



Durham York Energy Centre
Long-Term Sampling System
Quarterly (Q1) Report
January 2024-May 2024

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 first quarter (Q1) of 2024 and includes AMESA data collected from January 23, 2024, to May 10, 2024.

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 current 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 themselves 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, Council issued a directive to enhance the frequency of updates. Hence, verified, and calculated results for the AMESA sampling runs across both boiler units are prepared quarterly. These reports are prepared for Council and subsequently published on the website.

3. Cartridge Replacement Schedule

The AMESA sampling cartridge duration is approximately 30 days before it is removed and sent to the laboratory for analysis. As each boiler unit is independent, the duration may differ due to such things as alternating maintenance activities.

Table 1: AMESA Cartridge Replacement Schedule

Unit #	Run #	Start Date	End Date	Duration (days)
1	92	Feb 5, 2024	Feb 28, 2024	17
2	92	Jan 23, 2024	Feb 26, 2024	27
1	93	Feb 28, 2024	Mar 25, 2024	26
2	93	Feb 26, 2024	Mar 25, 2024	28
1	94	Mar 25, 2024	May 10, 2024	30
2	94	Mar 26, 2024	May 10, 2024	*

*Note 1: The cartridge duration times may differ even though the start and end dates are the same for both boiler units.

* Note 2: There is no result for boiler unit #2 for Run #94 due to sample invalidation. Refer to Section 7.1.

4. Laboratory Analysis

There were no issues 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 both weekly and monthly on an established schedule to discuss facility operations, and to review environmental monitoring results, trends and calculations where required for all monitoring programs, and the available AMESA results.

6. Oversight of AMESA Results

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

Any events to which 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 MECP had no concerns with the AMESA results detailed in the [2022 Annual Report](#) as posted via this link: [MECP Review of the DYEC 2022 Annual Report](#). [The 2023 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. Additionally, 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 are multiplied by their respective toxic equivalency factor (TEF) and added together to obtain a 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 and therefore the NATO TEF factors are applied to obtain the TEQ calculation. Table 2 shows each of the AMESA sampling runs, 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	92	Feb 5, 2024	Feb 28, 2024	1.087
2	92	Jan 23, 2024	Feb 26, 2024	1.135
1	93	Feb 28, 2024	Mar 25, 2024	1.317

Unit #	Run #	Start Date	End Date	Calculated Result (pg TEQ/Rm ³)
2	93	Feb 26, 2024	Mar 25, 2024	1.127
1	94	Mar 25, 2024	May 10, 2024	2.984
2	94	Mar 26, 2024	May 10, 2024	*

***Note 1: There is no result for boiler unit #2 for Run #94 due to sample invalidation. Refer to Section 7.1.**

While AMESA has no regulatory limit associated for 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 as it relates to AMESA results and trends. Figure 1 displays the results of the AMESA sampling runs conducted in the first quarter (Q1) of 2024.

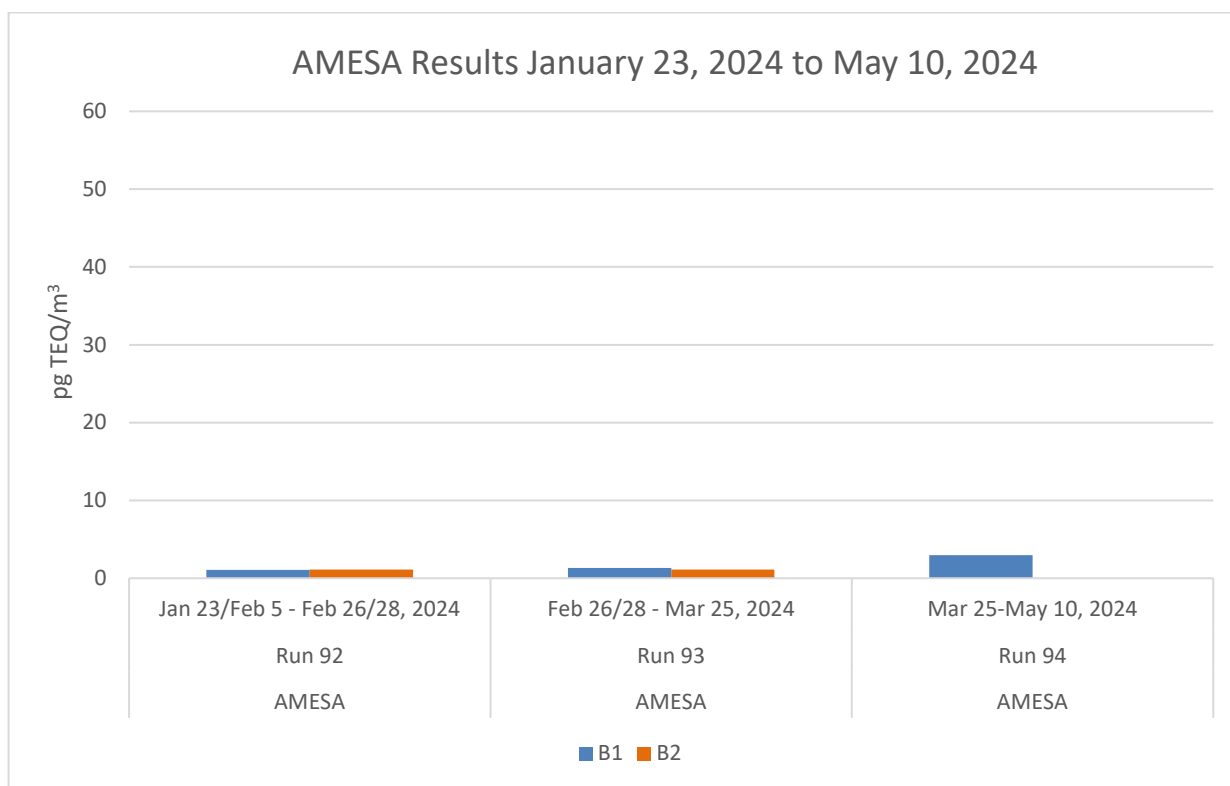


Figure 1: AMESA Results January 23, 2024, to May 10, 2024.

***Note 1: There is no result for boiler unit #2 for Run #94 due to sample invalidation. Refer to Section 7.1.**

7.1 Investigation

During the first quarter (Q1) of 2024, the AMESA Investigation Checklist was not triggered, however, due to unforeseen operation matters at the facility, an investigation was undertaken. which resulted in the invalidation of data for boiler #2 Run #94, as non-isokinetic conditions occurred.

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 Q1 calculated values compare to the most current source testing results. The source test compliance limit for dioxins and furans is 60 pgTEQ/m³. The chart below shows the AMESA Q1, 2024 results as compared to the 2024 March source test results. Results from the March source test also indicated the dioxins and furans result is below the regulatory compliance limit.

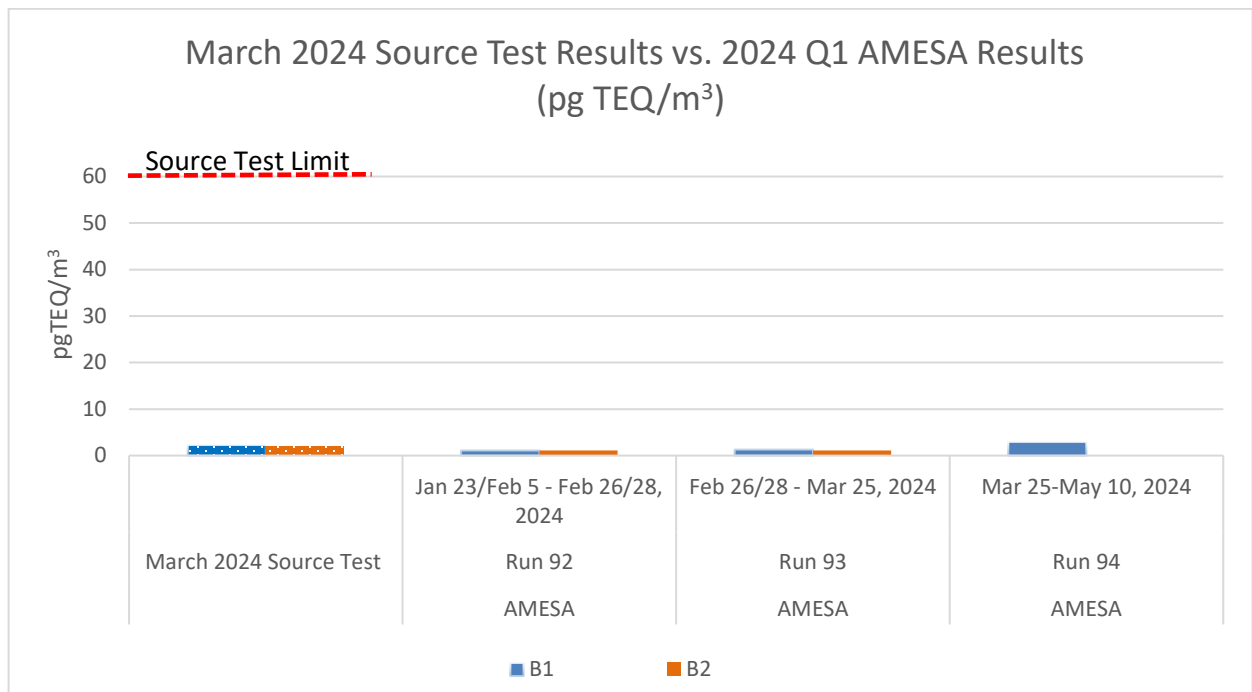


Figure 2 March 2024 Source Test Results vs. 2024 Q1 AMESA Results (pg TEQ/m³).

*Note 1: There is no result for boiler unit #2 for Run #94 due to sample invalidation. Refer to Section 7.1.

9. Ambient Air Dioxins and Furans Results—First Quarter (Q1) 2024

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 does provide an indication of local air quality. The monitoring equipment collects air samples, capturing ambient air emissions originating 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 first quarter (Q1), 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).

Of additional note, the Ontario Ambient Air Quality Criteria is 10 times lower than the Ontario Regulation 419 Upper Risk Threshold of 1 pgTEQ/m³ for dioxins and furans.

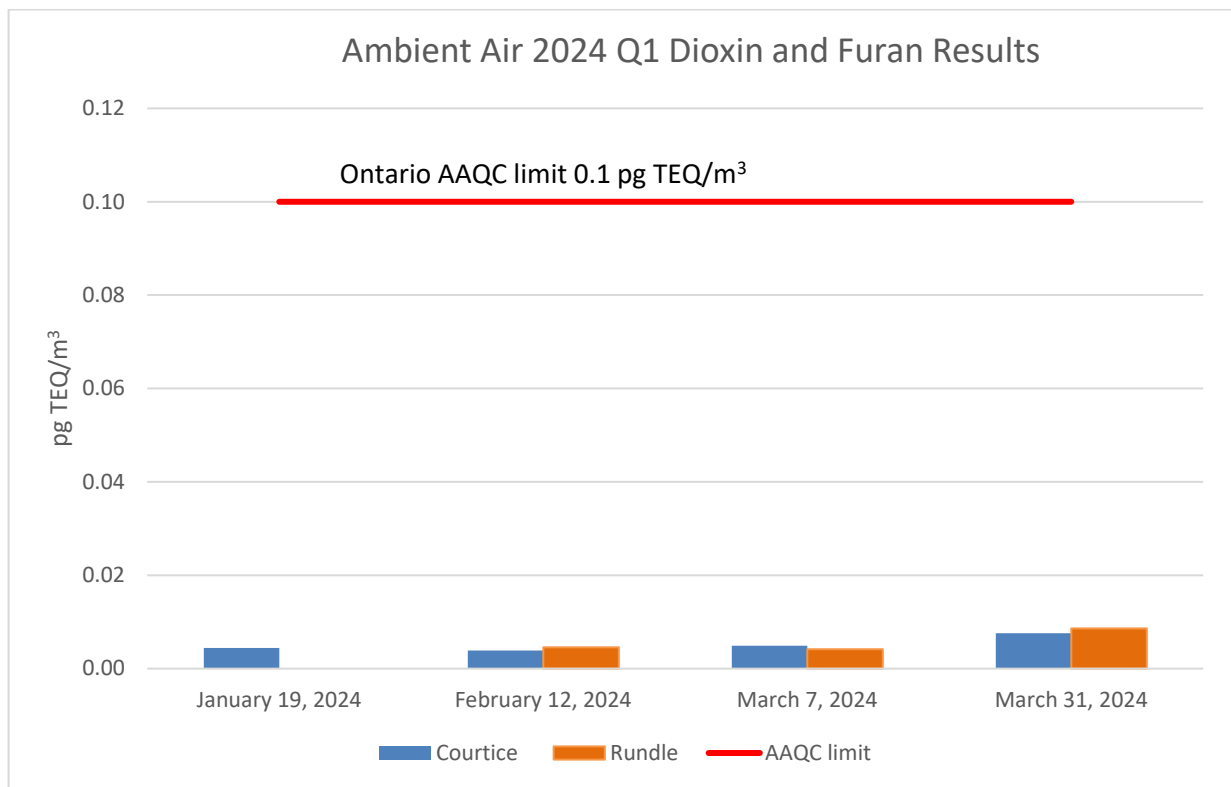


Figure 3: Ambient Air 2024 Q1 Dioxins and Furan Results

*** Note: 1: There is no dioxin and furan result for Rundle Road on January 19, 2024, as the sample was compromised during the laboratory extraction and preparation process.**

End of Report