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RE: Audit of Fall 2018 Compliance Source Testing – Preliminary Findings

Dear Mr. Anello,

At this time, we are providing our preliminary review of the sample collection for the Fall 2018 Compliance Source Testing of the Durham York Energy Centre (DYEC). This preliminary review will provide a general overview of our findings. A more detailed review of the testing campaign will be provided once the final source testing report has been issued. The field sampling audits were undertaken by Adomait Environmental Solutions Inc. (Adomait).

Source Sampling Audit
Adomait observed the sampling of two stack trains at the Durham York Energy Centre, focusing specifically on the sampling of semi-volatile organic compounds (SVOC) conducted on September 13th and 14th, 2018. Mr. Martin Adomait of Adomait was responsible for observing the stack samplers throughout the process. Mr. Adomait's observations focused primarily on the stack sampling methods and implementation procedures. Mr. Andrew Lanesmith observed the instrumentation in the process control room during the sample collection periods.

In the Process Operations Centre, observations were made on one-minute readings as they appeared on the system monitors. Readings were manually recorded every 10 minutes, although deviations were identified when they occurred. As a general observation, parameters being recorded for this review maintained stable readings throughout the observation period. A few deviations were observed and are discussed below; however, these did not persist and quickly returned to stable levels.

1. The sampling of Unit 1 was delayed on September 13th until a starting time of 10:17 am. Maintenance staff noted that a pressure gauge associated with the air pollution control (APC) system did not return to zero following air pulsing. The cause was traced to a blocked check-valve. Replacement of the valve eliminated the problem, thereby allowing the test to proceed.
2. The sampling of Unit 1 was also delayed on September 14th until a starting time of 9:36 am. The HCl analyzer, which normally reads between 2 to 4 mg/m^3 (one-minute average), started showing slight instability. Covanta staff increased the lime feed rate to 300 kg/hour until it was determined that lime concentrations were at appropriate levels, at which point testing began. The lime feed rate was returned to normal levels by 11:30 am. All the HCl spikes were short lived; at no time did the average HCl data exceed the regulatory stack limit (9 mg/m^3 with a 24-hour rolling average).

3. Oxygen concentrations were maintained > 6% (one-hour average) at all times and were generally between 6.6 to 9.3%. The ECA compliance limit is > 6%.
4. CO concentrations were stable throughout the tests with only two spikes observed over the two-day period. The CO spikes did not last beyond the 10-minute observation interval.
5. The quench tower inlet and outlet temperatures showed consistent control of the rising temperatures on both monitoring days during sample collection. The inlet temperatures rose moderately from 168°C to approximately 176°C. The outlet temperatures remained consistent throughout at 149°C to 154°C. Based on previous source testing observations, the quench tower inlet temperatures could be expected to increase during the day (within allowable limits).
6. As a result of consistent outlet temperatures from the Quench tower, the baghouse inlet temperatures remained ~140°C to 146°C. This is approximately the midpoint of the ECA performance requirement. The ECA performance requirement is 120°C to 185°C (Section 6(2)(h)). These readings were consistent with observations from previous stack tests. Consistent temperatures in the baghouse allow comparison between data sets at different times. It is also important when considering the volatilization of various dioxins and furans that may be in particle-bound form in the baghouse. Increased temperatures could volatilize dioxins and furans that are already captured by the baghouse in particle-bound form.
7. Production at the plant is often evaluated in terms of steam flow. Steam flow was typically in the range of 32 to 34 tonne/hour, although readings between 30.1 and 35.2 tonne/hour were recorded. This was similar to levels observed during other stack testing campaigns at this plant. Similar production also makes the comparison between different stack tests possible.
8. Carbon and lime dosage were consistent with the previous testing campaigns. Carbon doses of ~5 kg/hour are necessary to keep the dioxins in check. As noted in item 2 above, the lime feed rate was increased above normal operating range on the morning of September 14th.
9. Occasional anomalies in the one-minute data were observed in the flowrate and moisture numbers. The calculated moisture typically ranged from 15 to 20% although readings as high as 25% were observed and on one occasion the reading momentarily dropped to 1.8%. Similar to other testing campaigns, it is speculated that this is related to the problems that occur during the reading of dry verses wet oxygen analyzers.

Observations of the stack testing procedures were undertaken during the semi-volatile organic compound (SVOC) sampling part of the program. General observations are presented here, and will be presented in greater detail in the final report.

1. All leak checks of the dioxin and furan sampling runs were observed at both the start and at the end of all SVOC tests conducted. When the leak checks were successful (i.e., all leak checks were below 0.02 cfm) and thus, the tests could be considered as valid. Leak checks were always performed in a systematic and non-rushed manner to ensure good QA/QC. All trains were leaked checked at ~15 in Hg, which is prescribed by the method. All trains were checked before starting the first traverse and after the first traverse. Following movement of the train to the second traverse, the leak check was repeated, and following the test, it was performed again. In all the testing, only one train developed a leak problem after the movement. However, since the leak check before the move was acceptable, the problem was corrected prior to conducting the second traverse. It is common that leaks can develop during movement of the train due to the multiple

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glassware joints. All leak checks were recorded at levels less than 0.005 cfm at 15 in. Hg for sampling runs completed on September 13th and 14th.

2. The sampling trains typically operated at vacuums less than 7-9 in. Hg. Therefore, when the leak checks were performed, the vacuum of 15 in. Hg was adequate to ensure leak free operation during sampling.
3. Stack temperatures reported by the stack testing crew were checked with the auditor in the control room to verify that the temperature was accurate. Verification was completed on both days of dioxin and furan testing (September 13th and 14th). On September 13th, Covanta's control system reported the temperature of the baghouses at 141.6°C and 145.0°C for Units 1 and 2, respectively. The stack gas temperatures reported by Ortech around the same time (+/- 5 minutes) were 142.2°C (288°F) and 143.8°C (291°F). The procedure was performed the following day, as one of the control boxes was changed. Covanta's control system reported the temperature of the baghouses at 141.0°C and 143.0°C for Units 1 and 2, respectively. Ortech reported the stack gas temperatures at values 140°C (284°F) and 143.0°C (289°F) for Units 1 and 2, respectively. This level of variance between the control room and the stack testers is expected and acceptable.
4. The sealing of the ports was changed in this sampling round. Probes with an insulated sheathing were used and port covers fitting the opening were manufactured and implemented. Towels were no longer used for sealing the ports, as a rubber gasket was fitted around the slight opening.
5. Impinger/XAD temperatures were checked approximately every half hour at each sampling train. Ortech supplied plenty of ice to the crews. The temperatures were maintained in the 5.5°C to 12.7°C (42°F to 55°F). These temperatures improve adsorption of dioxins/furans on the sampling media.
6. The audit team also recorded dry gas meter correction and pitot factors for comparison with the final report.
7. All trains operating at the baghouse outlet locations were inserted into the stack while the sampling train was running. Given the high negative pressure in the stack at these locations, it was important to ensure that the filter was not displaced prior to the beginning of sampling. It also limits loss of any sample from the sampling train.
8. Auditing was only conducted on the sampling trains at the Boiler 1 and 2 outlets. The quench tower inlet locations were not monitored in this sampling round.

SVOC samples were collected following the procedures in EPS 1/RM/3 and US EPA Method 23. During the source testing, Ortech followed the sampling and recovery procedures as specified by the methods to maintain the integrity of the samples. Ortech had adequate staff on site to collect samples and transfer the sampling media to the on-site lab for recovery and clean-up. Communications with the control room were maintained at an excellent level to ensure samples were collected during representative operating conditions.

Laboratory Processing Audit

At the request of the Regional Municipality of Durham, Airzone One Ltd. (Airzone) did not audit the laboratory processing samples for the testing program. Airzone will review the laboratory data provided with Ortech's final report, with specific focus on the dioxin/furan and particulate matter results.

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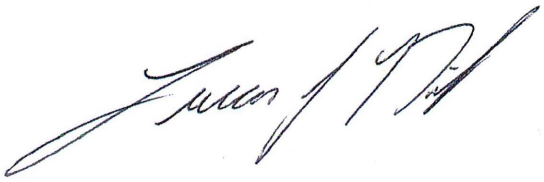
Conclusion

Based on the observations made during collection of samples, we are satisfied that Ortech collected all dioxin and furan samples according to standard operating procedures and approved methods, with the deviations from the methods/protocols already noted. Final comments concerning the results of all of the testing and compliance of the facility will be made upon review of the final stack testing report to be issued by Ortech.

Sincerely,



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