BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

APPLICATION OF PENNSYLVANIA ELECTRIC COMPANY FOR APPROVAL TO LOCATE AND CONSTRUCT THE BEDFORD NORTH-CENTRAL CITY WEST 115 KILOVOLT TRANSMISSION LINE PROJECT IN CENTRAL CITY BOROUGH AND SHADE TOWNSHIP, SOMERSET COUNTY, AND NAPIER, EAST ST. CLAIR, AND BEDFORD TOWNSHIPS, BEDFORD COUNTY, PENNSYLVANIA	:	**Docket No. A-2016-2565296**

REBUTTAL TESTIMONY OF

SALVATORE QUATTROCCHI

ON BEHALF OF

PENNSYLVANIA ELECTRIC COMPANY

REBUTTAL STATEMENT NO. 8

Re: Use of Herbicides for Corridor Maintenance

Dated: February 20, 2017

INTRODUCTION AND PURPOSE OF TESTIMONY

Q. Please state your name and business address.

A. Salvatore A. Quattrocchi. 873 Heritage Hills Drive, York, Pennsylvania 17402.

Q. By whom are you employed and in what capacity?

A. I am President of EnviroSolutions Group LLC, and in that capacity I provide Technical Herbicide Business Management Consulting.

Q. Please describe your professional experience and educational background.

A. I received a Bachelor of Science degree from the University of Tennessee in Agriculture Economics and Agricultural Business, focusing on plant science. I have a graduate degree in Agriculture Business and Finance from the University of Minnesota. I was employed for 34 years with Dow Chemical Company, Agricultural and Specialty Chemistry Industry. I was a technical herbicide field specialist for row crops in Arkansas, a Technical Agricultural Account Manager in Minnesota, and a technical business marketing manager, Indianapolis, Indiana. Turf & Ornamental technical regional manager NE region. IVM Technical business and sales manager mid Atlantic northeast region.

Q. Have you ever testified as an expert witness on the use of pesticides or herbicides?

A. Yes. I have testified in approximately 100 proceedings of civil litigation. I have testified as an expert on the technical attributes of herbicide molecules, on the herbicide

products themselves and the impacts of herbicides on safety, plants the environment and overall ecosystem.

Q. Have you published articles?

A. Yes. I have been published in agriculture professional journals and technical manuals focusing on herbicide specifications.

Q. On whose behalf are you providing testimony?

A. I am providing this testimony on behalf of Penelec for approval to locate and construct the Bedford North-Central City West 115 kV Transmission Line ("Project").

Q. What is your role on the Project?

A. I am a technical resource expert on the Company's herbicide program.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to provide technical herbicide and transmission vegetation management resource expertise.

Q. Have you sponsored direct testimony in this proceeding?

A. No. I am providing rebuttal testimony.

Q. **Are you familiar with the herbicides that the company proposes to use on the Project ROW corridors?**

A. The herbicides are Garlon 4, Milestone and Polaris and Tordon K.

Q. **In your work are you familiar with all of these herbicides?**

A. Yes. I am familiar with Garlon 4, Milestone and Polaris and Tordon K.

Q. **What is your understanding as to how these herbicides are going to be applied?**

A. They will be applied with a low-volume back pack, hand canister, and hydraulic application treatment. For initial clearing we'll use cut surface treatments and cut-stubble. For future maintenance we plan to use basal, cut surface, low and high volume foliar (LVF, HVF) and Aerial, and Cut Stubble.

Q. **Please describe the term "carrier" as used in the application of herbicides.**

A. There are two types of carrier: water or oil liquids. A highly refined basal oil carrier will be used for stump treatment low volume basal application. They are mixed into the liquid carrier (water or oil) and maintain a true independent solution or chemically bond to the water or oil. Bonding occurs with a negative and positive chemical charge. A clear

unseparated solution without particle separation is a desirable molecule mix with a carrier.

Q. Please explain how molecules attach to the carrier?

A. Molecules are mixed into the liquid carrier (water or oil) and maintain a true independent solution or chemically bond. Bonding occurs with a negative and positive chemical charge. A clear unseparated solution without particle separation is a desirable molecule mix with a carrier.

Q. Please explain the term "tank mix."

A. A tank mix is a combination of two or more compatible herbicide molecules in an end control the herbaceous vegetation and root system. It is pre-mixing of molecules. Specifically two or more herbicide active ingredients (products) are combined together in one container versus mixing each individual herbicide molecule separately into one container. End use application follows of both molecules versus two separate treatments of each individual product.

Q. Why are there going to be different types of herbicides or molecules required to treat the identified incompatible species?

A. Different herbicides control different plant/tree species. Multiple herbicide molecules combined into one tank-mix controls a broader spectrum of target species trees such as oaks, maple, ash, hickory, etc. Based on the ROW site diagnosis several molecules/products may be combined to optimize control of target species promoting growth of desirable low growing monocot species such as grasses and ferns.

Q. Is the approach of using different herbicides to treat identified incompatible species, consistent with the IVM best practices?

A. Yes it is. This strategy is considered industry Best Management Practices based on Intergraded Vegetation Management Principles (IVM) recognized within the industry and in the scientific community. Scientific research verifies through operational right of way treatments with nearly 65 years of research and development data from Gamelands 33 in Pennsylvania using multiple herbicides and treatment methods to achieve IVM best practices. The goal is to provide a stable early successional plant community. Initial work builds the foundation for the future stable early successional plant communities.

Q. Explain how the combination of the herbicides or molecules is going to affect the metabolism of the incompatible species on property.

A. The herbicide interrupts key plant metabolic growth mechanisms such as amino acid inhibition, enzyme disruptors and cell wall disruption. It's similar to removing one part of

the key to open a lock. When the herbicides is applied on the plant and begins to translocate or metabolize within the plant, one or more of these mechanisms is disrupted by the herbicide molecule controlling the plant.

Q. Please explain the process of how the combined molecules or product are absorbed by the incompatible species?

A. Absorption of the herbicide molecule occurs through the leaf stomata in foliar treatments. Stem and shoot absorption also occurs with foliar treatments. Soil active molecule absorption occurs within the soil solution from the soil colloid. This creates multiple metabolic path ways to control the plant.

Q. Is there any root absorption by the compatible species?

A. Compatible species are not treated. Compatible species such as grasses or monocots are not controlled by Garlon@ or Milestone@ herbicides. Selective single stem application isolates the herbicide treatment.

Q. Do the molecules chemically attach to the soil particles?

A. This is dependent on the molecule chemical characteristics. Polaris and Milestone are soil active molecules with different degree of molecular affinity (attachment) to the soil

colloid. These two products do attach to the soil colloid. The key is photosynthesis which creates continual root absorption through the plant of the molecule that did not chemically absorb through the leaf, stem or shoots.

Q. And what impact does that have on the molecules?

A. The molecules break down (degrade) chemically through plant absorption during photosynthesis processes. Other degradation factors include anaerobic conditions, soil/air temperature, ultraviolent light, water volume, microbial activity and percentage organic matter. The chemical affinity/attachments to the soil colloid decreases the percentage of active ingredient in solution available to other plants.

Q. And how are you using the term degrade?

A. The molecule "breaks downs," or degrades, decreasing available active ingredient through photosynthesis plant metabolism, soil solution characteristics referenced above, and chemical bonding making the molecule unavailable to the plant.

Q. Are the herbicide products approved by the EPA?

A. Yes. The molecules that are being proposed, have been reviewed and registered with the Federal Environmental Protection Agency (EPA).

Q. What do you mean that the product has been registered?

A. The products/molecules meet or exceed all EPA molecule registration requirements associated with environmental, mammalian, vertebrates, non-vertebrates, fish, and reptilian R & D stand lab practice tests required for an herbicide right of way application use pattern label.

Q. What does the EPA examine during its registration process?

A. Reference EPA documents for herbicide registration process and procedures. These documents encompass thousands of pages for documentation of testing procedures and protocols. Ten to 15 years and millions of dollars of research and development is invested in the molecule screening process to acquire an EPA registered molecule. Following application the molecules are intercepted by plant foliage and soil surface debris and then absorbed by the susceptible plants through roots, shoots, stem and leaves. All soil solution characters also degrade the molecule along with plant photosynthesis. These molecule metabolic factor are utilized as verification of the herbicide characteristics, environmental fate, and health impact through the EPA registration process. Molecule research and development encompasses thousands of standard laboratory procedures and protocols assessing the following: health impact for human, vertebrates, invertebrates,

fish reptiles, insects, and the environment. Research is conducted to eliminate carcinogenic, teratogenic compounds from ever being registered.

Q. In evaluating pesticide registration application, what does the EPA assess?

A. Within the EPA labeling process there are literally thousands of individual molecule tests assessing environmental fate, mammalian toxicity, chemical mode of action, etc. This eliminates teratogenic, carcinogenic, mutagenic molecules from being registered. The branded products/molecules meet or exceeds all EPA requirements impacting environmental, mammalian, vertebras, non-vertebras, fish, reptilian tests required for an herbicide application use pattern label. The herbicide use pattern is for right of way application.

Q. Are the herbicides safe for use around a water source?

A. Milestone cannot be applied in water. All treatments are applied to water's edge. Garlon 3A and Polaris can be under EPA registered aquatic use pattern. It is safe to do an application up to the water's edge.

Q. **If you were applying an oil-based herbicide into or on top of the tree stump, can the herbicide leech down into the groundwater or go downhill if there's a strong rainstorm?**

A. These products are not applied during rain events or adverse wind or weather conditions. These products are applied to or intercepted by plant foliage or stump cambium layer not applied to the soil surface. The exception is for a cut stubble treatment which applied to soil surface and absorbed by incompatible species root systems.

Herbicide products, when applied in accordance with manufacturer's recommendations, do not migrate beyond the point of application.

Q. **Should a landowner be concerned because of the location of water wells?**

A. It is standard practice prior to herbicide application to include coordinating with property owners to identify water sources, well and springs to avoid these areas. These herbicide products, when applied in accordance with manufacturers' recommendations, do not migrate beyond the point of application.

Q. **What is the effect of the herbicides on aquifers?**

A. The products intended for use have very limited mobility beyond the application site, and degrade quickly within the soil profile column. Herbicide molecules are absorbed through plant photosynthesis and are degraded by ultraviolet light, anaerobic soil

conditions, water volume, microbial activity, and high soil and air temperature. The molecules are intercepted by plant foliage and soil surface debris and do not reach the uppermost soil profile and, therefore, do not reach any soil or rock strata below. Additionally, all products intended for use have undergone extensive testing and are approved by USEPA for use in these types of settings

Q. **What can you say to allay people's concerns about the safety of the herbicides around aquifers?**

A. The molecules are intercepted by plant foliage and soil surface debris and do not reach the uppermost soil profile and, therefore, do not reach any soil or rock strata below. All soil solution characters degrade the molecule along with plant photosynthesis.

Q. Are there concerns about human health in exposure to the herbicides?

A. No. The herbicides are commonly used in transmission right of way maintenance and do not present health concerns, such as or reproductive concerns or teratogenicity or mutagenicity.

Q. Does this complete your rebuttal testimony?

A. Yes it does.