Durham York Energy Centre

Long-Term Sampling System

Quarterly (Q3) Report

July- September 2025

Prepared by

The Regional Municipality of Durham

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1. Introduction

This report provides additional details with respect to the reporting of operational data related to the AMESA Long-Term Sampling System (LTSS) for dioxins and furans at the Durham York Energy Centre (DYEC).

This report covers the third quarter (Q3) of 2025 and includes AMESA data collected from July 16, 2025, to October 6, 2025.

2. Background

To meet the requirements of Environmental Compliance Approval (ECA) Condition 7(3), a continuous sampling system (the Adsorption Method for Sampling dioxins and furans (AMESA) LTSS) is installed on each of the two boiler units at the DYEC to sample dioxins and furans.

The operation of the AMESA system was initiated in 2015 and has been maintained in accordance with guidance from the AMESA manufacturer, the North American vendor ENVEA, and the AMESA Technical Manual.

The AMESA system is used only for the purpose stated in ECA Condition 7(3), which relates to dioxins and furans emissions trend analysis and evaluation of Air Pollution Control equipment performance. The AMESA results alone do not constitute a compliance point for the facility operations.

ECA Condition 7(3), Testing, Monitoring and Auditing Long-Term Sampling for dioxins and furans, states:

a) The Owner shall develop, install, maintain, and update as necessary a long-term sampling system, with a minimum monthly sampling frequency, to measure the concentration of dioxins and furans in the Undiluted Gases leaving the Air Pollution Control (APC) Equipment associated with each boiler.

b) The Owner shall evaluate the performance of the long-term sampling system in determining dioxins and furans emission trends and/or fluctuations as well as demonstrating the ongoing performance of the APC Equipment associated with the boilers.

AMESA results are available at the site when requested by the Ministry of Environment, Conservation and Parks (MECP) and reported to the MECP as part of the Annual Report required by ECA Approval Condition 15 and posted to the DYEC website.

As the results of the LTSS AMESA sampling are reported annually as a 12-month rolling average to the MECP and contained in the Annual Report, a request from the public was suggested to provide more frequent updates. In 2021, Regional Council issued a directive to enhance the frequency of updates. Hence, verified, and calculated results for the AMESA sampling runs for both boiler units are prepared quarterly. These reports are prepared and subsequently published on the website.

3. Cartridge Replacement Schedule

The AMESA sampling cartridge is placed in situ for approximately 30 days in each boiler unit before it is removed and sent to the laboratory for analysis. As each boiler unit AMESA system is independent, the cartridge duration may differ between the two units due to alternating maintenance activities.

Table 1: AMESA Cartridge Replacement Schedule

Unit	Run	Start Date	End Date	Duration (days)
1	109	July 16, 2025	August 20, 2025	35
2	109	July 16, 2025	August 20, 2025	34
1	110	August 20, 2025	October 6, 2025	23
2	110	August 20, 2025	October 6, 2025	23

Note 1: The cartridge duration times, as well as the start and end dates, may vary for both boiler units.

4. Laboratory Analysis

No issues were identified with the AMESA sample cartridges or the analysis at the laboratory; however, the laboratory continues to experience delays in analysis and reporting.

5. Durham and York Regions and Reworld Monthly Data and Operations Review

Regional staff meet with Reworld on an established schedule to discuss facility operations and review environmental monitoring results, trends, and calculations where required for all monitoring programs, including the available AMESA results.

6. Oversight of AMESA Results

The Regional Municipality of Durham and the Regional Municipality of York staff and Reworld meet with the MECP every quarter to discuss all items pertinent to the ECA, the Environmental Monitoring Programs, and facility operations. Any concerns not determined to be reportable incidents in accordance with the ECA are discussed along with day-to-day operations and monitoring.

Any events the ECA deems reportable are done in accordance with the appropriate ECA condition.

Results of the AMESA LTSS are reported to the MECP in the DYEC Annual Reports and posted to the DYEC website. AMESA trends of validated data are presented as a 12-month rolling average together with an analysis to demonstrate the ongoing performance of the APC Equipment. The 2024 Annual Report has been posted to the website.

7. AMESA Performance

The measured concentrations for each of the 17 dioxins and furans congeners identified in the laboratory certificate of analysis are applied to established computations to obtain a result. These calculations quantify the dioxins and furans per cubic metre of gas at reference conditions. Standard temperature, pressure and oxygen correction factors are also applied to the measured concentration to obtain a value for regulatory comparison. Finally, each of the 17 dioxins and furans congeners is multiplied by their respective toxic equivalency factor (TEF) and added to obtain total dioxins and furans total toxic equivalence (TEQ). The ECA for the DYEC specifies the use of the NATO classification scheme for dioxins and furans; therefore, the NATO TEF factors are applied to obtain the TEQ calculation. Table 2 shows each AMESA sampling run, the start and end time the cartridge was in-situ for each boiler unit, and the calculated result.

Table 2: AMESA Calculated Results

Unit	Run	Start Date	End Date	Calculated Result (pg TEQ/Rm^3)
1	109	July 16, 2025	August 20, 2025	0.369
2	109	July 16, 2025	August 20, 2025	0.402
1	110	August 20, 2025	October 6, 2025	0.466
2	110	August 20, 2025	October 6, 2025	1.5

While AMESA has no regulatory limit associated with compliance as it is used to supplement source testing, the ECA directs that "The Owner shall evaluate the performance of the long-term sampling system in determining dioxins and furans emission trends and/or fluctuations as well as demonstrating the ongoing performance of the APC Equipment associated with the boilers." The Regions, their Engineering and Air Emissions oversight consultants, and Reworld will continue to monitor DYEC performance in relation to AMESA results and trends. Figure 1 displays the results of the AMESA sampling runs conducted in the third quarter (Q3) of 2025.

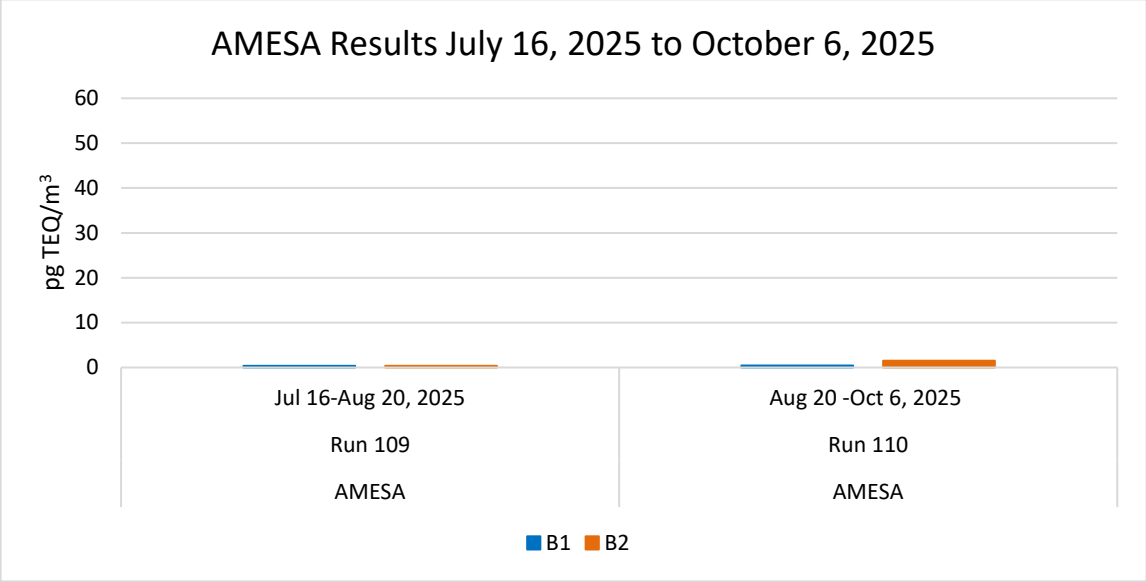

Figure 1: AMESA July 16 to October 6, 2025.

7.1 Investigation

There were no results in the third quarter (Q3) of 2025 that triggered the initiation of the AMESA Investigation Checklist.

8. AMESA relative to most current Source Testing Dioxins and Furans Results

AMESA is not used to assess compliance and should not be evaluated against Ministry standards, such as the dioxins and furans source testing limit. The testing methodology for AMESA and source testing sampling and analysis are different and are set out within their prescribed sampling method and manufacturer guidelines.

The AMESA results are presented in Figure 2 to show how the Q3 calculated values compare to the most current source testing results. The source test compliance limit for dioxins and furans is 60 pgTEQ/m^3. The chart below shows the AMESA Q3 2025 results compared to the May 2025 source test results. Results from the May source

test also indicated that the dioxins and furans results are below the regulatory compliance limit.

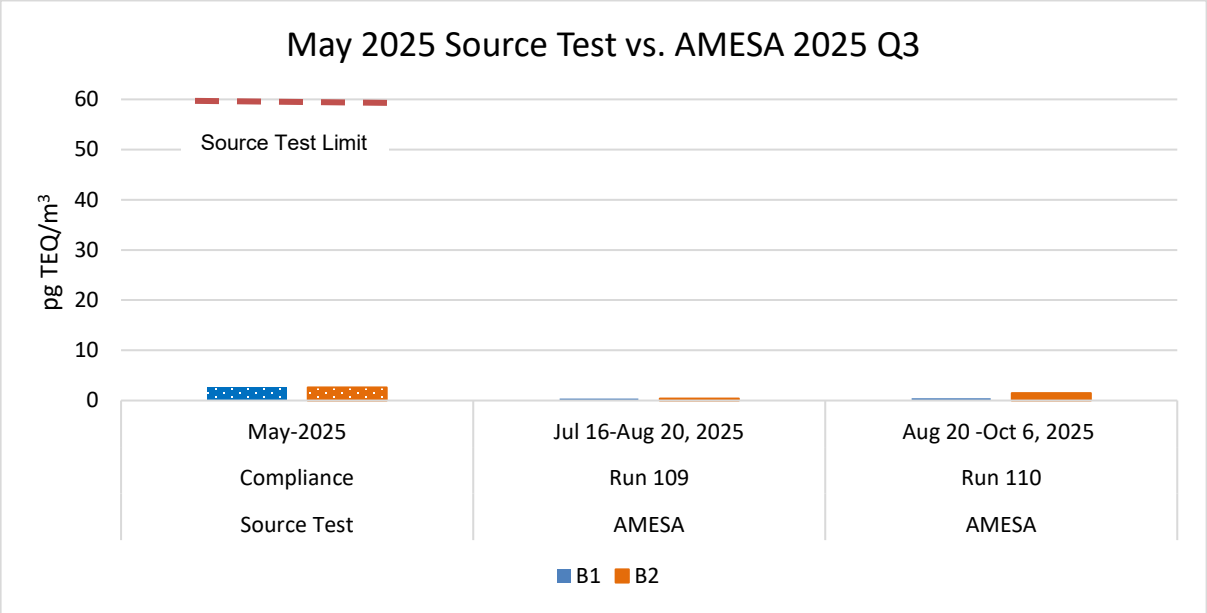

Figure 2: May 2025 Source Test Results vs. 2025 Q3 AMESA Results (pg TEQ/m3).

9. Ambient Air Dioxins and Furans Results–Third Quarter (Q3) 2025

The ambient air monitoring program samples for dioxins and furans. The sampling methodology, units of measurement, and reporting limits are prescribed differently and cannot be compared directly to the source testing or AMESA results. The ambient air monitoring program does not measure point source emissions, but it provides an indication of local air quality. The monitoring equipment collects air samples, capturing ambient air emissions from various sources within the vicinity. The results from the ambient air monitoring provide insights into local air quality and may indicate potential factors influenced by meteorological conditions, including wind speed and direction.

Figure 3 illustrates the results of the third quarter (Q3) at the two ambient air stations near the DYEC. The dioxins and furans levels consistently remain below the Ontario Ambient Air Quality Criteria of 0.1 picogram Toxic Equivalency per cubic meter (pgTEQ/m³).

Additionally, the Ontario Ambient Air Quality Criteria is 10 times lower than the Ontario Regulation 419 Upper Risk Threshold of 1 pgTEQ/m^3 for dioxins and furans.

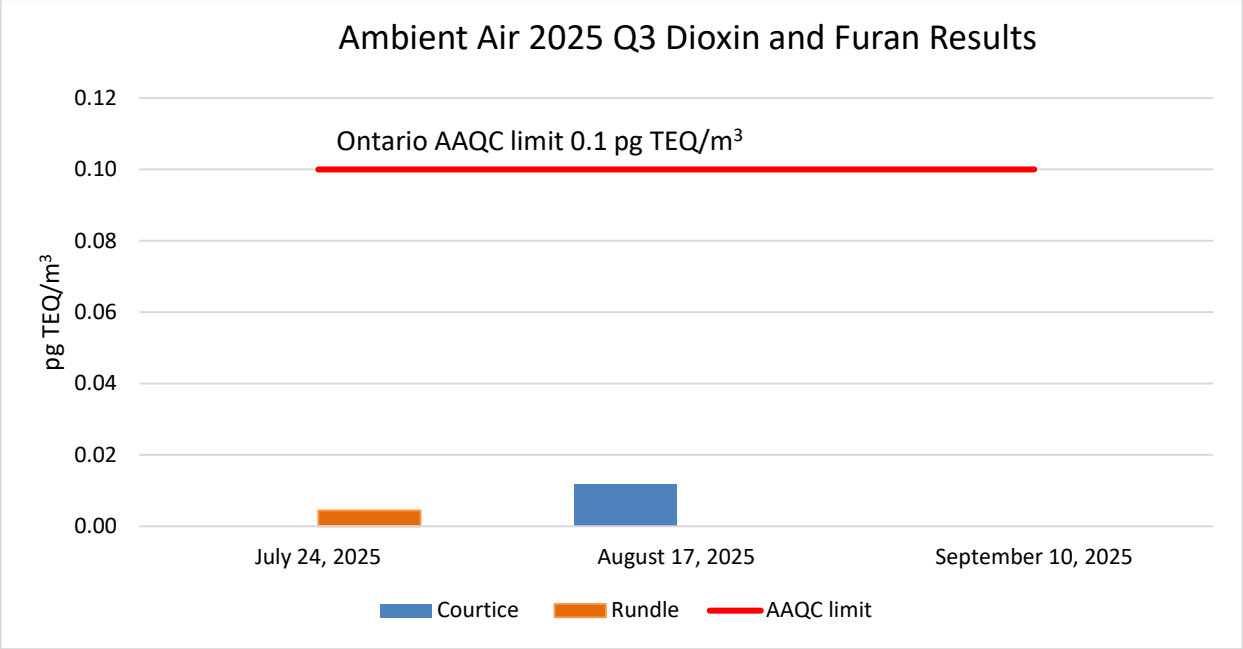

Figure 3: Ambient Air 2025 Q3 Dioxins and Furan Results.

Note 1: The Ambient Air July 24, 2025 result for Courtice and the August 17, 2025 result for Rundle was invalidated due to the sampling volume being outside of the sampling criteria. The ambient air samples for September 10, 2025 at both stations were invalidated due to damage to the sample cartridges, and recovery could not be completed.

End of Report