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ENVIRONMENTAL STRATEGIES CONSULTING LLC

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May 11, 2005

Mr. James E. Burke, P.E.  
Environmental Engineer  
New York State Department of Environmental Conservation  
Region 7  
615 Erie Boulevard West  
Syracuse, NY 13204-2400

Re: Geophysical Survey and Supplemental Groundwater Investigation  
Emerson Power Transmission, Ithaca, New York

In December 2004, the New York State Department of Environmental Conservation (NYSDEC) approved a work plan for the installation of additional offsite groundwater monitoring wells around the Emerson Power Transmission (EPT) facility in Ithaca, New York. Four wells (MW-18A, MW-19A, MW-23B, and MW-24B) were installed and sampled in February 2005. Five wells (MW-20B, MW-21B, MW-22B, MW-25A, and MW-26A) were installed in March 2005. All nine newly installed wells and one existing offsite well (MW-17-40) were sampled in April 2005.

Monitoring wells (MW-18A, MW-19A, MW-24B, MW-25A, and MW-26A) were installed in the western portion of the study area along West Spencer Street, South Geneva Street, Wood Street, and South Albany Street. During the April 2005 sampling event, no site-related chemical compounds of concern were detected in the samples collected from these five wells and the existing well MW-17-40.

Monitoring wells MW-20B, MW-21B, MW-22B, and MW-23B were installed in the north portion of the study area along South Cayuga Street, South Hill Terrace, and the EPT Access Road. During the April 2005 sampling event only a trace level of one site-related compound (below state drinking water standard) was detected in one of the four wells installed in this area. Figure 1 shows the location of the offsite groundwater monitoring wells and a summary of the sampling results.

Emerson recognizes the complex nature of the site geology and believes that additional characterization is appropriate to develop a more comprehensive understanding of the hydrogeologic conditions and flow paths in the area of the EPT site. Towards this end,

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Emerson proposes to conduct a geophysical survey both onsite and offsite to identify and map water-bearing bedrock fractures that may serve as migration pathways for affected groundwater.

In addition, Emerson proposes to install and sample three additional B-zone groundwater monitoring wells near the southern end of South Cayuga Street just northwest of the 2-phase groundwater extraction system. The proposed monitoring wells will help evaluate groundwater quality directly downgradient of the remediation system. All field activities will be conducted in accordance with the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation, dated December 25, 2002. The details of the proposed scope of work are present below.

### **Geophysical Survey**

Emerson proposes to conduct an electrical resistivity (ER) imaging geophysical survey to identify and map water-bearing bedrock fracture zones that may serve as groundwater flow paths downgradient of the site. The survey will consist of six roughly parallel ER lines oriented NE-SW and downgradient from the EPT facility. The ER lines will be designated as ER-1 through ER-6. The final array of ER lines will be determined in the field and will be may be adjusted based on site limitations. Figure 2 shows the proposed ER survey line locations.

Each of the ER lines in the survey will use an 84 electrode dipole-dipole array. With a 10 foot (3 meter) electrode spacing, the ER system is capable of imaging subsurface features to 160 feet below ground surface. The electrode spacing will be adjusted for maximum resolution in the target depth range of 13-55 feet below ground surface, corresponding to the B-zone and the upper portion of the fractured C-zone. The ER survey is expected to take approximately four days to complete in the field.

### **Monitoring Well Installation**

Emerson proposes to install three shallow bedrock groundwater monitoring wells along South Cayuga Street northwest of the 2-phase extraction system. Figure 1 shows the proposed monitoring well locations.

The three groundwater-monitoring wells (MW-30B, MW-31B, and MW-32B) will be installed and screened in the B-zone portion of the fractured bedrock. Final locations may be adjusted in the field based on access or limitations of the drilling equipment. The monitoring wells will be installed, constructed, and sampled in accordance with procedures outlined in the approved Supplemental Investigation Work Plan, dated July 28, 2004, and associated Response Letter, dated November 12, 2004. The well specifications are detailed below.

The monitoring wells will be designated with a "B" qualifier and will be completed to a depth of approximately 5 to 10 feet below the contact between the overburden and the bedrock. The final depth will be determined in the field based on core samples collected during drilling.

The wells will be screened within the highly fractured portion of the upper bedrock zone (B-zone). The total depth of the wells is expected to range from approximately 25-35 feet bgs.

Boreholes for the monitoring wells will be drilled through the overburden using 8.25-inch inside-diameter (ID) hollow-stem augers. Continuous soil samples will be collected from the ground surface to refusal at bedrock using 2-foot-long, split-spoon samplers. The soils recovered from the split spoons will be screened for organic vapors in the field using a PID. Sample descriptions and PID readings will be recorded in a field notebook.

The bedrock will then be cored so that the quantity of fractures and the physical characteristics of the fractures can be logged. The screened interval and final depth of the monitoring wells will depend on the quantity of fractures present. The borehole will be terminated as the quantity of fractures begins to diminish with depth. Once the terminal depth of the well is determined, the borehole for the well will be expanded (reamed) using a 6.25-inch rotary air hammer.

Boring logs will be prepared for each well borehole after completion of the field activities. All wells will be completed and installed by a driller licensed in the state of New York in accordance with the Environmental Conservation Law 15-1525.

The wells will be constructed of 2-inch-ID threaded, flush jointed, Schedule 40 PVC blank casing attached to 10-foot screens with 0.010-inch horizontal slots. A clean sand filter pack will be placed from the bottom of the well borehole to approximately 2 feet above the top of the screen. A 3-foot-thick bentonite seal will then be placed on top of the sand filter pack. The remaining annular space will be backfilled with a cement-bentonite grout mixture (tremie piped from the bottom to the top). Well construction information will be recorded in a field notebook, and as-built diagrams will be prepared for each monitoring well installed during the investigation.

The wells will be completed flush with the ground surface with protective, steel well coverings. The inner casing will be fitted with a watertight lockable cap.

The elevations of the ground surface at each new monitoring well and the top of the PVC well casing will be surveyed to the nearest 0.01 foot. The horizontal locations of the new wells will also be determined to the nearest 0.1 foot and referenced to the state plane coordinate system. A surveyor licensed in New York State will survey the well locations and elevations. The locations and elevations of the wells will be tied into the existing base map for the site.

The wells will be developed to remove sediments and to ensure effective communication between the well screens and surrounding saturated zones. Development will involve surging the screened interval to loosen any fine-grained sediment in the sand filter pack and adjacent aquifer material. Groundwater from the wells will then be removed by bailing or pumping. Turbidity, pH, temperature, and specific conductance will be periodically monitored during the development process to ensure that groundwater representative of the screened portion of

the aquifer is entering the well. Development will continue until the discharge is relatively free of suspended sediments. If water is added to the well borehole during the drilling and installation activities for the new monitoring wells, an equal volume of water will be removed during well development. Water generated during the well development will be collected in drums and added to the EPT onsite groundwater treatment system.

All development/redevelopment activities will be conducted with clean equipment to prevent potential cross-contamination between well locations. Equipment will be cleaned between each well, with the decontamination procedure dependent on the development and redevelopment method(s) and equipment used.

Groundwater samples will be collected from the monitoring wells approximately two weeks following well installation and development. Groundwater pH, conductivity, temperature, and redox potential will be measured at each monitoring well prior to sample collection. Groundwater samples will be submitted to the laboratory for analysis of VOCs using EPA Method 8260B, SVOCs using EPA method 8270, and PCBs using EPA Method 8082.

We plan to proceed with the work outlined in this letter in June 2005. We would appreciate receiving comments from the Departments by the end of May 2005.

Sincerely yours,



Scott Haitz  
Senior Project Director

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Enclosures

cc\encl: - Mr. Derek Chase, Emerson