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October 12, 2012

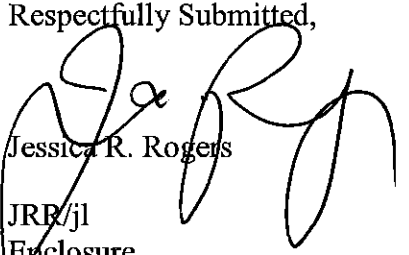
Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor North
P.O. Box 3265
Harrisburg, PA 17105-3265

RE: Daniel Brunda v. PPL Electric Utilities Corporation
Docket No. C-2012-2286040

Dear Secretary Chiavetta:

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

Respectfully Submitted,


Jessica R. Rogers

JRB/jl
Enclosure

cc: Certificate of Service
Honorable Katrina L. Dunderdale (*via Federal Express*)

CERTIFICATE OF SERVICE

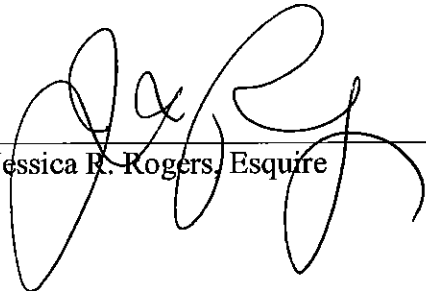
I hereby certify that a true and correct copy of the **Main Brief of PPL Electric Utilities Corporation** has been served upon the following persons, in the manner indicated, in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant).

VIA FEDERAL EXPRESS

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DATED: October 12, 2012



Jessica R. Rogers, Esquire

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Daniel Brunda	:	
	:	
v.	:	Docket No. C-2012-2286040
	:	
PPL Electric Utilities Corporation	:	

**MAIN BRIEF OF
PPL ELECTRIC UTILITIES CORPORATION**

TO ADMINISTRATIVE LAW JUDGE KATRINA L. DUNDERDALE:

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I. PROCEDURAL HISTORY

On February 1, 2012, Daniel Brunda (“Complainant”) filed a formal complaint with the Commission against PPL Electric Utilities Corporation (“PPL Electric”). Complainant’s claim relates to Electric and/or Magnetic Fields (“EMFs”) generated by the power lines adjacent to his property in Lansford, Pennsylvania.

PPL Electric filed an Answer to the Complaint on February 21, 2012. In its Answer, PPL Electric generally admitted that it owns and operates distribution lines in the vicinity of Mr. Brunda’s property but denied Complainant’s allegations regarding EMFs.

On March 1, 2012, the Commission issued an Initial Hearing Notice, wherein Administrative Law Judge Katrina L. Dunderdale (“ALJ”) set an initial hearing for April 2, 2012.

On March 5, 2012, PPL Electric filed a request for relief asking that the initial hearing scheduled for April 2, 2012, be converted to a prehearing conference. The ALJ granted the Company’s request, and a revised hearing notice was issued on March 13, 2012.

On April 2, 2012, a telephonic prehearing conference was held before the ALJ. At the prehearing conference, the parties agreed to the establishment of a procedural schedule that would include prefiled written testimony by both parties.

On April 25, 2012, the ALJ issued an order which included a procedural schedule. In that schedule and a telephonic hearing was scheduled for June 21, 2012.

As a result of subsequent filings, the telephonic hearing was rescheduled for August 16, 2012.

On August 16, 2012, the ALJ presided over a telephonic evidentiary hearing, wherein PPL Electric and the Complainant moved their direct evidence into the record. At the hearing, the Complainant also requested that the ALJ accept into the record an additional document, to

which the Complainant had made reference during the hearing. The document was later identified as Complainant's Exhibit 2.

PPL Electric indicated that it had not been provided with a copy of Complainant's Exhibit 2. PPL Electric requested the opportunity to inspect and respond to Complainant's Exhibit 2 and to use its discretion in responding to the Exhibit, depending on whether it was more in the nature of legal argument or testimony. The ALJ granted PPL Electric's request to inspect and respond to the exhibit. The ALJ gave PPL Electric until August 31, 2012 to file its response.

Complainant submitted Exhibit 2 to the ALJ and provided a copy to PPL Electric on August 20, 2012. On August 31, 2012, PPL Electric filed a Motion to Reopen the Record. In its Motion, the Company requested that the record be re-opened for the limited purpose of admitting PPL Electric's response to the Complainant's Exhibit 2, which was set forth in the Verification of Michael J. Silva ("Verification"). The Verification was included as "Appendix A" to the Motion.

On September 27, 2012, the ALJ issued the Seventh Interim Order, wherein she admitted PPL Electric's Verification into the record. The Order also allowed the parties to file briefs on this matter, which are due October 12, 2012, and reply briefs which are due October 19, 2012. PPL Electric is filing its brief on the proceeding pursuant to the ALJ's Seventh Interim Order.

II. LEGAL STANDARDS

Section 332(a) of the Public Utility Code (“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). In this case, because the Complaint was filed by Mr. Brunda, he has the burden of proving his case by a preponderance of the evidence.

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). The side which has produced the preponderance of the evidence is determined by the credibility of the testimony in the light of all the evidence in a case. *Burch v. Reading Co.*, 240 F.2d 574 (3d Cir. 1957) *cert. denied*, 353 U.S. 965 (1957).

If the complainant has established a *prima facie* case, the burden shifts to the utility to rebut with evidence that is at a minimum co-equal. *Waldron v. Philadelphia Electric Co.*, 54 Pa. PUC 98 (1980). If the utility presents a sufficient rebuttal, the burden then shifts back to the Complainant to rebut the utility's evidence by a preponderance of the evidence. *Poorbaugh v. West Penn Power Company*, 1994 Pa. PUC LEXIS 95.

Here, for the reasons explained below, PPL Electric has produced the preponderance of the evidence. The Complainant has failed to produce credible evidence in support of his contentions. His Complaint should be denied.

III. SUMMARY OF THE ARGUMENT

The Complainant asserts, based entirely on his personal, non-expert, opinion, that the distribution lines near his property in Lansford, Pennsylvania, pose a health and safety risk as a result of the EMFs produced by the normal operation of the lines. The distribution lines near his property are owned and operated by PPL Electric. The Complainant has failed to carry his burden of proof in this proceeding, because he has failed to provide any credible evidence showing that the distribution lines used by PPL Electric in Lansford, which are similar to distribution lines throughout the rest of PPL Electric's service territory, the rest of Pennsylvania, the rest of the United States and around the world, pose a health risk. Although Pennsylvania has not adopted specific standards for EMF levels, PPL Electric's distribution lines near Mr. Brunda's property comply with widely-accepted industry standards, and there is nothing unusual about the distribution lines or the EMF levels from the lines. Further, Complainant's proposed change is radical and shows his fundamental misunderstanding of how EMFs are produced, because it would result in an increase in EMF levels and not the decrease he claims is needed. His proposed solution would be counterproductive, completely unnecessary and very expensive.

IV. ARGUMENT

The Complainant has argued that PPL Electric's distribution lines near his property in Lansford, Pennsylvania, pose a health and safety risk as a result of the EMFs produced by the normal operation of the lines. In support of his position he has provided only his testimony on the matter.

As a starting point, 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*, 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”). Complainant did not present credible scientific evidence to show that EMFs present any hazard to human health.

PPL Electric produced the testimony and Verification of Mr. Michael J. Silva. Mr. Silva is a licensed professional in electrical engineering in California and seven other states, including Pennsylvania, who has worked as a design and research engineer on electrical projects for over 41 years. He is the President and Founder of Enertech. Enertech is a scientific research and consulting firm that specializes in applied research projects, engineering, exposure assessment, electromagnetic compatibility, and the development of computer software and instruments to calculate and measure EMFs. PPL Electric St. No. 1, p. 3. Enertech has conducted applied research projects involving EMF exposure assessment and EMF evaluations for major studies with researchers from state and federal government organizations, top universities, and research institutions. *Id.* at 4. Enertech also develops and manufactures high quality instrumentation for accurate measurement of EMFs and conducts a variety of measurement programs throughout the world. *Id.* Finally, Enertech develops computer software for calculating EMF levels, analyzing measurement data and modeling EMF and electrical environments. *Id.*

Mr. Silva explained that the term “EMF” refers to two phenomena -- electric fields and magnetic fields. Electric fields are created as a result of electrical voltage; magnetic fields are created by electric current. *Id.* at 7. A field is a space or region in which the influence can be said to exist. *Id.* EMFs are produced by many products associated with everyday living, including wiring in homes and businesses, power lines, lighting, home appliances, power tools, computers, electrical equipment in offices and medical or industrial facilities, and many other common sources. In his testimony, Mr. Silva produced measurements of magnetic field levels in

public places in the nearby City of Scranton, Pennsylvania showing that exposure to magnetic fields is a routine aspect of daily life. PPL Electric Ex. JMS-1 and JMS-2. People are exposed to a wide range of field levels from a variety of sources during everyday activities. PPL Electric St. No. 1, p. 14.

There are no federal or Pennsylvania state standards regarding magnetic field exposures. *Id.* at 15. No state has adopted magnetic field exposure limits for distribution lines. *Id.* Two well-respected international organizations, however, have developed voluntary guidelines for the general public's exposure to magnetic fields.

The Institute of Electrical and Electronics Engineers ("IEEE") is one of the leading standards-making organizations in the world. IEEE standards are relied upon in many areas, including power and energy, biomedical and health care, telecommunications, and nanotechnology, among others. PPL Electric Verification, p. 2. The International Commission on Non-Ionizing Radiation ("ICNIRP") is an independent scientific organization that provides expert advice and guidance about EMF in the frequency range from 0 Hz up to 300 GHz, including 60 Hz power frequency EMF. *Id.* ICNIRP's exposure guidelines have been adopted by national authorities in more than 50 countries. The IEEE and ICNIRP exposure standards for EMF were developed by committees of scientific experts and have been expressly endorsed by the World Health Organization ("WHO"), among others. *Id.* 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.

Most alternating current electric power in the United States and in PPL Electric's service territory has a frequency of 60 Hz. PPL Electric St. No. 1, p. 8. ICNIRP recommends that, for the general public, 60 Hz magnetic field exposures should not exceed 2,000 mG.¹ *Id.* at 15. The IEEE recommends that public exposures to 60 Hz magnetic fields should not exceed 9,040 mG. *Id.*

PPL Electric took measurements of magnetic field levels at various locations on Complainant's property on May 2, 1994, May 7, 2004, January 12, 2006, and April 29, 2011. *Id.* at 18. The average of the measurements taken near the house on Mr. Brunda's property at different times from 1994 to 2011 is 0.7 mG. *Id.* at 19-20. The magnetic field levels measured by PPL Electric at the Complainant's property are common, and it is common to find EMF levels many times higher in homes, workplaces and public places across the United States. *Id.* at 19.

In fact, in the 1990's, Mr. Silva's company, Enertech, conducted a large research program involving comprehensive measurements of EMF levels in approximately 1,000 homes across the United States. Based on the results of this nationwide study, there are more than 63 million homes in the United States where the average magnetic field level is at or higher than the average magnetic field level near the Complainant's residence. *Id.* at 20. In addition, Enertech conducted a large research program for the United States Department of Energy and the National Institute of Environmental Health Sciences to assess the daily magnetic field exposures of over 1,000 people across the United States. Based on this study, there are over 187 million people in the United States whose average daily exposure equals or exceeds the average levels measured near the residence on Mr. Brunda's property. *Id.*

¹ 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)

The Complainant has alleged that exposure to EMFs presents a health risk for humans. The Complainant has not provided any credible scientific evidence to support this claim. As noted by Mr. Silva, the WHO, in 2007, reviewed the scientific research on EMFs and provided information to the public to address health concerns. *Id.* at 23. The WHO reports that “[d]espite extensive research, to date there is no evidence to conclude that exposure to low level electromagnetic fields is harmful to human health.” *Id.* The Complainant has offered no credible evidence that EMFs are harmful.

As part of this proceeding, Mr. Brunda has proposed that PPL Electric convert the voltages in the distribution lines near his property from normal levels of about 7 kilovolts (“kV”) for single phase circuits or 12 kV for three phase circuits to 4 kV or less. As explained in Mr. Silva’s testimony, however, this proposal has serious problems. First, lowering the voltage of the distribution lines would be ineffective to address Mr. Brunda’s concerns. In fact, lowering the voltage would actually increase, not decrease, the magnetic field levels. *Id.* at 22. This increase would result because electrical power is the product of voltage and current. A specific power level is needed to serve Mr. Brunda’s property and other properties in the neighborhood. If the voltage on the distribution lines were reduced, then the amount of current, the amperage, would have to be increased in order to provide the same level of electric power to the neighborhood. *Id.* Magnetic fields are directly related to the amount of current. Therefore, increasing the amount of current on the distribution lines would also increase the level of magnetic fields. *Id.* At a voltage of 4 kV or lower, the amount of current on the lines would be at least three times higher than at the present 12 kV voltage. *Id.* Therefore, the magnetic field levels would similarly be at least three times higher than they are now. *Id.* Adopting Mr. Brunda’s proposal would have the opposite impact of what he desires.

Further, adopting Mr. Brunda's proposal would have serious implications for PPL Electric's distribution system. A 4 kV or lower distribution system is not a standard distribution voltage and would require design, testing and installation of special custom-made transformers, as well as replacing the existing neighborhood distribution lines with larger conductors and possibly installing new substation equipment to accommodate a low, non-standard distribution voltage. This voltage reduction would adversely affect the entire neighborhood distribution system and could create problems such as low voltage throughout the neighborhood that may require additional electrical distribution equipment to compensate for this problem. *Id.* at 22. In addition, the Complainant stated in Exhibit 2, p. 2, that, "lowering the voltage to 2-4 kV clearly requires a reduction of the transmitted power" to Lansford. This statement means that Complainant contemplates that far less electric power would be transmitted over the hypothetical 4 kV distribution system he proposes, which in turn would require other citizens, businesses, schools, and medical facilities in Lansford to drastically reduce their use of electric power. Verification, p. 2.

Finally, the radical change to the electric system advocated by Mr. Brunda would be ineffective to reduce a person's exposure to EMFs. It is not feasible to eliminate all sources of EMFs and continue to provide electric service to the property or adjacent properties in the neighborhood, because all the distribution lines would have to be removed, as would all other sources of EMFs such as interior electric wiring and every electric appliance. PPL Electric St. No. 1, p. 23. As discussed previously, people are exposed to EMFs from many sources as a result of normal daily activities. PPL Electric's distribution lines do not produce EMFs in an amount that adds substantially to the EMFs a person is normally exposed to as a result of their

normal daily activities. Thus, granting the Complainant's request would be both impractical and ineffective.

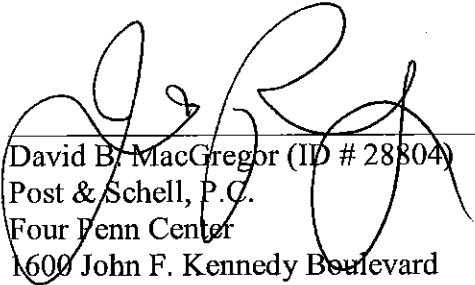
Both distribution lines near the Complainant's property are safe. They were designed in accordance with commonly used industry standards. *Id.* The distribution lines adjacent to the property are typical of the millions of miles of residential power distribution lines that have been in operation throughout Pennsylvania and the United States for many decades. *Id.* There is nothing unusual about these lines. Verification, p. 2. There also is nothing unusual about the EMF levels from the lines, which are similar to or less than EMF levels from many sources in our daily environments and are thousands of times lower than the EMF exposure levels recommended by credible international expert organizations. *Id.* There is no credible evidence supporting Complainant's claim that these distribution lines pose a health and safety risk to the public. Complainant has failed to meet his burden of proof in this proceeding.

V. **CONCLUSION**

Complainant, Daniel Brunda, has failed to carry his burden of proof in this proceeding. Therefore, PPL Electric Utilities Corporation requests that Administrative Law Judge Katrina Dunderdale and the Pennsylvania Public Utility Commission dismiss the above-captioned Complaint of Daniel Brunda with prejudice.

Respectfully submitted,

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Date: October 12, 2012

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