

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Application of PPL Electric Utilities :
Corporation Filed Pursuant to 52 Pa. Code :
Chapter 57, Subchapter G, for Approval of the : Docket No. A-2013-_____
Siting and Construction of the Double-Circuit :
138/69 kV Honey Brook – Twin Valley :
Transmission Line in Portions of Caernarvon :
Township in Berks County, Honey Brook :
Township in Chester County and Caernarvon :
Township in Lancaster County, Pennsylvania :
:

APPLICATION OF PPL ELECTRIC UTILITIES CORPORATION

TO THE PENNSYLVANIA PUBLIC UTILITY COMMISSION:

PPL Electric Utilities Corporation (“PPL Electric” or the “Company”) hereby files, pursuant to 52 Pa. Code § 57.72, this Application requesting Pennsylvania Public Utility Commission (“Commission”) approval to site and construct the Honey Brook – Twin Valley double-circuit 138/69 kV Transmission Line to connect the Honey Brook and Twin Valley 69-12 kV distribution substations (the “Project”) in order to improve service by resolving projected reliability violations of PPL Electric’s Reliability Principles and Practices (“RP&P”). The Project is located in portions of Caernarvon Township in Berks County, Honey Brook Township in Chester County and Caernarvon Township in Lancaster County. The reliability violations include excessive load losses in the event of outages of certain other transmission facilities in the area. The Project will enable PPL Electric to restore service to all customers served through the Honey Brook, Twin Valley and Morgantown substations in the event of an outage of the transmission lines that supply them. Presently, the Honey Brook Distribution Substation is supplied by a single, one circuit transmission line. The Morgantown 69-12 kV Distribution

Substation is supplied by a double-circuit transmission line. Both circuits can be used to supply the Morgantown Substation. One of the two circuits that supply the Morgantown Substation continues on and provides the only source of supply for the Twin Valley Distribution Substation. The proposed transmission line to connect the Honey Brook and Twin Valley distribution substations will enable PPL Electric to continue to provide service through the Honey Brook, Twin Valley and Morgantown substations in the event of an outage of the transmissions lines that presently supply them.

Subject to the Commission's approval, construction is scheduled to begin by August 2014 to meet the system in service date of March 2015. The proposed Honey Brook – Twin Valley Transmission Line will be approximately 5.3 miles in length. The estimated cost to site, design and construct the Project is \$10.5 million.

PPL Electric has explained the Project to representatives of Township of Caernarvon in Berks County, the Township of Honey Brook in Chester County and the Township of Caernarvon in Lancaster County, as well as to representatives of Berks, Chester and Lancaster counties, and they did not object to the Project.

In support of this Application, PPL Electric states as follows:

I. INTRODUCTION AND OVERVIEW

1. This Application 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:

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Two North Ninth Street
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PPL Electric's attorneys are authorized to receive all notices and communications regarding this Application.

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 those terms are defined in Sections 102 and 2803 of the Pennsylvania Public Utility Code, 66 Pa.C.S. §§ 102, 2803, respectively.

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. Accompanying this Application in a separate three-ring binder are the following Attachments that provide additional detailed information regarding the Project:

- Summary
- Attachment 1 PUC Regulation Cross-Reference Matrix
- Attachment 2 Necessity Statement
- Attachment 3 Environmental Setting
- Attachment 4 Siting Analysis
- Attachment 5 Design and Engineering Description
- Attachment 6 List of Owners of Property Within the Right-of-Way
- Attachment 7 Agency Permitting Requirements
- Attachment 8 List of Government Agencies, Municipalities and Other Public Entities Receiving the Application
- Attachment 9 List of Government Agencies, Municipalities, and Other Public Entities Contacted
- Attachment 10 List of Public Locations Where Application can be Examined
- Attachment 11 PPL Electric Magnetic Field Management Program
- Attachment 12 Vegetation Management
- Attachment 13 PPL Design Criteria and Safety Practices
- Attachment 14 Agency Coordination (PNDI/Wetlands)
- Attachment 15 Cultural Resources Report
- Attachment 16 Public Notice Requirements

This Application, including the accompanying Attachments, which are incorporated herein by reference, contains all of the information required by 52 Pa. Code §§ 57.72(c), 69.1101, 69.3102 – 69.3107.

II. NEED FOR THE PROJECT

A. TRANSMISSION PLANNING

7. System planning is the process which assures that transmission systems can supply electricity to all customer loads reliably and economically. The reliable and economical operation of transmission systems requires planning criteria for system expansion and reinforcement. The PPL Electric reliability and planning criteria are set forth in PPL Electric's RP&P, which was developed to ensure adequate and appropriate levels of electric service to its customers consistent with good utility practice.

8. In accordance with the RP&P criteria, PPL Electric's transmission system is planned so that it can be operated at all projected load levels and during normal scheduled outages to withstand specific unscheduled contingencies without exceeding the equipment capability, causing system instability, cascade tripping, or voltage levels that exceed tolerances. The transmission system is required to have adequate capability so that it can be operated normally and can withstand certain unscheduled contingencies and other system conditions. A further description of PPL Electric's system planning process is provided in Attachment 2 to this Application, the Necessity Statement.

9. PJM Interconnection, L.L.C. ("PJM") is a Federal Energy Regulatory Commission ("FERC") approved Regional Transmission Organization charged with ensuring the reliability of the electric transmission system under its functional control and coordinating the movement of electricity in all or parts of thirteen states and the District of Columbia, including Pennsylvania. PPL Electric, an owner of transmission facilities in Pennsylvania, is a member of PJM and actively participates in the PJM transmission planning process.

10. In order to ensure reliable transmission service, PJM prepares an annual Regional Transmission Expansion Plan ("RTEP") to ensure power continues to flow reliably to customers.

The North American Electric Reliability Corporation, PJM and transmission owner reliability criteria are used by PJM and the transmission owners to analyze the system and determine if specific transmission upgrade projects are needed to ensure long-term reliable electric service.

11. The PJM transmission system includes both the bulk electric system (“BES”) and the non-bulk electric system (“non-BES”). The BES is operated at voltages of 100 kV or higher. The non-BES is operated at less than 100 kV.

12. The local transmission operator, in this case PPL Electric, is responsible for identifying the reliability violations and correcting any violations to meet its own reliability and planning criteria on its non-BES.

13. In order to meet this responsibility, PPL Electric undertakes an independent analysis of its non-BES transmission system facilities to ensure that these facilities meet the planning criteria set forth in the RP&P. Based upon this analysis, PPL Electric determined that the proposed Honey Brook – Twin Valley Project is necessary to resolve violations of PPL Electric’s local planning criteria on the 69 kV system serving customers in Berks, Chester and Lancaster counties.

14. The Honey Brook – Twin Valley Project was presented to PJM for review and inclusion in the RTEP in November 2010. The Project was presented before stakeholders at the Mid-Atlantic Sub-Regional RTEP meeting on March 2, 2011, approved by the Board of PJM and included in the 2011 RTEP Report as baseline project b1526.

15. Once the PJM Board approves the RTEP that includes a transmission owner’s project such as the Honey Brook – Twin Valley Project, the transmission owner is obligated to implement the project under the PJM Open Access Transmission Tariff and the operating agreements.

16. Attachment 2 to this Application, the Necessity Statement, contains a detailed description of PJM's RTEP transmission planning process and PPL Electric's transmission planning process. Attachment 2 also explains that the Honey Brook – Twin Valley Project is necessary to resolve projected violations of PPL Electric's RP&P.

B. EXISTING SYSTEM

17. The existing Honey Brook 69-12 kV Substation is supplied from a 69 kV tap off the South Akron – Morgantown #2 kV Transmission Line. This tap is approximately 3.3 miles long and provides the only supply for the Substation. The Morgantown 69-12 kV Substation is supplied by the double-circuit #1 and #2 South Akron – Morgantown 69 kV Transmission Line. Normally, the Morgantown 69-12 kV Substation is served through the #1 and #2 circuits. From the Morgantown Substation, Twin Valley 69-12 kV Substation is supplied from a 1.7 mile long tap off the South Akron – Morgantown #1 69 kV Transmission Line, which is the sole source of supply. A portion of this tap, approximately 0.4 mile, is buried (underground facilities).

18. Due to customer demand load growth at 1.3% per year in the area, including the increasingly large customer load at Titanium Metals Corporation (TIMET) in Morgantown, the transmission planning studies project, for 2014 and beyond, that the loss the Twin Valley 69 kV Taps would interrupt approximately 40 MW of load, which equates to approximately 1,700 customers, including large industrial loads. Moreover, an outage in the approximately 0.4-mile underground line section of the Twin Valley tap could result in substantially longer outages for the customers served from the Twin Valley Substation due to the length of time required to repair underground facilities.

19. There are currently no alternate 69 kV ties to the Twin Valley 69 kV Taps to restore customer load in the event of an interruption. PPL Electric's RP&P states that the maximum allowable load loss is 30 MW for a single-circuit outage. This loss of load is

projected to increase every year as customer load served by the Twin Valley Substation increases. This amount of load loss would violate the RP&P criteria.

20. Furthermore, a loss of the double circuit South Akron – Morgantown #1 & #2 69 kV circuits would interrupt approximately 71 MW of load or 11,200 customers, including large industrial load. PPL Electric would be able to sectionalize the transmission system to restore a portion of this load within a few hours. However, after all switching moves are made to restore customer load, approximately 54 MW of load, or 3,700 customers, would remain interrupted for an extended period of time until repairs are completed. This amount of load loss is projected to increase every year as load served by the Twin Valley Substation increases. The RP&P states that the maximum allowable load loss is 45 MW for a double circuit outage. This load loss would violate that RP&P criteria.

21. During particular severe weather events that caused outages of transmission facilities, a backup or alternate transmission supply line would have enabled PPL Electric to restore more customer load in a shorter period of time. The South Akron – Morgantown #1 & #2 69 kV circuits have experienced 16 interruptions over the past 20 years which resulted in extended outages for the customers served from these circuits. If a different, additional source of supply had been available, service to additional customers could have been restored quicker.

22. In addition, load has been growing significantly in this area. The customers in eastern Lancaster County, southwestern Berks County and western Chester County areas served by the South Akron – Morgantown #1 & #2 69 kV circuits have increased their electric demands over the past 10 years by 1.4 percent annually on average.

23. PJM projects a 1.3% annual future summer demand growth rate for the overall PPL zone for future years. In addition, this area is experiencing significant industrial

development that could result in further load growth. Improvements to the local transmission facilities are necessary to maintain reliable service.

C. PROPOSED SOLUTION

24. To resolve the violations described above, PPL Electric, upon approval from the Commission, plans to construct a new double-circuit 138 kV transmission tie line, initially operated as a single-circuit 69 kV line, between the Honey Brook 69 kV Tap (near the Honey Brook 69/12 kV Substation) and the Twin Valley 69 kV Tap (near Twin Valley 69/12 kV Substation), a distance of approximately 5.3 miles. PPL Electric will design the new line to current 138 kV standards but will operate the line at 69 kV initially.

25. PPL Electric determined that this proposed new 138/69 kV line will resolve the RP&P transmission violations in the area because it will provide load transfer capability by means of a second supply. After this reinforcement Project has been constructed and in service, PPL Electric will be able to restore service to all customers through load sectionalizing moves in the event of an outage of the Twin Valley 69 kV Tap. Similarly, after this reinforcement Project is completed and in service, PPL Electric will be able to restore service to all customer load through load sectionalizing moves in the event of an outage of the South Akron – Morgantown #1 & #2 69 kV double-circuit Transmission Line near the Morgantown Substation.

26. Additionally, this reinforcement will provide a backup supply line to the Honey Brook Substation in the event of an outage of the 69 kV Tap to Honey Brook. Although the Honeybrook Substation load has not yet surpassed 30 MW, it is expected to reach this level in the next 10 to 15 years.

27. The functional arrangement of the existing and proposed transmission facilities in the area is shown in Figures 2-1 and 2-2, respectively, to Attachment 2, the Necessity Statement.

28. The total estimated cost for the proposed Project is approximately \$10.5 million.

III. ENGINEERING DESCRIPTION OF THE PROPOSED TRANSMISSION LINE

29. The total estimated costs to site, design and construct the Honey Brook – Twin Valley 138/69 kV Transmission Line Project is approximately \$10.5 million. This cost includes the siting, design, right-of-way acquisition and construction of the proposed transmission line.¹ Subject to the Commission's approval, construction of this Project is scheduled to begin in August 2014 to meet a system in-service date of March 2015.

30. PPL Electric proposes to construct a new 5.3-mile long transmission line to strengthen the electrical delivery system and improve reliability of service in the region.

31. The Project will begin northwest of PPL Electric's Honey Brook 69-12 kV Substation in Honey Brook Township, Chester County and will terminate near the existing Twin Valley 69-12 kV Substation in Caernarvon Township, Berks County. The Preferred Route for the new Line will generally travel in a northeasterly direction between the two substations through Honey Brook Township in Chester County, Caernarvon Townships in Lancaster County and Caernarvon Township in Berks County.

32. The Project will involve the installation of a new double-circuit 138/69 kV transmission line. Initially, however, only one circuit will be installed and it will operate at 69 kV until load growth in the area warrants the addition of the second circuit or an increase in the operating voltage.

33. The transmission line will be installed on new single-shaft steel poles. The tangent structures for the proposed new transmission line will be equipped with steel arms. Angle structures will be single-pole or two-pole steel structures, depending on the severity of the

¹ The design of the Line is preliminary. All figures and costs are estimated and are subject to change based on actual conditions and final design and engineering of the proposed transmission line.

line angle. The majority of poles will be direct embedded. Some poles, however, will be installed on concrete foundations in agricultural areas to avoid installing guy wires that could interfere with farming operations, in floodplains to elevate the steel structures above the floodplain, and in other areas as needed based on geotechnical considerations or structure tension. In addition, some direct embedded angled structures may be guyed instead of being installed on concrete foundations due to accessibility and terrain issues. Based on preliminary engineering, this Project requires the installation of approximately 52 structures, ranging from 88 to 120 feet in height. The average pole height will be approximately 100 feet. The average span length will be approximately 540 feet. The proposed structure types are shown in Figures 5-1 through 5-3 to Attachment 5.

34. The Line will have two overhead ground wires and each circuit will consist of three power conductors. Because the Line will be designed for double circuit operations, the structures will be designed to support six power conductors, although initially only one circuit will be installed. Each conductor will be 556.5 kcmil,² 24/7 stranding aluminum conductor steel reinforced (“ACSR”). The overhead ground wires will be a 48 fiber 0.567-inch diameter Optical Ground Wire (“OPGW”). The overhead ground wire will provide lightning protection for the proposed tie line.

35. The minimum conductor to ground clearance for the proposed 138/69 kV line will be 30 feet, which occurs at a maximum conductor temperature of 125°C. Table 5-1 and Table 5-2, in Attachment 5 identify the designed minimum conductor clearances and the conductor thermal ratings of the conductors, respectively.

² “Kcmil” stands for thousand circular mils. Kcmil wire size is the equivalent cross sectional area in thousands of circular mils. A circular mil is the area of a circle with a diameter of a thousandth (0.001) of an inch.

IV. LAND USE, ENVIRONMENTAL AND CULTURAL RESOURCES

36. The Routing Team identified a Study Area encompassing approximately 10,715 acres (16.7 square miles) within Chester, Berks and Lancaster counties, Pennsylvania. The Project Study Area is bounded generally by the intersection of the Pennsylvania Turnpike (“I-76”) and State Route 23 to the north; Robert G. Struble Lake, Chestnut Tree Road and Township Line Road to the east; Honey Brook Borough and U.S. Route 322 to the south; and the intersection of Maxwell Hill Road and Conestoga Creek Road west of State Route 10 to the west. The Study Area includes portions of Honey Brook Township, West Nantmeal Township and Honey Brook Borough in Chester County, Caernarvon Township in Berks County and Caernarvon Township in Lancaster County. A detailed analysis of the Study Area is provided in Attachment 3.

37. In its analysis, the PPL Electric used many sources of information to evaluate the Study Area including aerial imagery, federal, state and local Geographic Information System (“GIS”) data, U.S. Geological Survey (“USGS”) maps, county and municipal planning reports and field reconnaissance.

38. Land uses in the Study Area include agriculture, forest land, suburban and rural development, commercial development, open space and fields, water and wetlands and industrial lands. Each of these land uses in the Study Area is summarized below.

39. Agricultural uses are the predominant land use type in the Study Area. Agriculture represents a significant portion of the economy in the Study Area.

40. The Pennsylvania Agricultural Area Security Law of 1981, 3 Pa.C.S. §§ 901-15, the Pennsylvania Agricultural Conservation Easement Purchase Program and the Pennsylvania Farmland and Forest Land Assessment (“Clean and Green”) Act of 1974 provide certain protections for farmlands. Portions of the land used for agricultural purposes in the Study Area

are subject to these programs. Nevertheless, public utilities are permitted to construct facilities in protected areas if applicable requirements are met.

41. Forests provide settings for recreational experiences such as hunting, fishing, hiking, nature observations, camping and many other outdoor activities. Forested lands also provide watershed protection and habitat for various types of flora and fauna. In residential areas, forest remnants and woodlots serve as landscaping and provide privacy screening. Areas of forest exist on private lands scattered throughout the Study Area, particularly along Welsh Mountain, a forested ridge that extends along the boundary between Chester and Lancaster counties and into southern Berks County. Protection of headwater areas in the foothills of Welsh Mountain is a priority in the Honey Brook Township Land Preservation Plan. No state forests are located within the Study Area.

42. No high density developed areas are located within the Study Area. Honey Brook Borough in the south and Morgantown, in Caernarvon Township, Berks County in the north, are the most populated places in Study Area. Many smaller residential areas are scattered throughout the Study Area.

43. The population within the Study Area increased between 2000 and 2010 and is generally projected to increase by another 7 to 10 percent between 2010 and 2020. In Berks County, Caernarvon Township's population increased over 70 percent between 2000 and 2010, which far exceeded county and regional estimates prepared in 2003-2004. Therefore, although both county and regional estimates anticipated an increase in the township population in 2020, the projected population is actually below the 2010 actual census population count. Thus, the projected population of Caernarvon Township in Berks County for 2020 is probably understated.

44. Most commercial businesses in the Study Area are in the populated areas or adjacent to the Pennsylvania Turnpike.

45. One airport, the Morgantown Airport, is located within the Study Area. It is located in the northernmost part of the Study Area, approximately 0.5 mile northwest of the Twin Valley Substation.

46. The Study Area contains several types of linear features, including roads, electric transmission and a natural gas pipeline.

47. Roads serving the Study Area include the Pennsylvania Turnpike, State Highways 10 and 23 and numerous county and local roads. None of the Alternative Routes cross federal or PennDOT designated scenic byways.

48. A few electric transmission lines are located in the Study Area. The Twin Valley Substation is served by a 1.7-mile transmission tap line off the South Akron – Morgantown #1 69 kV Line, which parallels and crosses the Pennsylvania Turnpike and enters the substation from the west. The 138 kV Honey Brook Tap Line originates at a substation in Honey Brook Borough and traverses the southwestern portion of the Study Area. An underground natural gas pipeline bisects the northern portion of the Study Area.

49. As a general rule, the placement of electric transmission lines by a public utility in Pennsylvania is exempt from zoning ordinances. The Commission, however, in its Policy Statement on Local Land-use Plans and Ordinances has stated that it will consider the impact of its decisions on local comprehensive plans and zoning ordinances in electric transmission siting proceedings. 52 Pa. Code § 69.1101.

50. PPL Electric collected and reviewed all county and township comprehensive or land use plans for Lancaster, Berks and Chester counties that apply to the Study Area.

Comprehensive plans serve as a means for local governments to assess existing development and guide future development. Comprehensive plans provide general guidance only and are not intended to regulate development. Common themes among the plans include a discussion of challenges associated with accommodating significant growth in the region and the importance of preserving farmland and open space. The plans do not contain specific guidance regarding the siting of electric transmission lines but generally recognize that electric utility infrastructure needs to be reinforced from time to time.

51. All townships within the Study Area have enacted zoning ordinances. The zoning districts established by these ordinances are generally designed to guide future land use in the municipality by encouraging the development of desirable residential, commercial, agricultural and manufacturing areas in appropriate groups of compatible and related uses.

- a. The portion of the Study Area located in Honey Brook Township is mostly lands zoned A (agricultural) and but also includes lands that are zoned R (residential), I (industrial), FR (farm residential) and RC (resource conservation).
- b. The portion of the Study Area in Caernarvon Township in Berks County is zoned EAP (Effective Agricultural Preservation), I-1 (Limited Industrial), C-1 (Mixed Commercial), R-1 (Rural Conservation), PRD (Planned Residential Development), R-5 (Suburban Residential), R-6 (Suburban Residential), C-2 (Neighborhood Commercial) and C-3 (Highway Commercial).
- c. The portion of the Study Area within Caernarvon Township in Lancaster County consists primarily of lands zoned Agricultural, with smaller areas zoned Open Space Conservation, Mineral Recovery and Highway Commercial/Light Industrial.

- d. The portion of the Study Area located within West Nantmeal Township includes lands that are zoned R1 (Agricultural Preservation) and R2 (Rural Residential).³

Electric transmission lines are generally permitted under these ordinances as necessary for “essential service,” “public utility” or similar categorizations.

52. Below, information on recreational areas within approximately two miles of the Alternative Routes, including State Game Lands, State Parks, city and municipal parks, named trails, swimmable, boatable and fishable waters of the United States and other state and local resources is summarized.

53. No federal or county-owned recreational areas exist within the Study Area. Robert G. Struble Lake Park contains a 386-acre impoundment owned by the Commonwealth and managed by the Pennsylvania Fish and Boat Commission and Pennsylvania Game Commission for public fishing and boating. The Park is located along the southeastern edge of the Study Area in Honey Brook Township. No privately-owned recreational resources were identified in the Study Area.

54. The Study Area is part of the region known as the Piedmont, with a topography consisting of rolling hills and valleys. Several tributary streams of the Susquehanna River flow through the Study Area, including Brandywine Creek, the Conestoga River and their smaller tributaries. The landscape is generally characterized by farmland and open space, with expanses of forest along the higher ridges of the Welsh Mountain area and pockets of forest interspersed throughout the landscape. The aesthetics of the Study Area are largely characteristic of a rural/agricultural setting, while the aesthetics of areas around Honey Brook Borough, Morgantown and the I-76 corridor are more typical of developed areas.

³ Although a portion of Honey Brook Borough is in the Study Area, PPL Electric did not identify feasible routes in the Borough. Therefore, the Routing Team did not review planning documents for the Borough.

55. Resources of historic architectural and archaeological significance are located in the Study Area. To identify them, PPL Electric reviewed the Pennsylvania Historical and Museum Commission (“PHMC”)/Bureau of Historic Preservation (“BHP”) Cultural Resource Geographic Information System (“CRGIS”) on-line inventory of cultural resources.

56. Nine previously recorded historic architectural sites were identified within the Study Area: five in Berks County, three in Chester County and one in multiple counties.

57. Fifty-two previously recorded archaeological sites were identified in the Study Area: 16 in Berks County, 30 in Chester County and six in Lancaster County. According to CRGIS, one site was listed or determined eligible by the Keeper of the National Register, three sites were considered eligible by the submitter and 48 of the 52 sites were of undetermined eligibility due to insufficiency of available data.

58. Natural resources evaluated include geology and soils, water resources, vegetation and wildlife. Each of these resources is discussed below.

59. The Project Study Area is located in the southeastern portion of the Commonwealth in the Piedmont Province. The routes cross three different Sections of the Province: the Gettysburg-Newark Lowland Section, the Piedmont Lowland Section and the Piedmont Upland Section.⁴ Approximately 2 percent of the Study Area is located within the Gettysburg-Newark Lowland Section, while approximately 32 percent of the Study Area is located within the Piedmont Lowland Section and approximately 67 percent is located within the Piedmont Upland Section of the Piedmont Province.

60. The Gettysburg-Newark Lowland Section is generally characterized by rolling low hills and valleys developed on red sedimentary rock. The Piedmont Lowland Section is

⁴ A Section (*i.e.*, a succession of rock units) is then composed of a number of individual geologic units or formations.

generally characterized by broad, moderately dissected valleys separated by broad low hills. The Piedmont Upland Section is generally characterized by rounded hills, low ridges, relative high relief developed on metamorphic rock.

61. Various soil series are located within the Study Area. Approximately 10 percent of the soil series is hydric; approximately 71 percent are partially hydric; approximately 17 percent are non-hydric; and 1 percent is unclassified.⁵

62. No soil conditions were found that would limit construction of the proposed Project.

63. PPL Electric reviewed the water resources in the Study Area. River and streams were identified by using the National Hydrography Dataset (“NHD”).

64. The Study Area is located partially in the Chesapeake and partially in the Delaware watersheds. The Conestoga River runs predominantly northeast to southwest through the Study Area. It is a tributary of the Susquehanna River in the Chesapeake watershed.

65. Two branches of Brandywine Creek and six unnamed tributaries are located on the southeastern edge of the Study Area in Chester County. The East Branch and West Branch of the Brandywine Creek are tributaries to the Christiana River in the Delaware watershed. The East and West Branches and their tributaries form generally northeast of the Borough of Honey Brook and flow east to southeast.

66. Pennsylvania Water Quality Standards, 25 Pa. Code § 93.3, designate protected water uses which provide the basis for water quality criteria. Special quality waters consist of exceptional value and high quality waters. Those pertaining to biological uses include the

⁵ The NRCS National Soil Survey Handbook (NSSH), Part 614, defines hydric soil as a soil that forms under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils can indicate the presence of wetlands, ponds, streams and other hydro-related features.

maintenance and propagation of aquatic life, including coldwater and warmwater fisheries and fish that travel to or from salt water to spawn.

67. The Pennsylvania DEP protects four stream water uses: aquatic life, fish consumption, potable water supply and recreation. If a stream segment is not attaining any of these four uses, it is considered impaired. The Conestoga River and its tributaries are currently considered impaired as a result of nutrient and siltation pollution associated with farming and low oxygen levels.

68. PPL Electric used the U.S. Fish & Wildlife Service's National Wetland Inventory ("NWI") to preliminarily identify potential wetlands. The NWI produces information on the characteristics, extent and status of wetlands and deep water habitats. In addition, PPL Electric used hydric soils mapped by the Natural Resource Conservation Service.

69. PPL Electric presently is in the process of formally delineating wetlands along the Preferred Route using the U.S. Army Corps of Engineers 1987 Methodology. Formal delineations allow the line to be engineered to minimize impacts to wetlands and streams as much as practical. PPL Electric will continue its consultation with DEP, County Conservation Districts and the U.S. Army Corps of Engineers to further discuss wetland and sediment and erosion permitting requirements.

70. In evaluating the Study Area for siting the Honey Brook – Twin Valley 138/69 kV Transmission Line, PPL Electric identified 100-year floodplains. Floodplains are typically associated with streams and wetland complexes. In the Study Area, floodplains are generally concentrated to the north along the Conestoga River, West Branch of the Conestoga River and their respective tributaries in Caernarvon Township, Berks County and Caernarvon Township, Lancaster County as well as to the south along the West and East Branches of Brandywine Creek

and their respective tributaries in West Nantmeal and Honey Brook townships, Chester County. No floodplains are located in the central portion of the Study Area.

71. Much of the Study Area is farmed. According to the National Land Cover Database, the Study Area is dominated by grassland/pasture (40 percent), with lesser amounts of forest (25 percent) and cultivated croplands (24 percent). Grassland/pasture and cultivated croplands comprise the northern and southern portions of the Study Area, whereas forest cover is concentrated in a northeast to southwest linear path, generally along the Welsh Mountain ridge. Natural vegetation in the area is a Mixed Oak Forest, which typically include of various species of oak, tulip poplar, red maple and beech trees.

72. In analyzing the Study Area, PPL Electric identified special natural areas. A Natural Areas Inventories (“NAI”) has been prepared by The Nature Conservancy in association with the Pennsylvania Natural Heritage Program (“PNHP”) for Lancaster, Berks and Chester counties. The NAI includes information on the locations of rare, threatened and endangered species and the highest quality natural areas.

73. The NAI identified two special natural areas in the Study Area: (1) the Conestoga River Headwaters in Caernarvon Township, Berks County and Caernarvon Township, Lancaster County and Honey Brook Township, Chester County and (2) the West Branch Brandywine Creek in Honey Brook Township.

74. The Conestoga River Headwaters are primarily located within Berks County but include small areas in Chester and Lancaster counties. This natural area contains a diversity of habitats within a landscape formerly dominated by agriculture. The NAI indicates that a species of concern may be present in this area, but it is not specifically identified.

75. Most of the wetlands in the West Branch Brandywine Creek area were drained or dammed to create fields or farm ponds for agricultural production. Four species of concern are currently known to live in these wetlands including the Pennsylvania rare bushy bluestem, the Pennsylvania threatened sweet bay magnolia, the Pennsylvania endangered swamp lousewort and a specific plant species of concern not identified in the NAI.

76. In order to identify any threatened, endangered or rare species, on April 27, 2012, PPL Electric submitted a Large Project Review Pennsylvania Natural Diversity Inventory (“PNDI”) request to the three agencies responsible for the protection of rare wildlife species in Pennsylvania, the U.S. Fish & Wildlife Service (USFWS), Pennsylvania Game Commission (PGC) and Pennsylvania Fish and Boat Commission (“PFBC”). The results of these agency contacts are summarized below in Siting Analysis.

V. SITING ANALYSIS

77. The goal of the route selection study is to gain a detailed understanding of the opportunities and constraints in the Project Study Area to facilitate the development of Alternative Routes, evaluate potential impacts associated with the Alternative Routes and, ultimately, identify a Preferred Route for the Project. The Preferred Route is defined as the route that minimizes the effect of the transmission line on the natural and human environment, while avoiding unreasonable and circuitous routes, extreme costs and non-standard design requirements. Below, the Alternative Route identification, evaluation and selection process for the proposed Honey Brook – Twin Valley 138/69 kV Transmission Line Project are described.

78. A multi-disciplinary Routing Team performed the routing study. Team members were selected to bring wide experience to the routing study to achieve a thorough review of all aspects of developing the route. Members of the Routing Team have experience in transmission line routing, impact assessment for a wide variety of natural resources and the human

environment, impact mitigation, engineering and construction management. The team's objective was to identify a route that provided a reasonable balance between impacts on local communities and the natural environment, as determined through application of appropriate siting criteria and subject to technical guidelines.

79. The team worked together during the route selection study to define the study area, develop routing criteria, identify routing constraints and opportunities, collect and analyze environmental and design data, solicit public input and concerns, consult with resource and permitting agencies, develop and revise the siting alternatives and analyze and report on the selection of a Preferred Route.

80. Extensive use was made of existing GIS data. This information was obtained from many sources, including federal, state and county governments. Much of this information was obtained through official agency GIS data access websites, some was provided directly by government agencies and some was created by the Routing Team by either digitizing information from paper-based maps or through aerial photo interpretation.

81. The use of GIS data allows for the consideration and efficient use of a wide variety of information that would otherwise be unavailable or impractical to consider for a planning effort of this scope. GIS information is a highly effective tool when utilized for broad level planning studies, identifying and characterizing landscape level constraints and features and developing environmental inventory information useful for comparisons between planning alternatives.

82. Other maps reviewed for the Route Selection Study included U.S. Geological Survey ("USGS") 7.5-minute topographic quadrangle maps, existing County-level and park-

level natural resource maps, state and county road maps, transmission line map information and land ownership maps.

83. Routing Team members conducted field inspections throughout the Study Area. The team examined potential routes by automobile from points of public access and correlated observed features to information shown on aerial photography, USGS 7.5 minute topographic maps, road maps, locally available development sketch maps and other information. Relevant features were viewed, verified and recorded on laptop computers displaying aerial photography using GIS software supported by real-time Global Positioning System (“GPS”) tracking for positional information in each vehicle. The Routing Team conducted a preliminary field review in May 2011 to identify major constraints and to familiarize the Routing Team with the Study Area. Detailed field reconnaissance was conducted in February and April 2012 to review the Potential Routes and identify constraints. Subsequent field visits were conducted in December 2012.

84. The route development process is inherently iterative, with frequent modifications throughout the study as a result of the identification of new constraints, input from agencies, landowners and other stakeholders, periodic re-assessments of routes with respect to the routing criteria and adjustments to the overall route network. As a result of the evolving nature of the route development process, the Routing Team uses specific vocabulary to describe the routes at different stages in the process. Routes that are first identified and investigated by the Routing Team are referred to as “Potential Routes.”

85. Where Potential Routes intersect, links are formed as the segment of the route between two intersections. Together, the Potential Routes and their intersecting links are referred to as the Potential Route network.

86. As the route development process progresses, the Routing Team continues to evaluate new data and modifies the links of the Potential Route Network as appropriate. Eventually, formal Alternative Routes are developed by assembling the links that best meet the routing criteria into individual routes for analysis. The Routing Team then identifies a “Proposed Route” for review and approval, along with the other Alternative Routes.

87. The primary objective in identifying a suitable route for the Project was to minimize effects of the line on natural resources, humans, land uses, cultural resources and recreational resources, while providing safe, reliable and economic service to the region.

88. Identifying a route that minimizes constraints and maximizes opportunities requires a balancing and prioritization of many factors. For example, a route with minimal impacts on wildlife habitat may have increased impacts on residential resources and vice versa. In addition, federal and state laws and input from federal, state and sometimes local regulatory agencies may impact siting decisions.

89. Once the Study Area was identified, the Routing Team met in February 2012 to develop basic route selection criteria that would be used to analyze and select potential Alternative Routes. The recommendations for Project siting are based on the primary objective stated above and the following criteria and technical guidelines. In siting the Project, PPL Electric attempted to minimize:

- Route length, circuitry, cost and special design requirements,
- The removal or substantial interference with the use of existing residences,
- The removal of existing barns, garages, commercial buildings and other nonresidential structures,
- Interference with the use and operation of existing schools, recognized places of worship, cemeteries and facilities used for cultural, historical and recreational purposes,

- Interference with economic activities, including agricultural activities,
- Crossing of designated public resource lands such as national and state forests and parks, large camps and other recreation lands, designated battlefields, nature preserves or other designated historic resources and sites and conservation areas,
- Crossing of large lakes and large wetland complexes, critical habitat and other unique or distinct natural resources and
- Visual impact on residential areas and public resources.

90. The proposed line generally requires a 100-foot right-of-way to meet North American Electric Reliability Corporation (“NERC”) safety guidelines and PPL Electric’s design criteria. As indicated previously, the line will be designed for future double-circuit 138 kV operations. Based on system planning requirements, the new 138/69 kV transmission line will be designed to connect to the existing Honey Brook Tap 138/69 kV Transmission Line with Twin Valley Substation.

91. The Routing Team identified and mapped routing constraints in the Study Area. Constraints were defined as specific areas that should be avoided to the extent feasible during the route selection process. Constraints are generally divided into two groups based on size. Large area constraints are avoided to the extent practicable and are considered unfavorable by the Routing Team for developing Potential Routes.

92. After the Potential Routes had been initially developed to avoid large area constraints to the extent practicable, the alignments were adjusted where feasible to avoid and maximize distance from small area constraints. Small area constraints encompass other features within smaller geographic areas or site-specific locations. Small area constraints generally include:

- Individual residences (including houses, anchored mobile homes and multi-family buildings) and residential curtilage, which is interpreted in Pennsylvania as the

area up to 100 meters (328 feet) immediately surrounding a residence and used for domestic purposes. Curtilage does not extend beyond the individual's parcel boundaries and may also be "broken" by road or railroad rights-of-way or changes in land use,

- Commercial and industrial buildings,
- Tree farms,
- Cemeteries,
- Places of worship,
- Schools,
- Hospitals,
- Recorded sites of designated historic buildings and sites, including any specified buffer zone around each site,
- Small wetlands,
- Specific recreational sites, facilities and trails,
- Communications towers and
- Designated scenic vista points.

The Routing Team also considered alignments parallel to parcel boundaries and tree lines where practical to avoid bisecting properties.

93. The Routing Team attempted to keep the routes and all areas of the required right-of-way from passing over these point-specific constraints. However, in some instances, complete avoidance of small area constraints was not possible due to the large numbers or locations of these constraints.

94. The Routing Team defined routing opportunities as locations where the proposed transmission line might be located with the least impact. Practical routing opportunities

considered in the Study Area included sharing and/or paralleling existing rights-of-way and linear features, including:

- 69 and 138 kV transmission circuits
- Gas pipelines
- Railroads
- Major roads.

95. Existing transmission infrastructure did not provide significant routing opportunities, as few existing transmission lines are located within the Study Area. Existing transmission lines were not identified as a routing opportunity because there is insufficient space to construct a parallel route and rebuilding the line for double-circuit operation would not resolve the reliability issue or provide capacity for a future double-circuit 138 kV line.

96. An existing underground natural gas pipeline bisects the northern portion of the Study Area. There is not sufficient space, however, to parallel the pipeline in certain areas.

97. The Pennsylvania Turnpike, located adjacent to the Twin Valley Substation to the north, is the only major road that traverses the Study Area. Although the Pennsylvania Department of Transportation (“PennDOT”) allows transmission lines to cross the Turnpike, it does not permit utilities to construct transmission lines within the road right-of-way. Due to the proximity of the Morgantown Business Park, there is not sufficient space to parallel the Turnpike right-of-way into the Twin Valley Substation from the east. Local roads were not opportunities in this area because using them would result in greater aesthetic and residential impacts than other opportunities in the Study Area.

98. The Routing Team developed a network of Potential Routes. After the initial Potential Route network was developed, the Routing Team reviewed each route in the field.

99. The Potential Route identification effort resulted in a network of approximately 12 potential links to route the new line from the Honey Brook Substation to the Twin Valley Substation. As the process continued, the route network was modified, as routes were adjusted, links were removed and new links were added.

100. The Routing Team developed initial Potential Routes to avoid large area constraints and maximize the distance between small area constraints while avoiding circuitous routes and sharp angles. Where feasible, Potential Routes were sited to parallel property boundaries and tree lines rather than bisect these areas. The Routing Team developed Potential Routes that would enter the Twin Valley Substation from the east and west. The northernmost Potential Routes were generally developed to avoid crossing the active Martin Limestone Quarry while the southernmost Potential Routes were generally developed to avoid crossing Robert G. Struble Lake and minimize impacts to a large tree farm. Potential Routes were developed to connect the “northern” and “southern” links to provide additional options.

101. After the initial Potential Routes were identified, members of the Routing Team conducted field inspections. The team utilized a GPS unit, along with the mapped coordinates of the potential routes superimposed on road/street mapping software, to track precise locations and record the path of the field work. Residences, outbuildings, commercial buildings and other potentially sensitive receptors within 500 or 1,000 feet of each Potential Route center line were identified and recorded using database software. Homes or structures near the existing or proposed right-of-way, areas of environmental concern and various other routing challenges were identified.

102. The Honey Brook Substation is surrounded by commercial buildings to the east, south and west. Therefore, only one option to exit the Honey Brook Substation was identified.

This option exits the Honey Brook Substation to the north continues in that direction until it crosses State Route 10. From this point, the Routing Team identified a feasible “northern” and “southern” alternatives that minimized potential impacts to the built and natural environments. The Siting Team created various links for these conceptual routes to identify options in particularly challenging areas.

103. Similarly, due to constraints surrounding the Twin Valley Substation, including residential development and I-76, two feasible options were identified to connect into the Twin Valley Substation. The “northern” option parallels the headwaters to the Conestoga River through commercially zoned property adjacent to the Morgantown Business Park and a solar farm to connect to the substation from the north. The “southern” option parallels Mountain View Road between the Morgantown Business Park and the Mountain View residential community to enter the substation from the south. In the area between Talbotville Road and White School Road, the Routing Team evaluated several routes that traversed west-east. The Routing Team retained a potential link located in this central portion of the Study Area that connects the northern and southern Potential Routes. In addition, two options on the northern route were evaluated for crossing Best Road near the Lancaster-Berks County border. The field investigations resulted in changes to the Potential Routes.

104. Additional changes resulted from efforts to avoid residences and other buildings discovered in the field that were not identifiable from the aerial imagery, such as new residences. Based upon these field investigations, some links were dropped as they did not conform to the routing objectives or criteria.

105. The Routing Team subsequently met to discuss the remaining Potential Routes in March 2012. During this meeting, comparative data, aerial photos and notes taken during the

field reconnaissance were reviewed. The major environmental and land use factors considered in this evaluation were incremental aesthetic impact, proximity of residences and other buildings, known or suspected historic sites, threatened and endangered species sites, wetlands, stream crossings, tree clearing requirements, unique or sensitive habitat and length of new right-of-way required. Engineering factors, including extent of right-of-way overlapping opportunities, identification of areas where rebuilding existing transmission structures to accommodate a new 138/69 kV line may be feasible and areas that presented engineering and construction challenges, were considered. The remaining links were assembled into Potential Routes labeled A through F and presented to the public for comment during an open house in April 2012.

106. Once the Potential Routes were developed, the Routing Team considered additional information provided by agency outreach, field review, data analysis and public comment. A qualitative and quantitative screening process was employed to eliminate from the Potential Route network or modify links that were not suitable. By these means, the Routing Team narrowed the network and focused on refining the preferable links to establish Alternative Routes.

107. The Routing Team developed four Alternative Routes from the remaining Potential Route network, Routes A through D.

- a. Route A, the Preferred Route, exits the Honey Brook Substation in Chester County to the northeast and immediately crosses Twin County Road (State Route 10). Route A continues in a general northeasterly direction for approximately 13,500 feet crossing Welsh Road to a point northeast of Fieldstone Road and southeast of the Martin Limestone Quarry. From this location, Route A turns north and proceeds approximately 7,400 feet into Lancaster County, crossing Best

Road. At a point approximately 1,500 feet north of Best Road, the route turns east into Berks County and traverses approximately 7,400 feet, crossing Mill Road and Timber Road to enter Twin Valley Substation from the west.

- b. Route B exits the Honey Brook Substation along the same route as Route A until reaching a point northeast of Fieldstone Road and southeast of the Martin Limestone Quarry. At this point, Route B traverses east/southeast for a short distance, crossing Talbotville Road. It then heads northeast to a point just west of Morgantown Road. Route B then traverses north/northeast for approximately 1.4 miles through Chester County and along the east side of the Mountain View residential community to a point southeast of Mountain View Road. There, Route B turns northwest into Berks County and immediately turns north to parallel Mountain View Road into the Twin Valley Substation.
- c. Route C exits the Honey Brook Substation along the same route as Routes A and B until reaching a point 600 feet northeast of Twin County Road. At this point, Route C turns east/northeast for approximately 6,800 feet through Chester County, crossing Todd Road, White School Road and Homestead Road. Just east of Homestead Road, Route C turns north for approximately 5,100 feet to a point east of Fieldstone Road. At this point, Route C follows the same path as Route A for 3.3 miles into the Twin Valley Substation.
- d. Route D follows the same path as Route C for 2.5 miles to a point east of Field Stone Road. At this point, Route D follows the same path as Route B for 3.25 miles into the Twin Valley Substation.

108. Agency and public outreach is a significant component of the siting process. PPL Electric conducted extensive public outreach throughout the siting process, including regulatory agency consultation, public notification and open houses and meetings with property owners.

109. The Routing Team contacted federal, state and local agencies to inform them of the Project and request data used in the route planning process. Copies of correspondence with federal and state agencies are provided in Attachment 14.

110. Once the initial network of potential routes was narrowed to those that were potentially viable, a preliminary Pennsylvania Natural Diversity Inventory PNDI request was submitted to the USFWS. This submission, dated April 27, 2012 requested information pertaining to endangered, threatened, or rare species within the Project area. The USFWS's June 5, 2012 response indicated that the Project is located within the range of the federally threatened bog turtle. No specific locations of recorded bog turtle habitat were identified in the June 2012 letter. After the Preferred and Alternate routes were identified, a follow-up PNDI request was submitted to the USFWS on January 17, 2013. The USFWS's January 31, 2013 response did not provide any additional information. A copy of correspondence with the USFWS is included as Attachment 14.

111. A similar initial and follow-up PNDI requests were submitted to the DCNR, PGC and the PFBC on April 27, 2012 and January 17, 2013. The PFBC's May 20, 2012 and February 5, 2013 letters both indicated that no adverse impacts to state rare, candidate, threatened or endangered fish, reptiles, amphibians or aquatic invertebrates are anticipated. The PGC's July 13, 2012 and February 20, 2013 responses indicated that the Project is located in the vicinity of a state bat species of special concern, the northern myotis. No specific locations of recorded northern myotis habitat were identified in the either letter. DCNR's February 11, 2013 response

indicated that no impact is anticipated if Route A is selected. However, if the Alternate Route (Route D) were selected, DCNR would request surveys for the state-threatened sweet bay magnolia.

112. PPL Electric submitted an initial consultation letter to the Pennsylvania Historical and Museum Commission (“PHMC”) on February 21, 2013. PHMC’s March 14, 2013 response indicated that no impacts are anticipated to historic architecture. However, known archaeological resources are located within the Project Area. Therefore, the PHMC recommended a Phase I archaeological survey of the Project Area to verify the extent of known sites and to locate any other potentially significant archeological resources. PPL Electric retained The Louis Berger Group, Inc. (“Louis Berger”) to conduct an archaeological survey of the Project Area. The field investigations identified four potential archaeological sites located within the Project Area in Honey Brook Township, two of which may represent portions of a previously registered archaeological site, 36CH0547. Archeological site 36CH057 is characterized as an open prehistoric site of unknown function with insufficient data to determine whether either site is eligible for the NRHP. Louis Berger recommends additional consultation with the PHMC-BHP regarding the nature of the identified prehistoric archaeological sites. PPL Electric will attempt to avoid any identified archeological sites to the maximum extent practical.

113. Outreach to elected officials, the public and the media was an important part of the siting process. PPL Electric met with representatives of the Lancaster County Commissioners, Lancaster County Farmland Trust, Caernarvon Township, Penn Township, Pennsylvania Representative Denlinger, Pennsylvania Senator Brubaker and United States Representative Pitts on April 2, 2012 to introduce several projects planned for the Lancaster Region, including the Honey Brook – Twin Valley Project.

114. The Routing Team presented a potential route network to the public for comment at an open house on April 17, 2012. The public was notified of these open houses by direct mailings and newspaper advertisements. PPL Electric also created a website for the Project with information about it, an interactive map and answers to frequently asked questions.

115. PPL Electric notified the townships crossed by the Potential Routes, Honey Brook in Chester County, Caernarvon in Berks County and Caernarvon in Lancaster County, prior to each open house. In addition, PPL Electric met with Honey Brook Township on December 12, 2012.

116. Following the April open house, PPL Electric siting and real estate representatives held in-person meetings with numerous property owners located along the Potential Routes. The Routing Team used information from these meetings, online comments and comments from the April public open house to refine the potential routes and ultimately selected a Preferred and an Alternate Route.

117. A second public open house was held on October 4, 2012 to announce the Preferred Route and answer additional questions from the public. Comments during the October open house primarily focused on the right-of-way acquisition process and routing adjustments. The Routing Team finalized the Preferred Route alignment based on this information and additional meetings with property owners.

118. Many factors were considered in selecting the Preferred Route. The Alternate Routes were reviewed in detail and compared using a combination of information collected in the field, GIS data sources, public input, supporting documents and the collective knowledge and experience of the Routing Team.

119. One of the considerations was the constructability of a route. Major factors that affect constructability include steep topography, narrow rights-of-way, high angles, proximity to major highways, accessibility, ease of moving equipment, materials and workers to the construction sites; public and worker safety; logistical difficulties associated with obtaining the required easements and the actual amount of time and materials needed for construction.

120. All four routes are anticipated to require a similar number of angled structures. Routes A and C would traverse slightly fewer areas of steep slopes compared to Routes B and D. The areas of steep slope are primarily located in the vicinity of Welsh Mountain. Each Alternative Route has to traverse a steep area of Welsh Mountain in order to connect to the Twin Valley Substation. Routes A and C traverse a shorter length through the Welsh Mountain area. Routes B and D parallel an existing gas pipeline through a portion of Welsh Mountain and could potentially utilize existing access roads in this area. In all cases, the existing access roads may require substantial improvement to accommodate construction equipment through this steep terrain.

121. All four routes would cross one state road, State Route 10 at the same location. All other road crossings involve only local roads. No interstates or railways are crossed by any of the Alternative Routes.

122. PPL Electric evaluated the costs of the Alternative Routes based on estimates from siting, real estate, engineering, procurement and construction. The cost differential among the Alternative Routes is relatively minor. The preliminary cost estimate comparison indicated that Route A would cost about 6 percent less than Route D. The cost estimate to design and construct Route A is \$10.5 million. As shown in Table 4-4, Route A traverses 12 fewer parcels than Route D. Routes C and D traverse fewer forested areas than Routes A and B. Forested

areas require periodic vegetation management and, therefore, are expected to incur higher maintenance costs over the lifetime of the Project compared to open fields and developed areas.

123. Therefore, from an engineering and constructability perspective, Route A is slightly better than the remaining potential routes because it is shorter and traverses fewer areas of steep slopes. The shorter length will result in less right-of-way acquisition and vegetation clearing, including ongoing periodic tree trimming and earth disturbance, thereby reducing the overall Project cost and environmental impact.

124. Consideration of the built environment includes direct and indirect impacts to residential, commercial and industrial development, institutional uses, cultural resources and land use. Each Alternative Route traverses Honey Brook Township in Chester County more than any other municipality. Routes A and C traverse portions of Caernarvon Township in both Lancaster and Berks County while Routes B and D only traverse Caernarvon Township in Berks County. Land use is similar along all of the alternative routes. Based on data from the National Land Cover Dataset, agricultural land (grassland/pasture and cultivated crops) represent the largest type of land use within 1,000 feet of the Alternative Routes, followed by forest cover. Low- to high-density development represents approximately 5 percent or less of land use within 1,000 feet of the alternative routes. With the exception of the Welsh Mountain area and the developed area surrounding the Twin Valley Substation, nearly the entire lengths of all four Alternative Routes cross agricultural security or easement areas. Electric transmission lines are permitted in these areas and do not have a significant impact on the use of the property as agricultural land.

125. Route A would traverse the fewest parcels of land. Two residences are located within 100 feet of Routes A and C. However, one of these residences was not located within 100

feet as presented at the October 2012 public meeting; this change was subsequently made at the request of the property owner. Route A would traverse within 500 feet of fewer residences. Routes B and D traverse within the curtilage of one residence located west of South Twin Valley Road. The property is non-condemnable. Due to the presence of other residential development, including the Mountain View residential community, no other reasonable siting alternatives were identified in this area that can avoid the non-condemnable property. If negotiations with this property owner were unsuccessful, PPL Electric' inability to acquire a right-of-way across the non-condemnable property could prevent the construction of Routes B and D.

126. Route D is the only route with no schools within 1,000 feet of the centerline. Routes A and C are located within 1,000 feet of Goddard Preschool and Routes A and B are located within 1,000 feet of the Honey Brook Mennonite School. In both cases, the Routing Team attempted to maximize the distance from these facilities while considering other constraints.

127. Land use in the Study Area is dominated by agricultural uses. Welsh Mountain bisects the Study Area. Development is concentrated near the Twin Valley Substation. The topography in the southwestern and northeastern portions of the Study Area is gently rolling while topography is steep in the central portion of the Study Area in the vicinity of Welsh Mountain.

128. The southern portion of all four Alternative Route traverses agricultural land. In this area, the new transmission line would be visible. Regardless of route, the line would also be seen from some vantage points in the lower-lying areas as it traverses Welsh Mountain. The Alternative Routes converge south of the Martin Limestone Quarry and traverse a short, forested portion of Welsh Mountain along the same route. In this area, existing tree cover will buffer and

minimize visual impacts to adjacent landowners. After approximately 1,000 feet, the Routes A and C diverge from Routes B and D. Routes A and C continue north, cross Welsh Mountain and an agricultural area before turning east behind the Morgantown Business Park to enter the Twin Valley Substation. Where the Alternative Routes diverge, Routes B and D traverse in a general east/northeast direction through a mix of agricultural and forested land before paralleling Mountain View Road north into the Twin Valley Substation. Routes B and D traverse a larger portion of forested land compared to Routes A and C, including approximately 0.7 mile parallel to a gas pipeline. Except where Routes B and D parallel of Mountain View Road and a short parallel of Todd Road northeast of the Honey Brook Substation by Routes A and B, the Alternative Routes do not parallel existing roads.

129. No federal, state or designated local recreation areas are crossed by the Alternative Routes. The closest recreation area, Robert G. Struble Lake, is located approximately 3,500 feet south and east of Routes B and D at its closest point. Based on this distance and the structure height, visual impacts from the line on users of Struble Lake are anticipated to be minimal.

130. Initial analysis of the Project's potential to affect cultural resources involved a review of CRGIS on-line inventory of cultural resources. All four routes traverse within 1 mile of a few previously identified historic resources. Only one of these resources, the Morgantown Historic District, is currently listed on the NRHP. The Morgantown Historic District is located approximately 0.6 mile northwest of Routes A and C. The remaining resources are considered to be eligible by the Keeper of the National Register or the submitter. All four Alternative Routes traverse within 1 mile of an eligible portion of the Pennsylvania Turnpike and the Wilmington and Northern Railroad. The Alternative Routes cross within 0.25 mile of between six and ten

archeological sites. Two of these sites, Resource Nos. 36CH0547 and 36CH0267, are located within the right-of-way of Routes A and B. Site 36CH0547 is characterized as an open prehistoric site of unknown function and site 36CH0267 is characterized as open prehistoric habitation. Available data are insufficient to determine whether either site is eligible for the NRHP.

131. All reasonable efforts will be made to avoid affecting archaeological resources. Where practical, archaeological resources identified in the transmission line corridor, in the direct path of any needed access roads or at the locations of proposed work areas will be avoided by spanning any such resources or relocating towers, roads and work areas. PPL Electric will continue to consult with the PHMC throughout the planning, design and construction process and conduct field work and surveys as necessary during the Project permitting process to minimize impacts to cultural resources. Impacts on archaeological resources will be minimal, regardless of the route selected.

132. Prime farmland and farmland of statewide importance are special categories of highly productive cropland that are recognized and described by the Natural Resources Conservation Service (“NRCS”). Prime farmland is land that has the best combination of physical and chemical characteristics for producing crops. Soils that do not meet the prime farmland category but are still recognized for their productivity may qualify as farmland of statewide importance. Farmland in the Project area includes croplands and grasslands that could be used for grazing or hay production.

133. All four Alternative Routes traverse prime farmland for greater than 40 percent of their route. During construction of the Project’s right-of-way and access roads, some prime farmland and/or farmland of statewide importance may be removed temporarily from

productivity. However, access roads are normally temporary, so cropping and grazing can resume after construction is completed. Permanent removal of farmland from production for structures will be minimal because normal cropping and grazing should be extended to the base of the towers. Therefore, impacts on farmland will not be substantial regardless of which route is selected.

134. Soil surveys and digital soils data were used to locate areas with soils typically found in wetlands. NRCS soil surveys group areas into soil map units, which consist of one or more soil types. From 7.2 percent (Route C) to 17.7 percent (Route B) of the soils crossed by the alternate routes are hydric. The majority of soils crossed by all four Alternative Routes are partially hydric, with Routes C and D crossing the highest percentage of hydric or partially hydric soils. Based on the percentage of hydric and partially hydric soils crossed by each Alternative Route, Routes B and D potentially cross more wetland areas compared to Routes A and C.

135. All four Alternative Routes traverse two NAI areas identified by The Natural Conservancy: (1) the Conestoga River Headwaters and (2) the West Branch Brandywine Creek. The Conestoga River NAI is a large natural area encompassing the Twin Valley Substation, both sides of I-76, Morgantown and land north of I-76. This NAI contains a diversity of habitats including habitat for an unidentified species of concern. The Conestoga River NAI is traversed by the Alternative Routes as they enter the Twin Valley Substation. No impact for the species of concern is expected regardless of the route selected.

136. The West Branch Brandywine Creek NAI is a larger area encompassing the Honey Brook Substation, the Borough of Honey Brook and both sides of Route 322 and Route 10. This natural area has historically supported four plant species of concern: the Pennsylvania

rare bushy bluestem, the Pennsylvania threatened sweet bay magnolia, the Pennsylvania endangered swamp lousewort and one unidentified species of concern. The West Branch Brandywine Creek NAI is traversed by the Alternative Routes shortly after they exit the Honey Brook Substation. Route C and D cross about 30 more acres of this NAI compared to Routes A and B. The portions of the NAI areas crossed by the Alternative Routes are generally agricultural or developed land. Therefore, permanent impacts to these areas are anticipated to be limited to the structure footprints.

137. As stated above, DCNR indicated that Route D may have potential habitat for the state-threatened sweet bay magnolia. Sweet bay magnolia is typically found in moist, mostly acidic woods and swamps in sandy peaty soils, especially in association with red maple-black gum wet woods. DCNR does not anticipate impacts if Route A is selected.

138. The USFWS indicated that the entire Project is located within the range of the state and federally threatened bog turtle. The USFWS has requested wetland delineations within the Project area and that all wetlands identified within this area should be evaluated for potential suitability as bog turtle habitat. In March 2013, PPL Electric retained a qualified bog turtle surveyor to conduct Phase I bog turtle surveys for each delineated wetland identified along the Preferred Route. Based on the results of the survey, four wetlands located within the Project Area were identified as potential bog turtle habitat. PPL Electric submitted a formal Phase I bog turtle survey report in April 2013. The USFWS response dated May 22, 2013 concurred with the conclusions in the Phase I report. In accordance with USFWS guidelines, four Phase II bog turtle surveys were conducted at each of the four wetlands between April 15th and June 15th, 2013. No bog turtles or indicators of bog turtle presence were identified during these surveys. Based on the results of the Phase I and II surveys, no impacts to the bog turtle are anticipated.

PPL Electric will submit a Phase II bog turtle report to the USFWS for concurrence. In addition, PPL Electric will minimize in-stream and wetland impacts by spanning or avoiding them.

139. PBG indicated that the entire Project is located within the range of the northern myotis, a state species of special concern. PGC suggests that, in these portions of these routes, clearing of trees greater than 5-inch diameter at breast height be conducted between November 1 and March 31. Because routes A and C have fewer trees that need to be cleared, potential impacts to northern myotis are expected to be less than impacts from Routes B and D.

140. In conclusion, Routes B and D are slightly preferred over Routes A and C from a natural environment perspective primarily because Routes A and C parallel and in places are in the floodplain of the Conestoga River and the headwaters to the Conestoga River for 1.4 miles. Routes A and C also traverse a greater distance through identified natural areas. Conversely, Routes A and C are expected to result in fewer impacts to vegetation and associated forest habitat and wildlife. Field wetland delineations will be conducted for the Preferred Route and engineered access roads to determine the exact location of any wetlands or waterways. PPL Electric anticipates that Project engineering will minimize wetland and stream impacts through spanning and avoidance. However, if impacts are unavoidable, PPL Electric will obtain and adhere to all conditions contained in required state and federal permits.

141. Based on a qualitative and quantitative review of information obtained from GIS data, existing easements, field reconnaissance and extensive public outreach as well as engineering and financial estimates for this Project, the Routing Team selected Alternative Route A as the Preferred Route and Alternative Route D as the Alternate Route.

142. Although Alternative Route A will traverse within 100 feet of one residence, the Route was relocated closer to the residence at the request of the affected landowner. The

cumulative social, environmental and financial impacts associated with constructing Alternative Route A will be less than any other Alternative Route. Alternative Route A is the shorter of the two final routes considered and therefore, requires fewer acres of right-of-way. Alternative Route A also traverses fewer properties and the transmission center line crosses within 250 and 500 feet of fewer residences. No non-condemnable properties without an existing right-of-way agreement are crossed by Alternative Route A, which reduces risks to Project completion. From an environmental and engineering perspective, Alternative Route A will require fewer acres of forest clearing and cross fewer areas of steep slopes. Alternative Route A will also traverse fewer acres of cultivated crops compared to most alternatives. While any route selected would result in changes to the existing viewshed, Alternative Route A maximizes the distance between the proposed route and Robert G. Struble Lake, which was identified by several property owners as a scenic area.

143. The Commission defines an Alternate Route as a reasonable right-of-way which includes not more than 25 percent of the right-of-way of the Applicant's proposed route. Routes B and C overlap Route A, the Preferred Route, for more than 25 percent of their lengths. Therefore, they are eliminated as potential Alternate Routes. Therefore, Route D was identified as PPL Electric's Alternate Route.

144. After announcing the selection of the Preferred Route in October 2012, PPL Electric initiated real estate discussions with property owners. Based on these meetings, several property owners requested route alignment modifications through their property. Where the re-alignment request did not result in impacts to other property owners, PPL Electric accommodated individual property owners' requests to the maximum extent practical. In cases where realignment would impact adjacent property owners, PPL Electric considered

accommodating the request if reasonable and mutually agreed upon by all affected parties. These discussions resulted several minor changes to the final Preferred Route. The resulting changes are reflected in all figures and calculations included in this Attachment.

VI. RIGHTS-OF-WAY

145. PPL Electric's current standard right-of-way width for a double-circuit 138/69 kV transmission line is 100 feet. The right-of-way width is determined by the structure type, design tensions, span length and conductor "blowout," *i.e.*, the distance the wires are moved by a crosswind). A cross section of PPL Electric's current standard right-of-way for double-circuit 138/69 kV is illustrated in Figure 5-3 to Attachment 5. The aerial maps provided at the end of Attachment 4 identify the location of the proposed right-of-way.

146. There are a total of 19 different owners of 29 parcels along the route selected for the proposed Honey Brook – Twin Valley Line. PPL Electric has reached agreements with each of the 19 property owners for an easement and right-of-way necessary for the proposed Honey Brook – Twin Valley Line.⁶

VII. HEALTH AND SAFETY

147. The proposed construction of the Honey Brook – Twin Valley Transmission Line will not create any unreasonable risk to the public health or safety. The above-described transmission work for the Honey Brook – Twin Valley Transmission Line will be designed, constructed, operated and maintained in a manner that meets or surpasses all applicable NESC minimum standards and meets all applicable legal requirements. Descriptions of the NESC

⁶ At the time of this filing, formal easement and right-of-way agreements have been executed by 18 of the 19 property owners. PPL Electric has reached an agreement with the final property owner and anticipates that the easement and right-of-way agreement will be executed in the near future. In the event that the final easement and right-of-way agreement is not executed, PPL Electric will file a Condemnation Application, pursuant to Section 1511(c) of the Business Corporation Law of 1988, 15 Pa.C.S. § 1511(c), if necessary.

standards, PPL Electric's design criteria and PPL Electric's safety practices are provided in Attachment 13 to this Application.

148. PPL Electric's Magnetic Field Management Program is summarized in Attachment 11 and is applied to new and reconstructed transmission line projects. PPL Electric does not believe that the current scientific evidence demonstrates that magnetic fields cause any adverse health effects or pose a health or safety danger to the public. Nevertheless, PPL Electric has determined, as a matter of policy, to design its new and rebuilt transmission lines to reduce magnetic fields when that can be done at low or no cost and consistent with functional requirements. PPL Electric's Magnetic Field Management Program has been developed to implement that policy decision. In order to lower magnetic field exposures, the program generally prescribes the use of line design that provides five feet higher ground clearances than the minimum prescribed in the NESC and reverses phasing of new double circuit lines where it is feasible to do so at low or no cost and is consistent with functional requirements. The implementation of additional modifications will be considered, provided those modifications can be made at low or no cost and are consistent with functional requirements.

149. Consistent with the program, the conductors for this Project will have ground clearances that are a minimum of five feet higher than the required NESC minimum ground clearance for 138/69 kV lines to reduce magnetic field exposures. In addition, when the second circuit is added, PPL Electric will reverse phase the two circuits, thus further reducing the magnetic field.

VIII. NOTICE AND SERVICE

150. PPL Electric has provided public notices in accordance with the Commission's regulations at 52 Pa. Code § 57.74 and Section 69.3102 of the Commission's Interim Siting Guidelines, 52 Pa. Code § 69.3102.

151. As soon as practicable after the filing of this Application, PPL Electric will publish notice of the filing in two newspapers of general circulation in the area of the Honey Brook – Twin Valley Project. This notice will: (a) note the filing with the Commission; (b) provide brief description of the Project and its location; (c) provide locations where the complete application may be reviewed by the public; and (d) provide any additional information as directed by the Commission.

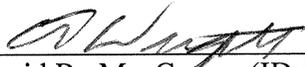
152. PPL Electric also requests that the Commission publish notice of this Application in the Pennsylvania Bulletin.

IX. CONCLUSION

WHEREFORE, PPL Electric Utilities Corporation respectfully requests that the Pennsylvania Public Utility Commission approve this Application for approval of the siting and construction of the double-circuit Honey Brook – Twin Valley 138/69 kV Transmission Line in Caernarvon Township, Berks County, Honey Brook Township, Chester County and Caernarvon Township, Lancaster County as explained above and in the Attachments to this Application.

Respectfully submitted,

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Date: November 7, 2013

Attorneys for PPL Electric Utilities Corporation

VERIFICATION

I, Stephanie Raymond, being the Transmission – Substation Vice President of 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 that 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: 11/1/13

Stephanie Raymond