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## Memorandum

**Date:** June 26, 2014

**To:** Gary Tomlinson  
Senior Environmental Officer  
Guelph District Office

**From:** Cynthia Doughty  
Hydrogeologist  
Water Resources Unit

**Re:** Risk Assessment Analysis of Groundwater Contamination at Transmission Line Poles  
Dufferin Wind Farm Project

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### 1. Documents Reviewed:

As requested, I have reviewed the following documents and provided comments and recommendations from a groundwater perspective:

1. Dillon Consulting, June 20, 2014. Memorandum RE: Risk Assessment Analysis of Groundwater Contamination at Transmission Line Poles.
2. Dillon Consulting, June 16, 2014. Memorandum RE: Risk Assessment Analysis of Groundwater Contamination at Transmission Line Poles.

During my review, I also referred to the following document:

3. Tulloch Engineering, March 27, 2013. Dufferin Wind Project – Geotechnical Report for the Proposed Transmission Corridor

### 2. Background:

The project consists of 396 transmission poles between Orangeville and Melancton Township. According to the reports, two types of pole foundations will be used for the project: 1) Wooden pole foundations and 2) Concrete foundations for steel poles constructed at corners and turns of the transmission lines. The main concern related to the foundations is whether the annular space between the steel sleeve and transmission pole will act as a preferential pathway for surface-

derived contamination to enter the subsurface and potentially impact the bedrock aquifer. The bedrock aquifer is the main source of potable water for the rural homes and farms near the transmission line.

### 3. Comments and Recommendations:

This section presents a list of comments and concerns identified during the review of the response to MOE comments (Section 3). The numbers below correspond to Nadia's original comments.

1. For wood poles, the annular space between the steel sleeve and pole will be or have been backfilled with 3/8 to 1/2-inch granular material and compacted. Any compacting that may occur would not have any significant impact on the movement of surface water. The proposal recommended adding a bentonite clay seal near surface for areas where the bottom of the foundation is anticipated to be within 2.5 m of the top of the local aquifer used as a potable water source (i.e., top of the bedrock surface or overburden aquifer). The basis for the 2.5 m separation distance between the bottom of the foundation and top of the uppermost aquifer used as a potable water source should be specified. The consultant should provide a map with the locations of the overburden aquifer used as potable water supply with the location of the transmission lines overlaid on this map. The depth and thickness of the overburden aquifer used as a potable supply should be provided, along with detailed information about the source of this information. Additionally, detailed information about the source of the depths to bedrock specified in the June 20, 2014 memorandum should be provided. The depth to bedrock was primarily confirmed east of Corbetton during the geotechnical investigation. There seems to be some uncertainty with respect to the depth of bedrock, as boreholes Honi North, Honi South, Bldg NW and Bldg NE appear to be adjacent to each other; however, the inferred bedrock depth varies from 4.42 to 15.24 m bgs. These boreholes were installed east of Orangeville in the area where bedrock is reportedly 15 to 50 m bgs.
2. The consultant should specify a minimum thickness of the surface seal and provide the rationale for the minimum thickness. The consultant should indicate if the bentonite clay will be installed as a slurry using a tremie pipe.
3. Based on discussions with Powertel, a currently undefined number of the steel pole foundations on the project will be or have been constructed using a temporary sleeve with concrete placed inside the temporary sleeve. The consultant should confirm that no annular space exists for poles constructed in this manner. Also a currently undefined number of the steel pole foundations appear to be constructed in the same way as the wood pole foundations. A steel sleeve is installed in the augered/cored hole and backfilled with granular material and compacted. The consultant should specify the maximum depth of the steel poles for both types of foundations used for steel poles. In areas where the steel sleeve cannot be driven due to subsurface conditions (e.g., rocky soils or the presence of rock at a shallow depth), an annular space between the steel casing and hole would exist. The outer diameter of the steel sleeve and the diameter of the borehole should be provided. The consultant should discuss the potential movement of surface water along the annular space

when the steel sleeve is not driven and the methodology that will be employed to limit the movement of surface water.

4. The seasonal high groundwater levels along the transmission line should be provided. The consultant should address the potential for pentachlorophenol to leach out of the wood transmission poles and impact groundwater.

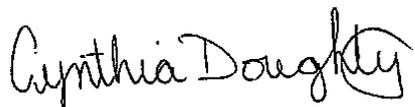
## Conclusions

This memorandum outlines a number of comments and recommendations with respect to the document reviewed. These comments should be addressed by the consultant.

## Limitations:

*The purpose of the preceding review is to provide advice to the Ministry of the Environment regarding subsurface conditions based on the information provided in the above referenced documents. The conclusions, opinions and recommendations of the reviewer are based on information provided by others, except where otherwise specifically noted. The Ministry cannot guarantee that the information that has been provided by others is accurate or complete. A lack of specific comment by the reviewer is not to be construed as endorsing the content or views expressed in the reviewed material.*

If you have any questions, please contact me by phone at (905)521-7866 or by e-mail at [cynthia.doughty@ontario.ca](mailto:cynthia.doughty@ontario.ca).



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