

EXHIBIT “D”
COOPERSBURG #1 & #2 138/69 kV TAP RECONSTRUCTION
ENGINEERING DESCRIPTION

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I. PROPOSED LINE DESIGN

PPL EU proposes to construct a new 138/69 kV transmission line between PPL EU's Coopersburg 69 – 12 kV Substation and the Buxmont – Quakertown #1 & #2 138/69 kV Transmission Line. The new line will be approximately 7.09 miles long. It will be built for double-circuit 138 kV operation although initially, both circuits will operate at 69 kV. The proposed transmission line will be built in portions of Upper Saucon Township in Lehigh County, and Springfield and Richland Townships in Bucks County.

Tangent poles on the proposed Coopersburg #1 and #2 138/69 kV Transmission Line will consist of single steel poles equipped with steel upswept conductor support arms. Angle structures will be either single steel poles or two-pole steel structures depending upon the severity of the angle. Tangent poles will be direct embedded, and angle poles will be installed on concrete foundations.

Additionally, some angle structures may be guyed. Altogether, this project requires the installation of approximately 72 structures averaging 85 feet high. Average span lengths will be 525 feet. The proposed structures are shown in Figures 1 and 2.

The proposed new line construction described above will be designed according to, and will meet, all National Electrical Safety Code standards. Design specifications and safety rules practiced by PPL EU are described in Appendix H. Six power conductors and one Fiber Optic Overhead Ground Wire (OPGW) will be installed. The conductors will be 556.5 KCMIL 24/7 stranding ACSR, and the groundwire will be 0.559-inch diameter OPGW with 36 single mode fibers.

Table 1 shows the designed minimum conductor clearances and the conductor thermal ratings of the proposed line.

TABLE 1
DESIGN MINIMUM CONDUCTOR CLEARANCES
FOR 556.5 KCMIL 24/7 STRANDING ACSR*
COOPERSBURG #1 & #2 138/69 kV TAPS

<u>Condition</u>	Transmission Double-Circuit Design <u>Clearance-to-Rail</u>	Transmission Double-Circuit Design <u>Clearance-to-Ground</u>
Normal load average weather (16°C ambient temperature)	48.5 feet	43.5 feet
Predicted extreme thermal load (125°C conductor temperature)	35 feet	30 feet
Predicted extreme weather conditions (1/2 inch ice, 0 lb. Wind, -18°C)	46.5 feet	41.5 feet

*Clearances based on a maximum tension of 9,500 pounds and a ruling span of 600 feet.

CONDUCTOR THERMAL RATING
556.5 KCMIL 24/7 STRANDING ACSR
125°C MAXIMUM CONDUCTOR TEMPERATURE

<u>Condition</u>	Ambient Temperature °C	Wind Speed <u>Knots</u>	Ampacity <u>Amps</u>
Summer Normal	35	0	815
Winter Normal	10	0	926
Summer Emergency	35	1-1/2	1041
Winter Emergency	10	1-1/2	1163

II. MAGNETIC FIELD MANAGEMENT PLAN

PPL EU has instituted a Magnetic Field Management Program for new and rebuilt transmission lines, which is described in Appendix I to this Application. The Company does not believe that the current scientific evidence demonstrates that magnetic fields cause any adverse health effects or pose a health or safety danger to the public. Nevertheless, PPL EU has determined, as a matter of policy, to design its new and rebuilt transmission lines to reduce magnetic fields when that can be done at low or no cost and consistent with functional requirements. PPL EU's Magnetic Field Management Program has been developed to implement that policy decision.

Consistent with this program, PPL EU will reverse phase the proposed Coopersburg #1 & #2 138/69 kV transmission line and increase pole heights by five feet.