands #288 and Pequea Creek Recreational Center which are located approximately 0.6 miles south of the Project where it turns east at Structure 6. The above-mentioned properties will not be affected.

3.0 CULTURAL RESOURCES

An online review of the Project Area and surrounding landscape was conducted through the Pennsylvania Historical and Museum Commission ("PHMC") Cultural Resources Geographic Information System site. Five listed State Historic Preservation Office ("SHPO") eligible properties are located close to the Project Area, but none are located within the Project Area.

- Safe Harbor Dam and Power Plant
- Safe Harbor Village
- Eschelman Farm
- Goods Mill
- Silver Mine Farm

PPL Electric is in the initial stage of coordination with the PHMC for the modifications being made to the transmission lines. This coordination will be required to receive permits to construct the Project and will be conducted in the near future. PPL Electric does not anticipate any impacts to SHPO eligible properties or any other PHMC related properties. 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.

4.0 NATURAL FEATURES

Unique Natural Features

No unique geological, scenic, or natural areas are located within the Project Area, according to the Pennsylvania Department of Conservation and Natural Resources ("PDCNR").

Soils

The Project traverses along hillsides and crosses over several stream valleys. Topography elevation ranges from approximately 200 feet above sea level ("abs") in the stream valleys to approximately 500 feet abs at the hillslope shoulders. The soils present within the Project Area consist of very stony silt loams, silt loams, and loams found on steeply to moderately sloped hillsides and gently sloped to nearly flat stream floodplain landforms.

Erosion and Sedimentation ("E&S") control plans will be developed and implemented for the Project to minimize the displacement of soils. These plans will require prior approval from the local county conservation districts. National Pollutant Discharge Elimination System ("NPDES") permits will also be required from the Pennsylvania Department of Environmental Protection ("PADEP") as needed. During construction, PPL Electric will adhere to all conditions specified in the NPDES permit. Impacts to local soil resources are anticipated to be minimal.

Waterways

The existing transmission lines span four National Hydrography Dataset waterways that will remain in place after the Project construction activities have occurred. The Conestoga River, a south flowing tributary to the Susquehanna River within the Lower Conestoga River Watershed (HUC-020503061107), is crossed by the Project south of the Manor Substation. The Conestoga River has a PADEP Chapter 93 Designated Use Stream Classification of Warm-Water Fishes (WWF), Migratory Fishes (MF). Three additional southeast flowing unnamed tributaries to Pequea Creek are crossed as the Project extends east to northeast along its route toward the Millwood Substation. These waterways are within the Climbers Run-Pequea Creek Watershed (HUC-020503061204) and all have PADEP Chapter 93 Designated Use Stream Classifications of WWF, MF. None of the crossed waterways have a Chapter 93 Existing Use Stream Classification

or any special protection Pennsylvania Fish and Boat Commission ("PFBC") classifications. All the waterways are part of the Lower Susquehanna Watershed within the Susquehanna River Basin.

An E&S control plan will be developed to address stormwater control in all watershed areas crossed by the Project. 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.

Wetlands

Based on review of the U.S. Fish and Wildlife Service's ("USFWS") National Wetlands Inventory ("NWI"), the Project crosses two Riverine (R2UBH) stream habitats, one Palustrine Forested (PFO1A) habitat, one Palustrine Scrub-Shrub (PSS1A) habitat, and two Palustrine Emergent (PEM1C and PEM5A) habitats. No impacts to these NWI features are anticipated by the proposed Project activities.

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 have been delineated, surveyed, and illustrated according to regulatory standards. This information is being used to minimize wetland and waterway impacts where feasible. Additionally, PPL Electric will avoid impacts to wetlands and waterways where possible by aerially spanning these features.

100-year Floodplains

The National Flood Hazard Layer for Lancaster County, Pennsylvania was obtained through the Federal Emergency Management Agency ("FEMA") Flood Map Service Center website and analyzed for 100-year floodplains within the Project Area and surrounding landscape. Based on review of this data, the Project spans the FEMA defined floodway and 100-year floodplain of the Conestoga River and the 100-year floodplain of one of the unnamed tributaries to Pequea Creek. No impacts to any floodplain areas are anticipated by the proposed Project activities.

Vegetation

Vegetative cover in the Project Area consists of woodlands, cleared wooded plots, and agricultural fields. The existing ROW areas for the transmission lines were previously cleared of woody vegetation, but some tree clearing is anticipated around work pads and along existing access roads. If vegetation management is required in this specific location, PPL Electric will apply its "Specifications for Transmission Vegetation Management LA-79827" to minimize potential impacts.

5.0 THREATENED AND ENDANGERED SPECIES

Natural Areas Inventory

Based on review of the *Natural Areas Inventory of Lancaster County, Pennsylvania*, published by The Nature Conservancy in 1998, the Project is located within two Pennsylvania Natural Heritage Program identified natural areas: Safe Harbor Woods and Silver Mine Park. Safe Harbor Woods, a wooded habitat that supports potentially rare and threatened plant species, is located at the west end of the Project adjacent to the Manor Substation. Silver Mine Park is located near the Millwood Substation and is an agricultural landscape that is underlain by limestone bedrock that supports rare cave invertebrates. The area also supports other potentially rare and threatened terrestrial species. Natural areas identified in these documents generally focus on sites that provide habitat conditions for threatened and endangered plant or animal species.

Threatened and Endangered Species

A Pennsylvania Natural Diversity Inventory review was conducted for the Project on November 16, 2020, to assess the potential presence of threatened and endangered species and/or special concern species. Specific agencies reviewing the Project included the following:

- Pennsylvania Game Commission ("PGC"),
- PFBC,
- PDCNR, and
- USFWS.

The PGC reported potential impacts to the Peregrine Falcon (*Falco peregrinus*). The PFBC and USFWS require further review to resolve any potential impacts. PPL Electric will continue to consult the jurisdictional agencies regarding potential impacts to protected species, complete all required surveys, obtain all necessary approvals and permits for Project construction, and comply with all conditions placed on those permits.

Figure 3-1a: Aerial Map of the Project

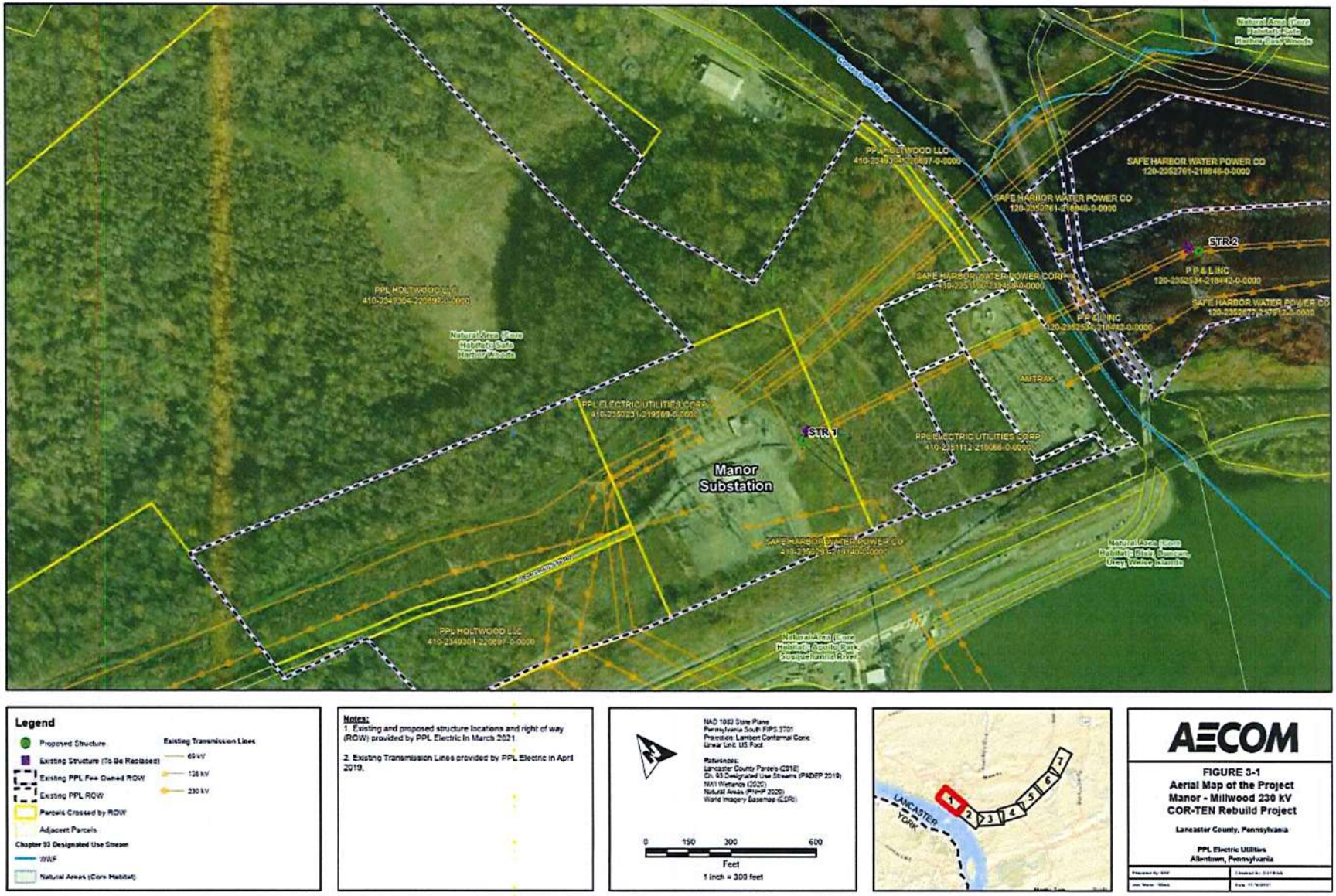


Figure 3-1b: Aerial Map of the Project

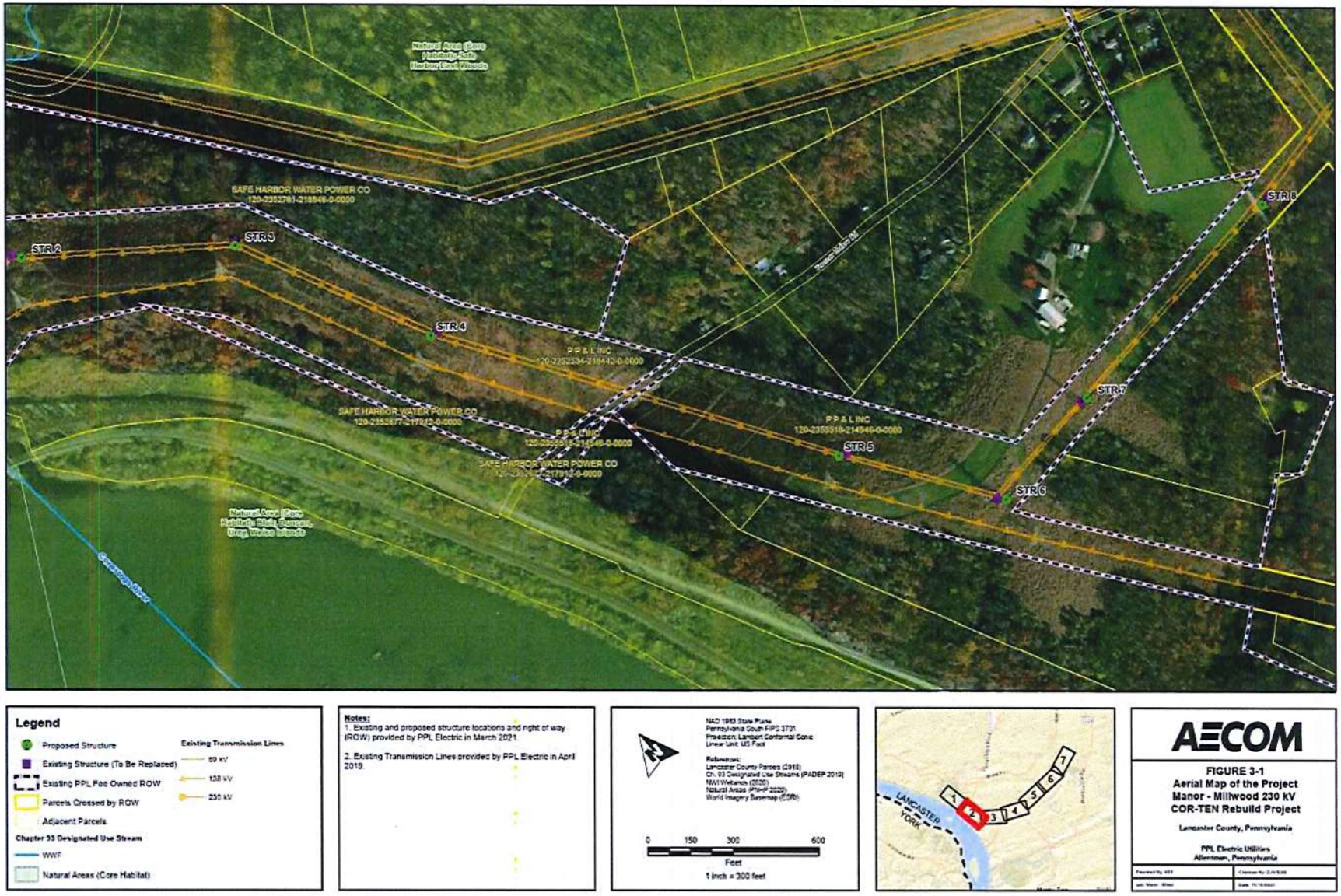


Figure 3-1c: Aerial Map of the Project

Legend

- Proposed Structure
- Existing Structure (To Be Replaced)
- Existing PPL Fee Owned ROW
- Existing PPL ROW
- Parcels Crossed by ROW
- Adjacent Parcels
- NWI Wetlands
- Natural Areas (Core Habitat)

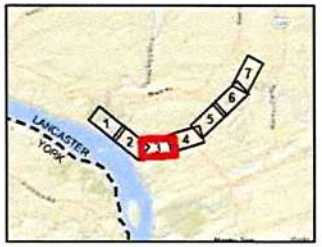
Existing Transmission Lines
69 kV
230 kV

Notes:
1. Existing and proposed structure locations and right of way (ROW) provided by PPL Electric in March 2021.
2. Existing Transmission Lines provided by PPL Electric in April 2019.

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

References:
Lancaster County Parcels (2019)
Ch. 93 Designated Use Streams (PADEP 2019)
NWI Wetlands (2020)
Natural Areas (PNHP 2020)
World Imagery Basemap (ESRI)

0 150 300 600
Feet
1 inch = 300 feet



AECOM

FIGURE 3-1
Aerial Map of the Project
Manor - Millwood 230 kV
COR-TEN Rebuild Project
Lancaster County, Pennsylvania

PPL Electric Utilities
Allentown, Pennsylvania

Figure 3-1d: Aerial Map of the Project

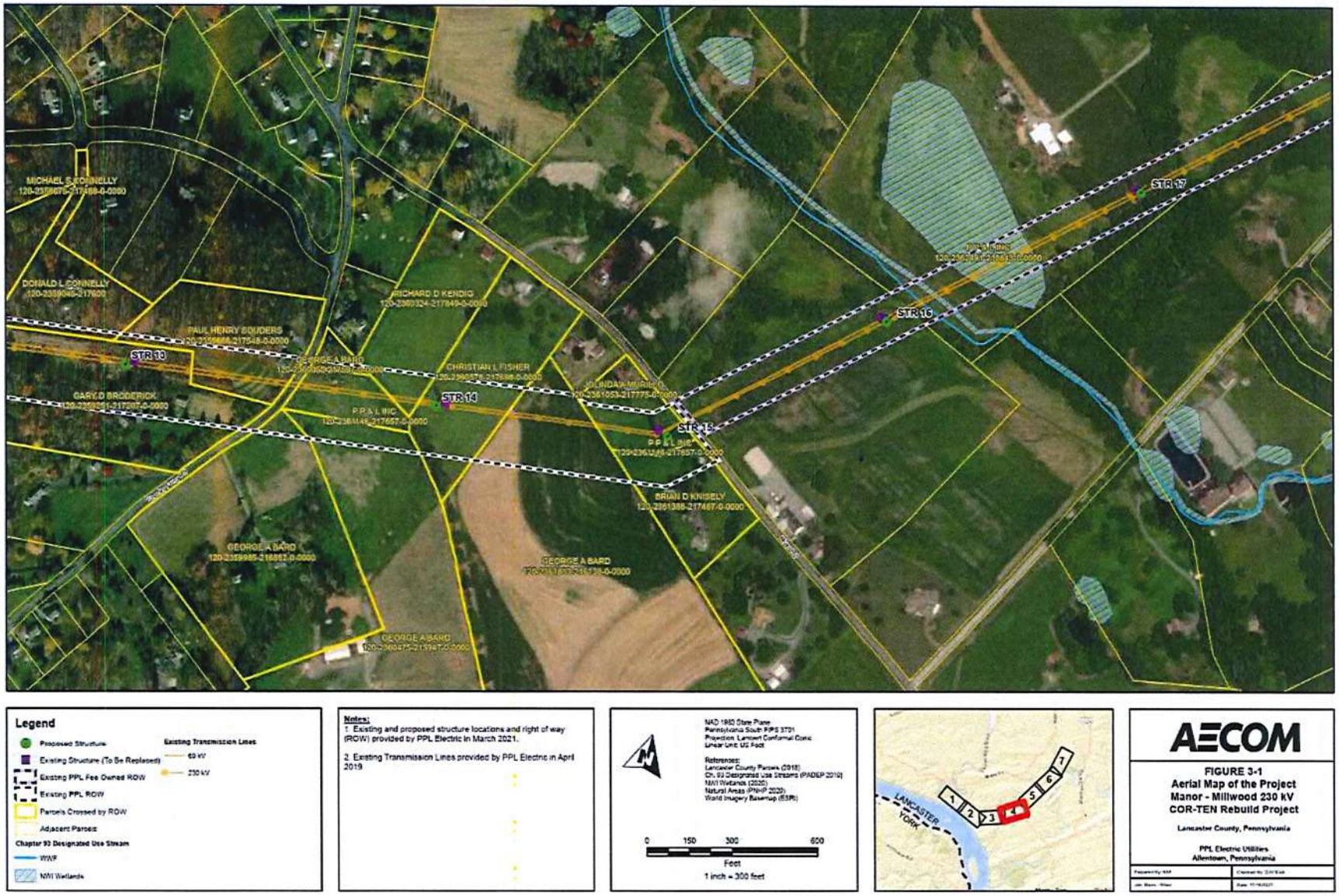


Figure 3-1e: Aerial Map of the Project

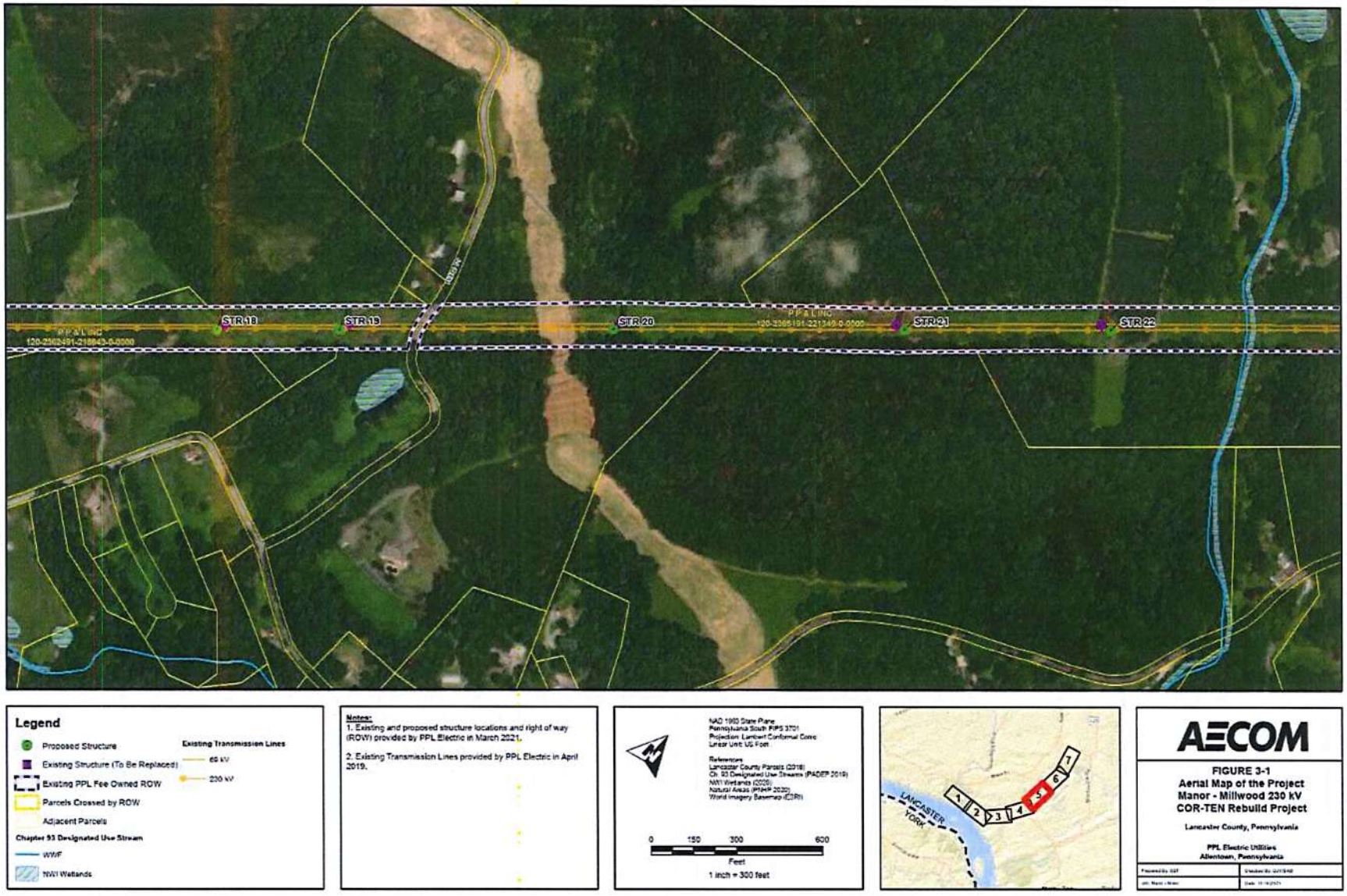
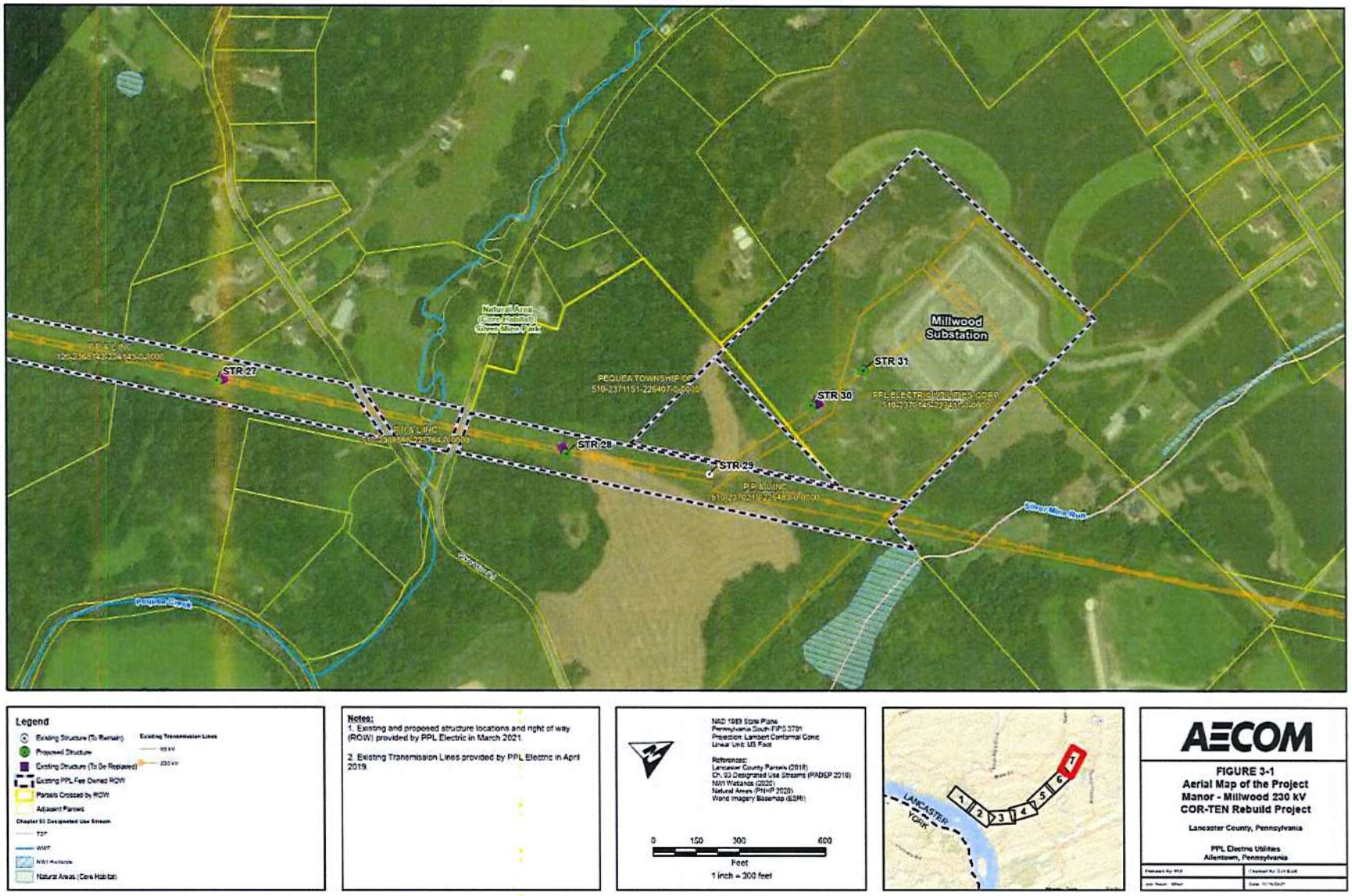


Figure 3-1f: Aerial Map of the Project

Figure 3-1g: Aerial Map of the Project



Attachment 4

MANOR-MILLWOOD 230 kV COR-TEN® REBUILD PROJECT

TABLE OF CONTENTS

List of Tables

1.0 DESIGN CONSIDERATIONS

PPL Electric Utilities' ("PPL Electric") new and rebuilt transmission lines are designed according to, and generally exceed, all National Electric Safety Code ("NESC") minimum standards. The NESC is a set of rules guiding safety standards 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.

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 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.

PPL Electric's rigorous design standards are further incorporated into the parameters utilized to account for ice and wind loadings on the wires and structure. Structure loading and line designs must accommodate a variety of operating conditions as different ice and wind combinations can

impact the conductor sags and tensions of the line. 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 beyond what is required by NESC. This means that PPL Electric lines are designed to operate safely and reliably during extreme inclement weather. In addition, PPL Electric design standards include a clearance to ground buffer in excess of NESC required clearances to account for construction and design tolerances and the filling or grading of land within the right of way by property owners. This buffer also significantly reduces the risk of a property owner inadvertently contacting a transmission line. This has occurred on PPL Electric's system in the past and higher clearances minimize the likelihood of future occurrences.

TABLE 4-1: 69 kV Vertical Clearance to Ground

Surface Underneath Conductors	NESC Standard Clearance	PPL Conductor Clearances
Roads, streets, and other areas subject to truck traffic	19.2 Ft.	22.2 Ft.
Other land traversed by vehicles such as cultivated grazing, forest, orchards, etc.	19.2 Ft.	22.2 Ft.
Spaces and ways subject to pedestrians or restricted traffic only	15.2 Ft.	22.2 Ft.
Track rails of railroads (except electrified railroads using overhead trolley conductors)	27.2 Ft.	30.2 Ft.

TABLE 4-2: 138 kV Vertical Clearance to Ground

Surface Underneath Conductors	NESC Standard Clearance	PPL Conductor Clearances
Roads, streets, and other areas subject to truck traffic	20.6 Ft.	23.6 Ft.
Other land traversed by vehicles such as cultivated grazing, forest, orchards, etc.	20.6 Ft.	23.6 Ft.
Spaces and ways subject to pedestrians or restricted traffic only	16.6 Ft.	23.6 Ft.
Track rails of railroads (except electrified railroads using overhead trolley conductors)	28.6 Ft.	31.6 Ft.

TABLE 4-3: 230 kV Vertical Clearance to Ground

Surface Underneath Conductors	NESC Standard Clearance	PPL Conductor Clearances
Roads, streets, and other areas subject to truck traffic	22.5 Ft.	25.5 Ft.
Other land traversed by vehicles such as cultivated grazing, forest, orchards, etc.	22.5 Ft.	25.5 Ft.
Spaces and ways subject to pedestrians or restricted traffic only	18.5 Ft.	25.5 Ft.
Track rails of railroads (except electrified railroads using overhead trolley conductors)	30.5 Ft.	33.5 Ft.

TABLE 4-4: 500 kV Vertical Clearance to Ground

Surface Underneath Conductors	NESC Standard Clearance	PPL Conductor Clearances
Roads, streets, and other areas subject to truck traffic	28.4 Ft.	31.4 Ft.
Other land traversed by vehicles such as cultivated grazing, forest, orchards, etc.	28.4 Ft.	31.4 Ft.
Spaces and ways subject to pedestrians or restricted traffic only	24.4 Ft.	31.4 Ft.
Track rails of railroads (except electrified railroads using overhead trolley conductors)	36.4 Ft.	39.4 Ft.

A relay protection system is also used on PPL Electric's transmission lines to protect public safety, as well as the equipment on the transmission system. The purpose of relay protection is 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 using 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

to 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 regard to both public and employee safety and follows or exceeds all codes and requirements. The following are a few examples of PPL Electric's safety rules that demonstrate its dedication to employee and contractor safety:

- 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 has been received.
- 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 voltage test is performed 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. Although there is no current scientific evidence demonstrating that magnetic fields cause any adverse health effects or pose a health or safety threat to the public, PPL Electric has established a policy to design its new and rebuilt transmission lines to reduce magnetic fields. 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 is considered, provided those modifications can be made at low or no cost and will not interfere with the operation of the line.

The program will be applied to this Project and designed with clearances that are at least three feet higher than NESC standards.

Attachment 5

MANO-MLWD REBUILD PROJECT

STATE AGENCIES

Pennsylvania Bureau of Investigation and Enforcement
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
2nd Floor, Room-N201
Harrisburg, Pennsylvania 17120
Attn: Richard Kanaskie

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

Pennsylvania Department of Transportation
Keystone Building
400 North Street, Fifth Floor
Harrisburg, Pennsylvania 17120
Attn: Jason D. Sharp, Chief Counsel

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

Pennsylvania Department of Conservation and Natural Resources
Rachel Carson State Office Building
400 Market Street
Harrisburg, Pennsylvania 17105-8767
Attn: Rebecca Bowen, Ecological Services Section Chief

Pennsylvania Game Commission
2001 Elmerton Avenue
Harrisburg, Pennsylvania 17110-9797
Attn: Peter Sussenbach, Director, Bureau of Wildlife Habitat Management

Pennsylvania Fish and Boat Commission
450 Robinson Lane
Bellefonte, Pennsylvania 16823-9620
Attn: Christopher A. Urban, Chief, Natural Diversity Section

Pennsylvania Office of Consumer Advocate
555 Walnut Street
5th Floor Forum Place
Harrisburg, Pennsylvania 17101-1923
Attn: Tanya J. McCloskey, Acting Consumer Advocate

Pennsylvania Office of Small Business Advocate
555 Walnut Street
1st Floor Forum Place
Harrisburg, Pennsylvania 17101
Attn: Steven C. Gray, Sr. Supervising Assistant Small Business Advocate

FEDERAL AGENCIES

U.S. Army Corps of Engineers
Baltimore District Corporate Communication Office
2 Hopkins Plaza
Baltimore, Maryland 21201
Attn: Planning Division

U.S. Fish and Wildlife Service
Pennsylvania Field Office
110 Radnor Rd, Suite 101
State College, Pennsylvania 16801
Attn: Lesa Lindsay

COUNTY AGENCIES

Lancaster County Conservation District
1383 Arcadia Road, Room 200
Lancaster, Pennsylvania 17601
ATTN: Christopher Thompson, District Manager

Lancaster County Planning Commission
150 North Queen Street, Suite #320
Lancaster, Pennsylvania 17603
ATTN: Alice Yoder, Chairperson

MUNICIPALITIES

Conestoga Township
3959 Main Street
Conestoga, Pennsylvania 17516
ATTN: William Rankin, Supervisor

Manor Township
950 West Fairway Drive
Lancaster, Pennsylvania 17603
ATTN: J. Ryan Strohecker, Township Manager

Pequea Township
1028 Millwood Road
Willow Street, Pennsylvania 17584
ATTN: Henry D. Lehman, Chairperson

LANDOWNERS

RICHARD J. ABBIATI 506 WAVERLY ROAD WYCKOFF, NJ 07481-1229	GEORGE A. BARD 121 SHENKS FERRY ROAD CONESTOGA, PA 17516-9403
ADNAN BRKIC AND MARIA F. KUZIO 20 BUCK RUN ROAD CONESTOGA, PA 17516-9578	GARY D. AND FAY A. BRODERICK 110 SHENKS FERRY ROAD CONESTOGA, PA 17516-9403
BRIAN W. AND AMELIA L. BURTON 30 GRANDVIEW LANE CONESTOGA, PA 17516-9686	MICHAEL S. AND WANDA J. CONNELLY 88 BUCK RUN ROAD CONESTOGA, PA 17516-9578
DONALD L. AND CHRISTINE A. CONNELLY 90 BUCK RUN ROAD CONESTOGA, PA 17516-9578	CHRISTIAN L. AND ANNIE G. FISHER 6580 RIVER ROAD CONESTOGA, PA 17516-9596
GEORGE K. AND AMANDA M. GESNER 22 GRANDVIEW LANE CONESTOGA, PA 17516-9686	DONALD E. AND RAE ANN M. HENRY 26 BUCK RUN ROAD CONESTOGA, PA 17516-9578

RICHARD D. AND ROSE A. KENDIG 1055 STONE HILL ROAD CONESTOGA, PA 17516-9652	BRIAN D. AND VICKI R. KNISELY 6664 RIVER ROAD CONESTOGA, PA 17516-9749
ERIK M. AND TRACY S. LAGAZA 28 CRESTVIEW DRIVE AKRON, PA 17501-1108	JOLINDA A. MURILLO AND JOSE SANTIAGO 6612 RIVER ROAD CONESTOGA, PA 17516-9749
STEVEN ORPNECH AND ALEXIS H. LE 28 GRANDVIEW LANE CONESTOGA, PA 17516-9686	SCOTT M. AND JUDY A. PHILLIPS 18 GRANDVIEW LAND CONESTOGA, PA 17516-9686
JAMES N. REIFF AND ALLISON S. KAPALKA 42 BUCK RUN ROAD CONESTOGA, PA 17516-9578	JAMES D. SCHWEBEL 120 CORRY AVENUE LANCASTER, PA 17601-3934
PAUL H. AND BRENDA SOUDERS 72 SHENKS FERRY ROAD CONESTOGA, PA 17516-9404	SAFE HARBOR WATER POWER COMPANY C/O PAUL BRENTON 200 DONALD LYNCH BOULEVARD, SUITE 300 MARLBOROUGH, MA 01752
AMTRACK C/O JONATHAN DEVRIES 30TH STREET STATION 2955 MARKET ST., BOX 64 PHILADELPHIA, PA 19104	

VERIFICATION

I, JOSEPH B. LOOKUP, being the Director of Asset Management 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: November 23, 2021

Joseph B. Lookup (Nov 23, 2021 13:50 EST)

Joseph B. Lookup