REPORT

# DURHAM YORK ENERGY CENTRE

COURTICE, ONTARIO

## 2022 Q1 AMBIENT AIR QUALITY MONITORING REPORT

RWDI #2200697

May 12, 2022

**SUBMITTED TO:**

**The Director, Legislative Services-Regional Clerk or Designate**

**The Regional Municipality of Durham**
605 Rossland Road East, 1st Floor
Corporate Services-Legislative Services Division
Whitby, ON L1N 6A3

***CC:***

**Gioseph Anello**
Gioseph.Anello@durham.ca

**Lyndsay Waller**
Lyndsay.Waller@durham.ca

**Andrew Evans**
Andrew.Evans@durham.ca

**SUBMITTED BY:**

**Khalid Hussein, P.Eng.**
Project Manager
Khalid.Hussein@rwdi.com

**RWDI AIR Inc.**
**Consulting Engineers & Scientists**
600 Southgate Drive
Guelph, ON N1G 4P6
T: 519.823.1311
F: 519.823.1316

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# 1 INTRODUCTION

RWDI AIR Inc. (RWDI) was retained by Durham Region and York Region (the Regions) to conduct discrete and continuous air quality ambient monitoring at the Durham York Energy Centre (DYEC) monitoring stations. The facility address is 1835 Energy Drive, Clarington, Ontario. The DYEC is a facility that manages post diversion municipal solid waste from Durham Region and York Region to create energy from waste combustion. Commercial operation of the DYEC commenced on February 1, 2016. The site location is shown below in Figure 1.

Condition 11 of the Environmental Assessment Notice of Approval and Condition 7(4) of the Environmental Compliance Approval (ECA) requires ambient air monitoring to be undertaken by the DYEC. An Ambient Air Monitoring and Reporting Plan was prepared and approved by the Ministry of Environment, Conservation and Parks (MECP) to satisfy these conditions. Two (2) monitoring stations were established to monitor ambient air quality around the DYEC and quantify the background ambient air quality levels and DYEC contributed emissions to ambient air quality levels.

This monitoring plan was developed based on the Regional Council mandate to provide ambient monitoring in the area of the DYEC. The purposes of the ambient monitoring program are to:

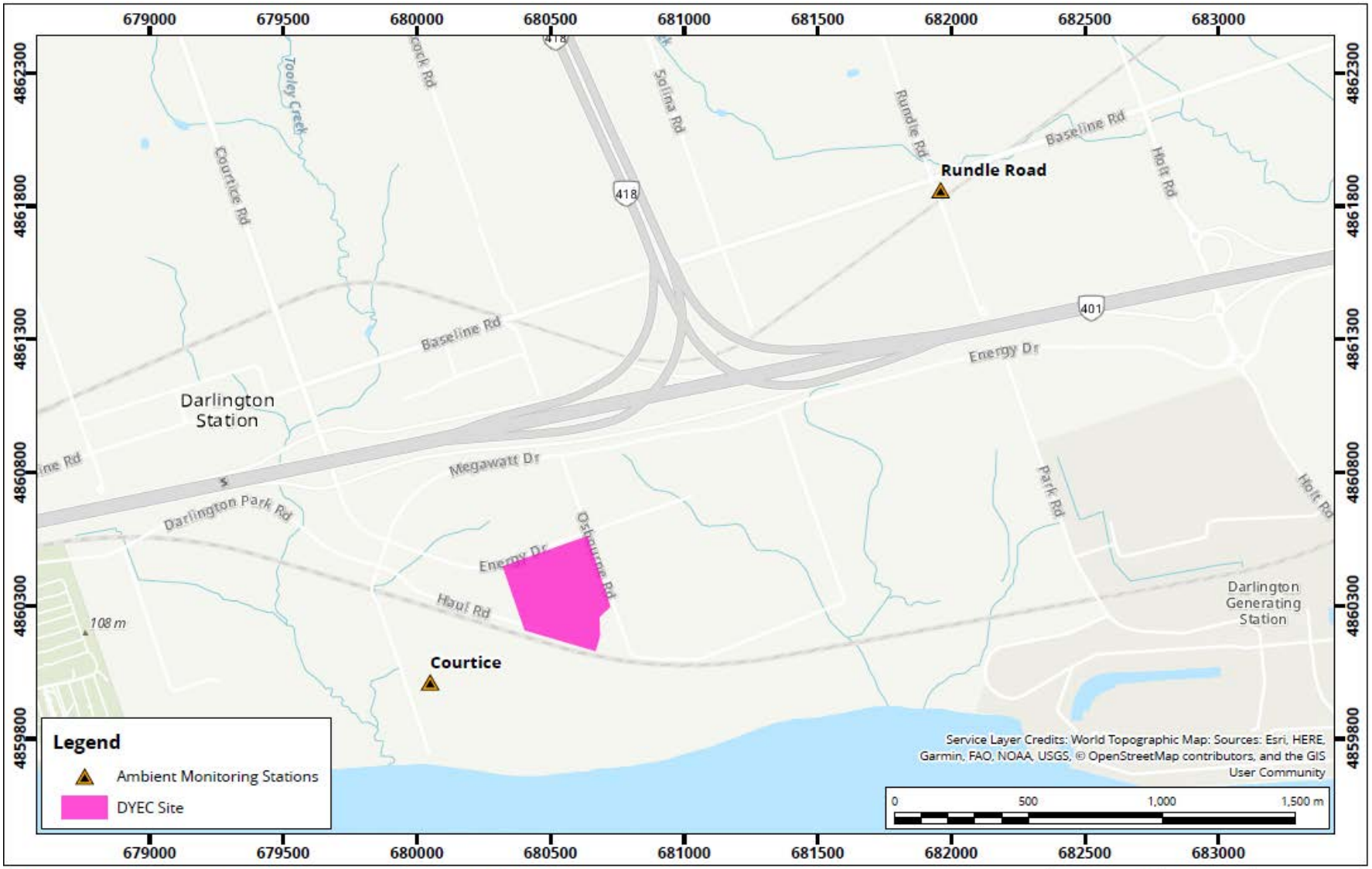
- Quantify any measurable ground level concentrations resulting from emissions from the DYEC cumulative to local air quality, including validating the predicted concentrations from the dispersion modelling conducted in the Environmental Assessment (2009a);
- Monitor concentration levels of EFW-related air contaminants in nearby residential areas; and,
- Quantify background ambient levels of air contaminants in the area.

The facility has two (2) monitoring stations which collect continuous and discrete ambient measurements, known as the Courtice Station and Rundle Road Station. The station locations are shown in Figure 1. The Courtice and Rundle Road Stations were operational in May of 2013 and have been operated on behalf of the Region of Durham by Stantec Consulting Ltd. since that time up until July 31, 2018. RWDI has overseen the operation of the stations on behalf of the Region of Durham since August 1, 2018.

The Courtice and Rundle Road Stations continuously monitor the following air quality parameters: Particulate Matter less than 2.5 microns ($PM_{2.5}$), Nitrogen Oxides ($NO_X$) and Sulfur Dioxide ($SO_2$). In addition, both discretely monitor the following air quality parameters: Total Suspended Particulate (TSP), Metals, Dioxins and Furans (D&F) and Polycyclic Aromatic Hydrocarbons (PAHs).

Continuous meteorological data is collected at the Courtice and Rundle Road Stations. The Rundle Road Station collects the following meteorological parameters: wind speed, wind direction, ambient temperature, precipitation and relative humidity. The Courtice Station collects the following meteorological parameters: wind speed, wind direction, ambient temperature, ambient pressure, precipitation and relative humidity. The meteorological towers at both stations are approximately 10 meters tall.

Throughout this monitoring period there were thirty-nine (39) exceedance events of the rolling 10-minute $SO_2$ AAQC and seventeen (17) exceedance events of the rolling 1-hour $SO_2$ AAQC at the Courtice station. There was one (1) exceedance of the Benzo(a) Pyrene AAQC, which occurred on March 18$^{th}$ at the Courtice Station, and three (3) exceedances of the Benzo(a) Pyrene AAQC, which occurred on February 22$^{nd}$, March 6$^{th}$ and March 30$^{th}$ at the Rundle Road Station. Data recovery rates were acceptable and valid for all measured Q1 continuous and discrete parameters except for PAH's at the Courtice Station and D&F's at both Monitoring Stations.




**DYEC Site and Ambient Monitoring Station Locations**

True North

Drawn by: DJH | Figure: 1

Approx. Scale: 1:20,000

Date Revised: Apr 17, 2020

Map Projection: NAD 1983 UTM Zone 17N

DYEC - Region of Durham, Ontario

Project #: 1803743

## 1.1 Sampling Locations

The Station sites were selected in consultation with a working group that included representatives from the MECP, the Region of Durham, York Region, and the Energy from Waste Advisory Committee (EFWAC), as required by Condition 11.3 of the Environmental Assessment Notice of Approval. The Courtice Station is predominantly upwind of the DYEC and is located on the Courtice WPCP property just southwest of the DYEC. The Rundle Road Station is predominantly downwind of the DYEC and is located just southeast of the intersection of Baseline Road and Rundle Road just northeast of the DYEC. Pictures of the two (2) Stations are presented as Figure 2 and 3.

**Figure 2. Rundle Road Station**

**Figure 3. Courtice Station**

# 2 SAMPLING METHODOLOGY

The Rundle Road and Courtice Stations are both equipped with the following continuous monitors: Thermo Scientific Model 5030 SHARP (Synchronized Hybrid Ambient Real-time Particulate) monitor ($PM_{2.5}$ analyzer), Teledyne Nitrogen Oxides Analyzer Model T200 ($NO_X$ analyzer), and a Teledyne Sulfur Dioxide Analyzer Model T100 ($SO_2$ analyzer). Both Stations also have the following periodic monitors: High Volume (Hi-Vol) Air Sampler outfitted with a TSP inlet head as approved by the United States Environmental Protection Agency (U.S. EPA), and a Hi-Vol Air Sampler outfitted with a polyurethane foam plug and circular quartz filter for measuring PAH's and D&F's as approved by U.S. EPA.

## 2.1 Nitrogen Oxide Analyzers

The Teledyne T200 Nitrogen Oxide ($NO_X$) analyzers use chemiluminescence detection, coupled with microprocessor technology to provide sensitivity and stability for ambient air quality applications. The instrument determines real-time concentration of nitric oxide (NO), total nitrogen oxides ($NO_X$) (the sum of NO and $NO_2$), and nitrogen dioxide ($NO_2$). The amount of NO is measured by detecting the chemiluminescence reaction that occurs in the reaction cell when NO molecules are exposed to ozone ($O_3$). The NO and $O_3$ molecules collide in the reaction cell and enter a higher energy state. When these excited molecules return to a stable energy state, they emit a photon of light which is proportional to the amount of NO in the sample stream of gas entering the analyzer. To determine the total $NO_X$ ($NO+NO_2$) measurement, sample gas is periodically bypassed through a heated molybdenum converter cartridge that converts any $NO_2$ molecules in the sample stream into NO (any existing NO molecules in the stream remain as is). The instrument will switch the sample stream through the converter periodically and then through the reaction cell where the same chemiluminescence reaction occurs with ozone. The resultant response produced is now the sum of NO and converted $NO_2$ producing a $NO_X$ measurement. The resultant $NO_2$ determination is the $NO_X$ measurement subtracted from the NO measurement.

The $NO_X$ analyzers were zero and span checked daily using the internal zero and span (IZS) system and calibrated once a month using either EPA protocol span gases and a dilution system or an ESA permeation tube calibrator. Automatic IZS checks were performed on a daily basis commencing at approximately 01:45 and ending at 02:15. The checks consisted of a 10-minute zero check, a 10-minute span check and a 10-minute purge. These checks provide a way to monitor daily performance of the analyzer using an external charcoal and purafil zeroing cartridge for the zero, and an internal permeation oven with a permeation tube for the span. These IZS checks are not for calibration purposes but are merely a diagnostic tool to identify instrument drift.

The instrument collects data using its own data acquisition system (DAS) on a 5-minute interval. Data is collected from the instrument directly to an EnviDAS logger at 1-min, 5-min and 60-min intervals. The logger can be accessed remotely, and all instrument parameters can be examined as well as the measurement data. This allows the tracking of instrument performance. Data was also collected at 1-minute intervals by an external datalogger using analog output connections as a back-up. The measurement data was averaged using Envista processing software over a 1-hour and 24-hour period to compare to the applicable ambient air quality criteria.

## 2.2 Sulphur Dioxide Analyzers

The Teledyne T100 Sulphur Dioxide ($SO_2$) Analyzer is a microprocessor-controlled analyzer that determines the concentration of $SO_2$ in a sample gas drawn through the instrument. In the sample chamber, sample gas is excited by ultraviolet light causing the $SO_2$ to absorb energy from the light and move to an active state ($SO_2$*). These active $SO_2$* molecules must decay into a stable state back to $SO_2$, and when this happens a photon of light is released which is recognized by the instrument as fluorescence. The instrument measures the amount of florescence to determine the amount of $SO_2$ present in the sample gas.

The $SO_2$ analyzers were zero and span checked daily using the IZS system and calibrated once a month using either EPA protocol span gases and a dilution system or an ESA permeation tube calibrator. Automatic IZS checks were performed on a daily basis commencing at approximately 1:45 and ending at 02:15. The checks consisted of a 10-minute zero check, a 10-minute span check and a 10-minute purge. These checks provide a way to monitor daily performance of the analyzer using an external charcoal and purafil zeroing cartridge for the zero, and an internal permeation oven with a permeation tube for the span. These IZS checks are not for calibration purposes but are merely a diagnostic tool to identify instrument drift.

The instrument collects data using its own data acquisition system (DAS) on a 5-minute interval. Data is collected from the instrument directly to an EnviDAS logger at 1-min, 5-min and 60-min intervals. The logger can be accessed remotely, and all instrument parameters can be examined as well as the measurement data. This allows the tracking of instrument performance. Data was also collected at 1-minute intervals by an external datalogger using analog output connections as a back-up. The measurement data was averaged using Envista processing software over a 1-hour and 24-hour period to compare to the applicable ambient air quality criteria.

## 2.3 SHARP 5030 $PM_{2.5}$ Analyzers

The SHARP 5030 is a hybrid nephelometric/radiometric particulate mass monitor capable of providing precise, real-time measurements with a superior detection limit. The SHARP incorporates a high sensitivity light scattering photometer whose output signal is continuously referenced to the time-averaged measurement of an integral beta attenuating mass sensor. The SHARP also incorporates a dynamic inlet heating system designed to maintain the relative humidity of the air passing through the filter tape constant.

The SHARP is calibrated once a month to ensure accuracy and validity of its data. The $PM_{2.5}$ inlet head and sharp cut cyclone is cleaned monthly as well to ensure proper performance. The monthly calibration process consists of the following: zeroing the nephelometer if necessary, calibration of ambient temperature, calibration of barometric pressure, and calibration of the flow.

The instrument collects data using its own data acquisition system (DAS) on a 5-minute interval. Data is collected from the instrument directly to an EnviDAS logger at 1-min, 5-min and 60-min intervals. The logger can be accessed remotely, and all instrument parameters can be examined as well as the measurement data. This allows the tracking of instrument performance. Data was also collected at 1-minute intervals by an external datalogger using analog output connections as a back-up. The measurement data was averaged using Envista processing software over a 1-hour and 24-hour period to compare to the applicable ambient air quality criteria.

## 2.4 TSP High Volume Air Samplers

The Tisch TE-5170 Total Suspended Particulate (TSP) high volume (Hi-Vol) air samplers were outfitted with a TSP gabled inlet capable of collecting particulate of all aerodynamic diameters. Each Hi-Vol is equipped with a mass flow controller, which ensures a flow rate of 40 cubic feet per minute (CFM), a chart recorder for measuring cfm flow throughout the run time, an elapsed timer and a wheel timer for starting and stopping each sample. In the latter part of 2019, the pin-based wheel timer was modified with an automated relay system controlled by a data logger to toggle the sampler on and off, and the chart recorder system was replaced by a digital pressure transducer to record the blower output pressure. Teflon coated glass fibre filters are outfitted at the top of the hi-vol samplers where air is drawn through the filter, thereby collecting TSP. Each Hi-Vol is calibrated quarterly (every three months) to ensure accuracy and validity of the volume of air drawn through the sampler.

The Teflon coated glass fibre filter media was pre and post weighed by ALS Laboratories in Burlington, Ontario. The filters are then analyzed for total particulate weight, metals analysis and mercury.

## 2.5 Polyurethane Foam Samplers

The D&F, and PAH samples were collected using Tisch TE-1000 samplers, which are listed as reference devices for U.S. EPA Methods TO-9 and TO-13. The samplers use a collection filter that is ‘backed-up’ by a polyurethane foam (PUF) plug. The airborne compounds present in the particulate phase are collected on the Teflon coated glass fibre filter and any compounds present in the vapour phase are absorbed in the PUF plug. Each PUF sampler is equipped with a mass flow controller, which can sustain 8 CFM of flow over the sampling period, an elapsed timer and a wheel timer for starting and stopping each sample. In the latter part of 2019, the pin-based wheel timer was modified with an automated relay system controlled by a data logger to toggle the sampler on and off, and the chart recorder system was replaced by a digital pressure transducer to record the blower output pressure. Each PUF sampler is calibrated quarterly (every three months) to ensure accuracy and validity of the volume of air drawn through the sampler.

The filter and PUF media/glassware is proofed and analyzed by ALS Laboratories in Burlington, Ontario. The filters and PUF/XAD plugs are then analyzed for PAH’s and D&F’s.

## 2.6 Meteorological Towers

Meteorological data was collected from the Rundle Road and Courtice Stations. This is done so that a vector could be associated with the applicable contaminant concentrations. The Rundle Road and Courtice Stations are outfitted with a Campbell Scientific HMP60 Temperature / Relative Humidity probe, and a Texas Instruments TE525M rain gauge. Meteorological data was collected at 1-minute intervals and was averaged using Envista processing software over a 1-hour period.

# 3 AIR QUALITY CRITERIA AND STANDARDS

The monitored contaminant concentrations were compared to air quality criteria and standards set by the MECP and by Environment Canada. The MECP developed Ambient Air Quality Criteria (AAQCs) which are the maximum desirable concentrations in the outdoor air, based on effects to the environment and health (MECP, 2012). Not all contaminants have an applicable regulatory limit; therefore, other criteria were used for comparison. These included human health risk assessment (HHRA) criteria.

Environment Canada has established a Canadian Ambient Air Quality Standard (CAAQS) which are health-based air quality objectives for the outdoor air (Environment Canada, 2013). The current CAAQS' for $PM_{2.5}$ are 27 µg/m$^3$ for the 3-year average of annual 98$^{th}$ percentile 24-hour concentration, and 8.8 µg/m$^3$ for the 3-year average of annual average concentrations (in effect as of 2020). The CAAQS' are listed in **Table 1**. No direct comparison to the 2020 CAAQS' is appropriate for this report, as the standards are only applicable to 3-year averaged data which is provided in the annual reports.

**Table 1. $PM_{2.5}$, $SO_2$ and $NO_2$ CAAQS' by Implementation Year**

| Parameter | Averaging Time | Year Applied | | Statistical Form |
|---|---|---|---|---|
| | | 2020 | 2025 | |
| Fine Particulate Matter ($PM_{2.5}$) | 24-hour | 27 µg/m$^3$ | | The 3-year average of the annual 98$^{th}$ percentile of the daily 24-hour average concentrations |
| | Annual | 8.8 µg/m$^3$ | | The 3-year average of the annual average of all 1-hour concentrations |
| Sulphur Dioxide ($SO_2$) | 1-hour | 70 ppb | 65 ppb | The 3-year average of the annual 99$^{th}$ percentile of the $SO_2$ daily maximum 1-hour average concentrations |
| | Annual | 5 ppb | 4 ppb | The average over a single calendar year of all 1-hour average $SO_2$ concentrations |
| Nitrogen Dioxide ($NO_2$) | 1-hour | 60 ppb | 42 ppb | The 3-year average of the annual 98$^{th}$ percentile of the daily maximum 1-hour average concentrations |
| | Annual | 17 ppb | 12 ppb | The average over a single calendar year of all 1-hour average concentrations |

(CCME,2019)

All applicable criteria and standards are shown in the 'Summary of Ambient Measurements' section of this report.

# 4 MECP AUDITS

There were no MECP audits conducted in Q1 of 2022.

# 5 SUMMARY OF AMBIENT MEASUREMENTS

Ambient air quality monitoring results for all contaminants sampled at the Courtice and Rundle Road Stations are discussed herein. Summary statistics from January to March 2022 are presented in a summary format below and in a more detailed matrix format in **Appendix A** for continuous measurements and **Appendix B** for discrete measurements.

# 5.1 Meteorological Station Results

## 5.1.1 Courtice Station Results

The Courtice Station collected the following meteorological parameters: wind speed, wind direction, relative humidity, ambient temperature, ambient pressure and precipitation. The meteorological tower at the station is at a height of approximately 10 meters tall. The Courtice Station maintained a minimum 96.8% of data collection for all of the parameters measured during Q1. Hourly statistics from the meteorological station are presented in **Table 2**. A wind rose showing trends in wind speed and wind direction during Q1 is provided in **Figure 4**.

**Figure 4. Wind Roses of Hourly Wind Speed and Wind Direction – January to March 2022**

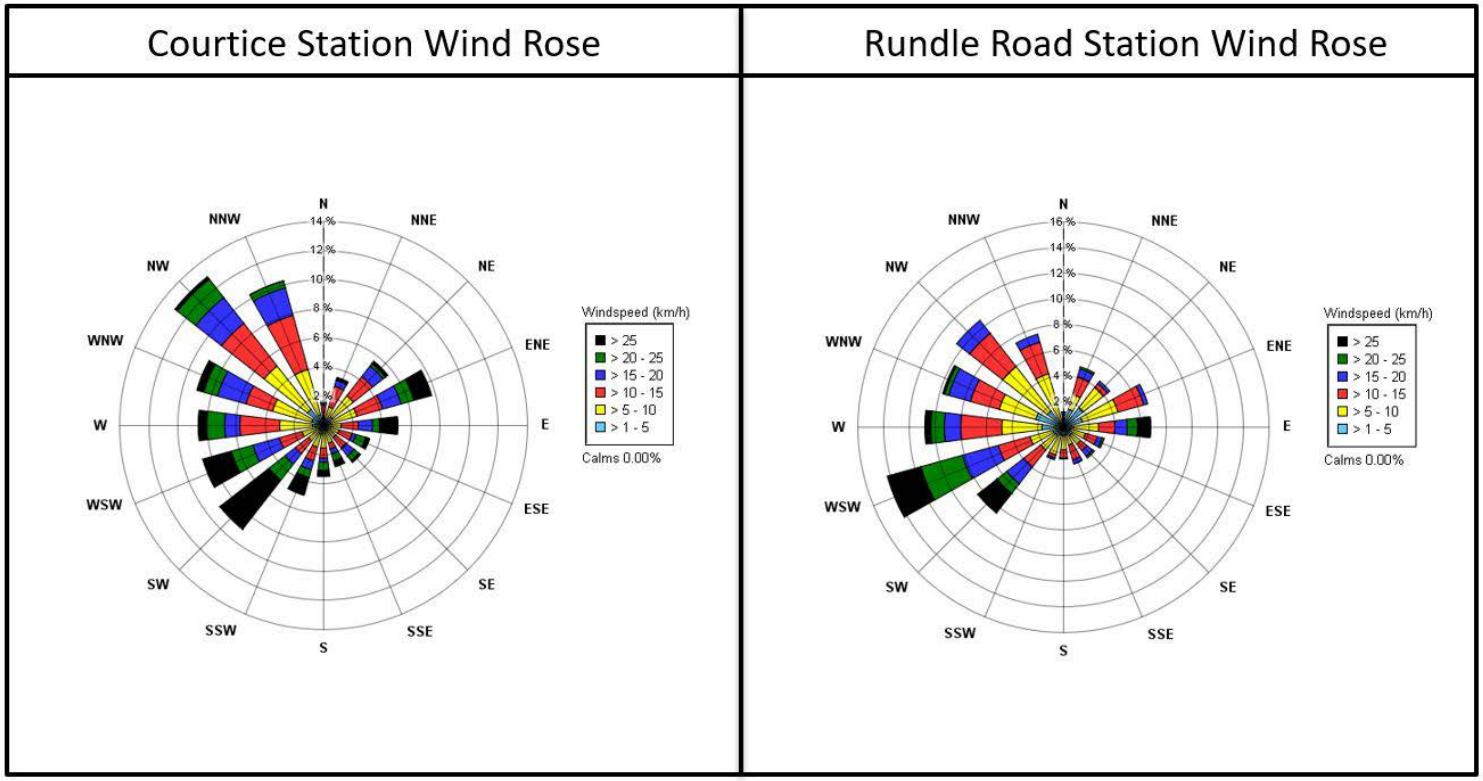


**Table 2. Hourly Statistics from the Courtice Meteorological Station**

| Courtice Station MET Statistics | Maximum 1 hr Mean | | | | | Minimum 1 hr Mean | | | | | Monthly Mean | | | | | Total | % Valid hours | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | WS | Temp | RH | Pres | Rain | WS | Temp | RH | Pres | Rain | WS | Temp | RH | Pres | Rain | Rain | WS | WD | Temp | RH | Pres | Rain |
| Units | (km/hr) | (°C) | (%) | Hg | mm | (km/hr) | (°C) | (%) | Hg | mm | (km/hr) | (°C) | (%) | Hg | mm | mm | (%) | | | | | |
| **January** | 45.7 | 4.7 | 100.0 | 30.4 | 1.0 | 0.1 | -23.6 | 24.1 | 28.9 | 0.0 | 15.2 | -7.4 | 60.1 | 29.8 | 0.0 | 4.3 | 100.0 | 98.8 | 100.0 | 100.0 | 100.0 | 100.0 |
| **February** | 51.1 | 7.1 | 100.0 | 30.3 | 4.0 | 1.1 | -18.8 | 25.9 | 29.2 | 0.0 | 15.3 | -3.9 | 61.2 | 29.8 | 0.1 | 50.7 | 100.0 | 99.4 | 100.0 | 100.0 | 100.0 | 100.0 |
| **March** | 44.4 | 14.7 | 100.0 | 30.2 | 4.4 | 0.3 | -13.1 | 19.3 | 29.0 | 0.0 | 13.6 | 0.6 | 66.2 | 29.7 | 0.1 | 41.0 | 100.0 | 96.8 | 100.0 | 100.0 | 100.0 | 100.0 |
| **Q1 Arithmetic Mean** | | | | | | | | | | | 14.7 | -3.5 | 62.5 | 29.8 | 0.0 | 96 | 100.0 | 98.3 | 100.0 | 100.0 | 100.0 | 100.0 |

## 5.1.2 Rundle Road Station Results

The Rundle Road Station collected the following meteorological parameters: wind speed, wind direction, relative humidity, ambient temperature and precipitation. The meteorological tower at the station is at a height of approximately 10 meters tall. The Rundle Road Station maintained a minimum 96.2% data collection for all of the meteorological parameters measured during Q1. Hourly statistics from the meteorological station is presented in **Table 3**. A wind rose showing trends in wind speed and wind direction during Q1 is provided in **Figure 4**.

**Table 3. Hourly Statistics from the Rundle Road Meteorological Station**

| Rundle Road Station MET Statistics | Maximum 1 hr Mean | | | | Minimum 1 hr Mean | | | | Monthly Mean | | | | Total | % Valid Hours | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | WS | Temp | RH | Rain | WS | Temp | RH | Rain | WS | Temp | RH | Rain | Rain | WS | WD | Temp | RH | Rain |
| Units | (km/hr) | (°C) | (%) | mm | (km/hr) | (°C) | (%) | mm | (km/hr) | (°C) | (%) | mm | mm | (%) | | | | |
| **January** | 40.8 | 4.5 | 100.0 | 0.5 | 0.0 | -26.9 | 28.9 | 0.0 | 11.6 | -8.1 | 67.0 | 0.0 | 5.6 | 100.0 | 97.7 | 100.0 | 100.0 | 100.0 |
| **February** | 40.8 | 6.7 | 100.0 | 4.8 | 1.2 | -19.5 | 32.3 | 0.0 | 12.0 | -4.4 | 68.0 | 0.1 | 69.0 | 100.0 | 99.0 | 100.0 | 100.0 | 100.0 |
| **March** | 36.2 | 14.1 | 100.0 | 5.5 | 0.4 | -16.0 | 25.2 | 0.0 | 11.0 | 0.4 | 71.3 | 0.1 | 66.7 | 100.0 | 96.2 | 100.0 | 100.0 | 100.0 |
| **Q1 Arithmetic Mean** | | | | | | | | | 11.5 | -4.1 | 68.8 | 0.1 | 141.3 | 100.0 | 97.6 | 100.0 | 100.0 | 100.0 |

## 5.2 $NO_x$, $SO_2$ and $PM_{2.5}$ Summary Table Results

**Table 4** provides a summary of Maximum 1-hour Rolling Means, Maximum 24-hour Rolling Means, Monthly Means, Quarterly Means and Percent valid data for the Courtice Station. **Table 5** provides a summary of Maximum 1-hour Means, Maximum 24-hour Means, Monthly Means, Quarterly Means and Percent valid data for the Rundle Road Station. **Table 6** provides a summary of exceedance statistics for both Courtice and Rundle Road Stations. At the Courtice Station, there were thirty-nine (39) exceedance events of the rolling 10-minute $SO_2$ AAQC and seventeen (17) exceedance events of the 1-hour $SO_2$ AAQC in Q1.

**Table 4. Summary of Courtice Station Continuous Data Statistics**

| Courtice Monitoring Station Data Statistics | Maximum Rolling 10 min Mean | Maximum Rolling 1 hr Mean | | | | | Maximum 24 hr Rolling Mean | | | | | Monthly Mean | | | | | % Valid Hours | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Compound | $SO_2$ | $PM_{2.5}$ | $NO_x$ | NO | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_x$ | NO | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_x$ | NO | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_x$ | NO | $NO_2$ | $SO_2$ |
| Units | ppb | ($\mu g/m^3$) | ppb | | | | ($\mu g/m^3$) | ppb | | | | ($\mu g/m^3$) | ppb | | | | (%) | | | | |
| AAQC/CAAQS | 67 | | | | 200 | 40 | 27[A] | | | 100 | | | | | | | | | | | |
| January | 143.6 | 33.9 | 73.8 | 36.4 | 41.7 | 68.1 | 22.9 | 31.9 | 6.0 | 25.9 | 7.7 | 6.5 | 6.8 | 1.0 | 5.9 | 1.9 | 99.9 | 99.5 | 99.5 | 99.5 | 99.5 |
| February | 13.8 | 45.6 | 41.0 | 15.8 | 34.8 | 6.2 | 22.0 | 27.0 | 4.7 | 22.3 | 2.0 | 6.4 | 5.1 | 0.5 | 4.8 | 0.8 | 99.9 | 99.6 | 99.6 | 99.6 | 99.7 |
| March | 224.5 | 32.3 | 87.9 | 54.9 | 35.2 | 111.1 | 16.9 | 32.3 | 15.3 | 17.5 | 15.9 | 6.1 | 8.1 | 1.7 | 6.5 | 3.2 | 99.7 | 99.6 | 99.6 | 99.6 | 99.2 |
| Q1 Arithmetic Mean | | | | | | | | | | | | 6.4 | 6.7 | 1.1 | 5.7 | 1.9 | 99.8 | 99.5 | 99.5 | 99.5 | 99.4 |

[A] The 24-hour $PM_{2.5}$ CAAQS applies to the 98th percentile over 3 consecutive years.

**Table 5. Summary of Rundle Road Station Continuous Data Statistics**

| Rundle Road Monitoring Station Data Statistics | Maximum Rolling 10 min Mean | Maximum Rolling 1 hr Mean | | | | | Maximum 24 hr Rolling Mean | | | | | Monthly Mean | | | | | % Valid Hours | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Compound | $SO_2$ | $PM_{2.5}$ | $NO_x$ | NO | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_x$ | NO | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_x$ | NO | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_x$ | NO | $NO_2$ | $SO_2$ |
| Units | ppb | ($\mu g/m^3$) | ppb | | | | ($\mu g/m^3$) | ppb | | | | ($\mu g/m^3$) | ppb | | | | (%) | | | | |
| AAQC/CAAQS | 67 | | | | 200 | 40 | 27[A] | | | 100 | | | | | | | | | | | |
| January | 9.9 | 32.2 | 34.1 | 14.5 | 28.3 | 4.8 | 25.3 | 20.3 | 2.5 | 17.8 | 1.0 | 6.7 | 4.9 | 0.8 | 4.1 | 0.2 | 99.9 | 99.6 | 99.6 | 99.6 | 99.7 |
| February | 2.4 | 42.9 | 48.1 | 19.9 | 38.6 | 2.1 | 23.0 | 19.0 | 3.0 | 16.6 | 1.2 | 6.8 | 6.1 | 0.9 | 5.2 | 0.5 | 99.7 | 99.7 | 99.7 | 99.7 | 99.7 |
| March | 29.2 | 28.2 | 51.7 | 31.0 | 28.3 | 10.9 | 16.9 | 26.0 | 8.2 | 18.1 | 0.8 | 6.2 | 6.0 | 1.3 | 4.8 | 0.2 | 99.6 | 99.6 | 99.6 | 99.6 | 99.7 |
| Q1 Arithmetic Mean | | | | | | | | | | | | 6.6 | 5.7 | 1.0 | 4.7 | 0.3 | 99.8 | 99.6 | 99.6 | 99.6 | 99.7 |

[A] The 24-hour $PM_{2.5}$ CAAQS applies to the 98th percentile over 3 consecutive years.

**Table 6. Summary of Exceedance Statistics**

| Event Statistics | Rolling Mean > 10 min AAQC for Courtice | Rolling Mean > 10 min AAQC for Rundle Road | Mean > 1 hr AAQC for Courtice Monitoring Station | | | Mean > 1 hr AAQC for Rundle Road Monitoring Station | | | Rolling Mean > 24 hr AAQC for Courtice Monitoring Station | | | Rolling Mean > 24 hr AAQC for Rundle Road Monitoring Station | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Compound | $SO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_2$ | $SO_2$ |
| Units | No. | No. | No. | | | No. | | | No. | | | No. | | |
| **January** | 10 | 0 | | 0 | 4 | | 0 | 0 | N/A | 0 | | N/A | 0 | |
| **February** | 0 | 0 | | 0 | 0 | | 0 | 0 | N/A | 0 | | N/A | 0 | |
| **March** | 29 | 0 | | 0 | 13 | | 0 | 0 | N/A | 0 | | N/A | 0 | |
| **Q1 Total** | 39 | 0 | | 0 | 17 | | 0 | 0 | N/A | 0 | | N/A | 0 | |

## 5.3 Oxides of Nitrogen Results

### 5.3.1 Courtice Station Results

Data recovery levels were high for oxides of nitrogen (99.5% valid data). Monitoring results were compared to the AAQC for $NO_2$ only, as it is the only parameter that has AAQC values for 1-hour and 24-hour averaging periods (there are no AAQC's for NO or $NO_X$). There were no exceedances above the AAQC values for the entirety of the sampling period for rolling 1-hour and 24-hour averaged data. The highest $NO_2$ value seen among the 1-hour rolling averages was 41.7 ppb, which is 20.9% of the AAQC. The highest $NO_2$ value seen among the rolling 24-hour averages was 25.9 ppb, which is 25.9% of the AAQC. The measurements are summarized in **Table 4** above. A pollution rose is presented in **Figure 5** for the Courtice Station during Q1 composed of hourly average $NO_2$ concentrations. A pollution rose indicates the percentage of time that the wind originates from a given direction coupled with the pollutant measurement for that time in either ppb or micrograms per meter cubed. In order to show where possible major sources of pollutants are coming from, levels below 5 ppb were omitted from the graphic wind rose representation.

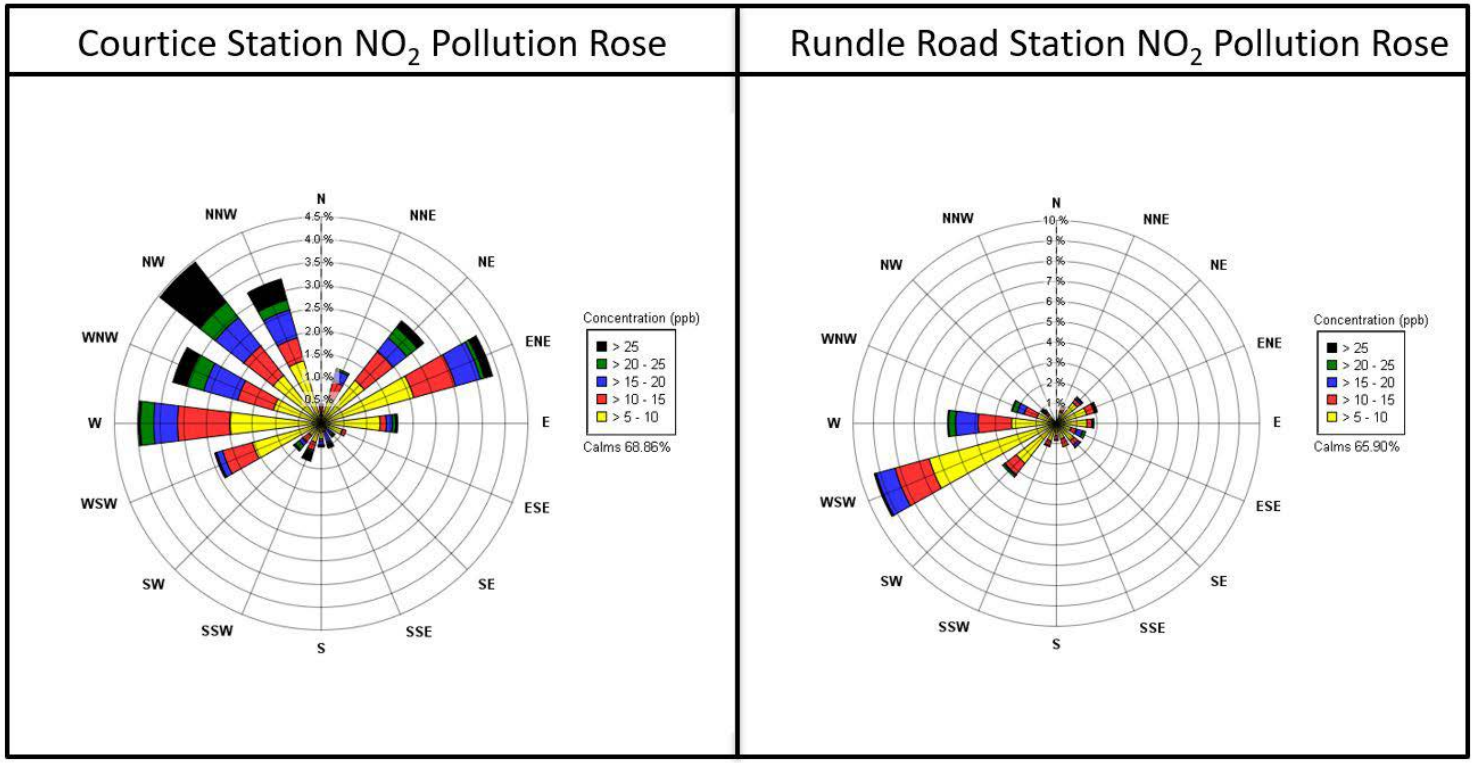
The Courtice Station pollution rose in **Figure 5** shows the majority of the $NO_2$ impacts were largely from the West-southwest to North-northwest and Northeast to East-northeast. The Station is downwind of the DYEC when winds are from the northeast and east-northeast directions, which happened occasionally during the monitoring period, therefore it is likely that the DYEC partially contributed to the observed concentrations. There are additional impacts from the West-southwest to North-northwest which indicates reception from surrounding industry or the highway and railway corridors.

### 5.3.2 Rundle Road Station Results

Data recovery levels were high for oxides of nitrogen (99.6% valid data). There were no exceedances above the AAQC values for the entirety of the sampling period for rolling 1-hour and 24-hour averaged data. The highest $NO_2$ value seen among the 1-hour rolling averages was 38.6 ppb, which is 19.3% of the AAQC. The highest $NO_2$ value seen among the rolling 24-hour averages was 18.1 ppb, which is 18.1% of the AAQC. The measurements are summarized in **Table 5** above. A pollution rose is presented in **Figure 5** for the Rundle Road Station during Q1 composed of hourly average $NO_2$ concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 ppb were omitted from the graphic wind rose representation.

The Rundle Road Station pollution rose in **Figure 5** shows that the majority of elevated $NO_2$ events at the Rundle Road Station occurred when winds were from the southwest to west, which is downwind of the DYEC but also partially in line with high traffic areas and urban background. It is likely that the DYEC partially contributed to the observed concentrations.

**Figure 5. Pollution Roses of Hourly Average $NO_2$ Concentrations – January to March 2022**



## 5.4 Sulphur Dioxide Results

### 5.4.1 Courtice Station Results

Data recovery levels were high for sulphur dioxide (99.4% valid data). Monitoring results were compared to the AAQC for 10-minute and 1-hour rolling average periods. In 2022, there have been more frequent $SO_2$ concentrations elevated above the AAQC's than in previous years due to the new limits imposed at the start of 2020. The highest $SO_2$ value seen among the 10-min rolling averages was 224.5 ppb, which is 335.1% of the AAQC. The highest $SO_2$ value seen among the 1-hour rolling averages was 111.1 ppb, which is 277.8% of the AAQC. There were thirty-nine (39) exceedance events of the rolling 10-minute AAQC and seventeen (17) exceedance events of the rolling 1-hour AAQC. A table outlining the interpretation of the exceedance period can be found in **Appendix E.**

The $SO_2$ statistical results are summarized in **Table 4** above. A pollution rose is presented in **Figure 6** for the Courtice Station during Q1 composed of hourly average $SO_2$ concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 ppb were omitted from the graphic wind rose representation. A pollution rose is presented in **Figure 7** for the Courtice Station during Q1 composed of 5-minute average $SO_2$ concentrations with levels below 67 ppb omitted to illustrate directionality of exceedance concentrations.

The Courtice Station pollution rose in **Figure 6** shows that the majority of elevated $SO_2$ events at Courtice occurred from the North-northeast to East-northeast directions. The events were possibly a result of emissions from surrounding industrial sources with contributions from the DYEC in the North-northeast to East-northeast directions. The Courtice Station pollution rose in **Figure 7** shows that <0.24% of the 5-min $SO_2$ events are elevated >67 ppb occurred from the North to East-northeast directions. It is possible that the DYEC contributed to $SO_2$ concentrations >67 ppb only from the East-northeast direction.

Durham Region staff have provided a Technical Memorandum summarizing the DYEC $SO_2$ continuous emissions monitoring system (CEMS) data during the exceedance events recorded at the Courtice and Rundle Road Ambient Monitoring Stations for Q1, which is included in **Appendix G**. The Memorandum indicates that based on the in-stack concentration levels measured by the CEMS, that there were no unusual levels in $SO_2$ emissions during the ambient Station exceedance events and that the facility's impact on ambient air quality would be expected to be quite low.

### 5.4.2 Rundle Road Station Results

Data recovery levels were high for sulphur dioxide (99.7% valid data). Monitoring results were compared to the AAQC for 10-minute and 1-hour rolling average periods. The highest $SO_2$ value seen among the 10-min rolling averages was 29.2 ppb, which is 43.6% of the AAQC. The highest $SO_2$ value seen among the 1-hour rolling averages was 10.9 ppb, which is 27.3% of the AAQC.

The $SO_2$ statistical results are summarized in **Table 5** above. A pollution rose is presented in **Figure 6** for the Rundle Road Station during Q1 composed of hourly average $SO_2$ concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 ppb were omitted from the graphic wind rose representation. A pollution rose is presented in **Figure 7** for the Rundle Road Station during Q1 composed of 5-minute average $SO_2$ concentrations with levels below 67 ppb omitted to illustrate directionality of exceedance concentrations

The Rundle Road Station pollution rose in **Figure 6** shows that the majority of elevated $SO_2$ events at the Rundle Road Station occurred when winds were from the East-southeast to Southeast. The pollution rose indicates that the DYEC was not a contributor to $SO_2$ levels at the station and that the levels may be related to other industrial activity nearby. The Rundle Road Station pollution rose in **Figure 7** shows that there were no $SO_2$ concentrations >67 ppb.

**Figure 6. Pollution Roses of Hourly Average $SO_2$ Concentrations – January to March 2022**

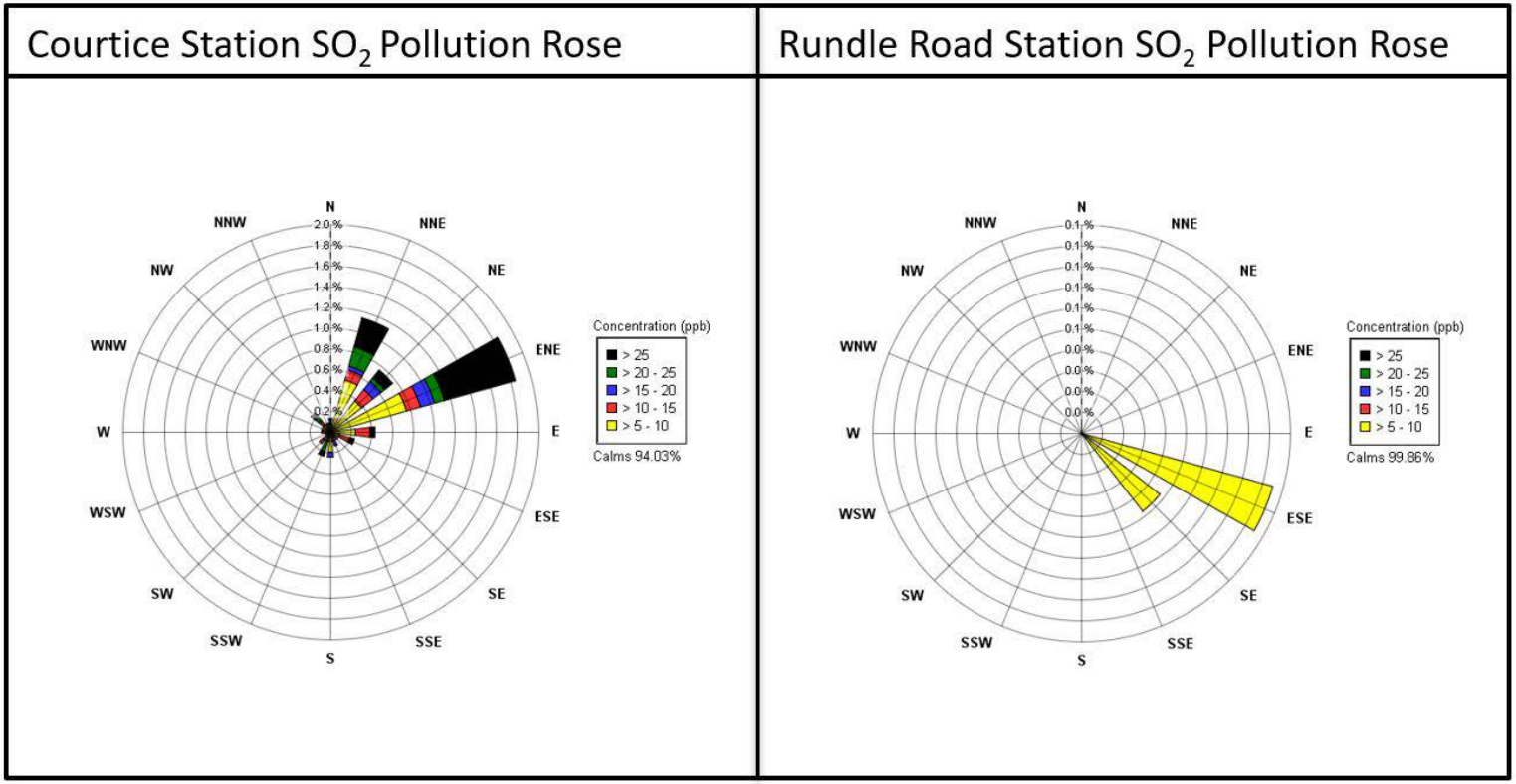
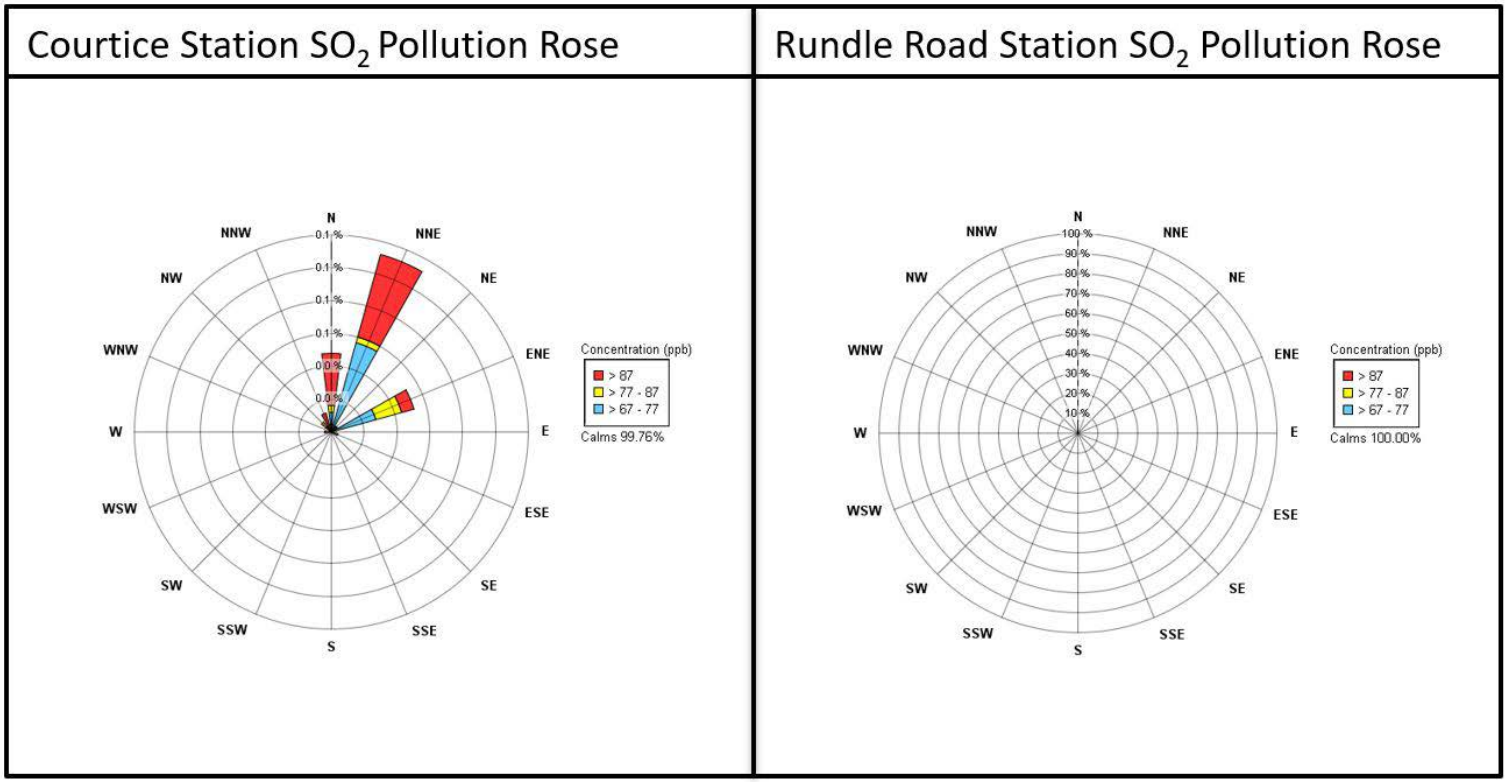


**Figure 7. Pollution Roses of 5-minute Average $SO_2$ Concentrations >67 ppb – January to March 2022**



## 5.5 Fine Particulate Matter ($PM_{2.5}$) Results

### 5.5.1 Courtice Station Results

Data recovery levels were high for particulate matter less than 2.5 microns (99.8% valid data). There is no 1-hour AAQC or standard for $PM_{2.5}$, but there is a 24-hour CAAQS of 27 µg/m$^3$ for the 3-year average of the annual 98$^{th}$ percentile 24-hour concentrations, and 8.8 µg/m$^3$ for the 3-year average of the annual average concentrations (in effect as of 2020). Note that since the reported data is only quarterly and the CAAQS is applicable to the 3-year average, the CAAQS' for $PM_{2.5}$ was not applicable to the data. The highest $PM_{2.5}$ value seen among the 1-hour rolling averages was 45.6 µg/m$^3$ and the highest value seen among the 24-hour rolling averages was 22.9 µg/m$^3$. The results are summarized in **Table 4** above. A pollution rose is presented in **Figure 8** for the Courtice Station during Q1 composed of hourly average $PM_{2.5}$ concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 µg/m$^3$ were omitted from the graphic wind rose representation.

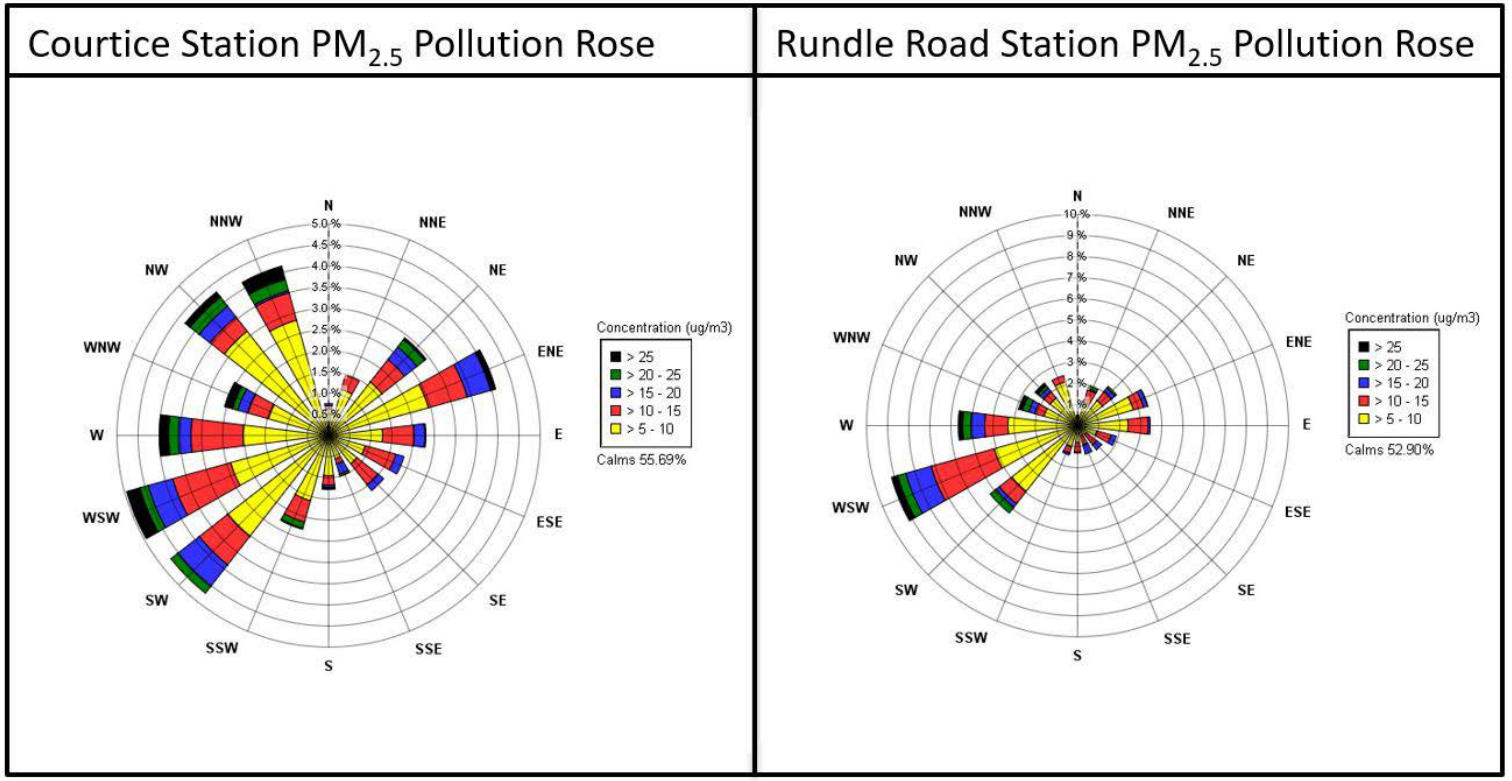
The Courtice Station pollution rose in **Figure 8** shows that the majority of elevated $PM_{2.5}$ events at Courtice occurred when winds were from the Southwest to North-northwest with other contributions from the Northeast to East, which places the station downwind of the DYEC only part of time. Other contributions from the Southwest to North-northwest are in line with nearby industrial activity.

### 5.5.2 Rundle Road Station Results

Data recovery levels were high for particulate matter less than 2.5 microns (99.8% valid data). The highest $PM_{2.5}$ value seen among the 1-hour rolling averages was 42.9 µg/m$^3$ and the highest value seen among the 24-hour rolling averages was 25.3 µg/m$^3$. The results are summarized in **Table 5** above. A pollution rose is presented in **Figure 8** for the Rundle Road Station during Q1 composed of hourly average $PM_{2.5}$ concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 µg/m$^3$ were omitted from the graphic wind rose representation.

The Rundle Road pollution rose in **Figure 8** shows that the majority of elevated $PM_{2.5}$ events at the Rundle Road Station occurred when winds were from the Southwest to West. The station is downwind of the DYEC in the WSW direction. Other contributions include high traffic areas and urban background.

**Figure 8. Pollution Roses of Hourly Average $PM_{2.5}$ Concentrations – January to March 2022**




## 5.6 TSP and Metals Hi-Vol Results

All of the TSP Hi-Vols operated on a discrete schedule every 6 days according to the NAPS schedule during Q1 with the sample days being: January 5th, 11th, 17th, 23rd, 29th, February 4th, 10th, 16th, 22nd, 28th and March 6th, 12th, 18th, 24th, and 30th, 2022.

### 5.6.1 Courtice Station Results

Data recovery levels were high for the TSP sampler at the Courtice Station (100% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for TSP, mercury or metals during Q1. **Table 7** is a summary of the statistics for this station.

**Table 7. Summary of TSP Sampler Courtice Station**

| Contaminant | Units | MECP Criteria | HHRA Health Based Criteria | No. > Criteria | Geometric Mean | Arithmetic Mean | Q1 Minimum Concentration | Q1 Maximum Concentration | January Maximum Concentration | February Maximum Concentration | March Maximum Concentration | Number of Valid Samples | % Valid data |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Particulate (TSP)** | µg/m$^3$ | *120* | *120* | 0 | 15.65 | 17.42 | 5.40 | 34.84 | 27.47 | 15.73 | 34.84 | 15 | 100 |
| **Total Mercury (Hg)** | µg/m$^3$ | *2* | *2* | 0 | 7.54E-06 | 9.63E-06 | 2.91E-06 | 3.48E-05 | 3.48E-05 | 1.82E-05 | 8.98E-06 | 15 | 100 |
| **Aluminum (Al)** | µg/m$^3$ | *4.8* | - | 0 | 8.38E-02 | 1.05E-01 | 3.12E-02 | 2.99E-01 | 9.16E-02 | 8.79E-02 | 2.99E-01 | 15 | 100 |
| **Antimony (Sb)** | µg/m$^3$ | *25* | *25* | 0 | 6.18E-04 | 9.63E-04 | 2.39E-04 | 6.20E-03 | 7.34E-04 | 1.35E-03 | 6.20E-03 | 15 | 100 |
| **Arsenic (As)** | µg/m$^3$ | *0.3* | *0.3* | 0 | 8.90E-04 | 8.90E-04 | 8.53E-04 | 9.43E-04 | 8.88E-04 | 9.15E-04 | 9.43E-04 | 15 | 100 |
| **Barium (Ba)** | µg/m$^3$ | *10* | *10* | 0 | 3.93E-03 | 4.70E-03 | 1.27E-03 | 1.89E-02 | 4.68E-03 | 4.53E-03 | 1.89E-02 | 15 | 100 |
| **Beryllium (Be)** | µg/m$^3$ | *0.01* | *0.01* | 0 | 1.48E-05 | 1.48E-05 | 1.42E-05 | 1.57E-05 | 1.48E-05 | 1.52E-05 | 1.57E-05 | 15 | 100 |
| **Bismuth (Bi)** | µg/m$^3$ | - | - | - | 5.34E-04 | 5.34E-04 | 5.12E-04 | 5.66E-04 | 5.33E-04 | 5.49E-04 | 5.66E-04 | 15 | 100 |
| **Boron (B)** | µg/m$^3$ | *120* | - | 0 | 4.45E-03 | 4.45E-03 | 4.26E-03 | 4.72E-03 | 4.44E-03 | 4.57E-03 | 4.72E-03 | 15 | 100 |
| **Cadmium (Cd)** | µg/m$^3$ | *0.025* | *0.025* | 0 | 1.31E-04 | 1.54E-04 | 4.47E-05 | 3.23E-04 | 3.02E-04 | 1.95E-04 | 3.23E-04 | 15 | 100 |
| **Chromium (Cr)** | µg/m$^3$ | *0.5* | - | 0 | 1.35E-03 | 1.59E-03 | 9.66E-04 | 4.19E-03 | 4.19E-03 | 1.04E-03 | 4.15E-03 | 15 | 100 |
| **Cobalt (Co)** | µg/m$^3$ | *0.1* | *0.1* | 0 | 8.92E-05 | 9.52E-05 | 5.57E-05 | 1.84E-04 | 9.56E-05 | 1.35E-04 | 1.84E-04 | 15 | 100 |
| **Copper (Cu)** | µg/m$^3$ | *50* | - | 0 | 1.29E-02 | 1.67E-02 | 4.09E-03 | 4.84E-02 | 4.84E-02 | 1.53E-02 | 4.53E-02 | 15 | 100 |
| **Iron (Fe)** | µg/m$^3$ | *4* | - | 0 | 2.05E-01 | 2.49E-01 | 6.88E-02 | 8.11E-01 | 2.39E-01 | 2.32E-01 | 8.11E-01 | 15 | 100 |
| **Lead (Pb)** | µg/m$^3$ | *0.5* | *0.5* | 0 | 1.86E-03 | 2.14E-03 | 8.06E-04 | 6.98E-03 | 2.66E-03 | 2.14E-03 | 6.98E-03 | 15 | 100 |
| **Magnesium (Mg)** | µg/m$^3$ | - | - | - | 1.53E-01 | 1.70E-01 | 7.16E-02 | 3.77E-01 | 3.77E-01 | 1.65E-01 | 2.86E-01 | 15 | 100 |
| **Manganese (Mn)** | µg/m$^3$ | *0.4* | - | 0 | 5.78E-03 | 6.57E-03 | 1.97E-03 | 1.65E-02 | 7.74E-03 | 6.40E-03 | 1.65E-02 | 15 | 100 |
| **Molybdenum (Mo)** | µg/m$^3$ | *120* | - | 0 | 9.40E-04 | 1.05E-03 | 4.43E-04 | 2.77E-03 | 1.81E-03 | 1.17E-03 | 2.77E-03 | 15 | 100 |
| **Nickel (Ni)** | µg/m$^3$ | *0.2* | - | 0 | 8.58E-04 | 9.70E-04 | 5.52E-04 | 3.31E-03 | 9.04E-04 | 8.24E-04 | 3.31E-03 | 15 | 100 |
| **Phosphorus (P)** | µg/m$^3$ | - | - | - | 2.22E-01 | 2.23E-01 | 2.13E-01 | 2.36E-01 | 2.22E-01 | 2.29E-01 | 2.36E-01 | 15 | 100 |
| **Selenium (Se)** | µg/m$^3$ | *10* | *10* | 0 | 4.38E-04 | 4.71E-04 | 3.70E-04 | 1.13E-03 | 3.85E-04 | 9.39E-04 | 1.13E-03 | 15 | 100 |
| **Silver (Ag)** | µg/m$^3$ | *1* | *1* | 0 | 6.77E-05 | 1.24E-04 | 2.62E-05 | 6.70E-04 | 1.50E-04 | 3.40E-04 | 6.70E-04 | 15 | 100 |
| **Strontium (Sr)** | µg/m$^3$ | *120* | - | 0 | 3.04E-03 | 3.97E-03 | 8.53E-04 | 1.02E-02 | 4.78E-03 | 3.51E-03 | 1.02E-02 | 15 | 100 |
| **Thallium (Tl)** | µg/m$^3$ | - | - | - | 2.67E-05 | 2.67E-05 | 2.56E-05 | 2.83E-05 | 2.66E-05 | 2.74E-05 | 2.83E-05 | 15 | 100 |
| **Tin (Sn)** | µg/m$^3$ | *10* | *10* | 0 | 6.28E-04 | 7.31E-04 | 1.71E-04 | 2.22E-03 | 8.17E-04 | 7.81E-04 | 2.22E-03 | 15 | 100 |
| **Titanium (Ti)** | µg/m$^3$ | *120* | - | 0 | 4.26E-03 | 5.17E-03 | 3.13E-03 | 1.45E-02 | 3.26E-03 | 3.35E-03 | 1.45E-02 | 15 | 100 |
| **Uranium (Ur)** | µg/m$^3$ | *1.5* | - | 0 | 1.26E-05 | 1.64E-05 | 5.23E-06 | 5.34E-05 | 2.21E-05 | 2.70E-05 | 5.34E-05 | 15 | 100 |
| **Vanadium (V)** | µg/m$^3$ | *2* | *1* | 0 | 1.48E-03 | 1.48E-03 | 1.42E-03 | 1.57E-03 | 1.48E-03 | 1.52E-03 | 1.57E-03 | 15 | 100 |
| **Zinc (Zn)** | µg/m$^3$ | *120* | - | 0 | 4.08E-02 | 4.51E-02 | 1.96E-02 | 7.86E-02 | 5.68E-02 | 7.86E-02 | 7.18E-02 | 15 | 100 |
| **Zirconium (Zr)** | µg/m$^3$ | *20* | - | 0 | 5.93E-04 | 5.93E-04 | 5.69E-04 | 6.29E-04 | 5.92E-04 | 6.10E-04 | 6.29E-04 | 15 | 100 |

**Note:** All non-detectable results were reported as 1/2 of the detection limit

### 5.6.2 Rundle Road Station Results

Data recovery levels were high for the TSP sampler at the Rundle Road Station (100% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for TSP, mercury or metals during Q1. **Table 8** is a summary of the Station statistics.

**Table 8. Summary of TSP Sampler Rundle Road Station**

| Contaminant | Units | MECP Criteria | HHRA Health Based Criteria | No. > Criteria | Geometric Mean | Arithmetic Mean | Q1 Minimum Concentration | Q1 Maximum Concentration | January Maximum Concentration | February Maximum Concentration | March Maximum Concentration | Number of Valid Samples | % Valid data |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Particulate (TSP)** | µg/m$^3$ | *120* | *120* | 0 | 17.2 | 19.2 | 4.4 | 37.3 | 25.3 | 31.9 | 37.3 | 15 | 100 |
| **Total Mercury (Hg)** | µg/m$^3$ | *2* | *2* | 0 | 7.45E-06 | 9.19E-06 | 2.82E-06 | 2.95E-05 | 2.95E-05 | 1.50E-05 | 9.49E-06 | 15 | 100 |
| **Aluminum (Al)** | µg/m$^3$ | *4.8* | - | 0 | 1.02E-01 | 1.22E-01 | 3.44E-02 | 2.94E-01 | 8.90E-02 | 1.98E-01 | 2.94E-01 | 15 | 100 |
| **Antimony (Sb)** | µg/m$^3$ | *25* | *25* | 0 | 3.59E-04 | 5.94E-04 | 7.35E-05 | 2.70E-03 | 4.77E-04 | 8.01E-04 | 2.70E-03 | 15 | 100 |
| **Arsenic (As)** | µg/m$^3$ | *0.3* | *0.3* | 0 | 9.08E-04 | 9.08E-04 | 8.47E-04 | 9.51E-04 | 9.29E-04 | 9.39E-04 | 9.51E-04 | 15 | 100 |
| **Barium (Ba)** | µg/m$^3$ | *10* | *10* | 0 | 4.12E-03 | 4.75E-03 | 1.56E-03 | 1.30E-02 | 4.02E-03 | 8.39E-03 | 1.30E-02 | 15 | 100 |
| **Beryllium (Be)** | µg/m$^3$ | *0.01* | *0.01* | 0 | 1.51E-05 | 1.51E-05 | 1.41E-05 | 1.58E-05 | 1.55E-05 | 1.56E-05 | 1.58E-05 | 15 | 100 |
| **Bismuth (Bi)** | µg/m$^3$ | - | - | - | 5.45E-04 | 5.45E-04 | 5.08E-04 | 5.70E-04 | 5.57E-04 | 5.63E-04 | 5.70E-04 | 15 | 100 |
| **Boron (B)** | µg/m$^3$ | *120* | - | 0 | 4.79E-03 | 4.94E-03 | 4.24E-03 | 1.06E-02 | 4.64E-03 | 1.06E-02 | 4.75E-03 | 15 | 100 |
| **Cadmium (Cd)** | µg/m$^3$ | *0.025* | *0.025* | 0 | 1.68E-04 | 2.09E-04 | 4.70E-05 | 5.99E-04 | 4.74E-04 | 2.62E-04 | 5.99E-04 | 15 | 100 |
| **Chromium (Cr)** | µg/m$^3$ | *0.5* | - | 0 | 1.51E-03 | 1.66E-03 | 9.60E-04 | 3.16E-03 | 2.24E-03 | 2.57E-03 | 3.16E-03 | 15 | 100 |
| **Cobalt (Co)** | µg/m$^3$ | *0.1* | *0.1* | 0 | 9.30E-05 | 1.02E-04 | 4.58E-05 | 1.86E-04 | 7.86E-05 | 1.81E-04 | 1.86E-04 | 15 | 100 |
| **Copper (Cu)** | µg/m$^3$ | *50* | - | 0 | 7.84E-03 | 9.54E-03 | 2.88E-03 | 2.39E-02 | 8.68E-03 | 2.39E-02 | 2.08E-02 | 15 | 100 |
| **Iron (Fe)** | µg/m$^3$ | *4* | - | 0 | 2.17E-01 | 2.65E-01 | 6.44E-02 | 6.32E-01 | 2.21E-01 | 4.73E-01 | 6.32E-01 | 15 | 100 |
| **Lead (Pb)** | µg/m$^3$ | *0.5* | *0.5* | 0 | 2.44E-03 | 3.98E-03 | 1.20E-03 | 2.85E-02 | 3.26E-03 | 2.90E-03 | 2.85E-02 | 15 | 100 |
| **Magnesium (Mg)** | µg/m$^3$ | - | - | - | 1.68E-01 | 1.82E-01 | 6.70E-02 | 3.34E-01 | 3.34E-01 | 2.85E-01 | 3.13E-01 | 15 | 100 |
| **Manganese (Mn)** | µg/m$^3$ | *0.4* | - | 0 | 6.17E-03 | 7.09E-03 | 2.12E-03 | 1.54E-02 | 7.70E-03 | 1.34E-02 | 1.54E-02 | 15 | 100 |
| **Molybdenum (Mo)** | µg/m$^3$ | *120* | - | 0 | 5.36E-04 | 6.38E-04 | 1.08E-04 | 1.48E-03 | 6.23E-04 | 1.28E-03 | 1.48E-03 | 15 | 100 |
| **Nickel (Ni)** | µg/m$^3$ | *0.2* | - | 0 | 8.18E-04 | 8.72E-04 | 5.12E-04 | 1.51E-03 | 8.36E-04 | 1.12E-03 | 1.51E-03 | 15 | 100 |
| **Phosphorus (P)** | µg/m$^3$ | - | - | - | 2.27E-01 | 2.27E-01 | 2.12E-01 | 2.38E-01 | 2.32E-01 | 2.35E-01 | 2.38E-01 | 15 | 100 |
| **Selenium (Se)** | µg/m$^3$ | *10* | *10* | 0 | 4.47E-04 | 4.82E-04 | 3.67E-04 | 1.19E-03 | 4.02E-04 | 1.19E-03 | 9.49E-04 | 15 | 100 |
| **Silver (Ag)** | µg/m$^3$ | *1* | *1* | 0 | 6.87E-05 | 1.21E-04 | 2.54E-05 | 4.24E-04 | 4.24E-04 | 3.28E-04 | 6.58E-05 | 15 | 100 |
| **Strontium (Sr)** | µg/m$^3$ | *120* | - | 0 | 3.96E-03 | 4.69E-03 | 8.82E-04 | 1.08E-02 | 5.48E-03 | 7.95E-03 | 1.08E-02 | 15 | 100 |
| **Thallium (Tl)** | µg/m$^3$ | - | - | - | 2.72E-05 | 2.73E-05 | 2.54E-05 | 2.85E-05 | 2.79E-05 | 2.82E-05 | 2.85E-05 | 15 | 100 |
| **Tin (Sn)** | µg/m$^3$ | *10* | *10* | 0 | 6.09E-04 | 7.14E-04 | 1.76E-04 | 1.41E-03 | 8.99E-04 | 1.11E-03 | 1.41E-03 | 15 | 100 |
| **Titanium (Ti)** | µg/m$^3$ | *120* | - | 0 | 4.46E-03 | 5.21E-03 | 3.11E-03 | 1.33E-02 | 3.41E-03 | 8.76E-03 | 1.33E-02 | 15 | 100 |
| **Uranium (Ur)** | µg/m$^3$ | *1.5* | - | 0 | 1.25E-05 | 1.66E-05 | 3.84E-06 | 5.34E-05 | 9.78E-06 | 4.11E-05 | 5.34E-05 | 15 | 100 |
| **Vanadium (V)** | µg/m$^3$ | *2* | *1* | 0 | 1.51E-03 | 1.51E-03 | 1.41E-03 | 1.58E-03 | 1.55E-03 | 1.56E-03 | 1.58E-03 | 15 | 100 |
| **Zinc (Zn)** | µg/m$^3$ | *120* | - | 0 | 4.52E-02 | 4.90E-02 | 1.79E-02 | 9.11E-02 | 9.11E-02 | 8.26E-02 | 5.42E-02 | 15 | 100 |
| **Zirconium (Zr)** | µg/m$^3$ | *20* | - | 0 | 6.05E-04 | 6.06E-04 | 5.65E-04 | 6.34E-04 | 6.19E-04 | 6.26E-04 | 6.34E-04 | 15 | 100 |

**Note:** All non-detectable results were reported as 1/2 of the detection limit

## 5.7 PAH Results

All of the PUF Hi-Vols operated on a discrete schedule every 12 days for PAH's according to the NAPS schedule during Q1 with the sample days being: January 5th, 17th, 29th, February 10th, 22nd and March 6th, 18th and 30th, 2022.

### 5.7.1 Courtice Station Results

Data recovery levels were low for the PAH results at the Courtice Station (63% valid data). There was one (1) exceedance of the Benzo(a) Pyrene AAQC during Q1 of 2022. There were no other exceedances of any of the AAQC's or HHRA Criteria.

The exceedance occurred on March 18th, 2022. Since the winds were predominantly coming from the NE to the ESE, the Courtice Station was downwind of the DYEC during part of the sampling period. It is possible that the measured BaP exceedance is attributable to the Energy Centre operations; however, other sources may have also played a role.

The exceedance documentation is attached in **Appendix F**. **Table 9** outlines the statistics summary for this station.

**Table 9. Statistics Summary of PAH Results for Courtice Station**

| Contaminant | Units | MECP Criteria (µg/m³) | No. > Criteria | Arithmetic Mean | Minimum Q1 Concentration | Maximum Q1 Concentration | January Maximum Concentration | February Maximum Concentration | March Maximum Concentration | Number of Valid Samples | % Valid data |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1-Methylnaphthalene** | ng/m³ | 12000 | 0 | N/A [1] | 1.58E+00 | 1.56E+01 | 2.39E+00 | 1.58E+00 | 1.56E+01 | 5 | 63 |
| **2-Methylnaphthalene** | ng/m³ | 10000 | 0 | N/A [1] | 2.83E+00 | 3.23E+01 | 3.46E+00 | 2.83E+00 | 3.23E+01 | 5 | 63 |
| **Acenaphthene** | ng/m³ | - | - | N/A [1] | 2.16E-01 | 7.94E+00 | 2.16E-01 | 2.82E-01 | 7.94E+00 | 5 | 63 |
| **Acenaphthylene** | ng/m³ | 3500 | 0 | N/A [1] | 6.48E-02 | 4.37E-01 | 9.13E-02 | 6.48E-02 | 4.37E-01 | 5 | 63 |
| **Anthracene** | ng/m³ | 200 | 0 | N/A [1] | 2.28E-02 | 2.07E-01 | 2.61E-02 | 2.28E-02 | 2.07E-01 | 5 | 63 |
| **Benzo(a)Anthracene** | ng/m³ | - | - | N/A [1] | 1.88E-02 | 5.47E-02 | 4.50E-02 | 2.29E-02 | 5.47E-02 | 5 | 63 |
| **Benzo(a)fluorene** | ng/m³ | - | - | N/A [1] | 2.71E-02 | 7.50E-02 | 6.15E-02 | 4.37E-02 | 7.50E-02 | 5 | 63 |
| **Benzo(a)Pyrene (Historically High)** | ng/m³ | 0.05 | 1 | N/A [1] | 2.80E-02 | 6.84E-02 | 4.63E-02 | 2.80E-02 | 6.84E-02 | 5 | 63 |
| **Benzo(b)Fluoranthene** | ng/m³ | - | - | N/A [1] | 4.34E-02 | 3.73E-01 | 1.06E-01 | 4.34E-02 | 3.73E-01 | 5 | 63 |
| **Benzo(b)fluorene** | ng/m³ | - | - | N/A [1] | 1.52E-02 | 3.06E-02 | 2.86E-02 | 2.72E-02 | 3.06E-02 | 5 | 63 |
| **Benzo(e)Pyrene** | ng/m³ | - | - | N/A [1] | 2.66E-02 | 1.25E-01 | 9.42E-02 | 2.66E-02 | 1.25E-01 | 5 | 63 |
| **Benzo(g,h,i)Perylene** | ng/m³ | - | - | N/A [1] | 3.24E-02 | 1.24E-01 | 7.09E-02 | 3.24E-02 | 1.24E-01 | 5 | 63 |
| **Benzo(k)Fluoranthene** | ng/m³ | - | - | N/A [1] | 4.50E-02 | 3.48E-01 | 8.06E-02 | 4.50E-02 | 3.48E-01 | 5 | 63 |
| **Biphenyl** | ng/m³ | - | - | N/A [1] | 1.38E+00 | 8.58E+00 | 1.97E+00 | 1.38E+00 | 8.58E+00 | 5 | 63 |
| **Chrysene** | ng/m³ | - | - | N/A [1] | 6.64E-02 | 2.40E-01 | 1.35E-01 | 6.64E-02 | 2.40E-01 | 5 | 63 |
| **Dibenzo(a,h)Anthracene** | ng/m³ | - | - | N/A [1] | 3.17E-03 | 1.72E-02 | 1.07E-02 | 6.54E-03 | 1.72E-02 | 5 | 63 |
| **Fluoranthene** | ng/m³ | - | - | N/A [1] | 4.14E-01 | 1.23E+00 | 4.14E-01 | 5.35E-01 | 1.23E+00 | 5 | 63 |
| **Fluorene** | ng/m³ | - | - | N/A [1] | 7.02E-01 | 6.17E+00 | 7.02E-01 | 7.03E-01 | 6.17E+00 | 5 | 63 |
| **Indeno(1,2,3-cd)Pyrene** | ng/m³ | - | - | N/A [1] | 2.50E-02 | 1.25E-01 | 7.18E-02 | 2.50E-02 | 1.25E-01 | 5 | 63 |
| **Naphthalene** | ng/m³ | 22500 | 0 | N/A [1] | 1.24E+01 | 4.53E+01 | 1.74E+01 | 1.42E+01 | 4.53E+01 | 5 | 63 |
| **o-Terphenyl** | ng/m³ | - | - | N/A [1] | 6.67E-03 | 1.91E-02 | 1.59E-02 | 1.35E-02 | 1.91E-02 | 5 | 63 |
| **Perylene** | ng/m³ | - | - | N/A [1] | 3.06E-04 | 8.93E-03 | 8.93E-03 | 3.06E-04 | 7.47E-03 | 5 | 63 |
| **Phenanthrene** | ng/m³ | - | - | N/A [1] | 9.61E-01 | 8.73E+00 | 9.61E-01 | 1.24E+00 | 8.73E+00 | 5 | 63 |
| **Pyrene** | ng/m³ | - | - | N/A [1] | 2.02E-01 | 6.55E-01 | 2.02E-01 | 2.24E-01 | 6.55E-01 | 5 | 63 |
| **Tetralin** | ng/m³ | - | - | N/A [1] | 1.00E+00 | 6.20E+00 | 1.00E+00 | 1.35E+00 | 6.20E+00 | 5 | 63 |
| **Total PAH** | ng/m³ | - | - | N/A [1] | 24.76 | 134.93 | 29.65 | 24.76 | 134.93 | 5 | 63 |

**Note:** All non-detectable results were reported as 1/2 of the detection limit

[1] No quarterly average can be calculated due to insufficient data validity

### 5.7.2 Rundle Road Station Results

Data recovery levels were acceptable for the PAH results at the Rundle Road Station (75% valid data). There were three (3) exceedances of the Benzo(a) Pyrene AAQC during Q1 of 2022. There were no other exceedances of any of the AAQC's or HHRA Criteria.

The first exceedance occurred on February 22nd, 2022. Since the winds were predominantly coming from the ENE to the E, the Rundle Road Station was upwind of the DYEC during the sampling period. It is unlikely that the measured BaP exceedance is attributable to the Energy Centre operations.

The second exceedance occurred on March 6th, 2022. Since the winds were predominantly coming from the W and WSW, the Rundle Road Station was downwind of the DYEC during the sampling period. It is possible that the measured BaP exceedance is attributable to the Energy Centre operations; however, other sources may have also played a role.

The third exceedance occurred on March 30th, 2022. Since the winds were predominantly coming from the NE to the ESE, the Rundle Road Station was upwind of the DYEC during the sampling period. It is unlikely that the measured BaP exceedance is attributable to the Energy Centre operations.

The exceedance documentation is attached in **Appendix F**. **Table 10** outlines the statistics summary for this station.

**Table 10. Statistics Summary of PAH Results for Rundle Road Station**

| Contaminant | Units | MECP Criteria (µg/m³) | No. > Criteria | Arithmetic Mean | Minimum Q1 Concentration | Maximum Q1 Concentration | January Maximum Concentration | February Maximum Concentration | March Maximum Concentration | Number of Valid Samples | % Valid data |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1-Methylnaphthalene** | ng/m³ | 12000 | 0 | 4.79E+00 | 1.99E+00 | 8.90E+00 | 1.99E+00 | 5.22E+00 | 8.90E+00 | 6 | 75 |
| **2-Methylnaphthalene** | ng/m³ | 10000 | 0 | 8.31E+00 | 2.83E+00 | 1.69E+01 | 2.83E+00 | 9.25E+00 | 1.69E+01 | 6 | 75 |
| **Acenaphthene** | ng/m³ | - | - | 1.73E+00 | 1.60E-01 | 3.89E+00 | 1.60E-01 | 2.00E+00 | 3.89E+00 | 6 | 75 |
| **Acenaphthylene** | ng/m³ | 3500 | 0 | 1.04E+00 | 6.80E-02 | 5.27E+00 | 1.26E-01 | 3.75E-01 | 5.27E+00 | 6 | 75 |
| **Anthracene** | ng/m³ | 200 | 0 | 4.81E-01 | 4.47E-02 | 2.45E+00 | 9.29E-02 | 9.72E-02 | 2.45E+00 | 6 | 75 |
| **Benzo(a)Anthracene** | ng/m³ | - | - | 1.33E-01 | 2.73E-02 | 6.11E-01 | 2.87E-02 | 4.88E-02 | 6.11E-01 | 6 | 75 |
| **Benzo(a)fluorene** | ng/m³ | - | - | 1.80E-01 | 4.91E-02 | 7.37E-01 | 7.16E-02 | 6.91E-02 | 7.37E-01 | 6 | 75 |
| **Benzo(a)Pyrene (Historically High)** | ng/m³ | 0.05 | 3 | 2.31E-01 | 2.60E-02 | 1.16E+00 | 4.71E-02 | 5.81E-02 | 1.16E+00 | 6 | 75 |
| **Benzo(b)Fluoranthene** | ng/m³ | - | - | 3.11E-01 | 5.55E-02 | 1.28E+00 | 1.15E-01 | 1.65E-01 | 1.28E+00 | 6 | 75 |
| **Benzo(b)fluorene** | ng/m³ | - | - | 1.34E-01 | 1.90E-02 | 6.21E-01 | 4.90E-02 | 3.31E-02 | 6.21E-01 | 6 | 75 |
| **Benzo(e)Pyrene** | ng/m³ | - | - | 2.25E-01 | 3.22E-02 | 9.69E-01 | 7.84E-02 | 1.04E-01 | 9.69E-01 | 6 | 75 |
| **Benzo(g,h,i)Perylene** | ng/m³ | - | - | 2.83E-01 | 4.54E-02 | 1.29E+00 | 6.94E-02 | 1.15E-01 | 1.29E+00 | 6 | 75 |
| **Benzo(k)Fluoranthene** | ng/m³ | - | - | 2.79E-01 | 7.42E-02 | 1.11E+00 | 1.69E-01 | 1.18E-01 | 1.11E+00 | 6 | 75 |
| **Biphenyl** | ng/m³ | - | - | 3.32E+00 | 1.37E+00 | 8.06E+00 | 2.15E+00 | 3.81E+00 | 8.06E+00 | 6 | 75 |
| **Chrysene** | ng/m³ | - | - | 3.58E-01 | 6.56E-02 | 1.40E+00 | 1.31E-01 | 2.01E-01 | 1.40E+00 | 6 | 75 |
| **Dibenzo(a,h)Anthracene** | ng/m³ | - | - | 3.27E-02 | 8.75E-03 | 1.11E-01 | 3.03E-02 | 1.79E-02 | 1.11E-01 | 6 | 75 |
| **Fluoranthene** | ng/m³ | - | - | 1.43E+00 | 4.16E-01 | 4.80E+00 | 4.16E-01 | 1.07E+00 | 4.80E+00 | 6 | 75 |
| **Fluorene** | ng/m³ | - | - | 2.45E+00 | 7.10E-01 | 5.49E+00 | 7.10E-01 | 2.61E+00 | 5.49E+00 | 6 | 75 |
| **Indeno(1,2,3-cd)Pyrene** | ng/m³ | - | - | 2.55E-01 | 3.80E-02 | 1.12E+00 | 6.48E-02 | 1.05E-01 | 1.12E+00 | 6 | 75 |
| **Naphthalene** | ng/m³ | 22500 | 0 | 2.65E+01 | 1.11E+01 | 4.95E+01 | 2.54E+01 | 2.83E+01 | 4.95E+01 | 6 | 75 |
| **o-Terphenyl** | ng/m³ | - | - | 1.40E-02 | 3.11E-03 | 2.61E-02 | 9.97E-03 | 1.58E-02 | 2.61E-02 | 6 | 75 |
| **Perylene** | ng/m³ | - | - | 4.73E-02 | 3.11E-03 | 2.00E-01 | 3.35E-02 | 1.09E-02 | 2.00E-01 | 6 | 75 |
| **Phenanthrene** | ng/m³ | - | - | 4.93E+00 | 1.38E+00 | 1.39E+01 | 1.38E+00 | 4.31E+00 | 1.39E+01 | 6 | 75 |
| **Pyrene** | ng/m³ | - | - | 1.06E+00 | 2.63E-01 | 4.33E+00 | 2.63E-01 | 5.38E-01 | 4.33E+00 | 6 | 75 |
| **Tetralin** | ng/m³ | - | - | 1.45E+00 | 9.48E-02 | 2.40E+00 | 9.48E-02 | 2.40E+00 | 1.93E+00 | 6 | 75 |
| **Total PAH** | ng/m³ | - | - | 60.01 | 25.98 | 127.23 | 36.46 | 60.61 | 127.23 | 6 | 75 |

**Note:** All non-detectable results were reported as 1/2 of the detection limit

## 5.8 Dioxin and Furan Results

All of the PUF Hi-Vols operated on a discrete schedule every 24 days for D&F's according to the NAPS schedule during Q1 with the sample days being: January 5th, 29th, February 22nd and March 18th, 2022.

### 5.8.1 Courtice Station Results

Data recovery levels were low for the D&F results at the Courtice Station (50% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for any of the D&F's during Q1. **Table 11** is a summary of the statistics for this station.

**Table 11. Courtice Station Q1 Monitoring Results for Dioxins and Furans**

| Contaminant | Units | *MECP Criteria* | *HHRA Health Based Criteria* | No. > Criteria | Arithmetic Mean | Q1 Minimum Concentration | Q1 Maximum Concentration | January Maximum Concentration | February Maximum Concentration | March Maximum Concentration | Number of Valid Samples | % Valid data |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | pg/m$^3$ | - | - | - | N/A [2] | 1.00E-03 | 1.90E-03 | 1.00E-03 | N/A [3] | 1.90E-03 | 2 | 50 |
| **1,2,3,7,8-PeCDD** | pg/m$^3$ | - | - | - | N/A [2] | 1.09E-03 | 1.50E-03 | 1.50E-03 | N/A [3] | 1.09E-03 | 2 | 50 |
| **1,2,3,4,7,8-HxCDD** | pg/m$^3$ | - | - | - | N/A [2] | 2.43E-04 | 6.14E-04 | 2.43E-04 | N/A [3] | 6.14E-04 | 2 | 50 |
| **1,2,3,6,7,8-HxCDD** | pg/m$^3$ | - | - | - | N/A [2] | 3.64E-04 | 8.22E-04 | 8.22E-04 | N/A [3] | 3.64E-04 | 2 | 50 |
| **1,2,3,7,8,9-HxCDD** | pg/m$^3$ | - | - | - | N/A [2] | 2.37E-04 | 9.84E-04 | 9.84E-04 | N/A [3] | 2.37E-04 | 2 | 50 |
| **1,2,3,4,6,7,8-HpCDD** | pg/m$^3$ | - | - | - | N/A [2] | 8.64E-04 | 1.08E-03 | 8.64E-04 | N/A [3] | 1.08E-03 | 2 | 50 |
| **OCDD** | pg/m$^3$ | - | - | - | N/A [2] | 7.07E-05 | 1.03E-04 | 7.07E-05 | N/A [3] | 1.03E-04 | 2 | 50 |
| **2,3,7,8-TCDF** | pg/m$^3$ | - | - | - | N/A [2] | 1.18E-04 | 2.22E-04 | 1.18E-04 | N/A [3] | 2.22E-04 | 2 | 50 |
| **1,2,3,7,8-PeCDF** | pg/m$^3$ | - | - | - | N/A [2] | 5.22E-05 | 6.31E-05 | 6.31E-05 | N/A [3] | 5.22E-05 | 2 | 50 |
| **2,3,4,7,8-PeCDF** | pg/m$^3$ | - | - | - | N/A [2] | 6.31E-04 | 9.02E-04 | 6.31E-04 | N/A [3] | 9.02E-04 | 2 | 50 |
| **1,2,3,4,7,8-HxCDF** | pg/m$^3$ | - | - | - | N/A [2] | 2.06E-04 | 7.06E-04 | 7.06E-04 | N/A [3] | 2.06E-04 | 2 | 50 |
| **1,2,3,6,7,8-HxCDF** | pg/m$^3$ | - | - | - | N/A [2] | 2.27E-04 | 3.16E-04 | 2.27E-04 | N/A [3] | 3.16E-04 | 2 | 50 |
| **2,3,4,6,7,8-HxCDF** | pg/m$^3$ | - | - | - | N/A [2] | 3.72E-04 | 4.59E-04 | 3.72E-04 | N/A [3] | 4.59E-04 | 2 | 50 |
| **1,2,3,7,8,9-HxCDF** | pg/m$^3$ | - | - | - | N/A [2] | 1.74E-04 | 3.72E-04 | 3.72E-04 | N/A [3] | 1.74E-04 | 2 | 50 |
| **1,2,3,4,6,7,8-HpCDF** | pg/m$^3$ | - | - | - | N/A [2] | 2.14E-04 | 3.26E-04 | 2.14E-04 | N/A [3] | 3.26E-04 | 2 | 50 |
| **1,2,3,4,7,8,9-HpCDF** | pg/m$^3$ | - | - | - | N/A [2] | 9.49E-06 | 1.29E-04 | 1.29E-04 | N/A [3] | 9.49E-06 | 2 | 50 |
| **OCDF** | pg/m$^3$ | - | - | - | N/A [2] | 3.09E-06 | 8.16E-06 | 8.16E-06 | N/A [3] | 3.09E-06 | 2 | 50 |
| **Total Toxic Equivalency** | pg TEQ/m$^3$ | *0.1*<br>*1*[1] | - | 0 | N/A [2] | 8.05E-03 | 8.33E-03 | 8.33E-03 | N/A [3] | 8.05E-03 | 2 | 50 |

**Notes:** All non-detectable results were reported as 1/2 of the detection limit
[1] O. Reg. 419/05 Schedule Upper Risk Thresholds
[2] No quarterly average can be calculated due to insufficient data validity
[3] No valid February samples

### 5.8.2 Rundle Road Station Results

Data recovery levels were low for the D&F results at the Rundle Road Station (50% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for any of the D&F's during Q1. **Table 12** is a summary of the statistics for this station.

**Table 12. Rundle Road Station Q1 Monitoring Results for Dioxins and Furans**

| Contaminant | Units | *MECP Criteria* | *HHRA Health Based Criteria* | No. > Criteria | Arithmetic Mean | Q1 Minimum Concentration | Q1 Maximum Concentration | January Maximum Concentration | February Maximum Concentration | March Maximum Concentration | Number of Valid Samples | % Valid data |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | pg/m$^3$ | - | - | - | N/A [2] | 3.45E-04 | 9.06E-04 | N/A [3] | 9.06E-04 | 3.45E-04 | 2 | 50 |
| **1,2,3,7,8-PeCDD** | pg/m$^3$ | - | - | - | N/A [2] | 1.81E-03 | 2.76E-03 | N/A [3] | 1.81E-03 | 2.76E-03 | 2 | 50 |
| **1,2,3,4,7,8-HxCDD** | pg/m$^3$ | - | - | - | N/A [2] | 2.87E-04 | 3.45E-04 | N/A [3] | 2.87E-04 | 3.45E-04 | 2 | 50 |
| **1,2,3,6,7,8-HxCDD** | pg/m$^3$ | - | - | - | N/A [2] | 3.94E-04 | 6.36E-04 | N/A [3] | 3.94E-04 | 6.36E-04 | 2 | 50 |
| **1,2,3,7,8,9-HxCDD** | pg/m$^3$ | - | - | - | N/A [2] | 2.03E-04 | 6.21E-04 | N/A [3] | 2.03E-04 | 6.21E-04 | 2 | 50 |
| **1,2,3,4,6,7,8-HpCDD** | pg/m$^3$ | - | - | - | N/A [2] | 6.88E-04 | 8.50E-04 | N/A [3] | 6.88E-04 | 8.50E-04 | 2 | 50 |
| **OCDD** | pg/m$^3$ | - | - | - | N/A [2] | 7.13E-05 | 8.94E-05 | N/A [3] | 7.13E-05 | 8.94E-05 | 2 | 50 |
| **2,3,7,8-TCDF** | pg/m$^3$ | - | - | - | N/A [2] | 1.19E-04 | 3.07E-04 | N/A [3] | 1.19E-04 | 3.07E-04 | 2 | 50 |
| **1,2,3,7,8-PeCDF** | pg/m$^3$ | - | - | - | N/A [2] | 1.92E-05 | 1.10E-04 | N/A [3] | 1.92E-05 | 1.10E-04 | 2 | 50 |
| **2,3,4,7,8-PeCDF** | pg/m$^3$ | - | - | - | N/A [2] | 6.09E-04 | 1.81E-03 | N/A [3] | 6.09E-04 | 1.81E-03 | 2 | 50 |
| **1,2,3,4,7,8-HxCDF** | pg/m$^3$ | - | - | - | N/A [2] | 1.47E-04 | 5.64E-04 | N/A [3] | 1.47E-04 | 5.64E-04 | 2 | 50 |
| **1,2,3,6,7,8-HxCDF** | pg/m$^3$ | - | - | - | N/A [2] | 1.42E-04 | 5.55E-04 | N/A [3] | 1.42E-04 | 5.55E-04 | 2 | 50 |
| **2,3,4,6,7,8-HxCDF** | pg/m$^3$ | - | - | - | N/A [2] | 5.28E-04 | 1.01E-03 | N/A [3] | 5.28E-04 | 1.01E-03 | 2 | 50 |
| **1,2,3,7,8,9-HxCDF** | pg/m$^3$ | - | - | - | N/A [2] | 1.17E-04 | 3.67E-04 | N/A [3] | 1.17E-04 | 3.67E-04 | 2 | 50 |
| **1,2,3,4,6,7,8-HpCDF** | pg/m$^3$ | - | - | - | N/A [2] | 1.76E-04 | 2.69E-04 | N/A [3] | 1.76E-04 | 2.69E-04 | 2 | 50 |
| **1,2,3,4,7,8,9-HpCDF** | pg/m$^3$ | - | - | - | N/A [2] | 4.34E-05 | 4.70E-05 | N/A [3] | 4.34E-05 | 4.70E-05 | 2 | 50 |
| **OCDF** | pg/m$^3$ | - | - | - | N/A [2] | 5.55E-06 | 5.93E-06 | N/A [3] | 5.93E-06 | 5.55E-06 | 2 | 50 |
| **Total Toxic Equivalency** | pg TEQ/m$^3$ | *0.1*<br>*1*[1] | - | 0 | N/A [2] | 6.26E-03 | 1.07E-02 | N/A [3] | 6.26E-03 | 1.07E-02 | 2 | 50 |

**Notes:** All non-detectable results were reported as 1/2 of the detection limit
[1] O. Reg. 419/05 Schedule Upper Risk Thresholds
[2] No quarterly average can be calculated due to insufficient data validity
[3] No valid January samples

# 6 DATA REQUESTS

The following sections outline any instrumentation issues encountered that have caused data loss at any of the monitors at each of the stations.

**Appendix C** contains monthly IZS zero trends for the $NO_X$ and $SO_2$ analyzers at the Courtice and Rundle Road Stations.

Edit logs identifying missing data, maintenance times, calibrations and any other missing data have been included in **Appendix D**.

## 6.1 Continuous Monitoring

On March 6th, 2022, there were some erroneous $PM_{2.5}$ 5-minutre records, which resulted in one hour of the data being invalidated at the Courtice station.

On March 8th, 2022, a power failure occurred at the Courtice station, which resulted in one hour of NO, $NO_2$, $NO_X$, $PM_{2.5}$ and $SO_2$ data being invalidated.

## 6.2 Discrete Monitoring

The January 5th, 2022 Rundle PAH/ D&F sample was invalidated because of insufficient sample volume due to a tripped GFI outlet which stopped power to the sampler mid run.

The January 17th, 2022 Courtice PAH sample was invalidated because of insufficient sample volume due to a tripped GFI outlet which stopped power to the sampler mid run.

The PUF sampling media was shipped late by the laboratory and did not arrive to the technician until the late afternoon of January 28th (the installation date). Upon arrival, it was found that the PUF sample filter media was missing from the shipment. Upon discovering the missing media, the laboratory was closed and the run date was the following day. This resulted in invalid PAH and D&F samples for both stations on January 29th.

The February 22nd, 2022 Courtice PAH/ D&F sample was invalidated because of insufficient sample volume due to a tripped GFI outlet which stopped power to the sampler mid run.

# 7 CONCLUSIONS

This Q1 report provides a summary of the ambient air quality data collected at the Courtice and Rundle Road Stations. There were thirty-nine (39) exceedance events of the rolling 10-minute $SO_2$ AAQC and seventeen (17) exceedance events of the 1-hour $SO_2$ AAQC at the Courtice Station. There was one (1) exceedance of the Benzo(a) Pyrene AAQC, which occurred on March 18th at the Courtice Station, and three (3) exceedances of the Benzo(a) Pyrene AAQC, which occurred on February 22nd, March 6th and March 30th at the Rundle Road Station. Data recovery rates were acceptable and valid for all measured Q1 continuous and discrete parameters except for PAH's at the Courtice Station and D&F's at both Monitoring Stations.

# 8 REFERENCES

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3. Ontario Ministry of the Environment and Climate Change, 2018. [Technical Assessment and Standards Development Branch] Ontario Air Standards for Sulphur Dioxide ($SO_2$). [Online]

4. Ontario Ministry of the Environment and Climate Change, 2012. [Standards Development Branch] Ontario's Ambient Air Quality Criteria (Sorted by Contaminant Name). PIBS #6570e01

# APPENDIX A

**Table A1: 2022 Summary Statistics for Q1**

| Courtice Monitoring Station Data Statistics | Maximum 10 min Rolling Mean | Maximum 1 hr Rolling Mean | | | | | Maximum 24 hr Rolling Mean | | | | | Monthly Mean | | | | | Valid Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Compound | $SO_2$ | $PM_{2.5}$ | $NO_x$ | NO | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_x$ | NO | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_x$ | NO | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_x$ | NO | $NO_2$ | $SO_2$ |
| Units | ppb | ($\mu g/m^3$) | ppb | | | | ($\mu g/m^3$) | ppb | | | | ($\mu g/m^3$) | ppb | | | | (%) | | | | |
| AAQC/CAAQS | 67 | | | | 200 | 40 | 27[A] | | | 100 | | | | | | | | | | | |
| January | 143.6 | 33.9 | 73.8 | 36.4 | 41.7 | 68.1 | 22.9 | 31.9 | 6.0 | 25.9 | 7.7 | 6.5 | 6.8 | 1.0 | 5.9 | 1.9 | 99.9 | 99.5 | 99.5 | 99.5 | 99.5 |
| February | 13.8 | 45.6 | 41.0 | 15.8 | 34.8 | 6.2 | 22.0 | 27.0 | 4.7 | 22.3 | 2.0 | 6.4 | 5.1 | 0.5 | 4.8 | 0.8 | 99.9 | 99.6 | 99.6 | 99.6 | 99.7 |
| March | 224.5 | 32.3 | 87.9 | 54.9 | 35.2 | 111.1 | 16.9 | 32.3 | 15.3 | 17.5 | 15.9 | 6.1 | 8.1 | 1.7 | 6.5 | 3.2 | 99.7 | 99.6 | 99.6 | 99.6 | 99.2 |
| Q1 Arithmetic Mean | | | | | | | | | | | | 6.4 | 6.7 | 1.1 | 5.7 | 1.9 | 99.8 | 99.5 | 99.5 | 99.5 | 99.4 |

| Rundle Monitoring Station Data Statistics | Maximum 10 min Rolling Mean | Maximum 1 hr Rolling Mean | | | | | Maximum 24 hr Rolling Mean | | | | | Monthly Mean | | | | | Valid Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Compound | $SO_2$ | $PM_{2.5}$ | $NO_x$ | NO | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_x$ | NO | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_x$ | NO | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_x$ | NO | $NO_2$ | $SO_2$ |
| Units | ppb | ($\mu g/m^3$) | ppb | | | | ($\mu g/m^3$) | ppb | | | | ($\mu g/m^3$) | ppb | | | | (%) | | | | |
| AAQC/CAAQS | 67 | | | | 200 | 40 | 27[A] | | | 100 | | | | | | | | | | | |
| January | 9.9 | 32.2 | 34.1 | 14.5 | 28.3 | 4.8 | 25.3 | 20.3 | 2.5 | 17.8 | 1.0 | 6.7 | 4.9 | 0.8 | 4.1 | 0.2 | 99.9 | 99.6 | 99.6 | 99.6 | 99.7 |
| February | 2.4 | 42.9 | 48.1 | 19.9 | 38.6 | 2.1 | 23.0 | 19.0 | 3.0 | 16.6 | 1.2 | 6.8 | 6.1 | 0.9 | 5.2 | 0.5 | 99.7 | 99.7 | 99.7 | 99.7 | 99.7 |
| March | 29.2 | 28.2 | 51.7 | 31.0 | 28.3 | 10.9 | 16.9 | 26.0 | 8.2 | 18.1 | 0.8 | 6.2 | 6.0 | 1.3 | 4.8 | 0.2 | 99.6 | 99.6 | 99.6 | 99.6 | 99.7 |
| Q1 Arithmetic Mean | | | | | | | | | | | | 6.6 | 5.7 | 1.0 | 4.7 | 0.3 | 99.7 | 99.6 | 99.6 | 99.6 | 99.7 |

| Event Statistics | Rolling Mean > 10 min AAQC for Courtice | Rolling Mean > 10 min AAQC for Rundle | Rolling Mean > 1 hr AAQC for Courtice | | | Rolling Mean > 1 hr AAQC for Rundle | | | Rolling Mean > 24 hr AAQC for Courtice Monitoring Station | | | Rolling Mean > 24 hr AAQC for Rundle Monitoring Station | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Compound | $SO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $NO_2$ | $SO_2$ |
| Units | No. | No. | No. | | | No. | | | No. | | | No. | | |
| January | 10 | 0 | | 0 | 4 | | 0 | 0 | N/A | 0 | | N/A | 0 | |
| February | 0 | 0 | | 0 | 0 | | 0 | 0 | N/A | 0 | | N/A | 0 | |
| March | 28 | 0 | | 0 | 14 | | 0 | 0 | N/A | 0 | | N/A | 0 | |
| Q1 Total | 38 | 0 | | 0 | 18 | | 0 | 0 | N/A | 0 | | N/A | 0 | |

| Courtice Station MET Statistics | Maximum 1 hr Mean | | | | | Minimum 1 hr Mean | | | | | Monthly Mean | | | | | Total | Valid Data | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | WS | Temp | RH | Pres | Rain | WS | Temp | RH | Pres | Rain | WS | Temp | RH | Pres | Rain | Rain | WS | WD | Temp | RH | Pres | Rain |
| Units | (km/hr) | (°C) | (%) | "Hg | mm | (km/hr) | (°C) | (%) | "Hg | mm | (km/hr) | (°C) | (%) | "Hg | mm | mm | (%) | | | | | |
| January | 45.7 | 4.7 | 100.0 | 30.4 | 1.0 | 0.1 | -23.6 | 24.1 | 28.9 | 0.0 | 15.2 | -7.4 | 60.1 | 29.8 | 0.0 | 4.3 | 100.0 | 98.8 | 100.0 | 100.0 | 100.0 | 100.0 |
| February | 51.1 | 7.1 | 100.0 | 30.3 | 4.0 | 1.1 | -18.8 | 25.9 | 29.2 | 0.0 | 15.3 | -3.9 | 61.2 | 29.8 | 0.1 | 50.7 | 100.0 | 99.4 | 100.0 | 100.0 | 100.0 | 100.0 |
| March | 44.4 | 14.7 | 100.0 | 30.2 | 4.4 | 0.3 | -13.1 | 19.3 | 29.0 | 0.0 | 13.6 | 0.6 | 66.2 | 29.7 | 0.1 | 41.0 | 100.0 | 96.8 | 100.0 | 100.0 | 100.0 | 100.0 |
| Q1 Arithmetic Mean | | | | | | | | | | | 14.7 | -3.5 | 62.5 | 29.8 | 0.0 | 96.0 | 100.0 | 98.3 | 100.0 | 100.0 | 100.0 | 100.0 |

| Rundle Station MET Statistics | Maximum 1 hr Mean | | | | Minimum 1 hr Mean | | | | Monthly Mean | | | | Total | Valid Data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | WS | Temp | RH | Rain | WS | Temp | RH | Rain | WS | Temp | RH | Rain | Rain | WS | WD | Temp | RH | Rain |
| Units | (km/hr) | (°C) | (%) | mm | (km/hr) | (°C) | (%) | mm | (km/hr) | (°C) | (%) | mm | mm | (%) | | | | |
| January | 40.8 | 4.5 | 100.0 | 0.5 | 0.0 | -26.9 | 28.9 | 0.0 | 11.6 | -8.1 | 67.0 | 0.0 | 5.6 | 100.0 | 97.7 | 100.0 | 100.0 | 100.0 |
| February | 40.8 | 6.7 | 100.0 | 4.8 | 1.2 | -19.5 | 32.3 | 0.0 | 12.0 | -4.4 | 68.0 | 0.1 | 69.0 | 100.0 | 99.0 | 100.0 | 100.0 | 100.0 |
| March | 36.2 | 14.1 | 100.0 | 5.5 | 0.4 | -16.0 | 25.2 | 0.0 | 11.0 | 0.4 | 71.3 | 0.1 | 66.7 | 100.0 | 96.2 | 100.0 | 100.0 | 100.0 |
| Q1 Arithmetic Mean | | | | | | | | | 11.5 | -4.1 | 68.8 | 0.1 | 141.3 | 100.0 | 97.6 | 100.0 | 100.0 | 100.0 |

## Table A2: 2022 Q1 Station Courtice Monitoring Results for $PM_{2.5}$

| Data Statistics | Rolling Mean > 24 hr AAQC | Arithmetic Mean | Maximum 1 hr Rolling Mean | Maximum 24 hr Rolling Mean | Number of Valid Hours | Valid Data |
|---|---|---|---|---|---|---|
| Month | $PM_{2.5}$ | $PM_{2.5}$ | $PM_{2.5}$ | $PM_{2.5}$ | $PM_{2.5}$ | $PM_{2.5}$ |
| | No. | ($ug/m^3$) | ($ug/m^3$) | ($ug/m^3$) | No. | % |
| January | N/A | 6.5 | 33.9 | 22.9 | 743 | 99.9 |
| February | N/A | 6.4 | 45.6 | 22.0 | 671 | 99.9 |
| March | N/A | 6.1 | 32.3 | 16.9 | 742 | 99.7 |

## Table A3: 2022 Q1 Station Rundle Monitoring Results for $PM_{2.5}$

| Data Statistics | Rolling Mean > 24 hr AAQC | Arithmetic Mean | Maximum 1 hr Rolling Mean | Maximum 24 hr Rolling Mean | Number of Valid Hours | Valid Data |
|---|---|---|---|---|---|---|
| Month | $PM_{2.5}$ | $PM_{2.5}$ | $PM_{2.5}$ | $PM_{2.5}$ | $PM_{2.5}$ | $PM_{2.5}$ |
| | No. | ($ug/m^3$) | ($ug/m^3$) | ($ug/m^3$) | No. | % |
| January | N/A | 6.7 | 32.2 | 25.3 | 743 | 99.9 |
| February | N/A | 6.8 | 42.9 | 23.0 | 670 | 99.7 |
| March | N/A | 6.2 | 28.2 | 16.9 | 741 | 99.6 |

## Table A4: 2022 Q1 Station Courtice Monitoring Results for NOx

| Data Statistics | Events > 1 hr AAQC | Events > 24 hr AAQC | Arithmetic Mean | Maximum 1 hr Rolling Mean | Maximum 24 hr Rolling Mean | Number of Valid Hours | Valid Data |
|---|---|---|---|---|---|---|---|
| Month | $NO_x$ | $NO_x$ | $NO_x$ | $NO_x$ | $NO_x$ | $NO_x$ | $NO_x$ |
| | No. | No. | (ppb) | (ppb) | (ppb) | No. | % |
| January | N/A | N/A | 6.8 | 73.8 | 31.9 | 740 | 99.5 |
| February | N/A | N/A | 5.1 | 41.0 | 27.0 | 669 | 99.6 |
| March | N/A | N/A | 8.1 | 87.9 | 32.3 | 741 | 99.6 |

## Table A5: 2022 Q1 Station Rundle Monitoring Results for NOx

| Data Statistics | Events > 1 hr AAQC | Events > 24 hr AAQC | Arithmetic Mean | Maximum 1 hr Rolling Mean | Maximum 24 hr Rolling Mean | Number of Valid Hours | Valid Data |
|---|---|---|---|---|---|---|---|
| Month | $NO_x$ | $NO_x$ | $NO_x$ | $NO_x$ | $NO_x$ | $NO_x$ | $NO_x$ |
| | No. | No. | (ppb) | (ppb) | (ppb) | No. | % |
| January | N/A | N/A | 4.9 | 34.1 | 20.3 | 741 | 99.6 |
| February | N/A | N/A | 6.1 | 48.1 | 19.0 | 670 | 99.7 |
| March | N/A | N/A | 6.0 | 51.7 | 26.0 | 741 | 99.6 |

## Table A6: 2022 Q1 Station Courtice  Monitoring Results for NO

| Data Statistics | Events > 1 hr AAQC | Events > 24 hr AAQC | Arithmetic Mean | Maximum 1 hr Rolling Mean | Maximum 24 hr Rolling Mean | Number of Valid Hours | Valid Data |
|---|---|---|---|---|---|---|---|
| Month | NO | NO | NO | NO | NO | NO | NO |
| | No. | No. | (ppb) | (ppb) | (ppb) | No. | % |
| January | N/A | N/A | 1.0 | 36.4 | 6.0 | 740 | 99.5 |
| February | N/A | N/A | 0.5 | 15.8 | 4.7 | 669 | 99.6 |
| March | N/A | N/A | 1.7 | 54.9 | 15.3 | 741 | 99.6 |

## Table A7: 2022 Q1 Station Rundle Monitoring Results for NO

| Data Statistics | Events > 1 hr AAQC | Events > 24 hr AAQC | Arithmetic Mean | Maximum 1 hr Rolling Mean | Maximum 24 hr Rolling Mean | Number of Valid Hours | Valid Data |
|---|---|---|---|---|---|---|---|
| Month | NO | NO | NO | NO | NO | NO | NO |
| | No. | No. | (ppb) | (ppb) | (ppb) | No. | % |
| January | N/A | N/A | 0.8 | 14.5 | 2.5 | 741 | 99.6 |
| February | N/A | N/A | 0.9 | 19.9 | 3.0 | 670 | 99.7 |
| March | N/A | N/A | 1.3 | 31.0 | 8.2 | 741 | 99.6 |

## Table A8: 2022 Q1 Station Courtice Monitoring Results for $NO_2$

| Data Statistics | Events > 1 hr AAQC | Events > 24 hr AAQC | Arithmetic Mean | Maximum 1 hr Rolling Mean | Maximum 24 hr Rolling Mean | Number of Valid Hours | Valid Data |
|---|---|---|---|---|---|---|---|
| Month | $NO_2$ | $NO_2$ | $NO_2$ | $NO_2$ | $NO_2$ | $NO_2$ | $NO_2$ |
| | No. | No. | (ppb) | (ppb) | (ppb) | No. | % |
| January | 0 | 0 | 5.9 | 41.7 | 25.9 | 740 | 99.5 |
| February | 0 | 0 | 4.8 | 34.8 | 22.3 | 669 | 99.6 |
| March | 0 | 0 | 6.5 | 35.2 | 17.5 | 741 | 99.6 |

## Table A9: 2022 Q1 Station Rundle Monitoring Results for $NO_2$

| Data Statistics | Events > 1 hr AAQC | Events > 24 hr AAQC | Arithmetic Mean | Maximum 1 hr Rolling Mean | Maximum 24 hr Rolling Mean | Number of Valid Hours | Valid Data |
|---|---|---|---|---|---|---|---|
| Month | $NO_2$ | $NO_2$ | $NO_2$ | $NO_2$ | $NO_2$ | $NO_2$ | $NO_2$ |
| | No. | No. | (ppb) | (ppb) | (ppb) | No. | % |
| January | 0 | 0 | 4.1 | 28.3 | 17.8 | 741 | 99.6 |
| February | 0 | 0 | 5.2 | 38.6 | 16.6 | 670 | 99.7 |
| March | 0 | 0 | 4.8 | 28.3 | 18.1 | 741 | 99.6 |

## Table A10: 2022 Q1 Station Courtice Monitoring Results for $SO_2$

| Data Statistics | Events > 10 min AAQC | Events > 1 hr AAQC | Arithmetic Mean | Maximum 10 min Rolling Mean | Maximum 1 hr Rolling Mean | Maximum 24 hr Rolling Mean | Number of Valid Hours | Valid Data |
|---|---|---|---|---|---|---|---|---|
| Month | $SO_2$ | $SO_2$ | $SO_2$ | $SO_2$ | $SO_2$ | $SO_2$ | $SO_2$ | $SO_2$ |
| | No. | No. | (ppb) | (ppb) | (ppb) | (ppb) | No. | % |
| January | 10 | 4 | 1.9 | 143.6 | 68.1 | 7.7 | 740 | 99.5 |
| February | 0 | 0 | 0.8 | 13.8 | 6.2 | 2.0 | 670 | 99.7 |
| March | 28 | 14 | 3.2 | 224.5 | 111.1 | 15.9 | 738 | 99.2 |

## Table A11: 2022 Q1 Station Rundle Monitoring Results for $SO_2$

| Data Statistics | Events > 10 min AAQC | Events > 1 hr AAQC | Arithmetic Mean | Maximum 10 min Rolling Mean | Maximum 1 hr Rolling Mean | Maximum 24 hr Rolling Mean | Number of Valid Hours | Valid Data |
|---|---|---|---|---|---|---|---|---|
| Month | $SO_2$ | $SO_2$ | $SO_2$ | $SO_2$ | $SO_2$ | $SO_2$ | $SO_2$ | $SO_2$ |
| | No. | No. | (ppb) | (ppb) | (ppb) | (ppb) | No. | % |
| January | 0 | 0 | 0.2 | 9.9 | 4.8 | 1.0 | 742 | 99.7 |
| February | 0 | 0 | 0.5 | 2.4 | 2.1 | 1.2 | 670 | 99.7 |
| March | 0 | 0 | 0.2 | 29.2 | 10.9 | 0.8 | 742 | 99.7 |

## Table A12: 2022 Q1 Courtice Meterological Station Windspeed Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Monthly Mean | Valid Data |
|---|---|---|---|---|
| Month | Wind Speed | Wind Speed | Wind Speed | Wind Speed |
| | (km/hr) | (km/hr) | (km/hr) | (%) |
| January | 45.7 | 0.1 | 15.2 | 100.0 |
| February | 51.1 | 1.1 | 15.3 | 100.0 |
| March | 44.4 | 0.3 | 13.6 | 100.0 |

## Table A13: 2022 Q1 Rundle Meterological Station Windspeed Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Monthly Mean | Valid Hours |
|---|---|---|---|---|
| Month | Wind Speed | Wind Speed | Wind Speed | Wind Speed |
| | (km/hr) | (km/hr) | (km/hr) | (%) |
| January | 40.8 | 0.0 | 11.6 | 100.0 |
| February | 40.8 | 1.2 | 12.0 | 100.0 |
| March | 36.2 | 0.4 | 11.0 | 100.0 |

## Table A14: 2022 Q1 Courtice Meterological Station Wind Direction Data Summary

| MET Statistics | Valid Data |
|---|---|
| Month | Wind Direction |
| | (%) |
| January | 98.8 |
| February | 99.4 |
| March | 96.8 |

## Table A15: 2022 Q1 Rundle Meterological Station Wind Direction Data Summary

| MET Statistics | Valid Data |
|---|---|
| Month | Wind Direction |
| | (%) |
| January | 97.7 |
| February | 99.0 |
| March | 96.2 |

## Table A16: 2022 Q1 Courtice Meterological Station Temperature Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Monthly Mean | Valid Data |
|---|---|---|---|---|
| Month | Temperature | Temperature | Temperature | Temperature |
| | (°C) | (°C) | (°C) | (%) |
| January | 4.7 | -23.6 | -7.4 | 100.0 |
| February | 7.1 | -18.8 | -3.9 | 100.0 |
| March | 14.7 | -13.1 | 0.6 | 100.0 |

## Table A17: 2022 Q1 Rundle Meterological Station Temperature Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Monthly Mean | Valid Data |
|---|---|---|---|---|
| Month | Temperature | Temperature | Temperature | Temperature |
| | (°C) | (°C) | (°C) | (%) |
| January | 4.5 | -26.9 | -8.1 | 100.0 |
| February | 6.7 | -19.5 | -4.4 | 100.0 |
| March | 14.1 | -16.0 | 0.4 | 100.0 |

## Table A18: 2022 Q1 Courtice Meterological Station Relative Humidity Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Monthly Mean | Valid Data |
|---|---|---|---|---|
| Month | Relative Humidity | Relative Humidity | Relative Humidity | Relative Humidity |
| | (%) | (%) | (%) | (%) |
| January | 100.0 | 24.1 | 60.1 | 100.0 |
| February | 100.0 | 25.9 | 61.2 | 100.0 |
| March | 100.0 | 19.3 | 66.2 | 100.0 |

## Table A19: 2022 Q1 Rundle Meterological Station Relative Humidity Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Monthly Mean | Valid Data |
|---|---|---|---|---|
| Month | Relative Humidity | Relative Humidity | Relative Humidity | Relative Humidity |
| | (%) | (%) | (%) | (%) |
| January | 100.0 | 28.9 | 67.0 | 100.0 |
| February | 100.0 | 32.3 | 68.0 | 100.0 |
| March | 100.0 | 25.2 | 71.3 | 100.0 |

## Table A20: 2022 Q1 Courtice Meterological Station Precipitation Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Monthly Mean | Total | Valid Data |
|---|---|---|---|---|---|
| Month | Precipitation | Precipitation | Precipitation | Precipitation | Precipitation |
| | (mm) | (mm) | (mm) | (mm) | % |
| January | 1.0 | 0.0 | 0.0 | 4.3 | 100.0 |
| February | 4.0 | 0.0 | 0.1 | 50.7 | 100.0 |
| March | 4.4 | 0.0 | 0.1 | 41.0 | 100.0 |

## Table A21: 2022 Q1 Rundle Meterological Station Precipitation Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Monthly Mean | Total | Valid Data |
|---|---|---|---|---|---|
| Month | Precipitation | Precipitation | Precipitation | Precipitation | Precipitation |
| | (mm) | (mm) | (mm) | (mm) | % |
| January | 0.5 | 0.0 | 0.0 | 5.6 | 100.0 |
| February | 4.8 | 0.0 | 0.1 | 69.0 | 100.0 |
| March | 5.5 | 0.0 | 0.1 | 66.7 | 100.0 |

## Table A22: 2022 Q1 Courtice Meterological Station Pressure Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Monthly Mean | Valid Data |
|---|---|---|---|---|
| Month | Pressure | Pressure | Pressure | Pressure |
| | ("Hg) | ("Hg) | ("Hg) | (%) |
| January | 30.4 | 28.9 | 29.8 | 100.0 |
| February | 30.3 | 29.2 | 29.8 | 100.0 |
| March | 30.2 | 29.0 | 29.7 | 100.0 |

# APPENDIX B

**Table B1: Summary of Sample Flow Rate and Sample Duration for Dioxins & Furans**

| Sample Date | Courtice | | | Rundle | | |
|---|---|---|---|---|---|---|
| | Filter ID | Sample Duration | Sample Volume | Filter ID | Sample Duration | Sample Volume |
| | No. | (min) | ($m^3$) | No. | (min) | ($m^3$) |
| January 5, 2022 | L2677335-1 | 1440 | 309 | Invalid Sample | | |
| January 29, 2022 | Invalid Sample | | | Invalid Sample | | |
| February 22, 2022 | Invalid Sample | | | L2563689-2 | 1440 | 320 |
| March 18, 2022 | L2694361-2 | 1440 | 316 | L2694361-1 | 1440 | 319 |

**Table B2: 2022 Courtice Station Q1 Monitoring Results for Dioxins & Furans**

| Contaminant | Units | *MECP Criteria* | *HHRA Health Based Criteria* | 5 Jan-22 | 29 Jan-22 | 22 Feb-22 | 18 Mar 22 | MECP Criteria (µg/m$^3$) | No. > Criteria | Arithmetic Mean | Q4 Minimum Concentration | Q4 Maximum Concentration | January Maximum Concentration | February Maximum Concentration | March Maximum Concentration | Number of Valid Samples | % Valid data |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | pg/m$^3$ | - | - | 1.00E-03 | Invalid Sample | Invalid Sample | 1.90E-03 | - | - | N/A [2] | 1.00E-03 | 1.90E-03 | 1.00E-03 | N/A [3] | 1.90E-03 | 2 | 50 |
| 1,2,3,7,8-PeCDD | pg/m$^3$ | - | - | 1.50E-03 | | | 1.09E-03 | - | - | N/A [2] | 1.09E-03 | 1.50E-03 | 1.50E-03 | N/A [3] | 1.09E-03 | 2 | 50 |
| 1,2,3,4,7,8-HxCDD | pg/m$^3$ | - | - | 2.43E-04 | | | 6.14E-04 | - | - | N/A [2] | 2.43E-04 | 6.14E-04 | 2.43E-04 | N/A [3] | 6.14E-04 | 2 | 50 |
| 1,2,3,6,7,8-HxCDD | pg/m$^3$ | - | - | 8.22E-04 | | | 3.64E-04 | - | - | N/A [2] | 3.64E-04 | 8.22E-04 | 8.22E-04 | N/A [3] | 3.64E-04 | 2 | 50 |
| 1,2,3,7,8,9-HxCDD | pg/m$^3$ | - | - | 9.84E-04 | | | 2.37E-04 | - | - | N/A [2] | 2.37E-04 | 9.84E-04 | 9.84E-04 | N/A [3] | 2.37E-04 | 2 | 50 |
| 1,2,3,4,6,7,8-HpCDD | pg/m$^3$ | - | - | 8.64E-04 | | | 1.08E-03 | - | - | N/A [2] | 8.64E-04 | 1.08E-03 | 8.64E-04 | N/A [3] | 1.08E-03 | 2 | 50 |
| OCDD | pg/m$^3$ | - | - | 7.07E-05 | | | 1.03E-04 | - | - | N/A [2] | 7.07E-05 | 1.03E-04 | 7.07E-05 | N/A [3] | 1.03E-04 | 2 | 50 |
| 2,3,7,8-TCDF | pg/m$^3$ | - | - | 1.18E-04 | | | 2.22E-04 | - | - | N/A [2] | 1.18E-04 | 2.22E-04 | 1.18E-04 | N/A [3] | 2.22E-04 | 2 | 50 |
| 1,2,3,7,8-PeCDF | pg/m$^3$ | - | - | 6.31E-05 | | | 5.22E-05 | - | - | N/A [2] | 5.22E-05 | 6.31E-05 | 6.31E-05 | N/A [3] | 5.22E-05 | 2 | 50 |
| 2,3,4,7,8-PeCDF | pg/m$^3$ | - | - | 6.31E-04 | | | 9.02E-04 | - | - | N/A [2] | 6.31E-04 | 9.02E-04 | 6.31E-04 | N/A [3] | 9.02E-04 | 2 | 50 |
| 1,2,3,4,7,8-HxCDF | pg/m$^3$ | - | - | 7.06E-04 | | | 2.06E-04 | - | - | N/A [2] | 2.06E-04 | 7.06E-04 | 7.06E-04 | N/A [3] | 2.06E-04 | 2 | 50 |
| 1,2,3,6,7,8-HxCDF | pg/m$^3$ | - | - | 2.27E-04 | | | 3.16E-04 | - | - | N/A [2] | 2.27E-04 | 3.16E-04 | 2.27E-04 | N/A [3] | 3.16E-04 | 2 | 50 |
| 2,3,4,6,7,8-HxCDF | pg/m$^3$ | - | - | 3.72E-04 | | | 4.59E-04 | - | - | N/A [2] | 3.72E-04 | 4.59E-04 | 3.72E-04 | N/A [3] | 4.59E-04 | 2 | 50 |
| 1,2,3,7,8,9-HxCDF | pg/m$^3$ | - | - | 3.72E-04 | | | 1.74E-04 | - | - | N/A [2] | 1.74E-04 | 3.72E-04 | 3.72E-04 | N/A [3] | 1.74E-04 | 2 | 50 |
| 1,2,3,4,6,7,8-HpCDF | pg/m$^3$ | - | - | 2.14E-04 | | | 3.26E-04 | - | - | N/A [2] | 2.14E-04 | 3.26E-04 | 2.14E-04 | N/A [3] | 3.26E-04 | 2 | 50 |
| 1,2,3,4,7,8,9-HpCDF | pg/m$^3$ | - | - | 1.29E-04 | | | 9.49E-06 | - | - | N/A [2] | 9.49E-06 | 1.29E-04 | 1.29E-04 | N/A [3] | 9.49E-06 | 2 | 50 |
| OCDF | pg/m$^3$ | - | - | 8.16E-06 | | | 3.09E-06 | - | - | N/A [2] | 3.09E-06 | 8.16E-06 | 8.16E-06 | N/A [3] | 3.09E-06 | 2 | 50 |
| Total Toxic Equivalency | pg TEQ/m$^3$ | *0.1 1* [1] | - | 8.33E-03 | | | 8.05E-03 | 0.1 | 0 | N/A [2] | 8.05E-03 | 8.33E-03 | 8.33E-03 | N/A [3] | 8.05E-03 | 2 | 50 |

NOTE: All non-detectable results were reported as 1/2 of the detection limit

[1] O. Reg. 419/05 Schedule Upper Risk Thresholds

**Table B3: 2022 Rundle Road Station Q1 Monitoring Results for Dioxins & Furans**

| Contaminant | Units | *MECP Criteria* | *HHRA Health Based Criteria* | 5 Jan-22 | 29 Jan-22 | 22 Feb-22 | 18 Mar 22 | MECP Criteria (µg/m$^3$) | No. > Criteria | Arithmetic Mean | Q4 Minimum Concentration | Q4 Maximum Concentration | January Maximum Concentration | February Maximum Concentration | March Maximum Concentration | Number of Valid Samples | % Valid data |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | pg/m$^3$ | - | - | Invalid Sample | Invalid Sample | 9.06E-04 | 3.45E-04 | - | - | N/A [2] | 3.45E-04 | 9.06E-04 | N/A [3] | 9.06E-04 | 3.45E-04 | 2 | 50 |
| 1,2,3,7,8-PeCDD | pg/m$^3$ | - | - | | | 1.81E-03 | 2.76E-03 | - | - | N/A [2] | 1.81E-03 | 2.76E-03 | N/A [3] | 1.81E-03 | 2.76E-03 | 2 | 50 |
| 1,2,3,4,7,8-HxCDD | pg/m$^3$ | - | - | | | 2.87E-04 | 3.45E-04 | - | - | N/A [2] | 2.87E-04 | 3.45E-04 | N/A [3] | 2.87E-04 | 3.45E-04 | 2 | 50 |
| 1,2,3,6,7,8-HxCDD | pg/m$^3$ | - | - | | | 3.94E-04 | 6.36E-04 | - | - | N/A [2] | 3.94E-04 | 6.36E-04 | N/A [3] | 3.94E-04 | 6.36E-04 | 2 | 50 |
| 1,2,3,7,8,9-HxCDD | pg/m$^3$ | - | - | | | 2.03E-04 | 6.21E-04 | - | - | N/A [2] | 2.03E-04 | 6.21E-04 | N/A [3] | 2.03E-04 | 6.21E-04 | 2 | 50 |
| 1,2,3,4,6,7,8-HpCDD | pg/m$^3$ | - | - | | | 6.88E-04 | 8.50E-04 | - | - | N/A [2] | 6.88E-04 | 8.50E-04 | N/A [3] | 6.88E-04 | 8.50E-04 | 2 | 50 |
| OCDD | pg/m$^3$ | - | - | | | 7.13E-05 | 8.94E-05 | - | - | N/A [2] | 7.13E-05 | 8.94E-05 | N/A [3] | 7.13E-05 | 8.94E-05 | 2 | 50 |
| 2,3,7,8-TCDF | pg/m$^3$ | - | - | | | 1.19E-04 | 3.07E-04 | - | - | N/A [2] | 1.19E-04 | 3.07E-04 | N/A [3] | 1.19E-04 | 3.07E-04 | 2 | 50 |
| 1,2,3,7,8-PeCDF | pg/m$^3$ | - | - | | | 1.92E-05 | 1.10E-04 | - | - | N/A [2] | 1.92E-05 | 1.10E-04 | N/A [3] | 1.92E-05 | 1.10E-04 | 2 | 50 |
| 2,3,4,7,8-PeCDF | pg/m$^3$ | - | - | | | 6.09E-04 | 1.81E-03 | - | - | N/A [2] | 6.09E-04 | 1.81E-03 | N/A [3] | 6.09E-04 | 1.81E-03 | 2 | 50 |
| 1,2,3,4,7,8-HxCDF | pg/m$^3$ | - | - | | | 1.47E-04 | 5.64E-04 | - | - | N/A [2] | 1.47E-04 | 5.64E-04 | N/A [3] | 1.47E-04 | 5.64E-04 | 2 | 50 |
| 1,2,3,6,7,8-HxCDF | pg/m$^3$ | - | - | | | 1.42E-04 | 5.55E-04 | - | - | N/A [2] | 1.42E-04 | 5.55E-04 | N/A [3] | 1.42E-04 | 5.55E-04 | 2 | 50 |
| 2,3,4,6,7,8-HxCDF | pg/m$^3$ | - | - | | | 5.28E-04 | 1.01E-03 | - | - | N/A [2] | 5.28E-04 | 1.01E-03 | N/A [3] | 5.28E-04 | 1.01E-03 | 2 | 50 |
| 1,2,3,7,8,9-HxCDF | pg/m$^3$ | - | - | | | 1.17E-04 | 3.67E-04 | - | - | N/A [2] | 1.17E-04 | 3.67E-04 | N/A [3] | 1.17E-04 | 3.67E-04 | 2 | 50 |
| 1,2,3,4,6,7,8-HpCDF | pg/m$^3$ | - | - | | | 1.76E-04 | 2.69E-04 | - | - | N/A [2] | 1.76E-04 | 2.69E-04 | N/A [3] | 1.76E-04 | 2.69E-04 | 2 | 50 |
| 1,2,3,4,7,8,9-HpCDF | pg/m$^3$ | - | - | | | 4.34E-05 | 4.70E-05 | - | - | N/A [2] | 4.34E-05 | 4.70E-05 | N/A [3] | 4.34E-05 | 4.70E-05 | 2 | 50 |
| OCDF | pg/m$^3$ | - | - | | | 5.93E-06 | 5.55E-06 | - | - | N/A [2] | 5.55E-06 | 5.93E-06 | N/A [3] | 5.93E-06 | 5.55E-06 | 2 | 50 |
| Total Toxic Equivalency | pg TEQ/m$^3$ | *0.1 1* [1] | - | | | 6.26E-03 | 1.07E-02 | 0.1 | 0 | N/A [2] | 6.26E-03 | 1.07E-02 | N/A [3] | 6.26E-03 | 1.07E-02 | 2 | 50 |

NOTE: All non-detectable results were reported as 1/2 of the detection limit

[1] O. Reg. 419/05 Schedule Upper Risk Thresholds

[2] No quarterly average can be calculated due to insufficient data validity

[3] No valid January samples

**Table B4: Summary of Sample Flow Rate and Sample Duration for PAHs**

| Sample Date | Courtice | | | Rundle | | |
|---|---|---|---|---|---|---|
| | Filter ID | Sample Duration | Sample Volume | Filter ID | Sample Duration | Sample Volume |
| | No. | (min) | ($m^3$) | No. | (min) | ($m^3$) |
| January 5, 2022 | L2675244-3 | 1440 | 309 | Invalid Sample | | |
| January 17, 2022 | Invalid Sample | | | L2680504-1 | 1440 | 310 |
| January 29, 2022 | Invalid Sample | | | Invalid Sample | | |
| February 10, 2022 | L2682542-3 | 1440 | 327 | L2682542-2 | 1440 | 326 |
| February 22, 2022 | Invalid Sample | | | L2563689-2 | 1440 | 320 |
| March 6, 2022 | L2691342-1 | 1440 | 309 | L2691342-2 | 1440 | 319 |
| March 18, 2022 | L2694361-2 | 1440 | 316 | L2694361-1 | 1440 | 319 |
| March 30, 2022 | L2696738-2 | 1440 | 315 | L2696738-1 | 1440 | 322 |

**Table B5: 2022 Courtice Station Q1 Monitoring Results for PAHs**

| Contaminant | Units | *MECP Criteria* | *HHRA Health Based Criteria* | 5-Jan-22 | 17-Jan-22 | 29-Jan-22 | 10-Feb-22 | 22-Feb-22 | 6-Mar-22 | 18-Mar-22 | 30-Mar-22 | No. > Criteria | Arithmetic Mean | Minimum Q1 Concentration | Maximum Q1 Concentration | January Maximum Concentration | February Maximum Concentration | March Maximum Concentration | Number of Valid Samples | % Valid data |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | $ng/m^3$ | *12000* | - | 2.39E+00 | | | 1.58E+00 | | 4.17E+00 | 1.56E+01 | 4.67E+00 | 0 | N/A [5] | 1.58E+00 | 1.56E+01 | 2.39E+00 | 1.58E+00 | 1.56E+01 | 5 | 63 |
| 2-Methylnaphthalene | $ng/m^3$ | *10000* | - | 3.46E+00 | | | 2.83E+00 | | 8.03E+00 | 3.23E+01 | 8.54E+00 | 0 | N/A [5] | 2.83E+00 | 3.23E+01 | 3.46E+00 | 2.83E+00 | 3.23E+01 | 5 | 63 |
| Acenaphthene | $ng/m^3$ | - | - | 2.16E-01 | | | 2.82E-01 | | 3.05E+00 | 7.94E+00 | 1.57E+00 | - | N/A [5] | 2.16E-01 | 7.94E+00 | 2.16E-01 | 2.82E-01 | 7.94E+00 | 5 | 63 |
| Acenaphthylene | $ng/m^3$ | *3500* | - | 9.13E-02 | | | 6.48E-02 | | 7.83E-02 | 4.37E-01 | 9.27E-02 | 0 | N/A [5] | 6.48E-02 | 4.37E-01 | 9.13E-02 | 6.48E-02 | 4.37E-01 | 5 | 63 |
| Anthracene | $ng/m^3$ | *200* | - | 2.61E-02 | | | 2.28E-02 | | 5.34E-02 | 2.07E-01 | 3.97E-02 | 0 | N/A [5] | 2.28E-02 | 2.07E-01 | 2.61E-02 | 2.28E-02 | 2.07E-01 | 5 | 63 |
| Benzo(a)Anthracene | $ng/m^3$ | - | - | 4.50E-02 | | | 2.29E-02 | | 2.47E-02 | 5.47E-02 | 1.88E-02 | - | N/A [5] | 1.88E-02 | 5.47E-02 | 4.50E-02 | 2.29E-02 | 5.47E-02 | 5 | 63 |
| Benzo(a)fluorene | $ng/m^3$ | - | - | 6.15E-02 | | | 4.37E-02 | | 2.71E-02 | 7.50E-02 | 4.13E-02 | - | N/A [5] | 2.71E-02 | 7.50E-02 | 6.15E-02 | 4.37E-02 | 7.50E-02 | 5 | 63 |
| Benzo(a)Pyrene (Historically High) | $ng/m^3$ | *0.05* [1] *5* [2] *1.1* [3] | *1* | 4.63E-02 | | | 2.80E-02 | | 4.82E-02 | 6.84E-02 | 3.30E-02 | 1 | N/A [5] | 2.80E-02 | 6.84E-02 | 4.63E-02 | 2.80E-02 | 6.84E-02 | 5 | 63 |
| Benzo(b)Fluoranthene | $ng/m^3$ | - | - | 1.06E-01 | | | 4.34E-02 | | 8.93E-02 | 3.73E-01 | 6.83E-02 | - | N/A [5] | 4.34E-02 | 3.73E-01 | 1.06E-01 | 4.34E-02 | 3.73E-01 | 5 | 63 |
| Benzo(b)fluorene | $ng/m^3$ | - | - | 2.86E-02 | | | 2.72E-02 | | 1.69E-02 | 3.06E-02 | 1.52E-02 | - | N/A [5] | 1.52E-02 | 3.06E-02 | 2.86E-02 | 2.72E-02 | 3.06E-02 | 5 | 63 |
| Benzo(e)Pyrene | $ng/m^3$ | - | - | 9.42E-02 | | | 2.66E-02 | | 4.69E-02 | 1.25E-01 | 4.76E-02 | - | N/A [5] | 2.66E-02 | 1.25E-01 | 9.42E-02 | 2.66E-02 | 1.25E-01 | 5 | 63 |
| Benzo(g,h,i)Perylene | $ng/m^3$ | - | - | 7.09E-02 | Invalid Sample | Invalid Sample | 3.24E-02 | Invalid Sample | 5.66E-02 | 1.24E-01 | 4.98E-02 | - | N/A [5] | 3.24E-02 | 1.24E-01 | 7.09E-02 | 3.24E-02 | 1.24E-01 | 5 | 63 |
| Benzo(k)Fluoranthene | $ng/m^3$ | - | - | 8.06E-02 | | | 4.50E-02 | | 5.21E-02 | 3.48E-01 | 6.67E-02 | - | N/A [5] | 4.50E-02 | 3.48E-01 | 8.06E-02 | 4.50E-02 | 3.48E-01 | 5 | 63 |
| Biphenyl | $ng/m^3$ | - | - | 1.97E+00 | | | 1.38E+00 | | 4.17E+00 | 8.58E+00 | 1.83E+00 | - | N/A [5] | 1.38E+00 | 8.58E+00 | 1.97E+00 | 1.38E+00 | 8.58E+00 | 5 | 63 |
| Chrysene | $ng/m^3$ | - | - | 1.35E-01 | | | 6.64E-02 | | 1.12E-01 | 2.40E-01 | 1.12E-01 | - | N/A [5] | 6.64E-02 | 2.40E-01 | 1.35E-01 | 6.64E-02 | 2.40E-01 | 5 | 63 |
| Dibenzo(a,h)Anthracene | $ng/m^3$ | - | - | 1.07E-02 | | | 6.54E-03 | | 1.72E-02 | 1.65E-02 | 3.17E-03 | - | N/A [5] | 3.17E-03 | 1.72E-02 | 1.07E-02 | 6.54E-03 | 1.72E-02 | 5 | 63 |
| Fluoranthene | $ng/m^3$ | - | - | 4.14E-01 | | | 5.35E-01 | | 7.28E-01 | 1.23E+00 | 5.02E-01 | - | N/A [5] | 4.14E-01 | 1.23E+00 | 4.14E-01 | 5.35E-01 | 1.23E+00 | 5 | 63 |
| Fluorene | $ng/m^3$ | - | - | 7.02E-01 | | | 7.03E-01 | | 2.62E+00 | 6.17E+00 | 1.37E+00 | - | N/A [5] | 7.02E-01 | 6.17E+00 | 7.02E-01 | 7.03E-01 | 6.17E+00 | 5 | 63 |
| Indeno(1,2,3-cd)Pyrene | $ng/m^3$ | - | - | 7.18E-02 | | | 2.50E-02 | | 5.79E-02 | 1.25E-01 | 5.43E-02 | - | N/A [5] | 2.50E-02 | 1.25E-01 | 7.18E-02 | 2.50E-02 | 1.25E-01 | 5 | 63 |
| Naphthalene | $ng/m^3$ | *22500* | *22500* | 1.74E+01 | | | 1.42E+01 | | 1.74E+01 | 4.53E+01 | 1.24E+01 | 0 | N/A [5] | 1.24E+01 | 4.53E+01 | 1.74E+01 | 1.42E+01 | 4.53E+01 | 5 | 63 |
| o-Terphenyl | $ng/m^3$ | - | - | 1.59E-02 | | | 1.35E-02 | | 1.78E-02 | 1.91E-02 | 6.67E-03 | - | N/A [5] | 6.67E-03 | 1.91E-02 | 1.59E-02 | 1.35E-02 | 1.91E-02 | 5 | 63 |
| Perylene | $ng/m^3$ | - | - | 8.93E-03 | | | 3.06E-04 | | 3.85E-03 | 7.47E-03 | 3.17E-03 | - | N/A [5] | 3.06E-04 | 8.93E-03 | 8.93E-03 | 3.06E-04 | 7.47E-03 | 5 | 63 |
| Phenanthrene | $ng/m^3$ | - | - | 9.61E-01 | | | 1.24E+00 | | 3.37E+00 | 8.73E+00 | 2.21E+00 | - | N/A [5] | 9.61E-01 | 8.73E+00 | 9.61E-01 | 1.24E+00 | 8.73E+00 | 5 | 63 |
| Pyrene | $ng/m^3$ | - | - | 2.02E-01 | | | 2.24E-01 | | 2.73E-01 | 6.55E-01 | 2.52E-01 | - | N/A [5] | 2.02E-01 | 6.55E-01 | 2.02E-01 | 2.24E-01 | 6.55E-01 | 5 | 63 |
| Tetralin | $ng/m^3$ | - | - | 1.00E+00 | | | 1.35E+00 | | 1.66E+00 | 6.20E+00 | 1.74E+00 | - | N/A [5] | 1.00E+00 | 6.20E+00 | 1.00E+00 | 1.35E+00 | 6.20E+00 | 5 | 63 |
| Total PAH[4] | $ng/m^3$ | - | - | 29.65 | | | 24.76 | | 46.22 | 134.93 | 35.74 | - | N/A [5] | 24.76 | 134.93 | 29.65 | 24.76 | 134.93 | 5 | 63 |

NOTE: All non-detectable results were reported as 1/2 of the detection limit

[1] AAQC

[2] O. Reg. 419/05 Schedule  Upper Risk Thresholds

[3] O. Reg. 419/05 24 Hour Guideline

[4] Total PAH sums all PAH contaminants

[5] No quarterly average can be calculated due to insufficient data validity

**Table B6: 2022 Rundle Station Q1 Monitoring Results for PAHs**

| Contaminant | Units | *MECP Criteria* | *HHRA Health Based Criteria* | 5-Jan-22 | 17-Jan-22 | 29-Jan-22 | 10-Feb-22 | 22-Feb-22 | 6-Mar-22 | 18-Mar-22 | 30-Mar-22 | No. > Criteria | Arithmetic Mean | Minimum Q1 Concentration | Maximum Q1 Concentration | January Maximum Concentration | February Maximum Concentration | March Maximum Concentration | Number of Valid Samples | % Valid data |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | $ng/m^3$ | *12000* | - | | 1.99E+00 | | 2.64E+00 | 5.22E+00 | 7.34E+00 | 8.90E+00 | 2.63E+00 | 0 | 4.79E+00 | 1.99E+00 | 8.90E+00 | 1.99E+00 | 5.22E+00 | 8.90E+00 | 6 | 75 |
| 2-Methylnaphthalene | $ng/m^3$ | *10000* | - | | 2.83E+00 | | 4.88E+00 | 9.25E+00 | 1.16E+01 | 1.69E+01 | 4.41E+00 | 0 | 8.31E+00 | 2.83E+00 | 1.69E+01 | 2.83E+00 | 9.25E+00 | 1.69E+01 | 6 | 75 |
| Acenaphthene | $ng/m^3$ | - | - | | 1.60E-01 | | 1.03E+00 | 2.00E+00 | 2.18E+00 | 3.89E+00 | 1.12E+00 | - | 1.73E+00 | 1.60E-01 | 3.89E+00 | 1.60E-01 | 2.00E+00 | 3.89E+00 | 6 | 75 |
| Acenaphthylene | $ng/m^3$ | *3500* | - | | 1.26E-01 | | 1.36E-01 | 3.75E-01 | 5.27E+00 | 2.54E-01 | 6.80E-02 | 0 | 1.04E+00 | 6.80E-02 | 5.27E+00 | 1.26E-01 | 3.75E-01 | 5.27E+00 | 6 | 75 |
| Anthracene | $ng/m^3$ | *200* | - | | 9.29E-02 | | 5.71E-02 | 9.72E-02 | 2.45E+00 | 1.46E-01 | 4.47E-02 | 0 | 4.81E-01 | 4.47E-02 | 2.45E+00 | 9.29E-02 | 9.72E-02 | 2.45E+00 | 6 | 75 |
| Benzo(a)Anthracene | $ng/m^3$ | - | - | | 2.87E-02 | | 2.73E-02 | 4.88E-02 | 6.11E-01 | 5.02E-02 | 3.35E-02 | - | 1.33E-01 | 2.73E-02 | 6.11E-01 | 2.87E-02 | 4.88E-02 | 6.11E-01 | 6 | 75 |
| Benzo(a)fluorene | $ng/m^3$ | - | - | | 7.16E-02 | | 4.91E-02 | 6.91E-02 | 7.37E-01 | 1.05E-01 | 5.12E-02 | - | 1.80E-01 | 4.91E-02 | 7.37E-01 | 7.16E-02 | 6.91E-02 | 7.37E-01 | 6 | 75 |
| Benzo(a)Pyrene (Historically High) | $ng/m^3$ | *0.05* [1] *5* [2] *1.1* [3] | *1* | | 4.71E-02 | | 2.60E-02 | 5.81E-02 | 1.16E+00 | 3.79E-02 | 5.56E-02 | 3 | 2.31E-01 | 2.60E-02 | 1.16E+00 | 4.71E-02 | 5.81E-02 | 1.16E+00 | 6 | 75 |
| Benzo(b)Fluoranthene | $ng/m^3$ | - | - | | 1.15E-01 | | 5.55E-02 | 1.65E-01 | 1.28E+00 | 1.59E-01 | 9.29E-02 | - | 3.11E-01 | 5.55E-02 | 1.28E+00 | 1.15E-01 | 1.65E-01 | 1.28E+00 | 6 | 75 |
| Benzo(b)fluorene | $ng/m^3$ | - | - | | 4.90E-02 | | 2.85E-02 | 3.31E-02 | 6.21E-01 | 5.14E-02 | 1.90E-02 | - | 1.34E-01 | 1.90E-02 | 6.21E-01 | 4.90E-02 | 3.31E-02 | 6.21E-01 | 6 | 75 |
| Benzo(e)Pyrene | $ng/m^3$ | - | - | | 7.84E-02 | | 3.22E-02 | 1.04E-01 | 9.69E-01 | 9.94E-02 | 6.58E-02 | - | 2.25E-01 | 3.22E-02 | 9.69E-01 | 7.84E-02 | 1.04E-01 | 9.69E-01 | 6 | 75 |
| Benzo(g,h,i)Perylene | $ng/m^3$ | - | - | | 6.94E-02 | | 4.54E-02 | 1.15E-01 | 1.29E+00 | 1.04E-01 | 6.86E-02 | - | 2.83E-01 | 4.54E-02 | 1.29E+00 | 6.94E-02 | 1.15E-01 | 1.29E+00 | 6 | 75 |
| Benzo(k)Fluoranthene | $ng/m^3$ | - | - | | 1.69E-01 | | 7.42E-02 | 1.18E-01 | 1.11E+00 | 1.18E-01 | 8.54E-02 | - | 2.79E-01 | 7.42E-02 | 1.11E+00 | 1.69E-01 | 1.18E-01 | 1.11E+00 | 6 | 75 |
| Biphenyl | $ng/m^3$ | - | - | | 2.15E+00 | | 1.75E+00 | 3.81E+00 | 8.06E+00 | 2.78E+00 | 1.37E+00 | - | 3.32E+00 | 1.37E+00 | 8.06E+00 | 2.15E+00 | 3.81E+00 | 8.06E+00 | 6 | 75 |
| Chrysene | $ng/m^3$ | - | - | | 1.31E-01 | | 6.56E-02 | 2.01E-01 | 1.40E+00 | 2.05E-01 | 1.44E-01 | - | 3.58E-01 | 6.56E-02 | 1.40E+00 | 1.31E-01 | 2.01E-01 | 1.40E+00 | 6 | 75 |
| Dibenzo(a,h)Anthracene | $ng/m^3$ | - | - | | 3.03E-02 | | 1.32E-02 | 1.79E-02 | 1.11E-01 | 8.75E-03 | 1.47E-02 | - | 3.27E-02 | 8.75E-03 | 1.11E-01 | 3.03E-02 | 1.79E-02 | 1.11E-01 | 6 | 75 |
| Fluoranthene | $ng/m^3$ | - | - | | 4.16E-01 | | 7.15E-01 | 1.07E+00 | 4.80E+00 | 1.05E+00 | 5.40E-01 | - | 1.43E+00 | 4.16E-01 | 4.80E+00 | 4.16E-01 | 1.07E+00 | 4.80E+00 | 6 | 75 |
| Fluorene | $ng/m^3$ | - | - | | 7.10E-01 | | 1.26E+00 | 2.61E+00 | 5.49E+00 | 3.54E+00 | 1.09E+00 | - | 2.45E+00 | 7.10E-01 | 5.49E+00 | 7.10E-01 | 2.61E+00 | 5.49E+00 | 6 | 75 |
| Indeno(1,2,3-cd)Pyrene | $ng/m^3$ | - | - | | 6.48E-02 | | 3.80E-02 | 1.05E-01 | 1.12E+00 | 1.38E-01 | 6.49E-02 | - | 2.55E-01 | 3.80E-02 | 1.12E+00 | 6.48E-02 | 1.05E-01 | 1.12E+00 | 6 | 75 |
| Naphthalene | $ng/m^3$ | *22500* | *22500* | | 2.54E+01 | | 1.86E+01 | 2.83E+01 | 4.95E+01 | 2.64E+01 | 1.11E+01 | 0 | 2.65E+01 | 1.11E+01 | 4.95E+01 | 2.54E+01 | 2.83E+01 | 4.95E+01 | 6 | 75 |
| o-Terphenyl | $ng/m^3$ | - | - | | 9.97E-03 | | 1.58E-02 | 1.50E-02 | 2.61E-02 | 1.38E-02 | 3.11E-03 | - | 1.40E-02 | 3.11E-03 | 2.61E-02 | 9.97E-03 | 1.58E-02 | 2.61E-02 | 6 | 75 |
| Perylene | $ng/m^3$ | - | - | | 3.35E-02 | | 5.09E-03 | 1.09E-02 | 2.00E-01 | 3.13E-02 | 3.11E-03 | - | 4.73E-02 | 3.11E-03 | 2.00E-01 | 3.35E-02 | 1.09E-02 | 2.00E-01 | 6 | 75 |
| Phenanthrene | $ng/m^3$ | - | - | | 1.38E+00 | | 2.19E+00 | 4.31E+00 | 1.39E+01 | 5.83E+00 | 1.92E+00 | - | 4.93E+00 | 1.38E+00 | 1.39E+01 | 1.38E+00 | 4.31E+00 | 1.39E+01 | 6 | 75 |
| Pyrene | $ng/m^3$ | - | - | | 2.63E-01 | | 3.44E-01 | 5.38E-01 | 4.33E+00 | 6.02E-01 | 3.10E-01 | - | 1.06E+00 | 2.63E-01 | 4.33E+00 | 2.63E-01 | 5.38E-01 | 4.33E+00 | 6 | 75 |
| Tetralin | $ng/m^3$ | - | - | | 9.48E-02 | | 2.40E+00 | 1.99E+00 | 1.66E+00 | 1.93E+00 | 6.34E-01 | - | 1.45E+00 | 9.48E-02 | 2.40E+00 | 9.48E-02 | 2.40E+00 | 1.93E+00 | 6 | 75 |
| Total PAH [4] | $ng/m^3$ | - | - | | 36.46 | | 36.44 | 60.61 | 127.23 | 73.34 | 25.98 | - | 60.01 | 25.98 | 127.23 | 36.46 | 60.61 | 127.23 | 6 | 75 |

Invalid Sample

Invalid Sample

NOTE: All non-detectable results were reported as 1/2 of the detection limit

[1] AAQC

[2] O. Reg. 419/05 Schedule  Upper Risk Thresholds

[3] O. Reg. 419/05 24 Hour Guideline

[4] Total PAH sums all PAH contaminants

**Table B7: Summary of Sample Flow Rate and Sample Duration for TSP**

| Sample Date | Courtice | | | Rundle | | |
|---|---|---|---|---|---|---|
| | Filter ID | Sample Duration | Sample Volume | Filter ID | Sample Duration | Sample Volume |
| | No. | (min) | ($m^3$) | No. | (min) | ($m^3$) |
| January 5, 2022 | L2677337-2 | 1440 | 1689 | L2677337-4 | 1440 | 1636 |
| January 11, 2022 | L2680506-3 | 1440 | 1693 | L2680506-1 | 1440 | 1697 |
| January 17, 2022 | L2680506-4 | 1440 | 1759 | L2680506-2 | 1440 | 1701 |
| January 23, 2022 | L2683574-3 | 1440 | 1758 | L2683574-1 | 1440 | 1615 |
| January 29, 2022 | L2683574-4 | 1440 | 1722 | L2683574-2 | 1440 | 1661 |
| February 4, 2022 | L2686220-1 | 1440 | 1773 | L2686220-3 | 1440 | 1722 |
| February 10, 2022 | L2686220-2 | 1440 | 1687 | L2686220-4 | 1440 | 1642 |
| February 16, 2022 | L2688356-3 | 1440 | 1704 | L2688356-1 | 1440 | 1598 |
| February 22, 2022 | L2688356-4 | 1440 | 1683 | L2688356-2 | 1440 | 1688 |
| February 28, 2022 | L2691345-1 | 1440 | 1700 | L2691345-3 | 1440 | 1702 |
| March 6, 2022 | L2691345-2 | 1440 | 1626 | L2691345-4 | 1440 | 1578 |
| March 12, 2022 | L2694364-4 | 1440 | 1697 | L2694364-2 | 1440 | 1666 |
| March 18, 2022 | L2694364-3 | 1440 | 1591 | L2694364-1 | 1440 | 1579 |
| March 24, 2022 | L2696743-4 | 1439 | 1644 | L2696743-2 | 1437 | 1586 |
| March 30, 2022 | L2696743-3 | 1440 | 1673 | L2696743-1 | 1440 | 1617 |

**Table B8: 2022 Courtice Station Q1 Monitoring Results for TSP and Metals**

| Contaminant | Units | *MECP Criteria* | *HHRA Health Based Criteria* | 5-Jan-22 | 11-Jan-22 | 17-Jan-22 | 23-Jan-22 | 29-Jan-22 | 4-Feb-22 | 10-Feb-22 | 16-Feb-22 | 22-Feb-22 | 28-Feb-22 | 6-Mar-22 | 12-Mar-22 | 18-Mar-22 | 24-Mar-22 | 30-Mar-22 | MECP Criteria (µg/m³) | No. > Criteria | Geometric Mean | Arithmetic Mean | Q1 Minimum Concentration | Q1 Maximum Concentration | January Maximum Concentration | February Maximum Concentration | March Maximum Concentration | Number of Valid Samples | % Valid data |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Particulate (TSP) | µg/m³ | *120* | *120* | 9.77 | 16.54 | 5.40 | 27.47 | 23.52 | 14.19 | 11.22 | 15.73 | 12.12 | 12.35 | 21.09 | 13.18 | 34.84 | 13.17 | 30.72 | *120* | 0 | 15.65 | 17.42 | 5.40 | 34.84 | 27.47 | 15.73 | 34.84 | 15 | 100 |
| Mercury (Hg) | µg/m³ | *2* | *2* | 8.29E-06 | 3.48E-05 | 7.96E-06 | 6.26E-06 | 1.05E-05 | 2.91E-06 | 3.05E-06 | 1.17E-05 | 8.32E-06 | 1.82E-05 | 8.61E-06 | 2.94E-06 | 8.81E-06 | 3.05E-06 | 8.98E-06 | *2* | 0 | 7.54E-06 | 9.63E-06 | 2.91E-06 | 3.48E-05 | 3.48E-05 | 1.82E-05 | 8.98E-06 | 15 | 100 |
| Aluminum (Al) | µg/m³ | *4.8* | - | 8.41E-02 | 9.16E-02 | 3.51E-02 | 6.60E-02 | 5.64E-02 | 3.12E-02 | 4.37E-02 | 6.10E-02 | 8.79E-02 | 6.12E-02 | 2.16E-01 | 9.71E-02 | 2.32E-01 | 1.09E-01 | 2.99E-01 | *4.8* | 0 | 8.38E-02 | 1.05E-01 | 3.12E-02 | 2.99E-01 | 9.16E-02 | 8.79E-02 | 2.99E-01 | 15 | 100 |
| Antimony (Sb) | µg/m³ | *25* | *25* | 5.45E-04 | 3.07E-04 | 2.39E-04 | 7.34E-04 | 4.41E-04 | 3.26E-04 | 3.90E-04 | 1.35E-03 | 7.25E-04 | 3.59E-04 | 8.92E-04 | 9.00E-04 | 6.20E-03 | 4.27E-04 | 6.05E-04 | *25* | 0 | 6.18E-04 | 9.63E-04 | 2.39E-04 | 6.20E-03 | 7.34E-04 | 1.35E-03 | 6.20E-03 | 15 | 100 |
| Arsenic (As) | µg/m³ | *0.3* | *0.3* | 8.88E-04 | 8.86E-04 | 8.53E-04 | 8.53E-04 | 8.71E-04 | 8.72E-04 | 9.15E-04 | 8.80E-04 | 8.91E-04 | 8.82E-04 | 9.23E-04 | 8.82E-04 | 9.43E-04 | 9.15E-04 | 8.98E-04 | *0.3* | 0 | 8.90E-04 | 8.90E-04 | 8.53E-04 | 9.43E-04 | 8.88E-04 | 9.15E-04 | 9.43E-04 | 15 | 100 |
| Barium (Ba) | µg/m³ | *10* | *10* | 2.98E-03 | 3.06E-03 | 1.27E-03 | 3.63E-03 | 4.68E-03 | 4.53E-03 | 3.54E-03 | 3.52E-03 | 3.88E-03 | 3.97E-03 | 5.07E-03 | 2.75E-03 | 1.89E-02 | 3.46E-03 | 5.28E-03 | *10* | 0 | 3.93E-03 | 4.70E-03 | 1.27E-03 | 1.89E-02 | 4.68E-03 | 4.53E-03 | 1.89E-02 | 15 | 100 |
| Beryllium (Be) | µg/m³ | *0.01* | *0.01* | 1.48E-05 | 1.48E-05 | 1.42E-05 | 1.42E-05 | 1.45E-05 | 1.45E-05 | 1.52E-05 | 1.47E-05 | 1.49E-05 | 1.47E-05 | 1.54E-05 | 1.47E-05 | 1.57E-05 | 1.52E-05 | 1.50E-05 | *0.01* | 0 | 1.48E-05 | 1.48E-05 | 1.42E-05 | 1.57E-05 | 1.48E-05 | 1.52E-05 | 1.57E-05 | 15 | 100 |
| Bismuth (Bi) | µg/m³ | - | - | 5.33E-04 | 5.32E-04 | 5.12E-04 | 5.12E-04 | 5.23E-04 | 5.23E-04 | 5.49E-04 | 5.28E-04 | 5.35E-04 | 5.29E-04 | 5.54E-04 | 5.29E-04 | 5.66E-04 | 5.49E-04 | 5.39E-04 | - | - | 5.34E-04 | 5.34E-04 | 5.12E-04 | 5.66E-04 | 5.33E-04 | 5.49E-04 | 5.66E-04 | 15 | 100 |
| Boron (B) | µg/m³ | *120* | - | 4.44E-03 | 4.43E-03 | 4.26E-03 | 4.27E-03 | 4.36E-03 | 4.36E-03 | 4.57E-03 | 4.40E-03 | 4.46E-03 | 4.41E-03 | 4.61E-03 | 4.41E-03 | 4.72E-03 | 4.57E-03 | 4.49E-03 | *120* | 0 | 4.45E-03 | 4.45E-03 | 4.26E-03 | 4.72E-03 | 4.44E-03 | 4.57E-03 | 4.72E-03 | 15 | 100 |
| Cadmium (Cd) | µg/m³ | *0.025* | *0.025* | 1.55E-04 | 1.59E-04 | 3.02E-04 | 1.36E-04 | 4.47E-05 | 5.23E-05 | 7.32E-05 | 1.95E-04 | 9.92E-05 | 1.29E-04 | 1.17E-04 | 2.96E-04 | 3.23E-04 | 1.22E-04 | 1.02E-04 | *0.025* | 0 | 1.31E-04 | 1.54E-04 | 4.47E-05 | 3.23E-04 | 3.02E-04 | 1.95E-04 | 3.23E-04 | 15 | 100 |
| Chromium (Cr) | µg/m³ | *0.5* | - | 1.01E-03 | 4.19E-03 | 9.66E-04 | 9.67E-04 | 9.87E-04 | 9.88E-04 | 1.04E-03 | 9.98E-04 | 1.01E-03 | 1.00E-03 | 2.21E-03 | 1.00E-03 | 4.15E-03 | 1.04E-03 | 2.34E-03 | *0.5* | 0 | 1.35E-03 | 1.59E-03 | 9.66E-04 | 4.19E-03 | 4.19E-03 | 1.04E-03 | 4.15E-03 | 15 | 100 |
| Cobalt (Co) | µg/m³ | *0.1* | *0.1* | 6.16E-05 | 9.16E-05 | 6.54E-05 | 9.56E-05 | 5.57E-05 | 6.10E-05 | 6.34E-05 | 1.02E-04 | 1.35E-04 | 8.53E-05 | 1.14E-04 | 7.29E-05 | 1.84E-04 | 8.60E-05 | 1.55E-04 | *0.1* | 0 | 8.92E-05 | 9.52E-05 | 5.57E-05 | 1.84E-04 | 9.56E-05 | 1.35E-04 | 1.84E-04 | 15 | 100 |
| Copper (Cu) | µg/m³ | *50* | - | 5.51E-03 | 1.01E-02 | 4.09E-03 | 1.17E-02 | 4.84E-02 | 1.34E-02 | 6.22E-03 | 1.19E-02 | 1.53E-02 | 1.20E-02 | 2.96E-02 | 7.88E-03 | 4.53E-02 | 1.03E-02 | 1.84E-02 | *50* | 0 | 1.29E-02 | 1.67E-02 | 4.09E-03 | 4.84E-02 | 4.84E-02 | 1.53E-02 | 4.53E-02 | 15 | 100 |
| Iron (Fe) | µg/m³ | *4* | - | 1.57E-01 | 2.39E-01 | 6.88E-02 | 1.77E-01 | 1.71E-01 | 9.88E-02 | 1.54E-01 | 1.51E-01 | 2.32E-01 | 1.92E-01 | 3.54E-01 | 1.69E-01 | 8.11E-01 | 2.24E-01 | 5.34E-01 | *4* | 0 | 2.05E-01 | 2.49E-01 | 6.88E-02 | 8.11E-01 | 2.39E-01 | 2.32E-01 | 8.11E-01 | 15 | 100 |
| Lead (Pb) | µg/m³ | *0.5* | *0.5* | 2.29E-03 | 1.71E-03 | 2.66E-03 | 1.96E-03 | 1.13E-03 | 1.45E-03 | 1.63E-03 | 1.99E-03 | 2.14E-03 | 8.06E-04 | 2.64E-03 | 9.94E-04 | 6.98E-03 | 1.59E-03 | 2.07E-03 | *2* | 0 | 1.86E-03 | 2.14E-03 | 8.06E-04 | 6.98E-03 | 2.66E-03 | 2.14E-03 | 6.98E-03 | 15 | 100 |
| Magnesium (Mg) | µg/m³ | - | - | 1.18E-01 | 3.77E-01 | 7.16E-02 | 1.25E-01 | 1.38E-01 | 9.59E-02 | 1.01E-01 | 1.14E-01 | 1.65E-01 | 1.27E-01 | 2.43E-01 | 1.30E-01 | 2.86E-01 | 1.84E-01 | 2.75E-01 | - | - | 1.53E-01 | 1.70E-01 | 7.16E-02 | 3.77E-01 | 3.77E-01 | 1.65E-01 | 2.86E-01 | 15 | 100 |
| Manganese (Mn) | µg/m³ | *0.4* | - | 6.51E-03 | 7.74E-03 | 1.97E-03 | 4.61E-03 | 3.64E-03 | 2.80E-03 | 4.88E-03 | 6.40E-03 | 5.45E-03 | 4.53E-03 | 9.35E-03 | 6.29E-03 | 1.65E-02 | 7.20E-03 | 1.06E-02 | *0.4* | 0 | 5.78E-03 | 6.57E-03 | 1.97E-03 | 1.65E-02 | 7.74E-03 | 6.40E-03 | 1.65E-02 | 15 | 100 |
| Molybdenum (Mo) | µg/m³ | *120* | - | 6.69E-04 | 1.06E-03 | 4.43E-04 | 9.44E-04 | 1.81E-03 | 1.05E-03 | 5.67E-04 | 9.27E-04 | 1.17E-03 | 8.24E-04 | 1.30E-03 | 4.94E-04 | 2.77E-03 | 8.11E-04 | 9.58E-04 | *120* | 0 | 9.40E-04 | 1.05E-03 | 4.43E-04 | 2.77E-03 | 1.81E-03 | 1.17E-03 | 2.77E-03 | 15 | 100 |
| Nickel (Ni) | µg/m³ | *0.2* | - | 6.34E-04 | 9.04E-04 | 6.54E-04 | 6.60E-04 | 5.52E-04 | 6.28E-04 | 8.05E-04 | 7.81E-04 | 6.60E-04 | 8.24E-04 | 1.12E-03 | 7.59E-04 | 3.31E-03 | 9.09E-04 | 1.35E-03 | *0.2* | 0 | 8.58E-04 | 9.70E-04 | 5.52E-04 | 3.31E-03 | 9.04E-04 | 8.24E-04 | 3.31E-03 | 15 | 100 |
| Phosphorus (P) | µg/m³ | - | - | 2.22E-01 | 2.22E-01 | 2.13E-01 | 2.13E-01 | 2.18E-01 | 2.18E-01 | 2.29E-01 | 2.20E-01 | 2.23E-01 | 2.21E-01 | 2.31E-01 | 2.21E-01 | 2.36E-01 | 2.29E-01 | 2.25E-01 | - | - | 2.22E-01 | 2.23E-01 | 2.13E-01 | 2.36E-01 | 2.22E-01 | 2.29E-01 | 2.36E-01 | 15 | 100 |
| Selenium (Se) | µg/m³ | *10* | *10* | 3.85E-04 | 3.84E-04 | 3.70E-04 | 3.70E-04 | 3.77E-04 | 3.78E-04 | 3.96E-04 | 9.39E-04 | 3.86E-04 | 3.82E-04 | 4.00E-04 | 3.82E-04 | 1.13E-03 | 3.96E-04 | 3.89E-04 | *10* | 0 | 4.38E-04 | 4.71E-04 | 3.70E-04 | 1.13E-03 | 3.85E-04 | 9.39E-04 | 1.13E-03 | 15 | 100 |
| Silver (Ag) | µg/m³ | *1* | *1* | 2.66E-05 | 9.98E-05 | 1.50E-04 | 8.30E-05 | 7.14E-05 | 2.62E-05 | 2.74E-05 | 1.74E-04 | 3.40E-04 | 2.65E-05 | 6.70E-04 | 2.65E-05 | 8.24E-05 | 2.74E-05 | 2.69E-05 | *1* | 0 | 6.77E-05 | 1.24E-04 | 2.62E-05 | 6.70E-04 | 1.50E-04 | 3.40E-04 | 6.70E-04 | 15 | 100 |
| Strontium (Sr) | µg/m³ | *120* | - | 8.88E-04 | 4.78E-03 | 8.53E-04 | 3.53E-03 | 3.77E-03 | 1.86E-03 | 9.15E-04 | 2.46E-03 | 3.51E-03 | 3.18E-03 | 6.95E-03 | 2.18E-03 | 8.99E-03 | 5.49E-03 | 1.02E-02 | *120* | 0 | 3.04E-03 | 3.97E-03 | 8.53E-04 | 1.02E-02 | 4.78E-03 | 3.51E-03 | 1.02E-02 | 15 | 100 |
| Thallium (Tl) | µg/m³ | - | - | 2.66E-05 | 2.66E-05 | 2.56E-05 | 2.56E-05 | 2.61E-05 | 2.62E-05 | 2.74E-05 | 2.64E-05 | 2.67E-05 | 2.65E-05 | 2.77E-05 | 2.65E-05 | 2.83E-05 | 2.74E-05 | 2.69E-05 | - | - | 2.67E-05 | 2.67E-05 | 2.56E-05 | 2.83E-05 | 2.66E-05 | 2.74E-05 | 2.83E-05 | 15 | 100 |
| Tin (Sn) | µg/m³ | *10* | *10* | 8.17E-04 | 3.60E-04 | 1.71E-04 | 5.63E-04 | 6.50E-04 | 4.71E-04 | 7.44E-04 | 7.81E-04 | 7.13E-04 | 3.94E-04 | 8.92E-04 | 5.06E-04 | 2.22E-03 | 1.07E-03 | 6.11E-04 | *10* | 0 | 6.28E-04 | 7.31E-04 | 1.71E-04 | 2.22E-03 | 8.17E-04 | 7.81E-04 | 2.22E-03 | 15 | 100 |
| Titanium (Ti) | µg/m³ | *120* | - | 3.26E-03 | 3.25E-03 | 3.13E-03 | 3.13E-03 | 3.19E-03 | 3.20E-03 | 3.35E-03 | 3.23E-03 | 3.27E-03 | 3.24E-03 | 1.11E-02 | 3.24E-03 | 1.45E-02 | 3.35E-03 | 1.32E-02 | *120* | 0 | 4.26E-03 | 5.17E-03 | 3.13E-03 | 1.45E-02 | 3.26E-03 | 3.35E-03 | 1.45E-02 | 15 | 100 |
| Uranium (Ur) | µg/m³ | *1.5* | - | 2.21E-05 | 9.75E-06 | 6.20E-06 | 7.79E-06 | 5.23E-06 | 7.33E-06 | 5.49E-06 | 1.68E-05 | 2.70E-05 | 1.64E-05 | 5.34E-05 | 6.71E-06 | 2.94E-05 | 7.38E-06 | 2.56E-05 | *1.5* | 0 | 1.26E-05 | 1.64E-05 | 5.23E-06 | 5.34E-05 | 2.21E-05 | 2.70E-05 | 5.34E-05 | 15 | 100 |
| Vanadium (V) | µg/m³ | *2* | *1* | 1.48E-03 | 1.48E-03 | 1.42E-03 | 1.42E-03 | 1.45E-03 | 1.45E-03 | 1.52E-03 | 1.47E-03 | 1.49E-03 | 1.47E-03 | 1.54E-03 | 1.47E-03 | 1.57E-03 | 1.52E-03 | 1.50E-03 | *2* | 0 | 1.48E-03 | 1.48E-03 | 1.42E-03 | 1.57E-03 | 1.48E-03 | 1.52E-03 | 1.57E-03 | 15 | 100 |
| Zinc (Zn) | µg/m³ | *120* | - | 3.41E-02 | 5.29E-02 | 5.68E-02 | 4.15E-02 | 1.96E-02 | 7.50E-02 | 4.53E-02 | 7.86E-02 | 2.29E-02 | 2.46E-02 | 3.02E-02 | 7.18E-02 | 6.17E-02 | 3.93E-02 | 2.17E-02 | *120* | 0 | 4.08E-02 | 4.51E-02 | 1.96E-02 | 7.86E-02 | 5.68E-02 | 7.86E-02 | 7.18E-02 | 15 | 100 |
| Zirconium (Zr) | µg/m³ | *20* | - | 5.92E-04 | 5.91E-04 | 5.69E-04 | 5.69E-04 | 5.81E-04 | 5.81E-04 | 6.10E-04 | 5.87E-04 | 5.94E-04 | 5.88E-04 | 6.15E-04 | 5.88E-04 | 6.29E-04 | 6.10E-04 | 5.99E-04 | *20* | 0 | 5.93E-04 | 5.93E-04 | 5.69E-04 | 6.29E-04 | 5.92E-04 | 6.10E-04 | 6.29E-04 | 15 | 100 |

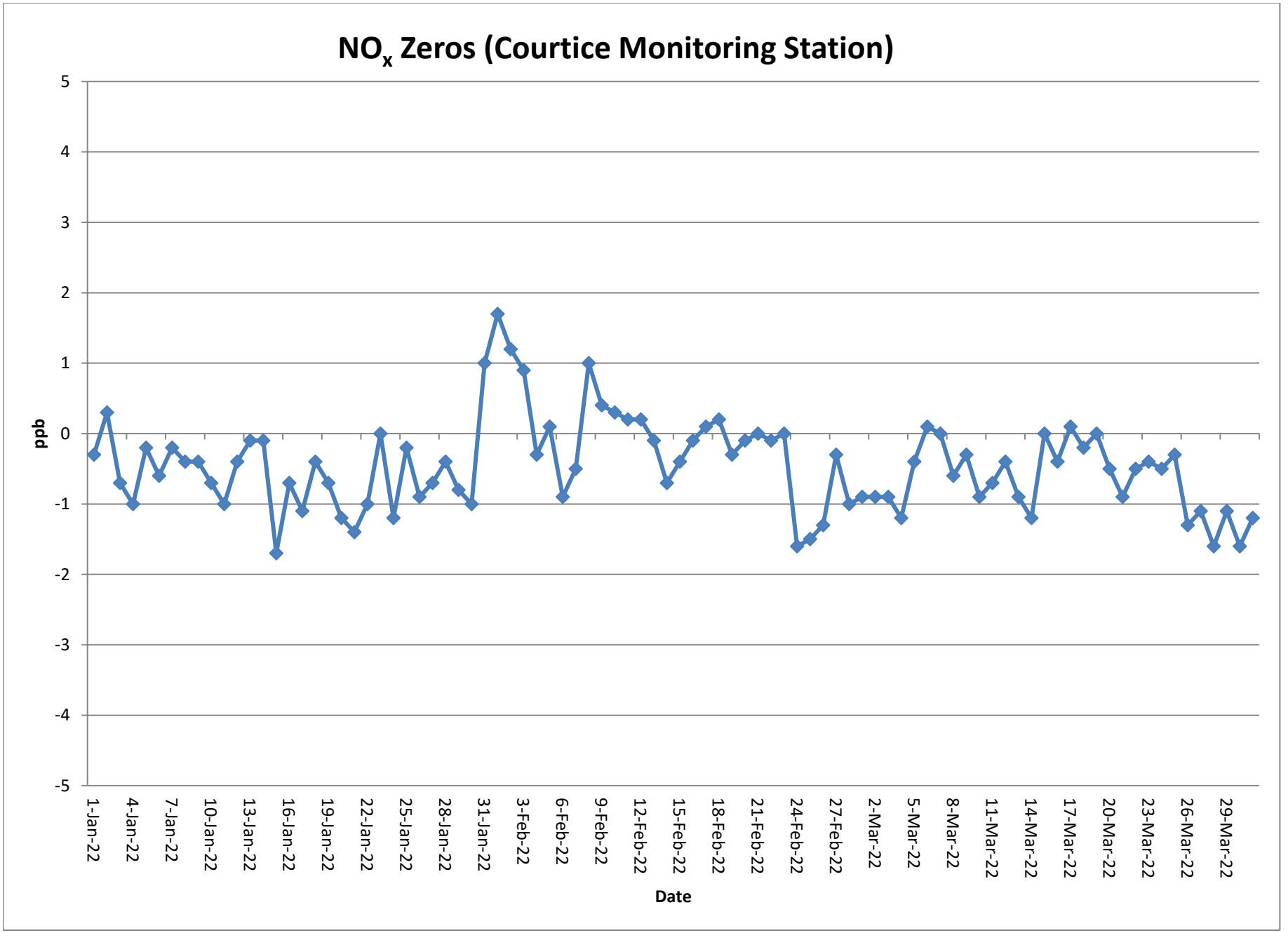
NOTE: All non-detectable results were reported as 1/2 of the detection limit

**Table B9: 2022 Rundle Station Q1 Monitoring Results for TSP and Metals**

| Contaminant | Units | *MECP Criteria* | *HHRA Health Based Criteria* | 5-Jan-22 | 11-Jan-22 | 17-Jan-22 | 23-Jan-22 | 29-Jan-22 | 4-Feb-22 | 10-Feb-22 | 16-Feb-22 | 22-Feb-22 | 28-Feb-22 | 6-Mar-22 | 12-Mar-22 | 18-Mar-22 | 24-Mar-22 | 30-Mar-22 | MECP Criteria ($\mu g/m^3$) | No. > Criteria | Geometric Mean | Arithmetic Mean | Q1 Minimum Concentration | Q1 Maximum Concentration | January Maximum Concentration | February Maximum Concentration | March Maximum Concentration | Number of Valid Samples | % Valid data |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Particulate (TSP) | $\mu g/m^3$ | *120* | *120* | 15.28 | 18.27 | 4.35 | 25.33 | 19.69 | 9.72 | 16.51 | 31.85 | 14.40 | 13.81 | 20.15 | 14.25 | 37.28 | 19.25 | 27.41 | *120* | 0 | 17.2 | 19.2 | 4.4 | 37.3 | 25.3 | 31.9 | 37.3 | 15 | 100 |
| Mercury (Hg) | $\mu g/m^3$ | *2* | *2* | 7.33E-06 | 2.95E-05 | 8.23E-06 | 9.91E-06 | 9.03E-06 | 2.82E-06 | 2.96E-06 | 1.50E-05 | 8.29E-06 | 1.35E-05 | 6.97E-06 | 2.99E-06 | 9.49E-06 | 3.14E-06 | 8.64E-06 | *2* | 0 | 7.45E-06 | 9.19E-06 | 2.82E-06 | 2.95E-05 | 2.95E-05 | 1.50E-05 | 9.49E-06 | 15 | 100 |
| Aluminum (Al) | $\mu g/m^3$ | *4.8* | - | 8.80E-02 | 8.90E-02 | 3.73E-02 | 6.50E-02 | 6.92E-02 | 3.44E-02 | 8.34E-02 | 1.98E-01 | 1.15E-01 | 7.81E-02 | 1.09E-01 | 1.34E-01 | 2.94E-01 | 1.62E-01 | 2.72E-01 | *4.8* | 0 | 1.02E-01 | 1.22E-01 | 3.44E-02 | 2.94E-01 | 8.90E-02 | 1.98E-01 | 2.94E-01 | 15 | 100 |
| Antimony (Sb) | $\mu g/m^3$ | *25* | *25* | 4.77E-04 | 2.12E-04 | 7.35E-05 | 2.72E-04 | 2.29E-04 | 1.64E-04 | 4.50E-04 | 8.01E-04 | 6.22E-04 | 2.12E-04 | 1.83E-03 | 7.49E-05 | 2.70E-03 | 4.15E-04 | 3.83E-04 | *25* | 0 | 3.59E-04 | 5.94E-04 | 7.35E-05 | 2.70E-03 | 4.77E-04 | 8.01E-04 | 2.70E-03 | 15 | 100 |
| Arsenic (As) | $\mu g/m^3$ | *0.3* | *0.3* | 9.17E-04 | 8.84E-04 | 8.82E-04 | 9.29E-04 | 9.03E-04 | 8.47E-04 | 8.88E-04 | 9.39E-04 | 8.89E-04 | 8.81E-04 | 9.51E-04 | 8.98E-04 | 9.49E-04 | 9.43E-04 | 9.26E-04 | *0.3* | 0 | 9.08E-04 | 9.08E-04 | 8.47E-04 | 9.51E-04 | 9.29E-04 | 9.39E-04 | 9.51E-04 | 15 | 100 |
| Barium (Ba) | $\mu g/m^3$ | *10* | *10* | 4.02E-03 | 2.97E-03 | 1.56E-03 | 3.54E-03 | 2.66E-03 | 2.15E-03 | 5.33E-03 | 8.39E-03 | 5.89E-03 | 3.63E-03 | 4.71E-03 | 2.69E-03 | 1.30E-02 | 5.55E-03 | 5.20E-03 | *10* | 0 | 4.12E-03 | 4.75E-03 | 1.56E-03 | 1.30E-02 | 4.02E-03 | 8.39E-03 | 1.30E-02 | 15 | 100 |
| Beryllium (Be) | $\mu g/m^3$ | *0.01* | *0.01* | 1.53E-05 | 1.47E-05 | 1.47E-05 | 1.55E-05 | 1.51E-05 | 1.41E-05 | 1.48E-05 | 1.56E-05 | 1.48E-05 | 1.47E-05 | 1.58E-05 | 1.50E-05 | 1.58E-05 | 1.57E-05 | 1.54E-05 | *0.01* | 0 | 1.51E-05 | 1.51E-05 | 1.41E-05 | 1.58E-05 | 1.55E-05 | 1.56E-05 | 1.58E-05 | 15 | 100 |
| Bismuth (Bi) | $\mu g/m^3$ | - | - | 5.50E-04 | 5.30E-04 | 5.29E-04 | 5.57E-04 | 5.42E-04 | 5.08E-04 | 5.33E-04 | 5.63E-04 | 5.33E-04 | 5.29E-04 | 5.70E-04 | 5.39E-04 | 5.70E-04 | 5.66E-04 | 5.56E-04 | - | - | 5.45E-04 | 5.45E-04 | 5.08E-04 | 5.70E-04 | 5.57E-04 | 5.63E-04 | 5.70E-04 | 15 | 100 |
| Boron (B) | $\mu g/m^3$ | *120* | - | 4.58E-03 | 4.42E-03 | 4.41E-03 | 4.64E-03 | 4.52E-03 | 4.24E-03 | 4.44E-03 | 1.06E-02 | 4.44E-03 | 4.41E-03 | 4.75E-03 | 4.49E-03 | 4.75E-03 | 4.72E-03 | 4.63E-03 | *120* | 0 | 4.79E-03 | 4.94E-03 | 4.24E-03 | 1.06E-02 | 4.64E-03 | 1.06E-02 | 4.75E-03 | 15 | 100 |
| Cadmium (Cd) | $\mu g/m^3$ | *0.025* | *0.025* | 1.94E-04 | 2.42E-04 | 1.54E-04 | 4.74E-04 | 4.70E-05 | 1.76E-04 | 9.94E-05 | 2.62E-04 | 1.69E-04 | 8.93E-05 | 5.99E-04 | 2.16E-04 | 2.63E-04 | 8.18E-05 | 7.65E-05 | *0.025* | 0 | 1.68E-04 | 2.09E-04 | 4.70E-05 | 5.99E-04 | 4.74E-04 | 2.62E-04 | 5.99E-04 | 15 | 100 |
| Chromium (Cr) | $\mu g/m^3$ | *0.5* | - | 1.04E-03 | 2.24E-03 | 9.99E-04 | 1.05E-03 | 1.02E-03 | 9.60E-04 | 2.25E-03 | 2.57E-03 | 2.01E-03 | 9.99E-04 | 1.08E-03 | 1.02E-03 | 3.16E-03 | 2.26E-03 | 2.22E-03 | *0.5* | 0 | 1.51E-03 | 1.66E-03 | 9.60E-04 | 3.16E-03 | 2.24E-03 | 2.57E-03 | 3.16E-03 | 15 | 100 |
| Cobalt (Co) | $\mu g/m^3$ | *0.1* | *0.1* | 7.46E-05 | 6.66E-05 | 4.64E-05 | 7.86E-05 | 6.20E-05 | 4.58E-05 | 1.11E-04 | 1.81E-04 | 1.20E-04 | 7.34E-05 | 9.44E-05 | 9.94E-05 | 1.86E-04 | 1.26E-04 | 1.69E-04 | *0.1* | 0 | 9.30E-05 | 1.02E-04 | 4.58E-05 | 1.86E-04 | 7.86E-05 | 1.81E-04 | 1.86E-04 | 15 | 100 |
| Copper (Cu) | $\mu g/m^3$ | *50* | - | 8.68E-03 | 4.54E-03 | 2.88E-03 | 6.81E-03 | 6.92E-03 | 4.41E-03 | 1.78E-02 | 7.88E-03 | 2.39E-02 | 9.87E-03 | 1.37E-02 | 4.43E-03 | 2.08E-02 | 4.09E-03 | 6.48E-03 | *50* | 0 | 7.84E-03 | 9.54E-03 | 2.88E-03 | 2.39E-02 | 8.68E-03 | 2.39E-02 | 2.08E-02 | 15 | 100 |
| Iron (Fe) | $\mu g/m^3$ | *4* | - | 2.21E-01 | 1.83E-01 | 7.05E-02 | 1.53E-01 | 1.11E-01 | 6.44E-02 | 2.45E-01 | 4.73E-01 | 3.12E-01 | 1.96E-01 | 2.25E-01 | 1.85E-01 | 6.32E-01 | 3.23E-01 | 5.78E-01 | *4* | 0 | 2.17E-01 | 2.65E-01 | 6.44E-02 | 6.32E-01 | 2.21E-01 | 4.73E-01 | 6.32E-01 | 15 | 100 |
| Lead (Pb) | $\mu g/m^3$ | *0.5* | *0.5* | 2.09E-03 | 1.51E-03 | 2.58E-03 | 3.26E-03 | 1.29E-03 | 2.01E-03 | 2.07E-03 | 2.90E-03 | 2.22E-03 | 1.46E-03 | 2.85E-02 | 1.20E-03 | 5.24E-03 | 1.34E-03 | 2.07E-03 | *2* | 0 | 2.44E-03 | 3.98E-03 | 1.20E-03 | 2.85E-02 | 3.26E-03 | 2.90E-03 | 2.85E-02 | 15 | 100 |
| Magnesium (Mg) | $\mu g/m^3$ | - | - | 1.39E-01 | 3.34E-01 | 6.70E-02 | 1.29E-01 | 1.57E-01 | 1.14E-01 | 1.76E-01 | 2.85E-01 | 1.46E-01 | 1.46E-01 | 1.62E-01 | 1.30E-01 | 3.13E-01 | 1.97E-01 | 2.33E-01 | - | - | 1.68E-01 | 1.82E-01 | 6.70E-02 | 3.34E-01 | 3.34E-01 | 2.85E-01 | 3.13E-01 | 15 | 100 |
| Manganese (Mn) | $\mu g/m^3$ | *0.4* | - | 7.70E-03 | 6.36E-03 | 2.12E-03 | 5.33E-03 | 3.47E-03 | 2.25E-03 | 8.99E-03 | 1.34E-02 | 7.11E-03 | 5.11E-03 | 5.93E-03 | 5.47E-03 | 1.54E-02 | 7.74E-03 | 9.88E-03 | *0.4* | 0 | 6.17E-03 | 7.09E-03 | 2.12E-03 | 1.54E-02 | 7.70E-03 | 1.34E-02 | 1.54E-02 | 15 | 100 |
| Molybdenum (Mo) | $\mu g/m^3$ | *120* | - | 6.23E-04 | 4.12E-04 | 3.59E-04 | 4.15E-04 | 5.36E-04 | 3.79E-04 | 1.28E-03 | 7.88E-04 | 1.09E-03 | 4.00E-04 | 7.98E-04 | 1.08E-04 | 1.48E-03 | 3.90E-04 | 5.06E-04 | *120* | 0 | 5.36E-04 | 6.38E-04 | 1.08E-04 | 1.48E-03 | 6.23E-04 | 1.28E-03 | 1.48E-03 | 15 | 100 |
| Nickel (Ni) | $\mu g/m^3$ | *0.2* | - | 6.30E-04 | 6.66E-04 | 6.00E-04 | 8.36E-04 | 5.12E-04 | 5.88E-04 | 8.88E-04 | 1.12E-03 | 7.52E-04 | 6.23E-04 | 7.22E-04 | 7.31E-04 | 1.51E-03 | 1.40E-03 | 1.51E-03 | *0.2* | 0 | 8.18E-04 | 8.72E-04 | 5.12E-04 | 1.51E-03 | 8.36E-04 | 1.12E-03 | 1.51E-03 | 15 | 100 |
| Phosphorus (P) | $\mu g/m^3$ | - | - | 2.29E-01 | 2.21E-01 | 2.20E-01 | 2.32E-01 | 2.26E-01 | 2.12E-01 | 2.22E-01 | 2.35E-01 | 2.22E-01 | 2.20E-01 | 2.38E-01 | 2.25E-01 | 2.37E-01 | 2.36E-01 | 2.31E-01 | - | - | 2.27E-01 | 2.27E-01 | 2.12E-01 | 2.38E-01 | 2.32E-01 | 2.35E-01 | 2.38E-01 | 15 | 100 |
| Selenium (Se) | $\mu g/m^3$ | *10* | *10* | 3.97E-04 | 3.83E-04 | 3.82E-04 | 4.02E-04 | 3.91E-04 | 3.67E-04 | 3.85E-04 | 1.19E-03 | 3.85E-04 | 3.82E-04 | 4.12E-04 | 3.89E-04 | 9.49E-04 | 4.09E-04 | 4.01E-04 | *10* | 0 | 4.47E-04 | 4.82E-04 | 3.67E-04 | 1.19E-03 | 4.02E-04 | 1.19E-03 | 9.49E-04 | 15 | 100 |
| Silver (Ag) | $\mu g/m^3$ | *1* | *1* | 2.75E-05 | 4.24E-04 | 1.19E-04 | 3.46E-04 | 5.90E-05 | 2.54E-05 | 6.92E-05 | 2.06E-04 | 3.28E-04 | 2.64E-05 | 2.85E-05 | 2.69E-05 | 6.58E-05 | 2.83E-05 | 2.78E-05 | *1* | 0 | 6.87E-05 | 1.21E-04 | 2.54E-05 | 4.24E-04 | 4.24E-04 | 3.28E-04 | 6.58E-05 | 15 | 100 |
| Strontium (Sr) | $\mu g/m^3$ | *120* | - | 2.69E-03 | 5.48E-03 | 8.82E-04 | 3.28E-03 | 4.52E-03 | 1.98E-03 | 4.44E-03 | 7.95E-03 | 4.56E-03 | 3.70E-03 | 3.42E-03 | 2.28E-03 | 1.08E-02 | 5.66E-03 | 8.70E-03 | *120* | 0 | 3.96E-03 | 4.69E-03 | 8.82E-04 | 1.08E-02 | 5.48E-03 | 7.95E-03 | 1.08E-02 | 15 | 100 |
| Thallium (Tl) | $\mu g/m^3$ | - | - | 2.75E-05 | 2.65E-05 | 2.65E-05 | 2.79E-05 | 2.71E-05 | 2.54E-05 | 2.66E-05 | 2.82E-05 | 2.67E-05 | 2.64E-05 | 2.85E-05 | 2.69E-05 | 2.85E-05 | 2.83E-05 | 2.78E-05 | - | - | 2.72E-05 | 2.73E-05 | 2.54E-05 | 2.85E-05 | 2.79E-05 | 2.82E-05 | 2.85E-05 | 15 | 100 |
| Tin (Sn) | $\mu g/m^3$ | *10* | *10* | 8.99E-04 | 1.77E-04 | 1.76E-04 | 6.56E-04 | 4.21E-04 | 4.63E-04 | 7.93E-04 | 1.11E-03 | 8.23E-04 | 3.70E-04 | 1.34E-03 | 7.01E-04 | 1.41E-03 | 5.91E-04 | 7.90E-04 | *10* | 0 | 6.09E-04 | 7.14E-04 | 1.76E-04 | 1.41E-03 | 8.99E-04 | 1.11E-03 | 1.41E-03 | 15 | 100 |
| Titanium (Ti) | $\mu g/m^3$ | *120* | - | 3.36E-03 | 3.24E-03 | 3.23E-03 | 3.41E-03 | 3.31E-03 | 3.11E-03 | 3.25E-03 | 8.76E-03 | 3.26E-03 | 3.23E-03 | 3.49E-03 | 3.29E-03 | 1.33E-02 | 8.18E-03 | 1.17E-02 | *120* | 0 | 4.46E-03 | 5.21E-03 | 3.11E-03 | 1.33E-02 | 3.41E-03 | 8.76E-03 | 1.33E-02 | 15 | 100 |
| Uranium (Ur) | $\mu g/m^3$ | *1.5* | - | 9.78E-06 | 9.07E-06 | 5.64E-06 | 7.55E-06 | 6.80E-06 | 3.84E-06 | 8.40E-06 | 1.68E-05 | 4.11E-05 | 2.36E-05 | 5.34E-05 | 1.05E-05 | 2.30E-05 | 7.23E-06 | 2.26E-05 | *1.5* | 0 | 1.25E-05 | 1.66E-05 | 3.84E-06 | 5.34E-05 | 9.78E-06 | 4.11E-05 | 5.34E-05 | 15 | 100 |
| Vanadium (V) | $\mu g/m^3$ | *2* | *1* | 1.53E-03 | 1.47E-03 | 1.47E-03 | 1.55E-03 | 1.51E-03 | 1.41E-03 | 1.48E-03 | 1.56E-03 | 1.48E-03 | 1.47E-03 | 1.58E-03 | 1.50E-03 | 1.58E-03 | 1.57E-03 | 1.54E-03 | *2* | 0 | 1.51E-03 | 1.51E-03 | 1.41E-03 | 1.58E-03 | 1.55E-03 | 1.56E-03 | 1.58E-03 | 15 | 100 |
| Zinc (Zn) | $\mu g/m^3$ | *120* | - | 3.83E-02 | 4.56E-02 | 9.11E-02 | 7.24E-02 | 2.49E-02 | 4.55E-02 | 4.98E-02 | 8.26E-02 | 3.84E-02 | 5.16E-02 | 5.42E-02 | 4.77E-02 | 4.19E-02 | 3.28E-02 | 1.79E-02 | *120* | 0 | 4.52E-02 | 4.90E-02 | 1.79E-02 | 9.11E-02 | 9.11E-02 | 8.26E-02 | 5.42E-02 | 15 | 100 |
| Zirconium (Zr) | $\mu g/m^3$ | *20* | - | 6.11E-04 | 5.89E-04 | 5.88E-04 | 6.19E-04 | 6.02E-04 | 5.65E-04 | 5.92E-04 | 6.26E-04 | 5.92E-04 | 5.88E-04 | 6.34E-04 | 5.99E-04 | 6.33E-04 | 6.29E-04 | 6.17E-04 | *20* | 0 | 6.05E-04 | 6.06E-04 | 5.65E-04 | 6.34E-04 | 6.19E-04 | 6.26E-04 | 6.34E-04 | 15 | 100 |

NOTE: All non-detectable results were reported as 1/2 of the detection limit

# APPENDIX C


NOx Zeros (Courtice Monitoring Station)
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3
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1
0
-1
-2
-3
-4
-5
1-Jan-22
4-Jan-22
7-Jan-22
10-Jan-22
13-Jan-22
16-Jan-22
19-Jan-22
22-Jan-22
25-Jan-22
28-Jan-22
31-Jan-22
3-Feb-22
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5-Mar-22
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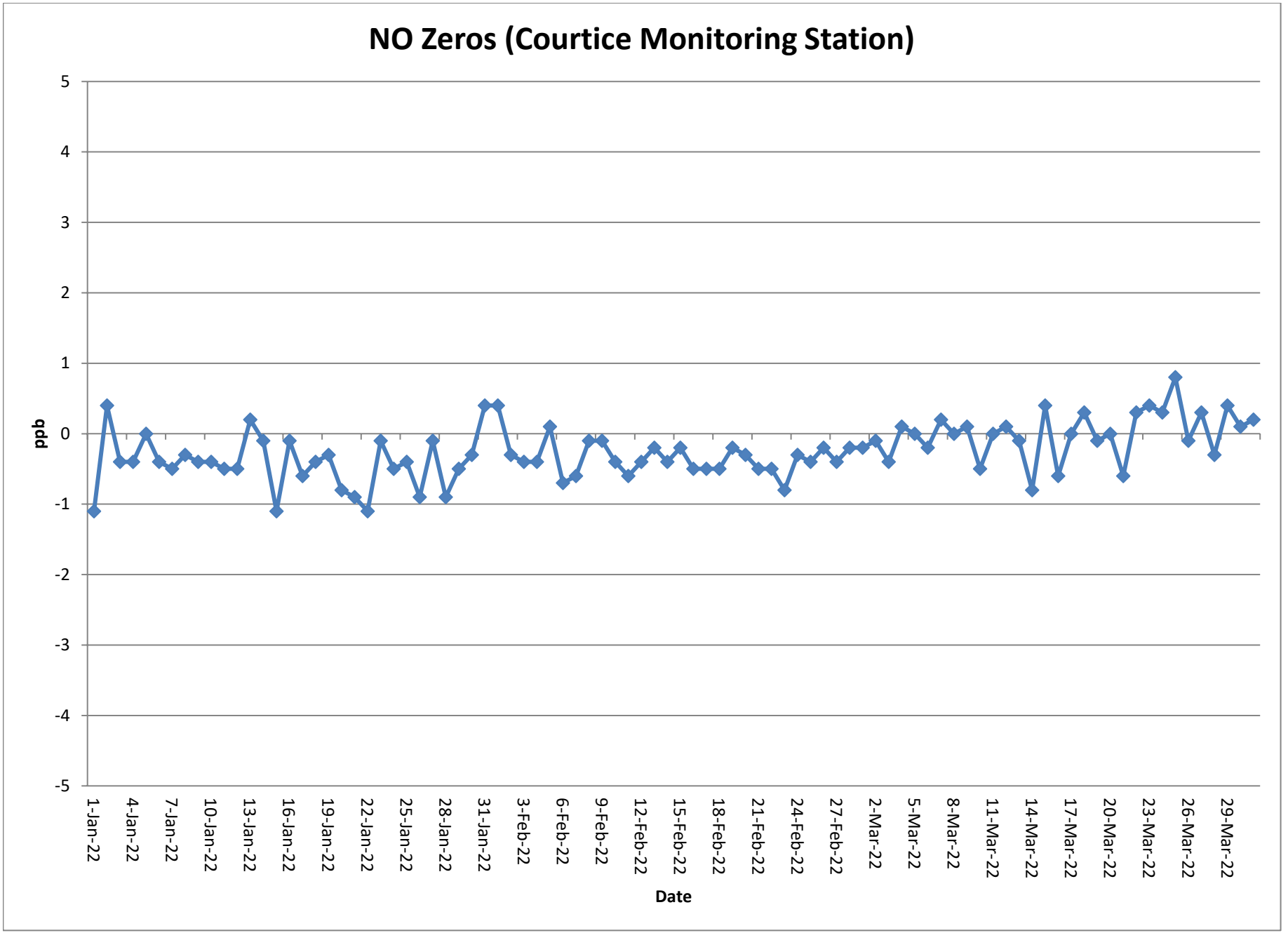
29-Mar-22
Date


NO Zeros (Courtice Monitoring Station)
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4
3
2
1
0
-1
-2
-3
-4
-5
1-Jan-22
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7-Jan-22
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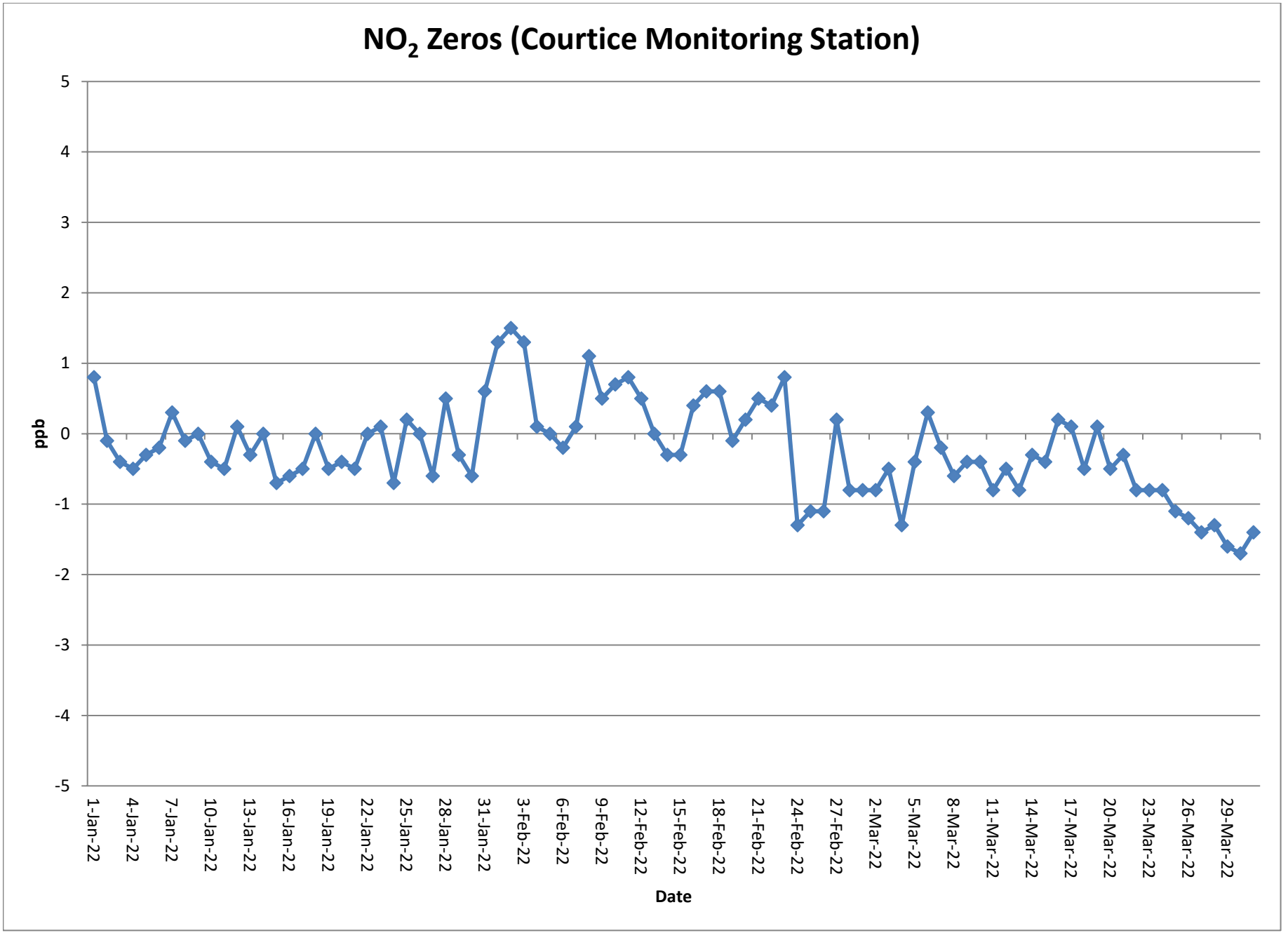
Date


NO2 Zeros (Courtice Monitoring Station)
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1
0
-1
-2
-3
-4
-5
1-Jan-22
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7-Jan-22
10-Jan-22
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22-Jan-22
25-Jan-22
28-Jan-22
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5-Mar-22
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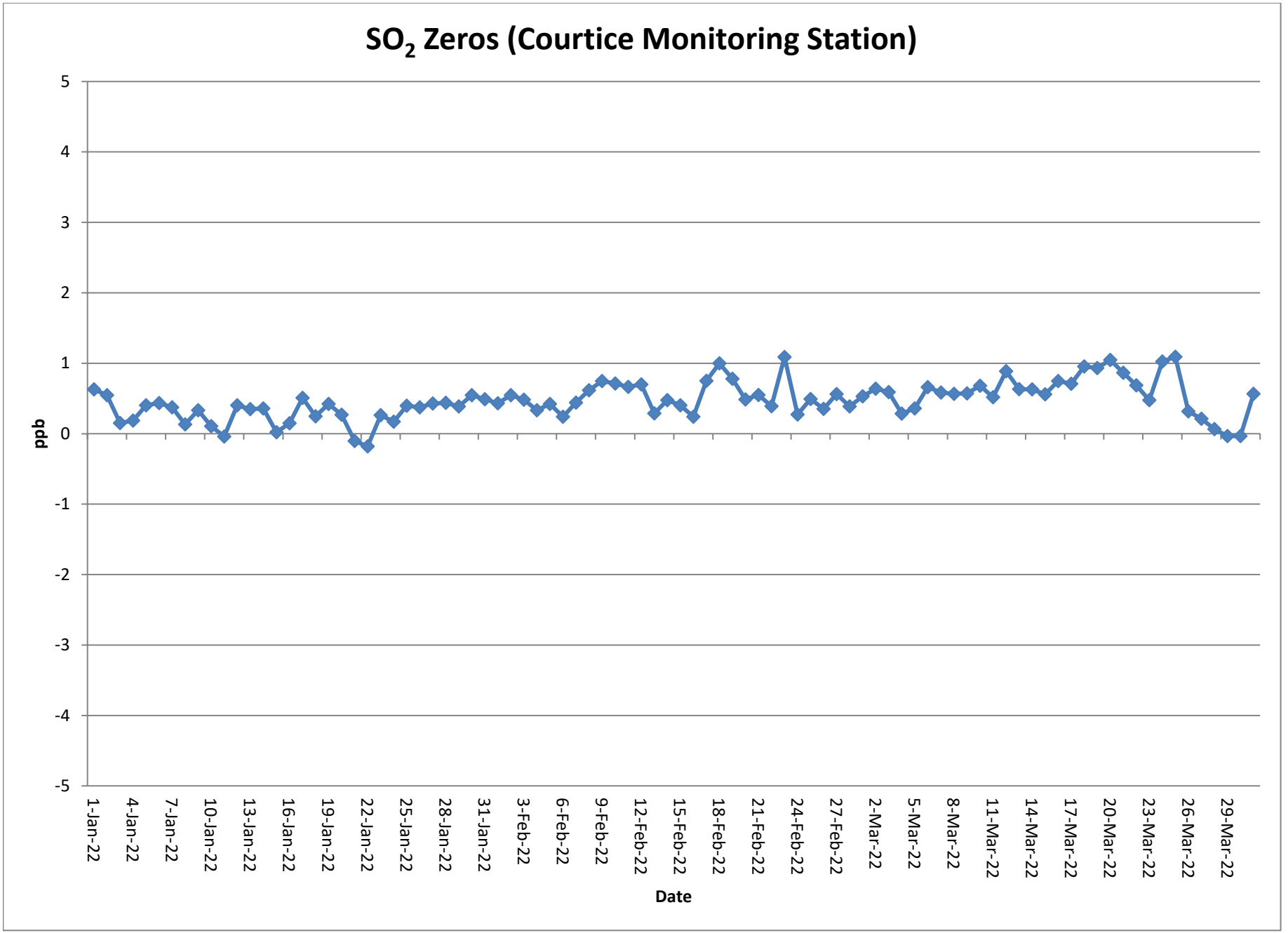
26-Mar-22
29-Mar-22
Date


SO2 Zeros (Courtice Monitoring Station)
ppb
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1
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-1
-2
-3
-4
-5
1-Jan-22
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21-Feb-22
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27-Feb-22
2-Mar-22
5-Mar-22
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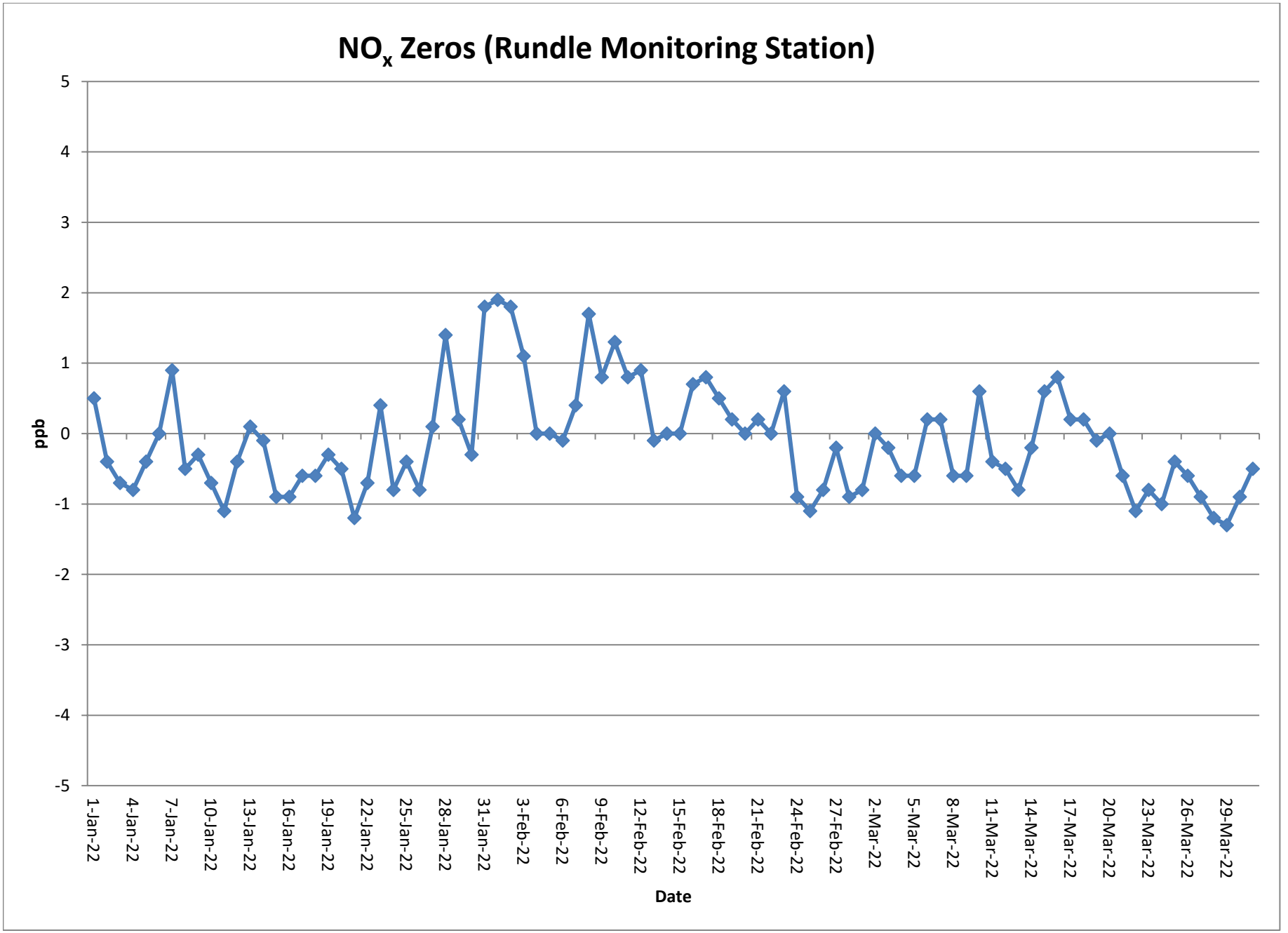
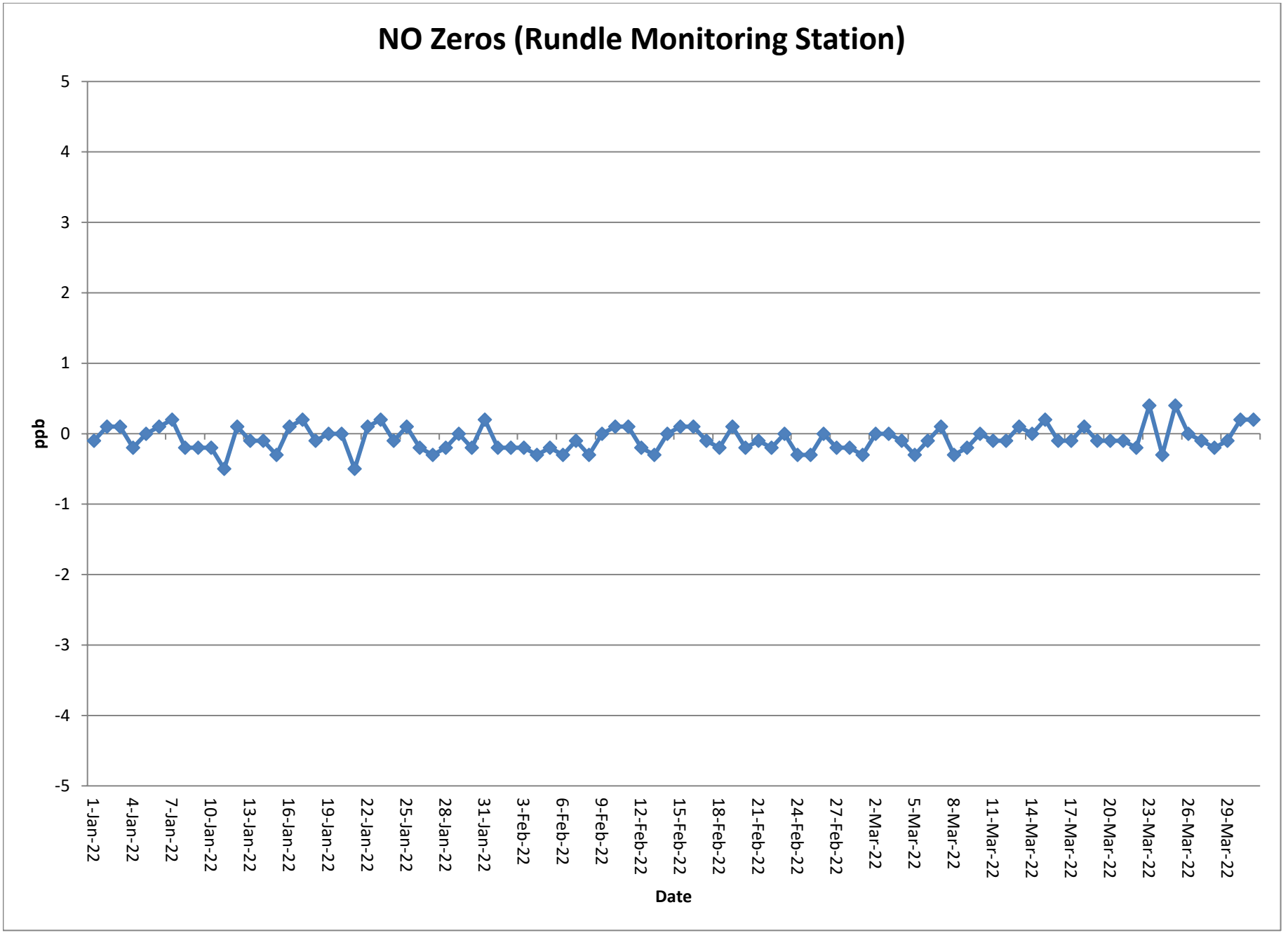
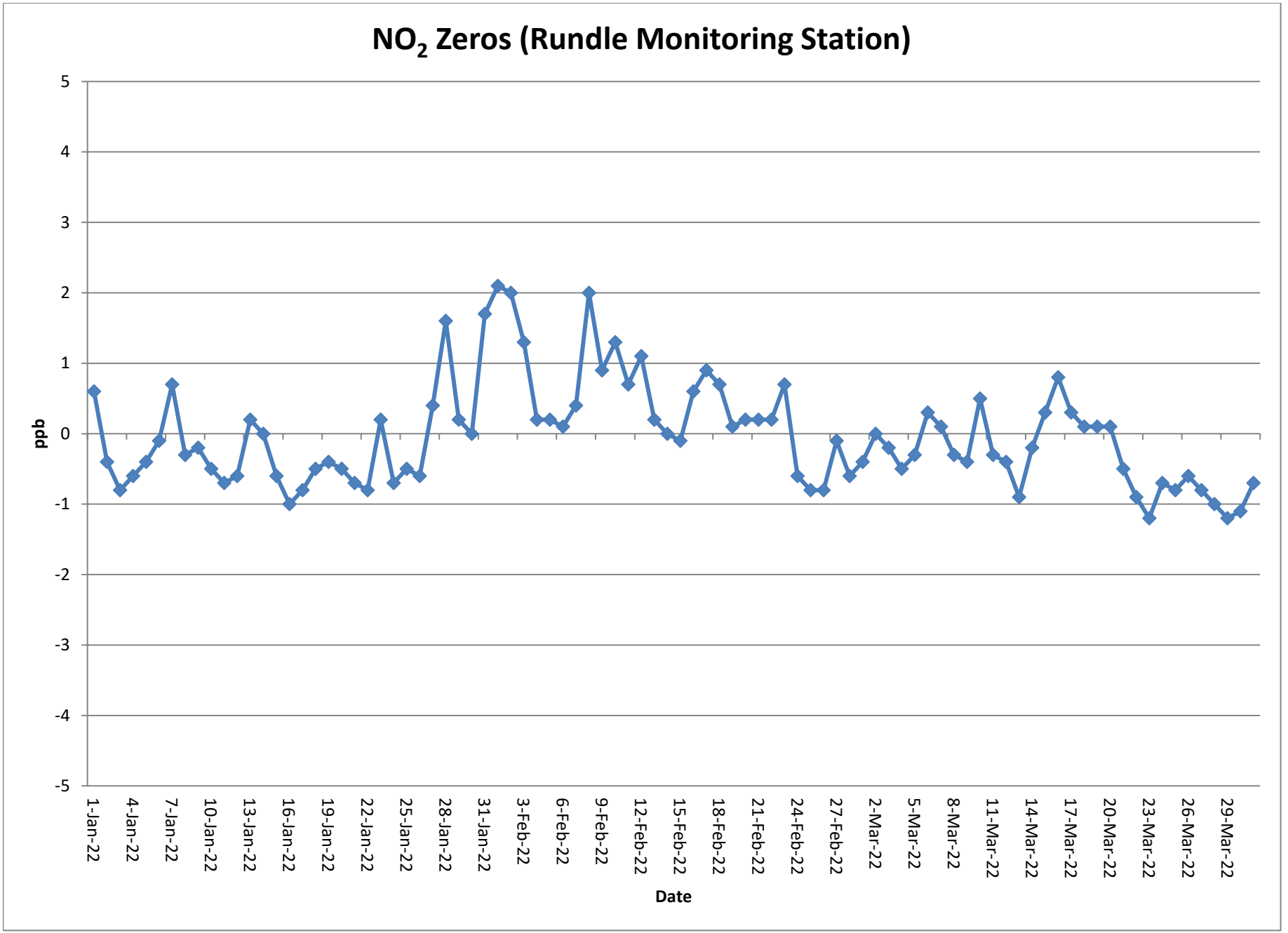
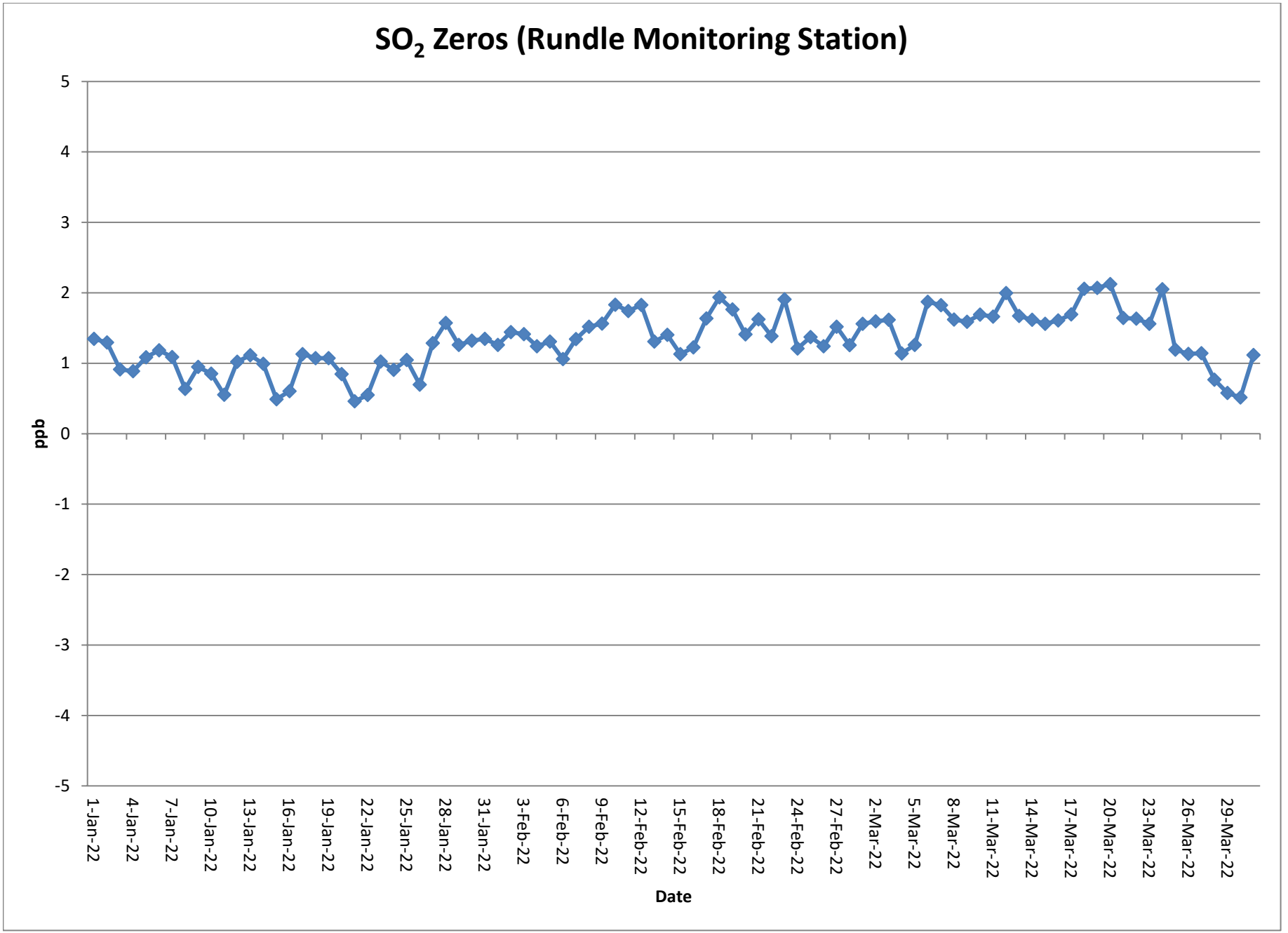
26-Mar-22
29-Mar-22
Date


NOx Zeros (Rundle Monitoring Station)
ppb
5
4
3
2
1
0
-1
-2
-3
-4
-5
1-Jan-22
4-Jan-22
7-Jan-22
10-Jan-22
13-Jan-22
16-Jan-22
19-Jan-22
22-Jan-22
25-Jan-22
28-Jan-22
31-Jan-22
3-Feb-22
6-Feb-22
9-Feb-22
12-Feb-22
15-Feb-22
18-Feb-22
21-Feb-22
24-Feb-22
27-Feb-22
2-Mar-22
5-Mar-22
8-Mar-22
11-Mar-22
14-Mar-22
17-Mar-22
20-Mar-22
23-Mar-22
26-Mar-22
29-Mar-22
Date


NO Zeros (Rundle Monitoring Station)
ppb
5
4
3
2
1
0
-1
-2
-3
-4
-5
1-Jan-22
4-Jan-22
7-Jan-22
10-Jan-22
13-Jan-22
16-Jan-22
19-Jan-22
22-Jan-22
25-Jan-22
28-Jan-22
31-Jan-22
3-Feb-22
6-Feb-22
9-Feb-22
12-Feb-22
15-Feb-22
18-Feb-22
21-Feb-22
24-Feb-22
27-Feb-22
2-Mar-22
5-Mar-22
8-Mar-22
11-Mar-22
14-Mar-22
17-Mar-22
20-Mar-22
23-Mar-22
26-Mar-22
29-Mar-22
Date


$NO_2$ Zeros (Rundle Monitoring Station)
ppb
5
4
3
2
1
0
-1
-2
-3
-4
-5
1-Jan-22
4-Jan-22
7-Jan-22
10-Jan-22
13-Jan-22
16-Jan-22
19-Jan-22
22-Jan-22
25-Jan-22
28-Jan-22
31-Jan-22
3-Feb-22
6-Feb-22
9-Feb-22
12-Feb-22
15-Feb-22
18-Feb-22
21-Feb-22
24-Feb-22
27-Feb-22
2-Mar-22
5-Mar-22
8-Mar-22
11-Mar-22
14-Mar-22
17-Mar-22
20-Mar-22
23-Mar-22
26-Mar-22
29-Mar-22
Date


SO2 Zeros (Rundle Monitoring Station)
ppb
5
4
3
2
1
0
-1
-2
-3
-4
-5
1-Jan-22
4-Jan-22
7-Jan-22
10-Jan-22
13-Jan-22
16-Jan-22
19-Jan-22
22-Jan-22
25-Jan-22
28-Jan-22
31-Jan-22
3-Feb-22
6-Feb-22
9-Feb-22
12-Feb-22
15-Feb-22
18-Feb-22
21-Feb-22
24-Feb-22
27-Feb-22
2-Mar-22
5-Mar-22
8-Mar-22
11-Mar-22
14-Mar-22
17-Mar-22
20-Mar-22
23-Mar-22
26-Mar-22
29-Mar-22
Date

# APPENDIX D

**Table D1: Q1 Edit Log for $PM_{2.5}$ at Courtice Station**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Emitter's Name:** Durham York Energy Centre | | | | | | | | | |
| **Contact** | **Name:** Ms. Lyndsay Waller | **Phone:** (905) 404-0888 ext 4107 | | **Email:** Lyndsay.Waller@Durham.ca | | | | | |
| **Station Number:** 45201 | | | **Station Name:** Courtice Station | | | | | | |
| **Station Address:** 100 Osbourne Road | | | **Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON | | | | | | |
| **Pollutants or Parameter:** $PM_{2.5}$ | | **Instrument Make & Model:** Thermo Scientific Model 5030 SHARP Monitor | | | | | **s/n:** E-1563 | | |
| **Data Edit Period** | Start Date: January 1, 2022 | | End Date: March 31, 2022 | | | All testing done in EST | | | |
| **Edit #** | **Edit date (dd/mm/yyyy)** | **Editor's Name** | **Edit Action** | **Starting** | | **Ending** | | **Duration** | **Reason** |
| | | | | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Deleted Hours** | |
| 1 | 25/01/2022 | SRS | Deleted Hours | 25/01/2022 | 15:00 | 25/01/2022 | 16:00 | 1 | Monthly Calibration |
| 2 | 23/02/2022 | SRS | Deleted Hours | 23/02/2022 | 14:00 | 23/02/2022 | 15:00 | 1 | Monthly Calibration |
| 3 | 25/03/2022 | SRS | Deleted Hours | 25/03/2022 | 13:00 | 25/03/2022 | 15:00 | 2 | Monthly Calibration |

**Table D2: Q1 Edit Log for $PM_{2.5}$ at Rundle Road Station**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Emitter's Name:** Durham York Energy Centre | | | | | | | | | |
| **Contact** | **Name:** Ms. Lyndsay Waller | | **Phone:** (905) 404-0888 ext 4107 | | **Email:** Lyndsay.Waller@Durham.ca | | | | |
| **Station Number:** 45200 | | | | **Station Name:** Rundle Road Station | | | | | |
| **Station Address:** Rundle Road | | | | **Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON | | | | | |
| **Pollutants or Parameter:** $PM_{2.5}$ | | | **Instrument Make & Model:** Thermo Scientific Model 5030 SHARP Monitor | | | | | | **s/n:** E-1569 |
| **Data Edit Period** | | Start Date: January 1, 2022 | | End Date: March 31, 2022 | | | All testing done in EST | | |
| **Edit #** | **Edit date (dd/mm/yyyy)** | **Editor's Name** | **Edit Action** | **Starting** | | **Ending** | | **Duration** | **Reason** |
| | | | | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Deleted Hours** | |
| 1 | 26/01/2022 | SRS | Deleted Hours | 26/01/2022 | 15:00 | 26/01/2022 | 16:00 | 1 | Monthly Calibration |
| 2 | 23/02/2022 | SRS | Deleted Hours | 23/02/2022 | 16:00 | 23/02/2022 | 18:00 | 2 | Monthly Calibration |
| 3 | 14/04/2022 | VML | Deleted Hours | 06/03/2022 | 20:00 | 06/03/2022 | 21:00 | 1 | Erroneous Values |
| 4 | 24/03/2022 | SRS | Deleted Hours | 24/03/2022 | 12:00 | 24/03/2022 | 14:00 | 2 | Monthly Calibration |

**Table D3: Q1 Edit Log for $NO_X$ at Courtice Station**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Emitter's Name:** Durham York Energy Centre | | | | | | | | | |
| **Contact** | **Name:** Ms. Lyndsay Waller | | **Phone:** (905) 404-0888 ext 4107 | | **Email:** Lyndsay.Waller@Durham.ca | | | | |
| **Station Number:** 45201 | | | | **Station Name:** Courtice Station | | | | | |
| **Station Address:** 100 Osbourne Road | | | | **Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON | | | | | |
| **Pollutants or Parameter:** NOx | | | **Instrument Make & Model:** Teledyne Nitrogen Oxide Analyzer Model T200 | | | | | | **s/n:** 675 |
| **Data Edit Period** | | Start Date: January 1, 2022 | | End Date: March 31, 2022 | | | All testing done in EST | | |
| **Edit #** | **Edit date (dd/mm/yyyy)** | **Editor's Name** | **Edit Action** | **Starting** | | **Ending** | | **Duration** | **Reason** |
| | | | | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Deleted Hours** | |
| 1 | 25/01/2022 | SRS | Deleted Hours | 25/01/2022 | 14:00 | 25/01/2022 | 18:00 | 4 | Monthly Calibration & GPT |
| 2 | 07/02/2022 | MPA | Zero correction | 01/01/2022 | 00:00 | 01/02/2022 | 00:00 | - | Correcting values <0 to 0 |
| 3 | 23/02/2022 | SRS | Deleted Hours | 23/02/2022 | 11:00 | 23/02/2022 | 14:00 | 3 | Monthly Calibration |
| 4 | 08/03/2022 | MPA | Zero correction | 01/02/2022 | 00:00 | 01/03/2022 | 00:00 | - | Correcting values <0 to 0 |
| 5 | 27/04/2022 | MPA | Deleted Hours | 08/03/2022 | 13:00 | 08/03/2022 | 14:00 | 1 | Power Failure |
| 6 | 24/03/2022 | SRS | Deleted Hours | 24/03/2022 | 14:00 | 24/03/2022 | 16:00 | 2 | Monthly Calibration |
| 7 | 11/04/2022 | SRS | Zero Offset Adjustement | 01/03/2022 | 00:00 | 01/04/2022 | 00:00 | - | Correcting Zero Drift |
| 8 | 11/04/2022 | SRS | Zero correction | 01/03/2022 | 00:00 | 01/04/2022 | 00:00 | - | Correcting values <0 to 0 |

**Table D4: Q1 Edit Log for $NO_X$ at Rundle Road Station**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Emitter's Name:** Durham York Energy Centre | | | | | | | | | |
| **Contact** | **Name:** Ms. Lyndsay Waller | | **Phone:** (905) 404-0888 ext 4107 | | **Email:** Lyndsay.Waller@Durham.ca | | | | |
| **Station Number:** 45200 | | | | **Station Name:** Rundle Road Station | | | | | |
| **Station Address:** Rundle Road | | | | **Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON | | | | | |
| **Pollutants or Parameter:** NOx | | | **Instrument Make & Model:** Teledyne Nitrogen Oxide Analyzer Model T200 | | | | | | **s/n:** 676 |
| **Data Edit Period** | | Start Date: January 1, 2022 | | End Date: March 31, 2022 | | | All testing done in EST | | |
| **Edit #** | **Edit date (dd/mm/yyyy)** | **Editor's Name** | **Edit Action** | **Starting** | | **Ending** | | **Duration** | **Reason** |
| | | | | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Deleted Hours** | |
| 1 | 26/01/2022 | SRS | Deleted Hours | 26/01/2022 | 13:00 | 26/01/2022 | 16:00 | 3 | Monthly Calibration & GPT |
| 2 | 07/02/2022 | MPA | Zero correction | 01/01/2022 | 00:00 | 01/02/2022 | 00:00 | - | Correcting values <0 to 0 |
| 3 | 23/02/2022 | SRS | Deleted Hours | 23/02/2022 | 16:00 | 23/02/2022 | 18:00 | 2 | Monthly Calibration |
| 4 | 08/03/2022 | MPA | Zero correction | 01/02/2022 | 00:00 | 01/03/2022 | 00:00 | - | Correcting values <0 to 0 |
| 5 | 23/02/2022 | SRS | Deleted Hours | 24/03/2022 | 11:00 | 24/03/2022 | 14:00 | 3 | Monthly Calibration |
| 6 | 13/04/2022 | SRS | Zero Offset Adjustement | 01/03/2022 | 00:00 | 01/04/2022 | 00:00 | - | Correcting Zero Drift |
| 7 | 13/04/2022 | SRS | Zero correction | 01/03/2022 | 00:00 | 01/04/2022 | 00:00 | - | Correcting values <0 to 0 |

**Table D5: Q1 Edit Log for $SO_2$ at Courtice Station**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Emitter's Name:** Durham York Energy Centre | | | | | | | |
| **Contact** | **Name:** Ms. Lyndsay Waller | **Phone:** (905) 404-0888 ext 4107 | | **Email:** Lyndsay.Waller@Durham.ca | | | |
| **Station Number:** 45201 | | | **Station Name:** Courtice Station | | | | |
| **Station Address:** 100 Osbourne Road | | | **Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON | | | | |
| **Pollutants or Parameter:** $SO_2$ | | **Instrument Make & Model:** Teledyne Sulfur Dioxide Analyzer Model T100 | | | | | **s/n:** 565 |
| **Data Edit Period** | Start Date: January 1, 2022 | | End Date: March 31, 2022 | | All testing done in EST | | |

| Edit # | Edit Date (dd/mm/yyyy) | Editor's Name | Edit Action | Starting | | Ending | | Duration | Reason |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Date (dd/mm/yyyy) | Hour (xx:xx) | Date (dd/mm/yyyy) | Hour (xx:xx) | Deleted Hours | |
| 1 | 25/01/2022 | SRS | Deleted Hours | 25/01/2022 | 11:00 | 25/01/2022 | 15:00 | 4 | Monthly Calibration & Perm Tube Replaced |
| 2 | 07/02/2022 | MPA | Zero correction | 01/01/2022 | 00:00 | 01/02/2022 | 00:00 | - | Correcting values <0 to 0 |
| 3 | 23/02/2022 | SRS | Deleted Hours | 23/02/2022 | 13:00 | 23/02/2022 | 15:00 | 2 | Monthly Calibration |
| 4 | 08/03/2022 | MPA | Zero correction | 01/02/2022 | 00:00 | 01/03/2022 | 00:00 | - | Correcting values <0 to 0 |
| 5 | 27/04/2022 | MPA | Deleted Hours | 08/03/2022 | 13:00 | 08/03/2022 | 14:00 | 1 | Power Failure |
| 6 | 25/03/2022 | SRS | Deleted Hours | 25/03/2022 | 10:00 | 25/03/2022 | 15:00 | 5 | Monthly Calibration & UV Lamp Replaced |
| 7 | 14/04/2022 | SRS | Zero correction | 01/03/2022 | 00:00 | 01/04/2022 | 00:00 | - | Correcting values <0 to 0 |

**Table D6: Q1 Edit Log for $SO_2$ at Rundle Road Station**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Emitter's Name:** Durham York Energy Centre | | | | | | | | | |
| **Contact** | **Name:** Ms. Lyndsay Waller | **Phone:** (905) 404-0888 ext 4107 | **Email:** Lyndsay.Waller@Durham.ca | | | | | | |
| **Station Number:** 45200 | | | **Station Name:** Rundle Road Station | | | | | | |
| **Station Address:** Rundle Road | | | **Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON | | | | | | |
| **Pollutants or Parameter:** $SO_2$ | | **Instrument Make & Model:** Teledyne Sulfur Dioxide Analyzer Model T100 | | | | | | **s/n:** 566 | |
| **Data Edit Period** | Start Date: January 1, 2022 | | End Date: March 31, 2022 | | | All testing done in EST | | | |
| **Edit #** | **Edit date (dd/mm/yyyy)** | **Editor's Name** | **Edit Action** | **Starting** | | **Ending** | | **Duration** | **Reason** |
| | | | | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Deleted Hours** | |
| 1 | 26/01/2022 | SRS | Deleted Hours | 26/01/2022 | 11:00 | 26/01/2022 | 13:00 | 2 | Monthly Calibration & Perm Tube Replaced |
| 2 | 07/02/2022 | MPA | Zero correction | 01/01/2022 | 00:00 | 01/02/2022 | 00:00 | - | Correcting values <0 to 0 |
| 3 | 23/02/2022 | SRS | Deleted Hours | 23/02/2022 | 15:00 | 23/02/2022 | 17:00 | 2 | Monthly Calibration |
| 4 | 08/03/2022 | MPA | Zero correction | 01/02/2022 | 00:00 | 01/03/2022 | 00:00 | - | Correcting values <0 to 0 |
| 5 | 24/03/2022 | SRS | Deleted Hours | 24/03/2022 | 10:00 | 24/03/2022 | 12:00 | 2 | Monthly Calibration |
| 6 | 14/04/2022 | SRS | Zero offset adjustment | 23/02/2022 | 17:00 | 24/03/2022 | 10:00 | - | Correcting zero drift |
| 7 | 14/04/2022 | SRS | Zero correction | 01/03/2022 | 00:00 | 01/04/2022 | 00:00 | - | Correcting values <0 to 0 |

**Table D7: Q1 Edit Log for Meteorological Parameters at Courtice Road Station**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Emitter's Name:** Durham York Energy Centre | | | | | | | | | |
| **Contact** | **Name:** Ms. Lyndsay Waller | | **Phone:** (905) 404-0888 ext 4107 | | **Email:** Lyndsay.Waller@Durham.ca | | | | |
| **Station Number:** 45201 | | | | **Station Name:** Courtice Station | | | | | |
| **Station Address:** 100 Osbourne Road | | | | **Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON | | | | | |
| **Pollutants or Parameter:** WS, WD, Ambient T, P, RH and Rain | | | **Instrument Make & Model:** Miscellaneous Meterological Instrumentation | | | | | | **s/n:** N/A |
| **Data Edit Period** | Start Date: January 1, 2022 | | | End Date: March 31, 2022 | | | All testing done in EST | | |
| **Edit #** | **Edit date (dd/mm/yyyy)** | **Editor's Name** | **Edit Action** | **Starting** | | **Ending** | | **Duration** | **Reason** |
| | | | | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Deleted Hours** | |
| - | - | - | - | - | - | - | - | - | |

**Table D8: Q1 Edit Log for Meteorological Parameters at Rundle Road Station**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Emitter's Name:** Durham York Energy Centre | | | | | | | | | |
| **Contact** | **Name:** Ms. Lyndsay Waller | | **Phone:** (905) 404-0888 ext 4107 | | **Email:** Lyndsay.Waller@Durham.ca | | | | |
| **Station Number:** 45200 | | | | **Station Name:** Rundle Station | | | | | |
| **Station Address:** Rundle Road | | | | **Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON | | | | | |
| **Pollutants or Parameter:** WS, WD, Ambient T, P, RH and Rain | | | **Instrument Make & Model:** Miscellaneous Meterological Instrumentation | | | | | | **s/n:** N/A |
| **Data Edit Period** | | Start Date: January 1, 2022 | | End Date: March 31, 2022 | | | All testing done in EST | | |
| **Edit #** | **Edit date (dd/mm/yyyy)** | **Editor's Name** | **Edit Action** | **Starting** | | **Ending** | | **Duration** | **Reason** |
| | | | | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Deleted Hours** | |
| - | - | - | - | - | - | - | - | - | |

**Table D9: Q1 Edit Log for Discrete Sampling at Courtice Station**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Emitter's Name:** Durham York Energy Center | | | | | | | | | |
| **Contact** | **Name:** Ms. Lyndsay Waller | **Phone:** (905) 404-0888 ext 4107 | **Email:** Lyndsay.Waller@Durham.ca | | | | | | |
| **Station Number:** 45201 | | | **Station Name:** Courtice Station | | | | | | |
| **Station Address:** 100 Osbourne Road | | | **Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON | | | | | | |
| **Pollutants or Parameter:** N/A | | **Instrument Make & Model:** N/A | | | | | | **s/n:** | |
| **Data Edit Period** | Start Date: January 1, 2022 | End Date: March 31, 2022 | | | | All testing done in EST | | | |
| **Edit #** | **Edit date (dd/mm/yyyy)** | **Editor's Name** | **Edit Action** | **Starting** | | **Ending** | | **Duration** | **Reason** |
| | | | | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Deleted Hours** | |
| 1 | 21/04/2022 | DAJH | Deleted Hours | 17/01/2022 | 00:00 | 18/01/2022 | 00:00 | 24 | Equipment Malfunction |
| 2 | 21/04/2022 | DAJH | Deleted Hours | 29/01/2022 | 00:00 | 30/01/2022 | 00:00 | 24 | Laboratory Error |
| 3 | 21/04/2022 | DAJH | Deleted Hours | 22/02/2022 | 00:00 | 23/02/2022 | 00:00 | 24 | Equipment Malfunction |

**Table D10: Q1 Edit Log for Discrete Sampling at Rundle Station**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Emitter's Name:** Durham York Energy Center | | | | | | | | | |
| **Contact** | **Name:** Ms. Lyndsay Waller | **Phone:** (905) 404-0888 ext 4107 | **Email:** Lyndsay.Waller@Durham.ca | | | | | | |
| **Station Number:** 45200 | | | **Station Name:** Rundle Station | | | | | | |
| **Station Address:** Rundle Rd | | | **Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON | | | | | | |
| **Pollutants or Parameter:** N/A | | **Instrument Make & Model:** N/A | | | | | | | **s/n:** |
| **Data Edit Period** | Start Date: January 1, 2022 | | End Date: March 31, 2022 | | | All testing done in EST | | | |
| **Edit #** | **Edit date (dd/mm/yyyy)** | **Editor's Name** | **Edit Action** | **Starting** | | **Ending** | | **Duration** | **Reason** |
| | | | | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Date (dd/mm/yyyy)** | **Hour (xx:xx)** | **Deleted Hours** | |
| 1 | 21/04/2022 | DAJH | Deleted Hours | 05/01/2022 | 00:00 | 06/01/2022 | 00:00 | 24 | Equipment Malfunction |
| 2 | 21/04/2022 | DAJH | Deleted Hours | 29/01/2022 | 00:00 | 30/01/2022 | 00:00 | 24 | Laboratory Error |

# APPENDIX E

**Table E1. $SO_2$ Courtice Monitoring Station 10-min Running Average Exceedance Periods on January 13, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 10 min Running Avg. | |
|---|---|---|---|
| EST | ppb | ppb | |
| 13/01/2022 04:35 | 1.838 | 5.705 | |
| 13/01/2022 04:40 | 1.454 | 1.646 | |
| 13/01/2022 04:45 | 2.137 | 1.796 | |
| 13/01/2022 04:50 | 1.786 | 1.962 | |
| 13/01/2022 04:55 | 4.419 | 3.103 | |
| 13/01/2022 05:00 | | | |
| 13/01/2022 05:05 | | 69.839 | 1 |
| 13/01/2022 05:10 | 16.143 | **76.715** | |
| 13/01/2022 05:15 | 7.112 | 11.628 | |
| 13/01/2022 05:20 | 3.52 | 5.316 | |
| 13/01/2022 05:25 | 9.741 | 6.631 | |

| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| | Exceedance number |

**Table E2. $SO_2$ Courtice Monitoring Station 10-min Running Average Exceedance Periods on January 18, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 10 min Running Avg. | |
|---|---|---|---|
| EST | ppb | ppb | |
| 18/01/2022 15:45 | 3.299 | 2.248 | |
| 18/01/2022 15:50 | 0.345 | 1.822 | |
| 18/01/2022 15:55 | 1.215 | 0.78 | |
| 18/01/2022 16:00 | 0.867 | 1.041 | |
| 18/01/2022 16:05 | | | |
| 18/01/2022 16:10 | | 83.921 | 2 |
| 18/01/2022 16:15 | | **143.553** | |
| 18/01/2022 16:20 | | **93.599** | 3 |
| 18/01/2022 16:25 | 74.205 | 70.843 | |
| 18/01/2022 16:30 | 6.882 | 40.544 | |
| 18/01/2022 16:35 | 43.701 | 25.292 | |
| 18/01/2022 16:40 | 65.826 | 54.764 | |
| 18/01/2022 16:45 | 5.372 | 35.599 | |
| 18/01/2022 16:50 | | 22.138 | |
| 18/01/2022 16:55 | | **88.086** | 4 |
| 18/01/2022 17:00 | 20.297 | 78.783 | |
| 18/01/2022 17:05 | 4.427 | 12.362 | |
| 18/01/2022 17:10 | 3.22 | 3.824 | |
| 18/01/2022 17:15 | 1.595 | 2.408 | |
| 18/01/2022 17:20 | 14.286 | 7.941 | |
| 18/01/2022 17:25 | 2.983 | 8.635 | |
| 18/01/2022 17:30 | 14.632 | 8.808 | |

| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| | Exceedance number |

**Table E3. $SO_2$ Courtice Monitoring Station 10-min Running Average Exceedance Period on January 20, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 10 min Running Avg. | |
|---|---|---|---|
| EST | ppb | ppb | |
| 20/01/2022 05:55 | 0.17 | 0.085 | |
| 20/01/2022 06:00 | 0.413 | 0.292 | |
| 20/01/2022 06:05 | 0.313 | 0.363 | |
| 20/01/2022 06:10 | 0 | 0.157 | |
| 20/01/2022 06:15 | 5.917 | 2.959 | |
| 20/01/2022 06:20 | 198.92 | 102.419 | 5 |
| 20/01/2022 06:25 | 50 | **124.46** | |
| 20/01/2022 06:30 | 15.538 | 32.769 | |
| 20/01/2022 06:35 | 6.5 | 11.019 | |
| 20/01/2022 06:40 | 23.466 | 14.983 | |

| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| # | Exceedance number |

**Table E4. $SO_2$ Courtice Monitoring Station 10-min Running Average Exceedance Period on January 21, 2022**

| | | |
|---|---|---|
| 21/01/2022 07:50 | 1.219 | 1.545 |
| 21/01/2022 07:55 | 1.169 | 1.194 |
| 21/01/2022 08:00 | 0.616 | 0.893 |
| 21/01/2022 08:05 | | |
| | | |
| 21/01/2022 08:15 | 19.3 | **84.513** |
| 21/01/2022 08:20 | 51.143 | 35.222 |
| 21/01/2022 08:25 | 40.071 | 45.607 |
| 21/01/2022 08:30 | 49.358 | 44.715 |

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| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| | Exceedance number |

**Table E5. $SO_2$ Courtice Monitoring Station 10-min Running Average Exceedance Periods on January 25, 2022**

| | | | |
|---|---|---|---|
| | | | |
| 25/01/2022 23:05 | 5.207 | 4.223 | |
| 25/01/2022 23:10 | 12.61 | 8.909 | |
| 25/01/2022 23:15 | 6.767 | 9.689 | |
| 25/01/2022 23:20 | | 35.791 | |
| | | | } 7 |
| 25/01/2022 23:30 | 4.578 | 39.965 | |
| 25/01/2022 23:35 | 7.022 | 5.8 | |
| 25/01/2022 23:40 | 2.913 | 4.968 | |

| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| } | Range of running average values during exceedance period |
| | Exceedance number |

**Table E6. $SO_2$ Courtice Monitoring Station 10-min Running Average Exceedance Periods on January 28, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 10 min Running Avg. | |
|---|---|---|---|
| EST | ppb | ppb | |
| 28/01/2022 22:15 | 41.285 | 37.915 | |
| 28/01/2022 22:20 | 42.142 | 41.714 | |
| 28/01/2022 22:25 | 53.239 | 47.691 | |
| 28/01/2022 22:30 | 30.314 | 41.777 | |
| 28/01/2022 22:35 | 56.686 | 43.5 | |
| 28/01/2022 22:40 | 67.603 | 62.145 | |
| 28/01/2022 22:45 | 62.238 | 64.921 | |
| 28/01/2022 22:50 | 98.949 | 80.594 | 8 |
| 28/01/2022 22:55 | 62.818 | **80.884** | |
| 28/01/2022 23:00 | 47.951 | 55.385 | |
| 28/01/2022 23:05 | 70.984 | 59.468 | |
| 28/01/2022 23:10 | 63.985 | **67.485** | 9 |
| 28/01/2022 23:15 | 67.646 | 65.816 | |
| 28/01/2022 23:20 | 64.715 | 66.181 | |
| 28/01/2022 23:25 | 68.866 | 66.791 | |
| 28/01/2022 23:30 | 70.751 | 69.809 | 10 |
| 28/01/2022 23:35 | 70.974 | **70.863** | |
| 28/01/2022 23:40 | 55.159 | 63.067 | |
| 28/01/2022 23:45 | 37.797 | 46.478 | |
| 28/01/2022 23:50 | 43.837 | 40.817 | |

| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| } | Range of running average values during exceedance period |
| # | Exceedance number |

**Table E7. $SO_2$ Courtice Monitoring Station 10-min Running Average Exceedance Periods on March 5, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 10 min Running Avg. | |
|---|---|---|---|
| EST | ppb | ppb | |
| 4/3/2022 23:45 | 6.128 | 3.389 | |
| 4/3/2022 23:50 | 5.33 | 5.729 | |
| 4/3/2022 23:55 | 0.35 | 2.84 | |
| 5/3/2022 0:00 | 0.369 | 0.36 | |
| 5/3/2022 0:05 | 126.837 | 63.603 | |
| 5/3/2022 0:10 | 158.288 | 142.563 | 11 |
| 5/3/2022 0:15 | 196.435 | **177.362** | |
| 5/3/2022 0:20 | 160.074 | 178.255 | 12 |
| 5/3/2022 0:25 | 201.315 | **180.695** | |
| 5/3/2022 0:30 | 197.03 | **199.173** | 13 |
| 5/3/2022 0:35 | 85.237 | 141.134 | |
| 5/3/2022 0:40 | 10.555 | 47.896 | |
| 5/3/2022 0:45 | 6.314 | 8.435 | |
| 5/3/2022 0:50 | 4.692 | 5.503 | |

| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| # | Exceedance number |

**Table E8. $SO_2$ Courtice Monitoring Station 10-min Running Average Exceedance Period on March 5, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 10 min Running Avg. | |
|---|---|---|---|
| EST | ppb | ppb | |
| 5/3/2022 2:20 | 9.261 | 6.117 | |
| 5/3/2022 2:25 | 5.142 | 7.202 | |
| 5/3/2022 2:30 | 4.56 | 4.851 | |
| 5/3/2022 2:35 | 6.642 | 5.601 | |
| 5/3/2022 2:40 | 82.323 | 44.483 | |
| 5/3/2022 2:45 | 97.73 | **90.027** | 14 |
| 5/3/2022 2:50 | 80.068 | | |
| 5/3/2022 2:55 | 9.609 | 44.839 | |
| 5/3/2022 3:00 | 38.541 | 24.075 | |
| 5/3/2022 3:05 | 106.869 | 72.705 | 15 |
| 5/3/2022 3:10 | 71.103 | **88.986** | |
| 5/3/2022 3:15 | 51.682 | 61.393 | |
| 5/3/2022 3:20 | 33.702 | 42.692 | |
| 5/3/2022 3:25 | 30.147 | 31.925 | |
| 5/3/2022 3:30 | 13.896 | 22.022 | |
| 5/3/2022 3:35 | 5.088 | 9.492 | |

| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| | Exceedance number |

**Table E9. $SO_2$ Courtice Monitoring Station 10-min Running Average Exceedance Periods on March 7, 2022**

| Date & Time EST | $SO_2$ 5 min Avg. ppb | $SO_2$ 10 min Running Avg. ppb | |
|---|---|---|---|
| 7/3/2022 3:20 | 6.653 | 5.698 | |
| 7/3/2022 3:25 | 69.887 | 38.27 | |
| 7/3/2022 3:30 | 68.128 | 69.008 | 16 |
| 7/3/2022 3:35 | 120.066 | **94.097** | |
| 7/3/2022 3:40 | 19.1 | **69.583** | 17 |
| 7/3/2022 3:45 | 51.739 | 35.42 | |
| 7/3/2022 3:50 | 62.891 | 57.315 | |
| 7/3/2022 3:55 | 26.558 | 44.725 | |
| 7/3/2022 4:00 | 42.528 | 34.543 | |
| 7/3/2022 4:05 | 9.378 | 25.953 | |

| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| # | Exceedance number |

**Table E10. $SO_2$ Courtice Monitoring Station 10-min Running Average Exceedance Periods on March 14, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 10 min Running Avg. | |
|---|---|---|---|
| EST | ppb | ppb | |
| 14/03/2022 06:10 | 0.898 | 0.732 | |
| 14/03/2022 06:15 | 4.904 | 2.901 | |
| 14/03/2022 06:20 | 116.532 | 60.718 | |
| 14/03/2022 06:25 | 18.871 | **67.702** | 18 |
| 14/03/2022 06:30 | 65.527 | 42.199 | |
| 14/03/2022 06:35 | 105.017 | **85.272** | 19 |
| 14/03/2022 06:40 | 11.971 | 58.494 | |
| 14/03/2022 06:45 | 5.845 | 8.908 | |
| 14/03/2022 06:50 | 71.433 | 38.639 | |
| 14/03/2022 06:55 | 128.58 | 100.007 | 20 |
| 14/03/2022 07:00 | 116.739 | **122.66** | |
| 14/03/2022 07:05 | 71.821 | **94.28** | 21 |
| 14/03/2022 07:10 | 92.408 | 82.115 | |
| 14/03/2022 07:15 | 162.947 | **127.678** | 22 |
| 14/03/2022 07:20 | 23.479 | 93.213 | |
| 14/03/2022 07:25 | 142.393 | 82.936 | 23 |
| 14/03/2022 07:30 | 252.717 | **197.555** | |
| 14/03/2022 07:35 | 196.224 | **224.471** | 24 |
| 14/03/2022 07:40 | 49.635 | 122.93 | |
| 14/03/2022 07:45 | 25.043 | 37.339 | |
| 14/03/2022 07:50 | 8.819 | 16.931 | |
| 14/03/2022 07:55 | 145.605 | 77.212 | 25 |
| 14/03/2022 08:00 | 27.449 | **86.527** | |
| 14/03/2022 08:05 | 114.494 | 70.972 | 26 |
| 14/03/2022 08:10 | 47.155 | **80.825** | |
| 14/03/2022 08:15 | 27.523 | 37.339 | |
| 14/03/2022 08:20 | 9.152 | 18.338 | |
| 14/03/2022 08:25 | 9.135 | 9.144 | |

| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| } | Range of running average values during exceedance period |
| # | Exceedance number |

**Table E11. $SO_2$ Courtice Monitoring Station 10-min Running Average Exceedance Periods on March 17, 2022**

| | | | |
|---|---|---|---|
| | | | |
| 17/03/2022 20:40 | 1.811 | 1.72 | |
| 17/03/2022 20:45 | 22.323 | 12.067 | |
| 17/03/2022 20:50 | | 45.378 | |
| | | | 27 |
| 17/03/2022 21:00 | 25.884 | | |
| 17/03/2022 21:05 | | 56.938 | |
| | | | 28 |
| 17/03/2022 21:15 | | | |
| | | | 29 |
| 17/03/2022 21:25 | | **179.8** | |
| | | | 30 |
| 17/03/2022 21:35 | | | |
| | | | 31 |
| 17/03/2022 21:45 | 29.252 | | |
| 17/03/2022 21:50 | 68.541 | 48.897 | |
| 17/03/2022 21:55 | 29.501 | 49.021 | |
| 17/03/2022 22:00 | 15.691 | 22.596 | |

| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| | Exceedance number |

**Table E12. $SO_2$ Courtice Monitoring Station 10-min Running Average Exceedance Periods on March 18, 2022**

| | | |
|---|---|---|
| | | |
| 18/03/2022 03:30 | 2.449 | 3.103 |
| 18/03/2022 03:35 | 3.548 | 2.999 |
| 18/03/2022 03:40 | | 52.33 |
| | | |
| 18/03/2022 03:50 | 6.769 | |
| 18/03/2022 03:55 | 5.068 | 5.919 |
| 18/03/2022 04:00 | 3.509 | 4.289 |
| 18/03/2022 04:05 | 3.344 | 3.427 |

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| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| | Exceedance number |

**Table E13. $SO_2$ Courtice Monitoring Station 10-min Running Average Exceedance Period on March 22, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 10 min Running Avg. | |
|---|---|---|---|
| EST | ppb | ppb | |
| 22/03/2022 06:30 | 10.975 | 6.6 | |
| 22/03/2022 06:35 | 36.323 | 23.6 | |
| 22/03/2022 06:40 | 98.071 | **67.2** | 33 |
| 22/03/2022 06:45 | 17.697 | 57.9 | |
| 22/03/2022 06:50 | 4.827 | 11.3 | |
| 22/03/2022 06:55 | 4.545 | 4.7 | |
| 22/03/2022 07:00 | 6.005 | 5.3 | |

| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| # | Exceedance number |

**Table E14. $SO_2$ Courtice Monitoring Station 10-min Running Average Exceedance Period on March 26, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 10 min Running Avg. | |
|---|---|---|---|
| EST | ppb | ppb | |
| 26/03/2022 03:55 | 23.23 | 19.509 | |
| 26/03/2022 04:00 | 30.65 | 26.94 | |
| 26/03/2022 04:05 | 151.566 | **91.108** | |
| 26/03/2022 04:10 | 7.073 | 79.32 | 34 |
| 26/03/2022 04:15 | 20.531 | 13.802 | |
| 26/03/2022 04:20 | 11.26 | 15.896 | |
| 26/03/2022 04:25 | 2.759 | 7.01 | |

| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| # | Exceedance number |

**Table E15. $SO_2$ Courtice Monitoring Station 10-min Running Average Exceedance Periods on March 30, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 10 min Running Avg. | |
|---|---|---|---|
| EST | ppb | ppb | |
| 30/03/2022 21:35 | 49.062 | 41.213 | |
| 30/03/2022 21:40 | 40.431 | 44.747 | |
| 30/03/2022 21:45 | 54.397 | 47.414 | |
| 30/03/2022 21:50 | 74.403 | 64.4 | |
| 30/03/2022 21:55 | 80.563 | **77.483** | 35 |
| 30/03/2022 22:00 | 67.046 | 73.805 | |
| 30/03/2022 22:05 | 73.253 | 70.15 | 36 |
| 30/03/2022 22:10 | 69.522 | **71.388** | |
| 30/03/2022 22:15 | 72.62 | 71.071 | 37 |
| 30/03/2022 22:20 | 86.903 | **79.762** | |
| 30/03/2022 22:25 | 93.266 | **90.085** | 38 |
| 30/03/2022 22:30 | 86.718 | 89.992 | |
| 30/03/2022 22:35 | 82.469 | **84.594** | 39 |
| 30/03/2022 22:40 | 65.744 | 74.107 | |
| 30/03/2022 22:45 | 50.231 | 57.988 | |
| 30/03/2022 22:50 | 46.556 | 48.394 | |

| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| } | Range of running average values during exceedance period |
| # | Exceedance number |

**Table E16. $SO_2$ Courtice Monitoring Station 1-Hour Running Average Exceedance Periods on January 18, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 1 hr Running Avg. |
|---|---|---|
| EST | ppb | ppb |
| 18/01/2022 15:25 | 3.22 | 0.63 |
| 18/01/2022 15:30 | 5.72 | 1.08 |
| 18/01/2022 15:35 | 3.54 | 1.35 |
| 18/01/2022 15:40 | 1.20 | 1.42 |
| 18/01/2022 15:45 | 3.30 | 1.66 |
| 18/01/2022 15:50 | 0.35 | 1.67 |
| 18/01/2022 15:55 | 1.22 | 1.74 |
| 18/01/2022 16:00 | 0.87 | 1.78 |
| 18/01/2022 16:05 | 0.45 | 1.74 |
| 18/01/2022 16:10 | 167.39 | 15.65 |
| 18/01/2022 16:15 | 119.72 | 25.60 |
| 18/01/2022 16:20 | 67.48 | 31.20 |
| 18/01/2022 16:25 | 74.21 | 37.12 |
| 18/01/2022 16:30 | 6.88 | 37.22 |
| 18/01/2022 16:35 | 43.70 | 40.56 |
| 18/01/2022 16:40 | 65.83 | 45.95 |
| 18/01/2022 16:45 | 5.37 | 46.12 |
| 18/01/2022 16:50 | 38.90 | 49.33 |
| 18/01/2022 16:55 | 137.27 | 60.67 |
| 18/01/2022 17:00 | 20.30 | 62.29 |
| 18/01/2022 17:05 | 4.43 | **62.62** |
| 18/01/2022 17:10 | 3.22 | 48.94 |
| 18/01/2022 17:15 | 1.60 | 39.10 |
| 18/01/2022 17:20 | 14.29 | 34.67 |
| 18/01/2022 17:25 | 2.98 | 28.73 |
| 18/01/2022 17:30 | 14.63 | 29.38 |
| 18/01/2022 17:35 | 61.69 | 30.88 |
| 18/01/2022 17:40 | 4.70 | 25.78 |

1

| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| | Exceedance number |

**Table E17. $SO_2$ Courtice Monitoring Station 1-Hour Running Average Exceedance Period on January 21, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 1 hr Running Avg. |
|---|---|---|
| EST | ppb | ppb |
| 21/01/2022 08:00 | 0.616 | 0.55 |
| 21/01/2022 08:05 | 1.11 | 0.58 |
| 21/01/2022 08:10 | 149.73 | 13.02 |
| 21/01/2022 08:15 | 19.30 | 14.63 |
| 21/01/2022 08:20 | 51.14 | 18.89 |
| 21/01/2022 08:25 | 40.07 | 22.22 |
| 21/01/2022 08:30 | 49.36 | 26.33 |
| 21/01/2022 08:35 | 41.10 | 29.76 |
| 21/01/2022 08:40 | 22.66 | 31.61 |
| 21/01/2022 08:45 | 35.33 | 34.40 |
| 21/01/2022 08:50 | 35.62 | 37.27 |
| 21/01/2022 08:55 | 30.54 | 39.71 |
| 21/01/2022 09:00 | 25.04 | 41.75 |
| 21/01/2022 09:05 | 22.01 | **43.49** |
| 21/01/2022 09:10 | 30.05 | 33.52 |
| 21/01/2022 09:15 | 26.35 | 34.11 |
| 21/01/2022 09:20 | 26.65 | 32.07 |
| 21/01/2022 09:25 | 9.50 | 29.52 |
| 21/01/2022 09:30 | 3.09 | 25.66 |
| 21/01/2022 09:35 | 2.06 | 22.41 |
| 21/01/2022 09:40 | 1.85 | 20.67 |
| 21/01/2022 09:45 | 2.00 | 17.90 |
| 21/01/2022 09:50 | 2.02 | 15.10 |
| 21/01/2022 09:55 | 2.16 | 12.73 |
| 21/01/2022 10:00 | 2.17 | 10.83 |
| 21/01/2022 10:05 | 2.01 | 9.16 |
| 21/01/2022 10:10 | 1.37 | 6.77 |

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| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| } | Range of running average values during exceedance period |
| | Exceedance number |

**Table E18. $SO_2$ Courtice Monitoring Station 1-Hour Running Average Exceedance Periods on January 28, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 1 hr Running Avg. |
|---|---|---|
| EST | ppb | ppb |
| 28/01/2022 21:30 | 18.94 | 9.06 |
| 28/01/2022 21:35 | 11.20 | 8.96 |
| 28/01/2022 21:40 | 8.33 | 8.85 |
| 28/01/2022 21:45 | 9.75 | 8.63 |
| 28/01/2022 21:50 | 12.43 | 8.91 |
| 28/01/2022 21:55 | 34.06 | 10.93 |
| 28/01/2022 22:00 | 49.79 | 14.49 |
| 28/01/2022 22:05 | 60.15 | 19.03 |
| 28/01/2022 22:10 | 34.54 | 21.61 |
| 28/01/2022 22:15 | 41.29 | 24.64 |
| 28/01/2022 22:20 | 42.14 | 27.62 |
| 28/01/2022 22:25 | 53.24 | 31.32 |
| 28/01/2022 22:30 | 30.31 | 32.27 |
| 28/01/2022 22:35 | | 36.06 |
| 28/01/2022 22:40 | | 41.00 |
| 28/01/2022 22:45 | 62.24 | 45.37 |
| 28/01/2022 22:50 | 98.95 | 52.58 |
| 28/01/2022 22:55 | 62.82 | 54.98 |
| 28/01/2022 23:00 | 47.95 | 54.83 |
| 28/01/2022 23:05 | 70.98 | 55.73 |
| 28/01/2022 23:10 | 63.99 | 58.18 |
| 28/01/2022 23:15 | 67.65 | 60.38 |
| 28/01/2022 23:20 | 64.72 | 62.26 |
| 28/01/2022 23:25 | 68.87 | 63.56 |
| 28/01/2022 23:30 | 70.75 | 66.93 |
| 28/01/2022 23:35 | | **68.12** |
| 28/01/2022 23:40 | | **67.09** |
| 28/01/2022 23:45 | 37.80 | 65.05 |
| 28/01/2022 23:50 | 43.84 | 60.46 |
| 28/01/2022 23:55 | 58.66 | 60.11 |
| 29/01/2022 00:00 | 51.27 | 60.39 |
| 29/01/2022 00:05 | 51.05 | 58.73 |
| 29/01/2022 00:10 | 21.73 | 55.21 |
| 29/01/2022 00:15 | 15.96 | 50.90 |
| 29/01/2022 00:20 | 3.68 | 45.81 |
| 29/01/2022 00:25 | 2.35 | 40.27 |
| 29/01/2022 00:30 | 1.77 | 34.52 |
| 29/01/2022 00:35 | 3.53 | 28.90 |
| 29/01/2022 00:40 | 6.93 | 24.88 |
| 29/01/2022 00:45 | 4.25 | 22.09 |
| 29/01/2022 00:50 | 1.73 | 18.58 |
| 29/01/2022 00:55 | 1.79 | 13.84 |
| 29/01/2022 01:00 | 1.48 | 9.69 |
| 29/01/2022 01:05 | 1.50 | 5.56 |

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| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| | Exceedance number |

**Table E19. $SO_2$ Courtice Monitoring Station 1-Hour Running Average Exceedance Periods on March 5, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 1 hr Running Avg. | |
|---|---|---|---|
| EST | ppb | ppb | |
| 4/3/2022 23:05 | 1.24 | 0.41 | |
| 4/3/2022 23:10 | 0.27 | 0.42 | |
| 4/3/2022 23:15 | 0.74 | 0.47 | |
| 4/3/2022 23:20 | 2.02 | 0.62 | |
| 4/3/2022 23:25 | 9.02 | 1.35 | |
| 4/3/2022 23:30 | 3.55 | 1.64 | |
| 4/3/2022 23:35 | 1.96 | 1.79 | |
| 4/3/2022 23:40 | 0.65 | 1.83 | |
| 4/3/2022 23:45 | 6.13 | 2.32 | |
| 4/3/2022 23:50 | 5.33 | 2.73 | |
| 4/3/2022 23:55 | 0.35 | 2.74 | |
| 5/3/2022 0:00 | 0.37 | 2.64 | |
| 5/3/2022 0:05 | 126.84 | 13.10 | |
| 5/3/2022 0:10 | | 26.27 | |
| | | | |
| 5/3/2022 0:20 | 160.07 | 55.75 | |
| 5/3/2022 0:25 | 201.32 | 71.77 | |
| 5/3/2022 0:30 | 197.03 | 87.90 | |
| 5/3/2022 0:35 | 85.24 | 94.84 | |
| 5/3/2022 0:40 | 10.56 | 95.66 | |
| 5/3/2022 0:45 | 6.31 | 95.68 | |
| 5/3/2022 0:50 | 4.69 | 95.63 | |
| 5/3/2022 0:55 | 13.25 | 96.70 | |
| 5/3/2022 1:00 | 7.80 | **97.32** | |
| 5/3/2022 1:05 | 58.17 | 91.60 | |
| 5/3/2022 1:10 | | 80.89 | 5 |
| | | | |
| 5/3/2022 1:20 | 21.02 | 58.22 | |
| 5/3/2022 1:25 | 6.48 | 41.98 | |
| 5/3/2022 1:30 | 11.41 | 26.51 | |
| 5/3/2022 1:35 | 8.14 | 20.09 | |
| 5/3/2022 1:40 | 7.60 | 19.84 | |
| 5/3/2022 1:45 | Zero | 21.07 | |
| 5/3/2022 1:50 | Zero | 22.71 | |
| 5/3/2022 1:55 | Span | 23.76 | |
| 5/3/2022 2:00 | Span | | |
| 5/3/2022 2:05 | Purge | | |
| 5/3/2022 2:10 | Purge | | 6 |
| 5/3/2022 2:15 | 2.97 | | |
| 5/3/2022 2:20 | 9.26 | | |
| 5/3/2022 2:25 | 5.14 | | |
| 5/3/2022 2:30 | 4.56 | | |
| 5/3/2022 2:35 | 6.64 | | |
| 5/3/2022 2:40 | 82.32 | | |
| 5/3/2022 2:45 | 97.73 | | |
| 5/3/2022 2:50 | 80.07 | | |
| 5/3/2022 2:55 | 9.61 | 33.15 | |
| 5/3/2022 3:00 | | 33.69 | |
| | | | |
| 5/3/2022 3:10 | 71.10 | 42.90 | |
| 5/3/2022 3:15 | 51.68 | 46.96 | |
| 5/3/2022 3:20 | 33.70 | 49.00 | |
| 5/3/2022 3:25 | 30.15 | 51.08 | |
| 5/3/2022 3:30 | 13.90 | **51.86** | |
| 5/3/2022 3:35 | 5.09 | 51.73 | |
| 5/3/2022 3:40 | 3.60 | 45.17 | |
| 5/3/2022 3:45 | 3.97 | 37.36 | |
| 5/3/2022 3:50 | 55.57 | 35.31 | |
| 5/3/2022 3:55 | 6.25 | 35.03 | |
| 5/3/2022 4:00 | 4.44 | 32.19 | 7 |
| 5/3/2022 4:05 | 3.27 | 23.56 | |
| 5/3/2022 4:10 | 2.70 | 17.86 | |
| 5/3/2022 4:15 | 2.33 | 13.75 | |

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| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| } | Range of running average values during exceedance period |
| 5 | Exceedance number |

**Table E20. $SO_2$ Courtice Monitoring Station 1-Hour Running Average Exceedance Period on March 7, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 1 hr Running Avg. |
|---|---|---|
| EST | ppb | ppb |
| 7/3/2022 2:35 | 10.16 | |
| 7/3/2022 2:40 | | |
| 7/3/2022 2:45 | | |
| 7/3/2022 2:50 | | |
| 7/3/2022 2:55 | | 17.95 |
| 7/3/2022 3:00 | | 21.79 |
| 7/3/2022 3:05 | | 24.64 |
| 7/3/2022 3:10 | | 24.21 |
| 7/3/2022 3:15 | | 24.56 |
| 7/3/2022 3:20 | | 25.08 |
| 7/3/2022 3:25 | | 30.87 |
| 7/3/2022 3:30 | | 36.45 |
| 7/3/2022 3:35 | | 45.61 |
| 7/3/2022 3:40 | 19.10 | 44.08 |
| 7/3/2022 3:45 | 51.74 | 47.25 |
| 7/3/2022 3:50 | 62.89 | **47.73** |
| 7/3/2022 3:55 | 26.56 | 46.56 |
| 7/3/2022 4:00 | 42.53 | 45.41 |
| 7/3/2022 4:05 | 9.38 | 41.76 |
| 7/3/2022 4:10 | 4.13 | 40.48 |
| 7/3/2022 4:15 | 4.96 | 40.50 |
| 7/3/2022 4:20 | 4.16 | 40.29 |
| 7/3/2022 4:25 | 2.53 | 34.68 |
| 7/3/2022 4:30 | 2.03 | 29.17 |
| 7/3/2022 4:35 | 1.99 | 19.33 |
| 7/3/2022 4:40 | 2.53 | 17.95 |
| 7/3/2022 4:45 | 4.95 | 14.05 |

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| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| | Exceedance number |

**Table E21. $SO_2$ Courtice Monitoring Station 1-Hour Running Average Exceedance Periods on March 14, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 1 hr Running Avg. | |
|---|---|---|---|
| EST | ppb | ppb | |
| 14/03/2022 05:45 | 1.09 | 0.61 | |
| 14/03/2022 05:50 | 0.89 | 0.64 | |
| 14/03/2022 05:55 | 0.70 | 0.65 | |
| 14/03/2022 06:00 | 0.61 | 0.67 | |
| 14/03/2022 06:05 | 0.57 | 0.68 | |
| 14/03/2022 06:10 | 0.90 | 0.71 | |
| 14/03/2022 06:15 | 4.90 | 1.07 | |
| 14/03/2022 06:20 | 116.53 | 10.74 | |
| 14/03/2022 06:25 | 18.87 | 12.26 | |
| 14/03/2022 06:30 | 65.53 | 17.67 | |
| 14/03/2022 06:35 | 105.02 | 26.37 | |
| 14/03/2022 06:40 | 11.97 | 27.30 | |
| 14/03/2022 06:45 | 5.85 | 27.69 | |
| 14/03/2022 06:50 | | 33.57 | |
| 14/03/2022 06:55 | 128.58 | 44.23 | |
| 14/03/2022 07:00 | 116.74 | 53.91 | |
| 14/03/2022 07:05 | 71.82 | 59.85 | |
| 14/03/2022 07:10 | 92.41 | 67.47 | |
| 14/03/2022 07:15 | 162.95 | 80.64 | |
| 14/03/2022 07:20 | 23.48 | 72.89 | |
| 14/03/2022 07:25 | 142.39 | 83.18 | 9 |
| 14/03/2022 07:30 | 252.72 | 98.78 | |
| 14/03/2022 07:35 | 196.22 | 106.38 | |
| 14/03/2022 07:40 | 49.64 | 109.52 | |
| 14/03/2022 07:45 | 25.04 | **111.12** | |
| 14/03/2022 07:50 | | 105.90 | |
| 14/03/2022 07:55 | | **107.32** | |
| 14/03/2022 08:00 | 27.45 | 99.88 | |
| 14/03/2022 08:05 | 114.49 | 103.43 | |
| 14/03/2022 08:10 | 47.16 | 99.66 | |
| 14/03/2022 08:15 | 27.52 | 88.38 | |
| 14/03/2022 08:20 | 9.15 | 87.18 | |
| 14/03/2022 08:25 | 9.14 | 76.08 | 10 |
| 14/03/2022 08:30 | 18.57 | 56.57 | |
| 14/03/2022 08:35 | 13.93 | 41.38 | |
| 14/03/2022 08:40 | 39.41 | 40.52 | |
| 14/03/2022 08:45 | 27.44 | 40.72 | |
| 14/03/2022 08:50 | 13.25 | 41.09 | |
| 14/03/2022 08:55 | 10.27 | 29.82 | |
| 14/03/2022 09:00 | 7.16 | 28.12 | |
| 14/03/2022 09:05 | 4.57 | 18.96 | |
| 14/03/2022 09:10 | 3.95 | 15.36 | |

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| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| | Exceedance number |

**Table E22. $SO_2$ Courtice Monitoring Station 1-Hour Running Average Exceedance Periods on March 17, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 1 hr Running Avg. |
|---|---|---|
| EST | ppb | ppb |
| 17/03/2022 20:10 | 8.07 | 3.27 |
| 17/03/2022 20:15 | | 5.95 |
| 17/03/2022 20:20 | | 5.91 |
| 17/03/2022 20:25 | | 5.77 |
| 17/03/2022 20:30 | | 5.79 |
| 17/03/2022 20:35 | | 5.80 |
| 17/03/2022 20:40 | 1.81 | 5.84 |
| 17/03/2022 20:45 | 22.32 | 7.58 |
| 17/03/2022 20:50 | 68.43 | 13.15 |
| 17/03/2022 20:55 | | 23.46 |
| 17/03/2022 21:00 | | 25.16 |
| 17/03/2022 21:05 | 87.99 | 32.24 |
| 17/03/2022 21:10 | | 41.98 |
| 17/03/2022 21:15 | 87.73 | 46.48 |
| 17/03/2022 21:20 | 191.83 | 62.19 |
| 17/03/2022 21:25 | 167.77 | 75.99 |
| 17/03/2022 21:30 | 84.61 | 82.89 |
| 17/03/2022 21:35 | 29.55 | 85.21 |
| 17/03/2022 21:40 | 203.78 | 102.04 |
| 17/03/2022 21:45 | 29.25 | 102.62 |
| 17/03/2022 21:50 | 68.54 | **102.63** |
| 17/03/2022 21:55 | 29.50 | 94.29 |
| 17/03/2022 22:00 | 15.69 | 93.44 |
| 17/03/2022 22:05 | 9.62 | 86.91 |
| 17/03/2022 22:10 | 36.78 | **79.56** |
| 17/03/2022 22:15 | 6.92 | 72.82 |
| 17/03/2022 22:20 | 5.17 | 57.27 |
| 17/03/2022 22:25 | 4.40 | 43.65 |
| 17/03/2022 22:30 | 3.76 | 36.91 |
| 17/03/2022 22:35 | 3.68 | 34.76 |
| 17/03/2022 22:40 | 3.69 | 18.08 |
| 17/03/2022 22:45 | 3.27 | 15.92 |
| 17/03/2022 22:50 | 3.00 | 10.46 |
| 17/03/2022 22:55 | 2.75 | 8.23 |
| 17/03/2022 23:00 | 2.54 | 7.13 |
| 17/03/2022 23:05 | 2.37 | 6.53 |
| 17/03/2022 23:10 | 2.40 | 3.66 |
| 17/03/2022 23:15 | 3.61 | 3.39 |

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| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| | Exceedance number |

**Table E23. $SO_2$ Courtice Monitoring Station 1-Hour Running Average Exceedance Periods on March 23, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 1 hr Running Avg. | |
|---|---|---|---|
| EST | ppb | ppb | |
| 23/03/2022 10:50 | 1.42 | 1.41 | |
| 23/03/2022 10:55 | 4.03 | 1.66 | |
| 23/03/2022 11:00 | 18.42 | 3.11 | |
| 23/03/2022 11:05 | 51.49 | 7.31 | |
| 23/03/2022 11:10 | 55.85 | 11.88 | |
| 23/03/2022 11:15 | 54.24 | 16.31 | |
| 23/03/2022 11:20 | 61.54 | 21.34 | |
| 23/03/2022 11:25 | 68.03 | 26.92 | |
| 23/03/2022 11:30 | 44.39 | 30.53 | |
| 23/03/2022 11:35 | 39.12 | 33.68 | |
| 23/03/2022 11:40 | 32.19 | 36.07 | |
| 23/03/2022 11:45 | 22.21 | 37.74 | |
| 23/03/2022 11:50 | | 38.89 | |
| 23/03/2022 11:55 | | 40.08 | |
| 23/03/2022 12:00 | 44.17 | 42.22 | |
| 23/03/2022 12:05 | 35.60 | 40.90 | |
| 23/03/2022 12:10 | 36.05 | 39.25 | |
| 23/03/2022 12:15 | 38.62 | 37.95 | |
| 23/03/2022 12:20 | 45.05 | 36.57 | |
| 23/03/2022 12:25 | 43.57 | 34.53 | |
| 23/03/2022 12:30 | 39.39 | 34.12 | |
| 23/03/2022 12:35 | 45.54 | 34.65 | |
| 23/03/2022 12:40 | 50.95 | 36.22 | |
| 23/03/2022 12:45 | 53.68 | 38.84 | |
| 23/03/2022 12:50 | | **42.19** | 13 |
| 23/03/2022 12:55 | | 44.95 | |
| 23/03/2022 13:00 | 54.03 | 45.77 | |
| 23/03/2022 13:05 | 49.29 | 46.91 | |
| 23/03/2022 13:10 | 43.59 | 47.54 | |
| 23/03/2022 13:15 | 58.60 | **49.20** | |
| 23/03/2022 13:20 | 26.20 | 47.63 | |
| 23/03/2022 13:25 | 31.56 | 46.63 | |
| 23/03/2022 13:30 | 30.01 | 45.85 | |
| 23/03/2022 13:35 | 25.33 | 44.17 | |
| 23/03/2022 13:40 | 35.53 | 42.88 | |
| 23/03/2022 13:45 | 36.10 | 41.42 | |
| 23/03/2022 13:50 | 43.47 | 40.42 | 14 |
| 23/03/2022 13:55 | 31.70 | 38.79 | |
| 23/03/2022 14:00 | 29.07 | 36.70 | |
| 23/03/2022 14:05 | 29.63 | 35.07 | |
| 23/03/2022 14:10 | 25.02 | 33.52 | |

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| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| | Exceedance number |

**Table E24. $SO_2$ Courtice Monitoring Station 1-Hour Running Average Exceedance Periods on March 30, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 1 hr Running Avg. | |
|---|---|---|---|
| EST | ppb | ppb | |
| 30/03/2022 20:50 | 37.82 | 32.15 | |
| 30/03/2022 20:55 | 30.26 | 32.97 | |
| 30/03/2022 21:00 | | 32.76 | |
| 30/03/2022 21:05 | | 31.25 | |
| 30/03/2022 21:10 | | 30.16 | |
| 30/03/2022 21:15 | | 30.51 | |
| 30/03/2022 21:20 | | 33.28 | |
| 30/03/2022 21:25 | | 34.01 | |
| 30/03/2022 21:30 | | 32.70 | |
| 30/03/2022 21:35 | | 33.94 | |
| 30/03/2022 21:40 | | 34.25 | |
| 30/03/2022 21:45 | | 34.39 | |
| 30/03/2022 21:50 | | 37.44 | |
| | | 41.63 | |
| 30/03/2022 22:00 | 67.05 | 45.45 | |
| 30/03/2022 22:05 | 73.25 | 50.05 | |
| 30/03/2022 22:10 | 69.52 | 53.68 | |
| 30/03/2022 22:15 | 72.62 | 57.16 | |
| 30/03/2022 22:20 | 86.90 | 60.96 | |
| 30/03/2022 22:25 | 93.27 | 66.24 | |
| 30/03/2022 22:30 | 86.72 | 70.68 | |
| 30/03/2022 22:35 | 82.47 | 73.47 | |
| 30/03/2022 22:40 | 65.74 | **75.58** | |
| 30/03/2022 22:45 | 50.23 | 75.23 | |
| 30/03/2022 22:50 | | 72.91 | |
| | | | |
| 30/03/2022 23:00 | 54.17 | 69.74 | |
| 30/03/2022 23:05 | 44.55 | 67.35 | |
| 30/03/2022 23:10 | 50.87 | 65.79 | |
| 30/03/2022 23:15 | 44.39 | 63.44 | |
| 30/03/2022 23:20 | 40.59 | 59.58 | |
| 30/03/2022 23:25 | 39.74 | 55.12 | |
| 30/03/2022 23:30 | 45.20 | 51.66 | |
| 30/03/2022 23:35 | 33.98 | 47.62 | |
| 30/03/2022 23:40 | 20.23 | 43.83 | |
| 30/03/2022 23:45 | 16.17 | 40.99 | |
| 30/03/2022 23:50 | 17.27 | 38.55 | |
| 30/03/2022 23:55 | 13.92 | 35.09 | |
| 31/03/2022 00:00 | 11.55 | 31.54 | |
| 31/03/2022 00:05 | 12.93 | 28.90 | |

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|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| | Range of running average values during exceedance period |
| # | Exceedance number |

**Table E25. $SO_2$ Courtice Monitoring Station 1-Hour Running Average Exceedance Period on March 31, 2022**

| Date & Time | $SO_2$ 5 min Avg. | $SO_2$ 1 hr Running Avg. |
|---|---|---|
| EST | ppb | ppb |
| 31/03/2022 05:20 | 13.368 | 8.34 |
| 31/03/2022 05:25 | 16.612 | 8.33 |
| 31/03/2022 05:30 | 11.66 | 7.83 |
| 31/03/2022 05:35 | 19.19 | 8.68 |
| 31/03/2022 05:40 | 26.40 | 10.50 |
| 31/03/2022 05:45 | 23.70 | 12.24 |
| 31/03/2022 05:50 | 40.76 | 15.42 |
| 31/03/2022 05:55 | 49.33 | 19.23 |
| 31/03/2022 06:00 | 56.02 | 23.30 |
| 31/03/2022 06:05 | 59.66 | 27.55 |
| 31/03/2022 06:10 | 57.57 | 31.77 |
| 31/03/2022 06:15 | 59.10 | 36.11 |
| 31/03/2022 06:20 | 53.96 | 39.50 |
| 31/03/2022 06:25 | 51.30 | 42.39 |
| 31/03/2022 06:30 | 55.81 | 46.07 |
| 31/03/2022 06:35 | 49.164 | 48.56 |
| 31/03/2022 06:40 | 28.542 | **48.74** |
| 31/03/2022 06:45 | 17.507 | 48.23 |
| 31/03/2022 06:50 | 9.786 | 45.65 |
| 31/03/2022 06:55 | 5.712 | 42.01 |
| 31/03/2022 07:00 | 4.662 | 37.73 |
| 31/03/2022 07:05 | 4.282 | 33.12 |
| 31/03/2022 07:10 | 4.216 | 28.67 |
| 31/03/2022 07:15 | 3.745 | 24.06 |
| 31/03/2022 07:20 | 3.386 | 19.84 |
| 31/03/2022 07:25 | 3.068 | 15.82 |
| 31/03/2022 07:30 | 2.845 | 11.41 |
| 31/03/2022 07:35 | 2.675 | 7.536 |

17

| | |
|---|---|
| D, T & V | Date, Time & Exceedance Value Reported (Reported exceedance is the first running avg. value highlighted) |
| **Max** | Maximum of the Range |
| Min | Minimum of the Range |
| Faded Values | These values are not used to calculate the number of reportable exceedances |
| | Range of 5-minute measurements that contribute to the exceedance value reported |
| } | Range of running average values during exceedance period |
| | Exceedance number |

# APPENDIX F

600 Southgate Drive
Guelph ON Canada
N1G 4P6

Tel: +1.519.823.1311
Fax: +1.519.823.1316
E-mail: solutions@rwdi.com

# MEMORANDUM

| | | |
|---|---|---|
| **DATE:** | 2022-04-25 | **RWDI Reference No.:** 2200697 |
| **TO:** | Gioseph Anello | **EMAIL:** Gioseph.Anello@Durham.ca |
| **CC:** | Andrew Evans | **EMAIL:** Andrew.Evans@Durham.ca |
| **CC:** | Lyndsay Waller | **EMAIL:** Lyndsay.Waller@Durham.ca |
| **FROM:** | Khalid Hussein | **EMAIL:** Khalid.Hussein@rwdi.com |
| **RE:** | **Exceedance Report – Benzo(a)Pyrene February 22, 2022**<br>**Region of Durham, DYEC** | |

On April 21st, 2022, the results from ALS Environmental were received regarding the PAH results from the February 22nd, 2022 sampling event. On April 21st, 2022, the results were entered and assessed, and it was found that there was one (1) measured Benzo(a)Pyrene (BaP) concentration in excess of the 24-hour AAQC on the February 22nd sampling date.

## February 22, 2022

On Tuesday, February 22nd, 2022, there was one (1) exceedance of the BaP 24-hour AAQC, which occurred at the Rundle Road Station, measured at the onsite PUF PS-1 sampler. Attached is a figure depicting a wind rose (indicating the wind speed and direction distribution during the sampling day), and the location of the sampling stations relative to the DYEC.

The following summarizes the BaP concentrations and onsite conditions during the February 22nd sampling date:

1. The guideline concentration for BaP is 0.05 ng/m$^3$. The measured concentration at the Rundle Road sampler was 0.058 ng/m$^3$.
2. During the sampling day the wind was predominantly from the ENE to the E with a very small contribution from the WSW, as recorded at the Rundle Road Meteorological Tower. One-hour average wind speeds at Rundle Road Meteorological Tower ranged from 1.22 km/h to 16.95 km/h.
3. The Rundle Road meteorological data suggests that the Rundle Road Station was upwind of the DYEC during the sampling period. Given the wind conditions, it is likely that the measured BaP exceedance is attributable to sources other than the Energy Centre operations.

At the Rundle Road Station, the $NO_2$ hourly values were less than 10% of the criteria for the same period. The $PM_{2.5}$ 24-hour average value was 6.1 micrograms per cubic metre at the Rundle Road Station.

We have attached the data files for the samples in question to aid with the review.

Respectfully submitted by:

**RWDI AIR Inc.**

Khalid Hussein, P.Eng.
Project Manager

KAMH/kta

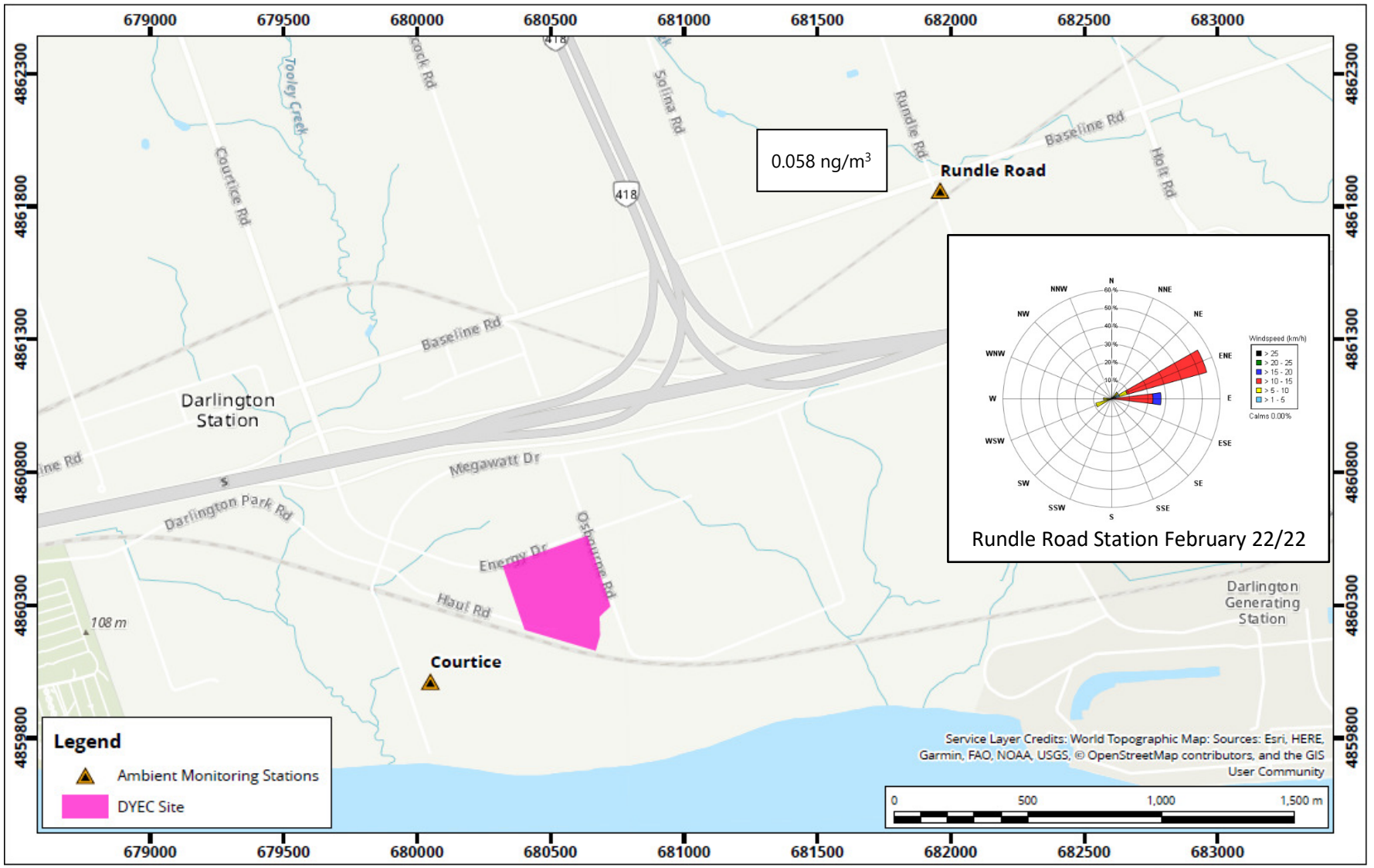
Attach.

# ATTACHMENTS

**Table B6: 2022 Rundle Station Q1 Monitoring Results for PAHs**

| Contaminant | Units | *MECP Criteria* | 22-Feb-22 | No. > Criteria |
|---|---|---|---|---|
| 1-Methylnaphthalene | ng/m$^3$ | *12000* | 5.22E+00 | 0 |
| 2-Methylnaphthalene | ng/m$^3$ | *10000* | 9.25E+00 | 0 |
| Acenaphthene | ng/m$^3$ | - | 2.00E+00 | - |
| Acenaphthylene | ng/m$^3$ | *3500* | 3.75E-01 | 0 |
| Anthracene | ng/m$^3$ | *200* | 9.72E-02 | 0 |
| Benzo(a)Anthracene | ng/m$^3$ | - | 4.88E-02 | - |
| Benzo(a)fluorene | ng/m$^3$ | - | 6.91E-02 | - |
| Benzo(a)Pyrene (Historically High) | ng/m$^3$ | *0.05* [1] *5* [2] *1.1* [3] | 5.81E-02 | 1 |
| Benzo(b)Fluoranthene | ng/m$^3$ | - | 1.65E-01 | - |
| Benzo(b)fluorene | ng/m$^3$ | - | 3.31E-02 | - |
| Benzo(e)Pyrene | ng/m$^3$ | - | 1.04E-01 | - |
| Benzo(g,h,i)Perylene | ng/m$^3$ | - | 1.15E-01 | - |
| Benzo(k)Fluoranthene | ng/m$^3$ | - | 1.18E-01 | - |
| Biphenyl | ng/m$^3$ | - | 3.81E+00 | - |
| Chrysene | ng/m$^3$ | - | 2.01E-01 | - |
| Dibenzo(a,h)Anthracene | ng/m$^3$ | - | 1.79E-02 | - |
| Fluoranthene | ng/m$^3$ | - | 1.07E+00 | - |
| Fluorene | ng/m$^3$ | - | 2.61E+00 | - |
| Indeno(1,2,3-cd)Pyrene | ng/m$^3$ | - | 1.05E-01 | - |
| Naphthalene | ng/m$^3$ | *22500* | 2.83E+01 | 0 |
| o-Terphenyl | ng/m$^3$ | - | 1.50E-02 | - |
| Perylene | ng/m$^3$ | - | 1.09E-02 | - |
| Phenanthrene | ng/m$^3$ | - | 4.31E+00 | - |
| Pyrene | ng/m$^3$ | - | 5.38E-01 | - |
| Tetralin | ng/m$^3$ | - | 1.99E+00 | - |
| Total PAH[4] | ng/m$^3$ | - | 60.61 | - |

NOTE: All non-detectable results were reported as 1/2 of the detection limit
[1] AAQC
[2] O. Reg. 419/05 Schedule  Upper Risk Thresholds
[3] O. Reg. 419/05 24 Hour Guideline
[4] Total PAH sums all PAH contaminants




## DYEC Site and Ambient Monitoring Station Locations

True North

Drawn by: DAJH | Figure: 1

Approx. Scale: 1:20,000

Date Revised: April 21, 2022

Map Projection: NAD 1983 UTM Zone 17N

DYEC - Region of Durham, Ontario

Project #: 1803743

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

# Certificate of Analysis

| | | | |
|---|---|---|---|
| **ALS Project Contact:** | Claire Kocharakkal | **Client Name:** | RWDI Air Inc. |
| **ALS Project ID:** | 23601 | **Client Address:** | 600 Southgate Dr. |
| **ALS WO#:** | L2688353 | | Guelph, ON N1G 4P6 |
| **Date of Report** | 21-Apr-22 | | Canada |
| **Date of Sample Receipt** | 25-Feb-22 | **Client Contact:** | Khalid Hussein |
| | | **Client Project ID:** | DYEC |

**COMMENTS:** **PAH by CARB method 429 (LR option)- Isotope dilution**

Certified by:

Steve Kennedy
Technical Supervisor

# ALS Life Sciences

## Sample Analysis Summary Report

| Sample Name | Method Blank | | Reagent Blank | | RUNDLE-DX/PAH-FEB22 | | Laboratory Control Sample |
|---|---|---|---|---|---|---|---|
| ALS Sample ID | WG3699937-1 | | WG3699937-4 | | L2688353-1 | | WG3699937-2 |
| Sample Size | 1 | | 1 | | 1 | | 1 |
| Sample units | sample | | sample | | sample | | n/a |
| Moisture Content | n/a | | n/a | | n/a | | n/a |
| Matrix | MEDIA | | REAGENT | | PUF | | MEDIA |
| Sampling Date | n/a | | n/a | | 22-Feb-22 | | n/a |
| Extraction Date | 26-Feb-22 | | 26-Feb-22 | | 26-Feb-22 | | 26-Feb-22 |
| **Target Analytes** | **ng/sample** | | **ng/sample** | | **ng/sample** | | **%** |
| Naphthalene | 99.0 | | 11.5 | | 9050 | | 136 |
| 2-Methylnaphthalene | 19.3 | | 2.80 | | 2960 | | 103 |
| 1-Methylnaphthalene | 10.7 | | 1.57 | | 1670 | | 100 |
| Acenaphthylene | 1.69 | R | <0.20 | U | 120 | R | 101 |
| Acenaphthene | 1.30 | | <0.20 | U | 641 | | 73.6 |
| Fluorene | 2.07 | | 0.410 | R | 834 | | 78.9 |
| Phenanthrene | 6.91 | | 2.87 | | 1380 | | 101 |
| Anthracene | 0.720 | M | <0.20 | U | 31.1 | | 100 |
| Fluoranthene | 2.73 | | 1.42 | M | 341 | | 97.7 |
| Pyrene | 2.77 | | 1.76 | | 172 | | 96.4 |
| Benzo(a)Anthracene | <0.20 | U | <0.20 | U | 15.6 | | 94.8 |
| Chrysene | <0.20 | U | <0.20 | U | 64.3 | | 101 |
| Benzo(b)Fluoranthene | <0.20 | U | <0.20 | U | 52.8 | M | 98.3 |
| Benzo(k)Fluoranthene | <0.20 | U | <0.20 | U | 37.9 | M | 101 |
| Benzo(e)Pyrene | <0.20 | U | <0.20 | U | 33.4 | M,R | 97.9 |
| Benzo(a)Pyrene | <0.20 | U | <0.20 | U | 18.6 | | 98.7 |
| Perylene | <0.20 | U | <0.20 | U | 3.49 | M | 112 |
| Indeno(1,2,3-cd)Pyrene | <0.20 | U | <0.20 | U | 33.6 | M | 102 |
| Dibenzo(a,h)Anthracene | <0.20 | U | <0.20 | U | 5.74 | | 96.2 |
| Benzo(g,h,i)Perylene | <0.20 | U | <0.20 | U | 36.9 | | 99.6 |
| **Additional Analytes** | | | | | | | |
| Tetralin | 27.8 | | 3.35 | | 636 | | NS |
| Biphenyl | 6.90 | | 2.18 | | 1220 | | NS |
| o-Terphenyl | 0.380 | M | 0.400 | R | 4.79 | | NS |
| Benzo(a)fluorene | <0.20 | U | <0.20 | U | 22.1 | | NS |
| Benzo(b)fluorene | <0.20 | U | <0.20 | U | 10.6 | | NS |
| **Field Sampling Standards** | **% Rec** | | **% Rec** | | **% Rec** | | **% Rec** |
| 1-Methylnaphthalene-D10 | NS | | NS | | 108.1 | | NS |
| Fluorene D10 | NS | | NS | | 72.4 | | NS |
| Terphenyl D14(Surr.) | NS | | NS | | 103.9 | | NS |
| **Extraction Standards** | **% Rec** | | **% Rec** | | **% Rec** | | **% Rec** |
| Naphthalene D8 | 34.6 | | 34.1 | | 76.9 | R | 47.9 |
| 2-Methylnaphthalene-D10 | 40.1 | | 42.2 | | 66.3 | | 57.1 |
| Acenaphthylene D8 | 42.9 | | 48.1 | | 49.6 | | 59.3 |
| Phenanthrene D10 | 59.5 | | 63.7 | | 73.3 | | 78.5 |
| Anthracene-D10 | 50.5 | | 51.1 | | 59.7 | | 69.6 |
| Fluoranthene D10 | 57.3 | | 68.0 | | 71.4 | R | 79.6 |
| Benz(a)Anthracene-D12 | 56.6 | | 72.0 | | 62.6 | | 80.6 |
| Chrysene D12 | 53.7 | | 71.2 | | 63.5 | | 81.3 |
| Benzo(b)Fluoranthene-D12 | 54.8 | | 67.8 | | 65.7 | | 77.5 |
| Benzo(k)Fluoranthene-D12 | 53.3 | | 68.0 | | 66.5 | | 78.7 |
| Benzo(a)Pyrene D12 | 48.4 | | 52.2 | | 57.9 | R | 73.1 |
| Perylene D12 | 26.9 | M | 11.5 | M | 44.5 | M | 51.2 |
| Indeno(1,2,3,cd)Pyrene-D12 | 57.8 | | 68.9 | | 66.9 | | 75.9 |
| Dibenz(a,h)Anthracene-D14 | 58.3 | | 76.1 | | 71.4 | | 81.1 |
| Benzo(g,h,i)Perylene D12 | 53.7 | | 67.3 | | 65.1 | | 77.8 |

| | |
|---|---|
| U | Indicates that this compound was not detected above the LOD. |
| M | Indicates that a peak has been manually integrated. |
| B | Indicates that this compound was detected in the method blank at greater than 10% of the sample value. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |
| NS | Indicates that the compound was not added to the sample |

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | Method Blank | Sampling Date | n/a |
| ALS Sample ID | WG3699937-1 | Extraction Date | 26-Feb-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | blank | | |
| Sample Matrix | QC | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3699937 |

Approved:
*Peter Nguyen*
--e-signature--
08-Apr-2022

| Run Information | Run 1 |
|---|---|
| Filename | PAH220302007.D |
| Run Date | 3/2/2022 17:47 |
| Final Volume | 0.1 mL |
| Dilution Factor | 1 |
| Analysis Units | ng/sample |
| Instrument | MSD-5 |
| Column | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | Flags |
|---|---|---|---|
| Naphthalene | 2.84 | 99.0 | |
| 2-Methylnaphthalene | 3.43 | 19.3 | |
| 1-Methylnaphthalene | 3.55 | 10.7 | |
| Acenaphthylene | 4.58 | 1.69 | R |
| Acenaphthene | 4.88 | 1.30 | |
| Fluorene | 5.81 | 2.07 | |
| Phenanthrene | 8.01 | 6.91 | |
| Anthracene | 8.14 | 0.720 | M |
| Fluoranthene | 11.42 | 2.73 | |
| Pyrene | 12.06 | 2.77 | |
| Benzo(a)Anthracene | NotFnd | <0.20 | U |
| Chrysene | NotFnd | <0.20 | U |
| Benzo(b)Fluoranthene | NotFnd | <0.20 | U |
| Benzo(k)Fluoranthene | NotFnd | <0.20 | U |
| Benzo(e)Pyrene | NotFnd | <0.20 | U |
| Benzo(a)Pyrene | NotFnd | <0.20 | U |
| Perylene | NotFnd | <0.20 | U |
| Indeno(1,2,3-cd)Pyrene | NotFnd | <0.20 | U |
| Dibenzo(a,h)Anthracene | NotFnd | <0.20 | U |
| Benzo(g,h,i)Perylene | NotFnd | <0.20 | U |
| **Additional Analytes** | | | |
| Tetralin | 2.72 | 27.8 | |
| Biphenyl | 3.97 | 6.90 | |
| o-Terphenyl | 9.29 | 0.380 | M |
| Benzo(a)fluorene | NotFnd | <0.20 | U |
| Benzo(b)fluorene | NotFnd | <0.20 | U |

| Field Sampling Standards | ng spiked | % Rec |
|---|---|---|
| 1-Methylnaphthalene-D10 | 0 | NS |
| Fluorene D10 | 0 | NS |
| Terphenyl D14(Surr.) | 0 | NS |

| Extraction Standards | | | % Rec | | Limits |
|---|---|---|---|---|---|
| Naphthalene D8 | 100 | 2.83 | 34.6 | | 50-150 |
| 2-Methylnaphthalene-D10 | 100 | 3.40 | 40.1 | | 50-150 |
| Acenaphthylene D8 | 100 | 4.56 | 42.9 | | 50-150 |
| Phenanthrene D10 | 100 | 7.96 | 59.5 | | 50-150 |
| Anthracene-D10 | 100 | 8.08 | 50.5 | | 50-150 |
| Fluoranthene D10 | 100 | 11.37 | 57.3 | | 50-150 |
| Benz(a)Anthracene-D12 | 100 | 15.90 | 56.6 | | 50-150 |
| Chrysene D12 | 100 | 16.02 | 53.7 | | 50-150 |
| Benzo(b)Fluoranthene-D12 | 100 | 19.24 | 54.8 | | 50-150 |
| Benzo(k)Fluoranthene-D12 | 100 | 19.32 | 53.3 | | 50-150 |
| Benzo(a)Pyrene D12 | 100 | 20.12 | 48.4 | | 50-150 |
| Perylene D12 | 100 | 20.35 | 26.9 | M | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.85 | 57.8 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 100 | 24.01 | 58.3 | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 100 | 24.84 | 53.7 | | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated. |
| U | Indicates that this compound was not detected above the MDL. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |
| NS | Indicates that the compound was not added to the sample |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | Reagent Blank | Sampling Date | n/a |
| ALS Sample ID | WG3699937-4 | Extraction Date | 26-Feb-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | QC | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3699937 |

Approved:
*Peter Nguyen*
--e-signature--
08-Apr-2022

| Run Information | Run 1 |
|---|---|
| Filename | PAH220302008.D |
| Run Date | 3/2/2022 18:25 |
| Final Volume | 0.1 mL |
| Dilution Factor | 1 |
| Analysis Units | ng/sample |
| Instrument | MSD-5 |
| Column | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | Flags |
|---|---|---|---|
| Naphthalene | 2.85 | 11.5 | |
| 2-Methylnaphthalene | 3.43 | 2.80 | |
| 1-Methylnaphthalene | 3.54 | 1.57 | |
| Acenaphthylene | NotFnd | <0.20 | U |
| Acenaphthene | NotFnd | <0.20 | U |
| Fluorene | 5.81 | 0.410 | R |
| Phenanthrene | 8.01 | 2.87 | |
| Anthracene | NotFnd | <0.20 | U |
| Fluoranthene | 11.42 | 1.42 | M |
| Pyrene | 12.06 | 1.76 | |
| Benzo(a)Anthracene | NotFnd | <0.20 | U |
| Chrysene | NotFnd | <0.20 | U |
| Benzo(b)Fluoranthene | NotFnd | <0.20 | U |
| Benzo(k)Fluoranthene | NotFnd | <0.20 | U |
| Benzo(e)Pyrene | NotFnd | <0.20 | U |
| Benzo(a)Pyrene | NotFnd | <0.20 | U |
| Perylene | NotFnd | <0.20 | U |
| Indeno(1,2,3-cd)Pyrene | NotFnd | <0.20 | U |
| Dibenzo(a,h)Anthracene | NotFnd | <0.20 | U |
| Benzo(g,h,i)Perylene | NotFnd | <0.20 | U |
| **Additional Analytes** | | | |
| Tetralin | 2.72 | 3.35 | |
| Biphenyl | 3.97 | 2.18 | |
| o-Terphenyl | 9.29 | 0.400 | R |
| Benzo(a)fluorene | NotFnd | <0.20 | U |
| Benzo(b)fluorene | NotFnd | <0.20 | U |

| Field Sampling Standards | ng spiked | % Rec |
|---|---|---|
| 1-Methylnaphthalene-D10 | 0 | NS |
| Fluorene D10 | 0 | NS |
| Terphenyl D14(Surr.) | 0 | NS |

| Extraction Standards | | | % Rec | | Limits |
|---|---|---|---|---|---|
| Naphthalene D8 | 100 | 2.83 | 34.1 | | 50-150 |
| 2-Methylnaphthalene-D10 | 100 | 3.40 | 42.2 | | 50-150 |
| Acenaphthylene D8 | 100 | 4.56 | 48.1 | | 50-150 |
| Phenanthrene D10 | 100 | 7.96 | 63.7 | | 50-150 |
| Anthracene-D10 | 100 | 8.08 | 51.1 | | 50-150 |
| Fluoranthene D10 | 100 | 11.37 | 68.0 | | 50-150 |
| Benz(a)Anthracene-D12 | 100 | 15.90 | 72.0 | | 50-150 |
| Chrysene D12 | 100 | 16.02 | 71.2 | | 50-150 |
| Benzo(b)Fluoranthene-D12 | 100 | 19.24 | 67.8 | | 50-150 |
| Benzo(k)Fluoranthene-D12 | 100 | 19.32 | 68.0 | | 50-150 |
| Benzo(a)Pyrene D12 | 100 | 20.12 | 52.2 | | 50-150 |
| Perylene D12 | 100 | 20.36 | 11.5 | M | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.85 | 68.9 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 100 | 24.01 | 76.1 | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 100 | 24.84 | 67.3 | | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated. |
| U | Indicates that this compound was not detected above the MDL. |
| B | Indicates that this compound was detected in the method blank at greater than 10% of the sample value. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |
| NS | Indicates that the compound was not added to the sample |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | RUNDLE-DX/PAH-FEB22 | Sampling Date | 22-Feb-22 |
| ALS Sample ID | L2688353-1 | Extraction Date | 26-Feb-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | Puf | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3699937 |

Approved:
*Peter Nguyen*
--e-signature--
08-Apr-2022

| Run Information | Run 1 | Run 2 | Run 3 |
|---|---|---|---|
| Filename | PAH220302010.D | PAH220302009.D | PAH220302016.D |
| Run Date | 3/2/2022 19:41 | 3/2/2022 19:03 | 3/3/2022 9:30 |
| Final Volume | 0.1 mL | 0.1 mL | 1 mL |
| Dilution Factor | 1 | 10 | 40 |
| Analysis Units | ng/sample | ng/sample | ng/sample |
| Instrument | MSD-5 | MSD-5 | MSD-5 |
| Column | HP-5MS US1609664H | HP-5MS US1609664H | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | Flags | Ret. Time. | Concentration ng/sample | Flags | Ret. Time. | Concentration ng/sample | Flags |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | | | | | | | 2.84 | 9050 | |
| 2-Methylnaphthalene | | | | | | | 3.43 | 2960 | |
| 1-Methylnaphthalene | | | | 3.55 | 1670 | | | | |
| Acenaphthylene | 4.58 | 120 | R | | | | | | |
| Acenaphthene | | | | 4.88 | 641 | | | | |
| Fluorene | | | | 5.81 | 834 | | | | |
| Phenanthrene | | | | 8.02 | 1380 | | | | |
| Anthracene | 8.13 | 31.1 | | | | | | | |
| Fluoranthene | | | | 11.42 | 341 | | | | |
| Pyrene | 12.06 | 172 | | | | | | | |
| Benzo(a)Anthracene | 15.97 | 15.6 | | | | | | | |
| Chrysene | 16.09 | 64.3 | | | | | | | |
| Benzo(b)Fluoranthene | 19.30 | 52.8 | M | | | | | | |
| Benzo(k)Fluoranthene | 19.36 | 37.9 | M | | | | | | |
| Benzo(e)Pyrene | 20.05 | 33.4 | M R | | | | | | |
| Benzo(a)Pyrene | 20.18 | 18.6 | | | | | | | |
| Perylene | 20.43 | 3.49 | M | | | | | | |
| Indeno(1,2,3-cd)Pyrene | 23.94 | 33.6 | M | | | | | | |
| Dibenzo(a,h)Anthracene | 24.14 | 5.74 | | | | | | | |
| Benzo(g,h,i)Perylene | 24.94 | 36.9 | | | | | | | |
| **Additional Analytes** | | | | | | | | | |
| Tetralin | | | | 2.73 | 636 | | | | |
| Biphenyl | | | | 3.97 | 1220 | | | | |
| o-Terphenyl | 9.29 | 4.79 | | | | | | | |
| Benzo(a)fluorene | 13.23 | 22.1 | | | | | | | |
| Benzo(b)fluorene | 13.45 | 10.6 | | | | | | | |

| Field Sampling Standards | ng spiked | | % Rec |
|---|---|---|---|
| 1-Methylnaphthalene-D10 | 200 | 3.51 | 108.1 |
| Fluorene D10 | 300 | 5.75 | 72.4 |
| Terphenyl D14(Surr.) | 300 | 12.86 | 103.9 |

| Extraction Standards | | | % Rec | Limits | | % Rec | | | % Rec | |
|---|---|---|---|---|---|---|---|---|---|---|
| Naphthalene D8 | 100 | | | 50-150 | | | | 2.83 | 76.9 | R |
| 2-Methylnaphthalene-D10 | 100 | | | 50-150 | | | | 3.40 | 66.3 | |
| Acenaphthylene D8 | 100 | | | 50-150 | 4.56 | 49.6 | | | | |
| Phenanthrene D10 | 100 | | | 50-150 | 7.96 | 73.3 | | | | |
| Anthracene-D10 | 100 | 8.08 | 59.7 | 50-150 | | | | | | |
| Fluoranthene D10 | 100 | | | 50-150 | 11.37 | 71.4 | R | | | |
| Benz(a)Anthracene-D12 | 100 | 15.90 | 62.6 | 50-150 | | | | | | |
| Chrysene D12 | 100 | 16.02 | 63.5 | 50-150 | | | | | | |
| Benzo(b)Fluoranthene-D12 | 100 | 19.24 | 65.7 | 50-150 | | | | | | |
| Benzo(k)Fluoranthene-D12 | 100 | 19.32 | 66.5 | 50-150 | | | | | | |
| Benzo(a)Pyrene D12 | 100 | 20.12 | 57.9 R | 50-150 | | | | | | |
| Perylene D12 | 100 | 20.35 | 44.5 M | 50-150 | | | | | | |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.85 | 66.9 | 50-150 | | | | | | |
| Dibenz(a,h)Anthracene-D14 | 100 | 24.01 | 71.4 | 50-150 | | | | | | |
| Benzo(g,h,i)Perylene D12 | 100 | 24.84 | 65.1 | 50-150 | | | | | | |

M Indicates that a peak has been manually integrated.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | Laboratory Control Sample | Sampling Date | n/a |
| ALS Sample ID | WG3699937-2 | Extraction Date | 26-Feb-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | QC | | |
| Sample Size | 1 n/a | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3699937 |

Approved:
*Peter Nguyen*
--e-signature--
08-Apr-2022

| Run Information | Run 1 |
|---|---|
| Filename | PAH220302005.D |
| Run Date | 3/2/2022 16:31 |
| Final Volume | 0.1 mL |
| Dilution Factor | 1 |
| Analysis Units | % |
| Instrument | MSD-5 |
| Column | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration % | Flags |
|---|---|---|---|
| Naphthalene | 2.84 | 136 | |
| 2-Methylnaphthalene | 3.43 | 103 | |
| 1-Methylnaphthalene | 3.55 | 100 | |
| Acenaphthylene | 4.58 | 101 | |
| Acenaphthene | 4.88 | 73.6 | |
| Fluorene | 5.81 | 78.9 | |
| Phenanthrene | 8.02 | 101 | |
| Anthracene | 8.13 | 100 | |
| Fluoranthene | 11.42 | 97.7 | |
| Pyrene | 12.07 | 96.4 | |
| Benzo(a)Anthracene | 15.97 | 94.8 | |
| Chrysene | 16.09 | 101 | |
| Benzo(b)Fluoranthene | 19.31 | 98.3 | |
| Benzo(k)Fluoranthene | 19.37 | 101 | |
| Benzo(e)Pyrene | 20.05 | 97.9 | |
| Benzo(a)Pyrene | 20.18 | 98.7 | |
| Perylene | 20.42 | 112 | |
| Indeno(1,2,3-cd)Pyrene | 23.94 | 102 | |
| Dibenzo(a,h)Anthracene | 24.14 | 96.2 | |
| Benzo(g,h,i)Perylene | 24.95 | 99.6 | |
| **Additional Analytes** | | | |
| Tetralin | | NS | |
| Biphenyl | | NS | |
| o-Terphenyl | | NS | |
| Benzo(a)fluorene | | NS | |
| Benzo(b)fluorene | | NS | |

| Field Sampling Standards | ng spiked | % Rec |
|---|---|---|
| 1-Methylnaphthalene-D10 | 0 | NS |
| Fluorene D10 | 0 | NS |
| Terphenyl D14(Surr.) | 0 | NS |

| Extraction Standards | | | % Rec | Limits |
|---|---|---|---|---|
| Naphthalene D8 | 100 | 2.83 | 47.9 | 50-150 |
| 2-Methylnaphthalene-D10 | 100 | 3.40 | 57.1 | 50-150 |
| Acenaphthylene D8 | 100 | 4.56 | 59.3 | 50-150 |
| Phenanthrene D10 | 100 | 7.96 | 78.5 | 50-150 |
| Anthracene-D10 | 100 | 8.08 | 69.6 | 50-150 |
| Fluoranthene D10 | 100 | 11.37 | 79.6 | 50-150 |
| Benz(a)Anthracene-D12 | 100 | 15.90 | 80.6 | 50-150 |
| Chrysene D12 | 100 | 16.02 | 81.3 | 50-150 |
| Benzo(b)Fluoranthene-D12 | 100 | 19.24 | 77.5 | 50-150 |
| Benzo(k)Fluoranthene-D12 | 100 | 19.32 | 78.7 | 50-150 |
| Benzo(a)Pyrene D12 | 100 | 20.12 | 73.1 | 50-150 |
| Perylene D12 | 100 | 20.35 | 51.2 | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.85 | 75.9 | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 100 | 24.01 | 81.1 | 50-150 |
| Benzo(g,h,i)Perylene D12 | 100 | 24.85 | 77.8 | 50-150 |

NS Indicates that the compound was not added to the sample

# Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2688353-COFC

COC Number: 17 -

Page | of |

| Report To | Contact and company name below will appear on the final report |
|---|---|
| Company: | RWDI |
| Contact: | Matt Lantz |
| Phone: | 519 823 1311 |
| | Company address below will appear on the final report |
| Street: | 600 Southgate Drive |
| City/Province: | Guelph, Ontario |
| Postal Code: | N1G 4P6 |
| Invoice To | Same as Report To ☐ YES ☐ NO |
| | Copy of Invoice with Report ☐ YES ☐ NO |
| Company: | |
| Contact: | |

| Report Format / Distribution | |
|---|---|
| Select Report Format: | ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL) |
| Quality Control (QC) Report with Report | ☐ YES ☐ NO |
| ☐ Compare Results to Criteria on Report - provide details below if box checked | |
| Select Distribution: | ☑ EMAIL ☐ MAIL ☐ FAX |
| Email 1 or Fax | Matt.Lantz@rwdi.com |
| Email 2 | |
| Email 3 | |

| Invoice Distribution | |
|---|---|
| Select Invoice Distribution: | ☑ EMAIL ☐ MAIL ☐ FAX |
| Email 1 or Fax | |
| Email 2 | |

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Standard TAT is 15 business days. DTOX analysis standard TAT is 5 business days

| PRIORITY (Business Days) | | EMERGENCY | |
|---|---|---|---|
| | 15 day [R- Regular] ☐ | | 5 Business day - DTOX [R - Regular] |
| | 10 day [P-50%] ☐ | | 3 Business day - DTOX [E - 100%] |
| | 5 day [E-100%] ☐ | | |

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

| Project Information | |
|---|---|
| ALS Account # / Quote #: | |
| Job #: | DYEC |
| PO / AFE: | 1803743 Phase 1000 |
| LSD: | |

| Oil and Gas Required Fields (client use) | |
|---|---|
| AFE/Cost Center: | PO# |
| Major/Minor Code: | Routing Code: |
| Requisitioner: | |
| Location: | |

ALS Lab Work Order # (lab use only):

ALS Contact:

Sampler: Martin Town

Analysis Request

NUMBER OF CONTAINERS

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

SAMPLES ON HOLD

| ALS Sample # (lab use only) | Sample Identification and/or Coordinates (This description will appear on the report) | Sample Air Volume (m3) | Date (dd-mmm-yy) | Sample Period | Sample Type | TSP, ICP on Hi-Vol Filter | PAH | DX |
|---|---|---|---|---|---|---|---|---|
| 1 | L2685020-3 - Rundle | 320 | 22-Feb-22 | 24hr | Air | | X | X |
| 1 | 742265 | 1598 | 16-Feb-22 | 24hr | Air | X | | |
| 2 | 742267 | 1688 | 22-Feb-22 | 24hr | Air | X | | |
| 3 | 742266 - Coutice | 1704 | 16-Feb-22 | 24hr | Air | X | | |
| 4 | 742268 | 1683 | 22-Feb-22 | 24hr | Air | X | | |
| | | | | 24hr | Air | | | |
| | | | | 24hr | Air | | | |
| | | | | 24hr | Air | | | |
| | | | | 24hr | Air | | | |
| | | | | 24hr | Air | | | |
| | | | | 24hr | Air | | | |
| | | | | 24hr | Air | | | |

| Drinking Water (DW) Samples[1] (client use) | Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only) |
|---|---|
| Are samples taken from a Regulated DW System? ☐ YES ☑ NO | |
| Are samples for human consumption/ use? ☐ YES ☑ NO | Samples are 10 day TAT |

SAMPLE CONDITION AS RECEIVED (lab use only)

| | | | |
|---|---|---|---|
| Frozen ☐ | | SIF Observations | Yes ☑ |
| Ice Packs ☑ | Ice Cubes ☐ | Custody seal intact | Yes ☑ |
| Cooling Initiated ☑ | | | |

| INITIAL COOLER TEMPERATURES °C | | FINAL COOLER TEMPERATURES °C | |
|---|---|---|---|
| 5.9°C | 14.8°C | | |

| SHIPMENT RELEASE (client use) | | | INITIAL SHIPMENT RECEPTION (lab use only) | | | FINAL SHIPMENT RECEPTION (lab use only) | | |
|---|---|---|---|---|---|---|---|---|
| Released by: M. Town | Date: 24-Jan-22 | Time: 1215 | Received by: KARA BOUTON | Date: 25-FEB-2022 | Time: 10:00 | Received by: | Date: | Time: |

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 20

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Station: RofD Rundle Daily: 22/02/2022 Type: AVG 1 Hr. [5 Min .!

| Date " Ti# e | $M2.5 | %& | %&2 | %&' | S&2 | A# ( ient T | Tr) Te# p | RH AVG | Rain total | * S +# /, r | * D | Hi-Vol $re ure | $. / $re ure | A# ( ient T | Hi0ol / lo1 | $. / / lo1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | u2/# 3 | pp( | pp( | pp( | pp( | 4 5 | 4 5 | 6 | # # | +# /, r | De2 | in H20 | in H20 | 7 | 8f# | 8f# |
| 22/02/2022 00:00 | 3.5 | 0 | 1 | 0.9 | 0.: ; 2 | -2 | 22.1 | ; 0.9 | 0 | 12.< | ; = | 3.<: | 52.2; | 2<1.155 | : 0.; < | =.0= |
| 22/02/2022 01:00 | : .2 | 0 | 1.2 | 1 | 0.: 9 | -2 | 22 | ; 1.1 | 0 | 11.52 | ; = | 3.<9 | 52.51 | 2<1.153 | : 0.92 | =.09 |
| 22/02/2022 02:00 | 5.1 | 0.2 | 1.; | 1.= | 0.519 | -1.9 | 21.9 | ; 2.1 | 0 | 11.; 5 | ; 9 | 3.<9 | 52.53 | 2<1.22 | : 0.9: | =.09 |
| 22/02/2022 03:00 | 5.; | 2.9 | : .3 | <.2 | 0.5; : | -1.9 | 22.1 | ; 3 | 0 | 12.: : | <1 | 3.= | 52.32 | 2<1.2; 5 | : 0.9= | =.0= |
| 22/02/2022 0: :00 | 5.; | 1.1 | 3.5 | : .5 | 0.5; < | -1.; | 22.1 | ; : | 0 | 11.9= | <5 | 3.= | 51.<: | 2<1.5: | : 0.95 | =.03 |
| 22/02/2022 05:00 | 5.< | 2 | ; .9 | =.= | 0.5; ; | -1.: | 22 | ; : .= | 0 | 12.; 9 | <; | 3.= | 51.19 | 2<1.; 9= | : 0.9; | <.99 |
| 22/02/2022 0; :00 | 5.< | 0.1 | : .9 | : .9 | 0.53< | -1.3 | 22 | ; 5.= | 0 | 13.: | <1 | 3.= | 50.: ; | 2<1.=5; | : 0.95 | <.9: |
| 22/02/2022 0<:00 | 5.; | 0.2 | 5 | 5.2 | 0.5== | -0.9 | 22 | ; 5.= | 0 | 13.; | <2 | 3.=1 | : 9.92 | 2<2.2<= | : 0.93 | <.9 |
| 22/02/2022 0=:00 | ; .: | 0.5 | <.9 | =.: | 0.; : 3 | -0.3 | 21.9 | ; 5.3 | 0 | 1: .05 | <9 | 3.= | : 9.2: | 2<2.903 | : 0.=3 | <.=: |
| 22/02/2022 09:00 | <.9 | 0.; | ; .: | < | 0.; ; ; | 0.3 | 22.1 | ; <.1 | 0 | 1; .95 | 92 | 3.= | : 9.05 | 2<3.: <= | : 0.=1 | <.=1 |
| 22/02/2022 10:00 | <.3 | 3.1 | <.= | 10.= | 0.<3= | 0.9 | 21.9 | ; <.3 | 0 | 13.2; | =; | 3.<9 | : 9.3< | 2<3.993 | : 0.<3 | <.=3 |
| 22/02/2022 11:00 | = | 3.; | =.9 | 12.5 | 0.<<9 | 1.: | 21.9 | <2.2 | 0 | 12.; 5 | 9= | 3.= | : 9.22 | 2<: .522 | : 0.<1 | <.=1 |
| 22/02/2022 12:00 | <.= | 0.9 | <.: | =.3 | 0.<1< | 1.5 | 21.9 | <=.< | 0 | 12.<5 | 91 | 3.= | : =.=9 | 2<: .; 3= | : 0.<5 | <.<9 |
| 22/02/2022 13:00 | =.5 | 0.9 | =.< | 9.; | 0.; =2 | 1.; | 22 | 90.5 | 0.13 | 10.59 | <= | 3.=2 | : =.5< | 2<: .<<3 | : 0.= | <.<; |
| 22/02/2022 1: :00 | 9.3 | 0.= | 9.3 | 10 | 0.<; 9 | 2 | 22.1 | 100 | 0.<= | 10.=: | <5 | 3.=1 | : =.5= | 2<5.1<5 | : 0.<: | <.<; |
| 22/02/2022 15:00 | <.5 | 0.2 | <.1 | <.: | 0.=21 | 3.1 | 21.9 | 100 | 1.: 3 | 13.5< | =: | 3.= | : =.05 | 2<; .25; | : 0.59 | <.<1 |
| 22/02/2022 1; :00 | =.2 | 0.: | 9.: | 9.= | 0.=: 5 | 3.9 | 21.= | 100 | 1.=: | 9.1 | ; : | 3.= | : <.32 | 2<; .99= | : 0.5: | <.; : |
| 22/02/2022 1<:00 | ; .9 | 0.5 | =.: | =.9 | 0.=<3 | : | 22 | 100 | 1.=: | 5.5: | : 9 | 3.= | : ; .93 | 2<<.13: | : 0.53 | <.; 1 |
| 22/02/2022 1=:00 | =.1 | 0.1 | 9.< | 9.< | 0.=2= | 3.9 | 22 | 100 | 0.: 2 | 3.<3 | <5 | 3.= | : <.02 | 2<<.00: | : 0.5< | <.; 2 |
| 22/02/2022 19:00 | : .< | 0 | <.< | <.< | 0.=: = | 3.9 | 22 | 100 | 0.91 | 1.22 | 4 al# | 3.= | : <.59 | 2<<.022 | : 0.5; | <.; ; |
| 22/02/2022 20:00 | 5.3 | 0.9 | 13.2 | 1: .1 | 0.=<5 | 3.< | 22.1 | 100 | 0.2 | 2.2< | 4 al# | 3.= | : = | 2<; .=52 | : 0.5: | <.; 9 |
| 22/02/2022 21:00 | 3.: | 1 | 12.5 | 13.: | 0.=<9 | : .5 | 22.1 | 100 | 0.01 | ; .=; | 2: 0 | 3.<= | : 5.: 1 | 2<<.; =9 | : 0.: | <.: 9 |
| 22/02/2022 22:00 | 3.: | 0.9 | 12.2 | 13 | 1.: 3= | : .; | 21.9 | 100 | 0 | ; .; 9 | 259 | 3.<< | : <.29 | 2<<.<23 | : 0.35 | <.; 3 |
| 22/02/2022 23:00 | 3.< | 1.; | 19.: | 21 | 1.955 | 5 | 22 | 100 | 0 | ; .=: | 2: : | 3.<; | : =.= | 2<=.1<3 | : 0.2= | <.<: |
| Mini# u# | 3.: | 0 | 1 | 0.9 | 0.: ; 2 | -2 | 21.= | ; 0.9 | 0 | 1.22 | : 9 | 3.<: | : 5.: 1 | 2<1.153 | : 0.2= | <.: 9 |
| MinDate | 21:00 | 00:00 | 00:00 | 00:00 | 00:00 | 00:00 | 1; :00 | 00:00 | 00:00 | 19:00 | 1<:00 | 00:00 | 21:00 | 01:00 | 23:00 | 21:00 |
| Ma>i# u# | 9.3 | 3.; | 19.: | 21 | 1.955 | 5 | 22.1 | 100 | 1.=: | 1; .95 | 259 | 3.=2 | 52.53 | 2<=.1<3 | : 0.9= | =.09 |
| Ma>Date | 1: :00 | 11:00 | 23:00 | 23:00 | 23:00 | 23:00 | 00:00 | 1: :00 | 1; :00 | 09:00 | 22:00 | 13:00 | 02:00 | 23:00 | 03:00 | 01:00 |
| A02 | ; .1 | 0.9 | <.< | =.; | 0.<<< | 1.3 | 22 | =1.2 | 0.32 | 10.29 | 99 | 3.<9 | : 9.2; | 2<: .: 3< | : 0.<1 | <.=2 |
| %u# | 2: | 2: | 2: | 2: | 2: | 2: | 2: | 2: | 2: | 2: | 22 | 2: | 2: | 2: | 2: | 2: |
| Data[6 ! | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 91.; < | 100 | 100 | 100 | 100 | 100 |
| STD | 1.= | 1 | : .1 | : .: | 0.3 | 2.5 | 0.1 | 1< | 0.; | : | 59.9 | 0 | 2 | 2.5 | 0.2 | 0.2 |

600 Southgate Drive
Guelph ON Canada
N1G 4P6

Tel: +1.519.823.1311
Fax: +1.519.823.1316
E-mail: solutions@rwdi.com

# MEMORANDUM

| | | |
|---|---|---|
| **DATE:** | 2022-03-31 | **RWDI Reference No.:** 2200697 |
| **TO:** | Gioseph Anello | **EMAIL:** Gioseph.Anello@Durham.ca |
| **CC:** | Andrew Evans | **EMAIL:** Andrew.Evans@Durham.ca |
| **CC:** | Lyndsay Waller | **EMAIL:** Lyndsay.Waller@Durham.ca |
| **FROM:** | Khalid Hussein | **EMAIL:** Khalid.Hussein@rwdi.com |
| **RE:** | **Exceedance Report – Benzo(a)Pyrene March 6, 2022**<br>**Region of Durham, DYEC** | |

On March 25, 2022, the results from ALS Environmental were received regarding the PAH results from the March 6, 2022 sampling event. On March 25, 2022, the results were entered and assessed, and it was found that there was one (1) measured Benzo(a)Pyrene (BaP) concentration in excess of the 24-hour AAQC on the March 6$^{th}$ sampling date.

## March 6, 2022

On Sunday, March 6, 2022, there was one (1) exceedance of the BaP 24-hour AAQC, which occurred at the Rundle Road Station, measured at the onsite PUF PS-1 sampler. Attached is a figure depicting a wind rose (indicating the wind speed and direction distribution during the sampling day), and the location of the sampling stations relative to the DYEC.

The following summarizes the BaP concentrations and onsite conditions during the March 6$^{th}$ sampling date:

1. The guideline concentration for BaP is 0.05 ng/m$^3$. The measured concentration at the Rundle Road sampler was 1.16 ng/m$^3$. Due to the unusually high concentration, the sample was reanalyzed to confirm the sample values. The lab reanalyzed from the archived sample extract and the sample was confirmed as an exceedance.
2. During the sampling day the wind was predominantly from the W and WSW with less significant contributions from the SW, NE and E, as recorded at the Rundle Road Meteorological Tower. One-hour average wind speeds at Rundle Road Meteorological Tower ranged from 0.73 km/h to 31.34 km/h.

3. The Rundle Road meteorological data suggests that the Rundle Road Station was downwind of the DYEC during part of the sampling period. Given the wind conditions during the sampling period, it is possible that the measured BaP exceedance is attributable to the Energy Centre operations; however, other sources may have also played a role.

At the Rundle Road Station, the $NO_2$ hourly values were less than 5% of the criteria for the same period. The $PM_{2.5}$ 24-hour average value was 11.8 micrograms per cubic metre at the Rundle Road Station.

We have attached the data files for the samples in question to aid with the review.

Respectfully submitted by:

**RWDI AIR Inc.**

Khalid Hussein, P.Eng.
Project Manager

KAMH/kta

Attach.

Station: RofD Rundle  Daily: 06/03/2022  Type: AVG 1 Hr. [  !  in".#

| Date $ Ti%e | &!  2. | ' ( | ' ( 2 | ' ( ) | S( 2 | A%* ient T | Tr+Te%p | RH AVG | Rain total | ,  S - %/. r | ,  D | Hi/Vol &re"" ure | &0 1 &re"" ure | A%* ient T | Hi2ol 1lo3 | &0 1 1lo3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | u4/%3 | pp* | pp* | pp* | pp* | 5 6 | 5 6 | 7 | %% | - %/. r | De4 | in H20 | in H20 | 8 | 9f% | 9f% |
| 06/03/2022 00:00 | : .: | 2.; | ; . | 6.< | 0.=<= | 3. | 21.< | 6: .3 | 0 | <.3 | <2 | 3.6 | ; <.<2 | 2=6.61 | 3<.; = | =.: ; |
| 06/03/2022 01:00 | 10.; | /0.1 | .2 | .1 | 0.=; | 2.2 | 21.< | =2.< | 0 | .<3 | 2 | 3.66 | 0.<; | 2=  .3  2 | 3<.< | =.<3 |
| 06/03/2022 02:00 | 12.1 | 0.; | ; . | ; .< | 0.: 1 | 1.< | 21.< | =6 | 0 | .6= | ; 0 | 3.6= | 1.; 2 | 2=  .061 | ; 0 | =.<6 |
| 06/03/2022 03:00 | 1; .3 | 0.1 | ; .: | ; .< | 0.: 2 | 2.= | 22 | =; | 0 | ; .; | =6 | 3.6: | 1.; | 2=  .: 6= | 3<.<= | =.< |
| 06/03/2022 0; :00 | 13.6 | 0.1 | ; .< | | 0.: 66 | 3.; | 22 | =2.: | 0.03 | ; .  2 | 31 | 3.66 | 1.13 | 2=6.  6 | 3<.: 2 | =.<2 |
| 06/03/2022 0  :00 | 1; .; | 0 | 3.: | 3.: | 0.: ; 2 | 3. | 21.: | : : .1 | 1. | 1.: 2 | 5 al% | 3.6 | 0.= | 2=6.6: | 3<.=; | =.: < |
| 06/03/2022 06:00 | 16.1 | 0.2 | 6.2 | 6.3 | 0.: 62 | 3.3 | 22 | <<.< | 0.1: | 2 | =< | 3.6; | 0.63 | 2=6.; 13 | 3<.= | =.: < |
| 06/03/2022 0=:00 | 16.= | 1.2 | : .3 | <. | 0.: : 3 | 3.2 | 22 | 100 | 0 | 0.=3 | 5 al% | 3.6; | ; <.<= | 2=6.3  1 | 3<.=2 | =.: ; |
| 06/03/2022 0: :00 | 13. | 1 | ; .< | .< | 0.<3 | =.; | 21. | 100 | 0 | =.=6 | 22< | 3.  < | ; <.6 | 2: 0.  2 | 3<.1= | =.=6 |
| 06/03/2022 0<:00 | <.6 | 0.< | 3. | ; .; | 1.02; | : .: | 23 | <<.: | 0 | 16.03 | 23 | 3.  6 | ; : .<: | 2: 1.<01 | 3: .<1 | =.= |
| 06/03/2022 10:00 | : | 1.6 | 3.1 | ; .= | 1.0; 1 | <. | 22.= | : 6.; | 0 | 2=.11 | 23< | 3.  = | ; : .<2 | 2: 2.63: | 3: .<2 | =.6< |
| 06/03/2022 11:00 | 6 | 0.6 | 2.1 | 2.= | 1.16 | <. | 23.3 | ==.2 | 0 | 26.33 | 2; 1 | 3.  ; | ; : .: < | 2: 2.6=< | 3: .= | =.6< |
| 06/03/2022 12:00 | ; .2 | 0. | 2 | 2. | 1.0= | 10.6 | 23.1 | 6: .6 | 0 | 31.3; | 2; 2 | 3.  6 | ; : | 2: 3.=26 | 3: .= | =.61 |
| 06/03/2022 13:00 | ; .3 | 0. | 1.< | 2.; | 1.066 | 11 | 23.2 | 6  .: | 0 | 2: .3; | 2; 2 | 3.  ; | ; : .2= | 2: ; .13; | 3: .62 | =.62 |
| 06/03/2022 1; :00 | 3.6 | 0. | 2.3 | 2.= | 1.00< | 1; | 22.: | ; .2 | 0 | 1<.63 | 2  6 | 3.; < | ; 6.6< | 2: =.1=< | 3: .1= | =.; = |
| 06/03/2022 1  :00 | 2.< | 0.2 | 1.= | 1.< | 0.<<= | 1; .1 | 23.1 | ; =.1 | 0 | 2: .1 | 26< | 3.  1 | ; 6.21 | 2: =.223 | 3: .2 | =.; ; |
| 06/03/2022 16:00 | 2.6 | 0.1 | 1.2 | 1.3 | 0.: 21 | 11.1 | 22.: | 2. | 0 | 2<.3= | 2=< | 3. | ; 6.61 | 2: ; .1< | 3: .66 | =. |
| 06/03/2022 1=:00 | ; . | 0 | 1.2 | 1.2 | 0.=36 | 6.: | 22. | 63.: | 0 | 2; .=2 | 2: | 3.  < | ; =.0< | 2=<.<63 | 3<.1< | =.  < |
| 06/03/2022 1: :00 | .: | 0 | 1.3 | 1.3 | 0.=32 | .; | 21.< | 6= | 0 | 20.: ; | 2=2 | 3.6 | ; =.0 | 2=: .; < | 3<.33 | =.61 |
| 06/03/2022 1<:00 | ; .6 | /0.1 | 1.3 | 1.2 | 0.=2; | ; .< | 22 | 6= | 0 | 23.2; | 26; | 3.6 | ; =.26 | 2=: .02< | 3<.3= | =.63 |
| 06/03/2022 20:00 | 101.6 | 0.2 | 3.< | ; .1 | 1.; < | ; .= | 21.< | 6= | 0 | 20.  ; | 2  : | 3.6 | ; =.: : | 2==.: 1 | 3<.3: | =.6= |
| 06/03/2022 21:00 | 2 | /0.1 | 2.1 | 2 | 0.: ; 2 | ; .; | 22 | 66. | 0 | 20.; 6 | 26= | 3.6 | ; : | 2==.  : 6 | 3<.; 3 | =.6< |
| 06/03/2022 22:00 | 1. | 0.1 | 1.2 | 1.; | 0.=6< | ; .1 | 22 | 66.= | 0 | 1: .=; | 26= | 3.6 | ; : .0< | 2==.2; 1 | 3<.; 6 | =.= |
| 06/03/2022 23:00 | 1.; | /0.2 | 0.: | 0.6 | 0.=3= | 3.= | 22 | 6; .: | 0 | 13.62 | 2== | 3.6 | ; : .<: | 2=6.: ; : | 3<.; = | =.== |
| !  ini%u% | 1.; | /0.2 | 0.: | 0.6 | 0.=2; | 1.< | 21. | ; =.1 | 0 | 0.=3 | 31 | 3.; < | ; 6.21 | 2=  .061 | 3: .1= | =.; ; |
| !  inDate | 23:00 | 23:00 | 23:00 | 23:00 | 1<:00 | 02:00 | 0: :00 | 1  :00 | 00:00 | 0=:00 | 0; :00 | 1; :00 | 1  :00 | 02:00 | 1; :00 | 1  :00 |
| !  a>i%u% | 101.6 | 2.; | : .3 | <. | 1.; < | 1; .1 | 23.3 | 100 | 1. | 31.3; | 2: | 3.6: | 1.; 2 | 2: =.223 | ; 0 | =.<6 |
| !  a>Date | 20:00 | 00:00 | 0=:00 | 0=:00 | 20:00 | 1  :00 | 11:00 | 0=:00 | 0  :00 | 12:00 | 1=:00 | 03:00 | 02:00 | 1  :00 | 02:00 | 02:00 |
| A24 | 11.: | 0.; | 3.2 | 3.6 | 0.<0: | 6.; | 22.3 | =3.6 | 0.0= | 16.2: | 20; | 3.6 | ; : .: 6 | 2=<.  ; ; | 3<.26 | =.=2 |
| '  u% | 2; | 2; | 2; | 2; | 2; | 2; | 2; | 2; | 2; | 2; | 22 | 2; | 2; | 2; | 2; | 2; |
| Data[7 # | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | <1.6= | 100 | 100 | 100 | 100 | 100 |
| STD | 1<.; | 0.6 | 1.< | 2.2 | 0.2 | 3.= | 0. | 1; .= | 0.3 | 10 | : <.2 | 0 | 1.6 | 3.= | 0. | 0.1 |

**Table B6: 2022 Rundle Station Q1 Monitoring Results for PAHs**

| Contaminant | Units | *MECP Criteria* | 6-Mar-22 | No. > Criteria |
|---|---|---|---|---|
| 1-Methylnaphthalene | ng/m$^3$ | *12000* | 7.34E+00 | 0 |
| 2-Methylnaphthalene | ng/m$^3$ | *10000* | 1.16E+01 | 0 |
| Acenaphthene | ng/m$^3$ | - | 2.18E+00 | - |
| Acenaphthylene | ng/m$^3$ | *3500* | 5.27E+00 | 0 |
| Anthracene | ng/m$^3$ | *200* | 2.45E+00 | 0 |
| Benzo(a)Anthracene | ng/m$^3$ | - | 6.11E-01 | - |
| Benzo(a)fluorene | ng/m$^3$ | - | 7.37E-01 | - |
| Benzo(a)Pyrene (Historically High) | ng/m$^3$ | *0.05* [1] *5* [2] *1.1* [3] | 1.16E+00 | 1 |
| Benzo(b)Fluoranthene | ng/m$^3$ | - | 1.28E+00 | - |
| Benzo(b)fluorene | ng/m$^3$ | - | 6.21E-01 | - |
| Benzo(e)Pyrene | ng/m$^3$ | - | 9.69E-01 | - |
| Benzo(g,h,i)Perylene | ng/m$^3$ | - | 1.29E+00 | - |
| Benzo(k)Fluoranthene | ng/m$^3$ | - | 1.11E+00 | - |
| Biphenyl | ng/m$^3$ | - | 8.06E+00 | - |
| Chrysene | ng/m$^3$ | - | 1.40E+00 | - |
| Dibenzo(a,h)Anthracene | ng/m$^3$ | - | 1.11E-01 | - |
| Fluoranthene | ng/m$^3$ | - | 4.80E+00 | - |
| Fluorene | ng/m$^3$ | - | 5.49E+00 | - |
| Indeno(1,2,3-cd)Pyrene | ng/m$^3$ | - | 1.12E+00 | - |
| Naphthalene | ng/m$^3$ | *22500* | 4.95E+01 | 0 |
| o-Terphenyl | ng/m$^3$ | - | 2.61E-02 | - |
| Perylene | ng/m$^3$ | - | 2.00E-01 | - |
| Phenanthrene | ng/m$^3$ | - | 1.39E+01 | - |
| Pyrene | ng/m$^3$ | - | 4.33E+00 | - |
| Tetralin | ng/m$^3$ | - | 1.66E+00 | - |
| Total PAH[4] | ng/m$^3$ | - | 127.23 | - |

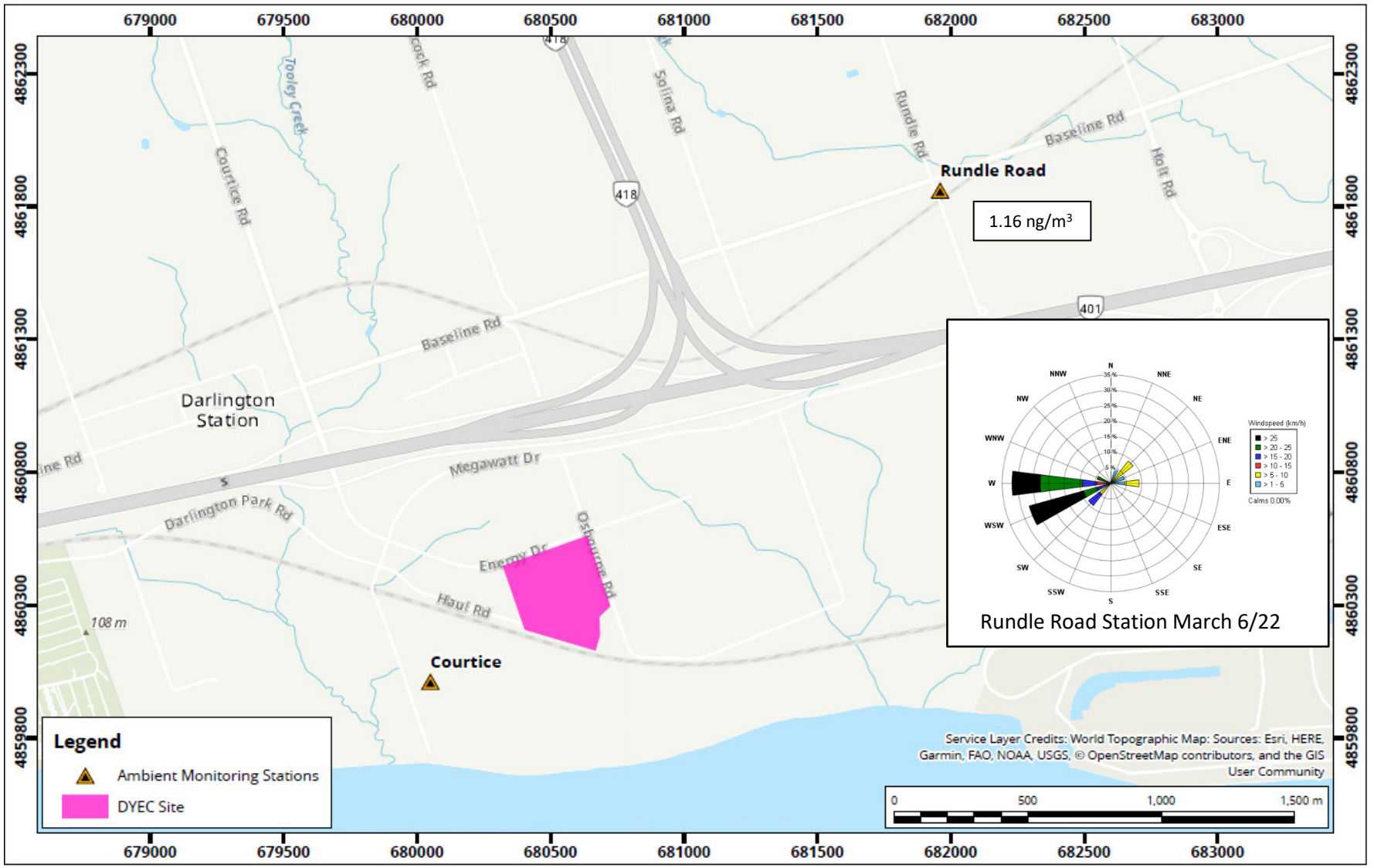
NOTE: All non-detectable results were reported as 1/2 of the detection limit

[1] AAQC

[2] O. Reg. 419/05 Schedule  Upper Risk Thresholds

[3] O. Reg. 419/05 24 Hour Guideline

[4] Total PAH sums all PAH contaminants




# DYEC Site and Ambient Monitoring Station Locations

True North

Drawn by: DAJH | Figure: 1

Approx. Scale: 1:20,000

Date Revised: Feb 14, 2022

Map Projection: NAD 1983 UTM Zone 17N

DYEC - Region of Durham, Ontario

Project #: 1803743

# Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2691342-COFC

COC Number: 17 -

Page 1 of 1

| Report To | Contact and company name below will appear on the final report |
|---|---|
| Company: | RWDI |
| Contact: | Matt Lantz |
| Phone: | 519 823 1311 |
| | Company address below will appear on the final report |
| Street: | 600 Southgate Drive |
| City/Province: | Guelph, Ontario |
| Postal Code: | N1G 4P6 |
| Invoice To | Same as Report To ☐ YES ☐ NO |
| | Copy of Invoice with Report ☐ YES ☐ NO |
| Company: | |
| Contact: | |

| Report Format / Distribution | |
|---|---|
| Select Report Format: | ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL) |
| Quality Control (QC) Report with Report | ☐ YES ☐ NO |
| ☐ Compare Results to Criteria on Report - provide details below if box checked | |
| Select Distribution: | ☑ EMAIL ☐ MAIL ☐ FAX |
| Email 1 or Fax | Matt.Lantz@rwdi.com |
| Email 2 | |
| Email 3 | |

| Invoice Distribution | |
|---|---|
| Select Invoice Distribution: | ☑ EMAIL ☐ MAIL ☐ FAX |
| Email 1 or Fax | |
| Email 2 | |

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Standard TAT is 15 business days. DTOX analysis standard TAT is 5 business days

| PRIORITY (Business Days) | | EMERGENCY | |
|---|---|---|---|
| | 15 day [R- Regular] ☐ | | 5 Business day - DTOX [R - Regular] |
| | 10 day [P-50%] ☐ | | 3 Business day - DTOX [E - 100%] |
| | 5 day [E-100%] ☐ | | |

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

| Project Information | |
|---|---|
| ALS Account # / Quote #: | |
| Job #: | DYEC |
| PO / AFE: | 1803743 Phase 1000 |
| LSD: | |

| Oil and Gas Required Fields (client use) | |
|---|---|
| AFE/Cost Center: | PO# |
| Major/Minor Code: | Routing Code: |
| Requisitioner: | |
| Location: | |

ALS Lab Work Order # (lab use only):

ALS Contact:

Sampler: Martin Town

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

| ALS Sample # (lab use only) | Sample Identification and/or Coordinates (This description will appear on the report) | Sample Air Volume (m3) | Date (dd-mmm-yy) | Sample Period | Sample Type | NUMBER OF CONTAINERS | TSP, ICP on Hi-Vol Filter | PAH | DX | SAMPLES ON HOLD |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | L2688303-2 - Courtice | 309 | 06-Mar-22 | 24hr | Air | | | X | | |
| 1 | 742350 | 1700 | 28-Feb-22 | 24hr | Air | | X | | | |
| 2 | 742352 | 1626 | 06-Mar-22 | 24hr | Air | | X | | | |
| 2 | L2688303-3 - Kunale | 319 | 06-Mar-22 | 24hr | Air | | | X | | |
| 3 | 742269 | 1702 | 28-Feb-22 | 24hr | Air | | X | | | |
| 4 | 742357 | 1578 | 06-Mar-22 | 24hr | Air | | X | | | |
| | | | | 24hr | Air | | | | | |
| | | | | 24hr | Air | | | | | |
| | | | | 24hr | Air | | | | | |
| | | | | 24hr | Air | | | | | |
| | | | | 24hr | Air | | | | | |
| | | | | 24hr | Air | | | | | |

| Drinking Water (DW) Samples[1] (client use) | Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only) |
|---|---|
| Are samples taken from a Regulated DW System? ☐ YES ☑ NO | |
| Are samples for human consumption/ use? ☐ YES ☑ NO | Samples are 10 day TAT |

SAMPLE CONDITION AS RECEIVED (lab use only)

| | | | |
|---|---|---|---|
| Frozen ☐ | | SIF Observations | Yes ☐ |
| Ice Packs ☑ | Ice Cubes ☐ | Custody seal intact | Yes ☑ |
| Cooling Initiated ☑ | | | |

| INITIAL COOLER TEMPERATURES °C | | FINAL COOLER TEMPERATURES °C | | | |
|---|---|---|---|---|---|
| 8.3°C | 12.9°C | | | | |

| SHIPMENT RELEASE (client use) | | | INITIAL SHIPMENT RECEPTION (lab use only) | | | FINAL SHIPMENT RECEPTION (lab use only) | | |
|---|---|---|---|---|---|---|---|---|
| Released by: | Date: 09-Mar-22 | Time: 11:30 | Received by: AARON BOLTON | Date: 10-March-2022 | Time: 10:15 | Received by: | Date: | Time: |

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 20

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

# Certificate of Analysis

| | | | |
|---|---|---|---|
| **ALS Project Contact:** | Claire Kocharakkal | **Client Name:** | RWDI Air Inc. |
| **ALS Project ID:** | 23601 | **Client Address:** | 600 Southgate Dr. |
| **ALS WO#:** | L2691342 | | Guelph, ON N1G 4P6 |
| **Date of Report** | 25-Mar-22 | | Canada |
| **Date of Sample Receipt** | 10-Mar-22 | **Client Contact:** | Khalid Hussein |
| | | **Client Project ID:** | DYEC |

**COMMENTS:** **PAH by CARB method 429 (LR option)- Isotope dilution**

The results for some targets have been reported from the analysis of diluted extracts due to elevated target concentrations.

Certified by:

Steve Kennedy
Technical Supervisor

# ALS Life Sciences

## Sample Analysis Summary Report

| Sample Name | Method Blank | | Method Blank | | COURTICE-PAH-MAR06 | | RUNDLE-PAH-MAR06 | | Laboratory Control Sample | |
|---|---|---|---|---|---|---|---|---|---|---|
| ALS Sample ID | WG3704535-1 | | WG3704535-4 | | L2691342-1 | | L2691342-2 | | WG3704535-2 | |
| Sample Size | 1 | | 1 | | 1 | | 1 | | 1 | |
| Sample units | sample | | sample | | sample | | sample | | n/a | |
| Moisture Content | n/a | | n/a | | n/a | | n/a | | n/a | |
| Matrix | MEDIA | | REAGENT | | PUF | | PUF | | MEDIA | |
| Sampling Date | n/a | | n/a | | 6-Mar-22 | | 6-Mar-22 | | n/a | |
| Extraction Date | 12-Mar-22 | | 12-Mar-22 | | 12-Mar-22 | | 12-Mar-22 | | 12-Mar-22 | |
| Target Analytes | ng/sample | | ng/sample | | ng/sample | | ng/sample | | % | |
| Naphthalene | 23.2 | R | 3.51 | B | 5390 | | 15800 | | 136 | B |
| 2-Methylnaphthalene | 3.67 | R | 1.29 | RB | 2480 | | 3690 | | 99.5 | |
| 1-Methylnaphthalene | 1.91 | | 0.760 | B | 1290 | | 2340 | | 97.4 | |
| Acenaphthylene | <0.20 | U | <0.20 | U | 24.2 | R | 1680 | | 99.8 | |
| Acenaphthene | 1.04 | R | <0.20 | U | 941 | | 695 | | 90.9 | |
| Fluorene | 0.950 | | <0.20 | U | 811 | | 1750 | | 88.1 | |
| Phenanthrene | 3.39 | | 2.00 | B | 1040 | | 4450 | | 98.6 | |
| Anthracene | <0.20 | U | <0.20 | U | 16.5 | | 781 | | 99.0 | |
| Fluoranthene | 1.49 | M | <0.20 | U | 225 | R | 1530 | | 98.7 | |
| Pyrene | 1.92 | M | 0.930 | B | 84.5 | | 1380 | | 98.0 | |
| Benzo(a)Anthracene | <0.20 | U | <0.20 | U | 7.63 | | 195 | | 98.1 | |
| Chrysene | <0.20 | U | <0.20 | U | 34.5 | | 447 | | 102 | |
| Benzo(b)Fluoranthene | <0.20 | U | <0.20 | U | 27.6 | R | 407 | | 99.2 | |
| Benzo(k)Fluoranthene | <0.20 | U | <0.20 | U | 16.1 | M | 354 | M | 99.0 | |
| Benzo(e)Pyrene | <0.20 | U | <0.20 | U | 14.5 | | 309 | | 108 | M |
| Benzo(a)Pyrene | <0.20 | U | <0.20 | U | 14.9 | M | 370 | | 114 | |
| Perylene | <0.20 | U | <0.20 | U | 1.19 | M | 63.8 | M | 102 | |
| Indeno(1,2,3-cd)Pyrene | <0.20 | U | <0.20 | U | 17.9 | R | 357 | R | 104 | |
| Dibenzo(a,h)Anthracene | <0.20 | U | <0.20 | U | 5.32 | M | 35.5 | | 105 | |
| Benzo(g,h,i)Perylene | <0.20 | U | <0.20 | U | 17.5 | R | 413 | | 100 | |
| Additional Analytes | | | | | | | | | | |
| Tetralin | 14.1 | | 0.650 | RB | 512 | | 528 | | NS | |
| Biphenyl | 3.44 | | 2.15 | B | 1290 | | 2570 | | NS | |
| o-Terphenyl | <0.20 | U | <0.20 | U | 5.51 | | 8.34 | | NS | |
| Benzo(a)fluorene | <0.20 | U | <0.20 | U | 8.38 | M | 235 | | NS | |
| Benzo(b)fluorene | <0.20 | U | <0.20 | U | 5.22 | | 198 | | NS | |
| Field Sampling Standards | % Rec | | % Rec | | % Rec | | % Rec | | % Rec | |
| 1-Methylnaphthalene-D10 | NS | | NS | | 85 | | 70.2 | | NS | |
| Fluorene D10 | NS | | NS | | 85.2 | | 73.5 | | NS | |
| Terphenyl D14(Surr.) | NS | | NS | | 112.7 | | 104.9 | | NS | |
| Extraction Standards | % Rec | | % Rec | | % Rec | | % Rec | | % Rec | |
| Naphthalene D8 | 80.5 | | 69.8 | | 55.2 | | 58.1 | | 62.5 | |
| 2-Methylnaphthalene-D10 | 82.3 | | 79.5 | | 66.3 | | 69.1 | | 73.8 | |
| Acenaphthylene D8 | 84.5 | | 79.6 | | 74.6 | | 61.8 | | 72.2 | |
| Phenanthrene D10 | 103.2 | | 89.4 | | 82.7 | | 92.8 | | 91.1 | |
| Anthracene-D10 | 91.7 | | 79.9 | | 78.5 | | 78.1 | | 83.4 | |
| Fluoranthene D10 | 111.7 | | 96.1 | | 97.9 | | 103.7 | | 96.7 | |
| Benz(a)Anthracene-D12 | 108.8 | | 84.6 | | 90.2 | | 77.7 | | 92.1 | |
| Chrysene D12 | 109.5 | | 86.6 | | 91.3 | | 85.6 | | 98 | |
| Benzo(b)Fluoranthene-D12 | 111.5 | | 92.4 | | 91 | | 95.4 | | 99.3 | |
| Benzo(k)Fluoranthene-D12 | 109.7 | | 92.7 | | 93.3 | | 105.9 | | 96.1 | |
| Benzo(a)Pyrene D12 | 86.6 | | 75.3 | | 78.6 | | 79.6 | | 84.6 | |
| Perylene D12 | 90.6 | | 65.1 | | 74.7 | | 75 | | 85.9 | |
| Indeno(1,2,3,cd)Pyrene-D12 | 96.2 | | 78.6 | | 84.5 | | 91.9 | | 83.9 | |
| Dibenz(a,h)Anthracene-D14 | 100.3 | | 78 | | 88.4 | | 93.8 | | 85.7 | |
| Benzo(g,h,i)Perylene D12 | 97.9 | | 83.7 | | 83.3 | | 87.5 | | 87.4 | |

| | |
|---|---|
| U | Indicates that this compound was not detected above the LOD. |
| M | Indicates that a peak has been manually integrated. |
| B | Indicates that this compound was detected in the method blank at greater than 10% of the sample value. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |
| NS | Indicates that the compound was not added to the sample. |

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | Method Blank | Sampling Date | n/a |
| ALS Sample ID | WG3704535-1 | Extraction Date | 12-Mar-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | blank | | |
| Sample Matrix | MEDIA | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3704535 |

Approved:
*Peter Nguyen*
--e-signature--
17-Mar-2022

| Run Information | Run 1 |
|---|---|
| Filename | PAH220316007.D |
| Run Date | 3/16/2022 10:56 |
| Final Volume | 0.1 mL |
| Dilution Factor | 1 |
| Analysis Units | ng/sample |
| Instrument | MSD-5 |
| Column | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | Flags |
|---|---|---|---|
| Naphthalene | 2.84 | 23.2 | R |
| 2-Methylnaphthalene | 3.43 | 3.67 | R |
| 1-Methylnaphthalene | 3.55 | 1.91 | |
| Acenaphthylene | NotFnd | <0.20 | U |
| Acenaphthene | 4.87 | 1.04 | R |
| Fluorene | 5.80 | 0.950 | |
| Phenanthrene | 8.01 | 3.39 | |
| Anthracene | NotFnd | <0.20 | U |
| Fluoranthene | 11.41 | 1.49 | M |
| Pyrene | 12.06 | 1.92 | M |
| Benzo(a)Anthracene | NotFnd | <0.20 | U |
| Chrysene | NotFnd | <0.20 | U |
| Benzo(b)Fluoranthene | NotFnd | <0.20 | U |
| Benzo(k)Fluoranthene | NotFnd | <0.20 | U |
| Benzo(e)Pyrene | NotFnd | <0.20 | U |
| Benzo(a)Pyrene | NotFnd | <0.20 | U |
| Perylene | NotFnd | <0.20 | U |
| Indeno(1,2,3-cd)Pyrene | NotFnd | <0.20 | U |
| Dibenzo(a,h)Anthracene | NotFnd | <0.20 | U |
| Benzo(g,h,i)Perylene | NotFnd | <0.20 | U |
| **Additional Analytes** | | | |
| Tetralin | 2.72 | 14.1 | |
| Biphenyl | 3.96 | 3.44 | |
| o-Terphenyl | NotFnd | <0.20 | U |
| Benzo(a)fluorene | NotFnd | <0.20 | U |
| Benzo(b)fluorene | NotFnd | <0.20 | U |

| Field Sampling Standards | ng spiked | % Rec |
|---|---|---|
| 1-Methylnaphthalene-D10 | 0 | NS |
| Fluorene D10 | 0 | NS |
| Terphenyl D14(Surr.) | 0 | NS |

| Extraction Standards | | Ret. Time | % Rec | | Limits |
|---|---|---|---|---|---|
| Naphthalene D8 | 200 | 2.83 | 80.5 | R | 50-150 |
| 2-Methylnaphthalene-D10 | 200 | 3.40 | 82.3 | | 50-150 |
| Acenaphthylene D8 | 200 | 4.56 | 84.5 | | 50-150 |
| Phenanthrene D10 | 200 | 7.96 | 103.2 | | 50-150 |
| Anthracene-D10 | 200 | 8.08 | 91.7 | R | 50-150 |
| Fluoranthene D10 | 200 | 11.36 | 111.7 | R | 50-150 |
| Benz(a)Anthracene-D12 | 200 | 15.90 | 108.8 | R | 50-150 |
| Chrysene D12 | 200 | 16.01 | 109.5 | R | 50-150 |
| Benzo(b)Fluoranthene-D12 | 200 | 19.24 | 111.5 | R | 50-150 |
| Benzo(k)Fluoranthene-D12 | 200 | 19.32 | 109.7 | R | 50-150 |
| Benzo(a)Pyrene D12 | 200 | 20.11 | 86.6 | R | 50-150 |
| Perylene D12 | 200 | 20.35 | 90.6 | R | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 200 | 23.85 | 96.2 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 200 | 24.01 | 100.3 | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 200 | 24.84 | 97.9 | | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated. |
| U | Indicates that this compound was not detected above the MDL. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |
| NS | Indicates that this standard has not been added. |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | Method Blank | Sampling Date | n/a |
| ALS Sample ID | WG3704535-4 | Extraction Date | 12-Mar-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | REAGENT | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3704535 |

Approved:
*Peter Nguyen*
--e-signature--
17-Mar-2022

| Run Information | Run 1 |
|---|---|
| Filename | PAH220316008.D |
| Run Date | 3/16/2022 11:34 |
| Final Volume | 0.1 mL |
| Dilution Factor | 1 |
| Analysis Units | ng/sample |
| Instrument | MSD-5 |
| Column | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | Flags |
|---|---|---|---|
| Naphthalene | 2.84 | 3.51 | B |
| 2-Methylnaphthalene | 3.43 | 1.29 | R B |
| 1-Methylnaphthalene | 3.54 | 0.760 | B |
| Acenaphthylene | NotFnd | <0.20 | U |
| Acenaphthene | NotFnd | <0.20 | U |
| Fluorene | NotFnd | <0.20 | U |
| Phenanthrene | 8.01 | 2.00 | B |
| Anthracene | NotFnd | <0.20 | U |
| Fluoranthene | NotFnd | <0.20 | U |
| Pyrene | 12.06 | 0.930 | B |
| Benzo(a)Anthracene | NotFnd | <0.20 | U |
| Chrysene | NotFnd | <0.20 | U |
| Benzo(b)Fluoranthene | NotFnd | <0.20 | U |
| Benzo(k)Fluoranthene | NotFnd | <0.20 | U |
| Benzo(e)Pyrene | NotFnd | <0.20 | U |
| Benzo(a)Pyrene | NotFnd | <0.20 | U |
| Perylene | NotFnd | <0.20 | U |
| Indeno(1,2,3-cd)Pyrene | NotFnd | <0.20 | U |
| Dibenzo(a,h)Anthracene | NotFnd | <0.20 | U |
| Benzo(g,h,i)Perylene | NotFnd | <0.20 | U |
| **Additional Analytes** | | | |
| Tetralin | 2.73 | 0.650 | R B |
| Biphenyl | 3.97 | 2.15 | B |
| o-Terphenyl | NotFnd | <0.20 | U |
| Benzo(a)fluorene | NotFnd | <0.20 | U |
| Benzo(b)fluorene | NotFnd | <0.20 | U |

| Field Sampling Standards | ng spiked | % Rec |
|---|---|---|
| 1-Methylnaphthalene-D10 | 0 | NS |
| Fluorene D10 | 0 | NS |
| Terphenyl D14(Surr.) | 0 | NS |

| Extraction Standards | | | % Rec | | Limits |
|---|---|---|---|---|---|
| Naphthalene D8 | 200 | 2.83 | 69.8 | R | 50-150 |
| 2-Methylnaphthalene-D10 | 200 | 3.40 | 79.5 | | 50-150 |
| Acenaphthylene D8 | 200 | 4.56 | 79.6 | | 50-150 |
| Phenanthrene D10 | 200 | 7.96 | 89.4 | | 50-150 |
| Anthracene-D10 | 200 | 8.08 | 79.9 | R | 50-150 |
| Fluoranthene D10 | 200 | 11.37 | 96.1 | R | 50-150 |
| Benz(a)Anthracene-D12 | 200 | 15.90 | 84.6 | R | 50-150 |
| Chrysene D12 | 200 | 16.02 | 86.6 | R | 50-150 |
| Benzo(b)Fluoranthene-D12 | 200 | 19.24 | 92.4 | R | 50-150 |
| Benzo(k)Fluoranthene-D12 | 200 | 19.32 | 92.7 | R | 50-150 |
| Benzo(a)Pyrene D12 | 200 | 20.12 | 75.3 | R | 50-150 |
| Perylene D12 | 200 | 20.35 | 65.1 | R | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 200 | 23.85 | 78.6 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 200 | 24.03 | 78.0 | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 200 | 24.84 | 83.7 | | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated. |
| U | Indicates that this compound was not detected above the MDL. |
| B | Indicates that this compound was detected in the method blank at greater than 10% of the sample value. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |
| NS | Indicates that this standard has not been added. |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | COURTICE-PAH-MAR06 | Sampling Date | 06-Mar-22 |
| ALS Sample ID | L2691342-1 | Extraction Date | 12-Mar-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | Puf | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3704535 |

Approved:
*Peter Nguyen*
--e-signature--
17-Mar-2022

| Run Information | Run 1 | Run 2 |
|---|---|---|
| Filename | PAH220316016.D | PAH220316011.D |
| Run Date | 3/16/2022 16:39 | 3/16/2022 13:29 |
| Final Volume | 0.1 mL | 0.1 mL |
| Dilution Factor | 1 | 10 |
| Analysis Units | ng/sample | ng/sample |
| Instrument | MSD-5 | MSD-5 |
| Column | HP-5MS US1609664H | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | Flags | Ret. Time. | Concentration ng/sample | Flags |
|---|---|---|---|---|---|---|
| Naphthalene | | | | 2.84 | 5390 | |
| 2-Methylnaphthalene | | | | 3.43 | 2480 | |
| 1-Methylnaphthalene | | | | 3.54 | 1290 | |
| Acenaphthylene | 4.58 | 24.2 | R | | | |
| Acenaphthene | | | | 4.88 | 941 | |
| Fluorene | | | | 5.80 | 811 | |
| Phenanthrene | | | | 8.01 | 1040 | |
| Anthracene | 8.13 | 16.5 | | | | |
| Fluoranthene | | | | 11.42 | 225 | R |
| Pyrene | 12.06 | 84.5 | | | | |
| Benzo(a)Anthracene | 15.97 | 7.63 | | | | |
| Chrysene | 16.08 | 34.5 | | | | |
| Benzo(b)Fluoranthene | 19.30 | 27.6 | R | | | |
| Benzo(k)Fluoranthene | 19.36 | 16.1 | M | | | |
| Benzo(e)Pyrene | 20.05 | 14.5 | | | | |
| Benzo(a)Pyrene | 20.18 | 14.9 | M | | | |
| Perylene | 20.42 | 1.19 | M | | | |
| Indeno(1,2,3-cd)Pyrene | 23.93 | 17.9 | R | | | |
| Dibenzo(a,h)Anthracene | 24.17 | 5.32 | M | | | |
| Benzo(g,h,i)Perylene | 24.95 | 17.5 | R | | | |
| **Additional Analytes** | | | | | | |
| Tetralin | | | | 2.72 | 512 | |
| Biphenyl | | | | 3.96 | 1290 | |
| o-Terphenyl | 9.28 | 5.51 | | | | |
| Benzo(a)fluorene | 13.22 | 8.38 | M | | | |
| Benzo(b)fluorene | 13.44 | 5.22 | | | | |

| Field Sampling Standards | ng spiked | | % Rec | | | % Rec |
|---|---|---|---|---|---|---|
| 1-Methylnaphthalene-D10 | 200 | 3.51 | 85 | | | |
| Fluorene D10 | 200 | 5.75 | 85.2 | | | |
| Terphenyl D14(Surr.) | 200 | 12.86 | 112.7 | R | | |

| Extraction Standards | | | % Rec | | Limits |
|---|---|---|---|---|---|
| Naphthalene D8 | 200 | 2.83 | 55.2 | R | 50-150 |
| 2-Methylnaphthalene-D10 | 200 | 3.40 | 66.3 | | 50-150 |
| Acenaphthylene D8 | 200 | 4.56 | 74.6 | | 50-150 |
| Phenanthrene D10 | 200 | 7.96 | 82.7 | | 50-150 |
| Anthracene-D10 | 200 | 8.08 | 78.5 | R | 50-150 |
| Fluoranthene D10 | 200 | 11.36 | 97.9 | R | 50-150 |
| Benz(a)Anthracene-D12 | 200 | 15.89 | 90.2 | R | 50-150 |
| Chrysene D12 | 200 | 16.01 | 91.3 | R | 50-150 |
| Benzo(b)Fluoranthene-D12 | 200 | 19.24 | 91.0 | R | 50-150 |
| Benzo(k)Fluoranthene-D12 | 200 | 19.32 | 93.3 | R | 50-150 |
| Benzo(a)Pyrene D12 | 200 | 20.11 | 78.6 | R | 50-150 |
| Perylene D12 | 200 | 20.35 | 74.7 | R | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 200 | 23.84 | 84.5 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 200 | 24.01 | 88.4 | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 200 | 24.83 | 83.3 | | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated. |
| U | Indicates that this compound was not detected above the MDL. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | RUNDLE-PAH-MAR06 | Sampling Date | 06-Mar-22 |
| ALS Sample ID | L2691342-2 | Extraction Date | 12-Mar-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | Puf | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3704535 |

Approved:
*Peter Nguyen*
--e-signature--
17-Mar-2022

| Run Information | Run 1 | Run 2 | Run 3 |
|---|---|---|---|
| Filename | PAH220316018.D | PAH220316014.D | PAH220317008.D |
| Run Date | 3/16/2022 17:55 | 3/16/2022 15:23 | 3/17/2022 10:40 |
| Final Volume | 0.1 mL | 0.1 mL | 0.1 mL |
| Dilution Factor | 1 | 10 | 20 |
| Analysis Units | ng/sample | ng/sample | ng/sample |
| Instrument | MSD-5 | MSD-5 | MSD-5 |
| Column | HP-5MS US1609664H | HP-5MS US1609664H | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | Flags | Ret. Time. | Concentration ng/sample | Flags | Ret. Time. | Concentration ng/sample | Flags |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | | | | | | | 2.84 | 15800 | |
| 2-Methylnaphthalene | | | | 3.43 | 3690 | | | | |
| 1-Methylnaphthalene | | | | 3.54 | 2340 | | | | |
| Acenaphthylene | | | | 4.58 | 1680 | | | | |
| Acenaphthene | | | | 4.88 | 695 | | | | |
| Fluorene | | | | 5.80 | 1750 | | | | |
| Phenanthrene | | | | 8.01 | 4450 | | | | |
| Anthracene | | | | 8.13 | 781 | | | | |
| Fluoranthene | | | | 11.42 | 1530 | | | | |
| Pyrene | | | | 12.06 | 1380 | | | | |
| Benzo(a)Anthracene | | | | 15.97 | 195 | R | | | |
| Chrysene | | | | 16.09 | 447 | R | | | |
| Benzo(b)Fluoranthene | | | | 19.31 | 407 | | | | |
| Benzo(k)Fluoranthene | | | | 19.36 | 354 | M | | | |
| Benzo(e)Pyrene | | | | 20.05 | 309 | R | | | |
| Benzo(a)Pyrene | | | | 20.19 | 370 | R | | | |
| Perylene | 20.42 | 63.8 | M | | | | | | |
| Indeno(1,2,3-cd)Pyrene | | | | 23.95 | 357 | R | | | |
| Dibenzo(a,h)Anthracene | 24.13 | 35.5 | R | | | | | | |
| Benzo(g,h,i)Perylene | | | | 24.95 | 413 | | | | |
| **Additional Analytes** | | | | | | | | | |
| Tetralin | | | | 2.72 | 528 | | | | |
| Biphenyl | | | | 3.96 | 2570 | | | | |
| o-Terphenyl | 9.28 | 8.34 | | | | | | | |
| Benzo(a)fluorene | | | | 13.23 | 235 | | | | |
| Benzo(b)fluorene | 13.44 | 198 | | | | | | | |

| Field Sampling Standards | ng spiked | | % Rec |
|---|---|---|---|
| 1-Methylnaphthalene-D10 | 200 | 3.50 | 70.2 |
| Fluorene D10 | 200 | 5.75 | 73.5 |
| Terphenyl D14(Surr.) | 200 | 12.86 | 104.9 |

| Extraction Standards | | | % Rec | | Limits |
|---|---|---|---|---|---|
| Naphthalene D8 | 200 | 2.83 | 58.1 | R | 50-150 |
| 2-Methylnaphthalene-D10 | 200 | 3.40 | 69.1 | | 50-150 |
| Acenaphthylene D8 | 200 | 4.56 | 61.8 | | 50-150 |
| Phenanthrene D10 | 200 | 7.96 | 92.8 | | 50-150 |
| Anthracene-D10 | 200 | 8.08 | 78.1 | | 50-150 |
| Fluoranthene D10 | 200 | 11.36 | 103.7 | R | 50-150 |
| Benz(a)Anthracene-D12 | 200 | 15.89 | 77.7 | R | 50-150 |
| Chrysene D12 | 200 | 16.01 | 85.6 | R | 50-150 |
| Benzo(b)Fluoranthene-D12 | 200 | 19.24 | 95.4 | R | 50-150 |
| Benzo(k)Fluoranthene-D12 | 200 | 19.32 | 105.9 | R | 50-150 |
| Benzo(a)Pyrene D12 | 200 | 20.11 | 79.6 | R | 50-150 |
| Perylene D12 | 200 | 20.35 | 75.0 | R | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 200 | 23.84 | 91.9 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 200 | 24.01 | 93.8 | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 200 | 24.83 | 87.5 | | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated. |
| U | Indicates that this compound was not detected above the MDL. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | Laboratory Control Sample | Sampling Date | n/a |
| ALS Sample ID | WG3704535-2 | Extraction Date | 12-Mar-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | MEDIA | | |
| Sample Size | 1 n/a | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3704535 |

Approved:
*Peter Nguyen*
--e-signature--
17-Mar-2022

| Run Information | Run 1 |
|---|---|
| Filename | PAH220316005.D |
| Run Date | 3/16/2022 9:40 |
| Final Volume | 0.1 mL |
| Dilution Factor | 1 |
| Analysis Units | % |
| Instrument | MSD-5 |
| Column | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration % | Flags |
|---|---|---|---|
| Naphthalene | 2.84 | 136 | B |
| 2-Methylnaphthalene | 3.43 | 99.5 | |
| 1-Methylnaphthalene | 3.54 | 97.4 | |
| Acenaphthylene | 4.58 | 99.8 | |
| Acenaphthene | 4.88 | 90.9 | |
| Fluorene | 5.80 | 88.1 | |
| Phenanthrene | 8.01 | 98.6 | |
| Anthracene | 8.13 | 99.0 | |
| Fluoranthene | 11.42 | 98.7 | |
| Pyrene | 12.06 | 98.0 | |
| Benzo(a)Anthracene | 15.97 | 98.1 | R |
| Chrysene | 16.09 | 102 | R |
| Benzo(b)Fluoranthene | 19.30 | 99.2 | R |
| Benzo(k)Fluoranthene | 19.37 | 99.0 | R |
| Benzo(e)Pyrene | 20.05 | 108 | M |
| Benzo(a)Pyrene | 20.18 | 114 | |
| Perylene | 20.42 | 102 | R |
| Indeno(1,2,3-cd)Pyrene | 23.94 | 104 | R |
| Dibenzo(a,h)Anthracene | 24.14 | 105 | R |
| Benzo(g,h,i)Perylene | 24.94 | 100 | R |
| **Additional Analytes** | | | |
| Tetralin | 2.72 | 24.4 | B |
| Biphenyl | 3.96 | 123 | |
| o-Terphenyl | 9.27 | 0.230 | R |
| Benzo(a)fluorene | NotFnd | <0.20 | U |
| Benzo(b)fluorene | NotFnd | <0.20 | U |

| Field Sampling Standards | ng spiked | % Rec |
|---|---|---|
| 1-Methylnaphthalene-D10 | 0 | NS |
| Fluorene D10 | 0 | NS |
| Terphenyl D14(Surr.) | 0 | NS |

| Extraction Standards | | | % Rec | | Limits |
|---|---|---|---|---|---|
| Naphthalene D8 | 200 | 2.83 | 62.5 | R | 50-150 |
| 2-Methylnaphthalene-D10 | 200 | 3.40 | 73.8 | | 50-150 |
| Acenaphthylene D8 | 200 | 4.56 | 72.2 | | 50-150 |
| Phenanthrene D10 | 200 | 7.96 | 91.1 | | 50-150 |
| Anthracene-D10 | 200 | 8.08 | 83.4 | R | 50-150 |
| Fluoranthene D10 | 200 | 11.36 | 96.7 | R | 50-150 |
| Benz(a)Anthracene-D12 | 200 | 15.89 | 92.1 | R | 50-150 |
| Chrysene D12 | 200 | 16.01 | 98.0 | R | 50-150 |
| Benzo(b)Fluoranthene-D12 | 200 | 19.24 | 99.3 | R | 50-150 |
| Benzo(k)Fluoranthene-D12 | 200 | 19.32 | 96.1 | | 50-150 |
| Benzo(a)Pyrene D12 | 200 | 20.11 | 84.6 | R | 50-150 |
| Perylene D12 | 200 | 20.35 | 85.9 | R | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 200 | 23.84 | 83.9 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 200 | 24.01 | 85.7 | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 200 | 24.83 | 87.4 | | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated. |
| U | Indicates that this compound was not detected above the MDL. |
| B | Indicates that this compound was detected in the method blank at greater than 10% of the sample value. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |
| NS | Indicates that this standard has not been added. |

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

# Certificate of Analysis

| | | | |
|---|---|---|---|
| **ALS Project Contact:** | Claire Kocharakkal | **Client Name:** | RWDI Air Inc. |
| **ALS Project ID:** | 23601 | **Client Address:** | 600 Southgate Dr. |
| **ALS WO#:** | L2691342 | | Guelph, ON N1G 4P6 |
| **Date of Report** | 30-Mar-22 | | Canada |
| **Date of Sample Receipt** | 10-Mar-22 | **Client Contact:** | Khalid Hussein |
| | | **Client Project ID:** | DYEC |

**COMMENTS:** **PAH by CARB method 429 (LR option)- Isotope dilution**

***** SUPPLEMENTAL REPORT *****

The results in this report are supplemental to those previously reported. The results differ from the originally reported results as follows:
The supplemental results are from the analysis of archived portions of the original raw sample extract, to provide confirmation of the original results.

The results for some targets have been reported from the analysis of diluted extracts due to elevated target concentrations.

Certified by:

Steve Kennedy
Technical Supervisor

# ALS Life Sciences

## Sample Analysis Summary Report

| Sample Name | Method Blank | | Method Blank | | COURTICE-PAH-MAR06 | | RUNDLE-PAH-MAR06 | | Laboratory Control Sample | |
|---|---|---|---|---|---|---|---|---|---|---|
| ALS Sample ID | WG3704535-1 | | WG3704535-4 | | L2691342-1 | | L2691342-2 | | WG3704535-2 | |
| Sample Size | 1 | | 1 | | 1 | | 1 | | 1 | |
| Sample units | sample | | sample | | sample | | sample | | n/a | |
| Moisture Content | n/a | | n/a | | n/a | | n/a | | n/a | |
| Matrix | MEDIA | | REAGENT | | Puf | | Puf | | QC | |
| Sampling Date | n/a | | n/a | | 6-Mar-22 | | 6-Mar-22 | | n/a | |
| Extraction Date | 12-Mar-22 | | 12-Mar-22 | | 12-Mar-22 | | 12-Mar-22 | | 12-Mar-22 | |
| **Target Analytes** | **ng/sample** | | **ng/sample** | | **ng/sample** | | **ng/sample** | | **%** | |
| Naphthalene | 23.0 | R | 4.21 | | 5350 | | 15200 | | 118 | |
| 2-Methylnaphthalene | 3.31 | R | 1.58 | | 2470 | | 3610 | | 102 | |
| 1-Methylnaphthalene | 3.35 | | 0.760 | | 1310 | | 2310 | | 99.9 | |
| Acenaphthylene | 0.600 | R | <0.20 | U | 25.5 | R | 1780 | | 96.1 | |
| Acenaphthene | 1.11 | M,R | <0.20 | U | 869 | | 656 | | 83.6 | |
| Fluorene | 0.710 | | <0.20 | U | 799 | | 1630 | | 89.6 | |
| Phenanthrene | 3.54 | | 1.58 | R | 1010 | | 4120 | | 97.1 | |
| Anthracene | 0.920 | | <0.20 | U | 16.1 | M | 886 | M | 96.8 | |
| Fluoranthene | 1.93 | R | 0.970 | M,R | 217 | R | 1650 | R | 96.8 | |
| Pyrene | 2.21 | R | 1.25 | M,R | 87.7 | R | 1560 | R | 100 | |
| Benzo(a)Anthracene | <0.20 | U | <0.20 | U | 7.42 | R | 201 | R | 92.8 | |
| Chrysene | <0.20 | U | <0.20 | U | 34.6 | R | 509 | | 93.7 | |
| Benzo(b)Fluoranthene | <0.20 | U | <0.20 | U | 23.8 | M | 352 | M | 110 | |
| Benzo(k)Fluoranthene | <0.20 | U | <0.20 | U | 22.5 | M | 430 | M | 103 | |
| Benzo(e)Pyrene | <0.20 | U | <0.20 | U | 16.3 | R | 294 | R | 92.1 | |
| Benzo(a)Pyrene | <0.20 | U | <0.20 | U | 14.4 | M | 263 | R | 110 | |
| Perylene | <0.20 | U | <0.20 | U | 1.02 | R | 68.8 | R | 97.2 | |
| Indeno(1,2,3-cd)Pyrene | <0.20 | U | <0.20 | U | 16.9 | R | 301 | R | 107 | |
| Dibenzo(a,h)Anthracene | <0.20 | U | <0.20 | U | 4.21 | R | 29.7 | | 83.6 | |
| Benzo(g,h,i)Perylene | <0.20 | U | <0.20 | U | 19.6 | | 351 | M,R | 103 | |
| **Additional Analytes** | | | | | | | | | | |
| Tetralin | 13.3 | R | 0.640 | M,R | 427 | | 535 | | 24.4 | |
| Biphenyl | 2.51 | | 1.15 | M | 1290 | | 2520 | | 123 | |
| o-Terphenyl | <0.20 | U | <0.20 | U | 6.49 | | 9.60 | | 0.230 | R |
| Benzo(a)fluorene | <0.20 | U | <0.20 | U | 9.84 | | 179 | | <0.20 | U |
| Benzo(b)fluorene | <0.20 | U | <0.20 | U | 7.51 | M | 192 | M | <0.20 | U |
| **Field Sampling Standards** | **% Rec** | | **% Rec** | | **% Rec** | | **% Rec** | | **% Rec** | |
| 1-Methylnaphthalene-D10 | NS | | NS | | 83.7 | | 70.3 | | NS | |
| Fluorene D10 | NS | | NS | | 86.4 | M | 68.0 | | NS | |
| Terphenyl D14(Surr.) | NS | | NS | | 114.1 | R | 120.1 | | NS | |
| **Extraction Standards** | **% Rec** | | **% Rec** | | **% Rec** | | **% Rec** | | **% Rec** | |
| Naphthalene D8 | 69.2 | | 60.7 | | 53.2 | | 51.9 | | 60.6 | |
| 2-Methylnaphthalene-D10 | 73.6 | | 71.3 | | 64.4 | | 63.6 | | 64.4 | |
| Acenaphthylene D8 | 93.0 | | 86.1 | | 75.1 | | 61.8 | | 89.7 | |
| Phenanthrene D10 | 76.9 | | 67.1 | | 69.2 | | 67.6 | | 64.4 | |
| Anthracene-D10 | 86.3 | | 71.7 | | 75.0 | | 65.7 | | 78.8 | |
| Fluoranthene D10 | 105.4 | | 89.9 | | 93.7 | | 97.1 | | 93.3 | |
| Benz(a)Anthracene-D12 | 101.9 | | 67.1 | | 77.7 | | 101.6 | | 111.5 | |
| Chrysene D12 | 114.8 | | 93.6 | M,R | 92.3 | | 108.0 | M,R | 117.8 | |
| Benzo(b)Fluoranthene-D12 | 91.8 | | 73.2 | | 79.0 | | 82.8 | | 82.3 | |
| Benzo(k)Fluoranthene-D12 | 103.4 | M,R | 96.9 | M,R | 90.5 | | 108.3 | M,R | 105.0 | |
| Benzo(a)Pyrene D12 | 89.3 | | 72.1 | | 72.2 | | 76.1 | | 89.9 | |
| Perylene D12 | 85.6 | | 78.3 | M | 66.2 | | 72.0 | | 88.6 | |
| Indeno(1,2,3,cd)Pyrene-D12 | 71.5 | | 72.4 | M | 87.1 | M | 65.4 | | 69.6 | |
| Dibenz(a,h)Anthracene-D14 | 96.4 | M | 90.6 | M | 71.8 | M | 76.7 | M | 94.1 | M |
| Benzo(g,h,i)Perylene D12 | 94.8 | M | 93.4 | M | 68.9 | M | 86.8 | M | 94.8 | M |

| | |
|---|---|
| U | Indicates that this compound was not detected above the LOD. |
| M | Indicates that a peak has been manually integrated. |
| B | Indicates that this compound was detected in the method blank at greater than 10% of the sample value. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |
| NS | Indicates that the compound was not added to the sample. |

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | Method Blank | Sampling Date | n/a |
| ALS Sample ID | WG3704535-1 | Extraction Date | 12-Mar-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | blank | | |
| Sample Matrix | MEDIA | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3704535 |

Approved:
*Peter Nguyen*
--e-signature--
30-Mar-2022

| Run Information | Run 1 |
|---|---|
| Filename | PAH220329014.D |
| Run Date | 3/29/2022 15:40 |
| Final Volume | 0.1 mL |
| Dilution Factor | 1 |
| Analysis Units | ng/sample |
| Instrument | MSD-5 |
| Column | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | Flags |
|---|---|---|---|
| Naphthalene | 2.86 | 23.0 | R |
| 2-Methylnaphthalene | 3.45 | 3.31 | R |
| 1-Methylnaphthalene | 3.57 | 3.35 | |
| Acenaphthylene | 4.61 | 0.600 | R |
| Acenaphthene | 4.90 | 1.11 M | R |
| Fluorene | 5.85 | 0.710 | |
| Phenanthrene | 8.06 | 3.54 | |
| Anthracene | 8.18 | 0.920 | |
| Fluoranthene | 11.48 | 1.93 | R |
| Pyrene | 12.13 | 2.21 | R |
| Benzo(a)Anthracene | NotFnd | <0.20 | U |
| Chrysene | NotFnd | <0.20 | U |
| Benzo(b)Fluoranthene | NotFnd | <0.20 | U |
| Benzo(k)Fluoranthene | NotFnd | <0.20 | U |
| Benzo(e)Pyrene | NotFnd | <0.20 | U |
| Benzo(a)Pyrene | NotFnd | <0.20 | U |
| Perylene | NotFnd | <0.20 | U |
| Indeno(1,2,3-cd)Pyrene | NotFnd | <0.20 | U |
| Dibenzo(a,h)Anthracene | NotFnd | <0.20 | U |
| Benzo(g,h,i)Perylene | NotFnd | <0.20 | U |
| **Additional Analytes** | | | |
| Tetralin | 2.73 | 13.3 | R |
| Biphenyl | 3.99 | 2.51 | |
| o-Terphenyl | 9.35 | <0.20 | U |
| Benzo(a)fluorene | 13.27 | <0.20 | U |
| Benzo(b)fluorene | 13.51 | <0.20 | U |

| Field Sampling Standards | ng spiked | % Rec |
|---|---|---|
| 1-Methylnaphthalene-D10 | 0 | NS |
| Fluorene D10 | 0 | NS |
| Terphenyl D14(Surr.) | 0 | NS |

| Extraction Standards | | Ret. Time | % Rec | | Limits |
|---|---|---|---|---|---|
| Naphthalene D8 | 200 | 2.84 | 69.2 | R | 50-150 |
| 2-Methylnaphthalene-D10 | 200 | 3.42 | 73.6 | | 50-150 |
| Acenaphthylene D8 | 200 | 4.59 | 93.0 | | 50-150 |
| Phenanthrene D10 | 200 | 8.01 | 76.9 | | 50-150 |
| Anthracene-D10 | 200 | 8.13 | 86.3 | R | 50-150 |
| Fluoranthene D10 | 200 | 11.43 | 105.4 | R | 50-150 |
| Benz(a)Anthracene-D12 | 200 | 15.99 | 101.9 | R | 50-150 |
| Chrysene D12 | 200 | 16.09 | 114.8 | R | 50-150 |
| Benzo(b)Fluoranthene-D12 | 200 | 19.32 | 91.8 | R | 50-150 |
| Benzo(k)Fluoranthene-D12 | 200 | 19.40 | 103.4 M | R | 50-150 |
| Benzo(a)Pyrene D12 | 200 | 20.20 | 89.3 | R | 50-150 |
| Perylene D12 | 200 | 20.43 | 85.6 | R | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 200 | 24.00 | 71.5 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 200 | 24.18 | 96.4 M | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 200 | 24.98 | 94.8 M | | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated |
| U | Indicates that this compound was not detected above the MDL. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion |
| NS | Indicates that this standard has not been added. |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | Method Blank | Sampling Date | n/a |
| ALS Sample ID | WG3704535-4 | Extraction Date | 12-Mar-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | REAGENT | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3704535 |

Approved:
*Peter Nguyen*
--e-signature--
30-Mar-2022

| Run Information | Run 1 |
|---|---|
| Filename | PAH220329015.D |
| Run Date | 3/29/2022 16:18 |
| Final Volume | 0.1 mL |
| Dilution Factor | 1 |
| Analysis Units | ng/sample |
| Instrument | MSD-5 |
| Column | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | Flags |
|---|---|---|---|
| Naphthalene | 2.86 | 4.21 | |
| 2-Methylnaphthalene | 3.45 | 1.58 | |
| 1-Methylnaphthalene | 3.57 | 0.760 | |
| Acenaphthylene | NotFnd | <0.20 | U |
| Acenaphthene | NotFnd | <0.20 | U |
| Fluorene | NotFnd | <0.20 | U |
| Phenanthrene | 8.07 | 1.58 | R |
| Anthracene | NotFnd | <0.20 | U |
| Fluoranthene | 11.48 | 0.970 M | R |
| Pyrene | 12.13 | 1.25 M | R |
| Benzo(a)Anthracene | NotFnd | <0.20 | U |
| Chrysene | NotFnd | <0.20 | U |
| Benzo(b)Fluoranthene | NotFnd | <0.20 | U |
| Benzo(k)Fluoranthene | NotFnd | <0.20 | U |
| Benzo(e)Pyrene | NotFnd | <0.20 | U |
| Benzo(a)Pyrene | NotFnd | <0.20 | U |
| Perylene | NotFnd | <0.20 | U |
| Indeno(1,2,3-cd)Pyrene | NotFnd | <0.20 | U |
| Dibenzo(a,h)Anthracene | NotFnd | <0.20 | U |
| Benzo(g,h,i)Perylene | NotFnd | <0.20 | U |
| **Additional Analytes** | | | |
| Tetralin | 2.74 | 0.640 M | R |
| Biphenyl | 3.99 | 1.15 M | |
| o-Terphenyl | NotFnd | <0.20 | U |
| Benzo(a)fluorene | NotFnd | <0.20 | U |
| Benzo(b)fluorene | NotFnd | <0.20 | U |

| Field Sampling Standards | ng spiked | % Rec |
|---|---|---|
| 1-Methylnaphthalene-D10 | 0 | NS |
| Fluorene D10 | 0 | NS |
| Terphenyl D14(Surr.) | 0 | NS |

| Extraction Standards | | | % Rec | | Limits |
|---|---|---|---|---|---|
| Naphthalene D8 | 200 | 2.84 | 60.7 | R | 50-150 |
| 2-Methylnaphthalene-D10 | 200 | 3.42 | 71.3 | | 50-150 |
| Acenaphthylene D8 | 200 | 4.59 | 86.1 | | 50-150 |
| Phenanthrene D10 | 200 | 8.01 | 67.1 | | 50-150 |
| Anthracene-D10 | 200 | 8.14 | 71.7 | R | 50-150 |
| Fluoranthene D10 | 200 | 11.43 | 89.9 | R | 50-150 |
| Benz(a)Anthracene-D12 | 200 | 16.00 | 67.1 | R | 50-150 |
| Chrysene D12 | 200 | 16.10 | 93.6 M | R | 50-150 |
| Benzo(b)Fluoranthene-D12 | 200 | 19.33 | 73.2 | R | 50-150 |
| Benzo(k)Fluoranthene-D12 | 200 | 19.41 | 96.9 M | R | 50-150 |
| Benzo(a)Pyrene D12 | 200 | 20.22 | 72.1 | R | 50-150 |
| Perylene D12 | 200 | 20.44 | 78.3 M | | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 200 | 24.01 | 72.4 M | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 200 | 24.23 | 90.6 M | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 200 | 24.99 | 93.4 M | | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated |
| U | Indicates that this compound was not detected above the MDL. |
| B | Indicates that this compound was detected in the method blank at greater than 10% of the sample value |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion |
| NS | Indicates that this standard has not been added. |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | COURTICE-PAH-MAR06 | Sampling Date | 06-Mar-22 00:00 |
| ALS Sample ID | L2691342-1 | Extraction Date | 12-Mar-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | Puf | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3704535 |

Approved:
*Peter Nguyen*
--e-signature--
30-Mar-2022

| Run Information | Run 1 | Run 2 |
|---|---|---|
| Filename | PAH220329019.D | PAH220329017.D |
| Run Date | 3/29/2022 18:49 | 3/29/2022 17:33 |
| Final Volume | 0.1 mL | 0.1 mL |
| Dilution Factor | 1 | 10 |
| Analysis Units | ng/sample | ng/sample |
| Instrument | MSD-5 | MSD-5 |
| Column | HP-5MS US1609664H | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | Flags | Ret. Time. | Concentration ng/sample | Flags |
|---|---|---|---|---|---|---|
| Naphthalene | | | | 2.86 | 5350 | |
| 2-Methylnaphthalene | | | | 3.45 | 2470 | |
| 1-Methylnaphthalene | | | | 3.57 | 1310 | |
| Acenaphthylene | 4.61 | 25.5 | R | | | |
| Acenaphthene | | | | 4.91 | 869 | |
| Fluorene | | | | 5.85 | 799 | |
| Phenanthrene | | | | 8.07 | 1010 | |
| Anthracene | 8.18 | 16.1 | M | | | |
| Fluoranthene | | | | 11.49 | 217 | R |
| Pyrene | 12.13 | 87.7 | R | | | |
| Benzo(a)Anthracene | 16.05 | 7.42 | R | | | |
| Chrysene | 16.15 | 34.6 | R | | | |
| Benzo(b)Fluoranthene | 19.39 | 23.8 | M | | | |
| Benzo(k)Fluoranthene | 19.42 | 22.5 | M | | | |
| Benzo(e)Pyrene | 20.12 | 16.3 | R | | | |
| Benzo(a)Pyrene | 20.26 | 14.4 | M | | | |
| Perylene | 20.49 | 1.02 | R | | | |
| Indeno(1,2,3-cd)Pyrene | 24.07 | 16.9 | R | | | |
| Dibenzo(a,h)Anthracene | 24.29 | 4.21 | R | | | |
| Benzo(g,h,i)Perylene | 25.09 | 19.6 | | | | |
| **Additional Analytes** | | | | | | |
| Tetralin | | | | 2.74 | 427 | |
| Biphenyl | | | | 3.99 | 1290 | |
| o-Terphenyl | 9.34 | 6.49 | | | | |
| Benzo(a)fluorene | 13.29 | 9.84 | | | | |
| Benzo(b)fluorene | 13.59 | 7.51 | M | | | |

| Field Sampling Standards | ng spiked | | % Rec | | |
|---|---|---|---|---|---|
| 1-Methylnaphthalene-D10 | 200 | 3.53 | 83.7 | | |
| Fluorene D10 | 200 | 5.79 | 86.4 | M | |
| Terphenyl D14(Surr.) | 200 | 12.93 | 114.1 | R | |

| Extraction Standards | | | % Rec | | Limits |
|---|---|---|---|---|---|
| Naphthalene D8 | 200 | 2.85 | 53.2 | R | 50-150 |
| 2-Methylnaphthalene-D10 | 200 | 3.42 | 64.4 | | 50-150 |
| Acenaphthylene D8 | 200 | 4.59 | 75.1 | | 50-150 |
| Phenanthrene D10 | 200 | 8.01 | 69.2 | | 50-150 |
| Anthracene-D10 | 200 | 8.14 | 75.0 | | 50-150 |
| Fluoranthene D10 | 200 | 11.42 | 93.7 | R | 50-150 |
| Benz(a)Anthracene-D12 | 200 | 15.98 | 77.7 | R | 50-150 |
| Chrysene D12 | 200 | 16.09 | 92.3 | R | 50-150 |
| Benzo(b)Fluoranthene-D12 | 200 | 19.32 | 79.0 | R | 50-150 |
| Benzo(k)Fluoranthene-D12 | 200 | 19.40 | 90.5 | R | 50-150 |
| Benzo(a)Pyrene D12 | 200 | 20.21 | 72.2 | R | 50-150 |
| Perylene D12 | 200 | 20.44 | 66.2 | R | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 200 | 23.98 | 87.1 | M | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 200 | 24.18 | 71.8 | M | 50-150 |
| Benzo(g,h,i)Perylene D12 | 200 | 24.98 | 68.9 | M | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated |
| U | Indicates that this compound was not detected above the MDL. |
| B | Indicates that this compound was detected in the method blank at greater than 10% of the sample value |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | RUNDLE-PAH-MAR06 | Sampling Date | 06-Mar-22 00:00 |
| ALS Sample ID | L2691342-2 | Extraction Date | 12-Mar-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | Puf | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3704535 |

Approved:
*Peter Nguyen*
--e-signature--
30-Mar-2022

| Run Information | Run 1 | Run 2 | Run 3 |
|---|---|---|---|
| Filename | PAH220329020.D | PAH220329018.D | PAH220329016.D |
| Run Date | 3/29/2022 19:28 | 3/29/2022 18:11 | 3/29/2022 16:55 |
| Final Volume | 0.1 mL | 0.1 mL | 0.1 mL |
| Dilution Factor | 1 | 10 | 20 |
| Analysis Units | ng/sample | ng/sample | ng/sample |
| Instrument | MSD-5 | MSD-5 | MSD-5 |
| Column | HP-5MS US1609664H | HP-5MS US1609664H | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | Flags | Ret. Time. | Concentration ng/sample | Flags | Ret. Time. | Concentration ng/sample | Flags |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | | | | | | | 2.86 | 15200 | |
| 2-Methylnaphthalene | | | | 3.45 | 3610 | | | | |
| 1-Methylnaphthalene | | | | 3.57 | 2310 | | | | |
| Acenaphthylene | | | | 4.61 | 1780 | | | | |
| Acenaphthene | | | | 4.91 | 656 | | | | |
| Fluorene | | | | 5.85 | 1630 | | | | |
| Phenanthrene | | | | 8.07 | 4120 | | | | |
| Anthracene | | | | 8.18 | 886 | M | | | |
| Fluoranthene | | | | 11.48 | 1650 | R | | | |
| Pyrene | | | | 12.13 | 1560 | R | | | |
| Benzo(a)Anthracene | | | | 16.06 | 201 | R | | | |
| Chrysene | | | | 16.17 | 509 | | | | |
| Benzo(b)Fluoranthene | | | | 19.43 | 352 | M | | | |
| Benzo(k)Fluoranthene | | | | 19.44 | 430 | M | | | |
| Benzo(e)Pyrene | | | | 20.13 | 294 | R | | | |
| Benzo(a)Pyrene | | | | 20.28 | 263 | R | | | |
| Perylene | 20.49 | 68.8 | R | | | | | | |
| Indeno(1,2,3-cd)Pyrene | | | | 24.11 | 301 | R | | | |
| Dibenzo(a,h)Anthracene | 24.26 | 29.7 | | | | | | | |
| Benzo(g,h,i)Perylene | | | | 25.12 | 351 | M R | | | |
| **Additional Analytes** | | | | | | | | | |
| Tetralin | | | | 2.74 | 535 | | | | |
| Biphenyl | | | | 3.99 | 2520 | | | | |
| o-Terphenyl | 9.34 | 9.60 | | | | | | | |
| Benzo(a)fluorene | | | | 13.30 | 179 | | | | |
| Benzo(b)fluorene | 13.51 | 192 | M | | | | | | |

| Field Sampling Standards | ng spiked | | % Rec | | |
|---|---|---|---|---|---|
| 1-Methylnaphthalene-D10 | 200 | 3.53 | 70.3 | | |
| Fluorene D10 | 200 | 5.79 | 68.0 | | |
| Terphenyl D14(Surr.) | 200 | 12.92 | 120.1 | R | |

| Extraction Standards | | | % Rec | | Limits |
|---|---|---|---|---|---|
| Naphthalene D8 | 200 | 2.84 | 51.9 | R | 50-150 |
| 2-Methylnaphthalene-D10 | 200 | 3.42 | 63.6 | | 50-150 |
| Acenaphthylene D8 | 200 | 4.59 | 61.8 | | 50-150 |
| Phenanthrene D10 | 200 | 8.01 | 67.6 | | 50-150 |
| Anthracene-D10 | 200 | 8.14 | 65.7 | R | 50-150 |
| Fluoranthene D10 | 200 | 11.42 | 97.1 | R | 50-150 |
| Benz(a)Anthracene-D12 | 200 | 15.97 | 101.6 | R | 50-150 |
| Chrysene D12 | 200 | 16.08 | 108.0 M | R | 50-150 |
| Benzo(b)Fluoranthene-D12 | 200 | 19.31 | 82.8 | R | 50-150 |
| Benzo(k)Fluoranthene-D12 | 200 | 19.39 | 108.3 M | R | 50-150 |
| Benzo(a)Pyrene D12 | 200 | 20.19 | 76.1 | R | 50-150 |
| Perylene D12 | 200 | 20.43 | 72.0 | R | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 200 | 23.97 | 65.4 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 200 | 24.14 | 76.7 M | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 200 | 24.96 | 86.8 M | | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated |
| U | Indicates that this compound was not detected above the MDL. |
| B | Indicates that this compound was detected in the method blank at greater than 10% of the sample value |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion |

# ALS Life Sciences

## Sample Analysis Report

| | | | | | |
|---|---|---|---|---|---|
| Sample Name | Laboratory Control Sample | | Sampling Date | n/a | |
| ALS Sample ID | WG3704535-2 | | Extraction Date | 12-Mar-22 | |
| Analysis Method | PAH by CARB 429 | | | | |
| Analysis Type | sample | | | | |
| Sample Matrix | QC | | | | Approved: |
| Sample Size | 1 | n/a | | | *Peter Nguyen* |
| Percent Moisture | n/a | | | | --e-signature-- |
| Split Ratio | 1 | | Workgroup | WG3704535 | 30-Mar-2022 |

| Run Information | Run 1 |
|---|---|
| Filename | PAH220329012.D |
| Run Date | 3/29/2022 14:24 |
| Final Volume | 0.1 mL |
| Dilution Factor | 1 |
| Analysis Units | % |
| Instrument | MSD-5 |
| Column | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration % | Flags |
|---|---|---|---|
| Naphthalene | 2.86 | 118 | |
| 2-Methylnaphthalene | 3.45 | 102 | |
| 1-Methylnaphthalene | 3.57 | 99.9 | |
| Acenaphthylene | 4.61 | 96.1 | |
| Acenaphthene | 4.91 | 83.6 | |
| Fluorene | 5.85 | 89.6 | |
| Phenanthrene | 8.06 | 97.1 | |
| Anthracene | 8.18 | 96.8 | |
| Fluoranthene | 11.48 | 96.8 | R |
| Pyrene | 12.12 | 100 | R |
| Benzo(a)Anthracene | 16.04 | 92.8 | R |
| Chrysene | 16.17 | 93.7 | R |
| Benzo(b)Fluoranthene | 19.38 | 110 | R |
| Benzo(k)Fluoranthene | 19.45 | 103 | R |
| Benzo(e)Pyrene | 20.12 | 92.1 | R |
| Benzo(a)Pyrene | 20.26 | 110 | |
| Perylene | 20.50 | 97.2 | R |
| Indeno(1,2,3-cd)Pyrene | 24.07 | 107 | |
| Dibenzo(a,h)Anthracene | 24.28 | 83.6 | R |
| Benzo(g,h,i)Perylene | 25.08 | 103 | |
| **Additional Analytes** | | | |
| Tetralin | 2.72 | 24.4 | |
| Biphenyl | 3.96 | 123 | |
| o-Terphenyl | 9.27 | 0.230 | R |
| Benzo(a)fluorene | NotFnd | <0.20 | U |
| Benzo(b)fluorene | NotFnd | <0.20 | U |

| Field Sampling Standards | ng spiked | % Rec |
|---|---|---|
| 1-Methylnaphthalene-D10 | 0 | NS |
| Fluorene D10 | 0 | NS |
| Terphenyl D14(Surr.) | 0 | NS |

| Extraction Standards | | | % Rec | | Limits |
|---|---|---|---|---|---|
| Naphthalene D8 | 200 | 2.84 | 60.6 | | 50-150 |
| 2-Methylnaphthalene-D10 | 200 | 3.42 | 64.4 | | 50-150 |
| Acenaphthylene D8 | 200 | 4.59 | 89.7 | | 50-150 |
| Phenanthrene D10 | 200 | 8.01 | 64.4 | | 50-150 |
| Anthracene-D10 | 200 | 8.13 | 78.8 | R | 50-150 |
| Fluoranthene D10 | 200 | 11.43 | 93.3 | R | 50-150 |
| Benz(a)Anthracene-D12 | 200 | 15.98 | 111.5 | R | 50-150 |
| Chrysene D12 | 200 | 16.09 | 117.8 | R | 50-150 |
| Benzo(b)Fluoranthene-D12 | 200 | 19.32 | 82.3 | R | 50-150 |
| Benzo(k)Fluoranthene-D12 | 200 | 19.39 | 105.0 | R | 50-150 |
| Benzo(a)Pyrene D12 | 200 | 20.20 | 89.9 | R | 50-150 |
| Perylene D12 | 200 | 20.43 | 88.6 | R | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 200 | 23.97 | 69.6 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 200 | 24.16 | 94.1 | M | 50-150 |
| Benzo(g,h,i)Perylene D12 | 200 | 24.97 | 94.8 | M | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated |
| U | Indicates that this compound was not detected above the MDL. |
| B | Indicates that this compound was detected in the method blank at greater than 10% of the sample value |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion |
| NS | Indicates that this standard has not been added. |

600 Southgate Drive
Guelph ON Canada
N1G 4P6

Tel: +1.519.823.1311
Fax: +1.519.823.1316
E-mail: solutions@rwdi.com

# MEMORANDUM

| | | |
|---|---|---|
| **DATE:** | 2022-04-25 | **RWDI Reference No.:** 2200697 |
| **TO:** | Gioseph Anello | **EMAIL:** Gioseph.Anello@Durham.ca |
| **CC:** | Andrew Evans | **EMAIL:** Andrew.Evans@Durham.ca |
| **CC:** | Lyndsay Waller | **EMAIL:** Lyndsay.Waller@Durham.ca |
| **FROM:** | Khalid Hussein | **EMAIL:** Khalid.Hussein@rwdi.com |
| **RE:** | **Exceedance Report – Benzo(a)Pyrene March 18, 2022**<br>**Region of Durham, DYEC** | |

On April 19th, 2022, the results from ALS Environmental were received regarding the PAH results from the March 18th, 2022 sampling event. On April 19th, 2022, the results were entered and assessed, and it was found that there was one (1) measured Benzo(a)Pyrene (BaP) concentration in excess of the 24-hour AAQC on the March 18th sampling date.

## March 18, 2022

On Friday, March 18th, 2022, there was one (1) exceedance of the BaP 24-hour AAQC, which occurred at the Courtice Station, measured at the onsite PUF PS-1 sampler. Attached is a figure depicting a wind rose (indicating the wind speed and direction distribution during the sampling day), and the location of the sampling stations relative to the DYEC.

The following summarizes the BaP concentrations and onsite conditions during the March 18th sampling date:

1. The guideline concentration for BaP is 0.05 ng/m$^3$. The measured concentration at the Courtice sampler was 0.068 ng/m$^3$.
2. During the sampling day the wind was predominantly from the NE to the ENE with less significant contributions from the ESE, SSW and WNW, as recorded at the Courtice Meteorological Tower. One-hour average wind speeds at Courtice Meteorological Tower ranged from 1.96 km/h to 25.25 km/h.
3. The Courtice meteorological data suggests that the Courtice Station was downwind of the DYEC during part of the sampling period. Given the wind conditions during the sampling period, it is possible that the measured BaP exceedance is attributable to the Energy Centre operations; however, other sources may have also played a role.

At the Courtice Station, the $NO_2$ hourly values were less than 17% of the criteria for the same period. The $PM_{2.5}$ 24-hour average value was 15.4 micrograms per cubic metre at the Courtice Station.

We have attached the data files for the samples in question to aid with the review.

Respectfully submitted by:

**RWDI AIR Inc.**

Khalid Hussein, P.Eng.
Project Manager

KAMH/kta

Attach.

# ATTACHMENTS

**Table B5: 2022 Courtice Station Q1 Monitoring Results for PAHs**

| Contaminant | Units | *MECP Criteria* | 18-Mar-22 | No. > Criteria |
|---|---|---|---|---|
| 1-Methylnaphthalene | ng/m$^3$ | *12000* | 1.56E+01 | 0 |
| 2-Methylnaphthalene | ng/m$^3$ | *10000* | 3.23E+01 | 0 |
| Acenaphthene | ng/m$^3$ | - | 7.94E+00 | - |
| Acenaphthylene | ng/m$^3$ | *3500* | 4.37E-01 | 0 |
| Anthracene | ng/m$^3$ | *200* | 2.07E-01 | 0 |
| Benzo(a)Anthracene | ng/m$^3$ | - | 5.47E-02 | - |
| Benzo(a)fluorene | ng/m$^3$ | - | 7.50E-02 | - |
| Benzo(a)Pyrene (Historically High) | ng/m$^3$ | *0.05* [1] *5* [2] *1.1* [3] | 6.84E-02 | 1 |
| Benzo(b)Fluoranthene | ng/m$^3$ | - | 3.73E-01 | - |
| Benzo(b)fluorene | ng/m$^3$ | - | 3.06E-02 | - |
| Benzo(e)Pyrene | ng/m$^3$ | - | 1.25E-01 | - |
| Benzo(g,h,i)Perylene | ng/m$^3$ | - | 1.24E-01 | - |
| Benzo(k)Fluoranthene | ng/m$^3$ | - | 3.48E-01 | - |
| Biphenyl | ng/m$^3$ | - | 8.58E+00 | - |
| Chrysene | ng/m$^3$ | - | 2.40E-01 | - |
| Dibenzo(a,h)Anthracene | ng/m$^3$ | - | 1.65E-02 | - |
| Fluoranthene | ng/m$^3$ | - | 1.23E+00 | - |
| Fluorene | ng/m$^3$ | - | 6.17E+00 | - |
| Indeno(1,2,3-cd)Pyrene | ng/m$^3$ | - | 1.25E-01 | - |
| Naphthalene | ng/m$^3$ | *22500* | 4.53E+01 | 0 |
| o-Terphenyl | ng/m$^3$ | - | 1.91E-02 | - |
| Perylene | ng/m$^3$ | - | 7.47E-03 | - |
| Phenanthrene | ng/m$^3$ | - | 8.73E+00 | - |
| Pyrene | ng/m$^3$ | - | 6.55E-01 | - |
| Tetralin | ng/m$^3$ | - | 6.20E+00 | - |
| Total PAH[4] | ng/m$^3$ | - | 134.93 | - |

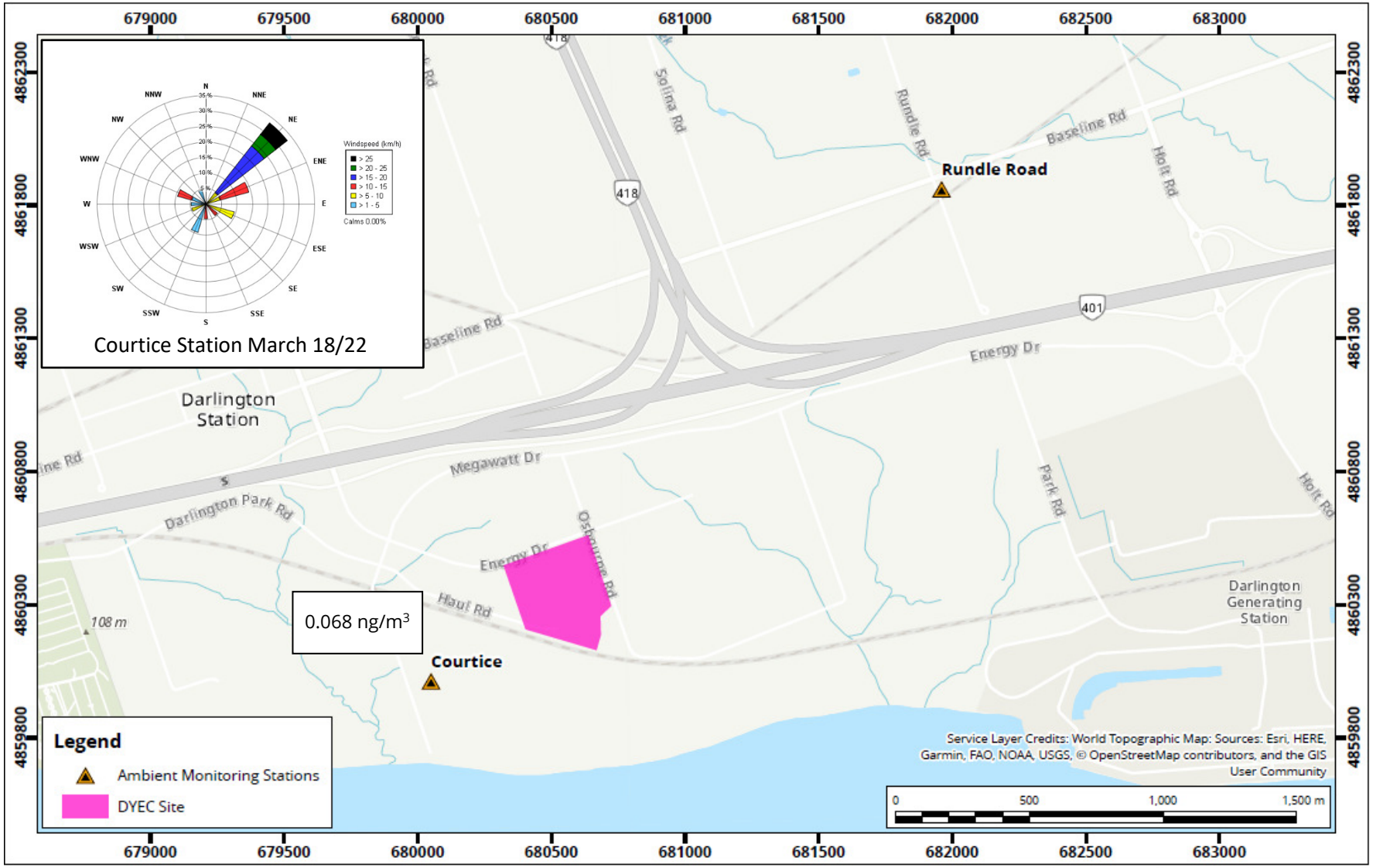
NOTE: All non-detectable results were reported as 1/2 of the detection limit

[1] AAQC

[2] O. Reg. 419/05 Schedule  Upper Risk Thresholds

[3] O. Reg. 419/05 24 Hour Guideline

[4] Total PAH sums all PAH contaminants




## DYEC Site and Ambient Monitoring Station Locations

Map Projection: NAD 1983 UTM Zone 17N

DYEC - Region of Durham, Ontario

True North

Project #: 1803743

| | |
|---|---|
| Drawn by: DAJH | Figure: 1 |
| Approx. Scale: | 1:20,000 |
| Date Revised: | April 14, 2022 |

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

# Certificate of Analysis

| | | | |
|---|---|---|---|
| **ALS Project Contact:** | Claire Kocharrakal | **Client Name:** | RWDI Air Inc. |
| **ALS Project ID:** | 23601 | **Client Address:** | 600 Southgate Dr |
| **ALS WO#:** | L2694361 | | Guelph, ON. N1G 4P6 |
| **Date of Report** | 18-Apr-22 | | Canada |
| **Date of Sample Receipt** | 24-Mar-22 | **Client Contact:** | Khalid Hussein |
| | | **Client Project ID:** | DYEC |

**COMMENTS:** **PAH by CARB method 429 (LR option)- Isotope dilution**

Most of the labeled surrogates (Extraction Standards) are below the method acceptance criteria. Since these are air samples, they cannot be re-extracted. The native results, calculated by Isotope Dilution, are recovery corrected and not expected to be biased. The accuracy of the Field Sampling standards and the native results of the Laboratory Control Sample demonstrate the absence of bias.

It appears that the MECP 24 hour criterion for benzo(a)pyrene has not been met for sample "COURTICE-DX/PAH-MAR18" (lab id L2694361-2)

Certified by:

Bradley Reimer
GC/MS Laboratory Senior Technical Specialist

# ALS Life Sciences

## Sample Analysis Summary Report

| Sample Name | Method Blank | | Reagent Blank | | RUNDLE-DX/PAH-MAR18 | | COURTICE-DX/PAH-MAR18 | | Laboratory Control Sample | |
|---|---|---|---|---|---|---|---|---|---|---|
| ALS Sample ID | WG3709606-1 | | WG3709606-4 | | L2694361-1 | | L2694361-2 | | WG3709606-2 | |
| Sample Size | 1 | | 1 | | 1 | | 1 | | 1 | |
| Sample units | sample | | sample | | sample | | sample | | n/a | |
| Moisture Content | n/a | | n/a | | n/a | | n/a | | n/a | |
| Matrix | QC | | QC | | Puf | | Puf | | QC | |
| Sampling Date | n/a | | n/a | | 18-Mar-22 | | 18-Mar-22 | | n/a | |
| Extraction Date | 25-Mar-22 | | 25-Mar-22 | | 25-Mar-22 | | 25-Mar-22 | | 25-Mar-22 | |
| Target Analytes | ng/sample | | ng/sample | | ng/sample | | ng/sample | | % | |
| Naphthalene | 46.2 | M | 4.81 | M,B | 8410 | | 14300 | | 131.3 | M,B |
| 2-Methylnaphthalene | 7.05 | | 3.88 | B | 5400 | | 10200 | | 113.2 | |
| 1-Methylnaphthalene | 4.82 | | 2.16 | B | 2840 | | 4940 | | 110.9 | |
| Acenaphthylene | 0.410 | | 0.390 | RB | 81.0 | M,B | 138 | | 102.8 | |
| Acenaphthene | 0.810 | | 0.360 | B | 1240 | | 2510 | | 103.4 | |
| Fluorene | 0.950 | | 0.380 | B | 1130 | | 1950 | | 102.2 | |
| Phenanthrene | 3.49 | | 1.24 | B | 1860 | | 2760 | | 106.7 | |
| Anthracene | 0.470 | | <0.20 | U | 46.7 | B | 65.5 | | 101.4 | |
| Fluoranthene | 1.33 | | 0.560 | RB | 334 | | 390 | | 102.3 | |
| Pyrene | 1.46 | | 0.750 | RB | 192 | B | 207 | | 107.4 | |
| Benzo(a)Anthracene | <0.20 | U | 0.230 | R | 16.0 | B | 17.3 | | 98.1 | |
| Chrysene | 0.480 | | <0.20 | U | 65.5 | B | 75.9 | | 106.7 | |
| Benzo(b)Fluoranthene | 1.02 | | <0.20 | U | 50.8 | M | 118 | | 98.1 | |
| Benzo(k)Fluoranthene | 0.460 | M,R | <0.20 | U | 37.5 | M | 110 | | 104.8 | |
| Benzo(e)Pyrene | <0.20 | U | <0.20 | U | 31.7 | M | 39.4 | | 131.9 | |
| Benzo(a)Pyrene | 1.78 | | <0.20 | U | 12.1 | M,B | 21.6 | | 72.4 | |
| Perylene | <0.20 | U | <0.20 | U | 10.0 | R | 2.36 | | 104.4 | |
| Indeno(1,2,3-cd)Pyrene | <0.20 | U | <0.20 | U | 43.9 | | 39.5 | | 79 | |
| Dibenzo(a,h)Anthracene | <0.20 | U | <0.20 | U | 2.79 | M,R | 5.20 | | 96.4 | |
| Benzo(g,h,i)Perylene | <0.20 | U | <0.20 | U | 33.2 | M | 39.2 | | 86.4 | |
| Additional Analytes | | | | | | | | | | |
| Tetralin | 36.7 | | 1.61 | B | 615 | | 1960 | | NS | |
| Biphenyl | 2.58 | | 1.27 | B | 888 | | 2710 | | NS | |
| o-Terphenyl | <0.20 | U | <0.20 | U | 4.39 | | 6.03 | | NS | |
| Benzo(a)fluorene | <0.20 | U | <0.20 | U | 33.5 | | 23.7 | | NS | |
| Benzo(b)fluorene | <0.20 | U | <0.20 | U | 16.4 | | 9.68 | | NS | |
| Field Sampling Standards | % Rec | | % Rec | | % Rec | | % Rec | | % Rec | |
| 1-Methylnaphthalene-D10 | NS | | NS | | 75.6 | R | 70.3 | | NS | |
| Fluorene D10 | NS | | NS | | 80 | | 64.5 | | NS | |
| Terphenyl D14(Surr.) | NS | | NS | | 104.9 | | 100 | | NS | |
| Extraction Standards | % Rec | | % Rec | | % Rec | | % Rec | | % Rec | |
| Naphthalene D8 | 37.2 | | 51.1 | | 6.4 | | 32.5 | | 40.1 | |
| 2-Methylnaphthalene-D10 | 38.4 | | 53.9 | | 5.9 | | 42.4 | | 43.5 | |
| Acenaphthylene D8 | 39.5 | | 52 | | 6.9 | | 51.7 | | 47.6 | |
| Phenanthrene D10 | 38.6 | | 63 | | 5.2 | | 51.6 | | 52.5 | |
| Anthracene-D10 | 35.6 | | 56.2 | | 6.1 | | 48.8 | | 47.8 | |
| Fluoranthene D10 | 37.3 | | 58.4 | | 6.9 | | 59.1 | | 48.8 | |
| Benz(a)Anthracene-D12 | 30.2 | | 37.6 | | 9.6 | | 47.6 | | 35.3 | |
| Chrysene D12 | 24.5 | | 31.8 | | 6.3 | | 40.5 | | 31.1 | |
| Benzo(b)Fluoranthene-D12 | 25.6 | | 35.1 | | 7.7 | | 58 | | 29.1 | |
| Benzo(k)Fluoranthene-D12 | 17.9 | | 22 | | 6.8 | | 47.9 | | 20.5 | |
| Benzo(a)Pyrene D12 | 24.7 | | 26.5 | | 14.3 | M | 49.2 | | 26 | |
| Perylene D12 | 13 | | 11.6 | M | 8.3 | | 36.6 | | 14.5 | |
| Indeno(1,2,3,cd)Pyrene-D12 | 15.6 | | 12.4 | | 7.3 | | 49.2 | | 12.6 | |
| Dibenz(a,h)Anthracene-D14 | 11.7 | | 9.2 | | 7.6 | M | 42.8 | | 9.2 | |
| Benzo(g,h,i)Perylene D12 | 15.5 | | 12.9 | | 8.8 | M | 46.4 | | 13.1 | |

| | |
|---|---|
| U | Indicates that this compound was not detected above the LOD. |
| M | Indicates that a peak has been manually integrated. |
| B | Indicates that this compound was detected in the method blank at greater than 10% of the sample value. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |
| NS | Indicates that the compound was not added to the sample |

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | Method Blank | Sampling Date | n/a |
| ALS Sample ID | WG3709606-1 | Extraction Date | 25-Mar-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | blank | | |
| Sample Matrix | QC | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3709606 |

Approved:
*Peter Nguyen*
--e-signature--
01-Apr-2022

| Run Information | Run 1 |
|---|---|
| Filename | PAH220331025.D |
| Run Date | 3/31/2022 22:46 |
| Final Volume | 0.1 mL |
| Dilution Factor | 1 |
| Analysis Units | ng/sample |
| Instrument | MSD-5 |
| Column | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | Flags |
|---|---|---|---|
| Naphthalene | 2.77 | 46.2 | M |
| 2-Methylnaphthalene | 3.36 | 7.05 | |
| 1-Methylnaphthalene | 3.47 | 4.82 | |
| Acenaphthylene | 4.50 | 0.410 | R |
| Acenaphthene | 4.80 | 0.810 | |
| Fluorene | 5.73 | 0.950 | |
| Phenanthrene | 7.93 | 3.49 | |
| Anthracene | 8.05 | 0.470 | R |
| Fluoranthene | 11.34 | 1.33 | R |
| Pyrene | 11.98 | 1.46 | R |
| Benzo(a)Anthracene | NotFnd | <0.20 | U |
| Chrysene | 16.00 | 0.480 | R |
| Benzo(b)Fluoranthene | 19.22 | 1.02 | R |
| Benzo(k)Fluoranthene | 19.29 | 0.460 M | R |
| Benzo(e)Pyrene | NotFnd | <0.20 | U |
| Benzo(a)Pyrene | 20.10 | 1.78 | |
| Perylene | NotFnd | <0.20 | U |
| Indeno(1,2,3-cd)Pyrene | NotFnd | <0.20 | U |
| Dibenzo(a,h)Anthracene | NotFnd | <0.20 | U |
| Benzo(g,h,i)Perylene | NotFnd | <0.20 | U |
| **Additional Analytes** | | | |
| Tetralin | 2.65 | 36.7 | |
| Biphenyl | 3.90 | 2.58 | |
| o-Terphenyl | 9.20 | <0.20 | U |
| Benzo(a)fluorene | NotFnd | <0.20 | U |
| Benzo(b)fluorene | NotFnd | <0.20 | U |

| Field Sampling Standards | ng spiked | % Rec |
|---|---|---|
| 1-Methylnaphthalene-D10 | | NS |
| Fluorene D10 | | NS |
| Terphenyl D14(Surr.) | | NS |

| Extraction Standards | | | % Rec | | Limits |
|---|---|---|---|---|---|
| Naphthalene D8 | 100 | 2.76 | 37.2 | R | 50-150 |
| 2-Methylnaphthalene-D10 | 100 | 3.33 | 38.4 | | 50-150 |
| Acenaphthylene D8 | 100 | 4.49 | 39.5 | | 50-150 |
| Phenanthrene D10 | 100 | 7.88 | 38.6 | | 50-150 |
| Anthracene-D10 | 100 | 8.00 | 35.6 | R | 50-150 |
| Fluoranthene D10 | 100 | 11.28 | 37.3 | R | 50-150 |
| Benz(a)Anthracene-D12 | 100 | 15.81 | 30.2 | R | 50-150 |
| Chrysene D12 | 100 | 15.92 | 24.5 | R | 50-150 |
| Benzo(b)Fluoranthene-D12 | 100 | 19.15 | 25.6 | R | 50-150 |
| Benzo(k)Fluoranthene-D12 | 100 | 19.23 | 17.9 | R | 50-150 |
| Benzo(a)Pyrene D12 | 100 | 20.02 | 24.7 | R | 50-150 |
| Perylene D12 | 100 | 20.26 | 13.0 | R | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.71 | 15.6 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 100 | 23.87 | 11.7 | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 100 | 24.68 | 15.5 | | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated. |
| U | Indicates that this compound was not detected above the MDL. |
| NS | Indicates that the compound was not added to the sample |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | Reagent Blank | Sampling Date | n/a |
| ALS Sample ID | WG3709606-4 | Extraction Date | 25-Mar-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | blank | | |
| Sample Matrix | QC | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3709606 |

Approved:
*Peter Nguyen*
--e-signature--
01-Apr-2022

| Run Information | Run 1 |
|---|---|
| Filename | PAH220331026.D |
| Run Date | 3/31/2022 23:24 |
| Final Volume | 0.1 mL |
| Dilution Factor | 1 |
| Analysis Units | ng/sample |
| Instrument | MSD-5 |
| Column | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | | Flags | |
|---|---|---|---|---|---|
| Naphthalene | 2.77 | 4.81 | M | | B |
| 2-Methylnaphthalene | 3.36 | 3.88 | | | B |
| 1-Methylnaphthalene | 3.47 | 2.16 | | | B |
| Acenaphthylene | 4.51 | 0.390 | | R | B |
| Acenaphthene | 4.80 | 0.360 | | | B |
| Fluorene | 5.73 | 0.380 | | | B |
| Phenanthrene | 7.93 | 1.24 | | | B |
| Anthracene | NotFnd | <0.20 | U | | |
| Fluoranthene | 11.33 | 0.560 | | R | B |
| Pyrene | 11.97 | 0.750 | | R | B |
| Benzo(a)Anthracene | 15.91 | 0.230 | | R | |
| Chrysene | 16.00 | <0.20 | U | | |
| Benzo(b)Fluoranthene | NotFnd | <0.20 | U | | |
| Benzo(k)Fluoranthene | NotFnd | <0.20 | U | | |
| Benzo(e)Pyrene | NotFnd | <0.20 | U | | |
| Benzo(a)Pyrene | NotFnd | <0.20 | U | | |
| Perylene | NotFnd | <0.20 | U | | |
| Indeno(1,2,3-cd)Pyrene | NotFnd | <0.20 | U | | |
| Dibenzo(a,h)Anthracene | NotFnd | <0.20 | U | | |
| Benzo(g,h,i)Perylene | NotFnd | <0.20 | U | | |
| **Additional Analytes** | | | | | |
| Tetralin | 2.65 | 1.61 | | | B |
| Biphenyl | 3.90 | 1.27 | | | B |
| o-Terphenyl | 9.22 | <0.20 | U | | |
| Benzo(a)fluorene | 13.14 | <0.20 | U | | |
| Benzo(b)fluorene | 13.35 | <0.20 | U | | |

| Field Sampling Standards | ng spiked | % Rec |
|---|---|---|
| 1-Methylnaphthalene-D10 | | NS |
| Fluorene D10 | | NS |
| Terphenyl D14(Surr.) | | NS |

| Extraction Standards | | | % Rec | | Limits |
|---|---|---|---|---|---|
| Naphthalene D8 | 100 | 2.76 | 51.1 | R | 50-150 |
| 2-Methylnaphthalene-D10 | 100 | 3.33 | 53.9 | | 50-150 |
| Acenaphthylene D8 | 100 | 4.49 | 52.0 | | 50-150 |
| Phenanthrene D10 | 100 | 7.88 | 63.0 | | 50-150 |
| Anthracene-D10 | 100 | 8.00 | 56.2 | R | 50-150 |
| Fluoranthene D10 | 100 | 11.28 | 58.4 | R | 50-150 |
| Benz(a)Anthracene-D12 | 100 | 15.81 | 37.6 | R | 50-150 |
| Chrysene D12 | 100 | 15.92 | 31.8 | R | 50-150 |
| Benzo(b)Fluoranthene-D12 | 100 | 19.15 | 35.1 | R | 50-150 |
| Benzo(k)Fluoranthene-D12 | 100 | 19.23 | 22.0 | R | 50-150 |
| Benzo(a)Pyrene D12 | 100 | 20.02 | 26.5 | R | 50-150 |
| Perylene D12 | 100 | 20.26 | 11.6 M | | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.71 | 12.4 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 100 | 23.87 | 9.2 | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 100 | 24.68 | 12.9 | | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated. |
| U | Indicates that this compound was not detected above the MDL. |
| B | Indicates that this compound was detected in the method blank at greater than 10% of the sample value. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |
| NS | Indicates that the compound was not added to the sample |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | RUNDLE-DX/PAH-MAR18 | Sampling Date | 18-Mar-22 00:00 |
| ALS Sample ID | L2694361-1 | Extraction Date | 25-Mar-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | Puf | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3709606 |

Approved:
*Peter Nguyen*
--e-signature--
14-Apr-2022

| Run Information | Run 1 | Run 2 |
|---|---|---|
| Filename | PAH220412035.D | PAH220412032.D |
| Run Date | 4/13/2022 9:46 | 4/13/2022 7:51 |
| Final Volume | 0.1 mL | 0.1 mL |
| Dilution Factor | 1 | 10 |
| Analysis Units | ng/sample | ng/sample |
| Instrument | MSD-5 | MSD-5 |
| Column | HP-5MS US1609664H | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | | Flags | Ret. Time. | Concentration ng/sample | Flags |
|---|---|---|---|---|---|---|---|
| Naphthalene | | | | | 2.85 | 8410 | |
| 2-Methylnaphthalene | | | | | 3.44 | 5400 | |
| 1-Methylnaphthalene | | | | | 3.56 | 2840 | |
| Acenaphthylene | 4.60 | 81.0 | M | B | | | |
| Acenaphthene | | | | | 4.90 | 1240 | |
| Fluorene | | | | | 5.84 | 1130 | |
| Phenanthrene | | | | | 8.06 | 1860 | |
| Anthracene | 8.18 | 46.7 | | B | | | |
| Fluoranthene | | | | | 11.49 | 334 | |
| Pyrene | 12.13 | 192 | | B | | | |
| Benzo(a)Anthracene | 16.04 | 16.0 | | B | | | |
| Chrysene | 16.16 | 65.5 | | B | | | |
| Benzo(b)Fluoranthene | 19.39 | 50.8 | M | | | | |
| Benzo(k)Fluoranthene | 19.41 | 37.5 | M | | | | |
| Benzo(e)Pyrene | 20.12 | 31.7 | M | | | | |
| Benzo(a)Pyrene | 20.26 | 12.1 | M | B | | | |
| Perylene | 20.53 | 10.0 | | R | | | |
| Indeno(1,2,3-cd)Pyrene | 24.07 | 43.9 | | | | | |
| Dibenzo(a,h)Anthracene | 24.28 | 2.79 | M | R | | | |
| Benzo(g,h,i)Perylene | 25.09 | 33.2 | M | | | | |
| **Additional Analytes** | | | | | | | |
| Tetralin | | | | | 2.73 | 615 | |
| Biphenyl | | | | | 3.98 | 888 | |
| o-Terphenyl | 9.35 | 4.39 | | | | | |
| Benzo(a)fluorene | 13.30 | 33.5 | | | | | |
| Benzo(b)fluorene | 13.52 | 16.4 | | | | | |

| Field Sampling Standards | ng spiked | | % Rec | | Limits |
|---|---|---|---|---|---|
| 1-Methylnaphthalene-D10 | 300 | 3.52 | 75.6 | R | |
| Fluorene D10 | 300 | 5.79 | 80 | | |
| Terphenyl D14(Surr.) | 300 | 12.93 | 104.9 | | |
| **Extraction Standards** | | | **% Rec** | | **Limits** |
| Naphthalene D8 | 100 | 2.83 | 6.4 | | 50-150 |
| 2-Methylnaphthalene-D10 | 100 | 3.41 | 5.9 | | 50-150 |
| Acenaphthylene D8 | 100 | 4.58 | 6.9 | | 50-150 |
| Phenanthrene D10 | 100 | 8.01 | 5.2 | | 50-150 |
| Anthracene-D10 | 100 | 8.14 | 6.1 | | 50-150 |
| Fluoranthene D10 | 100 | 11.43 | 6.9 | | 50-150 |
| Benz(a)Anthracene-D12 | 100 | 15.98 | 9.6 | | 50-150 |
| Chrysene D12 | 100 | 16.09 | 6.3 | | 50-150 |
| Benzo(b)Fluoranthene-D12 | 100 | 19.32 | 7.7 | | 50-150 |
| Benzo(k)Fluoranthene-D12 | 100 | 19.40 | 6.8 | | 50-150 |
| Benzo(a)Pyrene D12 | 100 | 20.20 | 14.3 | M | 50-150 |
| Perylene D12 | 100 | 20.43 | 8.3 | | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.99 | 7.3 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 100 | 24.15 | 7.6 | M | 50-150 |
| Benzo(g,h,i)Perylene D12 | 100 | 24.99 | 8.8 | M | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated. |
| U | Indicates that this compound was not detected above the MDL. |
| B | Indicates that this compound was detected in the method blank at greater than 10% of the sample value. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | COURTICE-DX/PAH-MAR18 | Sampling Date | 18-Mar-22 00:00 |
| ALS Sample ID | L2694361-2 | Extraction Date | 25-Mar-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | Puf | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3709606 |

Approved:
*Peter Nguyen*
--e-signature--
01-Apr-2022

| Run Information | Run 1 | Run 2 |
|---|---|---|
| Filename | PAH220331030.D | PAH220331028.D |
| Run Date | 4/1/2022 1:57 | 4/1/2022 0:41 |
| Final Volume | 0.1 mL | 0.1 mL |
| Dilution Factor | 1 | 10 |
| Analysis Units | ng/sample | ng/sample |
| Instrument | MSD-5 | MSD-5 |
| Column | HP-5MS US1609664H | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | Flags | Ret. Time. | Concentration ng/sample | Flags |
|---|---|---|---|---|---|---|
| Naphthalene | | | | 2.78 | 14300 | |
| 2-Methylnaphthalene | | | | 3.37 | 10200 | |
| 1-Methylnaphthalene | | | | 3.48 | 4940 | |
| Acenaphthylene | 4.51 | 138 | R | | | |
| Acenaphthene | | | | 4.80 | 2510 | |
| Fluorene | | | | 5.73 | 1950 | |
| Phenanthrene | | | | 7.93 | 2760 | |
| Anthracene | 8.05 | 65.5 | | | | |
| Fluoranthene | | | | 11.34 | 390 | R |
| Pyrene | | | | 11.98 | 207 | R |
| Benzo(a)Anthracene | 15.88 | 17.3 | R | | | |
| Chrysene | 15.99 | 75.9 | R | | | |
| Benzo(b)Fluoranthene | 19.22 | 118 | R | | | |
| Benzo(k)Fluoranthene | 19.22 | 110 | R | | | |
| Benzo(e)Pyrene | 19.96 | 39.4 | R | | | |
| Benzo(a)Pyrene | 20.09 | 21.6 | | | | |
| Perylene | 20.32 | 2.36 | R | | | |
| Indeno(1,2,3-cd)Pyrene | 23.79 | 39.5 | R | | | |
| Dibenzo(a,h)Anthracene | 24.00 | 5.20 | | | | |
| Benzo(g,h,i)Perylene | 24.78 | 39.2 | R | | | |
| **Additional Analytes** | | | | | | |
| Tetralin | | | | 2.66 | 1960 | |
| Biphenyl | | | | 3.90 | 2710 | |
| o-Terphenyl | 9.21 | 6.03 | | | | |
| Benzo(a)fluorene | 13.14 | 23.7 | | | | |
| Benzo(b)fluorene | 13.37 | 9.68 | | | | |

| Field Sampling Standards | ng spiked | | % Rec | | |
|---|---|---|---|---|---|
| 1-Methylnaphthalene-D10 | 300 | 3.44 | 70.3 | | |
| Fluorene D10 | 300 | 5.67 | 64.5 | | |
| Terphenyl D14(Surr.) | 300 | 12.78 | 100 | R | |

| Extraction Standards | | | % Rec | | Limits |
|---|---|---|---|---|---|
| Naphthalene D8 | 100 | 2.76 | 32.5 | R | 50-150 |
| 2-Methylnaphthalene-D10 | 100 | 3.32 | 42.4 | | 50-150 |
| Acenaphthylene D8 | 100 | 4.49 | 51.7 | | 50-150 |
| Phenanthrene D10 | 100 | 7.88 | 51.6 | | 50-150 |
| Anthracene-D10 | 100 | 8.00 | 48.8 | R | 50-150 |
| Fluoranthene D10 | 100 | 11.28 | 59.1 | R | 50-150 |
| Benz(a)Anthracene-D12 | 100 | 15.81 | 47.6 | R | 50-150 |
| Chrysene D12 | 100 | 15.92 | 40.5 | R | 50-150 |
| Benzo(b)Fluoranthene-D12 | 100 | 19.15 | 58.0 | R | 50-150 |
| Benzo(k)Fluoranthene-D12 | 100 | 19.23 | 47.9 | R | 50-150 |
| Benzo(a)Pyrene D12 | 100 | 20.02 | 49.2 | R | 50-150 |
| Perylene D12 | 100 | 20.26 | 36.6 | R | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.71 | 49.2 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 100 | 23.86 | 42.8 | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 100 | 24.67 | 46.4 | | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated. |
| U | Indicates that this compound was not detected above the MDL. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |

# ALS Life Sciences

## Laboratory Control Sample Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | Laboratory Control Sample | Sampling Date | n/a |
| ALS Sample ID | WG3709606-2 | Extraction Date | 25-Mar-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | LCS | | |
| Sample Matrix | QC | | |
| Sample Size | 1 n/a | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3709606 |

Approved:
*Peter Nguyen*
--e-signature--
01-Apr-2022

| Run Information | Run 1 |
|---|---|
| Filename | PAH220331023.D |
| Run Date | 3/31/2022 21:30 |
| Final Volume | 0.1 mL |
| Dilution Factor | 1 |
| Analysis Units | % |
| Instrument | MSD-5 |
| Column | HP-5MS US1609664H |

| Target Analytes | ug spiked | Ret. Time | % | Flags | Limits |
|---|---|---|---|---|---|
| Naphthalene | 100 | 2.77 | 131.3 | M B | 50-150 |
| 2-Methylnaphthalene | 100 | 3.36 | 113.2 | | 50-150 |
| 1-Methylnaphthalene | 100 | 3.47 | 110.9 | | 50-150 |
| Acenaphthylene | 100 | 4.51 | 102.8 | | 50-150 |
| Acenaphthene | 100 | 4.80 | 103.4 | | 50-150 |
| Fluorene | 100 | 5.73 | 102.2 | | 50-150 |
| Phenanthrene | 100 | 7.93 | 106.7 | | 50-150 |
| Anthracene | 100 | 8.05 | 101.4 | | 50-150 |
| Fluoranthene | 100 | 11.34 | 102.3 | R | 50-150 |
| Pyrene | 100 | 11.98 | 107.4 | R | 50-150 |
| Benzo(a)Anthracene | 100 | 15.87 | 98.1 | | 50-150 |
| Chrysene | 100 | 16.00 | 106.7 | R | 50-150 |
| Benzo(b)Fluoranthene | 100 | 19.21 | 98.1 | R | 50-150 |
| Benzo(k)Fluoranthene | 100 | 19.28 | 104.8 | R | 50-150 |
| Benzo(e)Pyrene | 100 | 19.96 | 131.9 | R | 50-150 |
| Benzo(a)Pyrene | 100 | 20.09 | 72.4 | R | 50-150 |
| Perylene | 100 | 20.32 | 104.4 | R | 50-150 |
| Indeno(1,2,3-cd)Pyrene | 100 | 23.79 | 79 | R | 50-150 |
| Dibenzo(a,h)Anthracene | 100 | 23.99 | 96.4 | R | 50-150 |
| Benzo(g,h,i)Perylene | 100 | 24.78 | 86.4 | | 50-150 |

| Field Sampling Standards | ng spiked | | % Rec | | |
|---|---|---|---|---|---|
| 1-Methylnaphthalene-D10 | | | NS | | |
| Fluorene D10 | | | NS | | |
| Terphenyl D14(Surr.) | | | NS | | |
| **Extraction Standards** | | | **% Rec** | | **Limits** |
| Naphthalene D8 | 100 | 2.76 | 40.1 | R | 30-150 |
| 2-Methylnaphthalene-D10 | 100 | 3.33 | 43.5 | | 30-150 |
| Acenaphthylene D8 | 100 | 4.48 | 47.6 | | 30-150 |
| Phenanthrene D10 | 100 | 7.88 | 52.5 | | 50-150 |
| Anthracene-D10 | 100 | 8.00 | 47.8 | R | 50-150 |
| Fluoranthene D10 | 100 | 11.28 | 48.8 | R | 50-150 |
| Benz(a)Anthracene-D12 | 100 | 15.81 | 35.3 | R | 50-150 |
| Chrysene D12 | 100 | 15.92 | 31.1 | R | 50-150 |
| Benzo(b)Fluoranthene-D12 | 100 | 19.14 | 29.1 | R | 50-150 |
| Benzo(k)Fluoranthene-D12 | 100 | 19.23 | 20.5 | R | 50-150 |
| Benzo(a)Pyrene D12 | 100 | 20.02 | 26.0 | | 30-150 |
| Perylene D12 | 100 | 20.26 | 14.5 | R | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.70 | 12.6 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 100 | 23.87 | 9.2 | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 100 | 24.68 | 13.1 | | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated. |
| B | Indicates that this compound was detected in the method blank at greater than 10% of the sample value. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |
| NS | Indicates that the compound was not added to the sample |

# Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2694361-COFC

COC Number: 17 -

Page 1 of 1

| Report To | Contact and company name below will appear on the final report |
|---|---|
| Company: | RWDI |
| Contact: | Matt Lantz |
| Phone: | 519 823 1311 |
| | Company address below will appear on the final report |
| Street: | 600 Southgate Drive |
| City/Province: | Guelph, Ontario |
| Postal Code: | N1G 4P6 |
| Invoice To | Same as Report To ☐ YES ☐ NO |
| | Copy of Invoice with Report ☐ YES ☐ NO |
| Company: | |
| Contact: | |

| Report Format / Distribution | |
|---|---|
| Select Report Format: | ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL) |
| Quality Control (QC) Report with Report | ☐ YES ☐ NO |
| ☐ Compare Results to Criteria on Report - provide details below if box checked | |
| Select Distribution: | ☑ EMAIL ☐ MAIL ☐ FAX |
| Email 1 or Fax | Matt.Lantz@rwdi.com |
| Email 2 | |
| Email 3 | |

| Invoice Distribution | |
|---|---|
| Select Invoice Distribution: | ☑ EMAIL ☐ MAIL ☐ FAX |
| Email 1 or Fax | |
| Email 2 | |

| Project Information | |
|---|---|
| ALS Account # / Quote #: | |
| Job #: | DYEC |
| PO / AFE: | 1803743 Phase 1000 |
| LSD: | |

| Oil and Gas Required Fields (client use) | |
|---|---|
| AFE/Cost Center: | PO# |
| Major/Minor Code: | Routing Code: |
| Requisitioner: | |
| Location: | |

ALS Lab Work Order # (lab use only):

ALS Contact:

Sampler: Martin Town

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Standard TAT is 15 business days. DTOX analysis standard TAT is 5 business days

PRIORITY (Business Days): ☐ 15 day [R- Regular] ☐ 10 day [P-50%] ☐ 5 day [E-100%]

EMERGENCY: 5 Business day - DTOX [R - Regular] 3 Business day - DTOX [E - 100%]

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

NUMBER OF CONTAINERS

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

| ALS Sample # (lab use only) | Sample Identification and/or Coordinates (This description will appear on the report) | Sample Air Volume (m3) | Date (dd-mmm-yy) | Sample Period | Sample Type | TSP, ICP on Hi-Vol Filter | PAH | DX | SAMPLES ON HOLD |
|---|---|---|---|---|---|---|---|---|---|
| 1 | L2690604-2 - Kindle | 319 | 18-Mar-22 | 24hr | Air | | X | X | |
| 1 | 742355 | 1579 | 18-Mar-22 | 24hr | Air | X | | | |
| 2 | 742353 | 1666 | 12-Mar-22 | 24hr | Air | X | | | |
| 2 | L2690604-3 - Courtice | 316 | 13-Mar-22 | 24hr | Air | | X | X | |
| 3 | 742350 | 1591 | 13-Mar-22 | 24hr | Air | X | | | |
| 4 | 742354 | 1697 | 12-Mar-22 | 24hr | Air | X | | | |
| | | | | 24hr | Air | | | | |
| | | | | 24hr | Air | | | | |
| | | | | 24hr | Air | | | | |
| | | | | 24hr | Air | | | | |
| | | | | 24hr | Air | | | | |
| | | | | 24hr | Air | | | | |

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

Samples are 10 day TAT

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ ☑

Ice Packs ☑ Ice Cubes ☐ Custody seal intact Yes ☑ ☐

Cooling Initiated ☑

| INITIAL COOLER TEMPERATURES °C | | FINAL COOLER TEMPERATURES °C | | | |
|---|---|---|---|---|---|
| 3.1°C | 14.3°C | | | | |

| SHIPMENT RELEASE (client use) | | | INITIAL SHIPMENT RECEPTION (lab use only) | | | FINAL SHIPMENT RECEPTION (lab use only) | | |
|---|---|---|---|---|---|---|---|---|
| Released by: M. Town | Date: 23-Mar-22 | Time: 11:30 | Received by: AARON BOLTON | Date: 24-March-2022 | Time: 10:00 | Received by: | Date: | Time: |

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 20

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Station: RofD Courtice Daily: 18/03/2022 Type: AVG 1 Hr. ! " in#.$

| Date %Ti&e | ' " 2.! | ( ) | ( ) 2 | ( ) * | S) 2 | A& +ient T | Tr, Te& p | RH AVG | ' re##ure | Rain total | - S . & // r | - D | Hi0Vol ' re##ure | ' 1 2 ' re##ure | ' re##ure | A& +ient T | Hi3ol 2lo4 | ' 1 2 2lo4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | u5/& 3 | pp+ | pp+ | pp+ | pp+ | C6 | C6 | 7 | in HG | & & | . & // r | De5 | in H20 | in H20 | .' a | 8 | cf& | cf& |
| 18/03/2022 00:00 | 28.2 | 91.! | 2! .: | ; : .2 | ; .8: < | ! .09; | 1< | 8; | 2<.; | 0 | 2.2 | 2<0 | 3.2: | 9: .11 | 100.29 | 2: 8.1<; | 38.! ; | 8.19 |
| 18/03/2022 01:00 | 31.! | 92.: | 2! .3 | ; 8 | 3.33; | ! .13! | 1<.9 | 8; .; | 2<.; | 0 | 3.82 | 2: 1 | 3.28 | 9: .91 | 100.2! | 2: 8.28! | 38.; | 8.1; |
| 18/03/2022 02:00 | 2: .: | 18.3 | 2; .1 | 99.9 | 2.90; | 9.8<: | 1<.! | 8; .3 | 2<.; 1 | 0 | 9.; 1 | 333 | 3.3 | 9: .! | 100.2: | 2: 8.09: | 38.: 2 | 8.1: |
| 18/03/2022 03:00 | 2; .1 | 13.2 | 2<.9 | 92.; | 1: .02: | ! .<: 2 | 1< | 81.< | 2<.; 1 | 0 | 1.<; | Cal& | 3.2; | 9: .13 | 100.28 | 2: <.122 | 38.99 | 8.13 |
| 18/03/2022 09:00 | 2; | 18.9 | 30.< | 9<.3 | 3.29< | ! .138 | 1<.! | <1.3 | 2<.; 2 | 0 | 2.09 | Cal& | 3.2; | 9; .; 9 | 100.3 | 2: 8.288 | 38.! 2 | 8.1 |
| 18/03/2022 0! :00 | 2: .3 | ! 0.: | 33.2 | 83.< | 19.; 3 | 9.91< | 1<.! | <; .2 | 2<.; 3 | 0 | 2.32 | 1<9 | 3.28 | 9; .! 3 | 100.33 | 2: : .! ; < | 38.; 8 | 8.11 |
| 18/03/2022 0; :00 | 29.: | 1; .2 | 2<.< | 9; | 9.133 | ! .23! | 18.< | <3.9 | 2<.; 3 | 0 | 2.<! | 20: | 3.2: | 9; .0< | 100.3! | 2: 8.38! | 38.! ! | 8.0; |
| 18/03/2022 0: :00 | 2! .; | 3: .9 | 33.< | : 1.3 | 3.012 | ; .02! | 1<.1 | 8! .; | 2<.; : | 0.08 | 2.3< | Cal& | 3.2! | 9! .82 | 100.98 | 2: <.1: ! | 38.93 | 8.03 |
| 18/03/2022 08:00 | 2! .9 | 1; .8 | 32.2 | 9< | 2.332 | ; .: 8< | 1<.: | <1.9 | 2<.; < | 0.03 | ! .1! | 292 | 3.2: | 9; .9: | 100.! 3 | 2: <.<3< | 38.98 | 8.08 |
| 18/03/2022 0<:00 | 13.< | 1.8 | < | 10.8 | 3.103 | 8.212 | 20.1 | ; ; | 2<.: 1 | 0 | 12.0! | 288 | 3.28 | 9! .8< | 100.; 1 | 281.3; 2 | 38.9; | 8.02 |
| 18/03/2022 10:00 | 10.3 | 0.: | 3.1 | 3.8 | ; .03! | 10.; ! 9 | 22.9 | ! 9.3 | 2<.: | 0 | 13.! 8 | 1: < | 3.29 | 99.8: | 100.! < | 283.809 | 38.03 | : .< |
| 18/03/2022 11:00 | 9.3 | 0.9 | 2.3 | 2.; | 3.223 | 12.2: 2 | 29.8 | 98 | 2<.; < | 0 | <.3 | 92 | 3.21 | 99.! 8 | 100.! 9 | 28! .922 | 3: .; < | : .8; |
| 18/03/2022 12:00 | : .9 | 0.9 | 3 | 3.9 | 1.0< | 8.91: | 29.: | ; 2.< | 2<.: | 0 | 11.21 | 131 | 3.29 | 9! .98 | 100.! ; | 281.! ; : | 38.1! | : .<8 |
| 18/03/2022 13:00 | ; .9 | 0.; | 9.2 | 9.8 | 0.892 | 8.30! | 29.8 | ; 2.: | 2<.; 8 | 0 | : .18 | 112 | 3.28 | 9! .81 | 100.! 2 | 281.9! ! | 38.93 | 8.01 |
| 18/03/2022 19:00 | ! .9 | 0.3 | 3.< | 9.1 | 1.0! | 10.83; | 29.! | ! ! | 2<.; : | 0 | : .2; | 108 | 3.2; | 9! .13 | 100.98 | 283.<8; | 38.0< | : .<2 |
| 18/03/2022 1! :00 | ; .8 | 1.2 | 10.2 | 11.9 | 0.<; 3 | 10.; 08 | 29.2 | ! ! .3 | 2<.; ; | 0 | 8.21 | : 2 | 3.2; | 9! .2 | 100.99 | 283.: ! 8 | 38.12 | : .<3 |
| 18/03/2022 1; :00 | ! .1 | 1.9 | <.8 | 11.1 | 0.<9! | 11.222 | 29.1 | ! 2.8 | 2<.; ! | 0 | 10.28 | ; 0 | 3.2; | 9; .! 1 | 100.3< | 289.3: 2 | 38.0! | 8.02 |
| 18/03/2022 1: :00 | ! .; | 0.9 | ! .3 | ! .; | 0.83< | 10.2: | 23.: | ! ; .8 | 2<.; 3 | 0 | 1: .8 | 9< | 3.2: | 9; .88 | 100.3! | 283.92 | 38.1< | 8.0; |
| 18/03/2022 18:00 | ; .8 | 1.2 | ! | ; .2 | 0.: 38 | <.328 | 22.8 | ! <.< | 2<.; 2 | 0 | 1; .1! | ! 0 | 3.28 | 9; .; 1 | 100.3 | 282.9: 8 | 38.32 | 8.0! |
| 18/03/2022 1<:00 | <.1 | 0.2 | 9.! | 9.9 | 0.; 8< | 8.; ! 8 | 21.< | ; 2.: | 2<.; 1 | 0 | 19.9< | ! : | 3.3 | 9; .83 | 100.28 | 281.808 | 38.9: | 8.0: |
| 18/03/2022 20:00 | <.! | 0.1 | 2.! | 2.; | 0.: 23 | 8.! 9! | 21.3 | ; 0.< | 2<.; 1 | 0 | 18.91 | ! 2 | 3.31 | 9: .01 | 100.2: | 281.; <! | 38.! 1 | 8.0< |
| 18/03/2022 21:00 | 11.2 | 1.8 | 3.; | ! .3 | 0.832 | 8.28; | 20.< | ; 1.1 | 2<.! < | 0 | 1<.02 | 98 | 3.31 | 9: .; ; | 100.1< | 281.93; | 38.! ! | 8.19 |
| 18/03/2022 22:00 | 12.< | 0 | 2.; | 2.! | 0.8: 8 | 8.0<2 | 20.; | ; 1.3 | 2<.! ! | 0 | 22.3< | 9: | 3.32 | 9: .21 | 100.0; | 281.292 | 38.; 1 | 8.1 |
| 18/03/2022 23:00 | 12.: | 0.3 | 2.2 | 2.9 | 0.<! 1 | 8.191 | 20.2 | ; 0 | 2<.! | 0 | 2! .2! | 9; | 3.33 | 9: .99 | <<.8< | 281.2<1 | 38.; 3 | 8.11 |
| " ini& u& | 9.3 | 0 | 2.2 | 2.9 | 0.; 8< | 9.91< | 18.< | 98 | 2<.! | 0 | 1.<; | 92 | 3.21 | 99.! 8 | <<.8< | 2: : .! ; < | 3: .; < | : .8; |
| " inDate | 11:00 | 22:00 | 23:00 | 23:00 | 1<:00 | 0! :00 | 0; :00 | 11:00 | 23:00 | 00:00 | 03:00 | 11:00 | 11:00 | 11:00 | 23:00 | 0! :00 | 11:00 | 11:00 |
| " a=i& u& | 31.! | ! 0.: | 33.< | 83.< | 1: .02: | 12.2: 2 | 29.8 | <; .2 | 2<.: 1 | 0.08 | 2! .2! | 333 | 3.33 | 9: .; ; | 100.; 1 | 28! .922 | 38.: 2 | 8.1: |
| " a=Date | 01:00 | 0! :00 | 0: :00 | 0! :00 | 03:00 | 11:00 | 11:00 | 0! :00 | 0<:00 | 0: :00 | 23:00 | 02:00 | 23:00 | 21:00 | 0<:00 | 11:00 | 02:00 | 02:00 |
| A35 | 1! .9 | 11.1 | 19.1 | 2! .1 | 3.32< | : .<38 | 21.9 | ; <.< | 2<.; 3 | 0 | 10 | 13: | 3.2: | 9; .91 | 100.3! | 281.088 | 38.3< | 8.0! |
| ( u& | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 21 | 29 | 29 | 29 | 29 | 29 | 29 |
| Data 7 $ | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 8: .! | 100 | 100 | 100 | 100 | 100 | 100 |
| STD | <.3 | 1! .8 | 12.9 | 2: | 9.1 | 2.3 | 2.2 | 1! .3 | 0 | 0 | ; .< | <: | 0 | 0.< | 0.2 | 2.3 | 0.2 | 0.1 |

600 Southgate Drive
Guelph ON Canada
N1G 4P6

Tel: +1.519.823.1311
Fax: +1.519.823.1316
E-mail: solutions@rwdi.com

# MEMORANDUM

| | | |
|---|---|---|
| **DATE:** | 2022-04-25 | **RWDI Reference No.:** 2200697 |
| **TO:** | Gioseph Anello | **EMAIL:** Gioseph.Anello@Durham.ca |
| **CC:** | Andrew Evans | **EMAIL:** Andrew.Evans@Durham.ca |
| **CC:** | Lyndsay Waller | **EMAIL:** Lyndsay.Waller@Durham.ca |
| **FROM:** | Khalid Hussein | **EMAIL:** Khalid.Hussein@rwdi.com |
| **RE:** | **Exceedance Report – Benzo(a)Pyrene March 30, 2022**<br>**Region of Durham, DYEC** | |

On April 20th, 2022, the results from ALS Environmental were received regarding the PAH results from the March 30th, 2022 sampling event. On April 21st, 2022, the results were entered and assessed, and it was found that there was one (1) measured Benzo(a)Pyrene (BaP) concentration in excess of the 24-hour AAQC on the March 30th sampling date.

## March 30, 2022

On Wednesday, March 30th, 2022, there was one (1) exceedance of the BaP 24-hour AAQC, which occurred at the Rundle Road Station, measured at the onsite PUF PS-1 sampler. Attached is a figure depicting a wind rose (indicating the wind speed and direction distribution during the sampling day), and the location of the sampling stations relative to the DYEC.

The following summarizes the BaP concentrations and onsite conditions during the March 30th sampling date:

1. The guideline concentration for BaP is 0.05 ng/m$^3$. The measured concentration at the Rundle Road sampler was 0.056 ng/m$^3$.
2. During the sampling day the wind was predominantly from the E with less significant contributions from the NE and ESE, as recorded at the Rundle Road Meteorological Tower. One-hour average wind speeds at Rundle Road Meteorological Tower ranged from 1.46 km/h to 31.64 km/h.
3. The Rundle Road meteorological data suggests that the Rundle Road Station was upwind of the DYEC during the sampling period. Given the wind conditions, it is likely that the measured BaP exceedance is attributable to sources other than the Energy Centre operations.

At the Rundle Road Station, the $NO_2$ hourly values were less than 8% of the criteria for the same period. The $PM_{2.5}$ 24-hour average value was 3.7 micrograms per cubic metre at the Rundle Road Station.

We have attached the data files for the samples in question to aid with the review.

Respectfully submitted by:

**RWDI AIR Inc.**

Khalid Hussein, P.Eng.
Project Manager

KAMH/kta

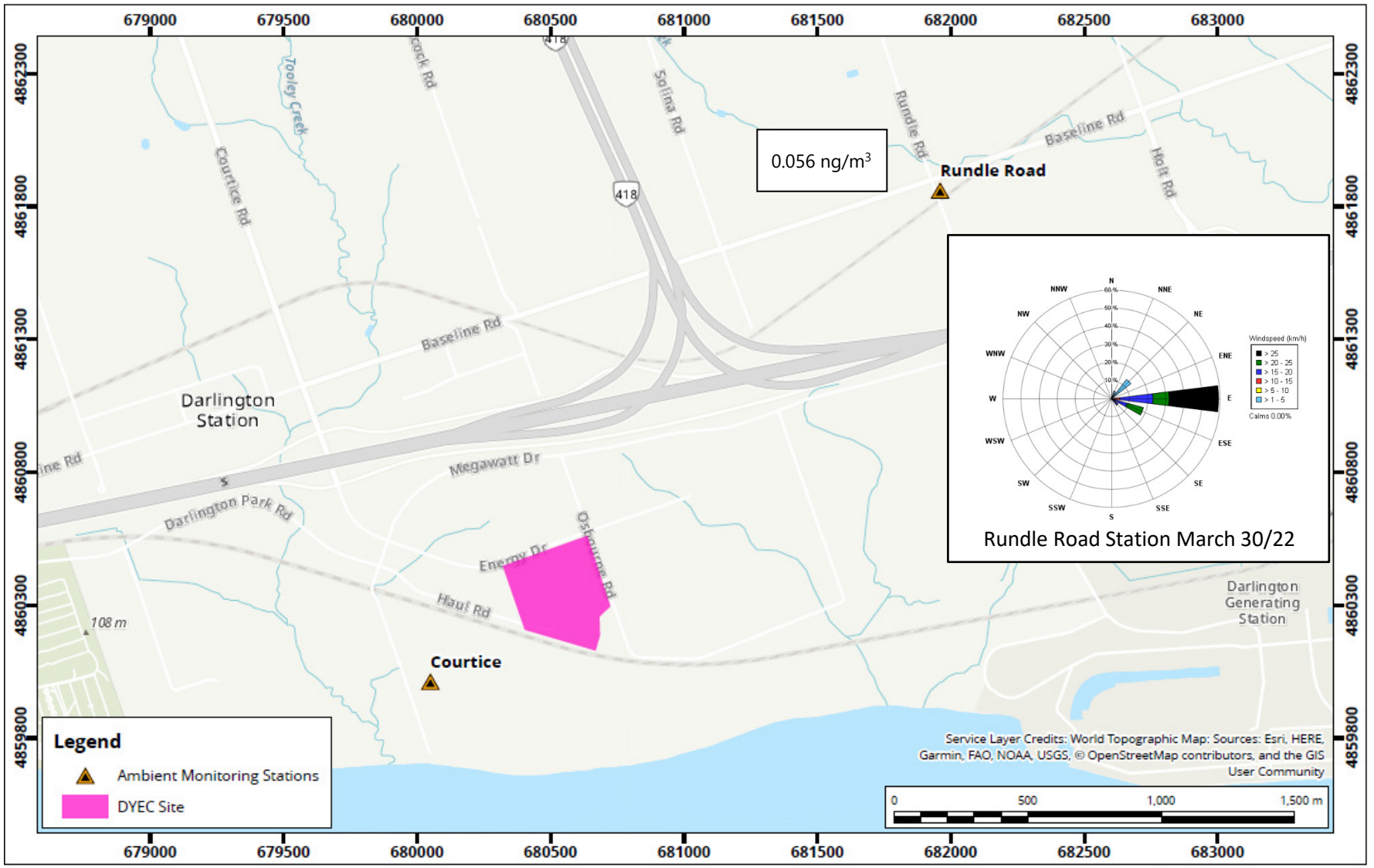
Attach.

# ATTACHMENTS

**Table B6: 2022 Rundle Station Q1 Monitoring Results for PAHs**

| Contaminant | Units | *MECP Criteria* | 30-Mar-22 | No. > Criteria |
|---|---|---|---|---|
| 1-Methylnaphthalene | ng/m$^3$ | *12000* | 2.63E+00 | 0 |
| 2-Methylnaphthalene | ng/m$^3$ | *10000* | 4.41E+00 | 0 |
| Acenaphthene | ng/m$^3$ | - | 1.12E+00 | - |
| Acenaphthylene | ng/m$^3$ | *3500* | 6.80E-02 | 0 |
| Anthracene | ng/m$^3$ | *200* | 4.47E-02 | 0 |
| Benzo(a)Anthracene | ng/m$^3$ | - | 3.35E-02 | - |
| Benzo(a)fluorene | ng/m$^3$ | - | 5.12E-02 | - |
| Benzo(a)Pyrene (Historically High) | ng/m$^3$ | *0.05* [1] *5* [2] *1.1* [3] | 5.56E-02 | 1 |
| Benzo(b)Fluoranthene | ng/m$^3$ | - | 9.29E-02 | - |
| Benzo(b)fluorene | ng/m$^3$ | - | 1.90E-02 | - |
| Benzo(e)Pyrene | ng/m$^3$ | - | 6.58E-02 | - |
| Benzo(g,h,i)Perylene | ng/m$^3$ | - | 6.86E-02 | - |
| Benzo(k)Fluoranthene | ng/m$^3$ | - | 8.54E-02 | - |
| Biphenyl | ng/m$^3$ | - | 1.37E+00 | - |
| Chrysene | ng/m$^3$ | - | 1.44E-01 | - |
| Dibenzo(a,h)Anthracene | ng/m$^3$ | - | 1.47E-02 | - |
| Fluoranthene | ng/m$^3$ | - | 5.40E-01 | - |
| Fluorene | ng/m$^3$ | - | 1.09E+00 | - |
| Indeno(1,2,3-cd)Pyrene | ng/m$^3$ | - | 6.49E-02 | - |
| Naphthalene | ng/m$^3$ | *22500* | 1.11E+01 | 0 |
| o-Terphenyl | ng/m$^3$ | - | 3.11E-03 | - |
| Perylene | ng/m$^3$ | - | 3.11E-03 | - |
| Phenanthrene | ng/m$^3$ | - | 1.92E+00 | - |
| Pyrene | ng/m$^3$ | - | 3.10E-01 | - |
| Tetralin | ng/m$^3$ | - | 6.34E-01 | - |
| Total PAH[4] | ng/m$^3$ | - | 25.98 | - |

NOTE: All non-detectable results were reported as 1/2 of the detection limit
[1] AAQC
[2] O. Reg. 419/05 Schedule  Upper Risk Thresholds
[3] O. Reg. 419/05 24 Hour Guideline
[4] Total PAH sums all PAH contaminants




# DYEC Site and Ambient Monitoring Station Locations

Map Projection: NAD 1983 UTM Zone 17N

DYEC - Region of Durham, Ontario

True North

Project #: 1803743

| | |
|---|---|
| Drawn by: DAJH | Figure: 1 |
| Approx. Scale: | 1:20,000 |
| Date Revised: | April 21, 2022 |

Phone: 905-331-3111, FAX: 905-331-4567

# Certificate of Analysis

| | | | |
|---|---|---|---|
| **ALS Project Contact:** | Claire Kocharrakal | **Client Name:** | RWDI Air Inc. |
| **ALS Project ID:** | 23601 | **Client Address:** | 600 Southgate Dr. |
| **ALS WO#:** | L2696738 | | Guelph, ON N1G 4P6 |
| **Date of Report** | 20-Apr-22 | | Canada |
| **Date of Sample Receipt** | 5-Apr-22 | **Client Contact:** | Khalid Hussein |
| | | **Client Project ID:** | DYEC |

**COMMENTS:** **PAH by CARB method 429 (LR option)- Isotope dilution**

The Method Blank had some laboratory background of selected analytes, but they were present at less than a tenth of the levels detected in the' client samples, so no impact to overall data quality is expected.

The sample "RUNDLE-PAH-MAR30" marginally exceeds the MECP 24 hour criterion for benzo(a)pyrene.

Certified by:

Bradley Reimer
GC/MS Laboratory Senior Technical Specialist

# ALS Life Sciences

## Sample Analysis Summary Report

| Sample Name | Method Blank | | RUNDLE-PAH-MAR30 | | COURTICE-PAH-MAR30 | | Laboratory Control Sample | |
|---|---|---|---|---|---|---|---|---|
| ALS Sample ID | WG3713735-1 | | L2696738-1 | | L2696738-2 | | WG3713735-2 | |
| Sample Size | 1 | | 1 | | 1 | | 1 | |
| Sample units | sample | | sample | | sample | | n/a | |
| Moisture Content | n/a | | n/a | | n/a | | n/a | |
| Matrix | QC | | Puf | | Puf | | QC | |
| Sampling Date | n/a | | 30-Mar-22 | | 30-Mar-22 | | n/a | |
| Extraction Date | 6-Apr-22 | | 6-Apr-22 | | 6-Apr-22 | | 6-Apr-22 | |
| **Target Analytes** | **ng/sample** | | **ng/sample** | | **ng/sample** | | **%** | |
| Naphthalene | 21.8 | M,R | 3590 | | 3910 | | 135.3 | RB |
| 2-Methylnaphthalene | 2.99 | | 1420 | | 2690 | | 109.3 | |
| 1-Methylnaphthalene | 2.25 | | 847 | | 1470 | | 113.1 | |
| Acenaphthylene | <2.0 | U | 21.9 | R | 29.2 | R | 97.3 | |
| Acenaphthene | <2.0 | U | 361 | | 494 | | 86.2 | |
| Fluorene | <2.0 | U | 351 | | 433 | | 89.9 | |
| Phenanthrene | <2.0 | U | 617 | | 696 | | 106.6 | |
| Anthracene | <2.0 | U | 14.4 | | 12.5 | | 100.2 | |
| Fluoranthene | <2.0 | U | 174 | | 158 | | 97.1 | |
| Pyrene | <2.0 | U | 99.8 | | 79.5 | | 100 | |
| Benzo(a)Anthracene | <2.0 | U | 10.8 | | 5.91 | | 90.8 | |
| Chrysene | <2.0 | U | 46.4 | | 35.4 | | 101.3 | |
| Benzo(b)Fluoranthene | <2.0 | U | 29.9 | M | 21.5 | M | 97.5 | |
| Benzo(k)Fluoranthene | <2.0 | U | 27.5 | M | 21.0 | M | 95.1 | |
| Benzo(e)Pyrene | <2.0 | U | 21.2 | | 15.0 | | 94.7 | |
| Benzo(a)Pyrene | 0.940 | M | 17.9 | | 10.4 | | 87.4 | |
| Perylene | <2.0 | U | <2.0 | U | <2.0 | U | 95 | |
| Indeno(1,2,3-cd)Pyrene | <2.0 | U | 20.9 | | 17.1 | | 93.4 | |
| Dibenzo(a,h)Anthracene | <2.0 | U | 4.73 | R | <2.0 | U | 99.2 | |
| Benzo(g,h,i)Perylene | <2.0 | U | 22.1 | | 15.7 | | 97.3 | |
| **Additional Analytes** | | | | | | | | |
| Tetralin | 8.06 | M | 204 | | 548 | | | |
| Biphenyl | <2.0 | U | 441 | | 575 | | | |
| o-Terphenyl | <2.0 | U | <2.0 | U | 2.10 | | | |
| Benzo(a)fluorene | <2.0 | U | 16.5 | | 13.0 | | | |
| Benzo(b)fluorene | <2.0 | U | 6.12 | | 4.80 | | | |
| **Field Sampling Standards** | **% Rec** | | **% Rec** | | **% Rec** | | **% Rec** | |
| 1-Methylnaphthalene-D10 | NS | | 80.2 | M | 80.4 | | NS | |
| Fluorene D10 | NS | | 98.7 | | 87.3 | | NS | |
| Terphenyl D14(Surr.) | NS | | 100.9 | | 96 | | NS | |
| **Extraction Standards** | **% Rec** | | **% Rec** | | **% Rec** | | **% Rec** | |
| Naphthalene D8 | 78.1 | | 63.8 | R | 69.9 | | 39.4 | R |
| 2-Methylnaphthalene-D10 | 77.5 | | 60.6 | | 61.3 | | 57.4 | |
| Acenaphthylene D8 | 91.7 | | 83.3 | | 76.6 | | 74.6 | |
| Phenanthrene D10 | 79.8 | | 80.7 | | 83.4 | | 71 | |
| Anthracene-D10 | 97.1 | | 95.7 | | 99.3 | | 88.1 | |
| Fluoranthene D10 | 97.5 | | 100.2 | | 99.4 | | 92 | |
| Benz(a)Anthracene-D12 | 114.4 | | 132.7 | | 117.1 | | 136.6 | |
| Chrysene D12 | 76.4 | M | 78.1 | | 74.4 | | 78.7 | |
| Benzo(b)Fluoranthene-D12 | 114.1 | M | 123.4 | | 110.1 | M | 119.9 | |
| Benzo(k)Fluoranthene-D12 | 90.6 | | 99.8 | | 90.6 | | 91.5 | |
| Benzo(a)Pyrene D12 | 95.7 | | 105.7 | | 91.9 | | 103.7 | |
| Perylene D12 | 103.7 | | 116.5 | | 101 | | 114.2 | |
| Indeno(1,2,3,cd)Pyrene-D12 | 100.1 | | 133.4 | | 115.7 | | 126 | |
| Dibenz(a,h)Anthracene-D14 | 84.2 | | 122.5 | | 93.8 | | 122.4 | |
| Benzo(g,h,i)Perylene D12 | 87.5 | | 109 | | 101.4 | M | 100.7 | |

| | |
|---|---|
| U | Indicates that this compound was not detected above the LOD. |
| M | Indicates that a peak has been manually integrated. |
| B | Indicates that this compound was detected in the method blank at greater than 10% of the sample value. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |
| NS | Indicates that the compound was not added to the sample |

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | Method Blank | Sampling Date | n/a |
| ALS Sample ID | WG3713735-1 | Extraction Date | 6-Apr-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | blank | | |
| Sample Matrix | QC | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3713735 |

Approved:
*Peter Nguyen*
--e-signature--
12-Apr-2022

| Run Information | Run 1 |
|---|---|
| Filename | PAH220411014.D |
| Run Date | 4/11/2022 16:03 |
| Final Volume | 1 mL |
| Dilution Factor | 1 |
| Analysis Units | ng/sample |
| Instrument | MSD-5 |
| Column | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | Flags |
|---|---|---|---|
| Naphthalene | 2.77 | 21.8 M | R |
| 2-Methylnaphthalene | 3.36 | 2.99 | |
| 1-Methylnaphthalene | 3.47 | 2.25 | |
| Acenaphthylene | NotFnd | <2.0 | U |
| Acenaphthene | NotFnd | <2.0 | U |
| Fluorene | 5.73 | <2.0 | U |
| Phenanthrene | 7.94 | <2.0 | U |
| Anthracene | 8.05 | <2.0 | U |
| Fluoranthene | 11.34 | <2.0 | U |
| Pyrene | 11.99 | <2.0 | U |
| Benzo(a)Anthracene | NotFnd | <2.0 | U |
| Chrysene | 16.02 | <2.0 | U |
| Benzo(b)Fluoranthene | 19.22 | <2.0 | U |
| Benzo(k)Fluoranthene | 19.30 | <2.0 | U |
| Benzo(e)Pyrene | NotFnd | <2.0 | U |
| Benzo(a)Pyrene | 20.09 | 0.940 M | |
| Perylene | NotFnd | <2.0 | U |
| Indeno(1,2,3-cd)Pyrene | 23.78 | <2.0 | U |
| Dibenzo(a,h)Anthracene | 24.05 | <2.0 | U |
| Benzo(g,h,i)Perylene | 24.82 | <2.0 | U |
| **Additional Analytes** | | | |
| Tetralin | 2.65 | 8.06 M | |
| Biphenyl | 3.90 | <2.0 | U |
| o-Terphenyl | NotFnd | <2.0 | U |
| Benzo(a)fluorene | NotFnd | <2.0 | U |
| Benzo(b)fluorene | NotFnd | <2.0 | U |

| Field Sampling Standards | ng spiked | % Rec |
|---|---|---|
| 1-Methylnaphthalene-D10 | | NS |
| Fluorene D10 | | NS |
| Terphenyl D14(Surr.) | | NS |

| Extraction Standards | | | % Rec | Limits |
|---|---|---|---|---|
| Naphthalene D8 | 100 | 2.76 | 78.1 | 50-150 |
| 2-Methylnaphthalene-D10 | 100 | 3.33 | 77.5 | 50-150 |
| Acenaphthylene D8 | 100 | 4.49 | 91.7 | 50-150 |
| Phenanthrene D10 | 100 | 7.88 | 79.8 | 50-150 |
| Anthracene-D10 | 100 | 8.01 | 97.1 | 50-150 |
| Fluoranthene D10 | 100 | 11.29 | 97.5 | 50-150 |
| Benz(a)Anthracene-D12 | 100 | 15.82 | 114.4 | 50-150 |
| Chrysene D12 | 100 | 15.94 | 76.4 M | 50-150 |
| Benzo(b)Fluoranthene-D12 | 100 | 19.17 | 114.1 M | 50-150 |
| Benzo(k)Fluoranthene-D12 | 100 | 19.24 | 90.6 | 50-150 |
| Benzo(a)Pyrene D12 | 100 | 20.05 | 95.7 | 50-150 |
| Perylene D12 | 100 | 20.28 | 103.7 | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.74 | 100.1 | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 100 | 23.90 | 84.2 | 50-150 |
| Benzo(g,h,i)Perylene D12 | 100 | 24.72 | 87.5 | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated. |
| U | Indicates that this compound was not detected above the MDL. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |
| NS | Indicates that the compound was not added to the sample |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | RUNDLE-PAH-MAR30 | Sampling Date | 30-Mar-22 00:00 |
| ALS Sample ID | L2696738-1 | Extraction Date | 6-Apr-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | Puf | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3713735 |

Approved:
*Peter Nguyen*
--e-signature--
12-Apr-2022

| Run Information | Run 1 | Run 2 |
|---|---|---|
| Filename | PAH220411021.D | PAH220411017.D |
| Run Date | 4/11/2022 20:30 | 4/11/2022 17:58 |
| Final Volume | 1 mL | 1 mL |
| Dilution Factor | 1 | 10 |
| Analysis Units | ng/sample | ng/sample |
| Instrument | MSD-5 | MSD-5 |
| Column | HP-5MS US1609664H | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | Flags | Ret. Time. | Concentration ng/sample | Flags |
|---|---|---|---|---|---|---|
| Naphthalene | | | | 2.78 | 3590 | |
| 2-Methylnaphthalene | 3.36 | 1420 | | | | |
| 1-Methylnaphthalene | 3.47 | 847 | | | | |
| Acenaphthylene | 4.51 | 21.9 | R | | | |
| Acenaphthene | 4.80 | 361 | | | | |
| Fluorene | 5.73 | 351 | | | | |
| Phenanthrene | 7.93 | 617 | | | | |
| Anthracene | 8.05 | 14.4 | | | | |
| Fluoranthene | 11.34 | 174 | | | | |
| Pyrene | 11.98 | 99.8 | | | | |
| Benzo(a)Anthracene | 15.89 | 10.8 | | | | |
| Chrysene | 16.00 | 46.4 | | | | |
| Benzo(b)Fluoranthene | 19.23 | 29.9 | M | | | |
| Benzo(k)Fluoranthene | 19.27 | 27.5 | M | | | |
| Benzo(e)Pyrene | 19.98 | 21.2 | | | | |
| Benzo(a)Pyrene | 20.10 | 17.9 | | | | |
| Perylene | 20.34 | <2.0 | U | | | |
| Indeno(1,2,3-cd)Pyrene | 23.83 | 20.9 | | | | |
| Dibenzo(a,h)Anthracene | 24.04 | 4.73 | R | | | |
| Benzo(g,h,i)Perylene | 24.82 | 22.1 | | | | |
| **Additional Analytes** | | | | | | |
| Tetralin | 2.65 | 204 | | | | |
| Biphenyl | 3.90 | 441 | | | | |
| o-Terphenyl | 9.21 | <2.0 | U | | | |
| Benzo(a)fluorene | 13.14 | 16.5 | | | | |
| Benzo(b)fluorene | 13.37 | 6.12 | | | | |

| Field Sampling Standards | ng spiked | | % Rec | |
|---|---|---|---|---|
| 1-Methylnaphthalene-D10 | 200 | 3.44 | 80.2 | M |
| Fluorene D10 | 200 | 5.68 | 98.7 | |
| Terphenyl D14(Surr.) | 200 | 12.78 | 100.9 | |

| Extraction Standards | | | % Rec | Limits | | % Rec | |
|---|---|---|---|---|---|---|---|
| Naphthalene D8 | 100 | | | 50-150 | 2.76 | 63.8 | R |
| 2-Methylnaphthalene-D10 | 100 | 3.33 | 60.6 | 50-150 | | | |
| Acenaphthylene D8 | 100 | 4.48 | 83.3 | 50-150 | | | |
| Phenanthrene D10 | 100 | 7.88 | 80.7 | 50-150 | | | |
| Anthracene-D10 | 100 | 8.00 | 95.7 | 50-150 | | | |
| Fluoranthene D10 | 100 | 11.29 | 100.2 | 50-150 | | | |
| Benz(a)Anthracene-D12 | 100 | 15.82 | 132.7 | 50-150 | | | |
| Chrysene D12 | 100 | 15.93 | 78.1 | 50-150 | | | |
| Benzo(b)Fluoranthene-D12 | 100 | 19.17 | 123.4 | 50-150 | | | |
| Benzo(k)Fluoranthene-D12 | 100 | 19.24 | 99.8 | 50-150 | | | |
| Benzo(a)Pyrene D12 | 100 | 20.05 | 105.7 | 50-150 | | | |
| Perylene D12 | 100 | 20.28 | 116.5 | 50-150 | | | |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.74 | 133.4 | 50-150 | | | |
| Dibenz(a,h)Anthracene-D14 | 100 | 23.90 | 122.5 | 50-150 | | | |
| Benzo(g,h,i)Perylene D12 | 100 | 24.72 | 109.0 | 50-150 | | | |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated. |
| U | Indicates that this compound was not detected above the MDL. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | COURTICE-PAH-MAR30 | Sampling Date | 30-Mar-22 00:00 |
| ALS Sample ID | L2696738-2 | Extraction Date | 6-Apr-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | Puf | | |
| Sample Size | 1 sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3713735 |

Approved:
*Peter Nguyen*
--e-signature--
12-Apr-2022

| Run Information | Run 1 | Run 2 |
|---|---|---|
| Filename | PAH220411022.D | PAH220411019.D |
| Run Date | 4/11/2022 21:08 | 4/11/2022 19:14 |
| Final Volume | 1 mL | 1 mL |
| Dilution Factor | 1 | 10 |
| Analysis Units | ng/sample | ng/sample |
| Instrument | MSD-5 | MSD-5 |
| Column | HP-5MS US1609664H | HP-5MS US1609664H |

| Target Analytes | Ret. Time | Concentration ng/sample | Flags | Ret. Time. | Concentration ng/sample | Flags |
|---|---|---|---|---|---|---|
| Naphthalene | | | | 2.78 | 3910 | |
| 2-Methylnaphthalene | | | | 3.36 | 2690 | |
| 1-Methylnaphthalene | 3.47 | 1470 | | | | |
| Acenaphthylene | 4.51 | 29.2 | R | | | |
| Acenaphthene | 4.80 | 494 | | | | |
| Fluorene | 5.73 | 433 | | | | |
| Phenanthrene | 7.93 | 696 | | | | |
| Anthracene | 8.05 | 12.5 | | | | |
| Fluoranthene | 11.34 | 158 | | | | |
| Pyrene | 11.98 | 79.5 | | | | |
| Benzo(a)Anthracene | 15.89 | 5.91 | | | | |
| Chrysene | 16.01 | 35.4 | | | | |
| Benzo(b)Fluoranthene | 19.23 | 21.5 | M | | | |
| Benzo(k)Fluoranthene | 19.27 | 21.0 | M | | | |
| Benzo(e)Pyrene | 19.98 | 15.0 | | | | |
| Benzo(a)Pyrene | 20.10 | 10.4 | | | | |
| Perylene | 20.34 | <2.0 | U | | | |
| Indeno(1,2,3-cd)Pyrene | 23.83 | 17.1 | | | | |
| Dibenzo(a,h)Anthracene | 24.01 | <2.0 | U | | | |
| Benzo(g,h,i)Perylene | 24.82 | 15.7 | | | | |
| **Additional Analytes** | | | | | | |
| Tetralin | 2.65 | 548 | | | | |
| Biphenyl | 3.89 | 575 | | | | |
| o-Terphenyl | 9.21 | 2.10 | | | | |
| Benzo(a)fluorene | 13.14 | 13.0 | | | | |
| Benzo(b)fluorene | 13.38 | 4.80 | | | | |

| Field Sampling Standards | ng spiked | | % Rec | | | |
|---|---|---|---|---|---|---|
| 1-Methylnaphthalene-D10 | 200 | 3.44 | 80.4 | | | |
| Fluorene D10 | 200 | 5.68 | 87.3 | | | |
| Terphenyl D14(Surr.) | 200 | 12.78 | 96 | | | |

| Extraction Standards | | | % Rec | | Limits | | % Rec |
|---|---|---|---|---|---|---|---|
| Naphthalene D8 | 100 | | | | 50-150 | 2.76 | 69.9 |
| 2-Methylnaphthalene-D10 | 100 | | | | 50-150 | 3.33 | 61.3 |
| Acenaphthylene D8 | 100 | 4.49 | 76.6 | | 50-150 | | |
| Phenanthrene D10 | 100 | 7.88 | 83.4 | | 50-150 | | |
| Anthracene-D10 | 100 | 8.00 | 99.3 | | 50-150 | | |
| Fluoranthene D10 | 100 | 11.29 | 99.4 | | 50-150 | | |
| Benz(a)Anthracene-D12 | 100 | 15.82 | 117.1 | | 50-150 | | |
| Chrysene D12 | 100 | 15.93 | 74.4 | | 50-150 | | |
| Benzo(b)Fluoranthene-D12 | 100 | 19.17 | 110.1 | M | 50-150 | | |
| Benzo(k)Fluoranthene-D12 | 100 | 19.25 | 90.6 | | 50-150 | | |
| Benzo(a)Pyrene D12 | 100 | 20.05 | 91.9 | | 50-150 | | |
| Perylene D12 | 100 | 20.28 | 101.0 | | 50-150 | | |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.74 | 115.7 | | 50-150 | | |
| Dibenz(a,h)Anthracene-D14 | 100 | 23.90 | 93.8 | | 50-150 | | |
| Benzo(g,h,i)Perylene D12 | 100 | 24.72 | 101.4 | M | 50-150 | | |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated. |
| U | Indicates that this compound was not detected above the MDL. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |

# ALS Life Sciences

## Laboratory Control Sample Analysis Report

| | | | |
|---|---|---|---|
| Sample Name | Laboratory Control Sample | Sampling Date | n/a |
| ALS Sample ID | WG3713735-2 | Extraction Date | 6-Apr-22 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | LCS | | |
| Sample Matrix | QC | | |
| Sample Size | 1 n/a | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3713735 |

Approved:
*Peter Nguyen*
--e-signature--
12-Apr-2022

| Run Information | Run 1 |
|---|---|
| Filename | PAH220411012.D |
| Run Date | 4/11/2022 14:47 |
| Final Volume | 1 mL |
| Dilution Factor | 1 |
| Analysis Units | % |
| Instrument | MSD-5 |
| Column | HP-5MS US1609664H |

| Target Analytes | ug spiked | Ret. Time | % | Flags | Limits |
|---|---|---|---|---|---|
| Naphthalene | 100 | 2.77 | 135.3 | R B | 50-150 |
| 2-Methylnaphthalene | 100 | 3.36 | 109.3 | | 50-150 |
| 1-Methylnaphthalene | 100 | 3.47 | 113.1 | | 50-150 |
| Acenaphthylene | 100 | 4.50 | 97.3 | | 50-150 |
| Acenaphthene | 100 | 4.80 | 86.2 | | 50-150 |
| Fluorene | 100 | 5.73 | 89.9 | | 50-150 |
| Phenanthrene | 100 | 7.93 | 106.6 | | 50-150 |
| Anthracene | 100 | 8.05 | 100.2 | | 50-150 |
| Fluoranthene | 100 | 11.34 | 97.1 | | 50-150 |
| Pyrene | 100 | 11.98 | 100 | | 50-150 |
| Benzo(a)Anthracene | 100 | 15.89 | 90.8 | | 50-150 |
| Chrysene | 100 | 16.01 | 101.3 | | 50-150 |
| Benzo(b)Fluoranthene | 100 | 19.22 | 97.5 | | 50-150 |
| Benzo(k)Fluoranthene | 100 | 19.30 | 95.1 | | 50-150 |
| Benzo(e)Pyrene | 100 | 19.97 | 94.7 | | 50-150 |
| Benzo(a)Pyrene | 100 | 20.10 | 87.4 | | 50-150 |
| Perylene | 100 | 20.34 | 95 | | 50-150 |
| Indeno(1,2,3-cd)Pyrene | 100 | 23.83 | 93.4 | | 50-150 |
| Dibenzo(a,h)Anthracene | 100 | 24.02 | 99.2 | | 50-150 |
| Benzo(g,h,i)Perylene | 100 | 24.82 | 97.3 | | 50-150 |

| Field Sampling Standards | ng spiked | % Rec |
|---|---|---|
| 1-Methylnaphthalene-D10 | | NS |
| Fluorene D10 | | NS |
| Terphenyl D14(Surr.) | | NS |

| Extraction Standards | | | % Rec | | Limits |
|---|---|---|---|---|---|
| Naphthalene D8 | 100 | 2.75 | 39.4 | R | 30-150 |
| 2-Methylnaphthalene-D10 | 100 | 3.32 | 57.4 | | 30-150 |
| Acenaphthylene D8 | 100 | 4.49 | 74.6 | | 30-150 |
| Phenanthrene D10 | 100 | 7.88 | 71.0 | | 50-150 |
| Anthracene-D10 | 100 | 8.00 | 88.1 | | 50-150 |
| Fluoranthene D10 | 100 | 11.29 | 92.0 | | 50-150 |
| Benz(a)Anthracene-D12 | 100 | 15.82 | 136.6 | | 50-150 |
| Chrysene D12 | 100 | 15.93 | 78.7 | | 50-150 |
| Benzo(b)Fluoranthene-D12 | 100 | 19.17 | 119.9 | | 50-150 |
| Benzo(k)Fluoranthene-D12 | 100 | 19.24 | 91.5 | | 50-150 |
| Benzo(a)Pyrene D12 | 100 | 20.04 | 103.7 | | 30-150 |
| Perylene D12 | 100 | 20.28 | 114.2 | | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.74 | 126.0 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 100 | 23.89 | 122.4 | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 100 | 24.71 | 100.7 | | 50-150 |

| | |
|---|---|
| M | Indicates that a peak has been manually integrated. |
| B | Indicates that this compound was detected in the method blank at greater than 10% of the sample value. |
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |
| NS | Indicates that the compound was not added to the sample |

# Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2696738-COFC

COC Number: 17 -

Page 1 of 1

| Report To | Contact and company name below will appear on the final report |
|---|---|
| Company: | RWDI |
| Contact: | Matt Lantz |
| Phone: | 519 823 1311 |
| | Company address below will appear on the final report |
| Street: | 600 Southgate Drive |
| City/Province: | Guelph, Ontario |
| Postal Code: | N1G 4P6 |
| Invoice To | Same as Report To ☐ YES ☐ NO |
| | Copy of Invoice with Report ☐ YES ☐ NO |
| Company: | |
| Contact: | |

| Report Format / Distribution | |
|---|---|
| Select Report Format: | ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL) |
| Quality Control (QC) Report with Report | ☐ YES ☐ NO |
| ☐ Compare Results to Criteria on Report - provide details below if box checked | |
| Select Distribution: | ☑ EMAIL ☐ MAIL ☐ FAX |
| Email 1 or Fax | Matt.Lantz@rwdi.com |
| Email 2 | |
| Email 3 | |

| Invoice Distribution | |
|---|---|
| Select Invoice Distribution: | ☑ EMAIL ☐ MAIL ☐ FAX |
| Email 1 or Fax | |
| Email 2 | |

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Standard TAT is 15 business days. DTOX analysis standard TAT is 5 business days

| PRIORITY (Business Days) | | EMERGENCY | |
|---|---|---|---|
| | 15 day [R- Regular] ☐ | | 5 Business day - DTOX [R - Regular] |
| | 10 day [P-50%] ☐ | | 3 Business day - DTOX [E - 100%] |
| | 5 day [E-100%] ☐ | | |

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

| Project Information | |
|---|---|
| ALS Account # / Quote #: | |
| Job #: | DYEC |
| PO / AFE: | 1803743 Phase 1000 |
| LSD: | |
| ALS Lab Work Order # (lab use only): | |

| Oil and Gas Required Fields (client use) | |
|---|---|
| AFE/Cost Center: | PO# |
| Major/Minor Code: | Routing Code: |
| Requisitioner: | |
| Location: | |
| ALS Contact: | Sampler: Martin Town |

Analysis Request

NUMBER OF CONTAINERS

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

SAMPLES ON HOLD

| ALS Sample # (lab use only) | Sample Identification and/or Coordinates (This description will appear on the report) | Sample Air Volume (m3) | Date (dd-mmm-yy) | Sample Period | Sample Type | TSP, ICP on Hi-Vol Filter | PAH | DX |
|---|---|---|---|---|---|---|---|---|
| 1 | L2693286-3 | 322 | 30-Mar-22 | 24hr | Air | | X | |
| 1 | 742359 | 1617 | 30-Mar-22 | 24hr | Air | X | | |
| 2 | 742357 | 1586 | 24-Mar-22 | 24hr | Air | X | | |
| 2 | L2693286-2 | 315 | 30-Mar-22 | 24hr | Air | | X | |
| 3 | 742360 | 1673 | 30-Mar-22 | 24hr | Air | X | | |
| 4 | 742358 | 1644 | 24-Mar-22 | 24hr | Air | X | | |
| | | | | 24hr | Air | | | |
| | | | | 24hr | Air | | | |
| | | | | 24hr | Air | | | |
| | | | | 24hr | Air | | | |
| | | | | 24hr | Air | | | |
| | | | | 24hr | Air | | | |

| Drinking Water (DW) Samples[1] (client use) | Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only) |
|---|---|
| Are samples taken from a Regulated DW System? ☐ YES ☑ NO | |
| Are samples for human consumption/ use? ☐ YES ☑ NO | Samples are 10 day TAT |

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ ☒

Ice Packs ☑ Ice Cubes ☐ Custody seal intact Yes ☑ ☐

Cooling Initiated ☑

| INITIAL COOLER TEMPERATURES °C | | FINAL COOLER TEMPERATURES °C | | | |
|---|---|---|---|---|---|
| 4.3°C | 12.6°C | | | | |

| SHIPMENT RELEASE (client use) | | | INITIAL SHIPMENT RECEPTION (lab use only) | | | FINAL SHIPMENT RECEPTION (lab use only) | | |
|---|---|---|---|---|---|---|---|---|
| Released by: | Date: | Time: | Received by: | Date: | Time: | Received by: | Date: | Time: |
| M Lantz | 04-Mar-22 | 12:00 | HARA BULTON | 5-Apr-2022 | 10:00 | | | |

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 20

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Station: RofD Rundle  Daily: 30/03/2022  Type: AVG 1 Hr. [5  in! ."

| Date # Ti$ e | % 2.5 | &' | &' 2 | &' ( | S' 2 | A$ ) ient T | Tr* Te$ p | RH AVG | Rain total | + S , $ /- r | + D | Hi.Vol %re! ! ure | %l 0 %re! ! ure | A$ ) ient T | Hi1ol 0lo2 | %l 0 0lo2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | u3/$ 3 | pp) | pp) | pp) | pp) | 4 5 | 4 5 | 6 | $ $ | , $ /- r | De3 | in H20 | in H20 | 7 | 8f$ | 8f$ |
| 30/03/2022 00:00 | 2.9 | 0.1 | 2.: | 2.: | 0 | .5.; | 22.2 | <2.2 | 0 | 2.9: | 4 al$ | 3.<: | 52.3: | 2<; .: < | : 0.3; | 9.13 |
| 30/03/2022 01:00 | 2.5 | 0.1 | 3 | 3 | 0 | .5.; | 22.1 | <3.9 | 0 | 2.=2 | 53 | 3.<5 | 52.0; | 2<; .: 23 | : 0.: < | 9.11 |
| 30/03/2022 02:00 | 2.9 | 0.1 | : | : .1 | 0 | .< | 22.2 | << | 0 | 3.< | 33 | 3.<5 | 52.0= | 2<; .1: | : 0.: < | 9.12 |
| 30/03/2022 03:00 | 3.1 | <.5 | ; .; | 1: .1 | 0.031 | .5.= | 22.2 | <: .: | 0 | 1.: < | 4 al$ | 3.<: | 51.3= | 2<; .2=3 | : 0.: 2 | 9.0; |
| 30/03/2022 0: :00 | 2.3 | 0.2 | ; .< | ; .; | 0 | .5.5 | 22.1 | <2.; | 0 | 3.; 9 | 50 | 3.<5 | 50.39 | 2<; .<: 9 | : 0.: 3 | ; .== |
| 30/03/2022 05:00 | 2.1 | 0.1 | <.= | <.= | 0 | .: .5 | 22 | 55.9 | 0 | : .<1 | 50 | 3.<: | : =.; 5 | 2<9.<1; | : 0.31 | ; .=3 |
| 30/03/2022 0<:00 | 1.9 | 0.3 | 5.2 | 5.5 | 0 | .2.: | 22.1 | 5=.= | 0 | 11.51 | =: | 3.<: | : =.<5 | 2; 0.; 91 | : 0.12 | ; .9= |
| 30/03/2022 0; :00 | 1.5 | 0.2 | 2.: | 2.< | 0.023 | .0.< | 22 | 59.2 | 0 | 1; .3= | 120 | 3.<2 | : 9.92 | 2; 2.<0: | 3=.= | ; .91 |
| 30/03/2022 09:00 | 2.< | 0.3 | 2.; | 3 | 0 | .0.3 | 21.9 | 59.1 | 0 | 1=.: 9 | 125 | 3.<3 | : 9.92 | 2; 2.9<1 | 3=.=3 | ; .91 |
| 30/03/2022 0=:00 | 3.= | 1 | 3.1 | : .1 | 0 | .0.3 | 21.9 | 5; .< | 0 | 1=.=5 | 122 | 3.<2 | : 9.<1 | 2; 2.9=2 | 3=.9= | ; .; = |
| 30/03/2022 10:00 | ; .2 | 11.= | 15.; | 2; .< | ; .251 | 0 | 21.= | 53.; | 0 | 22.3 | 10= | 3.<3 | : 9.2: | 2; 3.19; | 3=.=1 | ; .; < |
| 30/03/2022 11:00 | : .2 | 5 | =.9 | 1: .9 | 5.=3: | 0.1 | 21.= | 5: .3 | 0.05 | 2: .; 3 | 105 | 3.<: | : 9.1 | 2; 3.23; | 3=.=9 | ; .; 5 |
| 30/03/2022 12:00 | 3.1 | 1.1 | : | 5.1 | 1.: 33 | 0.2 | 21.= | 51.: | 0.01 | 2; .; : | 101 | 3.<5 | : 9.09 | 2; 3.3; : | : 0 | ; .; 5 |
| 30/03/2022 13:00 | 3.5 | 2 | 3.< | 5.< | 0.09 | 0.5 | 21.9 | 5; .2 | 0 | 30.0: | =; | 3.<< | : 9.: 3 | 2; 3.< | : 0.03 | ; .; ; |
| 30/03/2022 1: :00 | 3.9 | 0.3 | 2.1 | 2.: | 0.033 | 0.; | 22 | <0.1 | 0 | 31.<: | =; | 3.<; | : 9.22 | 2; 3.901 | : 0.1 | ; .; 5 |
| 30/03/2022 15:00 | 3.2 | 0.1 | 2.1 | 2.2 | 0.01= | 1.2 | 21.9 | 5=.3 | 0 | 30.: = | == | 3.<9 | : 9.19 | 2; : .31= | : 0.12 | ; .; : |
| 30/03/2022 1<:00 | 2.9 | 1.: | 3.: | : .9 | 0.0: 2 | 1.3 | 21.= | <2.5 | 0 | 2; | =; | 3.<9 | : 9.0; | 2; : .: <; | : 0.0; | ; .; 3 |
| 30/03/2022 1; :00 | 3.2 | 0 | 2.9 | 2.; | 0.01< | 1.3 | 21.9 | <9.2 | 0.1 | 25.01 | =5 | 3.<= | : 9.2 | 2; : .: <; | : 0.1: | ; .; : |
| 30/03/2022 19:00 | : .< | 0 | 2.< | 2.5 | 0.01: | 1.1 | 22.1 | ; =.5 | 0.<1 | 23.5; | =: | 3.<= | : ; .59 | 2; : .232 | : 0.1; | ; .; |
| 30/03/2022 1=:00 | : .< | 0 | 3 | 2.= | 0.01= | 1.3 | 21.= | ; ; .= | 0.0< | 21.13 | 9< | 3.; | : ; .05 | 2; : .: 15 | : 0.19 | ; .<< |
| 30/03/2022 20:00 | : .= | 0.1 | 3.; | 3.; | 0.001 | 1.; | 22.1 | ; <.< | 0 | 1; .=: | 9: | 3.<= | : ; .< | 2; : .90: | : 0.15 | ; .<= |
| 30/03/2022 21:00 | 5.1 | 2.9 | <.= | =.; | 0.09; | 2.3 | 21.= | ; 3.2 | 0 | 15.29 | 90 | 3.<9 | : 9.: : | 2; 5.: 59 | : 0.02 | ; .; 5 |
| 30/03/2022 22:00 | <.2 | 0.1 | 5.2 | 5.2 | 0.0: 9 | 3.2 | 22.2 | ; 0 | 0 | 15.<9 | 99 | 3.<= | : 9.=: | 2; <.3: = | 3=.=9 | ; .; ; |
| 30/03/2022 23:00 | 9.1 | < | : .3 | 10.3 | 0.1: = | : | 21.= | <9.5 | 0 | 1; .31 | 9= | 3.<= | : 9.39 | 2; ; .1=2 | 3=.=: | ; .; 2 |
| ini$ u$ | 1.5 | 0 | 2.1 | 2.2 | 0 | .< | 21.9 | 51.: | 0 | 1.: < | 33 | 3.<2 | : ; .05 | 2<; .1: | 3=.9= | ; .<< |
| inDate | ; :00 | 1; :00 | 1: :00 | 15:00 | 0:00 | 2:00 | 9:00 | 12:00 | 0:00 | 3:00 | 2:00 | ; :00 | 1=:00 | 2:00 | =:00 | 1=:00 |
| a>i$ u$ | 9.1 | 11.= | 15.; | 2; .< | ; .251 | : | 22.2 | ; =.5 | 0.<1 | 31.<: | 125 | 3.; | 52.3: | 2; ; .1=2 | : 0.: < | 9.13 |
| a>Date | 23:00 | 10:00 | 10:00 | 10:00 | 10:00 | 23:00 | 0:00 | 19:00 | 19:00 | 1: :00 | 9:00 | 1=:00 | 0:00 | 23:00 | 1:00 | 0:00 |
| A13 | 3.; | 1.; | : .9 | <.: | 0.<33 | .0.; | 22 | <3.: | 0.03 | 1; .3= | 9= | 3.<< | : =.0< | 2; 2.: 01 | : 0.13 | ; .93 |
| &u$ | 2: | 2: | 2: | 2: | 2: | 2: | 2: | 2: | 2: | 2: | 22 | 2: | 2: | 2: | 2: | 2: |
| Data[6 " | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | =1.<; | 100 | 100 | 100 | 100 | 100 |
| STD | 1.< | 2.= | 3.1 | 5.< | 1.9 | 3 | 0.1 | ; .< | 0.1 | =.< | 23.5 | 0 | 1.5 | 3 | 0.2 | 0.1 |

# APPENDIX G

# Technical Memorandum

**Date:** May 5, 2022

**To:** Khalid Hussein, Project Manager, RWDI

**From:** Gioseph Anello, Director, Waste Management Services, Durham Region

**Copy:** L. McDowell, Director, Environmental Protection and Promotion Region, York Region

**Subject:** Durham York Energy Centre (DYEC)
2022 Ambient Air Q1 Sulphur Dioxide Emissions

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In support of the 2022, Q1 Ambient Air Quality Monitoring Report prepared by RWDI Inc., the following information is provided in relation to the performance of the DYEC during the periods of elevated sulphur dioxide ($SO_2$) concentrations observed at the facility's Courtice ambient air monitoring station.

The Emission Summary and Dispersion Modelling (ESDM) report submitted as part of the DYEC ECA Application modelled $SO_2$ concentrations at the maximum point of impingement (POI) for a facility operating at 110% maximum continuous rating (MCR) with in-stack $SO_2$ concentrations at the permit limit of 35 mg/m$^3$. Under this conservative assumed facility operating condition, the predicted maximum 1-hour average concentration at the POI was 8.62 µg/m$^3$, which represents 8.62% of the new ambient air standard of 100 µg/m$^3$, which was implemented in 2020.

For the $SO_2$ events recorded from March 7 through to March 20, 2022, both boilers were offline for the spring maintenance outage and would not have contributed to recorded ambient air emissions measurements.

As indicated by RWDI in the 2022 DYEC Q1 Report, the Courtice Ambient Air Station pollution rose in Figure 7 shows that less than 0.24% of the 5-minute $SO_2$ events are elevated above 67 parts per

billion (ppb). Exceedance concentrations during Q1 were recorded with winds occurring from the north to east-northeast directions.

Each of the date and times of the $SO_2$ exceedances were compared against the wind direction recorded at the Courtice Ambient Air Station as well as the $SO_2$ concentrations measured at the DYEC. According to the DYEC's continuous emissions monitoring system (CEMS), when ambient $SO_2$ standards were exceeded in each of the 39, ten-minute events and 17 hourly events at the Courtice Road Ambient Air monitoring station, $SO_2$ CEMS concentrations for both boilers were well below the regulatory compliance limit of 35 mg/$Rm^3$. During the time the events occurred, both boilers CEMS concentrations, comprised of 24-hour rolling arithmetic average, were between 0-6 mg/$Rm^3$.

Due to the wind direction when the elevated $SO_2$ events were recorded, it is possible that there was some contribution from the DYEC, however, DYEC CEMS concentration limits were not exceeded at any point in time during Q1.