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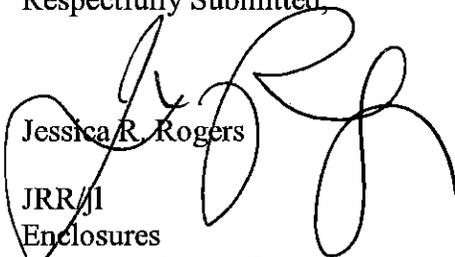
Rosemary Chiavetta, Secretary  
Pennsylvania Public Utility Commission  
Commonwealth Keystone Building  
400 North Street, 2nd Floor North  
P.O. Box 3265  
Harrisburg, PA 17105-3265

**RE: Application Of PPL Electric Utilities Corporation Under 15 Pa. C.S. §1511(c) For A Finding And Determination That The Service To Be Furnished By The Applicant Through Its Proposed Exercise Of The Power Of Eminent Domain To Acquire A Right-Of-Way And Easement Over And Across The Lands Of The Property Owners For The Proposed Richfield-Dalmatia 69 kV Transmission Tie Line In Portions of Snyder, Northumberland, and Juniata Counties, Pennsylvania Is Necessary Or Proper For The Service, Accommodation, Convenience Or Safety Of The Public - Docket Nos. A-2011-2267349, etc**

Dear Secretary Chiavetta:

Enclosed for electronic filing is the Main Brief of PPL Electric Utilities Corporation for the above-referenced proceeding. Copies have been provided to the persons as indicated on the Certificate of Service.

Respectfully Submitted,

  
Jessica R. Rogers

JRR/jl  
Enclosures

cc: Certificate of Service  
Honorable Joel H. Cheskis  
Honorable David A. Salapa

**CERTIFICATE OF SERVICE**

I hereby certify that a true and correct copy of the foregoing **Main Brief of PPL Electric Utilities Corporation** 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).

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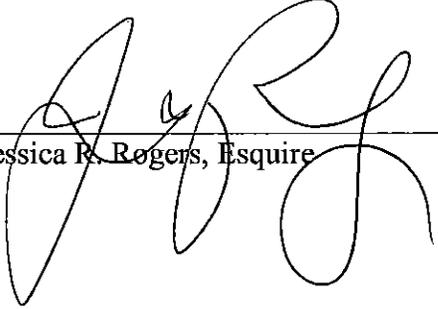
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Jessica R. Rogers, Esquire

**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Application Of PPL Electric Utilities :  
Corporation Under 15 Pa. C.S. §1511(c) For A :  
Finding And Determination That The Service :  
To Be Furnished By The Applicant Through :  
Its Proposed Exercise Of The Power Of :  
Eminent Domain To Acquire A Right-Of-Way :  
And Easement Over And Across The Lands Of : Docket Nos. A-2011-2267349, etc  
The Property Owners For The Proposed :  
Richfield-Dalmatia 69 kV Transmission Tie :  
Line In Portions of Snyder, Northumberland, :  
and Juniata Counties, Pennsylvania Is :  
Necessary Or Proper For The Service, :  
Accommodation, Convenience Or Safety Of :  
The Public :

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**MAIN BRIEF OF  
PPL ELECTRIC UTILITIES CORPORATION**

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## I. INTRODUCTION

Through its consolidated applications, PPL Electric seeks findings that the exercise of the power of eminent domain to acquire rights-of-way across nine tracts of land is necessary or proper for the service, accommodation, convenience or safety of the public.

PPL Electric is a public utility and electric distribution company subject to the regulatory jurisdiction of the Pennsylvania Public Utility Commission (“PUC” or “Commission”). PPL Electric furnishes electric distribution, transmission and supplier of last resort services to approximately 1.4 million customers in a service area that includes approximately 10,000 square miles covering all or portions of twenty-nine counties in eastern and central Pennsylvania. PPL Electric is a member of PJM Interconnection, L.L.C. (“PJM”).

PPL Electric conducted an extensive, multi-faceted analysis to determine the preferred route for the Richfield – Dalmatia 69 kV Transmission Line (“Richfield – Dalmatia Transmission Line”).<sup>1</sup> The Richfield – Dalmatia Transmission Line includes approximately 11.54 miles of 69 kV transmission line. The preferred route will originate near PPL Electric’s Richfield Substation and will proceed through portions of Snyder, Northumberland, and Juniata Counties to an area near PPL Electric’s Dalmatia Substation. The final engineering design of the Richfield – Dalmatia Transmission Line has not been completed. Therefore, the design of some structures may be modified. The line will be constructed as follows:

- Construction of a new 69 kV line from PPL Electric’s Juniata–Richfield 69 kV line in West Perry Township, Snyder County, running in a southeasterly direction to the Sunbury–Dauphin 69 kV line in Lower Mahanoy Township, Northumberland County.

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<sup>1</sup> As explained in detail in Sections IV(A) and IV(C), because this project involves the construction of a 69 kV transmission line, the Commission’s siting regulations at 52 Pa. Code § 57.72(c) do not apply. However, PPL Electric used the Commission’s regulations as a guideline in determining an appropriate route for this project.

This line will run through Snyder, Juniata, and Northumberland Counties and will cross the Susquehanna River. The project requires a 150 foot right-of-way at the proposed Susquehanna River crossing and a 100 foot right-of-way for the remainder of the project. In addition, the transmission line will provide power to a 69-12 kV substation, which will supply two new 12 kV distribution lines in the project area.

For the reasons set forth below, PPL Electric respectfully requests that Administrative Law Judges David A. Salapa and Joel H. Cheskis (“ALJs”) and the Commission: (1) make the findings that the service to be furnished through the exercise of the power of eminent domain by PPL Electric to acquire rights-of-way for an aerial transmission line across the nine identified tracts of land as necessary for the service, accommodation, convenience or safety of the public; and (2) grant any other approvals as may be required.

## **II. STATEMENT OF THE CASE**

This proceeding was initiated on October 11, 2011, when PPL Electric filed the following ten Applications of PPL Electric Utilities Corporation Under 15 Pa.C.S. § 1511(c) for a Finding and Determination That The Service To Be Furnished By The Applicant Through Its Proposed Exercise Of The Power Of Eminent Domain To Acquire A Right-Of-Way And Easement Over And Across The Lands Of The Property Owners Listed Below For The Proposed Richfield – Dalmatia 69 kV Transmission Line In Portions Of Snyder, Northumberland, and Juniata Counties, Pennsylvania Is Necessary or Proper For The Service, Accommodation, Convenience Or Safety Of The Public (hereinafter, collectively “Condemnation Applications”):

1. Michael and Logan Wendt, Doc. No. A-2011-2267349;
2. Randall Clark, Doc. No. A-2011-2267352;
3. John and Evelyn Zeiders, Doc. No. A-2011-2267353;

4. Roy and Cindy Maurer, Doc. No. A-2011-2267416;
5. Ronald and Dianne Mace, Doc. No. A-2011-2267418;
6. The Shoop Family Trust c/o Edwin and Denny Shoop, Doc. No. A-2011-2267426;
7. Gary and Dorene Lahr, Doc. No. A-2011-2267429;
8. Elijah and Faye Lahr, Doc. No. A-2011-2267446;
9. Marvin Roger Hess and Leona Hess, Doc. No. A-2011-2267448;
10. Michael Schwalm, Doc. No. A-2011-2267388.

On October 25, 2011, PPL Electric received correspondence from the Secretary's Bureau containing the publication notice for each of the Applications, as well as assignment of the cases to the ALJs. On December 14, 2011, PPL Electric's Condemnation Applications were consolidated by order of the ALJs.

PPL Electric reached a right-of-way agreement with Michael Schwalm, whose application was docketed at A-2011-2267388. Consequently, PPL Electric petitioned to withdraw Mr. Schwalm's condemnation application. PPL Electric's petition was granted in *Prehearing Order #2*, on December 14, 2011. Protests were filed by Randall Clark, John and Evelyn Zeiders, Roy and Cindy Maurer, Ronald and Dianne Mace, the Shoop Family Trust, Gary and Dorene Lahr, Elijah and Faye Lahr, and Michael and Logan Wendt. Petitions to intervene were filed by Paul Reed and Alvin and Angela Zeiders. The Reeds' petition was granted without objection at the prehearing. The Zeiders' petition to intervene was granted in an order dated January 10, 2012. Notices of appearance were filed by Scott Wyland on behalf of the Hesses, Maces, Maurers, Reeds, and the Shoop Family Trust (collectively "Protestants"), and by Michael Faherty, on behalf of the Wendts.

A prehearing conference was held on December 13, 2011. Following the prehearing conference, a scheduling order was issued on December 14, 2011. Pursuant to the procedural and discovery schedule set at the prehearing conference, the parties engaged in extensive discovery in support of their respective positions. On March 6, 2012, PPL Electric served the Direct Testimony of Lisa Krizenoskas and Howard Slugoeki. A public input hearing was held on March 7, 2012, in the Dalmatia area. On April 5, 2012, the Protestants served the Direct Testimony of four property owners and Edward G. McGavran, III.

On April 23, 2012, PPL Electric filed an amendment to the Application to reflect a reduction in the amount of right-of-way required for the river crossing on the Clark and Hess properties that came as a result of a redesign of the river crossing structure for the transmission line. On May 4, 2012, PPL Electric filed a Motion for Extension of the Procedural Schedule. This motion was granted on May 7, 2012. On June 15, 2012, PPL Electric served the parties with the Rebuttal Testimony of nine witnesses.<sup>2</sup> On July 20, 2012, the Protestants served the Surrebuttal Testimony of Troy Hess, Roy Maurer, and Mr. McGavran. On July 31, 2012, Paul and Kathryn Reed filed a notice of withdrawal from the proceeding. On August 10, 2012, PPL Electric served the Rejoinder Testimony of six witnesses.<sup>3</sup>

Evidentiary hearings were held before the ALJs on September 11 and 12, 2012. At the hearings, parties moved into evidence their respective testimonies and exhibits, and witnesses were cross-examined. PPL Electric's Applications were admitted into evidence as PPL Electric Exhibit 1 for each of the individual condemnations. Pursuant to the scheduling order, Main

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<sup>2</sup> Those witnesses were Justin Wehr, Lisa Krizenoskas, Howard Slugoeki, Dennis Braun, Richard Wodyka, Richard Mellon, Colleen Kester, Larry Feirick, and Danny Jarrah.

<sup>3</sup> Those witnesses were Justin Wehr, Lisa Krizenoskas, Howard Slugoeki, Richard Wodyka, Dennis Braun, and Danny Jarrah.

Briefs are due October 17, 2012, and Reply Briefs are due October 31, 2012. PPL Electric files herewith its Main Brief on the proceeding.

### **III. SUMMARY OF ARGUMENT**

The two principal issues presented in this proceeding are whether the service to be furnished through the Richfield – Dalmatia 69 kV Transmission Line is necessary for the service, accommodation, convenience or safety of the public. 15 Pa.C.S. § 1511(a)(3). Under the cases interpreting this section, it is appropriate also to consider whether PPL Electric has chosen a reasonable route for siting the line. *Paxtowne v. Pa. P.U.C.*, 398 A.2d 254, 256 (Pa. Cmwlth. 1979). As explained below, the line and substation are necessary, and PPL Electric has chosen a reasonable route for the line and site for the substation which will be supplied by the line.

Regarding need, PPL Electric’s decision to construct the Richfield – Dalmatia Project, including both the transmission line and the substation, was driven by both transmission and distribution reliability concerns.

To establish objective and appropriate standards for reliability of service, PPL Electric has adopted its Reliability Principles and Practices (“RP&P”) guidelines for both its transmission and distribution systems. Analyses of PPL Electric’s systems has revealed violations of both transmission system and distribution system guidelines.

The transmission planning department identified a violation of the RP&P. If an outage were to occur on the Juniata – Richfield 69 kV line, approximately 44 MW of load would remain interrupted after all field switches to transfer load to adjacent lines have been completed. The RP&P guidelines provide for no more than 30 MW of load to remain interrupted following all field switches.

In addition, the distribution planning department determined that there are violations of the RP&P on the Dalmatia 36-02 12 kV distribution line, which serves the majority of customer load in the project area. The Dalmatia 36-02 distribution line exceeds the RP&P guidelines for length and number of customers served. PPL Electric, as an electric distribution company, is required by the Commission's regulations at 52 Pa. Code § 57.195 to identify and submit quarterly reports on its Worst Performing Circuits and to take measures to improve reliability on those circuits. Despite the fact that PPL Electric had already undertaken all low cost alternatives for improving the Dalmatia 36-02 distribution line's performance, it has been repeatedly identified as a Worst Performing Circuit on the PPL Electric system. The line needs the long-term solution which will be provided by this Project.

In determining that the Richfield – Dalmatia Project, as proposed in the applications, was the best solution to address reliability concerns, PPL Electric considered alternatives. No other project, however, adequately addressed all of the reliability concerns. The transmission planning department determined that the only other possible electric solution would be to construct a new 15 mile 69 kV transmission line from the Sunbury Substation to the Richfield tie point. This alternative, however, is more expensive, would require more construction lead time, and encumbers more land because of the longer length of the new transmission line. The lead-time needed to acquire the necessary rights-of-way, and construction of the lines, would be significantly longer than the preferred solution. The alternative would also require a new termination at PPL Electric's Sunbury 69 kV Yard 2, which is very congested. In addition, this option does not provide load restoration support to the Sunbury – Dauphin 69 kV line like the preferred solution, and still requires a supply line to the proposed Meiserville Substation across the Susquehanna River. Therefore, this alternative was rejected.

For the distribution system, because PPL Electric had already considered and implemented other less expensive measures to improve service with only marginal results, a new substation was the only solution that would provide a significant improvement in reliability and allow PPL Electric to move towards compliance with its RP&P guidelines in the project area. Further, PPL Electric reviewed the alternatives advanced by the Protestants in this proceeding and showed that none would adequately address all of the reliability concerns identified by PPL Electric.

Regarding siting, PPL Electric's selected Alternative Route A for the Richfield – Dalmatia Transmission Line as the route with the least overall social and environmental impacts. Utilizing the Commission's regulations at 52 Pa. Code § 57.72(c) as a guide, PPL Electric conducted an extensive, multi-faceted analysis to determine the preferred route for this project. PPL Electric selected Alternative Route A for its proposed transmission line, because that route had the least overall impacts on the environment and community. The proposed line requires the construction of 11.54 miles of new 69 kV line. It will extend from PPL Electric's Juniata–Richfield 69 kV line in West Perry Township, Snyder County and run in a southeasterly direction to the Sunbury–Dauphin 69 kV line in Lower Mahanoy Township, Northumberland County. This line would run through Snyder, Juniata, and Northumberland Counties. The transmission line will cross the Susquehanna River. PPL Electric also considered alternative locations for the Meiserville 69-12 kV substation and determined that the proposed location is the most suitable to meet the project goals, to minimize environmental concerns and to minimize the distance to the transmission line.

In this proceeding, PPL Electric has shown that its siting process included a thorough investigation and review of the environmental and community factors relevant to the project

area. Further, PPL Electric has addressed, and attempted to resolve, where practical, concerns raised by the Protestants as well as concerns raised by members of the general public at the Public Input hearing held on March 7, 2012. No party to this proceeding has provided any evidence showing that PPL Electric's siting and selection of Route A is unreasonable nor has any argument been made that PPL Electric should have selected one of the other two routes it investigated.

PPL Electric recognizes that there will be adverse impacts associated with constructing the transmission line and substation. Such impacts are inevitable, as it is simply not possible to construct a transmission line and substation without some impacts on the environment and community. PPL Electric, however, has limited the incremental impacts of the new line and substation to the maximum extent practical.

For these reasons and as more fully explained below, PPL Electric requests that the ALJs and the Commission approve the Company's applications and make the findings and determinations necessary to permit the prompt construction of the Richfield – Dalmatia Transmission Line and the Meiserville Substation.

#### **IV. ARGUMENT**

##### **A. LEGAL STANDARDS**

###### **1. Burden of Proof**

Section 332(a) of the Public Utility Code, 66 Pa.C.S. § 332(a), provides that the party seeking a rule or order from the Commission has the burden of proof. It is axiomatic that “[a] litigant’s burden of proof before administrative tribunals as well as before most civil proceedings is satisfied by establishing a preponderance of evidence which is substantial and legally credible.” *Samuel J. Lansberry, Inc. v. Pa. P.U.C.*, 578 A.2d 600, 602 (Pa. Cmwlth. 1990). The

preponderance of evidence standard requires proof by a greater weight of the evidence. *Cmwlth. v. Williams*, 557 Pa. 207, 732 A.2d 1167 (1999). This standard is satisfied by presenting evidence more convincing, by even the smallest amount, than that presented by another party. *Brown v. Cmwlth.*, 940 A.2d 610, 614 n.14 (Pa. Cmwlth. 2008).

Additionally, any finding of fact necessary to support an adjudication of the Commission must be based upon substantial evidence. *Met-Ed Indus. Users Group v. Pa. PUC*, 960 A.2d 189, 193 n.2 (Pa. Cmwlth. 2008) (citing 2 Pa.C.S. § 704). Substantial evidence is such relevant evidence as a reasonable mind might accept as adequate to support a conclusion. *Borough of E. McKeesport v. Special/Temporary Civil Serv. Comm'n*, 942 A.2d 274, 281 (Pa. Cmwlth. 2008). Although substantial evidence must be “more than a scintilla and must do more than create a suspicion of the existence of the fact to be established,” *Kyu Son Yi v. State Bd. of Vet. Med.*, 960 A.2d 864, 874 (Pa. Cmwlth. 2008) (citation omitted), the “presence of conflicting evidence in the record does not mean that substantial evidence is lacking.” *Allied Mechanical and Elec., Inc. v. Pa. Prevailing Wage Appeals Bd.*, 923 A.2d 1220, 1228 (Pa. Cmwlth. 2007) (citation omitted).

If the applicant sets forth a *prima facie* case, then the burden shifts to the opponent. *McDonald v. Pennsylvania Railroad Co.*, 348 Pa. 558, 36 A.2d 492 (1940). Establishing a *prima facie* case requires either evidence sufficient to make a finding of fact permissible or evidence to create a presumption against an opponent which, if not met, results in an obligatory decision for the proponent. Once the party with the burden of proof produces evidence to meet its *prima facie* case on an issue, the burden to produce evidence of equal weight sufficient to refute the applicant’s evidence shifts to the party opposing the application. *Energy Conservation Council v. Pa. P.U.C.*, 995 A.2d 465, p. 483, n.16 (Pa. Cmwlth. 2010).

**2. Standards for Approval to Exercise the Power of Eminent Domain**

Section 1511 of the Business Corporation Law of 1988 (“BCL”), under which PPL Electric has filed its nine remaining Condemnation Applications, grants a public utility the power or authority to condemn property to provide electricity to the public, stating, in pertinent part:

(a) General Rule. -- A public utility corporation shall ... have the right to take, occupy and condemn property for one or more of the following principal purposes and ancillary purposes reasonably necessary or appropriate for the accomplishment of the principal purposes:

\* \* \* \*

(3) The ... transmission ... distribution or furnishing of ... electricity ... to or for the public.

15 Pa.C.S. § 1511(a)(3). Thus, the plain language of Section 1511 of the BCL grants a public utility, such as PPL Electric, the power and authority to take and condemn property for the purpose of providing electricity to the public.

Section 1511(b) of the BCL restricts the authority of a public utility to take and condemn property for the purpose of providing electricity to the public, stating, in pertinent part, as follows:

The powers conferred by subsection (a) shall not be exercised:

(1) To condemn for the purpose of constructing ... aerial electric transmission ... lines:

(i) Any dwelling house or . . . any part of the reasonable curtilage of a dwelling house within 100 meters therefrom and not within the limits of any street, highway, water or other public way or place.

(ii) Any place of public worship or burying ground.

15 Pa.C.S. § 1511(b).

Before a public utility may seek to exercise its statutorily granted authority to condemn property for the purposes of constructing aerial transmission or distribution facilities, it must obtain approval from the Commission.<sup>4</sup> Section 1511(c) provides, in pertinent part:

(c) The powers conferred by subsection (a) [for the running of aerial electric facilities] may be exercised to condemn property ... only after the Pennsylvania Utility Public Commission, upon application of the public utility corporation, has found and determined ... that the service to be furnished by the corporation through the exercise of those powers is necessary for the service, accommodation, convenience or safety of the public.

15 Pa.C.S. § 1511(c). Accordingly, on an application for condemnation, the Commission must determine whether the service, *i.e.*, the transmission or distribution of electricity to or for the public that will be provided if the subject property is condemned, is necessary for the service, accommodation, convenience or safety of the public.

Where the record establishes that the public utility's route selection was reasonable, considering all the factors involved in the selection of a route for a line, the degree of inconvenience to a landowner does not constitute grounds for withholding the exercise of the power to condemn the easement. *Paxtowne v. Pa. P.U.C.*, 398 A.2d 254, 256 (Pa. Cmwlth. 1979).

### **3. Standards for Determining Necessity and Reasonableness of the Route Selection**

The Pennsylvania appellate court cases dealing with the construction and siting of public utility facilities have arisen primarily in the context of the exercise of the power of eminent

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<sup>4</sup> As explained in the text above, PPL Electric must obtain Commission approval for the exercise of the power of eminent domain in order to construct aerial electric facilities. There are numerous references in the evidence to the siting of the Meiserville Substation, which is not an aerial facility. Although PPL Electric does not need to obtain Commission approval for the exercise of the power of eminent domain to construct the Meiserville Substation, the Substation will be supplied by an aerial 69 kV tap from the Richfield – Dalmatia Transmission Line. PPL Electric is seeking approval of the exercise of the power of eminent domain for the construction of the tap which will supply the Substation.

domain by public utilities under Section 1511(c) of the BCL of 1988, 15 Pa.C.S. § 1511(c) or its predecessors, and exemptions from zoning requirements for proposed buildings to be used by a public utility in serving the public under Section 619 of the Pennsylvania Municipalities Planning Code, Act of July 31, 1968, P.L. 805, *as amended*, 53 P.S. § 10619. In such cases, the courts have established the standard for the determination of need and the selection of routes for aerial utility lines.

With respect to need, the Commonwealth Court has determined that a transmission line should not be approved unless the electric utility demonstrates that the line is “necessary or proper for the accommodation, convenience and safety of its patrons, employees and the public.” *Pa. Power & Light Co. v. Pa. P.U.C.*, 696 A.2d 248, 250 (Pa. Cmwlth. 1997) (quoting 66 Pa.C.S. § 1501). In applying this standard, the Commonwealth Court held that the Commission should consider the “electric power needs of the public, the state of the available technology and the available alternatives.” *Id.* (quoting 52 Pa. Code § 57.76).

Regarding route selection issues, the Commonwealth Court has stated:

The applicable legal standards for review of the selection of a route for utility lines [by a public utility] are whether the powers conferred upon the public utility have been wantonly, capriciously or arbitrarily exercised. *West Penn Power Co. v. Pennsylvania Public Utility Commission*, 184 A.2d 143 (1962). The degree of inconvenience to a landowner, therefore, would not constitute grounds for withholding the exercise of the power to condemn the easement, *see Stone v. Pennsylvania Public Utility Commission*, 162 A.2d 18 (1960), where the record establishes that the utility’s route selection was reasonable considering all of the factors involved in the selection of the line.

*Paxtowne v. Pa. P.U.C.*, 398 A.2d 254, 256 (Pa. Cmwlth. 1979). Similarly, the selection of a route for transmission lines was explained by the Superior Court as follows:

Appellant’s [affected landowner’s] first two contentions are sufficiently answered by our opinion in *Phillips v. Pa. P.U.C.*, [181 Pa. Super. 625, 124 A.2d 625 (1956)], wherein we restated the

well-established proposition that the selection of routes for transmission lines is a matter for the utility in the first instance and, unless it is shown that it proposes to exercise the powers conferred upon it wantonly or capriciously, or that the rights of the landowner have been unreasonably disregarded, the Commission is not required to withhold its approval merely because another route might have been adopted.

*Laird v. Pa. P.U.C.*, 183 Pa. Super. 457, 133 A.2d, 579, 581 (1957).

In addition, the Commission has adopted regulations governing siting of high voltage transmission lines.<sup>5</sup> The Commission regulations on siting of high voltage transmission lines provide that:

The Commission will not grant the application, either as proposed or as modified, unless it finds and determines as to the proposed HV [high voltage] line:

- (1) That there is a need for it.
- (2) That it will not create an unreasonable risk of danger to the health and safety of the public.
- (3) That it is in compliance with the applicable statutes and regulations providing for the protection of the natural resources of this Commonwealth.
- (4) That it will have minimum adverse environmental impact, considering the electric power needs of the public, the state of available technology and the available alternatives.

52 Pa. Code § 57.76(a). Although these regulations do not apply in this proceeding, because this project does not involve the construction of a high voltage transmission line, the Commission's standards are instructive in determining the reasonableness of the route selected for this Project. As explained in greater detail in Section C of this Main Brief, the evidence in this proceeding

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<sup>5</sup> The Commission regulations define high voltage or HV transmission lines as those with a design voltage greater than 100,000 volts or 100 kV. 52 Pa. Code § 57.1. The siting regulations apply only to high voltage transmission lines. 52 Pa. Code § 57.71. The Richfield – Dalmatia Transmission Line is designed to operate at 69 kV. PPL Electric Exhibit 1, Attachment 1, p. 1. Therefore, the siting regulations do not apply to the Richfield – Dalmatia Transmission Line.

demonstrates that PPL Electric's route selection was reasonable based on the criteria explained above.

**B. NEED**

**1. Need For The Proposed Transmission Line**

**a. Transmission System Overview**

In reviewing the need for the proposed Richfield – Dalmatia 69 kV Transmission Line, it is important, as a preliminary matter, to understand the vital role transmission facilities play in supplying reliable electric service. On PPL Electric's system, power is transmitted via transmission lines that range from 69 kV to 500 kV in voltage from electric generators to transformation substations throughout PPL Electric's system. At these substations, the voltage level is sequentially stepped-down for ultimate delivery into the distribution system. Distribution transformers then further reduce the voltage from primary to secondary distribution levels for ultimate delivery to customers. Secondary distribution lines deliver the lower voltage electricity for use in homes and businesses. The transmission system provides the essential link between generators and end-users and is able to accommodate changes in load as different generators come on and go off line and as customer usage changes throughout the daily and annual load cycles.

PPL Electric's transmission lines are designed to operate at specified voltage levels, 69 kV and higher. The transmission system is further subdivided into bulk and non-bulk systems, with transmission lines operating at or above 100 kV constituting the bulk electric system. PPL Electric's 69 kV transmission system is called its regional transmission system. The regional transmission system is planned using guidelines, the Reliability Principles and Practices

("RP&P"), that have been adopted by PPL Electric to ensure that the system provides safe and reliable service to its customers.<sup>6</sup> PPL Electric St. No. 1, p. 4.

For transmission planning purposes, one important element that PPL Electric considers is the ability to restore load normally served by a 69 kV transmission line in the event of an outage of that line. In the event of an outage of a transmission line, every substation served by that transmission line, and all of the distribution lines served by those substations, will be without power. PPL Electric St. No. 4-RJ, pp. 1-2. For an outage of a single transmission line, this means that thousands of customers may be without power. Ensuring that load can be transferred from one 69 kV transmission line to another is important for restoring service to a large number of customers in the event of an outage. PPL Electric designs its system to limit the number of customers who will experience a prolonged outage in the event of the loss of a transmission line. This is accomplished by ensuring the system has sufficient line capacity to allow load normally served by one 69 kV transmission line to be transferred to another interconnected 69 kV transmission line while maintaining acceptable voltage levels.

For this reason, it is important that PPL Electric's transmission system continue to be reinforced by transmission line projects like the Richfield – Dalmatia Transmission Line, in order to ensure reliable service to PPL Electric's customers.

#### **b. Transmission Reliability Principles And Practices**

PPL Electric undertakes an independent analysis of its regional transmission facilities. PPL Electric St. No. 4-R, p. 6. The Company is responsible for analyzing and determining the need for projects for its regional transmission system and then presenting those projects to PJM as part of the PJM Regional Transmission Expansion Plan ("RTEP") process. PPL Electric St.

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<sup>6</sup> There are RP&P guidelines for both transmission facilities and for distribution facilities.

No. 7-R, pp. 6-8. In this way, PPL Electric actively participates in the PJM RTEP process and provides the results of its independent studies to PJM for consideration and inclusion in the RTEP.

The PPL Electric transmission planning guidelines are set forth in its RP&P, which was developed to ensure adequate and appropriate levels of cost-effective electric service consistent with good utility practice. PPL Electric St. 4-R, p. 4. The transmission RP&P addresses the planning, protection, and operation of the Company's electric power transmission system.

The RP&P first provides general "Principles" for the orderly and economic development of the electric power system to meet future needs while maintaining an acceptable level of reliability. The Principles are qualitative statements concerning the degree of reliability and support which PPL Electric intends to provide its customers. PPL Electric plans, constructs, and operates its transmission system with the intent of adhering to the Principles outlined in the RP&P to the extent practical. These Principles are implemented through a set of "Practices," which are the quantitative guidelines to implement the Principles. Past PPL Electric and industry-wide experience with design and operation of electrical facilities and equipment provides the basis for the Practices. PPL Electric St. 4-R, p. 3.

The quantitative standards adopted in the transmission RP&P and implemented in the planning process assure that the regional power transmission system can supply electricity to all customer loads in a reliable and economic manner. The process is designed to ensure that the regional power transmission system can sustain probable contingencies and disturbances with minimal customer interruptions and adequately serve each customer's needs with regard to capacity, voltage and reliability. PPL Electric's RP&P and regional planning processes have been developed and refined over the years using industry-wide experience and historical

performance benchmarks to ensure acceptable and appropriate levels of service that remain consistent with good utility practice. PPL Electric St. 4-R, p. 4.

The RP&P guidelines for a single circuit 69 kV transmission line allow up to 60 MW of load to be interrupted for up to 2 hours. Beyond 2 hours, not more than 30 MW of load may remain interrupted after all available field switching has been completed. PPL Electric St. 4-R, p. 2. The amount of load which is exposed to an interruption for a single contingency is derived from the emergency rating of standard 69 kV line conductor which is 120 MW. The emergency rating is the point beyond which operating the line for more than a limited duration will start to compromise the condition of the conductor. Tr. 201. The RP&P loading guideline of 60 MW for a 69 kV line allows for emergency transfers to restore load from an adjacent line, if available. That is, 60 MW of load normally served by a 69 kV transmission line that is experiencing an outage can be transferred to another 69 kV transmission line serving 60 MW of load without exceeding the line's emergency rating of 120 MW. The amount of load exposed to a long duration outage after a single contingency is based upon the loss of a single fully loaded distribution substation (69-12 kV, Type A station).<sup>7</sup> PPL Electric St. 4-R, p. 4.

PPL Electric has applied this methodology to the development of the power system since the 1980s, and this design philosophy has provided for a highly reliable power system that is consistent with good utility practice. This methodology has also been presented to the Commission as the basis for PPL Electric's planning decisions in numerous transmission project applications over the last thirty years. PPL Electric St. 4-R, p. 5.

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<sup>7</sup> A Type A Substation consists of a single transformer bank (one or two transformers) supplied by a single 138 kV or 69 kV transmission source. An outage of the transmission source or transformer will interrupt load until repair is completed, a mobile transformer is connected, or the load is transferred. PPL Electric St. No. 4-R, p. 5.

**c. Transmission Planning Process**

In order to ensure reliable service, PPL Electric engages in system planning for its facilities. For transmission planning, the process starts with a computer model of the future system. A specific study year is chosen, and the future system model is developed using the existing system plus any planned modifications to the transmission system. PPL Electric uses load levels that are based on the latest forecasts, which are prepared annually by the PJM Load Analysis Subcommittee. PPL Electric uses its annual peak load forecast to test its transmission system under statistically normal peak weather conditions (*i.e.*, the 50/50 load normalization). Tr. 245. In the 50/50 load normalization, PPL Electric considers peak load that has occurred, and then normalizes that load based on the fact that peak load conditions only occur for a few hours a day. *Id.* This allows the Company to develop a more realistic average summer peak, which in turn allows the Company to reinforce the system without overbuilding it. *Id.*

Transmission planners then test the system by simulating an outage of each regional transmission and bulk electric facility. All conditions where the system violates PPL Electric's reliability criteria are identified. Where violations are shown, the system planners undertake extensive analyses to find solutions that will resolve the violations. After examining available alternatives, the planners select the best solution, considering a variety of factors, including whether and to what degree the proposed solution resolves the violations, for how long the solution resolves the violation, and the estimated cost. Computer simulations of the system with the identified reinforcement alternatives are completed to identify the best overall reinforcement strategy to meet demand in a reliable and economic manner. PPL Electric Ex. 1, Attachment 1, p. 3. Importantly, this determination of the best engineering solution does not involve establishing an actual transmission line route; rather, it simply establishes the best electrical

resolution of the violations identified by the transmission planning group and identifies a need for an electrical path for further analysis through the siting process.

For this Project, PPL Electric's transmission planning department identified that an outage on the Juniata – Richfield 69 kV line would cause approximately 44 MW of load to remain interrupted after all field switching and load transfers to adjacent lines have been completed. This is a violation of PPL Electric's RP&P guidelines. In addition, an outage on the Sunbury –Dauphin 69kV transmission line would cause approximately 10 MW of load to remain interrupted after all field switching is completed. Although the situation on the Sunbury – Dauphin Transmission Line is not a violation of the RP&P guidelines, this Project will resolve the load restoration issue on that line, as well. PPL Electric St. No. 4-R, pp. 2-3.

After identifying the RP&P violation, the Transmission Planning group assessed a variety of potential engineering solutions and selected two for more thorough assessment. Those two solutions were identified as Alternatives 1 and 2 in the Necessity Statements. PPL Electric Ex. 1, Attachment 1, pp. 7-9. The two alternatives were considered based on their ability to restore load on the Juniata – Richfield and Sunbury – Dauphin transmission lines under various line outage conditions and to bring the Juniata – Richfield transmission line into compliance with the RP&P.

Under Alternative 1, PPL Electric would construct a new 11 mile long 69 kV line with double circuit design. The line would initially be constructed with a single circuit. The proposed line would extend from the vicinity of the Richfield Substation to the vicinity of the Dalmatia Substation, tying together the existing Juniata – Richfield and Sunbury – Dauphin 69 kV transmission lines. The estimated cost of this alternative was \$12 million, including the costs of the rights-of-way. PPL Electric Ex. 1, Attachment 1, pp. 7-8.

Under Alternative 2, PPL Electric would construct a new 15 mile long 69 kV line with double circuit design. The line would initially be constructed with a single circuit. The proposed line would run from the Richfield Tie point on the Sunbury—Middleburg line to the Sunbury Substation 69 kV Yard 2. In addition to the 15 miles of double circuit line, another 5 miles of transmission line would be required to supply the proposed Meiserville 69-12 kV substation, which would necessitate constructing a 69 kV transmission line across the Susquehanna River. This alternative would also require installation of a new single breaker 69 kV termination in the Sunbury Substation 69kV Yard 2. This alternative would cost an estimated \$22 million. PPL Electric Ex. 1, Attachment 1, pp. 8-9.

After investigating the two alternatives, Alternative 1 was selected as the preferred configuration. In order for Alternative 2 to fully resolve the load restoration violation, PPL Electric would be required to reconfigure its existing and already congested Sunbury Substation 69 kV yard 2, which would add additional costs to the project. PPL Electric St. No. 4-R, pp. 15-16. Alternative 2 would be more expensive, require a longer construction lead time and would encumber more land due to the longer length of the new transmission line. PPL Electric St. No. 1, pp. 8-9. Another consideration that made Alternative 1 preferable was that it provided load restoration support for the loss of Sunbury-Dauphin 69 kV line whereas Alternative 2 would not. For these reasons, PPL Electric rejected Alternative 2 in favor of Alternative 1.

As part of its project planning, PPL Electric submitted the proposed Richfield-Dalmatia transmission line project to PJM in March, 2012. The PJM staff monitors the planning of the regional transmission facilities, such as the Richfield – Dalmatia Project, under the PJM RTEP Process. PPL Electric St. 7-R, p. 9. These facilities are included in the RTEP as developed by each individual PJM Transmission Operator, such as PPL Electric. *Id.* Transmission Operators

submit regional facility plans to PJM as they are developed, and the plans are reviewed under the PJM RTEP Process through the PJM Subregional RTEP Committee. *Id.* The PJM Board approved the inclusion of the Richfield – Dalmatia project in the RTEP in its July 10, 2012 meeting. The project has been identified by PJM in the RTEP as Project b1898. PPL Electric St. 4-RJ, p. 9.

**d. Response to the Protestants**

The Protestants argue that resolving the RP&P violation on the Juniata – Richfield 69 kV Transmission Line is unnecessary. Protestants’ witness, Mr. McGavran, bases this conclusion on his observation that there have been few instances of any long-term transmission outages on the Juniata – Richfield 69 kV Transmission Line or the Sunbury – Dauphin 69 kV Transmission Line. P-McGavran-D1, p. 20.

This observation by Protestants misses the point of the proposed Project. The transmission portion of the Richfield – Dalmatia Project will not reduce the total number of individual outages on the transmission lines. Rather, it will reduce the duration of outages and improve PPL Electric’s ability to restore service when an outage on the Juniata – Richfield Transmission Line occurs. PPL Electric St. 4-R, p. 3. The historical number of transmission outages in this area was not the focus of PPL Electric’s inquiry. The fact is that future transmission line outages in the area cannot be completely prevented and are inevitable. Transmission line outages can result from, among other things, downed conductors and failures of cross arms, insulators and line structures. PPL Electric Ex. 1, Att. 1, p. 4. While Mr. McGavran argues in his testimony that these outages are caused by neglect, P-McGavran-D1, p. 21, that is simply not the case. PPL Electric performs regular maintenance on its transmission and distribution systems. PPL Electric St. No. 3-R, pp. 10-12. However, no amount of

maintenance can prevent all equipment failures. The real reliability issue, therefore, is whether PPL Electric has sufficient ability to restore customer load when an outage occurs.

PPL Electric's Transmission RP&P sets load restoration guidelines that recognize the necessity of maintaining a proper balance between service reliability and cost and that avoid large scale, long-term or frequent interruptions due to the adverse effects they have on the general public. PPL Electric St. 4-R, 4. This Project is designed to bring the transmission facilities in the project area into compliance with the RP&P guidelines.

In his testimony, Mr. McGavran argues that PPL Electric should utilize some variation of Alternative 2, which was presented in the Necessity Statement. In his direct testimony, Mr. McGavran states that "it is more prudent to upgrade the existing transmission lines by either installing heavier conductors with more capacity...or adding a new circuit with more capacity on each line." P-McGavran-D1, p. 10. More specifically, Mr. McGavran proposes that the Sunbury – Middleburg 69 kV Transmission Line be upgraded.

The Sunbury – Middleburg 69 kV Line originates at the Sunbury 230-69 kV Substation and travels approximately 12 miles southwest to the Richfield Tie point. Tr. 220. At this point, the line continues approximately 11 miles to the Beavertown and Middleburg Substations. The Sunbury – Middleburg line also includes a normally open tie to the Juniata – Richfield 69 kV line which is 8.2 miles in length. *Id.* The Sunbury – Middleburg 69 kV line traverses developed residential areas and serves the Penns, Middleburg, and Beavertown Distribution Substations and the customer-owned Beavertown Weaving Substation. Tr. 217.

As PPL Electric's witness Ms. Krizenoskas stated, Mr. McGavran's proposed solution has problems. With regard to the proposal that PPL Electric rebuild the existing single-circuit Sunbury – Middleburg Transmission Line with heavier conductors, Ms. Krizenoskas testified

that this option would not resolve the RP&P violation targeted with this Richfield – Dalmatia Transmission Project. This is because a substantial amount of customer load is supplied between Sunbury and Richfield. If PPL Electric were to reconstruct the existing Sunbury-Middleburg 69 kV line with increased conductor capacity, the line would still not be able to restore load to within RP&P guidelines for the loss of the Juniata-Richfield 69 kV line while keeping within acceptable voltage levels along the line. Tr 217. This proposal would also not provide the added benefit of load restoration for the loss of the Sunbury-Dauphin 69 kV line as PPL Electric's preferred solution does. PPL Electric did not investigate the use of non-standard higher capacity conductor for a single circuit rebuild because the rebuild project had other serious constraints that made it more expensive and impractical to use.

Whether PPL Electric rebuilt the Sunbury – Middleburg 69 kV Transmission Line as a single or a double circuit, other constraints would make the rebuild impractical. First, the 14 non-condemnable properties would prevent PPL Electric from acquiring needed right-of-way for the rebuild if even one of the property owners refused to sell needed land rights to PPL Electric. PPL Electric utilizes a 100 foot right-of-way for all new 69 kV transmission lines and attempts to use the 100 foot right-of-way for rebuilt lines, as well. PPL Electric St. No. 3-RJ, p. 2, PPL Electric St. No. 4-R, pp. 15-16. The present Sunbury – Middleburg 69 kV Transmission Line is an older line which has portions constructed in a 50-foot right-of-way.

If PPL Electric could not obtain the additional right-of-way from owners of non-condemnable properties, PPL Electric would have to redesign the line for the 50-foot right-of-way. This would mean, at a minimum, that more poles would be required to minimize blow-out of the transmission line in the more narrow right-of-way and that the poles would have to be

custom-designed.<sup>8</sup> The increase in the number of poles and the need to use custom-designed poles would greatly increase the cost of the Project. Tr. 253.

In addition, under either a single or double circuit rebuild, PPL Electric would still need to maintain service to existing customers along the Sunbury – Middleburg 69 kV line. The line that Mr. McGavran proposes to be rebuilt serves many customers. It does not have good ties to other lines, which limits PPL Electric's ability to transfer load to other lines. Tr. 224. In order for PPL Electric to rebuild the Sunbury – Middleburg 69 kV Line, the load served from this line would need to be transferred to the neighboring Sunbury – Lock Haven 69 kV line and/or the neighboring Juniata-Richfield 69 kV line. If the load were transferred to the Sunbury – Lock Haven 69 kV line for the rebuild, there are sections of conductor that have inadequate capacity to accommodate the transfer of load during the reconstruction. Tr. 224. If the load were transferred to the Juniata-Richfield 69 kV line, unacceptable voltage levels would be experienced at distribution substations near the end of the line. Consequently it would be necessary to build temporary facilities to accommodate the line reconstruction, which would add to the overall project cost. PPL Electric St. 4-R, p. 16.

Further, the only way a rebuild project could address the reliability concerns identified by PPL Electric in this area is if the line were rebuilt for double circuit operation. However, not only would a double circuit rebuild be plagued by the right-of-way and outage concerns previously explained, but also the addition of a second circuit would require PPL Electric to reconfigure the Sunbury 230-69 kV Substation. The Sunbury Substation is very congested, and substantial rearrangement would be required in order to accommodate an additional 69 kV circuit. Tr. 226. Rebuilding the Sunbury - Middleburg 69 kV Transmission Line as a double

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<sup>8</sup> Blow out is the distance that conductors can be moved by a crosswind.

circuit line, with the addition of a breaker in the 69 kV yard 2, as well as other associated substation yard work, would be more expensive to build than the proposed Project. Tr. 227.

Protestants reference Project b0916, and argue that this project will sufficiently address reliability concerns in the area. P-McGavran-D1, p. 12. Project b0916 is a reconductoring of the Sunbury – Dalmatia 69 kV line. By the Summer of 2012, with the system operating in its normal configuration, a portion of the Sunbury – Dauphin 69kV line from Sunbury to Dalmatia will experience load levels that exceed the normal planning rating of the line’s 4/0 Copper-weld Copper conductors due to general load growth in northern Dauphin and Juniata counties. The Sunbury – Dauphin 69 kV line was constructed in the 1960s with lower capacity 4/0 Copper-weld Copper conductor, and the b0916 project proposes to upgrade the line to PPL Electric’s standard 556 KCMIL<sup>9</sup> Aluminum Conductor Steel Reinforced (“ACSR”) from Sunbury to Dalmatia in order to eliminate the thermal overloads. The existing wooden structures will be removed and replaced with steel structures to support the larger, heavier conductors. Though the rebuild of the Sunbury – Dauphin 69 kV line is necessary to resolve a normal overload condition on the line, the rebuild will not improve load restoration capabilities for loss of the Sunbury – Dauphin 69 kV line supplied from Sunbury or for the loss of the Juniata – Richfield 69 kV line supplied from Juniata like the new Richfield – Dalmatia 69 kV tie line will. Tr. 205-206.

That is not to say, however, that Project b0916 is irrelevant to the Richfield – Dalmatia Project. The b0916 Project is already under construction. Without the completion of Project b0916, the proposed 69 kV tie line between the Richfield and Dalmatia substations would not provide the optimal benefit desired to comply with PPL Electric’s RP&P. Project b0916 provides a high capacity tie from the Sunbury 230-69 kV Substation on the Sunbury-Dauphin 69 kV line,

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<sup>9</sup> Thousands of circular mils.

which will provide increased load restoration capability for lines sourced from Juniata once the Richfield – Dalmatia 69 kV tie line has been installed. PPL Electric 4-R, p. 9. Neither project negates the necessity of the other. *Id.* Both projects are required to address fully all reliability concerns. It is also worth noting that, while Mr. McGavran has made much in this case about PJM’s belief that project b0916 is urgent by PJM, P-McGavran-SR1, p. 5, PPL Electric’s witness, Richard Wodyka, who was employed by PJM for 32 years,<sup>10</sup> has testified that PJM has not indicated any urgency with regard to this project. PPL Electric St. No. 7-RJ, pp. 2-3.

PPL Electric has shown that the transmission portion of the Richfield - Dalmatia Project is necessary to provide reliable service to its customers. The Protestants failed to show that this Project is not necessary. Without it, PPL Electric does not have sufficient transmission line capacity in the vicinity to restore service to a reasonable number of customers following an outage of the Juniata – Richfield 69 kV Transmission Line. Further, the alternative selected by PPL Electric will provide a superior and more cost effective engineering solution to the identified reliability violation than the alternatives suggested by the Protestants. The alternatives advanced by the Protestants would be more costly and would not provide as many load restoration or operating flexibility benefits to the system as PPL Electric’s proposed project. Finally, none of the alternatives proposed by the Protestants allows PPL Electric to address its distribution reliability concerns, which are explained in the following section.

## **2. The Need For The Meiserville 69-12 kV Substation**

The proposal to construct the Meiserville 69-12 kV Substation and related distribution facilities was developed by PPL Electric’s distribution planning department independently from the proposal by the PPL Electric transmission planning department to construct the Richfield –

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<sup>10</sup> PPL electric St. 7-R, p. 3.

Dalmatia 69 kV Transmission Line. Tr. 162. The Meiserville Substation proposal was developed to solve the distribution reliability issues identified in the project area. The Meiserville Substation will improve reliability of distribution service in the project area by improving load transfer capability between distribution substations and reducing the number of customers impacted by individual distribution line outages.

**a. Distribution System Overview**

Distribution Planning continuously monitors the load on PPL Electric's system and the reliability of the system. The Distribution Planning group meets on a quarterly basis with field personnel to discuss reinforcements to the electric system. Once a reinforcement has been determined to be necessary, Distribution Planning takes an overall, "big picture" view of the area and finds alternatives that reinforce the system for the near and long term in an economic manner. In designing an engineering solution, PPL Electric utilizes the alternative solution that offers the most benefit and value to the customer. PPL Electric St. 5-R, p. 10; Tr. 149. The chosen solution may not be the cheapest solution considered by PPL Electric's engineers, but it is the best solution for resolving a reliability problem.

Through monitoring of the distribution system, PPL Electric determined that a reinforcement of the distribution system in the Richfield - Dalmatia project area was required. The Richfield – Dalmatia project area is currently served primarily by one 12 kV distribution line, the Dalmatia 36-02 12 kV distribution line ("Dalmatia 36-02 line"). The Dalmatia 36-02 line is a radial line; that is, it is not networked with other distribution lines. It has a single source of supply, the Dalmatia 69-12 kV Substation, in Lower Mahanoy Township, Northumberland County. It stretches across several townships in Northumberland, Snyder, and Juniata Counties. The line currently extends 194 circuit miles, and supplies approximately 2,200 customers. PPL Electric St. No. 2, p. 3.

All Pennsylvania EDCs, including PPL Electric, are required to maintain a list of their worst performing circuits. EDCs are required to file with the Commission quarterly reports regarding the 5 percent of circuits on their systems that are classified as the worst performing circuits based on the number and duration of service interruptions and the number of customers affected by such outages. The reports also must include remedial plans to improve the performance of these circuits. 52 Pa. Code § 57.195. The Dalmatia 36-02 circuit has historically been one of PPL Electric's worst performing distribution circuits. It was included in the first worst-performing circuit report to the Commission, which was submitted for third quarter of 2003. PPL Electric St. 5-R, p. 3. It has been on the worst-performing circuits list 16 of 31 quarters thereafter, making it a chronic worst performer.

It is important to note here that the reliability issues identified by PPL Electric in this portion of its service territory are not related to voltage concerns on the Dalmatia 36-02 line. PPL Electric St. 5-RJ, p. 4. The project area has not experienced voltage issues. Instead, it has experienced reliability concerns stemming mainly from the length of the circuit and the number of customers served by it. Over the years, PPL Electric has taken steps to improve the reliability of the Dalmatia 36-02 line by addressing these two issues. In addition, PPL Electric has reinforced the distribution system in the area through numerous projects. Nevertheless, the Dalmatia 36-02 line kept reappearing on the worst performing circuits list.

When the Dalmatia 36-02 line first appeared on the list in 2003, it was approximately 260 miles long, and served more than 3,000 customers. In order to improve the reliability of service from this distribution line, PPL Electric split the line and transferred a portion of the customer load from the original Dalmatia 36-02 line onto a new 12 kV distribution line named the Dalmatia 36-01. Tr. 150. In addition, the Company installed reclosers and fuses at the proper

locations using proper coordination methods,<sup>11</sup> as well as installing lightning arresters on every distribution transformer. PPL Electric St. 5-R, p. 3. None of these measures provided more than a marginal improvement to the reliability concerns on the Dalmatia 36-02 line, because the Dalmatia 36-02 line has reappeared on the list of worst performing circuits. PPL Electric St. 5-R, p. 4. A robust reinforcement of the distribution system — a substation — is required. PPL Electric St. 5-RJ, p. 3.

**b. Distribution Reliability Principles And Practices**

The Distribution RP&P contains the guidelines that PPL Electric uses to plan expansions and reinforcements of its distribution system. The RP&P guides the design of the system, including how much and for how long load can be interrupted for any given contingency. The allowable time and amount of load interrupted were determined by examining historical outages and doing a statistical analysis to establish practical values that would permit system improvements to be implemented at reasonable costs. PPL Electric St. 5-R, p. 7. The purpose of many of the distribution guidelines in the RP&P is to limit the size, length and duration of outages to reasonable levels

Given that the Dalmatia 36-02 line has been continually on the list of worst performing circuits, it is not surprising that it does not comply with PPL Electric's RP&P. PPL Electric's Distribution Planning Department determined that the Dalmatia 36-02 line does not meet the RP&P guidelines for miles of circuit and for customer count per line. These violations result in greater exposure to outages due to the length of the circuit and large amounts of load being

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<sup>11</sup> A recloser is used to isolate a fault to limit the number of customers who experience an outage. If the device registers a fault current, it opens, waits five seconds and then recloses. If the fault is still there, it repeats the process several times until it locks out in the open position. The recloser is similar to a circuit breaker.

interrupted due to the large number of customers served. In addition, it is time-consuming to locate and repair the causes of outages on the Dalmatia 36-02 line due to its length.

Both PPL Electric's witness, Mr. Slugocki, and the Protestants' witness Mr. McGavran, agree that line exposure negatively impacts the reliability of a distribution line, such as the Dalmatia 36-02 line. PPL Electric St. 5-R, p. 6; P-McGavran-D1, p. 20. Fewer circuit miles per distribution line means that each distribution line has less potential exposure. Fewer circuit miles also reduces the amount of time required for PPL Electric to locate the cause of an outage on a distribution line. PPL Electric St. 5-R, p. 10. Similarly, fewer customers per line means that, for an individual line outage, fewer customers will be affected. *Id.* For these reasons, the RP&P limits the number of customers and circuit miles per feeder. PPL Electric's guidelines limiting the customer count and length of distribution lines are consistent with industry-wide practices. PPL Electric St. 7-R, p. 27.

The Distribution RP&P guidelines provide that no more than 1,300 customers should be served from a 12 kV line. In addition, the RP&P guidelines provide that a 12 kV line should not be more than 50 miles long. The Dalmatia 36-02 line currently serves more than 2,200 customers and is 194 miles long, almost four times the guideline maximum. The Meiserville Substation will enable PPL Electric to split the Dalmatia 36-02 Line into three lines. The split will bring the distribution system in the area into compliance with the RP&P guideline regarding the number of customers served by a 12 kV distribution line and will enable PPL Electric to reduce the length of the resulting lines so they are much closer to the RP&P standard. PPL Electric St. 5-R, p. 7. Distribution Planners utilized the RP&P guidelines to address the reliability concerns on the Dalmatia 36-02 line.

**c. Response to the Protestants**

The Protestants have claimed that the Meiserville substation is not required to improve reliability in the project area because, in their view, service without the Meiserville 69-12 kV Substation is reliable. The Protestants have also offered a number of other proposals that they believe would improve the reliability of service in the area without the need for a new substation. Protestants' proposals include increased vegetation maintenance and low cost modifications to the system, such as the installation of fuses, reclosers and lightning arresters. As PPL Electric explains next, none of these other alternatives provide the long-term reliability improvements that are needed in the project area.

The Protestants deny that a substation is needed to address the distribution reliability concerns identified by PPL Electric. They argue instead that increased vegetation management would resolve any reliability concerns. P-McGavran-D1, p. 22. Protestants' witness, Mr. McGavran, bases this claim on the fact that PPL Electric recently shifted its vegetation management practice from a six year cycle to a four year cycle, and that the Dalmatia 36-02 line experienced a relatively low number of outages in 2010. PPL Electric St. 6-R, pp. 9-10. From these two pieces of information, Mr. McGavran concluded that additional and more aggressive vegetation management has significantly reduced the outages experienced on the Dalmatia 36-02 line, and that "vigilant line maintenance" would make the substation project unnecessary. P-McGavran-D1, p. 22.

Mr. McGavran's conclusion relies on the premise that additional vegetation management would provide a significant reduction in outages. His testimony, however, is incorrect for the reasons explained by PPL Electric's forester and by its distribution system planner. As PPL Electric's regional forester, Dennis Braun, stated in his testimony, it simply is not the case that increased vegetation management will significantly reduce outages. Mr. Braun stated, with

regard to the number of outages on the Dalmatia 36-02 line: “More frequent pruning or inspection would not have a meaningful impact on this situation. PPL Electric cannot remove every tree outside the right-of-way because the Company does not have the right to do so. Further, it is not possible to identify every diseased or dying tree.” PPL Electric St. 6-R, p. 9. Mr. Slugoeki testified that additional vegetation management will provide only marginal benefits to reliability, and would not accomplish the reliability goals of this project. PPL Electric St. 5-RJ, pp. 1-2. The goals of the project are not directed at reducing the number of individual outages, but are instead intended to reduce the number of customers affected by each outage and the duration of each outage. *Id.* As clearly explained in PPL Electric’s testimony, additional vegetation management will not resolve the distribution reliability concerns associated with the Dalmatia 36-02 line. As explained next, Mr. Braun’s and Mr. Slugoeki’s conclusions are borne out by the facts; Mr. McGavran’s conclusions are not.

Mr. McGavran’s conclusions regarding the vegetation management program are not accurate for three reasons. First, PPL Electric’s recent shift in its program from a six year cycle to a four year cycle was not implemented in the project area until late in 2010. PPL Electric trimmed vegetation in the project area in 2004 before PPL Electric adopted the four year cycle. Therefore, the trimming in 2004 was designed to be sufficient to last six years. The four year trim cycle was not implemented until six years later. Consequently, the change from the six year trim cycle to the four year cycle realistically could not possibly have any significant effect on the project area until 2011. PPL Electric St. 6-RJ, p. 3.

Second, when PPL Electric shifted to the four year cycle, it also instituted less aggressive pruning. Previously, PPL Electric trimmed vegetation sufficiently to permit six years of growth without interfering with distribution line operations. PPL Electric now prunes to allow only

enough room for four years of growth. PPL Electric St. 6-R, p. 10. Thus, while the Company is in the field more often, it adjusted its pruning practices to reflect that fact. The primary area where the shift in cycle lengths has had an impact is in removing danger trees. PPL Electric St. 6-RJ, p. 2. However, for distribution lines, PPL Electric often does not have an ability to remove trees that are not located within the right-of-way, which limits the Company's ability to remove trees that may pose a risk of falling and damaging the distribution line. *Id.* Thus, the change in cycles has had a limited impact on distribution reliability.

Third, Mr. McGavran's conclusion that 2010 had fewer outages as a direct result of the change in PPL Electric's vegetation management practices is incorrect. As previously noted, PPL Electric did not trim until the second half of 2010, which means that for most of 2010, vegetation along the Dalmatia 36-02 line was at its maximum growth. Under these circumstances, if reliability of service were primarily dependent on how recently vegetation was trimmed, outages in 2010 would have been at their highest level. Instead, they were at their lowest level, as shown on the ten year outage history that was provided as PPL Electric Ex. DB-1. The fact is that, although vegetation management is important in maintaining reliable service, many other factors are important. Outages can result from storm conditions such as wind, rain, ice, lightning and snow, as well as interference from animals, vehicular accidents and equipment failures. P-McGavran-D1, Outage List by Feeder. In addition, system improvements can have substantial impacts on reliability of service. PPL Electric St. 5-RJ, pp. 4-5. For example, PPL Electric's outages on the Dalmatia 36-02 line for the years 2008 through 2011, were substantially reduced in 2008 by the splitting of the Dalmatia 36-02 line. Part of the Dalmatia 36-02 line became the Dalmatia 36-01 line. The results of the split were a reduction of customers being served by the Dalmatia 36-02 line and a reduction in the length of the Dalmatia 36-02 line. PPL

Electric St. 5-R, pp. 9-10. Therefore, differences in the number of outages during 2008 through 2011 to the outages prior to 2008 for the project area do not reflect changes in vegetation management practices as much as the reductions in the number of customers and circuit miles on the Dalmatia 36-02 line.

Mr. McGavran's reliance on outage data for 2010 to support his contention that vegetation management is sufficient to improve the reliability of service in the project area is inapposite for the additional reason that 2010 was a relatively storm free year. Storms cause a significant portion of outages experienced by PPL Electric's customers. Tr. 160. Mr. McGavran objected to the inclusion of storm related outages in determining reliability. P-McGavran-SR1, pp. 17-19. However, as Mr. Braun testified, from the perspective of customers and the Commission, excluding storm related outages does not make sense. PPL Electric St. 6-RJ, p. 3. In 2011, a year that included numerous major storm events, P-McGavran-SR1, pp. 17-18, the number of outages on the Dalmatia 36-02 increased dramatically from levels in 2010, despite the vegetation management that was done in late 2010. PPL Electric Ex. DB-1. Mr. McGavran's reliance on a relatively storm free year as having a low number of outages does not support his conclusion that increased vegetation management has reduced the number of outages on the Dalmatia 36-02 line, particularly when the outage numbers almost tripled the very next year, which was the first full year after the trimming in late 2010 that marked the implementation of the four year trimming cycle in the project area.

Mr. McGavran, on behalf of the Protestants, suggested that PPL Electric should not construct the Meiserville 69-12 kV Substation because reliability of service in the area could be improved through lower-cost alternatives. P-McGavran-SR1, pp. 2-3. Mr. McGavran's suggestion, however, is not well-founded because PPL Electric has already implemented all of

the lower-cost alternatives suggested by Mr. McGavran that would improve reliability. Based on actual experience, the lower-cost alternatives have not resolved the reliability concerns on the Dalmatia 36-02 line.

PPL Electric's Distribution Planning group has implemented a variety of solutions for addressing the reliability concerns on the Dalmatia 36-02 line since 2003. PPL Electric first utilized lower cost solutions for improving reliability to determine if they would improve service sufficiently before concluding that a substation was the only solution that would resolve completely the reliability concerns in the area. PPL Electric St. 5-RJ, p. 3. It should be recalled also that the cost of a new substation on the west shore of the Susquehanna River has been greatly reduced by the decision by PPL Electric's transmission planners, for transmission reasons, to construct the Richfield – Dalmatia 69 kV Transmission Line through the area served by the Dalmatia 36-02 line. The presence of the Richfield – Dalmatia 69 kV line greatly reduces the cost of obtaining a source of supply for the new substation. The Richfield – Dalmatia 69 kV line makes the Meiserville Substation much more economically feasible.

The low cost solutions already employed by PPL Electric included all of the low cost alternatives identified by Mr. McGavran on page 2 of his surrebuttal testimony, namely the installation of fuses, reclosers, and additional lightning arresters, as well as splitting off a portion of the customer load served by the Dalmatia 36-02 to create a new 12 kV distribution line named the Dalmatia 36-01. P-McGavran-SR1, p. 2. Mr. McGavran also recommended on page 3 of his surrebuttal testimony that PPL Electric upgrade its distribution lines to use heavier conductor. This will not address the reliability concerns PPL Electric has identified, because it will leave the line exposed in exactly the same ways it currently is: a large number of customers served by a line with a large number of circuit miles.

A new substation will improve reliability of service in the project area more than the lower cost alternatives because a new substation provides significant benefits over other potential solutions. For the project area, building a new substation is the only way to add new circuits without increasing the number of miles of circuit. In addition, the Meiserville Substation will provide a 12 kV source on the west side of the Susquehanna River, which will enable PPL Electric to transfer Dalmatia 36-02 line customers to the Meiserville source in the event of an outage of the Dalmatia Substation. Also, if there is an outage on the west side of the river, those customers can be transferred back to the Dalmatia 36-02 line to minimize the impact of the outage. PPL Electric will add automatic devices to the new lines, which will enable PPL Electric to isolate any outage to approximately 500 customers, instead of the more than 2,200 customers who could be affected by an outage presently. The Company does not currently have that capability on the Dalmatia 36-02 line. In addition, the Meiserville Substation will be supplied from a different 69 kV source, so that in the event of a 69 kV outage of the Meiserville Substation, all customers normally served by it could be transferred to the other 69 kV source, which serves the Dalmatia substation. PPL Electric St. 5-R, p. 5. This Project will also satisfy the Commission's requirement that PPL Electric actively address reliability on its worst performing circuits.

Mr. McGavran also stated in his testimony that PPL Electric should have considered alternative projects that involved distribution only upgrades. P-McGavran-SR1, p. 3. However, a distribution only solution is not viable for this project for two reasons. First, the only solution of that type available to PPL Electric in the project area would have involved building a tie line between two substations. Such a line, however, was not feasible, because the substations in the area do not have sufficient capacity to supply a new tie line. PPL Electric St. 5-RJ, p. 5. Second,

such a solution would not resolve the transmission reliability concerns that were identified by PPL Electric's transmission planning department. *Id.* Thus, the alternatives selected by PPL Electric resolves both the distribution reliability concerns in the project area and the transmission reliability concerns.

PPL Electric has shown that this Project is necessary to resolve the distribution reliability issues on the Dalmatia 36-02 line. The Protestants have not shown that this Project is not necessary, or that other alternatives would resolve the reliability concerns identified by PPL Electric. Further, because the Richfield – Dalmatia Project will resolve reliability concerns on both the transmission and distribution systems, PPL Electric has shown that this Project is necessary to provide reliable and safe service to its customers. Therefore, PPL Electric's applications for approval of the exercise of the power of eminent domain necessary to construct the Richfield – Dalmatia Transmission Line and the 69 kV tap to supply the Meiserville 69-12 kV Substation from the Richfield – Dalmatia 69 kV Transmission Line should be approved.

### **C. REASONABLENESS OF THE ROUTE**

After PPL Electric determined that the Richfield – Dalmatia project was reasonably necessary to provide adequate and reliable service to the public, PPL Electric was required to determine the most appropriate route for the transmission line. As explained below, PPL Electric undertook a detailed study of the area in which the Project must be constructed to accomplish its functional purposes, in order to find the route that best balances the numerous competing interests that must be taken into consideration in siting a high voltage transmission line.

At the outset, several general observations are appropriate in order to provide the proper framework for determining whether the route selected in this case is reasonable. Initially, although it may be obvious, there is no “perfect” line route. A transmission line cannot be designed and built without causing some effects on the environment, the public and individual

property owners. The fact that the Protestants may have pointed out some adverse effects of the transmission line does not support rejection of the applications. The only way to avoid all adverse effects on the environment, the public at large and individual property owners would be to not build transmission lines at all. But that approach would have a significant adverse effect in that it would prevent PPL Electric from continuing to provide adequate and reliable electric service to the public. Therefore, merely identifying some adverse effects along a proposed line route does not justify moving the line somewhere else, where it would have similar or perhaps even greater adverse effects on others.

It should be further noted that the selection of Route A as the preferred route is essentially unopposed. Although several individuals testified that the route has specific negative impacts on their property, no expert testimony supports the selection of any other route, and no witness for any other party presented anything that even purports to be a comprehensive analysis of the alternative routes. Further, PPL Electric has provided evidence to show that many of the concerns expressed in the testimony regarding the proposed route are unfounded, exaggerated or have been addressed by PPL Electric.

The siting process must carefully balance a wide variety of relevant factors. For example, the Commission's transmission line siting regulations list specific issues that must be considered. 52 Pa. Code § 57.75(e) & 57.76. Although, as previously noted, the regulations do not apply to this proceeding, the regulations are instructive, and PPL Electric has utilized them as a guideline in siting this Project. PPL Electric gave substantial consideration to numerous factors including reliability of the system, safety of the facilities to the public, impact on the environment, Project cost, inconvenience to the public during construction and maintenance, effect on historic areas, effect on archaeologic areas and the need for the Project. Based on a

careful balancing of all relevant factors, PPL Electric selected Route A for this Project. PPL Electric St. 3, p. 6.<sup>12</sup>

As explained below, Route A is the most appropriate route for the Richfield – Dalmatia Project, and PPL Electric has met the applicable legal standard of selecting a reasonable route for this Project.

### **1. Siting Process**

The first step in determining the optimal route for the Richfield – Dalmatia Project was to determine the area to be studied. The Study Area generally is the area in which a proposed line can feasibly be sited to meet the project’s functional requirements and, simultaneously, minimize environmental impacts and project costs. The Study Area selected by PPL Electric covers approximately 64.2 square miles in total land area. PPL Electric St. No. 3, p. 4. The Study Area included portions of Monroe Township and Susquehanna Township in Juniata County, Chapman Township, Perry Township, and West Perry Township in Snyder County, and Lower Mahanoy Township, in Northumberland County. *Id.*

The boundaries of the Richfield-Dalmatia Project Study Area were determined by the potential supply and destination service points viewed with consideration for man-made and natural boundaries beyond which line route alternatives would not be reasonable. PPL Electric Ex. 1, Attachment 2, p. 3. The east and west boundaries of the Study Area are generally defined by the need to connect the existing Juniata – Richfield 69 kV Line in the West Perry and Monroe Township area (Snyder and Juniata Counties) to the existing Sunbury – Dauphin 69 kV Line located in Lower Mahanoy Township, Northumberland County. PPL Electric St. No. 3, p. 4.

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<sup>12</sup> PPL Electric notes that in the direct testimony of Mr. Wehr for all of the applications, the Alternative Routes are numbered 1, 2 and 3, rather than A, B, and C. PPL Electric will refer to the Alternative Routes as A, B, and C, consistent with the Attachments to Exhibit 1.

The northern and southern Study Area boundaries represent points beyond which it becomes impractical to site a new transmission line due to increased impacts. The functional requirements define the Study Area, which is between approximately 4.9 and 4.2 miles from north to south, and is approximately 12 miles from east to west. *Id.*

PPL Electric's next step in the siting and route selection process was the identification of routing constraints. Large constraints were identified and avoided to the extent practical. Large constraints included the congested area of Dalmatia, residential development along the west bank of the Susquehanna River, and the State Game Lands #194. *Id.*

The next step in the route selection was the collection of environmental data. Sources of data included, inter alia, aerial photography, maps from many sources, Geographic Information System ("GIS") data from federal, state and county governments, field inspections to confirm and update information shown on maps and other data sources, and contacts with numerous federal, state, regional agencies and other interested organizations. In collecting and analyzing environmental data, PPL Electric utilized the Commission's siting regulations, which require that consideration be given to the impact, and efforts to minimize the impact, of the proposed line on the following:

- (i) Land use
- (ii) Soil and sedimentation
- (iii) Plant and wildlife habitats
- (iv) Terrain
- (v) Hydrology
- (vi) Landscape
- (vii) Archaeologic areas
- (viii) Geologic areas
- (ix) Historic areas
- (x) Scenic areas

- (xi) Wilderness areas
- (xii) Scenic rivers

52 Pa. Code § 57.75(e)(3). The environmental data collected by PPL Electric, a detailed analysis of which is provided in Attachment 2 to PPL Electric Exhibit 1, pages 5 through 27, included the following broad subjects:

- Linear Features
- Existing Land Use
- Agricultural Preservation
- Soil Characteristics
- Steep Slopes
- Natural Features
- Geology
- Cultural and Historic Features

In addressing these broad categories, PPL Electric thoroughly considered all twelve of the subjects identified in the Commission’s siting regulations. In particular, the section “Natural Features” included many subparts that addressed wildlife, vegetation, scenic rivers, wetlands, floodplains, and natural heritage sites. PPL Electric Ex. 1, Attachment 2, pp. 16-22. This section also includes an explanation of the potential impacts of the construction of the Richfield – Dalmatia transmission line on the Susquehanna River. *Id.* at p. 22. While noting these important elements in the project study area and avoiding them to the extent practicable in determining the three alternative routes, PPL Electric also prioritized avoiding certain features, such as wetlands, streams, and outstanding natural areas, as part of the process of selecting a final route.

After collecting the environmental data, PPL Electric developed maps showing linear features, existing land use, agricultural preservation areas, soil characteristics, steep slopes, natural features, geology, cultural and historic features, and constraints. The maps are located at the end of Attachment 2 to PPL Electric Ex. 1. The maps also show the three alternative routes. All of these subjects were considered in selecting alternative routes. *Id.* Utilizing its route selection criteria, PPL Electric began to locate potential routes. Potential routes are those routes that avoid, to the extent practical, large area constraints and meet siting objectives and criteria. PPL Electric St. No. 3, p. 4. After considering the project's functional requirements, identifying constraints, and receiving input from local governments and the public, PPL Electric identified three possible alternative routes. *Id.* at 4-5. The three alternative routes identified by PPL Electric are described as follows:

- Alternative A, the selected route, involves the construction of 11.54 miles of new 69 kV line that would extend from PPL Electric's Juniata-Richfield 69 kV line in West Perry Township, Snyder County, and run in a southeasterly direction to the Sunbury-Dauphin 69 kV line in Lower Mahanoy Township, Northumberland County. This line would run through Snyder, Juniata, and Northumberland Counties. Alternative A would require a 150 foot right-of-way at the proposed Susquehanna River crossing and a new 100 foot right-of-way for the remainder of the line.
- Alternative B would involve the construction of 12.49 miles of new 69 kV line that would extend from PPL Electric's Juniata-Richfield 69 kV line in West Perry Township, Snyder County and would proceed in an east/southeasterly direction to connect with the existing Sunbury-Dauphin 69 kV line in Lower Mahanoy Township,

Northumberland County. Alternative B would require a new 100 foot right-of-way, and would have approximately 2.5 miles in common with Alternative A.

- Alternative C would involve the construction of 12.07 miles of new 69 kV line from the Juniata–Richfield 69 kV line in Monroe Township and would proceed in a southeasterly direction to its connection point with the existing Sunbury–Dauphin 69 kV line in Lower Mahanoy Township. This alternative would require a 150 foot right-of-way at the proposed Susquehanna River crossing and a new 100 foot right-of-way for the remainder of the line.

A more detailed description of each alternative route can be found in Attachment No. 3 to PPL Electric Ex. 1.

In determining which of the three alternative routes was most appropriate for the Project, PPL Electric considered public and government input and used three different mathematical models for analyzing the potential impacts of the different routes. PPL Electric St. No. 3, p. 5. The Company considered land use, environmental impacts, social and functional considerations, construction and maintenance impediments, and cost. *Id.* PPL Electric used an Ordinal method, Relative Maximum-Minimum method, and a Relative Z-Score method in order to determine the preferred alternative. *Id.* A detailed discussion of the Company’s analysis is provided in Attachment No. 4 to PPL Electric Ex. 1. The inputs and results of the different mathematical models are provided in Attachment No. 4 to PPL Electric Ex. 1.

Based on PPL Electric’s analysis, Route A was shown to have many advantages over the other Routes. The primary advantage of Route A is that it has the lowest cumulative impact. It is the shortest of the three alternatives and requires the least amount of new rights-of-way. PPL Electric St. No. 3, p. 6. It also requires the least amount of tree clearing, has the shortest river

crossing, and has the least impact on natural areas. *Id.* In contrast, although Route B is less expensive than Route A, it would have the most impact on the Susquehanna River, because it would require construction activities in the river. *Id.* Both Routes B and C would require more extensive tree clearing. *Id.* Route C would have a greater impact on natural areas because it crosses the most streams. *Id.* Finally, Routes B and C would both require more extensive private rights-of-way. *Id.* Using the identified criteria and mathematical methods, PPL Electric determined that Route A was the preferred route. This decision was then communicated to the public and to municipal, state and federal officials and agencies for further feedback and adjustments, where appropriate. PPL Electric St. No. 3, pp. 5-6.

In siting the Meiserville Substation, PPL Electric considered three alternative sites for the preferred route. One of the alternative sites was located on the direct opposite side of Old Trail Road from the preferred substation site. The second alternative site considered was proposed by the owner of the preferred site, Mr. Hess. This site was again located on the opposite side of Old Trail Road from the preferred site and approximately 170 feet farther northeast. PPL Electric St. No. 3-R, p. 5. Although Mr. Slugocki noted that there could be other possible locations for the Meiserville Substation, he limited the difference in location to a few hundreds yards in order to address the Company's goals of reducing the length of the lines and the number of customers per feeder. Tr. 167; PPL Electric St. No. 5-R, pp. 10-11.

In selecting the preferred location for the substation, many factors were considered. These included the distance to the source transmission line, distance to the distribution facilities to be connected to, environmental impacts, social impacts, visual impacts, site access, permits required to construct the Project, and potential impacts to threatened and endangered species. PPL Electric St. No. 3-R, p. 6. Some of these factors, such as the distance to the source

transmission line and distribution facilities to be supplied from the substation, were approximately equal among the preferred site and alternative sites. Therefore, those were not substantial factors in selecting the preferred site for the substation. *Id.*

A major factor that led to PPL Electric's selection of the preferred site was the fact that the preferred site is located entirely outside of a 100-year floodplain; the other two sites are at least partially in the floodplain. *Id.* Avoiding the floodplain minimizes the environmental impacts and permit considerations associated with the substation site. *Id.* In addition, the preferred site is situated adjacent to an existing tree row, which will minimize the visual effects to the adjoining properties. *Id.* The two other alternative sites considered for the preferred route were located in open fields and did not have an existing visual buffer. *Id.* In addition, the preferred site is located near an active tire recycling facility and associated used tire storage area and a manufactured home production facility. Therefore, the incremental effects of the substation on the proposed site will not be as great as they would be for the other alternative sites. *Id.*

## **2. Response to Protestants**

Protestants have argued that PPL Electric failed to adequately address environmental conditions in the project area, including plant and wildlife habitats, landscape, scenic areas, and other elements of the Commission's siting regulations. P-McGavran-D1, p. 6. Protestants are incorrect. As shown in the previous section of this Main Brief, in the detailed environmental inventory contained in Attachment 2 to PPL Electric Ex. 1, and in the thorough siting analysis contained in Attachment 3 to PPL Electric Ex. 1, this argument is without merit. PPL Electric has shown that it compiled a detailed environmental inventory of the project study area and attempted to avoid or minimize its impact on the natural and human environments where it was

practical to do so. Further, Protestants did not conduct any meaningful environmental analysis of their own. Thus, they have offered no evidence to rebut PPL Electric's analysis and conclusions.

Protestants also argued that PPL Electric could construct its transmission lines in existing 12 kV corridors, rather than requiring a new right-of-way. P-McGavran-SR1, p. 5. The existing 12 kV corridors in the area, however, are not large enough to accommodate a 69 kV line. PPL Electric St. No. 3-R, p. 9. The corridors would have to be widened from either 30 or 50 feet, depending on whether the existing circuit was a single phase or three phase circuit, to 100 feet in densely populated areas. *Id.* Using these corridors would require the expansion of the existing 12 kV corridors across more than a dozen non-condemnable residential properties. *Id.* Section 1511(c) of the BCL does not authorize public utilities to condemn residences or their reasonable curtilages. Therefore, this siting alternative was not a practical solution.

In addition, the Protestants raised specific concerns with regard to the siting of the transmission line and substation on two of the properties at issue in this proceeding. The first of these properties is the Maurer property, where the transmission line would cross a portion of land used for growing Christmas trees. The second property is the Hess property. The issues raised regarding the Hess property include the risks associated with siting a transmission line over a pond on the property, near a fire hydrant, and near a tire recycling facility. PPL Electric addresses each of these issues below.

**a. Concerns Related to the Maurer Property**

The Maurers operate a Christmas Tree farm on the property that will be crossed by the Richfield – Dalmatia transmission line. P-Maurer-SR1, p. 2. A significant portion of the business consists of the sale of trees ranging from twelve to fifteen feet in height. *Id.* Although the transmission line will cross only 8.4% of the Maurer's property, PPL Electric St. No. 3-RJ, p. 4, PPL Electric determined that it could redesign this portion of the line to increase the ground

clearance so that the Maurers will be able to continue to grow Christmas trees under the line.<sup>13</sup> PPL Electric St. No. 10-RJ, p. 7. The Company determined that it could adjust the design of the line at minimal additional expense to allow trees to grow in the right-of-way up to fifteen feet in height. *Id.* The Maurers testified that allowing trees to grow to fifteen feet in height will allow them to continue their tree farm operations under the transmission line. The Company will construct the portion of the line over the Maurer property so that they can continue to grow trees up to fifteen feet in height. *Id.* Therefore, PPL Electric has addressed the siting concerns expressed by the Maurers in their testimony.

**b. Concerns Related to the Hess Property**

A portion of the Hess property is used as a tire recycling facility. As part of its facility, the property has a pond with a pump house and fire hydrant. In addition, a large number of used tires are stored on the property for future recycling. P-Hess-D1, p. 1, Tr. 374. The pond supplies the recycling facility's fire sprinkler system. P-Hess-D1, pp. 3-4. In addition, the local fire department uses the pond and fire hydrant to fill its fire trucks. The transmission line proposed by PPL Electric will pass over the pond. PPL Electric St. No. 3-R, p. 4. The hydrant will be located 30 feet outside the right-of-way. *Id.* at 3. In Mr. Hess' testimony, he argues that PPL Electric's proposed transmission line will limit his ability to expand the tire recycling facility, and that the proximity of the transmission line to the pond and hydrant pose a safety risk to facility workers and fire fighters. P-Hess-SR1, pp. 3-4. It should be noted that in response to the concerns expressed by the Hesses, PPL Electric met with the Hesses on a number of occasions to discuss the location of the proposed route, and adjusted the route of the transmission line across

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<sup>13</sup> It should be understood that a small number of Christmas trees will have to be removed to accommodate transmission line structures and construction activities. Of course, PPL Electric will compensate the Maurers for the loss of trees.

the Hess property based on input from the Hesses. Tr. 335. Nevertheless, they have pursued their protest.

To support his claim that the proposed route will limit his ability to expand the tire storage areas, Mr. Hess relies on National Fire Protection Association (“NFPA”) Fire Code, Standard 33.1.7. P-Hess-SR1, p. 3. The NFPA Fire Code cited by Mr. Hess is a model safety code that is published by a nonprofit organization, the NFPA. It is intended to be considered by state and local governments, or used as a guideline in establishing a fire code. PPL Electric St. No. 10-RJ, p. 2. It is not a binding code, in and of itself, and it has not been adopted by any governing body having jurisdiction over the Hess property. *Id.* Electric utility companies in Pennsylvania are required to follow the provisions of the National Electric Safety Code (“NESC”) pursuant to Section 2807(a) of the Public Utility Code. *Id.* at. 3. The NESC does not prohibit the storage of tires under or near transmission lines. *Id.* Finally, PPL Electric will only be encumbering approximately 2.43% of the total property that is used for tire recycling and tire storage facility. PPL Electric St. No. 3-RJ, p. 4. Therefore, the vast majority of the property, 97.57%, is available for the expansion of the tire recycling and storage facility. Mr. Hess’ claims that the proposed project will inhibit his ability to expand his business are overstated and not supported by the evidence in this proceeding.

With regard to the Hesses’ concerns about the location of the transmission line over the pond, PPL Electric has shown that construction of a transmission line over a pond is safe. PPL Electric has significant experience in constructing and operating transmission lines that cross bodies of water, including 54 transmission lines that cross the Susquehanna River. Tr. 331. In addition, PPL Electric’s transmission lines cross numerous streams and wetlands. For example, the proposed Richfield - Dalmatia transmission line will cross 17 streams and several wetlands.

PPL Electric Ex. 1, Attachment 3, p. 13. The Hesses' claim that the possibility that the transmission line could fall into the pond creates an unreasonable hazard for the pump house and firemen filling tank trucks using the hydrant near the pond. P-Hess-D1, pp. 2-4. Such concerns are exaggerated.

Transmission lines are reliable; they rarely fall. PPL Electric St. No. 10-R, pp. 3-4. Protestants' witness, Mr. McGavran, expressed concern that the overcurrent protection may not detect a high impedance ground fault if a line were to fall. P-McGavran-SR1, pp. 21-22. PPL Electric explained that, in the rare event of a transmission line failure, the line has overcurrent protection that would detect a high impedance ground fault and stop the flow of electricity. PPL Electric St. No. 10-RJ, p. 3. In addition, the protection on PPL Electric's system is designed so that, if a transmission line were to fall into a body of water, that event would trip the line and interrupt the flow of electricity. *Id.* at 4. PPL Electric's facilities would respond appropriately even to a high impedance ground fault or a downed line that contacts water.

The standards employed by PPL Electric, as well as the equipment, are consistent with standard utility industry practice. *Id.* The Hesses contend that the transmission line would pose a hazard to the pump house if the line were to fall into the pond. As Mr. Jarrah stated in his testimony, the transmission line poses little hazard to the pump house. *Id.* at 5. First, as previously noted it is extremely unlikely that the transmission line would fall, and even more unlikely that it would fall into the pond. Second, the system is designed to trip should the line contact the ground or the surface of the water. *Id.* at 4. Finally, in the extremely unlikely event that a line falls and contacts the water, it is also unlikely that the current would be able to reach beyond the pond or to the pump house, because the current would dissipate over the pond. *Id.* at

5. As shown by PPL Electric, the concerns expressed by the Hesses with regard to the pond and pump house are substantially overstated.

Mr. Hess expressed specific concern with regard to the proximity of the fire hydrant to the transmission line. P-Hess-D1, p. 4. His concerns are not well-founded. There has been no demonstration that Mr. Hess has any training or experience in fighting fires. First, it is worth noting that fire hydrants under or near transmission or distribution lines are common in PPL Electric's service territory. PPL Electric St. No. 10-RJ, p. 4. The hydrant at the Hess property is 30 feet from the nearest edge of the right-of-way and approximately 70 feet from the nearest conductor. PPL Electric St. No. 3-R, p. 3. Many hydrants throughout PPL Electric's service territory are closer to the power lines than the proposed Richfield – Dalmatia transmission line will be to the fire hydrant on the Hess property. PPL Electric St. No. 10-RJ, p. 4. Most public fire hydrants are in street rights-of-way and most 12 kV distribution lines are also in street rights-of-way. PPL Electric St. No. 10-R, p. 6. Therefore, it is common for hydrants to be directly under or across the street from power lines. In fact, PPL Electric produced photographs of such arrangements in the Allentown area involving both distribution lines and transmission lines. PPL Electric Ex. DJ-1. Thus, the situation on the Hess property is common within PPL Electric's service territory and does not constitute an undue hazard.

Not surprisingly, because the situation is common, there is a means of addressing safety concerns for the use of hydrants located near electric facilities. Lines near fire hydrants can be de-energized. In situations involving first responders such as firemen, PPL Electric defers to the expertise and experience of the first responders to determine whether the situation requires that the power line be de-energized in order to safely accommodate firefighters. *Id.* If the fire chief believes that there is an immediate threat to life or property, he contacts PPL Electric through the

911 Call Center, and PPL Electric can immediately de-energize the transmission line through remote switching. *Id.* at 6. PPL Electric has facilitated the development and successful use of this process in a variety of ways. The Company provides educational materials to first responders. *Id.* at 5. PPL Electric also staffs its call center and is ready to respond to emergency situations 24 hours a day, 7 days a week. *Id.* at 7. In addition the Company has troublemen in the field who are on call in the region 24 hours a day, 7 days a week. *Id.*

Routing the transmission line over the pond located on the Hess property is reasonable, and PPL Electric has shown that such a route is safe and that PPL Electric has significant experience operating transmission lines that cross bodies of water. PPL Electric has sited the portion of the transmission line that crosses the Hess property based on input from the Hesses and has minimized the impacts on the Hesses' business to the extent practicable while still accomplishing the goals of the Project.

### **3. Response to Public Input Hearing**

On March 7, 2012, the Commission held a Public Input hearing, where members of the general public were given the opportunity to testify regarding the proposed Project. PPL Electric responded to the concerns raised at the Public Input hearing in its rebuttal testimony. The main issues raised at the Public Input hearing identified the following subjects: impact of the Project on birds, particularly eagles; effects of electric and/or magnetic fields ("EMFs"); the impact of the Project on property values; and vegetation management concerns. The concerns raised in the Public Input hearing have been fully addressed by PPL Electric in this proceeding.

#### **a. Impact on Birds**

Witnesses at the Public Input hearing testified regarding their concern about the impact that the proposed transmission line would have on bird populations, including eagles, in the

project area. Tr. 52-56. In particular, the witnesses expressed concerns regarding the impact of construction activities on nesting bald eagles, and bird fatalities from transmission lines.

Contrary to these concerns, the Project will have little, if any, impact on eagles. It is very unlikely that human activities related to the Richfield – Dalmatia Project will prevent eagles from settling in the vicinity or cause eagles to leave the area. PPL Electric St. No. 8-R, p. 7. To address such concerns, PPL Electric follows the recommendations of, among others, the United States Fish and Wildlife Service (“USFWS”). The USFWS requests that transmission lines maintain 1,000 foot buffers around nests during construction. The USFWS believes that construction activities more than 1,000 feet from an eagle’s nest are not likely to disturb nesting eagles. There are no known eagle nests within 1,000 feet of the proposed Project. *Id.* at 6. Therefore, disturbance should not be a problem. Further, the impact of human activity and interference on bald eagles is not clear cut, and evidence was produced in this proceeding showing that bald eagles are known to tolerate human interaction in some circumstances. For example, eagle populations at the Conowingo Dam are thriving despite substantial human activity in the area. *Id.* at 7-8.

Witnesses also expressed concern that the presence of the transmission line could result in birds colliding with the power lines. Tr. 55. Such concerns are overstated because collisions between birds and the Richfield - Dalmatia transmission line are very unlikely. Generally, three situations can lead to bird-transmission line collisions: flocking birds, poor visibility and large birds with limited maneuverability. PPL Electric St. No. 8-R, p. 8. None of these situations will be present at the Richfield – Dalmatia transmission line. Few flocking birds are found in the area of the proposed Project. *Id.* at page 9. The flocking birds present in the area generally do not fly at the height of the transmission line so collisions are unlikely. Further, birds present in the area

generally do not fly during inclement weather when visibility would be poor. *Id.* Finally, there are a few large-bodied birds in the project area, but those present are highly maneuverable and do not appear to be significantly impacted by transmission lines. *Id.* at pp. 10-11. PPL Electric nevertheless appreciates the need to address the potential for avian collisions and is working closely with USFWS to best address the issue. *Id.* at 8. PPL Electric is consulting with the USFWS to obtain its recommendations to reduce risks to eagles and other birds, and will implement all recommendations from the USFWS. PPL Electric St. No. 10-R, p. 11.

In addition, PPL Electric has reviewed the Project with the Federal Aviation Administration (“FAA”). It is PPL Electric’s standard practice to include devices on the Transmission Line at the river crossing in order to make the Line more visible and reduce aviation hazards. *Id.* at 11. The devices will make the line more visible to birds, thereby further reducing the risk that a bird will collide with the conductors. *Id.* at 11. PPL Electric owns and operates 54 transmission lines that cross the Susquehanna River, and no evidence has been presented in this proceeding to show that its existing lines present an unreasonable risk of avian death.

One witness expressed concerns regarding avian electrocutions that might occur as a result of the proposed transmission line. Tr. 55. The same precautions that PPL Electric is taking to reduce the risk of collisions are also effective in reducing the risk of avian electrocution. PPL Electric St. No. 8-R, p. 8. In addition, PPL Electric utilizes a standard line design which provides sufficient horizontal and vertical clearance to reduce the risk of electrocution to bald eagles, as described in “Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006.” PPL Electric St. No. 10-R, p. 9. There is no indication

that the Richfield-Dalmatia transmission line, which will be constructed using PPL Electric's standard design, will pose any unreasonable risk to birds.

**b. Electric and/or Magnetic Fields**

One witness at the Public Input hearing expressed concern regarding the impact of EMFs on the health of the public. Tr. 78-87. Such concerns are not supported by most scientific literature. The World Health Organization<sup>14</sup> ("WHO") conducted an in-depth review of the scientific literature regarding EMFs. The review did not confirm the existence of any health consequences from exposure to low level EMFs. PPL Electric St. No. 10-R, p. 7. Pennsylvania has not adopted any exposure standards for EMFs from transmission lines. However, the exposure guidelines from the International Commission on Non-Ionizing Radiation Protection ("ICNIRP") and the Institute of Electrical and Electronics Engineers ("IEEE") are 2,000 mG<sup>15</sup> and 9,040 mG, respectively. The guidelines have been endorsed by the WHO. *Id.* at 7-8. The EMF levels from the proposed transmission line will be far lower than either of these two exposure guidelines. PPL Electric St. No. 10-R, p. 8.

PPL Electric notes that the Commission has previously found that, with regard to EMFs, no unreasonable risk of danger to the health and safety of the public was present where, "there is no conclusive evidence that EMF presents a known hazard to human health." *Letter Notification Of Philadelphia Electric Company Regarding The Woodbourne-Heaton 230 kV Line*, Docket No. A-110550F055 (November 12, 1993). *See also Certification Application Of Pennsylvania Power & Light Company Regarding The Wescosville-Trexlerstown #3 and #4 138/69 kV Line*,

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<sup>14</sup> The WHO is the directing and coordinating authority for health within the United Nations system. It is responsible for providing leadership on global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries and monitoring and assessing health trends.

<sup>15</sup> A Gauss (G) is the most common unit used by engineers to describe a magnetic field. One milligauss equals 1/1000 of a Gauss (1 mG = 0.001 G)

Docket Nos. A-110500F0162 and 110500F0169 (March 17, 1994) ("We conclude that the testimony and the exhibits demonstrate that there is no scientific basis to conclude that magnetic fields from the proposed line would cause adverse health effects."), *Certification Application of Pennsylvania Power & Light Company Filed Pursuant to 52 Pa. Code Chapter 57 With Respect to the Proposed Line Replacement of the Existing West Shore-Carlisle 69 kV Transmission Line with a West Shore-Carlisle 138/69 kV Transmission Line*, Docket Nos. A-110500F0196 and A-110500F0203.(Recommended Decision entered October 21, 1994) ("[T]here is no basis to conclude that electric and magnetic fields ("EMF") are a human health hazard"), *Application of PPL Electric Utilities Corporation Filed Pursuant to 52 Pa. Code Chapter 57, Subchapter G, for Approval of the Siting and Construction of the Pennsylvania Portion of The Proposed Susquehanna-Roseland 500 kV Transmission Line in Portions of Lackawanna, Luzerne, Monroe, Pike and Wayne Counties, Pennsylvania*, Docket No. A-2009-2082652 (Order entered on February 12, 2010) ("There is no reliable scientific basis to conclude that exposure to power frequency EMF...will cause or contribute to adverse health effects in children or adults"). No party presented credible scientific evidence to show that EMFs present any hazard to human health.

Despite the absence of proof that EMFs are dangerous, PPL Electric has for many years had a Magnetic Field Management Policy which involves taking no-cost/low-cost measures to reduce EMFs where practicable in the design and operation of new or rebuilt transmission lines. *Id.* at 8. Reverse Phasing is an arrangement of the wires on a double-circuit transmission line that reduces the magnetic field levels when the current on both circuits is flowing in the same direction. *Id.* For this line, when a second circuit is added in the future, PPL Electric will use "reverse phasing" which will cancel some EMFs produced by the line. *Id.* at 9. In addition, the

line will exceed NESC minimum conductor to ground clearance by approximately 10 feet. This will result in reducing the level of EMFs from the levels that would be produced by conductors at the minimum NESC permitted height. *Id.* at 8.

The PUC has previously commented favorably on the Plan:

Based on the extensive scientific evidence developed to date, which has been discussed in the preceding section, it is clear that EMF should not be regarded as a health hazard. However, the Company believes that it makes sense, as a matter of policy, to deal with customer concerns about EMF by reducing electric and magnetic fields in new and rebuilt facilities where that can be done with no-cost or low-cost design changes. Consequently, with that goal in mind, PP&L initiated its Magnetic Field Management Program in March 1991....

Magnetic fields from overhead power lines and human exposure to those fields can be reduced by a number of methods including increasing ground clearance; balancing phase currents and circuit loads; using low reactance (reverse) phasing; adopting line configurations that reduce the space between phase conductors; increasing right-of-way widths; and, in general, locating lines in less densely populated areas.... Based upon a detailed investigation of these factors, including their environmental impact, costs and benefits, PP&L developed the guidelines incorporated in its Magnetic Field Management Program.

*Application of Pennsylvania Power & Light Company Filed Pursuant to 52 Pa. Code Chapter 57, 1994 Pa. PUC LEXIS 65, \*67-\*69 (Oct. 21, 1994).*

**c. Impact on Property Values**

One witness testified regarding the impact of the proposed Project on property values. Tr. 79-85. The witness referred to certain published materials regarding the effect of high voltage transmission lines on the value of nearby residential real estate. PPL Electric attempted to obtain as many of these sources as possible and provided copies of all the articles it could locate. PPL Electric St. No. 9-R, p. 4, PPL Electric Exs. CK-1 through CK-5. A thorough review of these articles does not support the conclusion that transmission lines have a negative impact on property value. PPL Electric St. No. 9-R, p.9.

PPL Electric also produced two additional articles, PPL Electric Exhibits CK-6 and CK-7, which directly contradict the conclusion drawn by the witness. In the first of these two articles, the authors conclude that there is no evidence of effects based on either proximity or visibility of high voltage transmission lines on residential real estate values. *Id.* at 9-10. The second article concludes that the limited effects of a high voltage transmission line on residential values dissipate as the distance from the line increases. *Id.* at 11. A review of all of the articles produced as part of the record in this proceeding leads to the conclusion that the presence of a high voltage transmission line has little or no effect on the values of residential properties. *Id.*

**d. Vegetation Management Concerns**

Witnesses at the Public Input hearing testified regarding vegetation management concerns. Some of these concerns overlapped with the issues raised by the Protestants, that additional more aggressive vegetation management would negate the necessity of this Project. PPL Electric has already addressed this argument in Section B.2.c of this Main Brief. However, an additional issue was raised with regard to the “tree of heaven,” also known as *ailanthus altissima*, a very fast growing species of tree.

PPL Electric is aware of the species and treats it with herbicides to eliminate the root system when it is found growing in a right-of-way. PPL Electric St. No. 6-R, p. 11. It is easily controlled in the four year trim cycle. *Id.* Mr. Braun, PPL Electric’s forester for the project area, stated that he was unaware of the tree of heaven being a problem within a PPL Electric right-of-way. *Id.* at 11-12. However, Mr. Braun did note that this species grows near many telephone rights-of-way, which people sometimes confuse with PPL Electric’s lines. *Id.* at 12.

V. **CONCLUSION**

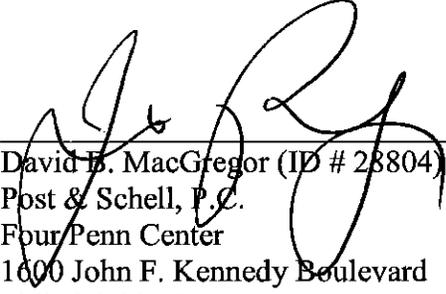
WHEREFORE, PPL Electric Utilities Corporation respectfully requests that the Administrative Law Judges and the Pennsylvania Public Utility Commission approve the following “Applications of PPL Electric Utilities Corporation Under 15 Pa.C.S. § 1511(c) for a Finding and Determination That The Service To Be Furnished By The Applicant Through Its Proposed Exercise Of The Power Of Eminent Domain To Acquire A Right-Of-Way And Easement Over And Across The Lands Of The Property Owners Listed Below For The Proposed Richfield – Dalmatia 69 kV Transmission Line In Portions Of Snyder, Northumberland, and Juniata Counties, Pennsylvania Is Necessary or Proper For The Service, Accommodation, Convenience Or Safety Of The Public:”

1. Michael and Logan Wendt, Doc. No. A-2011-2267349;
2. Randall Clark, Doc. No. A-2011-2267352;
3. John and Evelyn Zeiders, Doc. No. A-2011-2267353;
4. Roy and Cindy Maurer, Doc. No. A-2011-2267416;
5. Ronald and Dianne Mace, Doc. No. A-2011-2267418;
6. The Shoop Family Trust c/o Edwin and Denny Shoop, Doc. No. A-2011-2267426;
7. Gary and Dorene Lahr, Doc. No. A-2011-2267429;
8. Elijah and Faye Lahr, Doc. No. A-2011-2267446;
9. Marvin Roger Hess and Leona Hess, Doc. No. A-2011-2267448;

PPL Electric Utilities Corporation respectfully requests that the Administrative Law Judges and the Pennsylvania Public Utility Commission grant such other approvals as are necessary or appropriate under all of the circumstances.

Respectfully submitted,

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Date: October 17, 2012

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# **APPENDIX “A”**

**APPENDIX A**  
**FINDING OF FACTS**

**BACKGROUND**

1. PPL Electric is a public utility and electric distribution company subject to the regulatory jurisdiction of the Pennsylvania Public Utility Commission (“PUC” or “Commission”). PPL Electric Ex. 1, p 1.

2. PPL Electric furnishes electric distribution, transmission and supplier of last resort services to approximately 1.4 million customers in a service area that includes approximately 10,000 square miles covering all or portions of twenty-nine counties in eastern and central Pennsylvania. PPL Electric Ex. 1, pp. 1-2.

3. PPL Electric is a member of PJM Interconnection, L.L.C. (“PJM”). PPL Electric Ex. 1, p. 3.

4. PPL Electric seeks findings that the service to be furnished through the exercise of the power of eminent domain by PPL Electric to acquire rights-of-way across the nine identified tracts of land for construction of aerial transmission lines is necessary for the service, accommodation, convenience or safety of the public. PPL Electric Ex 1., p. 14.

**NEED FOR THE PROPOSED TRANSMISSION LINE**

5. PPL Electric’s transmission lines are designed to operate at specified voltage levels of 69 kV and higher. PPL Electric St. No. 4-R, p. 6.

6. The transmission system is subdivided into bulk and non-bulk systems, with transmission lines operating at or above 100 kV constituting the bulk electric system. PPL Electric’s 69 kV transmission system is called its regional transmission system. PPL Electric St. No. 4-R, p. 6.

7. The regional transmission system is planned using guidelines, the Reliability Principles and Practices (“RP&P”), that have been adopted by PPL Electric to ensure that the system provides safe and reliable service to its customers.<sup>16</sup> PPL Electric St. No. 1, p. 3.

8. Ensuring that load can be transferred from one 69 kV transmission line to another is important for restoring service to a large number of customers in the event of an outage. PPL Electric St. No. 4-R, p. 4.

9. Load transfers are accomplished by ensuring the system has sufficient line capacity to allow load normally served by one 69 kV transmission line to be transferred to another interconnected 69 kV transmission line while maintaining acceptable voltage levels. PPL Electric St. No. 4-R, pp.4-5.

10. It is important that PPL Electric’s transmission system continue to be reinforced by transmission line projects like the Richfield – Dalmatia Transmission Line, in order to ensure reliable service to PPL Electric’s customers. PPL Electric St. No. 4-R, pp.4-5.

11. PPL Electric actively participates in the PJM RTEP process and provides the results of its independent studies to PJM for consideration and inclusion in the RTEP. PPL Electric St. No. 7-R, pp. 6-8.

12. PPL Electric plans, constructs, and operates its transmission system to adhere to the Principles outlined in the RP&P to the extent practical. PPL Electric St. No. 4-R, p. 3.

13. The quantitative standards adopted in the transmission RP&P and implemented in the planning process assure that the regional power transmission system can supply electricity to all customer loads in a reliable and economic manner. PPL Electric St. No. 4-R, p. 4.

14. PPL Electric’s RP&P and regional planning processes have been developed and refined over the years using industry-wide experience and historical performance benchmarks to

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<sup>16</sup> There are RP&P guidelines for both transmission facilities and for distribution facilities.

ensure acceptable and appropriate levels of service that remain consistent with good utility practice. PPL Electric St. No. 4-R, p. 4.

15. The RP&P guidelines for a single circuit 69 kV transmission line allow up to 60 MW of load to be interrupted for up to 2 hours. Beyond 2 hours, not more than 30 MW of load may remain interrupted after all available field switching has been completed. PPL Electric St. No. 4-R, p. 2.

16. PPL Electric has applied the RP&P to the development of the power system since the 1980s, and this design philosophy has provided for a highly reliable power system that is consistent with good utility practice. PPL Electric St. No. 4-R, p. 5.

17. The RP&P has also been presented to the Commission as the basis for PPL Electric's planning decisions in numerous transmission project applications over the last thirty years. PPL Electric St. No. 4-R, p. 5.

18. PPL Electric's transmission planning department identified that an outage on the Juniata – Richfield 69 kV line would cause approximately 44 MW of load to remain interrupted after all field switching and load transfers to adjacent lines have been completed. This is a violation of PPL Electric's RP&P guidelines. PPL Electric St. No. 4-R, pp. 2-3.

19. An outage on the Sunbury –Dauphin 69kV transmission line would cause approximately 10 MW of load to remain interrupted after all field switching is completed. Although the situation on the Sunbury – Dauphin Transmission Line is not a violation of the RP&P guidelines, this project will resolve the load restoration issue on that line, as well. PPL Electric St. No. 4-R, pp. 2-3.

20. The Transmission Planning group assessed a variety of potential engineering solutions and selected two for more thorough assessment. Those two solutions were identified as Alternatives 1 and 2 in the Necessity Statements. PPL Electric Ex. 1, Attachment 1, pp. 7-9.

21. In Alternative 1, PPL Electric would construct a new 11 mile long 69 kV line with double circuit design. The line would initially be constructed with a single circuit. The proposed line would extend from the vicinity of the Richfield substation to the vicinity of the Dalmatia substation, tying together the existing Juniata – Richfield and Sunbury – Dauphin 69 kV transmission lines. PPL Electric Ex. 1, Attachment 1, pp. 7-8.

22. The estimated cost of this alternative was \$12 million, including the costs of the rights-of-way. PPL Electric Ex. 1, Attachment 1, p. 7.

23. In Alternative 2, PPL Electric would construct a new 15 mile long 69 kV line with double circuit design. The line would initially be constructed with a single circuit. The proposed line would run from the Richfield Tie point on the Sunbury—Middleburg line to the Sunbury Substation 69 kV Yard 2. In addition to the 15 miles of double circuit line, another 5 miles of transmission line would be required to supply the proposed Meiserville 69-12 kV substation. PPL Electric Ex. 1, Attachment 1, pp. 8-9.

24. This alternative would cost an estimated \$22 million. PPL Electric Ex. 1, Attachment 1, p. 9.

25. After investigating the two alternatives, Alternative 1 was selected as the preferred configuration. PPL Electric Ex. 1, Attachment 1, p. 9.

26. Alternative 2 would be more expensive, require a longer construction lead time and would encumber more land due to the longer length of the new transmission line. PPL Electric St. No. 4-R, pp. 15-16.

27. Alternative 1 is also preferable because it provided load restoration support of the loss of the Sunbury – Dauphin 69 kV line, whereas Alternative 2 did not. PPL Electric St. No. 4-R, p. 16.

28. PPL Electric submitted the proposed Richfield-Dalmatia transmission line project to PJM in March, 2012. PPL Electric St. No. 7-R, p. 9.

29. The PJM Board approved the inclusion of the Richfield – Dalmatia Project in the RTEP in its July 10, 2012 meeting. The project has been identified by PJM in the RTEP as b1898. PPL Electric St. No. 4-RJ, p. 9.

30. PPL Electric performs regular maintenance on its transmission and distribution systems. However, no amount of maintenance can prevent all equipment failures. PPL Electric St. No. 3-R, pp. 10-12.

31. PPL Electric's Transmission RP&P sets load restoration guidelines that recognize the necessity of maintaining a proper balance between service reliability and cost and that avoid large scale, long-term or frequent interruptions due to the adverse effects they have on the general public. PPL Electric St. No. 4-R, p. 4.

32. Rebuilding the existing single-circuit Sunbury – Middleburg Transmission Line with heavier conductors would not resolve the RP&P violation targeted with the Richfield – Dalmatia Transmission Project, because the line would still not be able to restore load to within the RP&P guidelines for the loss of the Juniata – Richfield 69 kV line while maintaining acceptable voltage levels. Tr. 217.

33. This proposal would also not provide the added benefit of load restoration for the loss of the Sunbury – Dauphin 69 kV line as PPL Electric's preferred solution will. PPL Electric St. No. 4-R, p. 17.

34. A rebuild of the Sunbury – Middleburg 69 kV Transmission Line as a single or a double circuit would have other constraints that make the rebuild impractical. Tr. 223-224.

35. PPL Electric utilizes a 100 foot right-of-way for all new 69 kV transmission lines and attempts to use the 100 foot right-of-way for rebuilt lines, as well. PPL Electric St. No. 3-RJ, p. 2, PPL Electric St. No. 4-R, pp. 15-16.

36. The present Sunbury – Middleburg 69 kV Transmission Line is an older line which includes portions that were constructed in a 50-foot right-of-way. Tr. 223

37. There are 14 non-condemnable properties on the right-of-way for the rebuild. PPL Electric St. No. 4-R, p. 16

38. If even one of the property owners refused to sell needed land rights to PPL Electric, then. PPL Electric would have to redesign the line for the 50 foot right-of-way, which would mean that more poles would be required and that the poles would have to be custom-designed. These would greatly increase the cost of the Project. Tr. 253.

39. Under either a single or double circuit rebuild, PPL Electric would need to build temporary facilities to continue to provide service to those customers served by the exiting Sunbury – Middleburg 69 kV line. PPL Electric St. No. 4-R, p. 16.

40. A double circuit rebuild of the Sunbury – Middleburg 69 kV line would be required to solve the reliability concerns, however the addition of a second circuit would require PPL Electric to reconfigure the Sunbury 230-69 kV Substation. Tr. 226.

41. The Sunbury Substation is very congested, and substantial rearrangement would be required in order to accommodate an additional 69 kV circuit. Tr. 226.

42. Rebuilding the Sunbury - Middlesburg 69 kV Transmission Line as a double circuit, with the addition of a breaker in the 69 kV yard 2 as well as other associated substation yard work, would be more expensive to build than the proposed project. Tr. 226-227.

43. Project b0916, which is defined as a reconductoring of the Sunbury to Dalmatia 69 kV line, while necessary to resolve a normal overload condition on the line, will not improve load restoration capabilities for loss of the Sunbury – Dauphin 69 kV line supplied from Sunbury or for the loss of the Juniata – Richfield 69 kV line supplied from Juniata like the new Richfield – Dalmatia 69 kV tie line will. Tr. 205-206.

44. Neither project negates the necessity of the other. Both projects are required to resolve reliability concerns. PPL Electric St. No. 4-R, p. 9.

#### **NEED FOR THE PROPOSED MEISERVILLE 69-12 KV SUBSTATION**

45. The proposal to construct the Meiserville 69-12 kV Substation and related distribution facilities was developed by PPL Electric’s distribution planning department independently from the proposal to construct the Richfield – Dalmatia 69 kV Transmission Line which was developed by the transmission planning department. Tr. 162.

46. In designing an engineering solution, PPL Electric utilizes the alternative solution that offers the most benefit and value to the customer. PPL Electric St. 5-R, p. 10; Tr. 149.

47. The Richfield – Dalmatia project area is currently served primarily by one 12 kV distribution line, the Dalmatia 36-02 12 kV distribution line (“Dalmatia 36-02 line”). PPL Electric St. No. 2, pp. 3-4.

48. The Dalmatia 36-02 line has a single source of supply, the Dalmatia 69-12 kV Substation, in Lower Mahanoy Township, Northumberland County. It stretches across several townships and a borough in Northumberland, Snyder, and Juniata Counties. PPL Electric St. No. 2, p. 3.

49. The Dalmatia 36-02 circuit has historically been one of PPL Electric's worst performing distribution circuits. It was included in the first worst-performing circuit report to the Commission, which was submitted for third quarter of 2003. It has been on the worst-performing circuits list 16 of 31 quarters thereafter, making it a chronic worst performer. PPL Electric St. No. 5-R, p. 3.

50. The reliability issues identified by PPL Electric in this portion of its service territory are not related to voltage concerns on the Dalmatia 36-02 line. PPL Electric St. No. 5-RJ, p. 4.

51. When the Dalmatia 36-02 line first appeared on the list in 2003, it was approximately 260 miles long, and served more than 3,000 customers. PPL Electric Ex. 1, Attachment 1, p. 5.

52. After PPL Electric took engineering considerations into account, it split the line and transferred a portion of the circuit miles and customer load of the original Dalmatia 36-02 line onto a new 12 kV distribution line named the Dalmatia 36-01. Tr. 150.

53. The Company installed reclosers and fuses at the proper locations using proper coordination methods, as well as installing lightning arresters on every distribution transformer. PPL Electric St. No. 5-RJ, p. 3.

54. Despite these measures, the Dalmatia 36-02 line has reappeared on the list of worst performing circuits. PPL Electric St. No. 5-R, p. 4.

55. A robust reinforcement of the distribution system is required. PPL Electric St. No. 5-RJ, p. 3.

56. The RP&P guides the design of the system, including how much and for how long load can be interrupted for any given single contingency. The allowable time and amount of

load interrupted were determined by examining historical outages, and doing a statistical analysis to establish practical values that would permit system improvements to be implemented at reasonable costs. PPL Electric St. No. 5-R, p. 7.

57. PPL Electric's Distribution Planning Department determined that the Dalmatia 36-02 line does not meet the RP&P guidelines for miles of circuit and for customer count per line. PPL Electric St. No. 2, p. 3.

58. These violations result in greater exposure to outages due to the length of the circuit and large amounts of load being interrupted due to the large number of customers served. PPL Electric St. No. 2, p. 3.

59. In addition, it is time-consuming to locate and repair the cause of outages on the Dalmatia 36-02 line due to its length. PPL Electric St. No. 5-R, p. 4.

60. Line exposure negatively impacts the reliability of a distribution line, such as the Dalmatia 36-02 line. PPL Electric St. No. 5-R, p. 6; P-McGavran-D1, p. 20.

61. Fewer circuit miles per distribution line means that each distribution line has less potential exposure. Fewer circuit miles also reduces the amount of time it requires PPL Electric to locate the cause of an outage on a distribution line. PPL Electric St. No. 5-R, p. 10.

62. Similarly, fewer customers per feeder means that, for an individual line outage, fewer customers will be affected. PPL Electric St. No. 5-R, p. 10.

63. PPL Electric's RP&P guidelines limiting the customer count and length of distribution lines are consistent with industry-wide practices. PPL Electric St. No. 7-R, p. 27.

64. The Distribution RP&P guidelines provide that no more than 1,300 customers should be served from a 12 kV line. In addition, the RP&P guidelines provide that a 12 kV line should not be more than 50 miles long. PPL Electric St. No. 2, p. 3.

65. The Dalmatia 36-02 line currently serves more than 2,200 customers and is 194 miles long. PPL Electric St. No. 2, p. 3.

66. The Meiserville Substation will enable PPL Electric to split the Dalmatia 36-02 Line by adding two new 12 kV distribution lines out of the Meiserville Substation. PPL Electric St. No. 2, p. 4.

67. The split brings the distribution system in the area into compliance with the RP&P guideline regarding the number of customers served by a 12 kV distribution line and enables PPL Electric to reduce the length of the resulting lines so they are much closer to the RP&P standard. PPL Electric St. No. 5-R, p. 7.

68. Increased vegetation management will not significantly reduce outages on the Dalmatia 36-02 line. PPL Electric St. No. 6-R, p. 9.

69. The goals of the project are not directed at reducing the number of individual outages but are instead intended to reduce the number of customers affected by each outage and the duration of each outage. PPL Electric St. No. 5-RJ, pp. 1-2.

70. Additional vegetation management would provide only marginal benefits to reliability, and would not accomplish the reliability goals of this project. PPL Electric St. No. 5-RJ, pp. 1-2.

71. The change from the six year trim cycle to the four year cycle realistically had no significant effect on the project area until 2011. PPL Electric St. No. 6-RJ, p. 3.

72. System improvements can have substantial impacts on reliability of service. PPL Electric St. No. 5-RJ, pp. 4-5.

73. Storms cause a significant portion of outages experienced by PPL Electric's customers. Tr. 160.

74. In assessing the number of outages experienced on a distribution line, excluding storm related outages would be improper. PPL Electric St. No. 6-RJ, pp. 3-4.

75. In 2011, a year that included major storm events, the number of outages on the Dalmatia 36-02 increased dramatically from levels in 2010, despite the vegetation management that was done in late 2010. PPL Electric Ex. DB-1.

76. PPL Electric first utilized lower cost solutions for improving reliability to determine if they would improve service sufficiently before concluding that a substation was the only solution that would resolve completely the reliability concerns in the area. PPL Electric St. No. 5-RJ, p. 3.

77. PPL Electric will add automatic devices to the new lines, which will enable PPL Electric to isolate any outage to approximately 500 customers, instead of the more than 2,200 customers who could be affected by an outage presently. PPL Electric St. No. 5-R, p. 5.

78. The Meiserville Substation will be supplied from a different 69 kV source, so that in the event of a 69 kV outage of the Meiserville Substation, all customers normally served by it could be transferred to the other 69 kV source, which serves the Dalmatia substation. PPL Electric St. No. 5-R, p. 5.

79. This project will also satisfy the Commission's requirement that PPL Electric actively address reliability on its worst performing circuits. PPL Electric St. No. 5-R, p. 5.

#### **REASONABLENESS OF THE ROUTE**

80. PPL Electric gave substantial weight to numerous factors including reliability of the system, safety of the facilities to the public, impact on the environment, project cost, inconvenience to the public during construction and maintenance, effect on historic areas, effect on archaeological areas and the need for the project, and based on a careful balancing of all relevant factors, PPL Electric selected Route A for this project. PPL Electric St. No. 3, p. 6.

81. The first step in determining the optimal route for the Richfield – Dalmatia project was to determine the area to be studied, which covers approximately 64.2 square miles in total land area.. PPL Electric St. No. 3, p. 4.

82. The Study Area included portions of Monroe Township and Susquehanna Township in Juniata County, Chapman Township, Perry Township, and West Perry Township in Snyder County, and Lower Mahanoy Township, in Northumberland County. PPL Electric St. No. 3, p. 4.

83. The boundaries of the Richfield-Dalmatia Project Study Area were determined by the potential supply and destination service points viewed with consideration for man-made and natural boundaries beyond which line route alternatives would not be reasonable. PPL Electric Ex. 1, Attachment 2, p. 3.

84. The east and west boundaries of the Study Area are generally defined by the need to connect the existing Juniata – Richfield 69 kV Line in the West Perry and Monroe Township area (Snyder and Juniata Counties) to the existing Sunbury – Dauphin 69 kV Line located in Lower Mahanoy Township, Northumberland County. PPL Electric St. No. 3, p. 4.

85. The northern and southern Study Area boundaries represent points beyond which it becomes impractical to site a new transmission line due to increased impacts. The functional requirements define the Study Area, which is between approximately 4.9 and 4.2 miles from north to south, and is approximately 12 miles long east to west. PPL Electric St. No. 3, p. 4.

86. PPL Electric’s next step in the siting and route selection process was the identification of routing constraints ,which included the congested area of Dalmatia, residential development along the west bank of the Susquehanna River, and the State Game Lands #194. PPL Electric St. No. 3, p. 4.

87. PPL Electric collected and analyzed environmental data, utilizing the Commission's siting regulations. PPL Electric Ex. 1, Attachment 2, pp. 5-27.

88. After collecting the environmental data, PPL Electric developed maps showing linear features, existing land use, agricultural preservation areas, soil characteristics, steep slopes, natural features, geology, cultural and historic features, and constraints. PPL Electric Ex. 1, Attachment 2.

89. Utilizing its route selection criteria, PPL Electric began to locate potential routes. Potential routes are those routes that avoid, to the extent practical, large area constraints and meet siting objectives and criteria. PPL Electric St. No. 3, p. 4.

90. After considering the project's functional requirements, identifying constraints, and receiving input from local governments and the public, PPL Electric identified three possible alternative routes. PPL Electric St. No. 3, pp. 4-5, PPL Electric Ex. 1, Attachment No. 3.

91. In determining which of the three alternative routes was most appropriate for the Project, PPL Electric considered public and government input and used three different mathematical models for analyzing the potential impacts of the different routes. PPL Electric St. No. 3, p. 5.

92. The Company considered land use, environmental impacts, social and functional considerations, construction and maintenance impediments, and cost. PPL Electric St. No. 3, p. 5.

93. PPL Electric used an Ordinal method, Relative Maximum-Minimum method, and a Relative Z-Score method in order to determine the preferred alternative. PPL Electric St. No. 3, p. 5; PPL Electric Ex. 1, Attachment No. 4.

94. Route A is the shortest of the three alternatives and requires the least amount of new rights-of-way. PPL Electric St. No. 3, p. 6.

95. Route A requires the least amount of tree clearing, has the shortest river crossing, and has the least impact on natural areas. PPL Electric St. No. 3, p. 6.

96. Although Route B is less expensive than Route A, it would have the most impact on the Susquehanna River, because it would require construction activities in the river. PPL Electric St. No. 3, p. 6.

97. Both Routes B and C would require more extensive tree clearing. PPL Electric St. No. 3, p. 6.

98. Route C would have a greater impact on natural areas because it crosses the most streams. PPL Electric St. No. 3, p. 6.

99. Routes B and C would both require more extensive private rights-of-way. PPL Electric St. No. 3, p. 6.

100. Using the identified criteria and mathematical methods, PPL Electric determined that Route A was the preferred route. PPL Electric St. No. 3, p. 6.

101. This decision was then communicated to the public and to municipal, state and federal officials and agencies for further feedback and adjustments, where appropriate. PPL Electric St. No. 3, pp. 5-6.

102. In siting the Meiserville substation, three alternative sites were considered. One of the alternative sites was located on the direct opposite side of Old Trail Road from the preferred substation site. The second alternative site considered was proposed by the owner of the preferred site, Mr. Hess. This site was again located on the opposite side of Old Trail Road

from the preferred site and approximately 170 feet farther northeast. PPL Electric St. No. 3-R, p. 5.

103. In selecting the preferred location for the substation, many factors were considered including: the distance to the source transmission line, distance to the distribution facilities to be connected to, environmental impacts, social impacts, visual impacts, site access, permits required to construct the project, and potential impacts to threatened and endangered species. PPL Electric St. No. 3-R, p. 6.

104. A major factor that led to PPL Electric's selection of the preferred site was the fact that the preferred site is located entirely outside of a 100-year floodplain; the other two sites are at least partially in the floodplain. PPL Electric St. No. 3-R, p. 6.

105. Avoiding the floodplain minimizes the environmental impacts and permit considerations associated with the substation site. PPL Electric St. No. 3-R, p. 6.

106. In addition, the preferred site is situated adjacent to an existing tree row, which will minimize the visual effects to the adjoining properties. PPL Electric St. No. 3-R, p. 6.

107. The two other alternative sites considered for the preferred route were located in open fields and did not have an existing visual buffer. PPL Electric St. No. 3-R, p. 6.

108. In addition, the preferred site is located near an active tire recycling facility and associated used tire storage area and a manufactured home production facility. PPL Electric St. No. 3-R, p. 6.

109. PPL Electric has shown that it compiled a detailed environmental inventory of the project study area and attempted to avoid or minimize its impact on the natural and human environments where it was practical to do so. PPL Electric Ex. 1, Attachment 2; PPL Electric Ex. 1, Attachment 3.

110. The existing 12 kV corridors in the area are not large enough to accommodate a 69 kV line. PPL Electric St. No. 3-R, p. 9.

111. The corridors would have to be widened from either 30 or 50 feet, depending on whether the existing circuit was a single phase or three phase circuit, to 100 feet in densely populated areas. PPL Electric St. No. 3-R, p. 9.

112. Using these corridors would require the expansion of the existing 12 kV corridors across more than a dozen non-condemnable residential properties. PPL Electric St. No. 3-R, p. 9.

113. The Company will construct the portion of the line over the Maurer property so that they can continue to grow trees up to fifteen feet in height. PPL Electric St. No. 10-RJ, p. 7.

114. The transmission line proposed by PPL Electric will pass over the pond on the Hess property. PPL Electric St. No. 3-R, p. 4.

115. PPL Electric met with the Hesses on several occasions to discuss the location of the proposed route, and adjusted the route of the transmission line across the Hess property based on input from the Hesses. Tr. 335.

116. The NFPA Fire Code is a model safety code that is published by a nonprofit organization, the NFPA. It is intended to be considered by state and local governments, or used as a guideline in establishing a fire code. PPL Electric St. No. 10-RJ, p. 2.

117. It is not a binding code, in and of itself, and it has not been adopted by any governing body having jurisdiction over the Hess property. PPL Electric St. No. 10-RJ, p. 2.

118. Electric utility companies in Pennsylvania are required to follow the provisions of the National Electric Safety Code (“NESC”) pursuant to Section 2807(a) of the Public Utility Code. PPL Electric St. No. 10-RJ, p. 3.

119. The NESC does not prohibit the storage of tires under or near transmission lines. PPL Electric St. No. 10-RJ, p. 3.

120. PPL Electric will only be encumbering approximately 2.43% of the total property that is used for tire recycling and tire storage facility. PPL Electric St. No. 3-RJ, p. 4.

121. PPL Electric has significant experience in constructing and operating transmission lines that cross bodies of water, including 54 transmission lines that cross the Susquehanna River. Tr. 331.

122. PPL Electric's transmission lines cross numerous streams and wetlands, including 17 streams and several wetlands for this project. PPL Electric Ex. 1, Attachment 3, p. 13.

123. Transmission lines are reliable; they rarely fall. PPL Electric St. No. 10-R, pp. 3-4.

124. In the rare event of a transmission line failure, the line has overcurrent protection that would detect a high impedance ground fault and stop the flow of electricity if the line were to fall. PPL Electric St. No. 10-RJ, p. 3.

125. In addition, the protection on PPL Electric's system is designed so that if a transmission line were to fall into a body of water, that event would trip the line and interrupt the flow of electricity. PPL Electric St. No. 10-RJ, p. 4.

126. The standards employed by PPL Electric, as well as the equipment, are consistent with standard utility industry practice. PPL Electric St. No. 10-RJ, p. 4.

127. In the extremely unlikely event that a line falls and contacts the water, it is also unlikely that the current would be able to reach beyond the pond or to the pump house, because the current would dissipate over the pond. PPL Electric St. No. 10-RJ, p. 5.

128. The transmission line poses little hazard to the pump house. PPL Electric St. No. 10-RJ, p. 5.

129. Fire hydrants under or near transmission or distribution lines are common in PPL Electric's service territory. PPL Electric St. No. 10-RJ, p. 4.

130. The hydrant at the Hess property is 30 feet from the nearest edge of the right-of-way and approximately 70 feet from the nearest conductor. PPL Electric St. No. 3-R, p. 3.

131. Many hydrants throughout PPL Electric's service territory are closer to the power lines than the proposed Richfield – Dalmatia transmission line will be to the fire hydrant on the Hess property. PPL Electric St. No. 10-RJ, p. 4.

132. Most public fire hydrants are in street rights-of-way and most 12 kV distribution lines are also in street rights-of-way. PPL Electric St. No. 10-R, p. 6.

133. In situations involving first responders such as firemen, PPL Electric defers to the expertise and experience of the first responders to determine whether the situation requires that the transmission line be de-energized in order to safely accommodate firefighters. PPL Electric St. No. 10-R, p. 6.

134. If the fire chief believes that there is an immediate threat to life or property, he contacts PPL Electric through the 911 Call Center, and PPL Electric can immediately de-energize the transmission line through remote switching. PPL Electric St. No. 10-R, p. 6.

135. PPL Electric staffs its call center and is ready to respond to emergency situations 24 hours a day, 7 days a week. PPL Electric St. No. 10-R, p. 7.

136. The Company has troublemen in the field who are on call in the region 24 hours a day, 7 days a week. PPL Electric St. No. 10-R, p. 7.

137. The Project will have little, if any, impact on eagles. It is very unlikely that human activities related to the Richfield – Dalmatia Project will prevent eagles from settling in the vicinity or cause eagles to leave the area. PPL Electric St. No. 8-R, p. 7.

138. Generally, three situations can lead to bird-transmission line collisions: flocking birds, poor visibility and large birds with limited maneuverability. PPL Electric St. No. 8-R, p. 8.

139. None of these situations will be present at the Richfield – Dalmatia transmission line. PPL Electric St. No. 8-R, pp. 9-11.

140. PPL Electric is working closely with USFWS to best address potential collision issues. PPL Electric St. No. 8-R, p. 8.

141. PPL Electric is consulting with the USFWS to obtain its recommendations to reduce risks to eagles and other birds, and will implement all recommendations from the USFWS. PPL Electric St. No. 10-R, p. 11.

142. It is PPL Electric's standard practice to include devices on the transmission line at the river crossing in order to make the line more visible and reduce aviation hazards, which will also make the line more visible to birds, thereby further reducing the risk that a bird will collide with the conductors. PPL Electric St. No. 10-R, p. 11.

143. The same precautions that PPL Electric is taking to reduce the risk of collisions are also effective in reducing the risk of avian electrocution. PPL Electric St. No. 8-R, p. 8.

144. PPL Electric utilizes a standard line design which provides sufficient horizontal and vertical clearance to reduce the risk of electrocution to bald eagles, as described in "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006." PPL Electric St. No. 10-R, p. 9.

145. The World Health Organization (“WHO”) conducted an in-depth review of the scientific literature regarding EMFs which did not confirm the existence of any health consequences from exposure to low level EMFs. PPL Electric St. No. 10-R, p. 7.

146. The exposure guidelines from the International Commission on Non-Ionizing Radiation Protection (“ICNIRP”) and the Institute of Electrical and Electronics Engineers (“IEEE”) are 2,000 mG and 9,040 mG, respectively, both of which have been endorsed by the WHO. PPL Electric St. No. 10-R, pp. 7-8.

147. The EMF levels from the proposed transmission line will be far lower than either of these two exposure guidelines. PPL Electric St. No. 10-R, p. 8.

148. PPL Electric has for many years had a Magnetic Field Management Policy which involves taking no-cost/low-cost measures to reduce EMFs where practicable in the design and operation of new or rebuilt transmission lines. PPL Electric St. No. 10-R, p. 8.

149. Reverse Phasing is an arrangement of the wires on a double-circuit transmission line that reduces the magnetic field levels when the current on both circuits is flowing in the same direction. PPL Electric St. No. 10-R, p. 8.

150. For this line, when a second circuit is added in the future, PPL Electric will use “reverse phasing” which will cancel some EMFs produced by the line. PPL Electric St. No. 10-R, p. 9.

151. The line will exceed NESC minimum conductor to ground clearance by approximately 10 feet, which will result in reducing the level of EMFs from the levels that would be produced by conductors at the minimum NESC permitted height. PPL Electric St. No. 10-R, p. 8.

152. The presence of a high voltage transmission line has little or no effect on the values of residential properties. PPL Electric St. No. 9-R, p. 11.

153. The “tree of heaven,” also known as *ailanthus altissima*, is a very fast growing species of tree that is easily controlled in the four year trim cycle. PPL Electric St. No. 6-R, p. 11.

# **APPENDIX “B”**

**APPENDIX B**  
**PROPOSED CONCLUSIONS OF LAW**

1. Pursuant to Chapter 11 of the Public Utility Code, 66 Pa.C.S. §§ 1101, *et seq.*, and 15 Pa.C.S. § 1511(c), the Commission has jurisdiction over the subject matter of this proceeding.

2. The service to be furnished by the proposed Richfield – Dalmatia 69 kV Transmission Line in portions of Snyder, Northumberland, and Juniata Counties, is necessary or proper for the accommodation, convenience, and safety of its patrons, employees and the public.

3. The siting and construction of the Richfield – Dalmatia 69 kV Transmission Line in Route A will not create an unreasonable risk of danger to the health and safety of the public.

4. The siting and construction of the Richfield – Dalmatia 69 kV Transmission Line in Route A is in compliance with applicable statutes and regulations providing for the protection of the natural resources of this Commonwealth.

5. The siting and construction of the Richfield – Dalmatia 69 kV Transmission Line in Route A will have a minimum adverse environmental impact, considering the electric power needs of the public and the available alternatives.

6. The selection of Route A for the Richfield – Dalmatia 69 kV Transmission Line is reasonable and was not selected wantonly, capriciously, or arbitrarily.

7. PPL Electric has demonstrated that the Alternative Route A is superior to the alternative Route B and Route C.

8. The Applications for findings that the service to be furnished through the exercise of the power of eminent domain, pursuant to 15 Pa.C.S. § 1511, to acquire rights-of-way and easements necessary for the construction, operation, maintenance, and aerial crossing by the Richfield – Dalmatia 69 kV Transmission Line over the following properties is necessary and proper for the service, accommodation, convenience or safety of the public: the property owned

by Michael and Logan Wendt, in Perry Township, Snyder County, Docket No. A-2011-2267349; Randall Clark, Lower Mahanoy Township, Northumberland County, Docket No. A-2011-2267352; John and Evelyn Zeiders, Lower Mahanoy Township, Northumberland County, Docket No. A-2011-2267353; Roy and Cindy Maurer, Lower Mahanoy Township, Northumberland County, Docket No. A-2011-2267416; Ronald and Dianne Mace, Lower Mahanoy Township, Northumberland County, Docket No. A-2011-2267418; The Shoop Family Trust c/o Edwin and Denny Shoop, Lower Mahanoy Township, Northumberland County, Docket No. A-2011-2267426; Gary and Dorene Lahr, Lower Mahanoy Township, Northumberland County, Docket No. A-2011-2267429; Elijah and Faye Lahr, Lower Mahanoy Township, Northumberland County, Docket No. A-2011-2267446; and the property owned by Marvin Roger Hess and Leona Hess in Susquehanna Township, Juniata County, Docket No. A-2011-2267448.