CAPTION SHEET CASE MANAGEMENT SYSTEM

1. REPORT DATE: 00/00/00	
2. BUREAU: FUS	
3. SECTION(S):	4. PUBLIC MEETING DATE: 00/00/00
5. APPROVED BY:	
DIRECTOR:	
SUPERVISOR:	
6. PERSON IN CHARGE:	7. DATE FILED: 04/28/04
8. DOCKET NO: A-110500 F0347	9. EFFECTIVE DATE: 00/00/00

PARTY/COMPLAINANT:

RESPONDENT/APPLICANT: PPL ELECTRIC UTILITIES CORP

COMP/APP COUNTY: UTILITY CODE: 110500

ALLEGATION OR SUBJECT

LETTER OF NOTIFICATION OF PPL ELECTRIC UTILITIES CORPORATION FILED PURSUANT TO 52 PA. CODE CHAPTER 57 SUBCHAPTER G WITH RESPECT TO THE TWIN LAKES 138/69 KV TAP LINE MODIFICATIONS TO BE CONSTRUCTED IN DINGMAN TOWNSHIP, PIKE COUNTY.

Morgan, Lewis & Bockius LLP
1701 Market Street
Philadelphia, PA 19103-2921
Tel: 215.963.5000
Fax: 215.963.5001
www.morganlewis.com

ORIGINAL

Morgan Lewis
COUNSELORS AT LAW

Anthony C.DeCusatis
215.963.5034
adecusatis@morganlewis.com

April 28, 2004

VIA OVERNIGHT MAIL

James J. McNulty, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor
Harrisburg, PA 17120

Re: **Letter of Notification of PPL Electric Utilities Corporation Filed Pursuant to 52 Pa. Code Chapter 57 Subchapter G With Respect to the Twins Lakes 138/69 kV Tap Line Modifications to be constructed in Dingman Township, Pike County**

Dear Secretary McNulty: A-110500 F0347

Enclosed for filing in the above-captioned matter are an original and six (6) copies of PPL Electric Utilities Corporation's ("PPL") Letter of Notification requesting approval to modify the Twin Lakes 138/69 kV Tap Line. This Letter of Notification is filed pursuant to the Commission's regulations at 52 Pa. Code Section 57.72(d).

Copies of the Letter of Notification have been served upon the parties listed on the attached Certificate of Service. The enclosed documents are to be deemed filed on the date shown above, which is the date they were deposited with an overnight express delivery service as shown on the delivery receipt attached to the mailing envelope.

Also enclosed is an additional copy of the Letter of Notification, which we request that you date stamp as evidence of filing and return to us in the stamped, self-addressed envelope provided for that purpose

Very truly yours,

Anthony C. DeCusatis
Counsel for PPL Electric Utilities Corporation

Enclosure

cc: Darren Gill

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PPL Electric Utilities Corporation Filed Pursuant to 52 Pa. Code Chapter 57 Subchapter G With Respect to the Twin Lakes 138/69 kV Tap Line Modifications to be Constructed in Dingman Township, Pike County	:	**Docket No.** A-110500F0347

CERTIFICATE OF SERVICE

I hereby certify that I have, this 28th day of April, 2004, served true and correct copies of the Letter of Notification and accompanying Exhibit Nos. A, B and C upon the persons and in the manner listed below.

BY CERTIFIED MAIL/RETURN RECEIPT REQUESTED

(GOVERNMENTAL AGENCIES)

Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Division of Archaeology and Protection
P.O. Box 1026
Harrisburg, Pennsylvania 17108-1026
Attn: Mr. Kurt W. Carr, Chief

Commonwealth of Pennsylvania
Department of Transportation
Commonwealth Keystone Building
400 North Street, 8th Floor
Harrisburg, Pennsylvania 17120
Attn: The Honorable Bradley L. Mallory, Secretary

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

Pike County Commissioners
Administration Building
506 Broad Street
Milford, Pennsylvania 18337
Attn: Mr. Harry Forbes, Chairman

Pike County Planning Commission
Administration Building
506 Broad Street
Milford, Pennsylvania 18337
Attn: Mr. Michael Billig, Chairman

Dingman Township Board of Supervisors
118 Fisher Lane
Milford, Pennsylvania 18337
Attn: Mr. Thomas Mincer, Chairman

Dingman Township Planning Commission
118 Fisher Lane
Milford, Pennsylvania 18337
Attn: Mr. Walter Myer, Chairman

FirstEnergy Service Company
2800 Pottsville Pike
Reading, Pennsylvania 19612-6001
Attn: Mr. Ronald P. Lantzy
Regional President, Eastern Pennsylvania

Anthony C. DeCusatis
Counsel for PPL Electric Utilities Corporation

April 28, 2004

ORIGINAL

RECEIVED

APR 2 8 2004

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Re: Letter of Notification of PPL Electric Utilities Corporation Filed Pursuant To 52 Pa. Code Chapter 57 Subchapter G With Respect To The Twin Lakes 138/69 kV Tap Line Modifications To Be Constructed In Dingman Township, Pike County	:	Docket No. A-110500 F0347

LETTER OF NOTIFICATION

1. This Letter of Notification is filed pursuant to 52 Pa. Code §57.72(d)(1)(vi) to request the approval of the Pennsylvania Public Utility Commission ("Commission") to modify the existing Twin Lakes 138/69 kV Tap Line in Dingman Township, Pike County, to accommodate the connection of a new 69 kV transmission line to supply a 69-34.5 kV substation being built by the Metropolitan Edison Company ("MetEd"), also known as "MetEd a FirstEnergy Company". Subject to the Commission's siting approval, as requested herein, the construction of this project will begin as soon as possible to support MetEd's projected in-service date in November 2004. Accompanying this Letter of Notification is a separately bound volume containing Exhibits A-C and Appendices A-D, which provide additional information about the project. This Letter of Notification and the accompanying Exhibits and Appendices, which are incorporated herein by reference, contain all of the information required by 52 Pa. Code § 57.72(d)(4).

2. The applicant is PPL Electric Utilities Corporation ("PPL"), Two North Ninth Street, Allentown, Pennsylvania 18101, a public utility incorporated in Pennsylvania for the purpose of supplying light, heat and power to the public by means of electricity in all or portions of twenty-nine counties in eastern-central Pennsylvania.

DOCKETED
MAY 11 2004

3. PPL's attorneys are:

David B. MacGregor
Anthony C. DeCusatis
Morgan, Lewis & Bockius LLP
1701 Market Street
Philadelphia, Pennsylvania 19103
215.963.5034 (T) 215.963.5001(Fax)

Paul E. Russell
PPL Electric Utilities Corporation
Two North Ninth Street
Allentown, Pennsylvania 18101
610.774.4254 (T) 610.774.6726 (Fax)

PPL's attorneys are authorized to receive all notices and communications regarding this Letter of Notification.

4. MetEd is planning to construct a new 69-34.5 kV substation, to be called the "Walker 69-34.5 kV Substation," at a location adjacent to PPL's existing Twin Lakes 138/69 kV Tap Line. MetEd has entered into an agreement with PPL to supply power to the new substation because PPL's Twin Lake 138/69 kV Tap Line is the closest source of power for the new substation. MetEd's closest transmission line is approximately 32 miles from the proposed substation location, and FirstEnergy's nearest transmission line is approximately 19 miles away. PPL will install a single circuit 69 kV transmission line, to be called the "Walker 69 kV Tap Line," from its existing Twin Lakes 138/69 kV Tap Line to supply power to the Walker 69-34.5 kV Substation. Although the new Walker 69 kV Tap Line will be below the 100 kV threshold that triggers the need for siting approval under Chapter 57 of the Commission's regulations, the Twin Lakes 138/69 kV Tap Line, which was constructed for 138 kV operation but is currently energized at 69 kV, will have to be modified to accommodate the connection with the new Walker 69 kV Tap Line. Accordingly, this filing is being made to obtain the necessary PUC

approval for the modification of the Twin Lake 138/69 kV Tap Line that must be done as part of the 69 kV line construction.

5. The proposed line modifications involve the installation of two new tap structures on the Twin Lakes 138/69 kV Tap Line, which are needed to connect the planned Walker 69 kV Tap Line. Both new structures will be single shaft steel poles. The tallest structure will be approximately 100 feet in height and will be direct embedded. The other structure will be approximately 50 feet in height and will be either guyed or installed on a concrete foundation. The structures will be similar to the ones shown in Figure 1 at the end of Exhibit B. The new Walker 69 kV Tap Line will connect to the existing 138/69 kV transmission system by three power conductors of 556.5 KCMIL 24/7 stranding ACSR. No additional overhead ground wires are required because the existing facilities provide the appropriate protection at the points where the new 69 kV lines connect to the 138/69 kV system.

6. The project will be designed, constructed, operated and maintained in a manner that satisfies or surpasses National Electrical Safety Code ("NESC") standards, PPL's design criteria and safety practices, and all applicable legal requirements. The proposed project will not create an unreasonable risk of danger to the public health or safety. A description of NESC standards and PPL's design criteria and safety practices is set forth in Appendix A. Minimum conductor-to-ground clearances for the Walker 69 kV Tap Line and the affected portion of the Twin Lakes 138/69 kV Tap Line are set forth in Exhibit B.

7. All of the necessary right-of-way for this project is either already owned by PPL or will be supplied by MetEd, which is the only other property owner affected.

8. The project described herein is proposed to begin as soon as possible after obtaining the Commission's siting approval in order to support MetEd's proposed in-service date in November 2004. The estimated cost of the entire project is $145,700.

9. The proposed modification of the Twin Lakes 138/69 kV Tap Line will have few, if any, impacts because the new tapping structures are being constructed on PPL's existing property and right-of-way, where transmission lines already exist. No railroads, airports, communications towers, pipelines, or other utilities (other than MetEd, as explained above) will be affected by the proposed reconstruction. This project was reviewed with Dingman Township and Pike County, and neither has any objection.

10. A project review by the Pennsylvania Historical Museum and Commission has determined that this project will have no effect on archeological resources. There are no places of historic or cultural interest that will be affected by the project.

11. The project will not affect any unique geological, scenic or natural areas. No National Natural Landmarks, parks, or recreational facilities are located near the project area. The line modifications will not cross any wetlands or other aquatic resources. In conducting the work necessary for this project, PPL will employ, as appropriate, the mitigating measures set forth in its "Program for Vegetation Management" and "Specifications for Soil Erosion and Sedimentation Control for Transmission Line Rights-of-Way." In addition, PPL has coordinated with various state and federal agencies and determined that no threatened or endangered plant or animal species will be affected by the project. PPL's environmental assessment of the proposed relocation is set forth in Exhibit C.

12. A copy of this Letter of Notification is being served in accordance with the provisions of 52 Pa. Code §57.72(d)(3).

13. As soon as practicable after the filing of this Letter of Notification, PPL will publish notice of the filing in newspapers of general circulation in the area of the proposed project. Such notice will contain: (a) the date this Letter of Notification was filed with the Commission; (b) a brief description of the project and its location; (c) locations where the complete Letter of Notification may be reviewed by the public; and (d) an instruction that the interested parties should contact, within 15 days, James J. McNulty, Secretary, at the Commission's Harrisburg address.

14. This Letter of Notification is filed on the date set forth below. As provided in 52 Pa. Code § 57.72(d)(5), the Commission will review and, by order, approve or disapprove this Letter of Notification. If the Commission approves this Letter of Notification, the proposed project will be constructed as proposed herein without the formal application process set forth at 52 Pa. Code §57.71 *et seq*. If the Commission does not approve this Letter of Notification, the Commission's Order shall direct PPL to file for approval to construct the proposed project pursuant to the Commission's formal certification regulations.

WHEREFORE, PPL respectfully requests that the Commission approve the modification of the Twin Lakes 138/69 kV Tap Line as proposed herein.

Respectfully submitted,

David B. MacGregor
Anthony C. DeCusatis
Morgan, Lewis & Bockius LLP
1701 Market Street
Philadelphia, PA 19103

Paul E. Russell
PPL Electric Utilities Corporation
Two North Ninth Street
Allentown, PA 18101

Attorneys for PPL Electric Utilities Corporation

Dated: April 28, 2004

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA)
: SS
COUNTY OF LEHIGH :
)

JOHN F. SIPICS, being duly sworn according to law, deposes and says that he is President of PPL Electric Utilities Corporation; that he is authorized to and does make this affidavit for it; and that the facts set forth above are true and correct to the best of his knowledge, information and belief and he expects PPL Electric Utilities Corporation to be able to prove the same at hearing hereof.

John F. Sipics

Sworn to and subscribed
before me this 23rd day
of April, 2004.

Notarial Seal
James R. Harper, Notary Public
City Of Allentown, Lehigh County
My Commission Expires Dec. 23, 2006
Member, Pennsylvania Association Of Notaries

ORIGINAL

ppl

Before the
Pennsylvania Public Utility Commission

Twin Lakes 138/69 kV Line Modification

RECEIVED

APR 28 2004

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

Letter of Notification

Application Docket No. A-110500 F0347

Submitted by: PPL Electric Utilities Corp.

DOCKETED
MAY 11 2004

SUMMARY

This filing is submitted by PPL Electric Utilities Corporation (PPL) pursuant to the Pennsylvania Public Utility Commission's (PUC, or the Commission) regulations at 52 Pa. Code §§57.71 through 57.77 for PUC approval to modify the existing Twin Lakes 138/69 kV Tap.

PPL will install a single circuit 69 kV line from its existing Twin Lakes 138/69 kV Tap to supply a new substation being constructed by Metropolitan Edison Company (Met Ed) also known as Met Ed a FirstEnergy Company. Although the new 69 kV line is below the 100 kV threshold that triggers the need for siting approval under Chapter 57 of the Commission's regulations, the Twin Lakes 138/69 kV line, which was constructed for 138 kV operation but is energized at 69 kV, will have to be modified to accommodate the connection with the new 69 kV line. Accordingly, this filing is being made to obtain the necessary PUC approval for the modification of the Twin Lakes 135/69 kV Tap that must be done as part of the 69 kV line construction.

The estimated cost to design and construct the proposed 69 kV line and to modify the Twin Lakes 138/69 kV Tap is $145,700. Construction of the new facilities will begin as soon as possible in an effort to meet the project's in-service date of November 2004.

This document, which describes the need for the project and discusses the engineering and siting analysis for the proposed reconstruction, consists of the following exhibits and appendices:

Exhibit "A" - Necessity Statement
Exhibit "B" - Engineering Description
Exhibit "C" - Environmental Assessment

Appendix A - PPL Design Criteria and Safety Practices
Appendix B - Magnetic Field Management at PPL

Appendix C - List of Property Owners Within the Proposed Right-of-Way

Appendix D - List of Involved Governmental Agencies, Municipalities, and Other Public Entities

LOCATION MAP

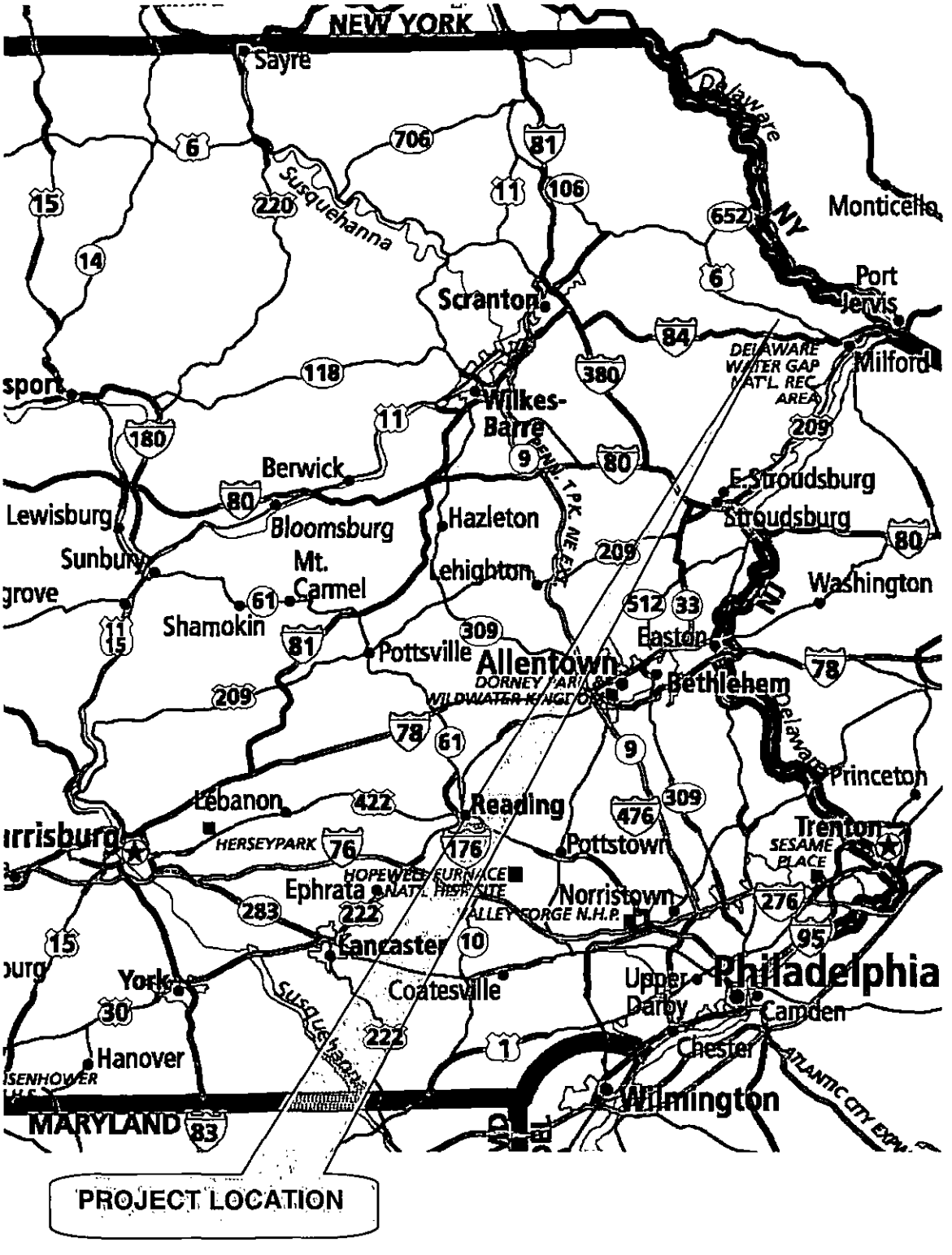


EXHIBIT A

EXHIBIT "A"

TWIN LAKES 138/69 kV TAP LINE MODIFICATION

NECESSITY STATEMENT

EXHIBIT "A"

TWIN LAKES 138/69 kV TAP LINE MODIFICATION

NECESSITY STATEMENT

Met Ed is planning to build a new 69-34.5 kV substation that will be located adjacent to PPL's existing Twin Lakes 138/69 kV Tap Line. Met Ed has entered into an agreement with PPL to supply power to the new substation because PPL's Twin Lakes 138/69 kV Tap is the closest source of supply for the new substation. Met Ed's closest transmission facility is approximately 32 miles from the proposed substation location, and FirstEnergy's closest transmission line is approximately 19 miles away. The location of the proposed substation and the Twin Lakes 138/69 kV Tap Line modification is in Dingman Township, Pike County.

As required by the PUC's regulations, a PPL system map showing the existing transmission facilities with a design voltage of 35 kV or greater is included in the Exhibit "A" map pocket. This filing only addresses the existing and proposed 138 kV regional transmission system in this section of Pike County.

Met Ed's substation, which will be known as the "Walker Substation," will be supplied by constructing an approximate 110-foot, single circuit 69 kV line between PPL's existing Twin Lakes 138/69 kV Tap and the Walker Substation. A one-line diagram showing the proposed transmission line can be found in Figure 1 at the end of Exhibit "A".

The estimated cost to design and construct the proposed tap is $145,700. PPL will construct, own and operate the line. Met Ed will construct, own and operate the Walker Substation.

Line construction is scheduled to begin in September 2004 in order to meet the required in-service date of November 2004.

FUNCTIONAL ONE-LINE DIAGRAM OF PROPOSED MODIFICATION

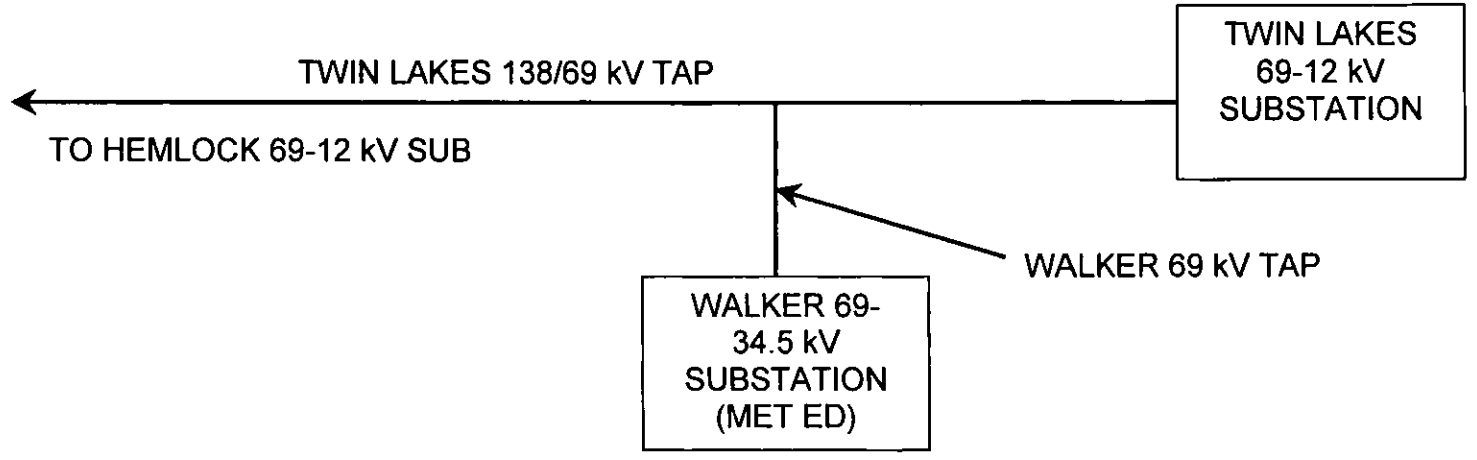
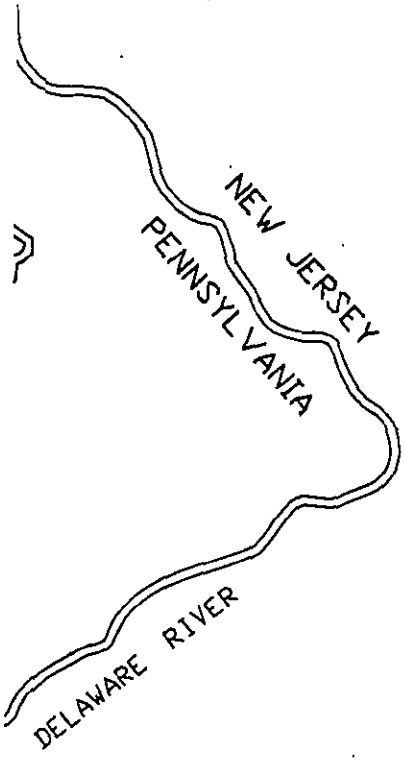


FIGURE 1



OVERSIZED DOCUMENT(S)

ppl
PPL ELECTRIC UTILITIES

ACCT– 805201	ELECTRICAL SYSTEM MAP
SCALE– NONE	TWIN LAKES TAP
BY–	
REVIEWED	
APPROVED ORIGINALLY BY G. HAKUN III	DATE 7/17/85
PP&L DRAWING NO. D191030	SHEET NO. 1
REV. 26	

EXHIBIT B

EXHIBIT "B"

TWIN LAKES 138/69 kV TAP LINE MODIFICATION

ENGINEERING DESCRIPTION

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

MAP

EXHIBIT "B"
TWIN LAKES 138/69 kV TAP LINE MODIFICATION
ENGINEERING DESCRIPTION

A. DESCRIPTION OF PROPOSED LINE MODIFICATION

PPL proposes to construct approximately 110 feet of single circuit 69 kV transmission line, to be known as the Walker 69 kV Tap, between PPL's Twin Lakes 138/69 kV Tap and Met Ed's proposed Walker 69-34.5 kV Substation. The project is located in Dingman Township, Pikes County. A plot plan for the transmission line project is provided at the end of Exhibit "B".

The proposed line modification will involve the installation of two new structures in the Twin Lakes 138/69 kV Tap. These structures are required to connect the planned Walker 69 kV Tap to the Twin Lakes Tap. Both of the new structures will be single-shaft steel poles. The taller of the two poles will be approximately 100 feet high and will be direct embedded. The other structure will be approximately 50 feet high and will be either guyed or installed on a concrete foundation. The proposed structures will be similar to the ones shown in Figure 1 at the end of Exhibit "B". The new 69 kV line will connect to the existing 138/69 kV transmission system utilizing three power conductors. The conductors will be 556.5 KCMIL 24/7 stranding ACSR. The existing 3/8-inch high-strength steel overhead groundwire will remain.

The proposed line will be designed to, and generally exceed, National Electrical Safety Code standards. Design specifications and safety rules practiced by PPL are included in Appendix A. The minimum conductor-to-ground clearance for the modified section of Twin Lakes Tap will be 30 feet, which occurs at a maximum conductor temperature of 125° C. The designed minimum conductor clearances and conductor thermal ratings for the Walker 69 kV Tap and the affected portion of the Twin Lake 138/69 kV Tap are as follows:

TABLE 1

DESIGN MINIMUM CONDUCTOR CLEARANCES

FOR 556.5 KCMIL 24/7 STRANDING ACSR*

Condition	Transmission Single-Circuit Design Clearance-to-Ground
Normal load average weather (16°C ambient Temperature)	30.5 feet
Predicted extreme thermal load (125°C conductor Temperature)	30.0 feet
Predicted extreme weather conditions (1-inch ice, 0 lbs. Wind, -18°C)	30.7 feet

*Clearances based on a maximum tension of 8,641 pounds and a ruling span of 385 feet.

CONDUCTOR THERMAL RATING

556.5 KCMIL 24/7 STRANDING ACSR

125°C MAXIMUM CONDUCTOR TEMPERATURE

Condition	Ambient Temperature-°C	Wind Speed Knots	Ampacity Amps
Summer Normal	35	0	810
Winter Normal	10	0	920
Summer Emergency	35	1½	1,030
Winter Emergency	10	1½	1,150

B. MAGNETIC FIELD MANAGEMENT

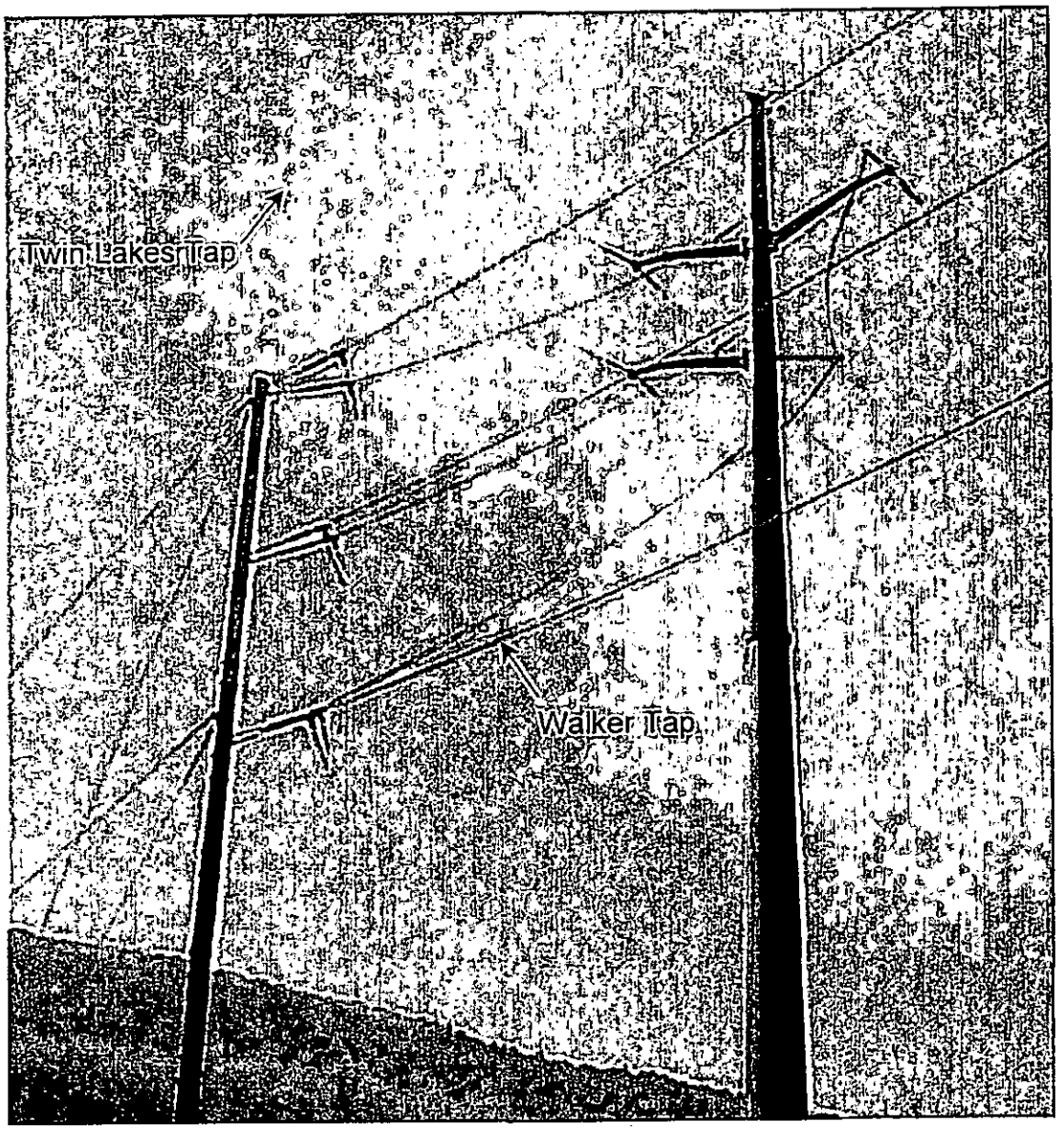
PPL's Magnetic Field Management Program, summarized in Appendix "B," is applied to new and reconstructed transmission line projects. To reduce magnetic field exposures, the program generally prescribes the use of a line design that provides five feet higher ground clearance and reverse phasing of new double circuit lines. The implementation of additional modifications will be considered, provided those modifications can be made at low or no cost.

Reverse phasing is not possible on this project because the existing Twin Lakes 138/69 kV Tap is only a single circuit line. Furthermore, the use of taller poles is outside the scope of the company's Magnetic Field Management Program because of the cost involved in rebuilding the line when only a small section of the line is being modified.

C. RIGHT-OF-WAY STATUS

Met Ed, the only property owner involved, will execute a right-of-way agreement for the required easement.

PROPOSED 138/69 kV TAP STRUCTURES

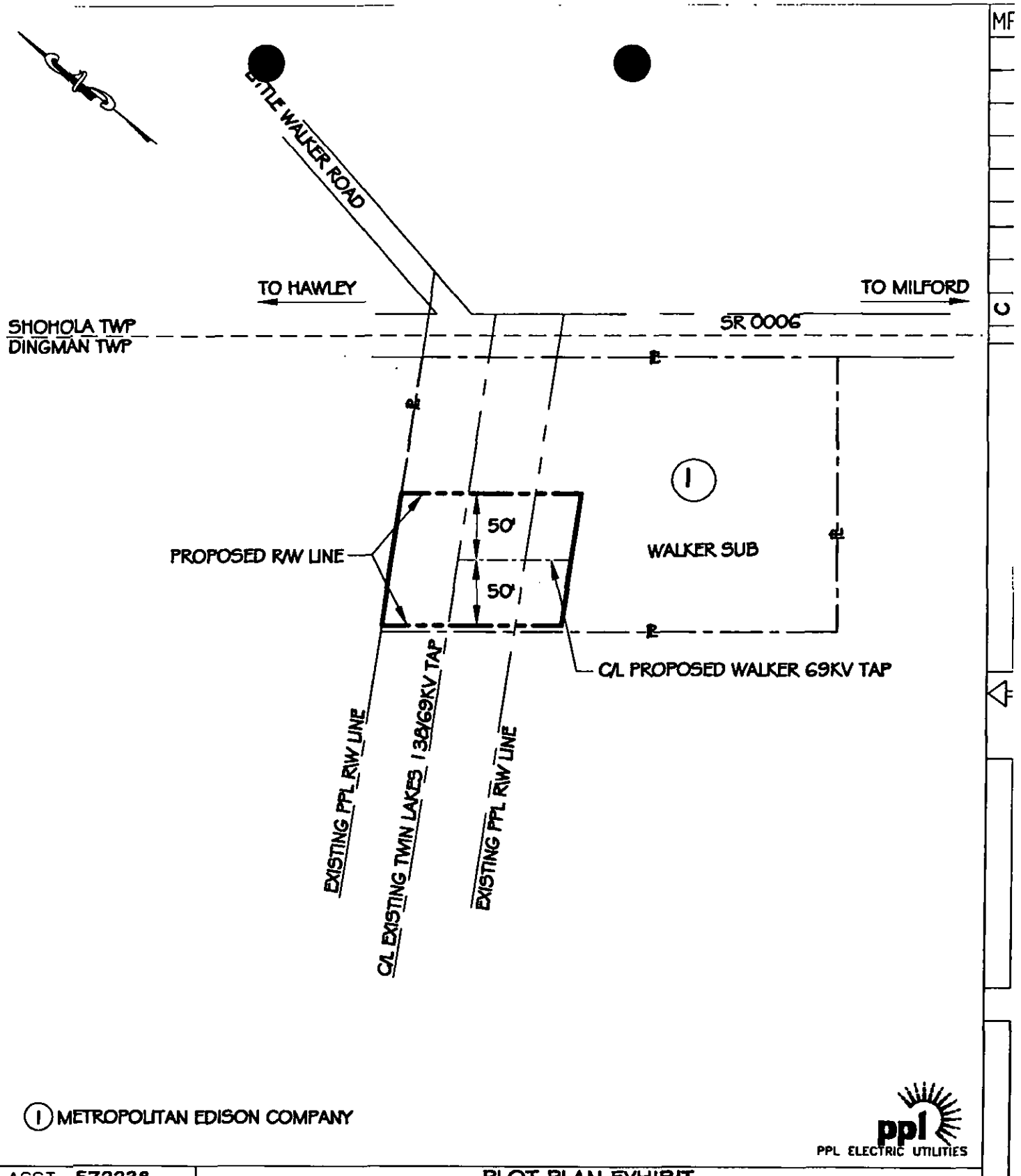


Pole Height – 50'

Pole Height – 100'
Arm Length – 7'

OVERSIZED DOCUMENT(S)

FIGURE 1



(1) METROPOLITAN EDISON COMPANY

PPL ELECTRIC UTILITIES

ACCT - 572238
SCALE -
BY - CDW
DLH

REVIEWED

PLOT PLAN EXHIBIT

TWIN LAKES 138/69KV LINES MODIFICATION

DINGMAN TWP. PIKE CO., PA.

APPROVAL DATE

PPL ELECTRIC UTILITIES

PPL DRAWING NO. SHEET NO. REV.

56325

CAD

EXHIBIT C

EXHIBIT "C"

TWIN LAKES 138/69 kV TAP LINE MODIFICATION

ENVIRONMENTAL ASSESSMENT

TABLE OF CONTENTS

EXHIBIT "C"
TWIN LAKES 138/69 kV TAP LINE MODIFICATION
ENVIRONMENTAL ASSESSMENT

A. INTRODUCTION

Met Ed has contracted with PPL to supply electricity to Met Ed's planned Walker 69 – 34.5 kV Substation. The new substation is located adjacent to PPL's existing Twin Lakes 138/69 kV Tap in Dingman Township, Pike County. The nearest Met Ed transmission line is approximately 32 miles from the new substation, and the nearest FirstEnergy transmission line is approximately 19 miles. Tapping PPL's neighboring transmission line results in a much shorter tap, encumbering less land and resulting in the least amount of impact to the environment.

The project was reviewed with Dingman Township and Pike County, and neither the Township nor the County has any objection. A list of involved governmental agencies, municipalities and other public entities is presented in Exhibit C.

B. LAND USE

The project area is located along Route 6 just south of the boarder between Dingman and Shohola Townships and approximately six miles west of Milford Borough. The terrain is mostly wooded with pockets of scattered development in the immediate vicinity. The nearest home is approximately 300 feet northwest of the project area. Impacts to the residence are not anticipated because of the dense wooded area between the home and the project site.

No railroads, airports, pipelines or communication towers will be affected by the proposed line modification since none exist in the vicinity of the project area.

C. CULTURAL RESOURCES

This project was reviewed with the Pennsylvania Historical and Museum Commission (PHMC). PHMC has determined that, due to the absence of historical sites and the small project size, no further archaeological investigations are required.

The following lists were reviewed for the presence of historical districts and structures in the area:

- National Historic Landmarks in Pennsylvania
- National Register Historic Districts in Pennsylvania
- National Register Individual Properties and Historic Districts in Pennsylvania
- National Register/Listed and Eligible Properties in Pennsylvania

The closest structures of historical significance are located in and around Milford Borough. These structures are more then six miles from the project location and will not be impacted.

D. NATURAL FEATURES

The project is located in the Glaciated Plateau Section of the Appalachian Plateau Physiographic Province. Therefore, a number of important natural features are located in the area. One of the more significant features is the Delaware Water Gap National Recreation Area located approximately six miles from the project site. Shohola Falls is located approximately 2.5 miles northwest of the site. Numerous wetlands are located throughout the immediate vicinity. The closest is Crooked Swamp in the Delaware State Forest. Crooked Swamp is approximately 2,400 feet from the project area. Impacts to these areas will be minimal, if any, due to the small size of the project and its distance from these areas of interest.

The modification to the Twin Lakes Tap occurs along existing and previously cleared right-of-way. Therefore, tree clearing, if any, will be minimal. Should tree clearing be required PPL will utilize its "Program for Vegetation Management" to mitigate any impacts. Also, the proposed modification to the Twin Lakes Transmission Line will not encroach on any wetland or other water resource. PPL will employ its "Specification for Soil Erosion and Sedimentation Control on Transmission Line Rights-of-Way" as appropriate.

E. THREATENED AND ENDANGERED SPECIES

PPL has coordinated with different state and federal agencies to obtain information regarding endangered and threatened species that could occur in the study area. The agencies report that, except for occasional transient species of wildlife, no threatened or endangered plant or animal life is found in the project area.

APPENDICES

LIST OF APPENDICIES

APPENDIX A

PPL DESIGN CRITERIA AND SAFETY PRACTICES

The National Electrical Safety Code (NESC) is a set of rules to safeguard people during the installation, operation, and maintenance of electric power lines. The NESC contains the basic provisions considered necessary for the safety of employees and the public. Although it is not intended as a design specification, its provisions establish minimum design requirements. PPL Electric Utilities Corp. (PPL) has developed design specifications and safety rules which meet or surpass all provisions specified by the NESC.

Engineering Design Criteria and Parameters

The NESC includes loading requirements and clearances for the design, construction, and operation of power lines. The "loads" on conductors and supporting structures are the mechanical forces that develop from the weight of the conductors, the weight of ice on the conductors, plus wind pressure on the conductors and supporting structures. Loading requirements are the loads on the conductors and structures that are anticipated assuming certain ice and wind conditions. Loading requirements always contain "safety factors" to allow for unknown or unanticipated contingencies. The clearances and loading requirements contained in the NESC were developed to ensure public safety and welfare.

PPL transmission line design standards meet or surpass the NESC standards. For example, the relative order of grades of construction for conductors and supporting structures is B, C, and N; Grade B being the highest. According to the NESC standards, construction Grades B, C, or N may be used for transmission lines (except at crossings of railroad tracks and limited access highways where Grade B construction is specified). However, PPL designs all of its transmission lines for Grade B construction. The use of Grade B design and construction specifies such things as larger minimum crossarm dimensions, larger minimum conductor size, and increased safety factors.

Another example is the design parameters utilized to account for ice and wind loadings on the overhead ground wire (OHGW) and power conductors. The NESC standard ice and wind design magnitudes for the PPL territory are 0.5 inch thickness of radial ice combined with four pounds per square foot horizontal wind pressure (equivalent to 40-mile per hour wind velocity). The conductor sags and tensions used in line designs are the result of various ice and wind combinations, depending on the elevation at the line location and line design voltage. The conductor sags and tensions used in the design of all PPL transmission lines are at least 0.5-inch ice combined with eight pounds wind pressure (equivalent to 57 miles per hour wind velocity). This means that PPL lines are designed to operate safely and reliably during inclement weather even more severe than assumed by the NESC. In addition, PPL transmission lines are designed with more clearance to the ground than required by the NESC. The tables below compare PPL and NESC ground clearances for lines of various voltages.

138 kV

Surface Underneath Conductors	Vertical Clearance to Ground NESC Standard	PPL Design
Roads, streets, alleys	21 Ft.	30 Ft.
Other land traversed by vehicles (such as cultivated Field, forest, etc.)	21 Ft.	30 Ft.
Spaces accessible to pedestrians only	17 Ft.	30 Ft.
Railroad tracks	31 Ft.	35 Ft.

230 kV

Surface Underneath Conductors	Vertical Clearance to Ground NESC Standard	PPL Design
Roads, streets, alleys	23 Ft.	32 Ft.
Other land traversed by vehicles (such as cultivated Field, forest, etc.)	23 Ft.	32 Ft.
Spaces accessible to pedestrians only	19 Ft.	32 Ft.
Railroad tracks	31 Ft.	36 Ft.

500 kV

Surface Underneath Conductors	Vertical Clearance to Ground NESC Standard	PPL Design
Roads, streets, alleys	28 Ft.	53 Ft.
Other land traversed by vehicles (such as cultivated Field, forest, etc.)	28 Ft.	53 Ft.
Spaces accessible to pedestrians only	24 Ft.	53 Ft.
Railroad tracks	38 Ft.	53 Ft.

A relay protection system is used to protect the public safety and welfare as well as equipment and the transmission system. Relay protection is installed for all transmission lines to automatically de-energize the line in the unlikely event that the line or supporting structure fails and the line contacts the ground.

Periodic Maintenance Program on All Transmission Lines

To ensure continued public safety and integrity of service, a periodic maintenance and inspection program is implemented for every transmission line. The program is administered through the use of helicopter patrols, with supplemental foot and structure climbing patrols. A number of helicopter patrols are performed on all lines annually. The

two-man helicopter crew flies parallel, to the left, and above the line so that the observer can look for signs of line damage or deterioration and observe clearances between vegetation and conductors. The observations are included in a report that is forwarded to the appropriate department for corrective action.

Foot and structure climbing patrol programs for a transmission line begin approximately three to five years after the line is energized, unless a helicopter patrol reports a need for earlier action. The frequency of foot patrols varies from once every year to once every several years depending on line type and age.

An assigned foot patroller checks right-of-way conditions, including access roads, bridges, pole washouts, tower footers, vegetation height and clearance to conductors, pole and tower deterioration and, with the use of binoculars, insulators, and condition of hardware. Identified problems are included in a report which is forwarded to the appropriate department for corrective action.

A scheduled line outage is required to perform an overhead patrol because of "hands-on" inspection of hardware. Overhead patrols are conducted on a schedule determined by line age, operating record, and observed general condition. The necessary repairs are also done during the inspection outage.

Personnel Safety Rules

The following are a few of the PPL safety rules which demonstrate the Company's concern for employee safety:

- Work procedures have been developed to allow work to be performed on energized facilities in a safe manner. When lines or apparatus are removed from service to be worked on, the Energy Control Process system is applied. This system provides that a red tag must be physically placed on the control handle of the de-energized equipment. The red tag may be removed only after proper authorization to energize the equipment. Various other tags are used for limited operations and informational purposes. Employees will not apply or remove a tag or change the status of tagged equipment unless authorized.

- Temporary safety grounds are used on de-energized facilities for employee safety during maintenance, construction, or reconstruction work. Safety grounds are wires connecting the de-energized facility to an electrical ground. If the facility should be energized, the safety grounds will divert the current directly to ground and reduce the likelihood of personal injury. The conductor size and attachment clamps of temporary safety grounds must be capable of conducting anticipated fault currents. Rubber gloves, rubber sleeves, and additional rubber protective equipment are used as required when applying or removing temporary safety grounds to or from the lines or apparatus to be grounded. An approved nonconductive working stick of sufficient length to allow workers to maintain the following required minimum clearances is used to test that the line has been de-energized and to apply temporary safety grounds:

Voltage-kV	Minimum Clearance
138	3'-7"
230	5'-3"
500	11'-3"

Before applying grounds, a test is done to confirm that the line is de-energized. The voltage test device is checked before and after use to assure reliability. When ground pins are used to establish proper ground points, they are driven to a depth of not less than four feet as near vertical as possible.

- Poles or structures are inspected and examined for structural integrity before climbing. If there is any reason to believe that a pole is unsafe, it is stabilized before work is performed. Appropriate safety gear in the form of body belts, safety straps, hard hats, gloves, etc., is worn by linemen during line work activity.

MAGNETIC FIELD MANAGEMENT

PP&L, Inc.

APPENDIX B

OCTOBER 1998

TABLE OF CONTENTS

INTRODUCTION

At PP&L, Inc., magnetic field management means investigating and implementing methods at low or no cost to reduce magnetic fields in new or rebuilt transmission and distribution lines. This document explains PP&L, Inc.'s Magnetic Field Management Program, which is part of PP&L, Inc.'s larger Electric and Magnetic Fields ("EMF") policy.

PP&L, Inc.'s View

Some people are worried that electric and magnetic fields are harming their health. Others think the scientific research does not show a problem at all, and still others believe there's just too much scientific uncertainty to draw any conclusions.

Here's what we do know now. Various panels of scientists that have reviewed the EMF research generally have drawn two main conclusions. First, the large body of evidence does not demonstrate that EMF are harmful. Second, additional research is recommended to explore questions raised in some studies.

Given these conclusions, PP&L, Inc. is taking a reasoned approach in responding to the EMF issue. PP&L, Inc.'s approach to the EMF issue consists of five elements:

- Providing EMF information to customers and employees
- Providing magnetic field measurements
- Establishing and implementing a magnetic field management program to reduce magnetic fields in new or rebuilt facilities when it can be done at no, or low, cost
- Integrating EMF in the public involvement process that PP&L, Inc. undertakes in the siting of transmission lines
- Have supported additional research

EMF Are All Around Us

Electric and magnetic fields occur in nature and in all living things. The earth, for instance, has a magnetic field, which makes the needle on a compass point north.

Electric fields and magnetic fields of a different type also surround every wire that carries electricity. In everyday life, these EMF arise from several basic sources, including power lines, electrical appliances, home and building wiring, other utility lines and cables, and currents flowing on water pipes. Though they often occur together, EMF are made up of two separate components:

Electric Fields

Electric fields are produced by the voltage — or electrical pressure — on a wire. The higher the voltage, the higher the electric field. As long as a wire is energized — has voltage present — an electric field is present (see figure 1). In other words, an appliance, or an electric power line, doesn't actually have to be turned on to create an electric field. It just has to be plugged in. Electric fields diminish with distance and can be blocked or partially shielded by objects such as trees and houses.

Magnetic Fields

Magnetic fields are created by the current or flow of electricity through a wire. Generally speaking, the higher the current, the higher the magnetic field. Because they only occur when current is flowing, magnetic fields are present only when the power is turned on (see figure 1). Magnetic fields also diminish with distance, but — unlike electric fields — are not blocked by common objects. In recent years, public and scientific interest has turned toward the magnetic field component of EMF because of some scientific studies regarding these fields.

Figure 1

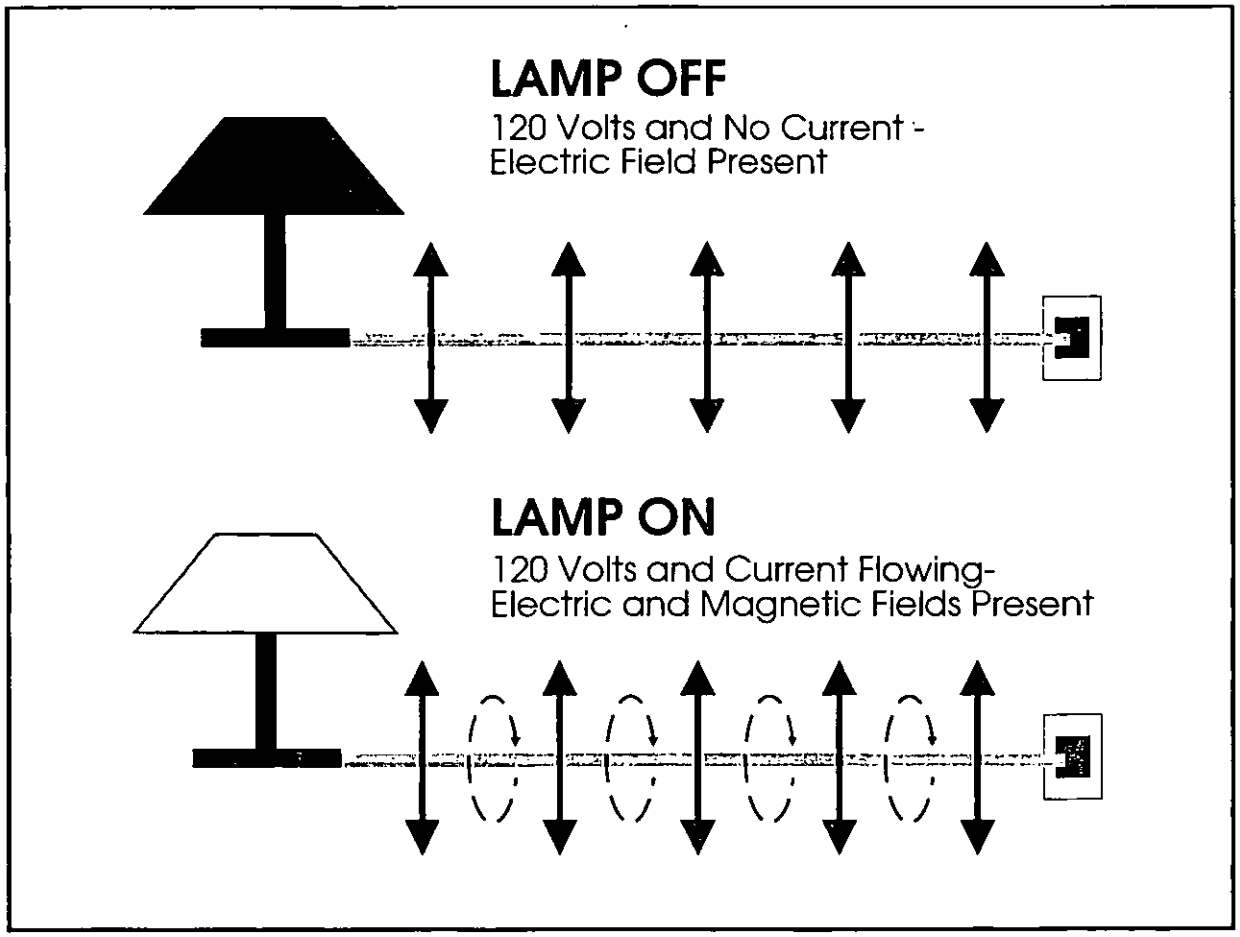


Figure 2

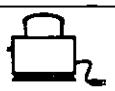
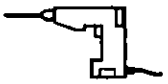
Magnetic field strengths decrease with distance Magnetic fields are measured in milligauss	Source: "EMF In Your Environment", U.S. Environmental Protection Agency 1992 At 6 inches	At 1 foot	At 2 feet
Clothes dryer 	2 to 10	* to 3	*
Microwave oven 	100 to 300	1 to 200	1 to 30
Toaster 	5 to 20	* to 7	*
Power drill 	100 to 200	20 to 40	3 to 6
Can opener 	500 to 1500	40 to 300	3 to 30
Mixer 	30 to 600	5 to 100	* to 10
Hair dryer 	1 to 700	* to 70	* to 10
Color television 	Data not available	* to 20	* to 8

FIGURE 2 * The magnetic field measurement at this distance from the operating appliance could not be distinguished from background measurements taken before the appliance had been turned on.

Measuring Magnetic Fields

Magnetic fields usually are measured in a unit called a milligauss. Magnetic field levels found in the living areas of homes typically range from less than 1 milligauss to about 4 milligauss according to the U.S. Environmental Protection Agency. They can be higher in some cases. The levels next to appliances can exceed 1,000 milligauss (1 gauss). Figures 2 and 3 show how the strength of the field falls off as you move away from the source, just as the heat of a campfire grows weaker as you walk away from it.

For overhead power lines, the strength of the magnetic fields is dependent upon a number of factors that will be explained later. Those factors produce a magnetic field that drops off rapidly as you move away from the power line.

Figure 3

Sample Magnetic Field Levels in Milligauss				
Type of Overhead Power Line	**Distance from the line**			
	Under the line	**50 ft.**	**100 ft.**	**200 ft.**
220 kV and 500 kV	5-400	5-250	1-75	0.5-20
69 kV and 138 kV	3-80	0.5-25	0.1-10	0.1-3
12 kV and below	0.4-20	0.1-1	-	-

The magnetic field values provided in this table represent a general range of values associated with the types of overhead power lines listed and are provided for illustration. There will be circumstances in which there will be magnetic field levels above or below the range of values provided due to variations in such factors as height of the wires, current flow and so on.

DEVELOPMENT OF PP&L, INC.'S MAGNETIC FIELD MANAGEMENT PROGRAM

One element of our response to EMF concerns expressed by some of our customers is PP&L, Inc.'s Magnetic Field Management Program. The program was initiated in March 1991 because PP&L, Inc. believes it makes good sense, as a matter of policy, to respond to the concerns expressed by some of our customers and to reduce magnetic fields in new and rebuilt facilities where it can be done with either no-cost or low-cost design changes.

This document updates the original program which has been revised several times since 1991. These guidelines were developed by PP&L, Inc.'s EMF Working Group.

VARIABLES THAT AFFECT MAGNETIC FIELDS

Magnetic fields from transmission and distribution lines are a function of a number of design variables. The following parameters affect the magnetic field levels produced by transmission and distribution lines:

- Current
- Height of conductors above ground
- Configuration of conductors
- Distance from the line

Effect of Phase Current on Magnetic Fields

At power frequencies (i.e. 60 hertz), the magnetic field level is a function of the current or flow of electricity through a wire. Keeping all other parameters the same, the magnetic field is proportional to the current. Hence, if the current increases by 25 percent, the resulting magnetic field level will increase by 25 percent.

The overall load current on any line varies with the demand for power. It's usually highest during daytime hours and lowest at night. There also are weekly, monthly, seasonal and yearly variations.

The difference in the currents between each phase in a multiphase line also can affect the magnetic field. This difference is called phase unbalance. For a constant load, a statistical analysis of this phase unbalance can be made to determine its effect on the magnetic field. Close to the line, there is very little effect. However, the phase unbalance slows the rate at which the magnetic field decreases with distance from the line.

Effect of Conductor Configuration on Magnetic Fields

In the transmission and distribution of power, utilities like PP&L, Inc. presently use both three-phase and single-phase lines. Each phase on a three-phase power line has either a single conductor or a bundle of two or more conductors. In a three-phase system, the ground-level magnetic field is a result of the fields produced by the currents in each of the phases. Placing the three phases as close together as possible (compaction) creates some field cancellation, and the ground-level magnetic field is reduced. However, appropriate phase separation is required for the reliable operation of the line. In addition, the arrangement of the phases can create some field cancellation and reduction of the ground-level magnetic field.

Effect of Distance From the Magnetic Field Source

Magnetic field strength diminishes with the vertical and lateral distances from the magnetic field source. Increasing the height of the conductors above ground is useful for magnetic field reduction at ground level, but may result in increased structure costs and increased aesthetic impact of the structures. Another possible method of increasing the distance to the magnetic field source is to increase the right-of-way requirements. By keeping buildings off increased rights of way, thereby requiring the public to live and work further away from lines, exposure to magnetic fields produced by the lines can be reduced. Increases in right of way are not always practical and may increase costs significantly, however.

SUMMARY OF PP&L, INC.'S MAGNETIC FIELD MANAGEMENT PROGRAM

Under its Magnetic Field Management Program, PP&L, Inc. has changed the way it builds and rebuilds some of its transmission and distribution lines. These design changes reduce magnetic field levels (assuming balanced circuit loadings and phase currents) by up to 69 percent in most of the company's new transmission lines. These guidelines now are being applied to new and reconstructed transmission facilities, based on this program.

The distribution component of the program focuses on 12 kV lines, the company's standard distribution voltage. It concentrates on the three-phase, primary 12 kV lines, since these are the most heavily loaded facilities and often are located in densely populated areas. The guidelines in this program are being applied to these three-phase, primary 12 kV lines.

A maximum 3-5 percent change in estimated cost was used as the limit for the guidelines since this value is consistent with low cost, is within estimating accuracy and is likely to have little impact on overall line costs.

The magnetic field calculations used in this document for the design of PP&L, Inc.'s overall magnetic field management plan assume balanced load conditions among the phases and a fixed level of current, not necessarily representative of specific transmission or distribution lines. These levels were calculated using the Electric Power Research Institute's ENVIRO computer program. Under actual operating conditions, the magnetic field levels that result may vary due to such things as actual load per circuit, overall current on each phase conductor and the electrical configuration and operation of each line.

MAGNETIC FIELD MANAGEMENT PROGRAM GUIDELINES

The guidelines for magnetic field management are noted below, with discussion points for each.

OVERHEAD LINES

New or Rebuilt Transmission Lines

1. **Balance transmission circuit loads and phase currents as much as possible.**
   - PP&L, Inc. should continue to make every effort to balance loadings between the two circuits of a double circuit line when planning new or rebuilt facilities to maximize the effects of reverse phasing.
   - PP&L, Inc. should continue the practice of balancing single-phase loads across the three phases of the distribution system. (Unbalanced phase currents on the distribution system are reflected through to the transmission system.)
     - — Unbalanced phase currents result in higher magnetic fields that do not drop off as quickly with distance as do the fields resulting from balanced phase currents.
     - — For a 5 percent phase current unbalance, the magnetic field 50 feet from the centerline of a single circuit 138 kV line could be more than twice the value than if the same line had balanced phase circuits.
       - Balanced phase currents on each three-phase distribution circuit also reduce magnetic fields from the distribution circuits themselves. In addition, they reduce magnetic fields on the transmission system from which the distribution system circuits are supplied and connected through substations.
       - Apart from magnetic field considerations, balanced phase currents on each three-phase distribution circuit also reduce line losses and improve the system voltage.

2. **Continue with the present practice of using long-span construction as the PP&L, Inc. 138/69 kV standard.**
   - Structure designs for short-span and long-span construction are illustrated on charts I and II, respectively.
   - Short-span design does not significantly reduce magnetic fields when compared to long-span design even though it is more compact than long-span design. Comparison of the magnetic field values from chart III indicates essentially the same values. Therefore, short-span design should not be used solely to reduce magnetic fields.
   - PP&L, Inc. will continue to use long-span construction for 138/69 kV double-circuit lines and for single-circuit/future-double-circuit lines.
   - For single-circuit/future-double-circuit lines, PP&L, Inc. will continue to install two conductors

on the top positions and one in the middle position as shown in chart IV.

— This arrangement minimizes magnetic fields as shown in chart V by placing the three initial conductors higher on the structure, which increases the ground clearances, and by placing the conductors in a triangular configuration.

3. Compact design structures are not a low-cost alternative and should be used for magnetic field reduction only in special applications.

Chart VI illustrates the compact design structure.

- The compact design increases the initial installation costs by 79 percent when compared to the long-span design but reduces the magnetic field from 9 mG to 3 mG (about 67 percent) at the edge of the 100-foot-wide right of way as shown on chart III.

4. Reverse phase new or rebuilt double-circuit transmission lines for all voltage levels.

- Reverse phasing was adopted by PP&L, Inc. in March 1991 for double-circuit 138/69 kV transmission lines and in April 1992 for all other double circuit transmission lines. Reverse phasing is shown in chart VII. Reverse phasing will reduce the magnetic fields when the current flow on both circuits is in the same direction. Calculated values contained here are based on balanced and equal phase currents on both circuits.
  - — Reverse phasing reduces the magnetic field of a double circuit 138 kV single pole transmission line from 29 mG to 9 mG (about 69 percent) at the edge of the 100-foot-wide right of way as shown on chart III.
  - — Reverse phasing reduces the magnetic field of a double circuit 230 kV single pole transmission line from 49 mG to 16 mG (about 67 percent) at the edge of the 150-foot-wide right of way as shown on chart VIII.
  - — Reverse phasing reduces the magnetic field of a double-circuit 500 kV single pole transmission line from 37 mG to 21 mG (about 43 percent) at the edge of the 200-foot-wide right of way as shown on chart IX.
- When new or rebuilt double-circuit lines require tapping existing double-circuit lines, PP&L , Inc. will review the existing lines to determine if reverse phasing can be provided at low cost.
- Computer modeling is required to develop the optimum phasing and overall conductor arrangements for lines added to, or rebuilt in, multiple-line corridors.
  - — Merely adding a reverse-phase double-circuit line to an existing transmission line corridor or reverse phasing a rebuilt line in the multiple-line corridor will not necessarily produce lower magnetic field levels at the edge of the corridor right of way.
  - — The corridor must be computer modeled with all the lines, existing phase conductor locations and currents. Then, magnetic field calculations must be made varying the phase arrangements of the new or reconstructed line to determine the appropriate phasing arrangement.
  - — Current flow direction on a line also must be considered. For example, a reverse-phased

line should have the current flowing in the same direction on both circuits. If the current flow is in the opposite direction for one circuit, reverse phasing will not produce the lowest magnetic field and another phase arrangement that produces lower fields may need to be utilized.

5. **Increase the minimum ground clearance for all new transmission lines.**

138/69 kV Transmission Lines

- Increasing the minimum line design ground clearance from 25 feet to 30 feet may add up to about 5 percent to the installed cost of a new double-circuit single pole 138/69 kV line. For a given project, such cost may be substantially less, however. In fact, PP&L, Inc. frequently uses higher-than-minimum ground clearances due to such features as road crossings, line crossings and site-specific terrain. With long-span reverse-phase design, the magnetic field is reduced from 9 mG to 7 mG (about 22 percent) at the edge of a 100-foot-wide right of way as shown in chart X.
  - — In the actual design of transmission lines to include higher minimum ground clearances, there may be limited segments (such as highway crossings, severe slopes and transmission line crossing locations) where National Electrical Safety Code (NESC) minimum ground clearances may need to be used. The NESC minimum ground clearances are less than the increased ground clearance discussed previously.

230 kV Transmission Lines

- Increasing the minimum line design ground clearances from 27 feet to 32 feet may add up to about 5 percent to the cost of a single-circuit single-pole line (current standard). For a given project, such cost may be substantially less, however. In fact, PP&L, Inc. frequently uses higher-than-minimum ground clearances due to such features as road crossings, line crossings and site-specific terrain. By increasing the clearances, the magnetic field is reduced from 30 mG to 28 mG (about 7 percent) at the edge of a 150-foot-wide right of way.
- Increasing clearances from 27 feet to 32 feet could theoretically add up to about 2.8 percent to the cost of a double-circuit single-pole line (current standard) and reduce the magnetic field of a reverse-phase line from 16 mG to 15 mG (about 6 percent) at the edge of a 150-foot-wide right of way. Chart XI is a summary of this data.
- Studies are required for each new 230 kV line to determine optimum structure types, ground clearances, configurations and designs to reduce field levels. Such studies could include analysis of reduction measures such as additional minimum ground clearances, increasing conductor tensions, using reduced phase spacing (a "Delta" configuration on a single-circuit line), installing the second circuit initially, and/or adding a second set of conductors that are reverse phased and operated in parallel with the first set (bundled/split phase).

500 kV Transmission Lines

- Increasing ground clearances from 33 feet to 53 feet may add up to about 4.5 percent to the

cost of a single-circuit "H-frame" line (current standard). For a given project, such cost may be substantially less, however. In fact, PP&L, Inc. frequently uses higher-than-minimum ground clear ances due to such features as road crossings, line crossings and site-specific terrain. By increasing the clearances, the magnetic field is reduced from 42 mG to 35 mG (about 17 percent) at the edge of a 200-foot-wide right of way.

- Increasing ground clearances from 33 feet to 53 feet could theoretically add up to 2.8 percent to the cost of a double-circuit "H-frame" line (current standard) and reduces the magnetic field of a reverse-phase line from 21 mG to 16 mG (about 24 percent) at the edge of a 200-foot-wide right of way. Chart XII is a summary of this data.
- Studies are required for each new 500 kV line to determine optimum structure types, ground clearances, configurations and designs to reduce field levels. Such studies could include analysis of reduction measures such as additional minimum ground clearances, increasing conductor tensions, using reduced-phase spacing (a "Delta" configuration on a single circuit line), installing the second circuit initially, and/or adding a second set of conductors that are reverse phased and operated in parallel with the first set (bundled/split phase).

Reconductoring or Adding Additional Circuits to Existing Transmission Lines

When reconductoring or adding additional circuits to existing transmission lines, PP&L, Inc. will evaluate low-cost or no-cost options for magnetic field management on a case-by-case basis.

When reconductoring existing transmission lines or adding additional circuits, low-cost alternatives may not exist; however, the following steps will be taken:

- For a single-circuit line, the use of a Delta arrangement or other modifications on the existing structure, with reduced-phase spacing, will be evaluated.
- For double-circuit lines, application of reverse phasing may reduce the magnetic field under the line and within the right of way and will be evaluated.
- For single- and double-circuit lines, evaluate using higher conductor tensions that can increase the minimum line design ground clearance.

Distribution Lines

At the 12 kV distribution level, new main three-phase lines will continue to be constructed with five feet of additional ground clearance.

- Main lines are the most heavily loaded sections of a distribution line and therefore have the highest magnetic fields associated with them.
- Increasing the ground clearance by five feet reduces the magnetic field under the line from 14 mG to 11 mG using the standard eight-foot crossarm design. These values are based on increasing pole heights from 45 feet to 50 feet and a typical operating current of 300 amps per phase.

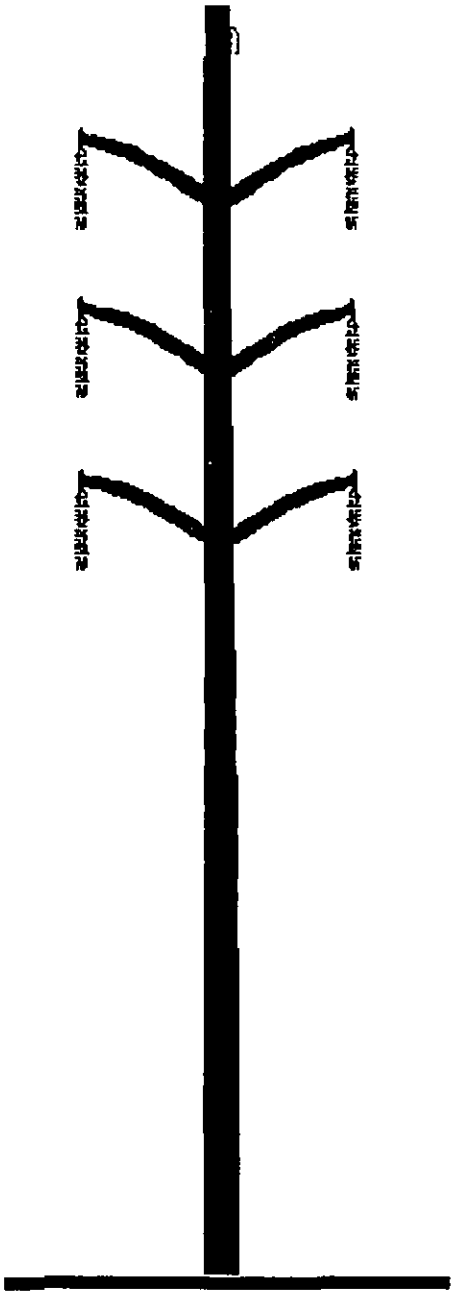
• Chart XIII is a summary of this data. Increasing ground clearance by five feet could theoretically add about 5 percent to the cost of a typical distribution line.

Underground Transmission Lines

If underground transmission lines are required due to environmental or land use factors or restrictions on available clearances, PP&L, Inc. will evaluate options for magnetic field management techniques on a case-by-case basis.

- The phase arrangement that produces the lowest field will be determined.
- The depth of burial of the line will be determined considering the cost of excavation and the location of other buried utilities in the area.
- The use of steel pipe ferromagnetic shielding that reduces magnetic fields will be evaluated.

Short-Span Construction

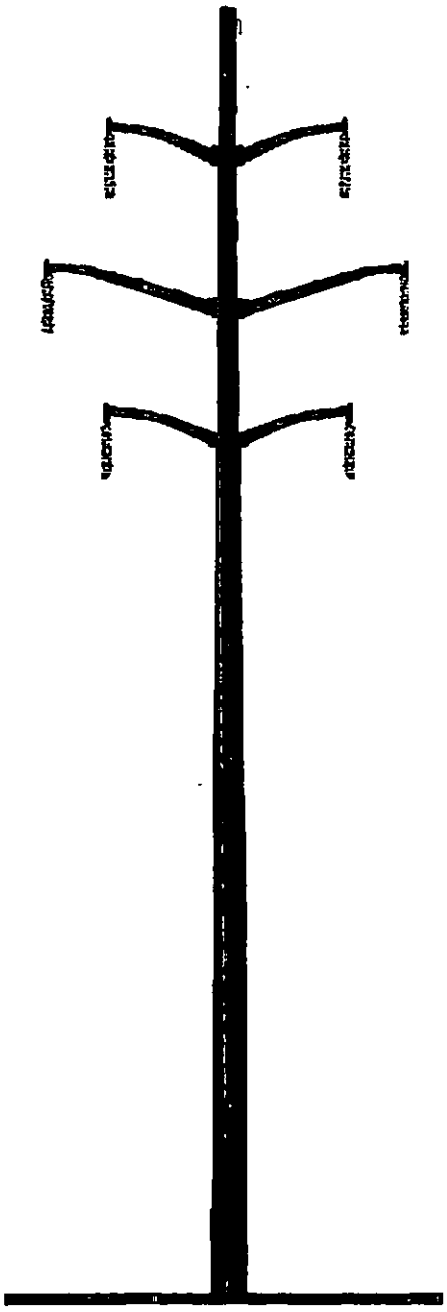


- More compact design
- Should not be used solely to reduce magnetic fields
- Typical conductor data:

  1 3/8" HS steel overhead ground wire - 7.3 feet sag
  6-556.5 KCMIL 24/7 ACSR power conductors - (PARAKEET) 10.0 feet sag
  Average span - 400 feet

CHART II

Long-Span Construction Remains
PP&L, Inc. 138kV Standard



- **Lower cost alternative**
- **Reduces magnetic fields due to higher structures**
- **Typical conductor data:**

  1 3/8" HS steel overhead ground wire - 17.3 feet sag
  6-556.5 KCMIL 24/7 ACSR power conductors - (PARAKEET) 23.0 feet sag
  Average span - 600 feet

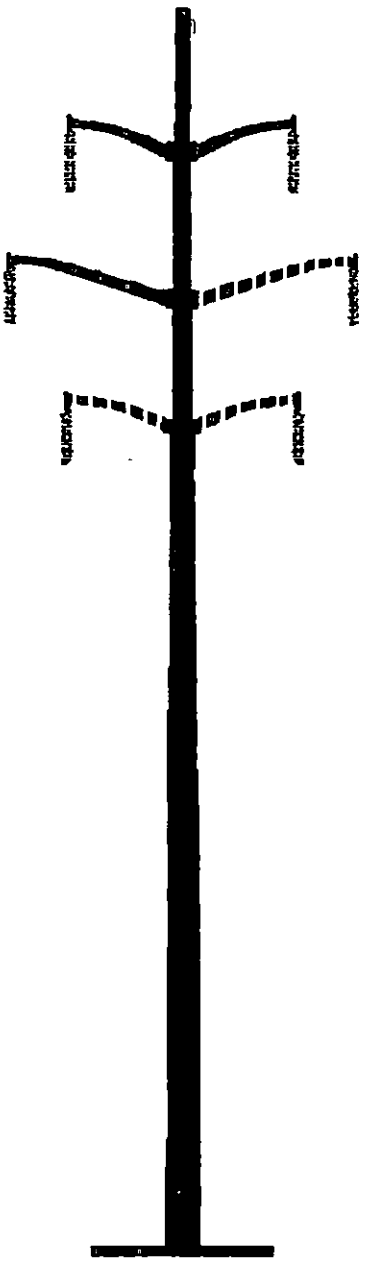
138/69 kV REVERSE-PHASE TRANSMISSION LINES
CALCULATED MAGNETIC FIELDS AT 400 AMPERES

TYPE CONSTRUCTION	MAGNETIC FIELD IN MILLLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
SHORT SPAN (CHART I)	30
SHORT SPAN (REVERSE PHASE)	8
LONG SPAN (CHART II)	29
LONG SPAN (REVERSE PHASE)	9
COMPACT (CHART VI)	14
COMPACT (REVERSE PHASE)	3

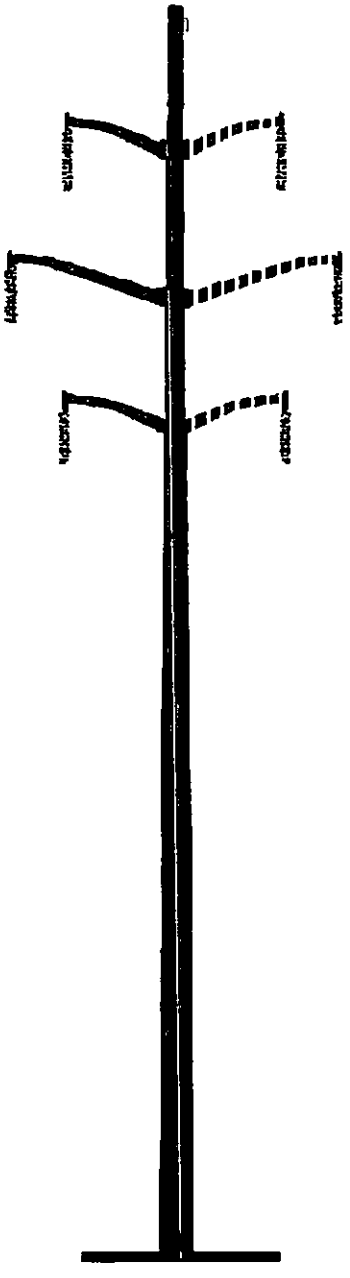
The edge of right of way is 50 feet from the line centerline.
The 400 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 25 feet.
LONG SPAN, SHORT SPAN and COMPACT are double-circuit lines.

CHART IV

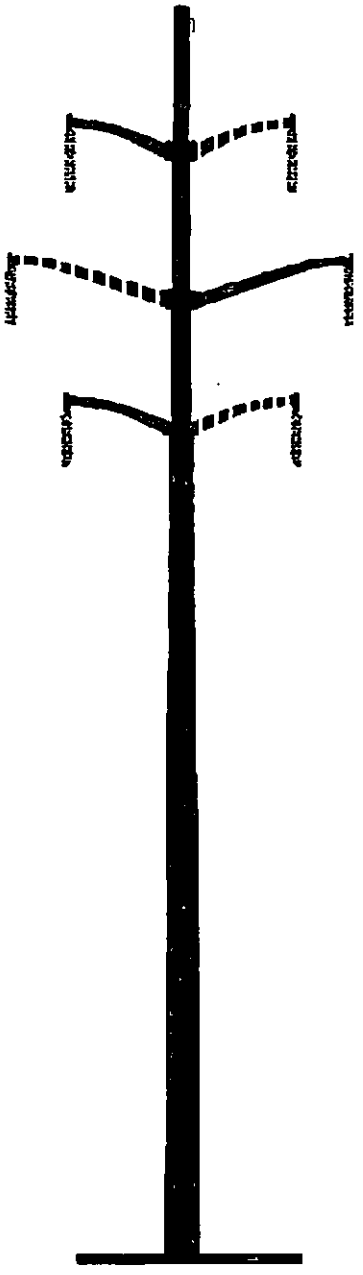
Typical Single-Circuit Structure Designs



Top/Middle



Vertical



Top/Middle/Bottom

initial single circuit

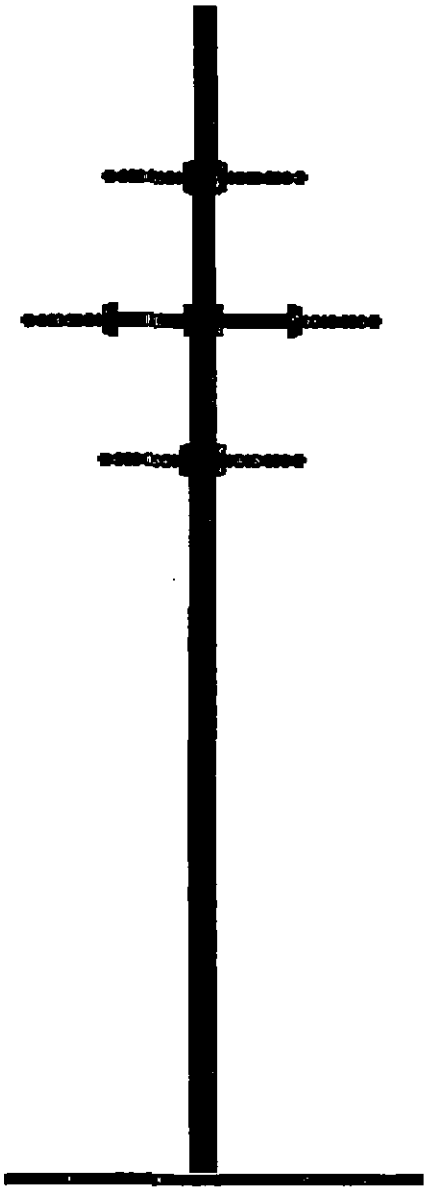
future second circuit

138/69 kV SINGLE CIRCUIT TRANSMISSION LINES
CALCULATED MAGNETIC FIELDS AT 400 AMPERES

TYPE CONSTRUCTION	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
TOP/MIDDLE/BOTTOM	20
VERTICAL	17
TOP/MIDDLE	12

The edge of right of way is 50 feet from the line centerline.
The 400 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 25 feet.

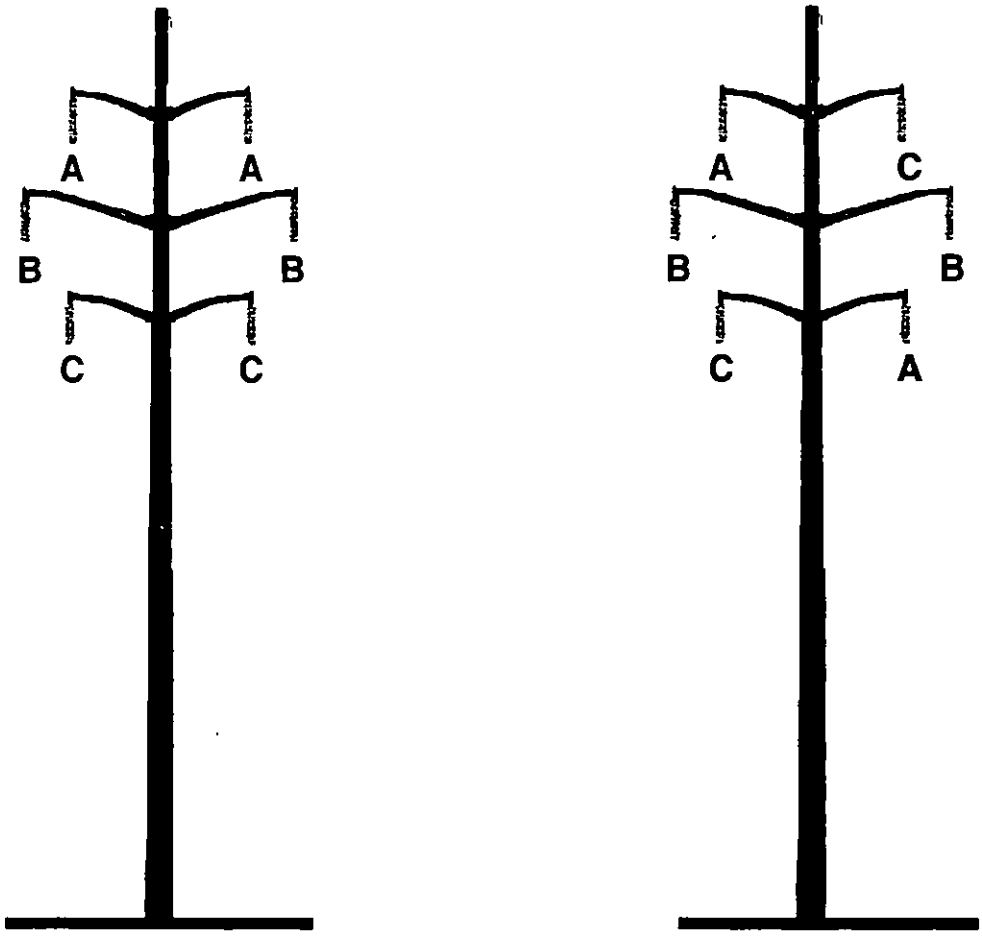
Compact Design Structure



- **Minimize magnetic fields due to compact design**
- **Not a low-cost alternative**
- **Typical conductor data:**

  1 3/8" HS steel overhead ground wire - 9.0 feet sag
  6-556.5 KCMIL 24/7 ACSR power conductors - (PARAKEET) 9.0 feet sag
  Average span -300 feet

Reverse Phasing of Double-Circuit Transmission Lines



From: ⟶ ⟶ ⟶ ⟶ To:

Reverse phasing also can be one of the following phase arrrangements:

A	B		B	A		B	C		C	A		C	B	
C	C	or	C	C	or	A	A	or	B	B	or	A	A	
B	A		A	B		C	B		A	C		B	C	

CHART VIII

230 kV REVERSE-PHASE TRANSMISSION LINES CALCULATED MAGNETIC FIELDS AT 800 AMPERES

TYPE CONSTRUCTION	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
DOUBLE CIRCUIT POLE	49
DOUBLE CIRCUIT POLE (REVERSE-PHASE)	16

The edge of right of way is 75 feet from the line centerline.
The 800 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 27 feet.

CHART IX

500 kV REVERSE-PHASE TRANSMISSION LINES CALCULATED MAGNETIC FIELDS AT 1100 AMPERES

TYPE CONSTRUCTION	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
DOUBLE CIRCUIT POLE	37
DOUBLE CIRCUIT POLE (REVERSE PHASE)	21

The edge of right of way is 100 feet from the line centerline.
The 1,100 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 33 feet.

INCREASED 138/69 kV MINIMUM GROUND CLEARANCE
CALCULATED MAGNETIC FIELDS AT 400 AMPERES

TYPE CONSTRUCTION	MINIMUM GROUND CLEARANCE FEET	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
SINGLE CIRCUIT TOP/MIDDLE	25	12
SINGLE CIRCUIT TOP/MIDDLE	30	10
LONG SPAN	25	29
LONG SPAN	30	26
LONG SPAN (REVERSE PHASE)	25	9
LONG SPAN (REVERSE PHASE)	30	7

The edge of right of way is 50 feet from the line centerline.
The 400 ampere phase current is balanced between phases.

CHART XI

INCREASED 230 kV MINIMUM GROUND CLEARANCE CALCULATED MAGNETIC FIELDS AT 800 AMPERES

TYPE CONSTRUCTION	MINIMUM GROUND CLEARANCE FEET	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
SINGLE CIRCUIT TOP/MIDDLE	27	30
SINGLE CIRCUIT TOP/MIDDLE	32	28
DOUBLE CIRCUIT POLE	27	49
DOUBLE CIRCUIT POLE	32	46
DOUBLE CIRCUIT POLE (REVERSE PHASE)	27	16
DOUBLE CIRCUIT POLE (REVERSE PHASE)	32	15

The edge of right of way is 75 feet from the line centerline.
The 800 ampere phase current is balanced between phases.

INCREASED 500 kV MINIMUM GROUND CLEARANCE CALCULATED MAGNETIC FIELDS AT 1,100 AMPERES

TYPE CONSTRUCTION	MINIMUM GROUND CLEARANCE FEET	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
SINGLE CIRCUIT "H" STRUCTURE	33	42
SINGLE CIRCUIT "H" STRUCTURE	53	35
DOUBLE CIRCUIT POLE	33	37
DOUBLE CIRCUIT POLE	53	31
DOUBLE CIRCUIT POLE (REVERSE PHASE)	33	21
DOUBLE CIRCUIT POLE (REVERSE PHASE)	53	16

The edge of right of way is 100 feet from the line centerline.
The 1,100 ampere phase current is balanced between phases.

CHART XIII

12 kV DISTRIBUTION LINES
CALCULATED MAGNETIC FIELDS AT 300 AMPERES

TYPE CONSTRUCTION	POLE HEIGHT FEET	MAGNETIC FIELD IN MILLIGAUSS*	
		AT CENTERLINE	AT 30 FEET FROM CENTERLINE
STANDARD CROSSARM	45	14	7
STANDARD CROSSARM	50	11	6

* Field level under the line at mid-span based on 300 amps, balanced loading, one meter above ground level.

APPENDIX C

LIST OF PROPERTY OWNERS WITHIN THE PROPOSED RIGHT-OF-WAY

1. Mr. Charles E. Jones
   Sr. Vice President
   Metropolitan Edison Company
   76 South Main Street
   Akron, Ohio 44308

APPENDIX D

LIST OF INVOLVED GOVERNMENTAL AGENCIES, MUNICIPALITIES AND OTHER PUBLIC ENTITIES

1. Pennsylvania Historical and Museum Commission
   Bureau for Historic Preservation
   Division for Archaeology and Protection
   P.O. Box 1026
   Harrisburg, Pennsylvania 17108-1026
   Attn: Mr. Kurt W. Carr, Chief

2. Pennsylvania Department of Transportation
   Commonwealth Keystone Building
   400 North Street, 8th Floor
   Harrisburg, Pennsylvania 17120
   Attn: The Honorable Bradley L. Mallory, Secretary

3. Department of Environmental Protection
   P.O. Box 2063
   Market Street State Office Building
   Harrisburg, Pennsylvania 17105-2063
   Attn: Mr. Joseph Sieber

4. Pike County Commissioners
   Administration Building
   506 Broad Street
   Milford, Pennsylvania 18337
   Attn: Mr. Harry Forbes, Chairman

5. Pike County Planning Commission
   Administration Building
   506 Broad Street
   Milford, Pennsylvania 18337
   Attn: Mr. Michael Billig, Chairman

6. Dingman Township Board of Supervisors
   118 Fisher Lane
   Milford, Pennsylvania 18337
   Attn: Mr. Thomas Mincer, Chairman

7. Dingman Township Planning Commission
   118 Fisher Lane
   Milford, Pennsylvania 18337
   Attn: Mr. Walter Myer, Chairman

8. Mr. Ronald P. Lantzy
Regional President, Eastern PA
FirstEnergy Service Company
2800 Pottsville Pike
Reading, Pennsylvania 19612-6001

COMMONWEALTH OF PENNSYLVANIA

DATE: May 11, 2004

DOCKETED
MAY 11 2004

SUBJECT: A-110500 F0347

TO: Bureau of Fixed Utility Services

DOCUMENT FOLDER

FROM: James J. McNulty, Secretary

Letter of Notification of PPL Electric Utilities Corporation

We attach hereto a copy of the Letter of Notification of PPL Electric Utilities Corporation, which has been captioned and docketed to the above number.

May we have a report prepared by your Bureau for Public Meeting.

Attachment

cc: Law Bureau

jih

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA PUBLIC UTILITY COMMISSION
P. O. BOX 3265, HARRISBURG PA 17105-3265

IN REPLY PLEASE
REFER TO OUR FILE
Secretary
717-772-7777

May 11, 2004

DOCUMENT
FOLDER
A-110500 F0347

DOCKETED
MAY 11 2004

MORGAN, LEWIS & BOCKIUS LLP
ANTHONY C. DECUSATIS
1701 MARKET STREET
PHILADELPHIA PA 19103-2921

Dear Mr. DeCusatis:

Receipt is acknowledged of the Letter of Notification of PPL Electric Utilities Corporation which has been captioned and docketed to the above number.

This matter will receive the attention of the Commission and you will be advised of any further necessary procedure.

Sincerely,

James J. McNulty
Secretary

JJM:jih

Morgan, Lewis & Bockius LLP
1701 Market Street
Philadelphia, PA 19103-2921
Tel: 215.963.5000
Fax: 215.963.5001
www.morganlewis.com

Morgan Lewis
COUNSELORS AT LAW

ORIGINAL

Anthony C.DeCusatis
215.963.5034
adecusatis@morganlewis.com

June 11, 2004

VIA OVERNIGHT MAIL

James J. McNulty, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor
Harrisburg, PA 17120

Re: Letter of Notification of PPL Electric Utilities Corporation Filed Pursuant to 52 Pa. Code Chapter 57 Subchapter G With Respect to the Twins Lakes 138/69 kV Tap Line Modifications to be constructed in Dingman Township, Pike County Docket No. A-110500F0347

Dear Secretary McNulty:

Enclosed for filing please find an original and three copies of the Proofs of Publication from the Pike County Dispatch and The News Eagle, newspapers of general distribution in the project area, of the Public Notice for the above-referenced Letter of Notification. Publication occurred twice during two consecutive weeks.

Very truly yours,

Anthony C. DeCusatis
Counsel for PPL Electric Utilities Corporation

Enclosure

cc: Darren Gill

RJP

103

Commonwealth of Pennsylvania
County of Pike } ss.

PUBLIC NOTICE

TRANSMISSION LINE CONSTRUCTION

PPL Electric Utilities Corp. (PPL) plans to modify the existing Twin Lakes 138/69 kV Tap. This modification is required to supply electricity to a new substation being built by Metropolitan Edison Company (Met Ed) also known as Met Ed a FirstEnergy Company. The project is located in Dingman Township, Pike County, near the intersection of U.S. Route 6 and Little Walker Road.

Met Ed has requested service from PPL because the closest FirstEnergy transmission line is approximately 19 miles away while the PPL transmission line crosses Met Ed's substation site.

If you would like more information about this project, please contact PPL Regional Community Relations Director, Paul J. Canevari, at 570/620-3310.

On April 28, 2004, PPL filed an application with the Pennsylvania Public Utility Commission (PUC), which must approve the project before work can begin. A copy of this application is available for public inspection on weekdays during business hours at:

Dingman Township Municipal Building
118 Fisher Lane
Milford, PA 18837

If you wish to participate in the PUC application process, you should contact within 15 days:

James J. McNulty, Esquire
Prothonotary
Pennsylvania Public Utility Commission
PO Box 3265
Harrisburg, PA 17105-3265

As a reference aid, be sure to include the project's "docket number," which is A-110500F037.

Sue Doty-Lloyd duly sworn, according to law, deposes and says that she is publisher of the "Pike County Dispatch," a weekly paper of general circulation established in the year 1826 published at No. 105 West Catharine Street, in the Borough Milford, County and State aforesaid; and that a printed copy, an exact copy of which is hereto annexed, was published in said newspaper two times, to wit, in its issues of May 27 June 3 2004 and the affidavit further states that she is not interested in the subject matter of this notice or advertisement that all of the allegations of the statement as to time, place and character of publication are true.

Pike County Dispatch

Judith M. Craven, Attorney-In-Fact
Sue Doty-Lloyd, Principal

Sworn to and subscribed to before me this 3rd day of June A.D. 2004

Tami M. Stenger

Commission Expires

Notarial Seal
Tami M. Stenger, Notary Public
Milford Boro, Pike County
My Commission Expires June 6, 2006
Member, Pennsylvania Association Of Notaries

The News Eagle

• Main Office/Printing Plant •
522-24 Spring Street
Hawley, PA 18428
(570) 226-4547 Fax 226-4548

Proof of Publication

PUBLIC NOTICE

TRANSMISSION LINE CONSTRUCTION

PPL Electric Utilities Corp. (PPL) plans to modify the existing Twin Lakes 138/69 kV Tap. This modification is required to supply electricity to a new substation being built by Metropolitan Edison Company (Met Ed) also know as Met Ed a FirstEnergy Company. The project is located in Dingman Township, Pike County near the intersection of U. S. Route 6 and Little Walker Road.

Met Ed has requested service from PPL because the closest FirstEnergy transmission line is approximately 19 miles away while the PPL transmission line crosses Met Ed's substation site.

If you would like more information about this project, please contact PPL Regional Community Relations Director, Paul J. Canevari, at 570-620-3310.

On April 2S, 2004, PPL filed an application with the Pennsylvania Public Utility Commission (PUC), which must approve the project before work can begin. A copy of this application is available for public inspection on weekdays during business hours at:

Dingman Township Municipal Building
118 Fisher Lane
Milford, PA 18337

If you wish to participate in the PUC application process~ you should contact within 15 days:

James J. McNulty, Esquire
Prothonotary
Pennsylvania Public Utility Commission
PO Box 3265
Hanisburg, PA 17105-3265

*As a reference aid, be sure to include the project's "docket number," which is A-110500 F0347.

COMMONWEALTH of PENNSYLVANIA
COUNTY of WAYNE

JOHN R. DIEHL, JR.

being duly sworn, according to law, deposes and says that **HE** is **PUBLISHER** of THE NEWS EAGLE, a newspaper of general circulation, established in 1956, and published three times weekly in the Borough of Hawley, Wayne County, Pennsylvania; and that the advertising notice hereto annexed was published in said newspaper on the following dates:

05/27//04

06/03/04

DOCKETED
AUG 18 2004

And the affiant further declares that he is not interested in the subject matter of the notice, and that all of the allegations as to the time, place and character of publications are true and correct.

Sworn to and subscribed before me this 3rd day of June 2004

Christine Altemier

Christine Altemier
Hawley Boro, Wayne County
My commission expires June 20, 2007

DOCUMENT FOLDER