REPORT

# DURHAM YORK ENERGY CENTRE

COURTICE, ONTARIO

## 2021 Q1 AMBIENT AIR QUALITY MONITORING REPORT

RWDI #1803743

May 13, 2021

**SUBMITTED TO:**

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

**The Regional Municipality of Durham**
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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:

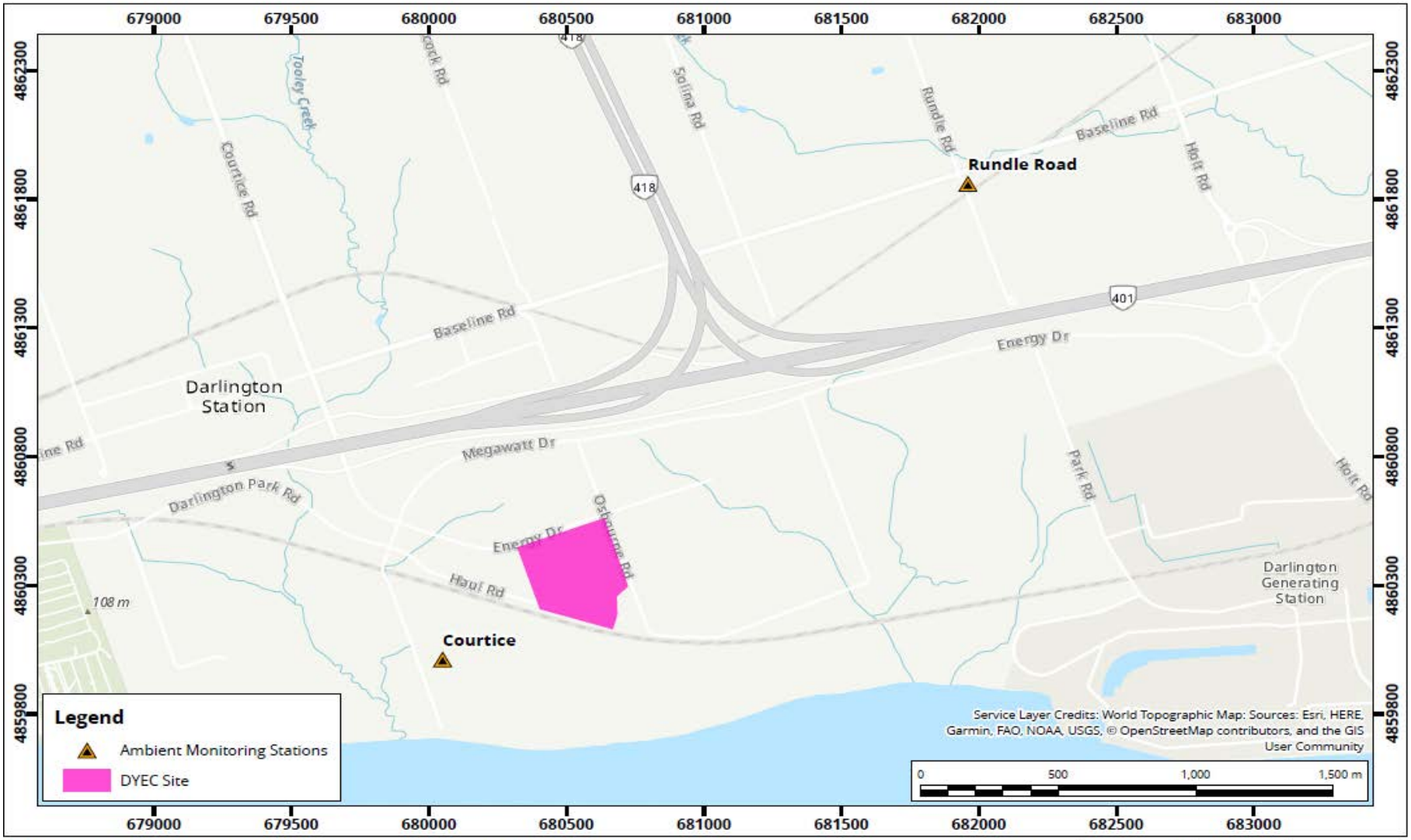
- Quantify any measurable ground level concentrations resulting from emissions from the DYEC cumulative to local air quality, including validating the predicted concentrations from the dispersion modelling conducted in the Environmental Assessment (2009a);
- Monitor concentration levels of EFW-related 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 (PM2.5), 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 meteorological tower there, is approximately 10 meters tall. The Courtice Station collects the following meteorological parameters: ambient temperature, ambient pressure, precipitation and relative humidity. For purposes of this report, wind speed and wind direction data for the Courtice Station have been obtained from the adjacent Courtice Water Pollution Control Plant (WPCP) meteorological tower, which is approximately 20 meters tall.

Throughout this monitoring period there were three (3) exceedances of the AAQC for Benzo(a) Pyrene which occurred on March 11th at the Rundle Road Station and March 23rd at the Courtice and Rundle Road Stations. Recovery rates were acceptable and valid for all measured Q1 parameters.




**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 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.

## 2.2 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. New AAQC's for $SO_2$ were implemented in 2020, including a 10-minute rolling average AAQC of 67 ppb, a 1-hour rolling average AAQC of 40ppb and an annual AAQC of 4 ppb.

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 was no MECP audit during Q1.

# 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 2021 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: relative humidity, ambient temperature, ambient pressure and precipitation. For purposes of this report, wind speed and wind direction data for the Courtice Station have been obtained from the adjacent Courtice Water Pollution Control Plant (WPCP) meteorological tower, which is approximately 20 meters tall. The Courtice Station maintained a minimum 99.8% of data collection for all of the parameters measured during Q1. One hour of data was lost due to an overwriting issue with the WPCP software during the daylight savings shift on March 14th. 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 2021**

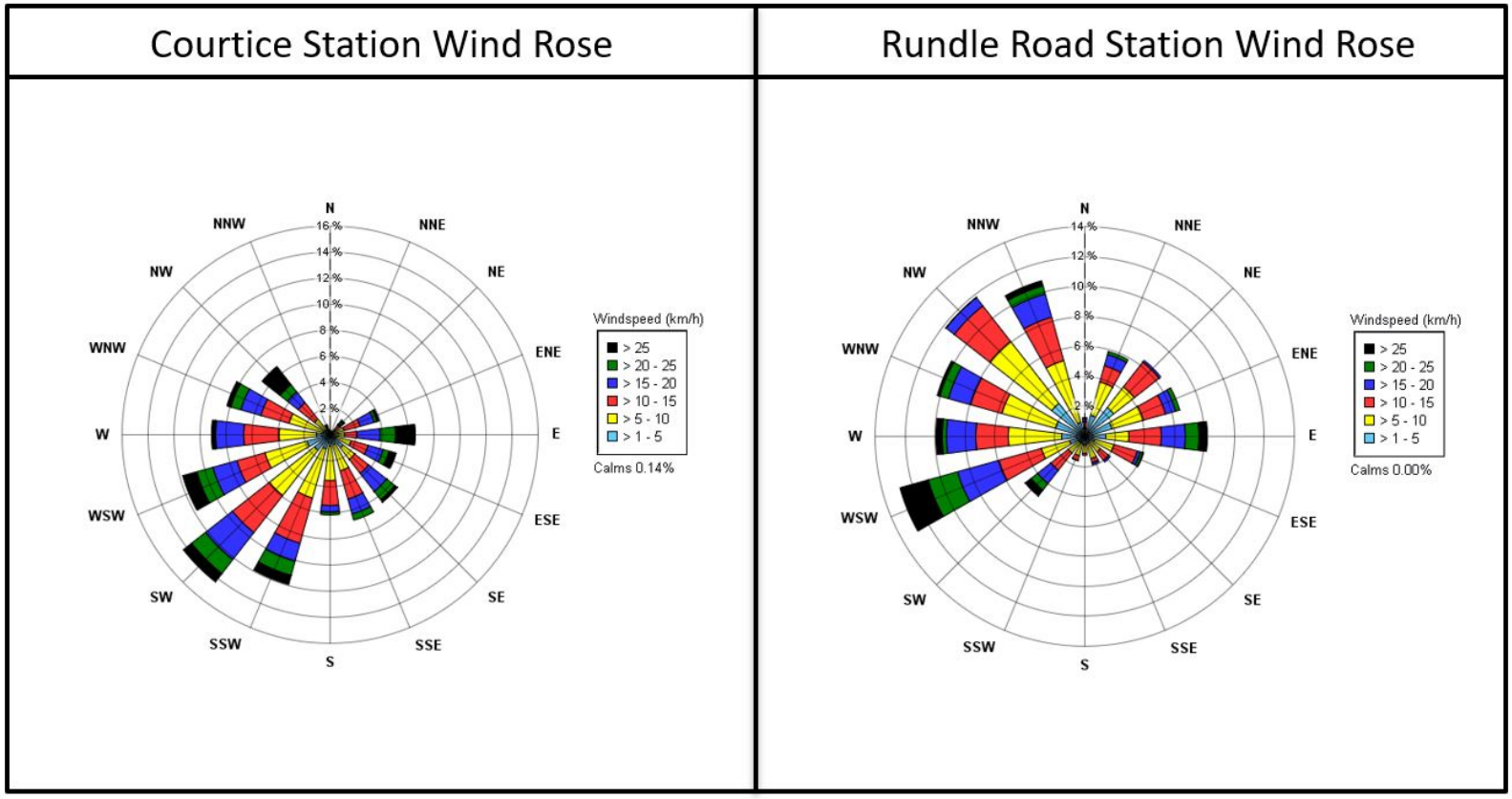


**Table 2: Hourly Statistics from the Courtice Station and WPCP (WS and WD) Meteorological Station**

| 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 | 39.6 | 4.8 | 96.9 | 30.2 | 3.0 | 1.0 | -16.9 | 28.9 | 29.1 | 0.0 | 12.1 | -2.5 | 70.9 | 29.7 | 0.0 | 21.1 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| February | 45.3 | 6.6 | 97.4 | 30.2 | 2.4 | 0.7 | -18.1 | 32.7 | 29.0 | 0.0 | 13.8 | -4.5 | 64.5 | 29.8 | 0.0 | 18.9 | 100.0 | 99.9 | 100.0 | 100.0 | 100.0 | 100.0 |
| March | 36.1 | 15.6 | 97.2 | 30.3 | 6.2 | 0.8 | -14.1 | 23.0 | 29.1 | 0.0 | 13.9 | 2.2 | 57.7 | 29.8 | 0.1 | 47.9 | 99.6 | 99.6 | 100.0 | 100.0 | 100.0 | 100.0 |
| Q1 Arithmetic Mean | | | | | | | | | | | 13.3 | -1.5 | 64.4 | 29.8 | 0.0 | 87.9 | 99.9 | 99.8 | 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 97.4% 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 | 32.0 | 5.1 | 100.0 | 3.4 | 0.0 | -18.9 | 32.1 | 0.0 | 9.4 | -3.0 | 72.9 | 0.0 | 24.0 | 100.0 | 96.5 | 100.0 | 100.0 | 100.0 |
| February | 40.7 | 6.2 | 100.0 | 2.5 | 0.5 | -21.4 | 32.4 | 0.0 | 11.5 | -5.0 | 65.9 | 0.1 | 33.8 | 100.0 | 98.2 | 100.0 | 100.0 | 100.0 |
| March | 31.9 | 16.9 | 100.0 | 6.3 | 0.2 | -14.4 | 23.0 | 0.0 | 11.2 | 1.8 | 59.0 | 0.1 | 54.7 | 100.0 | 97.6 | 100.0 | 100.0 | 100.0 |
| Q1 Arithmetic Mean | | | | | | | | | 10.7 | -2.1 | 65.9 | 0.1 | 112.5 | 100.0 | 97.4 | 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. There were no exceedance events above the AAQC guidelines for any continuous parameters in Q1 of 2021.

**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 | 49.7 | 39.7 | 60.7 | 40.9 | 30.2 | 37.7 | 29.4[A] | 29.7 | 13.7 | 16.1 | 6.3 | 6.7 | 7.1 | 1.5 | 5.8 | 1.1 | 99.7 | 99.6 | 99.6 | 99.6 | 99.7 |
| February | 21.0 | 39.8 | 71.6 | 37.7 | 36.1 | 12.5 | 22.0 | 26.8 | 8.3 | 18.5 | 3.7 | 6.2 | 7.0 | 1.1 | 5.9 | 0.9 | 99.9 | 99.7 | 99.7 | 99.7 | 99.7 |
| March | 27.1 | 37.8 | 54.2 | 24.4 | 34.9 | 10.8 | 16.1 | 21.4 | 4.7 | 16.8 | 3.3 | 6.0 | 6.0 | 0.9 | 5.4 | 0.6 | 99.7 | 99.7 | 99.7 | 99.7 | 99.7 |
| Q1 Arithmetic Mean | | | | | | | | | | | | 6.3 | 6.7 | 1.2 | 5.7 | 0.8 | 99.8 | 99.7 | 99.7 | 99.7 | 99.7 |

[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 | 17.4 | 33.7 | 50.9 | 35.4 | 29.4 | 9.0 | 26.0 | 20.2 | 6.2 | 16.7 | 1.1 | 6.7 | 4.7 | 0.9 | 4.1 | 0.3 | 99.9 | 99.7 | 99.7 | 99.7 | 99.7 |
| February | 10.7 | 34.4 | 38.8 | 13.0 | 28.8 | 4.8 | 20.7 | 16.3 | 2.3 | 14.2 | 0.9 | 6.2 | 4.8 | 0.6 | 4.4 | 0.2 | 99.9 | 99.7 | 99.7 | 99.7 | 99.7 |
| March | 5.6 | 25.8 | 36.1 | 13.0 | 32.8 | 4.7 | 16.3 | 15.6 | 2.7 | 13.1 | 1.0 | 6.1 | 4.7 | 0.8 | 4.1 | 0.3 | 99.9 | 99.6 | 99.6 | 99.6 | 99.7 |
| Q1 Arithmetic Mean | | | | | | | | | | | | 6.3 | 4.7 | 0.8 | 4.2 | 0.3 | 99.9 | 99.7 | 99.7 | 99.7 | 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 | 0 | 0 | | 0 | 0 | | 0 | 0 | N/A | 0 | | N/A | 0 | |
| February | 0 | 0 | | 0 | 0 | | 0 | 0 | N/A | 0 | | N/A | 0 | |
| March | 0 | 0 | | 0 | 0 | | 0 | 0 | N/A | 0 | | N/A | 0 | |
| Q1 Total | 0 | 0 | | 0 | 0 | | 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 (99.7% 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 36.1 ppb, which is 18.1% of the AAQC. The highest $NO_2$ value seen among the rolling 24-hour averages was 18.5 ppb, which is 18.5% 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.

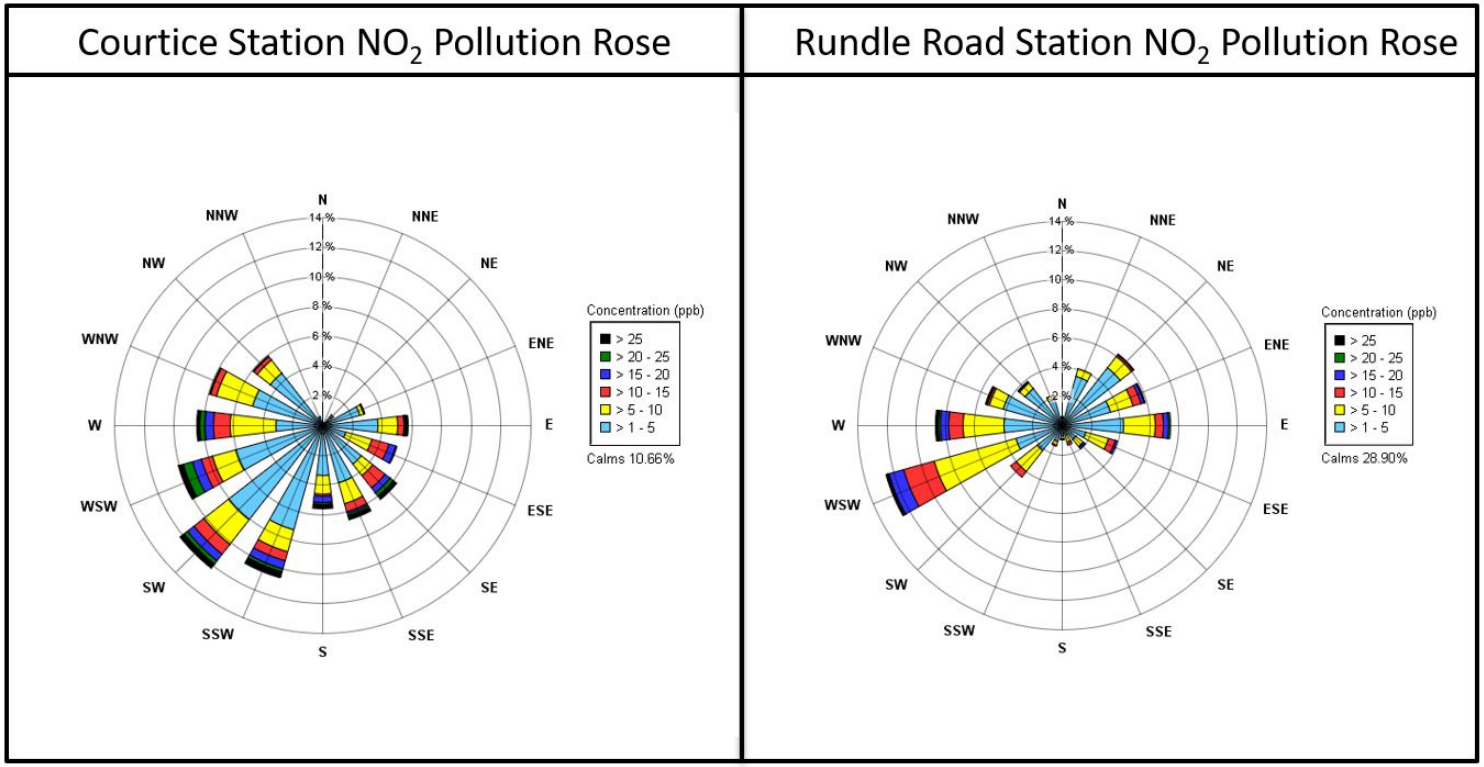
The Courtice Station pollution rose in **Figure 5** shows the majority of the $NO_2$ impacts were largely between the ESE and W directions. The Station would be downwind of the DYEC if winds were from the NE and ENE components, which happened to be very minimal, therefore it is unlikely that any significant impact came from the DYEC. There are larger impacts from the W which indicates likely impacts from the surrounding industry along the lakeshore, and from the ESE-SW which is likely from long range transport across the lake.

### 5.3.2 Rundle Road Station Results

Data recovery levels were high for oxides of nitrogen (99.7% 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 32.8 ppb, which is 16.4% of the AAQC. The highest $NO_2$ value seen among the rolling 24-hour averages was 16.7 ppb, which is 16.7% 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 pollution 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 WSW and E, which is in line with high traffic areas and urban background, with a possible contribution from DYEC in the WSW quadrant. It is unlikely that the DYEC was a major contributor to $NO_2$ levels at the station.

**Figure 5. Pollution Roses of Hourly Average $NO_2$ Concentrations – January to March 2021**



## 5.4 Sulphur Dioxide Results

### 5.4.1 Courtice 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 49.7 ppb, which is 74.2% of the AAQC. The highest $SO_2$ value seen among the 1-hour rolling averages was 37.7 ppb, which is 94.3% of the AAQC. There were no exceedance events of the rolling 10-minute AAQC or the rolling 1-hour AAQC.

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 pollution 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 E to S directions. The events were possibly a result of emissions from long range transport across the lake and a contribution from the SSE direction which would possibly originate from industrial sources along the lakeshore. It is unlikely that any significant contribution of measured $SO_2$ came from the DYEC. The Courtice Station pollution rose in **Figure 7** shows that there were no 5-min $SO_2$ events which were elevated >67 ppb.

### 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 17.4 ppb, which is 26.0% of the AAQC. The highest $SO_2$ value seen among the 1-hour rolling averages was 9.0 ppb, which is 22.5% of the AAQC. There were no exceedance events of the rolling 10-minute AAQC or the rolling 1-hour 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 pollution 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 ESE and WSW. The pollution rose indicates that the DYEC was a not major contributor to $SO_2$ levels at the station and that the levels may be related to other industrial activity. The Rundle Road Station pollution rose in **Figure 7** shows that no 5-min $SO_2$ events occurred which had elevated >67 ppb concentrations.

**Figure 6. Pollution Roses of Hourly Average $SO_2$ Concentrations – January to March 2021**

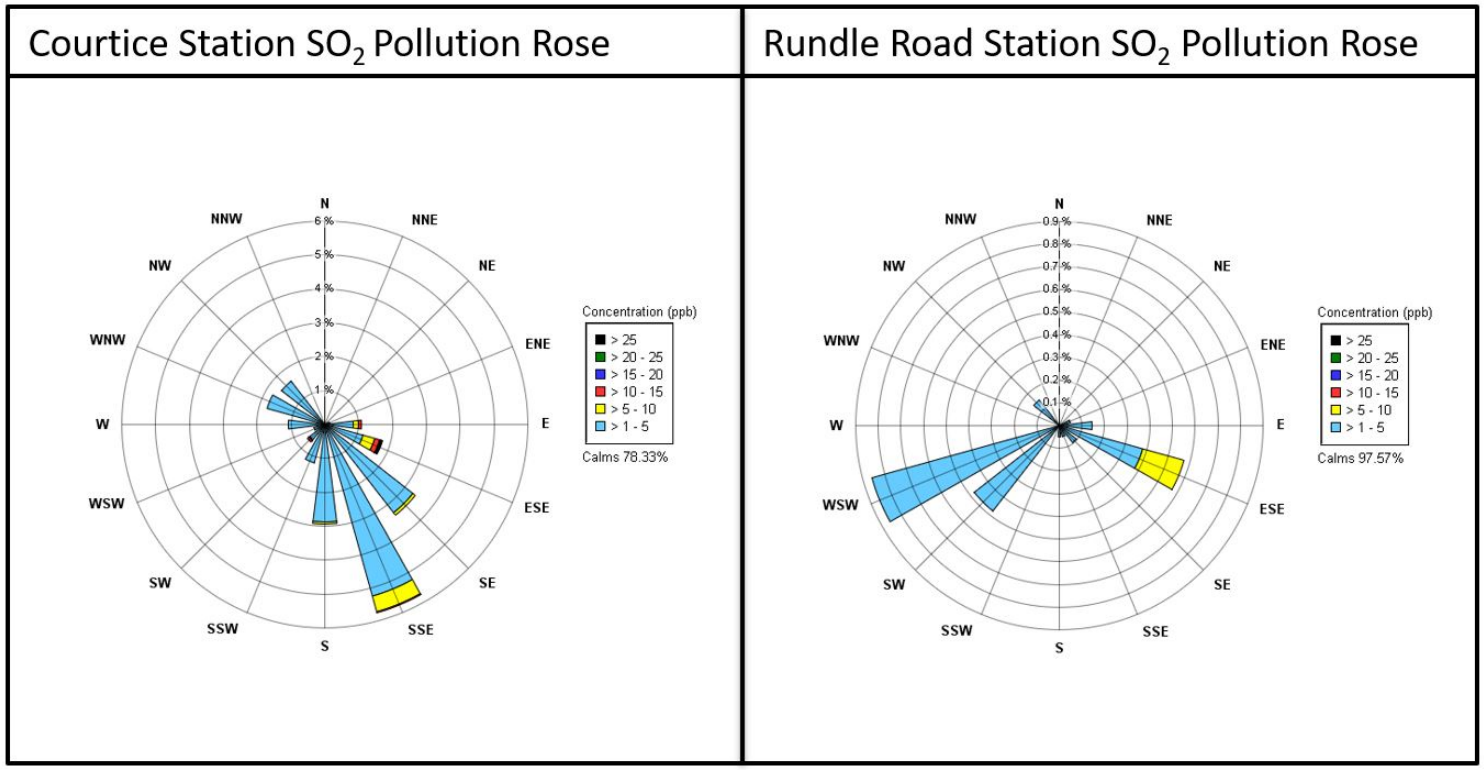
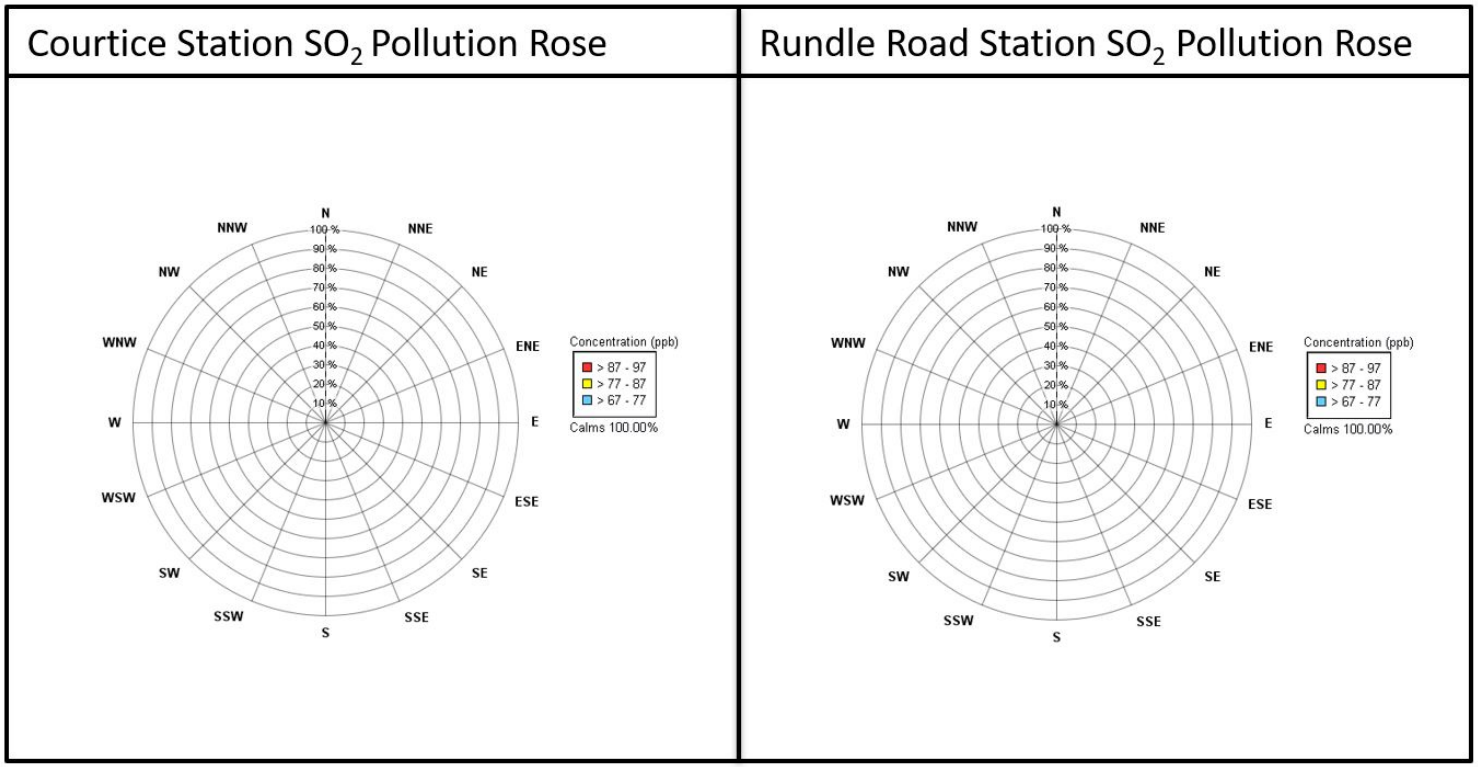


**Figure 7. Pollution Roses of 5-minute Average $SO_2$ Concentrations >67 ppb – January to March 2021**



## 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). 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 39.8 µg/m$^3$ and the highest value seen among the 24-hour rolling averages was 29.4 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.

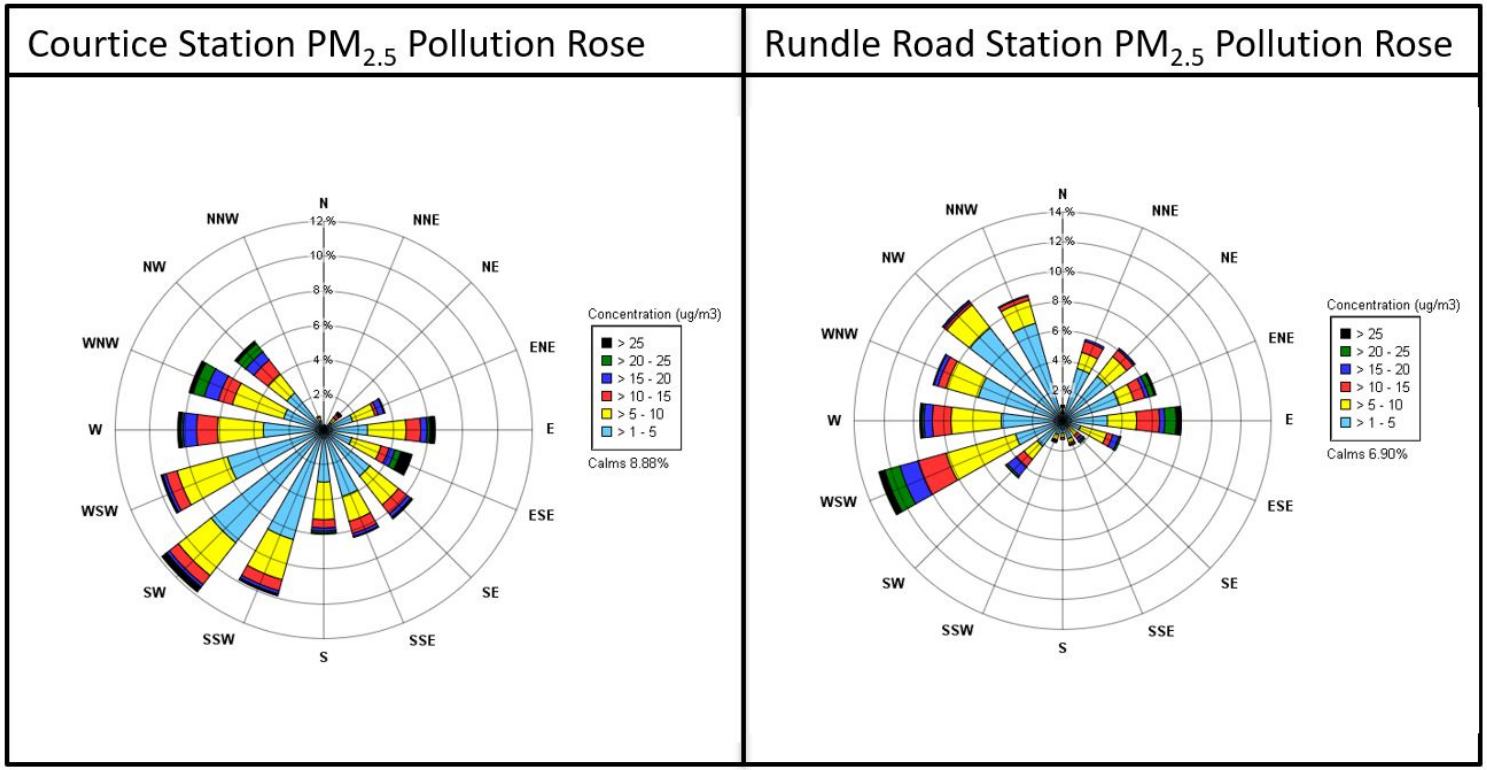
The Courtice Station pollution rose in **Figure 8** shows that the majority of elevated $PM_{2.5}$ events at Courtice were largely from the SW and ESE. Elevated $PM_{2.5}$ measurements were likely related to urban background, roadway emissions and other nearby industrial sources.

### 5.5.2 Rundle Road Station Results

Data recovery levels were high for particulate matter less than 2.5 microns (99.9% valid data). The highest $PM_{2.5}$ value seen among the 1-hour rolling averages was 34.4 µg/m$^3$ and the highest value seen among the 24-hour rolling averages was 26.0 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 WSW and E, which is in line with high traffic areas and urban background, with a possible contribution from the DYEC.

**Figure 8. Pollution Roses of Hourly Average $PM_{2.5}$ Concentrations – January to March 2021**



## 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 4, 10, 16, 22, 28, February 3, 9, 15, 21, 27 and March 5, 11, 17, 23, 29.

### 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 | 17.65 | 20.66 | 8.75 | 49.27 | 17.98 | 30.97 | 49.27 | 15 | 100 |
| **Total Mercury (Hg)** | µg/m$^3$ | *2* | *2* | 0 | 6.24E-06 | 9.45E-06 | 1.48E-06 | 2.68E-05 | 6.51E-06 | 2.44E-05 | 2.68E-05 | 15 | 100 |
| **Aluminum (Al)** | µg/m$^3$ | *4.8* | - | 0 | 8.22E-02 | 1.36E-01 | 2.86E-02 | 7.19E-01 | 9.32E-02 | 1.39E-01 | 7.19E-01 | 15 | 100 |
| **Antimony (Sb)** | µg/m$^3$ | *25* | *25* | 0 | 5.16E-04 | 7.72E-04 | 2.12E-04 | 3.16E-03 | 8.39E-04 | 3.16E-03 | 1.94E-03 | 15 | 100 |
| **Arsenic (As)** | µg/m$^3$ | *0.3* | *0.3* | 0 | 9.39E-04 | 9.62E-04 | 8.75E-04 | 1.95E-03 | 8.94E-04 | 9.01E-04 | 1.95E-03 | 15 | 100 |
| **Barium (Ba)** | µg/m$^3$ | *10* | *10* | 0 | 4.36E-03 | 5.46E-03 | 2.15E-03 | 1.97E-02 | 4.67E-03 | 4.45E-03 | 1.97E-02 | 15 | 100 |
| **Beryllium (Be)** | µg/m$^3$ | *0.01* | *0.01* | 0 | 2.06E-05 | 2.25E-05 | 1.46E-05 | 4.48E-05 | 2.98E-05 | 4.48E-05 | 4.01E-05 | 15 | 100 |
| **Bismuth (Bi)** | µg/m$^3$ | - | - | - | 5.36E-04 | 5.36E-04 | 5.25E-04 | 5.51E-04 | 5.37E-04 | 5.41E-04 | 5.51E-04 | 15 | 100 |
| **Boron (B)** | µg/m$^3$ | *120* | - | 0 | 5.80E-03 | 6.44E-03 | 4.38E-03 | 1.19E-02 | 1.19E-02 | 4.51E-03 | 4.59E-03 | 15 | 100 |
| **Cadmium (Cd)** | µg/m$^3$ | *0.025* | *0.025* | 0 | 1.85E-04 | 2.59E-04 | 5.00E-05 | 5.96E-04 | 5.96E-04 | 3.14E-04 | 1.75E-04 | 15 | 100 |
| **Chromium (Cr)** | µg/m$^3$ | *0.5* | - | 0 | 2.50E-03 | 2.78E-03 | 1.02E-03 | 5.69E-03 | 3.96E-03 | 3.10E-03 | 5.69E-03 | 15 | 100 |
| **Cobalt (Co)** | µg/m$^3$ | *0.1* | *0.1* | 0 | 2.43E-04 | 3.51E-04 | 8.34E-05 | 9.77E-04 | 5.96E-04 | 1.56E-04 | 9.77E-04 | 15 | 100 |
| **Copper (Cu)** | µg/m$^3$ | *50* | - | 0 | 1.41E-02 | 2.07E-02 | 4.06E-03 | 7.73E-02 | 2.43E-02 | 6.83E-02 | 7.73E-02 | 15 | 100 |
| **Iron (Fe)** | µg/m$^3$ | *4* | - | 0 | 2.58E-01 | 3.51E-01 | 1.27E-01 | 1.47E+00 | 2.31E-01 | 2.81E-01 | 1.47E+00 | 15 | 100 |
| **Lead (Pb)** | µg/m$^3$ | *0.5* | *0.5* | 0 | 1.70E-03 | 2.05E-03 | 6.88E-04 | 5.07E-03 | 2.67E-03 | 3.18E-03 | 5.07E-03 | 15 | 100 |
| **Magnesium (Mg)** | µg/m$^3$ | - | - | - | 1.39E-01 | 1.87E-01 | 2.96E-02 | 5.85E-01 | 1.25E-01 | 1.68E-01 | 5.85E-01 | 15 | 100 |
| **Manganese (Mn)** | µg/m$^3$ | *0.4* | - | 0 | 7.03E-03 | 9.19E-03 | 2.90E-03 | 3.23E-02 | 8.19E-03 | 1.05E-02 | 3.23E-02 | 15 | 100 |
| **Molybdenum (Mo)** | µg/m$^3$ | *120* | - | 0 | 6.79E-04 | 7.90E-04 | 2.95E-04 | 1.71E-03 | 1.71E-03 | 1.18E-03 | 1.54E-03 | 15 | 100 |
| **Nickel (Ni)** | µg/m$^3$ | *0.2* | - | 0 | 1.37E-03 | 1.56E-03 | 7.59E-04 | 3.51E-03 | 2.36E-03 | 3.03E-03 | 3.51E-03 | 15 | 100 |
| **Phosphorus (P)** | µg/m$^3$ | - | - | - | 2.36E-01 | 2.42E-01 | 2.19E-01 | 5.06E-01 | 2.24E-01 | 5.06E-01 | 2.29E-01 | 15 | 100 |
| **Selenium (Se)** | µg/m$^3$ | *10* | *10* | 0 | 7.81E-04 | 1.17E-03 | 3.79E-04 | 2.98E-03 | 2.98E-03 | 9.01E-04 | 8.39E-04 | 15 | 100 |
| **Silver (Ag)** | µg/m$^3$ | *1* | *1* | 0 | 6.01E-05 | 1.08E-04 | 2.63E-05 | 2.98E-04 | 2.98E-04 | 2.70E-05 | 1.11E-04 | 15 | 100 |
| **Strontium (Sr)** | µg/m$^3$ | *120* | - | 0 | 2.74E-03 | 4.17E-03 | 8.75E-04 | 1.64E-02 | 2.47E-03 | 4.59E-03 | 1.64E-02 | 15 | 100 |
| **Thallium (Tl)** | µg/m$^3$ | - | - | - | 2.68E-05 | 2.68E-05 | 2.63E-05 | 2.75E-05 | 2.68E-05 | 2.70E-05 | 2.75E-05 | 15 | 100 |
| **Tin (Sn)** | µg/m$^3$ | *10* | *10* | 0 | 6.27E-04 | 8.29E-04 | 1.76E-04 | 2.07E-03 | 2.07E-03 | 1.11E-03 | 1.82E-03 | 15 | 100 |
| **Titanium (Ti)** | µg/m$^3$ | *120* | - | 0 | 4.47E-03 | 6.19E-03 | 3.21E-03 | 2.38E-02 | 3.28E-03 | 7.07E-03 | 2.38E-02 | 15 | 100 |
| **Uranium (Ur)** | µg/m$^3$ | *1.5* | - | 0 | 1.90E-05 | 2.73E-05 | 5.10E-06 | 9.20E-05 | 2.98E-05 | 4.06E-05 | 9.20E-05 | 15 | 100 |
| **Vanadium (V)** | µg/m$^3$ | *2* | *1* | 0 | 1.49E-03 | 1.49E-03 | 1.46E-03 | 1.53E-03 | 1.49E-03 | 1.50E-03 | 1.53E-03 | 15 | 100 |
| **Zinc (Zn)** | µg/m$^3$ | *120* | - | 0 | 2.46E-02 | 3.20E-02 | 1.04E-02 | 1.49E-01 | 2.65E-02 | 1.49E-01 | 4.14E-02 | 15 | 100 |
| **Zirconium (Zr)** | µg/m$^3$ | *20* | - | 0 | 5.95E-04 | 5.95E-04 | 5.83E-04 | 6.12E-04 | 5.96E-04 | 6.01E-04 | 6.12E-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/m³ | *120* | *120* | 0 | 20.2 | 23.1 | 10.2 | 48.0 | 20.5 | 31.6 | 48.0 | 15 | 100 |
| **Total Mercury (Hg)** | µg/m³ | *2* | *2* | 0 | 5.40E-06 | 7.78E-06 | 1.48E-06 | 2.10E-05 | 3.05E-06 | 1.58E-05 | 2.10E-05 | 15 | 100 |
| **Aluminum (Al)** | µg/m³ | *4.8* | - | 0 | 9.51E-02 | 1.40E-01 | 2.67E-02 | 5.60E-01 | 1.17E-01 | 1.46E-01 | 5.60E-01 | 15 | 100 |
| **Antimony (Sb)** | µg/m³ | *25* | *25* | 0 | 3.04E-04 | 4.37E-04 | 7.16E-05 | 1.22E-03 | 6.11E-04 | 6.21E-04 | 1.22E-03 | 15 | 100 |
| **Arsenic (As)** | µg/m³ | *0.3* | *0.3* | 0 | 8.93E-04 | 8.93E-04 | 8.59E-04 | 9.16E-04 | 9.15E-04 | 9.11E-04 | 9.16E-04 | 15 | 100 |
| **Barium (Ba)** | µg/m³ | *10* | *10* | 0 | 3.69E-03 | 4.58E-03 | 1.09E-03 | 1.35E-02 | 4.84E-03 | 4.60E-03 | 1.35E-02 | 15 | 100 |
| **Beryllium (Be)** | µg/m³ | *0.01* | *0.01* | 0 | 1.79E-05 | 1.89E-05 | 1.43E-05 | 3.05E-05 | 3.05E-05 | 1.52E-05 | 1.53E-05 | 15 | 100 |
| **Bismuth (Bi)** | µg/m³ | - | - | - | 5.36E-04 | 5.36E-04 | 5.15E-04 | 5.50E-04 | 5.49E-04 | 5.47E-04 | 5.50E-04 | 15 | 100 |
| **Boron (B)** | µg/m³ | *120* | - | 0 | 5.80E-03 | 6.46E-03 | 4.29E-03 | 1.22E-02 | 1.22E-02 | 4.56E-03 | 4.58E-03 | 15 | 100 |
| **Cadmium (Cd)** | µg/m³ | *0.025* | *0.025* | 0 | 2.26E-04 | 2.84E-04 | 1.00E-04 | 6.10E-04 | 6.10E-04 | 3.31E-04 | 1.90E-04 | 15 | 100 |
| **Chromium (Cr)** | µg/m³ | *0.5* | - | 0 | 2.47E-03 | 2.66E-03 | 1.02E-03 | 4.87E-03 | 3.54E-03 | 2.63E-03 | 4.87E-03 | 15 | 100 |
| **Cobalt (Co)** | µg/m³ | *0.1* | *0.1* | 0 | 2.10E-04 | 2.98E-04 | 6.58E-05 | 7.16E-04 | 6.10E-04 | 1.40E-04 | 7.16E-04 | 15 | 100 |
| **Copper (Cu)** | µg/m³ | *50* | - | 0 | 8.86E-03 | 1.29E-02 | 3.09E-03 | 3.99E-02 | 3.16E-02 | 3.31E-02 | 3.99E-02 | 15 | 100 |
| **Iron (Fe)** | µg/m³ | *4* | - | 0 | 2.25E-01 | 3.03E-01 | 5.71E-02 | 8.84E-01 | 2.46E-01 | 2.84E-01 | 8.84E-01 | 15 | 100 |
| **Lead (Pb)** | µg/m³ | *0.5* | *0.5* | 0 | 1.56E-03 | 1.80E-03 | 7.21E-04 | 3.14E-03 | 2.42E-03 | 2.79E-03 | 3.14E-03 | 15 | 100 |
| **Magnesium (Mg)** | µg/m³ | - | - | - | 1.38E-01 | 1.76E-01 | 3.05E-02 | 4.41E-01 | 1.45E-01 | 1.38E-01 | 4.41E-01 | 15 | 100 |
| **Manganese (Mn)** | µg/m³ | *0.4* | - | 0 | 5.94E-03 | 7.80E-03 | 1.35E-03 | 1.94E-02 | 9.38E-03 | 7.90E-03 | 1.94E-02 | 15 | 100 |
| **Molybdenum (Mo)** | µg/m³ | *120* | - | 0 | 4.64E-04 | 5.38E-04 | 2.57E-04 | 1.23E-03 | 9.15E-04 | 8.66E-04 | 1.23E-03 | 15 | 100 |
| **Nickel (Ni)** | µg/m³ | *0.2* | - | 0 | 1.22E-03 | 1.36E-03 | 7.13E-04 | 2.79E-03 | 1.39E-03 | 2.79E-03 | 2.66E-03 | 15 | 100 |
| **Phosphorus (P)** | µg/m³ | - | - | - | 2.23E-01 | 2.23E-01 | 2.15E-01 | 2.29E-01 | 2.29E-01 | 2.28E-01 | 2.29E-01 | 15 | 100 |
| **Selenium (Se)** | µg/m³ | *10* | *10* | 0 | 6.67E-04 | 1.08E-03 | 3.72E-04 | 3.05E-03 | 3.05E-03 | 3.95E-04 | 3.97E-04 | 15 | 100 |
| **Silver (Ag)** | µg/m³ | *1* | *1* | 0 | 5.58E-05 | 1.05E-04 | 2.58E-05 | 3.05E-04 | 3.05E-04 | 2.73E-05 | 1.06E-04 | 15 | 100 |
| **Strontium (Sr)** | µg/m³ | *120* | - | 0 | 3.50E-03 | 4.81E-03 | 8.74E-04 | 1.21E-02 | 3.63E-03 | 4.33E-03 | 1.21E-02 | 15 | 100 |
| **Thallium (Tl)** | µg/m³ | - | - | - | 2.86E-05 | 2.99E-05 | 2.58E-05 | 7.40E-05 | 2.75E-05 | 2.73E-05 | 7.40E-05 | 15 | 100 |
| **Tin (Sn)** | µg/m³ | *10* | *10* | 0 | 6.60E-04 | 1.36E-03 | 1.72E-04 | 1.11E-02 | 1.11E-02 | 1.09E-03 | 1.39E-03 | 15 | 100 |
| **Titanium (Ti)** | µg/m³ | *120* | - | 0 | 4.61E-03 | 5.87E-03 | 3.15E-03 | 1.92E-02 | 3.36E-03 | 6.68E-03 | 1.92E-02 | 15 | 100 |
| **Uranium (Ur)** | µg/m³ | *1.5* | - | 0 | 1.59E-05 | 2.16E-05 | 5.32E-06 | 6.86E-05 | 3.05E-05 | 1.25E-05 | 6.86E-05 | 15 | 100 |
| **Vanadium (V)** | µg/m³ | *2* | *1* | 0 | 1.49E-03 | 1.49E-03 | 1.43E-03 | 1.53E-03 | 1.53E-03 | 1.52E-03 | 1.53E-03 | 15 | 100 |
| **Zinc (Zn)** | µg/m³ | *120* | - | 0 | 2.03E-02 | 2.38E-02 | 8.26E-03 | 6.93E-02 | 3.08E-02 | 6.93E-02 | 2.73E-02 | 15 | 100 |
| **Zirconium (Zr)** | µg/m³ | *20* | - | 0 | 5.95E-04 | 5.95E-04 | 5.72E-04 | 6.11E-04 | 6.10E-04 | 6.08E-04 | 6.11E-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 10, 22, February 3, 15, 27 and March 11 and 23.

### 5.7.1 Courtice Station Results

Data recovery levels were high for the PAH results at the Courtice Station (100% valid data). There was one (1) exceedance of the Benzo(a) Pyrene AAQC on March 23rd. There were no other exceedances of any of the AAQC's or HHRA Criteria. According to the Courtice meteorological data, the Courtice Station was not upwind or downwind of the DYEC during the sampling period. Since the winds were predominantly coming from the ENE-S, it is likely that the measured BaP exceedances may be attributed to industrial sources along the lakeshore with a possible contribution from DYEC in the ENE quadrant.

The Rundle Road Station was upwind of the DYEC during the sampling period and also measured a BaP exceedance on March 23rd. This is a further indication that high the concentrations of BaP measured on this date originated from an off-site source rather than the Energy Centre operations, as high readings recorded at both the upwind and downwind stations suggest elevated background concentrations in the surrounding area.

The exceedance documentation is attached in **Appendix E**. **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 | 3.11E+00 | 1.94E+00 | 4.55E+00 | 4.55E+00 | 3.43E+00 | 3.90E+00 | 7 | 100 |
| 2-Methylnaphthalene | ng/m³ | 10000 | 0 | 4.30E+00 | 2.54E+00 | 6.48E+00 | 5.61E+00 | 4.26E+00 | 6.48E+00 | 7 | 100 |
| Acenaphthene | ng/m³ | - | - | 3.17E-01 | 1.95E-01 | 4.42E-01 | 3.02E-01 | 3.47E-01 | 4.42E-01 | 7 | 100 |
| Acenaphthylene | ng/m³ | 3500 | 0 | 1.13E-01 | 3.28E-02 | 2.81E-01 | 2.81E-01 | 1.79E-01 | 7.86E-02 | 7 | 100 |
| Anthracene | ng/m³ | 200 | 0 | 2.32E-01 | 1.89E-02 | 1.36E+00 | 4.35E-02 | 1.36E+00 | 8.46E-02 | 7 | 100 |
| Benzo(a)Anthracene | ng/m³ | - | - | 3.33E-02 | 7.59E-03 | 1.20E-01 | 2.47E-02 | 2.43E-02 | 1.20E-01 | 7 | 100 |
| Benzo(a)fluorene | ng/m³ | - | - | 3.61E-02 | 1.50E-02 | 9.34E-02 | 4.72E-02 | 3.85E-02 | 9.34E-02 | 7 | 100 |
| Benzo(a)Pyrene (Historically High) | ng/m³ | 0.05 | 1 | 4.40E-02 | 1.05E-02 | 1.62E-01 | 2.15E-02 | 2.93E-02 | 1.62E-01 | 7 | 100 |
| Benzo(b)Fluoranthene | ng/m³ | - | - | 7.56E-02 | 2.98E-02 | 1.57E-01 | 8.41E-02 | 9.64E-02 | 1.57E-01 | 7 | 100 |
| Benzo(b)fluorene | ng/m³ | - | - | 2.29E-02 | 4.08E-03 | 6.42E-02 | 3.15E-02 | 2.35E-02 | 6.42E-02 | 7 | 100 |
| Benzo(e)Pyrene | ng/m³ | - | - | 5.95E-02 | 1.81E-02 | 1.55E-01 | 6.31E-02 | 5.57E-02 | 1.55E-01 | 7 | 100 |
| Benzo(g,h,i)Perylene | ng/m³ | - | - | 6.47E-02 | 1.76E-02 | 2.22E-01 | 5.51E-02 | 4.95E-02 | 2.22E-01 | 7 | 100 |
| Benzo(k)Fluoranthene | ng/m³ | - | - | 8.76E-02 | 2.30E-02 | 2.48E-01 | 1.01E-01 | 1.06E-01 | 2.48E-01 | 7 | 100 |
| Biphenyl | ng/m³ | - | - | 1.52E+00 | 1.04E+00 | 1.81E+00 | 1.81E+00 | 1.80E+00 | 1.64E+00 | 7 | 100 |
| Chrysene | ng/m³ | - | - | 1.11E-01 | 3.89E-02 | 2.97E-01 | 1.04E-01 | 1.21E-01 | 2.97E-01 | 7 | 100 |
| Dibenzo(a,h)Anthracene | ng/m³ | - | - | 1.03E-02 | 3.12E-04 | 2.73E-02 | 2.73E-02 | 4.60E-03 | 2.29E-02 | 7 | 100 |
| Fluoranthene | ng/m³ | - | - | 2.86E-01 | 1.35E-01 | 4.40E-01 | 4.15E-01 | 4.40E-01 | 2.76E-01 | 7 | 100 |
| Fluorene | ng/m³ | - | - | 4.96E-01 | 3.14E-01 | 6.36E-01 | 5.68E-01 | 6.21E-01 | 6.36E-01 | 7 | 100 |
| Indeno(1,2,3-cd)Pyrene | ng/m³ | - | - | 5.92E-02 | 1.48E-02 | 1.84E-01 | 5.15E-02 | 5.34E-02 | 1.84E-01 | 7 | 100 |
| Naphthalene | ng/m³ | 22500 | 0 | 1.59E+01 | 9.28E+00 | 2.40E+01 | 2.40E+01 | 1.94E+01 | 2.08E+01 | 7 | 100 |
| o-Terphenyl | ng/m³ | - | - | 7.76E-03 | 4.29E-03 | 1.11E-02 | 6.78E-03 | 8.61E-03 | 1.11E-02 | 7 | 100 |

| Contaminant | Units | MECP Criteria (µg/m$^3$) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perylene | ng/m$^3$ | - | - | 9.89E-03 | 3.13E-04 | 3.52E-02 | 4.02E-03 | 1.92E-02 | 3.52E-02 | 7 | 100 |
| Phenanthrene | ng/m$^3$ | - | - | 1.08E+00 | 4.43E-01 | 1.87E+00 | 1.63E+00 | 1.87E+00 | 8.64E-01 | 7 | 100 |
| Pyrene | ng/m$^3$ | - | - | 2.30E-01 | 1.12E-01 | 5.72E-01 | 2.54E-01 | 2.51E-01 | 5.72E-01 | 7 | 100 |
| Tetralin | ng/m$^3$ | - | - | 1.69E+00 | 1.26E+00 | 2.33E+00 | 2.22E+00 | 2.33E+00 | 2.03E+00 | 7 | 100 |
| Total PAH | ng/m$^3$ | - | - | 2.44E+01 | 0.00E+00 | 4.23E+01 | 4.23E+01 | 3.47E+01 | 2.26E+01 | 7 | 100 |

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

### 5.7.2 Rundle Road Station Results

Data recovery levels were high for the PAH results at the Rundle Road Station (100% valid data). There were two (2) exceedances of the Benzo(a) Pyrene AAQC which occurred on March 11th and March 23rd. There were no other exceedances of any of the AAQC's or HHRA Criteria.

According to the March 11th Rundle Road meteorological data, the Rundle Road Station was downwind of the DYEC, with winds predominantly from the WSW and SW, during part of the sampling period. The Courtice station was completely upwind of the DYEC during the sample day and the BaP reading there was 90% of the AAQC. This is an indication that high concentrations of BaP were coming from an off-site source SW of the DYEC and contributing to high BaP background concentrations. It is possible that the measured BaP exceedance measured at the Rundle Road Station, is partially attributable to the DYEC; however, it is likely that the exceedance is attributable to sources other than the Energy Centre operations, based on the recorded elevated BaP background concentrations in the surrounding area.

According to the March 23rd Rundle Road meteorological data, the Rundle Road Station was upwind of the DYEC during the sampling period. Since the winds were predominantly coming from the NE and E, it is likely that the measured BaP exceedances may be attributed to off-site sources rather than the Energy Centre operations.

The exceedance documentation is attached in **Appendix E**. **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/m$^3$) | 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* | 0 | 3.70E+00 | 1.45E+00 | 5.07E+00 | 4.81E+00 | 3.81E+00 | 5.07E+00 | 7 | 100 |
| 2-Methylnaphthalene | ng/m$^3$ | *10000* | 0 | 5.31E+00 | 1.81E+00 | 8.74E+00 | 5.84E+00 | 5.90E+00 | 8.74E+00 | 7 | 100 |
| Acenaphthene | ng/m$^3$ | - | - | 6.38E-01 | 6.86E-02 | 1.66E+00 | 2.65E-01 | 9.55E-01 | 1.66E+00 | 7 | 100 |
| Acenaphthylene | ng/m$^3$ | *3500* | 0 | 1.33E-01 | 5.86E-02 | 2.32E-01 | 1.70E-01 | 2.32E-01 | 1.12E-01 | 7 | 100 |
| Anthracene | ng/m$^3$ | *200* | 0 | 2.40E-01 | 3.88E-02 | 1.24E+00 | 1.07E-01 | 1.24E+00 | 7.84E-02 | 7 | 100 |
| Benzo(a)Anthracene | ng/m$^3$ | - | - | 3.36E-02 | 7.82E-03 | 1.03E-01 | 2.41E-02 | 2.38E-02 | 1.03E-01 | 7 | 100 |
| Benzo(a)fluorene | ng/m$^3$ | - | - | 4.54E-02 | 1.43E-02 | 1.16E-01 | 4.56E-02 | 3.83E-02 | 1.16E-01 | 7 | 100 |
| Benzo(a)Pyrene (Historically High) | ng/m$^3$ | *0.05* | 2 | 5.34E-02 | 1.03E-02 | 1.71E-01 | 2.52E-02 | 4.54E-02 | 1.71E-01 | 7 | 100 |
| Benzo(b)Fluoranthene | ng/m$^3$ | - | - | 8.76E-02 | 3.50E-02 | 1.77E-01 | 8.09E-02 | 9.68E-02 | 1.77E-01 | 7 | 100 |
| Benzo(b)fluorene | ng/m$^3$ | - | - | 2.72E-02 | 5.17E-03 | 7.07E-02 | 3.01E-02 | 2.05E-02 | 7.07E-02 | 7 | 100 |
| Benzo(e)Pyrene | ng/m$^3$ | - | - | 6.38E-02 | 1.93E-02 | 1.45E-01 | 6.19E-02 | 5.69E-02 | 1.45E-01 | 7 | 100 |
| Benzo(g,h,i)Perylene | ng/m$^3$ | - | - | 6.97E-02 | 1.81E-02 | 2.26E-01 | 5.19E-02 | 4.95E-02 | 2.26E-01 | 7 | 100 |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzo(k)Fluoranthene | ng/m³ | - | - | 8.36E-02 | 2.78E-02 | 2.10E-01 | 7.53E-02 | 8.15E-02 | 2.10E-01 | 7 | 100 |
| Biphenyl | ng/m³ | - | - | 1.79E+00 | 8.73E-01 | 2.41E+00 | 2.16E+00 | 1.72E+00 | 2.41E+00 | 7 | 100 |
| Chrysene | ng/m³ | - | - | 1.18E-01 | 4.30E-02 | 2.81E-01 | 1.04E-01 | 1.17E-01 | 2.81E-01 | 7 | 100 |
| Dibenzo(a,h)Anthracene | ng/m³ | - | - | 1.06E-02 | 3.93E-03 | 2.53E-02 | 1.86E-02 | 5.43E-03 | 2.53E-02 | 7 | 100 |
| Fluoranthene | ng/m³ | - | - | 3.93E-01 | 2.20E-01 | 5.83E-01 | 4.25E-01 | 4.31E-01 | 5.83E-01 | 7 | 100 |
| Fluorene | ng/m³ | - | - | 7.79E-01 | 2.94E-01 | 1.55E+00 | 5.69E-01 | 1.08E+00 | 1.55E+00 | 7 | 100 |
| Indeno(1,2,3-cd)Pyrene | ng/m³ | - | - | 6.50E-02 | 2.29E-02 | 1.87E-01 | 5.00E-02 | 5.30E-02 | 1.87E-01 | 7 | 100 |
| Naphthalene | ng/m³ | *22500* | 0 | 1.78E+01 | 8.37E+00 | 2.51E+01 | 2.28E+01 | 1.89E+01 | 2.51E+01 | 7 | 100 |
| o-Terphenyl | ng/m³ | - | - | 7.47E-03 | 3.41E-03 | 1.13E-02 | 7.34E-03 | 8.47E-03 | 1.13E-02 | 7 | 100 |
| Perylene | ng/m³ | - | - | 9.27E-03 | 2.99E-04 | 3.14E-02 | 4.47E-03 | 8.52E-03 | 3.14E-02 | 7 | 100 |
| Phenanthrene | ng/m³ | - | - | 1.71E+00 | 8.67E-01 | 2.72E+00 | 1.93E+00 | 1.98E+00 | 2.72E+00 | 7 | 100 |
| Pyrene | ng/m³ | - | - | 2.61E-01 | 1.23E-01 | 5.66E-01 | 2.57E-01 | 2.48E-01 | 5.66E-01 | 7 | 100 |
| Tetralin | ng/m³ | - | - | 1.61E+00 | 4.90E-01 | 3.23E+00 | 1.79E+00 | 3.23E+00 | 1.91E+00 | 7 | 100 |
| Total PAH | ng/m³ | - | - | 2.79E+01 | 0.00E+00 | 4.46E+01 | 4.17E+01 | 3.79E+01 | 4.46E+01 | 7 | 100 |

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 10, February 3, February 27 and March 23, 2021.

### 5.8.1 Courtice Station Results

Data recovery levels were high for the D&F results at the Courtice Station (100% 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 | $pg/m^3$ | - | - | - | 1.48E-03 | 5.50E-04 | 2.49E-03 | 2.33E-03 | 2.49E-03 | 5.66E-04 | 4 | 100 |
| 1,2,3,7,8-PeCDD | $pg/m^3$ | - | - | - | 1.63E-03 | 7.90E-04 | 2.89E-03 | 2.89E-03 | 1.48E-03 | 1.35E-03 | 4 | 100 |
| 1,2,3,4,7,8-HxCDD | $pg/m^3$ | - | - | - | 2.40E-04 | 1.09E-04 | 4.72E-04 | 4.72E-04 | 2.06E-04 | 1.73E-04 | 4 | 100 |
| 1,2,3,6,7,8-HxCDD | $pg/m^3$ | - | - | - | 4.73E-04 | 2.49E-04 | 7.74E-04 | 7.74E-04 | 5.09E-04 | 3.62E-04 | 4 | 100 |
| 1,2,3,7,8,9-HxCDD | $pg/m^3$ | - | - | - | 6.15E-04 | 2.49E-04 | 1.03E-03 | 4.45E-04 | 7.35E-04 | 1.03E-03 | 4 | 100 |
| 1,2,3,4,6,7,8-HpCDD | $pg/m^3$ | - | - | - | 6.22E-04 | 2.92E-04 | 9.43E-04 | 6.21E-04 | 6.29E-04 | 9.43E-04 | 4 | 100 |
| OCDD | $pg/m^3$ | - | - | - | 9.70E-05 | 5.30E-05 | 1.56E-04 | 5.30E-05 | 1.56E-04 | 1.19E-04 | 4 | 100 |
| 2,3,7,8-TCDF | $pg/m^3$ | - | - | - | 2.53E-04 | 8.08E-05 | 4.42E-04 | 4.42E-04 | 2.80E-04 | 2.11E-04 | 4 | 100 |
| 1,2,3,7,8-PeCDF | $pg/m^3$ | - | - | - | 5.20E-05 | 4.67E-06 | 9.02E-05 | 9.02E-05 | 7.84E-05 | 3.49E-05 | 4 | 100 |
| 2,3,4,7,8-PeCDF | $pg/m^3$ | - | - | - | 1.59E-03 | 2.89E-04 | 3.40E-03 | 2.01E-03 | 3.40E-03 | 6.60E-04 | 4 | 100 |
| 1,2,3,4,7,8-HxCDF | $pg/m^3$ | - | - | - | 3.53E-04 | 2.20E-04 | 5.71E-04 | 5.71E-04 | 3.26E-04 | 2.20E-04 | 4 | 100 |
| 1,2,3,6,7,8-HxCDF | $pg/m^3$ | - | - | - | 3.82E-04 | 1.48E-04 | 5.86E-04 | 5.58E-04 | 5.86E-04 | 2.36E-04 | 4 | 100 |
| 2,3,4,6,7,8-HxCDF | $pg/m^3$ | - | - | - | 4.06E-04 | 1.43E-04 | 1.12E-03 | 1.12E-03 | 1.58E-04 | 2.04E-04 | 4 | 100 |
| 1,2,3,7,8,9-HxCDF | $pg/m^3$ | - | - | - | 2.72E-04 | 1.27E-04 | 5.68E-04 | 5.68E-04 | 1.71E-04 | 2.20E-04 | 4 | 100 |
| 1,2,3,4,6,7,8-HpCDF | $pg/m^3$ | - | - | - | 2.05E-04 | 1.06E-04 | 2.89E-04 | 2.89E-04 | 1.85E-04 | 2.41E-04 | 4 | 100 |
| 1,2,3,4,7,8,9-HpCDF | $pg/m^3$ | - | - | - | 3.85E-05 | 9.35E-06 | 6.70E-05 | 4.68E-05 | 3.09E-05 | 6.70E-05 | 4 | 100 |
| OCDF | $pg/m^3$ | - | - | - | 1.07E-05 | 6.13E-06 | 1.70E-05 | 1.30E-05 | 1.70E-05 | 6.13E-06 | 4 | 100 |
| Total Toxic Equivalency | $pg\ TEQ/m^3$ | *0.1*<br>*1*[1] | - | 0 | 8.72E-03 | 4.68E-03 | 1.33E-02 | 1.33E-02 | 1.03E-02 | 6.64E-03 | 4 | 100 |

Note: All non-detectable results were reported as 1/2 of the detection limit
[1] O. Reg. 419/05 Schedule Upper Risk Thresholds

### 5.8.2 Rundle Road Station Results

Data recovery levels were high for the D&F results at the Rundle Road Station (100% 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$^3$ | - | - | - | 1.07E-03 | 4.72E-04 | 1.96E-03 | 1.20E-03 | 1.96E-03 | 4.72E-04 | 4 | 100 |
| 1,2,3,7,8-PeCDD | pg/m$^3$ | - | - | - | 1.12E-03 | 6.88E-04 | 1.73E-03 | 6.88E-04 | 1.05E-03 | 1.73E-03 | 4 | 100 |
| 1,2,3,4,7,8-HxCDD | pg/m$^3$ | - | - | - | 2.40E-04 | 9.06E-05 | 5.35E-04 | 9.06E-05 | 2.23E-04 | 5.35E-04 | 4 | 100 |
| 1,2,3,6,7,8-HxCDD | pg/m$^3$ | - | - | - | 4.03E-04 | 1.03E-04 | 7.58E-04 | 2.19E-04 | 5.33E-04 | 7.58E-04 | 4 | 100 |
| 1,2,3,7,8,9-HxCDD | pg/m$^3$ | - | - | - | 5.71E-04 | 3.09E-04 | 1.13E-03 | 3.97E-04 | 4.47E-04 | 1.13E-03 | 4 | 100 |
| 1,2,3,4,6,7,8-HpCDD | pg/m$^3$ | - | - | - | 4.72E-04 | 2.88E-04 | 8.93E-04 | 3.97E-04 | 3.09E-04 | 8.93E-04 | 4 | 100 |
| OCDD | pg/m$^3$ | - | - | - | 6.42E-05 | 1.73E-05 | 1.11E-04 | 1.73E-05 | 1.11E-04 | 1.03E-04 | 4 | 100 |
| 2,3,7,8-TCDF | pg/m$^3$ | - | - | - | 1.25E-04 | 5.31E-05 | 2.48E-04 | 5.31E-05 | 1.39E-04 | 2.48E-04 | 4 | 100 |
| 1,2,3,7,8-PeCDF | pg/m$^3$ | - | - | - | 4.23E-05 | 2.18E-05 | 6.89E-05 | 6.89E-05 | 4.23E-05 | 3.63E-05 | 4 | 100 |
| 2,3,4,7,8-PeCDF | pg/m$^3$ | - | - | - | 5.99E-04 | 2.04E-04 | 1.12E-03 | 7.29E-04 | 3.40E-04 | 1.12E-03 | 4 | 100 |
| 1,2,3,4,7,8-HxCDF | pg/m$^3$ | - | - | - | 2.30E-04 | 5.29E-05 | 5.60E-04 | 1.36E-04 | 1.70E-04 | 5.60E-04 | 4 | 100 |
| 1,2,3,6,7,8-HxCDF | pg/m$^3$ | - | - | - | 2.05E-04 | 1.11E-04 | 4.84E-04 | 1.11E-04 | 1.15E-04 | 4.84E-04 | 4 | 100 |
| 2,3,4,6,7,8-HxCDF | pg/m$^3$ | - | - | - | 2.26E-04 | 5.59E-05 | 4.44E-04 | 4.44E-04 | 1.51E-04 | 2.52E-04 | 4 | 100 |
| 1,2,3,7,8,9-HxCDF | pg/m$^3$ | - | - | - | 3.10E-04 | 6.87E-05 | 4.75E-04 | 3.53E-04 | 3.44E-04 | 4.75E-04 | 4 | 100 |
| 1,2,3,4,6,7,8-HpCDF | pg/m$^3$ | - | - | - | 1.44E-04 | 2.27E-05 | 2.21E-04 | 1.65E-04 | 1.69E-04 | 2.21E-04 | 4 | 100 |
| 1,2,3,4,7,8,9-HpCDF | pg/m$^3$ | - | - | - | 2.01E-05 | 6.65E-06 | 4.22E-05 | 4.22E-05 | 8.08E-06 | 2.36E-05 | 4 | 100 |
| OCDF | pg/m$^3$ | - | - | - | 7.51E-06 | 2.11E-06 | 1.21E-05 | 1.21E-05 | 5.15E-06 | 1.07E-05 | 4 | 100 |
| Total Toxic Equivalency | pg TEQ/m$^3$ | *0.1 1*[1] | - | 0 | 5.85E-03 | 4.30E-03 | 9.05E-03 | 5.13E-03 | 4.93E-03 | 9.05E-03 | 4 | 100 |

Note: All non-detectable results were reported as 1/2 of the detection limit
[1] O. Reg. 419/05 Schedule Upper Risk Thresholds

# 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**.

# 7 CONCLUSIONS

This Q1 report provides a summary of the ambient air quality data collected at the Courtice and Rundle Road Stations. Throughout this monitoring period there were three (3) exceedances of the AAQC for Benzo(a) Pyrene which occurred on March 23rd at the Courtice Station as well as March 11th and March 23rd at the Rundle Road Station. There were no exceedance events for any continuous parameters at the Courtice or Rundle Road Stations. Data recovery rates were acceptable and valid for all measured Q1 continuous parameters and all discrete parameters.

# 8 REFERENCES

1. Canadian Council of Ministers of the Environment (CCME), 2012. Guidance Document on Achievement Determination Canadian Ambient Air Quality Standards for Fine Particulate Matter and Ozone. PN 1483 978-1-896997-91-9 PDF

2. Canadian Council of Ministers of the Environment (CCME), 2019. Guidance Document on Air Zone Management. PN 1593 978-1-77202-050-2 PDF

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: 2021 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 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 | 49.7 | 39.7 | 60.7 | 40.9 | 30.2 | 37.7 | 29.4 | 29.7 | 13.7 | 16.1 | 6.3 | 6.7 | 7.1 | 1.5 | 5.8 | 1.1 | 99.7 | 99.6 | 99.6 | 99.6 | 99.7 |
| February | 21.0 | 39.8 | 71.6 | 37.7 | 36.1 | 12.5 | 22.0 | 26.8 | 8.3 | 18.5 | 3.7 | 6.2 | 7.0 | 1.1 | 5.9 | 0.9 | 99.9 | 99.7 | 99.7 | 99.7 | 99.7 |
| March | 27.1 | 37.8 | 54.2 | 24.4 | 34.9 | 10.8 | 16.1 | 21.4 | 4.7 | 16.8 | 3.3 | 6.0 | 6.0 | 0.9 | 5.4 | 0.6 | 99.7 | 99.7 | 99.7 | 99.7 | 99.7 |
| Q1 Arithmetic Mean | | | | | | | | | | | | 6.3 | 6.7 | 1.2 | 5.7 | 0.8 | 99.8 | 99.7 | 99.7 | 99.7 | 99.7 |

| Rundle Monitoring Station Data Statistics | Maximum 10 min Rolling Mean | Maximum 1 hr Rolling 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 | 17.4 | 33.7 | 50.9 | 35.4 | 29.4 | 9.0 | 26.0 | 20.2 | 6.2 | 16.7 | 1.1 | 6.7 | 4.7 | 0.9 | 4.1 | 0.3 | 99.9 | 99.7 | 99.7 | 99.7 | 99.7 |
| February | 10.7 | 34.4 | 38.8 | 13.0 | 28.8 | 4.8 | 20.7 | 16.3 | 2.3 | 14.2 | 0.9 | 6.2 | 4.8 | 0.6 | 4.4 | 0.2 | 99.9 | 99.7 | 99.7 | 99.7 | 99.7 |
| March | 5.6 | 25.8 | 36.1 | 13.0 | 32.8 | 4.7 | 16.3 | 15.6 | 2.7 | 13.1 | 1.0 | 6.1 | 4.7 | 0.8 | 4.1 | 0.3 | 99.9 | 99.6 | 99.6 | 99.6 | 99.7 |
| Q1 Arithmetic Mean | | | | | | | | | | | | 6.3 | 4.7 | 0.8 | 4.2 | 0.3 | 99.9 | 99.7 | 99.7 | 99.7 | 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 | 0 | 0 | | 0 | 0 | | 0 | 0 | N/A | 0 | | N/A | 0 | |
| February | 0 | 0 | | 0 | 0 | | 0 | 0 | N/A | 0 | | N/A | 0 | |
| March | 0 | 0 | | 0 | 0 | | 0 | 0 | N/A | 0 | | N/A | 0 | |
| Q1 Total | 0 | 0 | | 0 | 0 | | 0 | 0 | N/A | 0 | | N/A | 0 | |

| 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 | 39.6 | 4.8 | 96.9 | 30.2 | 3.0 | 1.0 | -16.9 | 28.9 | 29.1 | 0.0 | 12.1 | -2.5 | 70.9 | 29.7 | 0.0 | 21.1 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| February | 45.3 | 6.6 | 97.4 | 30.2 | 2.4 | 0.7 | -18.1 | 32.7 | 29.0 | 0.0 | 13.8 | -4.5 | 64.5 | 29.8 | 0.0 | 18.9 | 100.0 | 99.9 | 100.0 | 100.0 | 100.0 | 100.0 |
| March | 36.1 | 15.6 | 97.2 | 30.3 | 6.2 | 0.8 | -14.1 | 23.0 | 29.1 | 0.0 | 13.9 | 2.2 | 57.7 | 29.8 | 0.1 | 47.9 | 99.6 | 99.6 | 100.0 | 100.0 | 100.0 | 100.0 |
| Q1 Arithmetic Mean | | | | | | | | | | | 13.3 | -1.5 | 64.4 | 29.8 | 0.0 | 87.9 | 99.9 | 99.8 | 100.0 | 100.0 | 100.0 | 100.0 |

| Rundle 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 | 32.0 | 5.1 | 100.0 | 3.4 | 0.0 | -18.9 | 32.1 | 0.0 | 9.4 | -3.0 | 72.9 | 0.0 | 24.0 | 100.0 | 96.5 | 100.0 | 100.0 | 100.0 |
| February | 40.7 | 6.2 | 100.0 | 2.5 | 0.5 | -21.4 | 32.4 | 0.0 | 11.5 | -5.0 | 65.9 | 0.1 | 33.8 | 100.0 | 98.2 | 100.0 | 100.0 | 100.0 |
| March | 31.9 | 16.9 | 100.0 | 6.3 | 0.2 | -14.4 | 23.0 | 0.0 | 11.2 | 1.8 | 59.0 | 0.1 | 54.7 | 100.0 | 97.6 | 100.0 | 100.0 | 100.0 |
| Q1 Arithmetic Mean | | | | | | | | | 10.7 | -2.1 | 65.9 | 0.1 | 112.5 | 100.0 | 97.4 | 100.0 | 100.0 | 100.0 |

## Table A2: 2021 Q1 Station Courtice Monitoring Results for PM2.5

| 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 | 39.7 | 29.4 | 742 | 99.7 |
| February | N/A | 6.2 | 39.8 | 22.0 | 671 | 99.9 |
| March | N/A | 6.0 | 37.8 | 16.1 | 742 | 99.7 |

## Table A3: 2021 Q1 Station Rundle Monitoring Results for PM2.5

| 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 | 33.7 | 26.0 | 743 | 99.9 |
| February | N/A | 6.2 | 34.4 | 20.7 | 671 | 99.9 |
| March | N/A | 6.1 | 25.8 | 16.3 | 743 | 99.9 |

## Table A4: 2021 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 | 7.1 | 60.7 | 29.7 | 741 | 99.6 |
| February | N/A | N/A | 7.0 | 71.6 | 26.8 | 670 | 99.7 |
| March | N/A | N/A | 6.0 | 54.2 | 21.4 | 742 | 99.7 |

## Table A5: 2021 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 | 4.7 | 50.9 | 20.2 | 742 | 99.7 |
| February | N/A | N/A | 4.8 | 38.8 | 16.3 | 670 | 99.7 |
| March | N/A | N/A | 4.7 | 36.1 | 15.6 | 741 | 99.6 |

## Table A6: 2021 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 | 1.5 | 40.9 | 13.7 | 741 | 99.6 |
| February | N/A | N/A | 1.1 | 37.7 | 8.3 | 670 | 99.7 |
| March | N/A | N/A | 0.9 | 24.4 | 4.7 | 742 | 99.7 |

## Table A7: 2021 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 | 0.9 | 35.4 | 6.2 | 742 | 99.7 |
| February | N/A | N/A | 0.6 | 13.0 | 2.3 | 670 | 99.7 |
| March | N/A | N/A | 0.8 | 13.0 | 2.7 | 693 | 99.6 |

## Table A8: 2021 Q1 Station Courtice Monitoring Results for NO2

| 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 | 5.8 | 30.2 | 16.1 | 741 | 99.6 |
| February | 0 | 0 | 5.9 | 36.1 | 18.5 | 670 | 99.7 |
| March | 0 | 0 | 5.4 | 34.9 | 16.8 | 742 | 99.7 |

## Table A9: 2021 Q1 Station Rundle Monitoring Results for NO2

| 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 | 29.4 | 16.7 | 742 | 99.7 |
| February | 0 | 0 | 4.4 | 28.8 | 14.2 | 670 | 99.7 |
| March | 0 | 0 | 4.1 | 32.8 | 13.1 | 741 | 99.6 |

## Table A10: 2021 Q1 Station Courtice Monitoring Results for SO2

| 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 | 1.1 | 49.7 | 37.7 | 6.3 | 742 | 99.7 |
| February | 0 | 0 | 0.9 | 21.0 | 12.5 | 3.7 | 670 | 99.7 |
| March | 0 | 0 | 0.6 | 27.1 | 10.8 | 3.3 | 742 | 99.7 |

## Table A11: 2021 Q1 Station Rundle Monitoring Results for SO2

| 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 | 0.3 | 17.4 | 9.0 | 1.1 | 742 | 99.7 |
| February | 0 | 0 | 0.2 | 10.7 | 4.8 | 0.9 | 670 | 99.7 |
| March | 0 | 0 | 0.3 | 5.6 | 4.7 | 1.0 | 742 | 99.7 |

## Table A12: 2021 Q1 Courtice Meterological Station Windspeed Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Quarterly Mean | % Valid Hours |
|---|---|---|---|---|
| Month | Wind Speed | Wind Speed | Wind Speed | Wind Speed |
| | (km/hr) | (km/hr) | (km/hr) | (%) |
| January | 39.6 | 1.0 | 12.1 | 100.0 |
| February | 45.3 | 0.7 | 13.8 | 100.0 |
| March | 36.1 | 0.8 | 13.9 | 99.6 |

## Table A13: 2021 Q1 Rundle Meterological Station Windspeed Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Quarterly Mean | % Valid Hours |
|---|---|---|---|---|
| Month | Wind Speed | Wind Speed | Wind Speed | Wind Speed |
| | (km/hr) | (km/hr) | (km/hr) | (%) |
| January | 32.0 | 0.0 | 9.4 | 100.0 |
| February | 40.7 | 0.5 | 11.5 | 100.0 |
| March | 31.9 | 0.2 | 11.2 | 100.0 |

## Table A14: 2021 Q1 Courtice Meterological Station Wind Direction Data Summary

| MET Statistics | % Valid Hours |
|---|---|
| Month | Wind Direction |
| | (%) |
| January | 100.0 |
| February | 99.9 |
| March | 99.6 |

## Table A15: 2021 Q1 Rundle Meterological Station Wind Direction Data Summary

| MET Statistics | % Valid Hours |
|---|---|
| Month | Wind Direction |
| | (%) |
| January | 96.5 |
| February | 98.2 |
| March | 97.6 |

## Table A16: 2021 Q1 Courtice Meterological Station Temperature Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Quarterly Mean | % Valid Hours |
|---|---|---|---|---|
| Month | Temperature | Temperature | Temperature | Temperature |
| | (°C) | (°C) | (°C) | (%) |
| January | 4.8 | -16.9 | -2.5 | 100.0 |
| February | 6.6 | -18.1 | -4.5 | 100.0 |
| March | 15.6 | -14.1 | 2.2 | 100.0 |

## Table A17: 2021 Q1 Rundle Meterological Station Temperature Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Quarterly Mean | % Valid Hours |
|---|---|---|---|---|
| Month | Temperature | Temperature | Temperature | Temperature |
| | (°C) | (°C) | (°C) | (%) |
| January | 5.1 | -18.9 | -3.0 | 100.0 |
| February | 6.2 | -21.4 | -5.0 | 100.0 |
| March | 16.9 | -14.4 | 1.8 | 100.0 |

## Table A18: 2021 Q1 Courtice Meterological Station Relative Humidity Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Monthly Mean | % Valid Hours |
|---|---|---|---|---|
| Month | Relative Humidity | Relative Humidity | Relative Humidity | Relative Humidity |
| | (%) | (%) | (%) | (%) |
| January | 96.9 | 28.9 | 70.9 | 100.0 |
| February | 97.4 | 32.7 | 64.5 | 100.0 |
| March | 97.2 | 23.0 | 57.7 | 100.0 |

## Table A19: 2021 Q1 Rundle Meterological Station Relative Humidity Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Monthly Mean | % Valid Hours |
|---|---|---|---|---|
| Month | Relative Humidity | Relative Humidity | Relative Humidity | Relative Humidity |
| | (%) | (%) | (%) | (%) |
| January | 100.0 | 32.1 | 72.9 | 100.0 |
| February | 100.0 | 32.4 | 65.9 | 100.0 |
| March | 100.0 | 23.0 | 59.0 | 100.0 |

## Table A20: 2021 Q1 Courtice Meterological Station Precipitation Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Monthly Mean | Total | % Valid Hours |
|---|---|---|---|---|---|
| Month | Precipitation | Precipitation | Precipitation | Precipitation | Precipitation |
| | (mm) | (mm) | (mm) | (mm) | % |
| January | 3.0 | 0.0 | 0.0 | 21.1 | 100.0 |
| February | 2.4 | 0.0 | 0.0 | 18.9 | 100.0 |
| March | 6.2 | 0.0 | 0.1 | 47.9 | 100.0 |

## Table A21: 2021 Q1 Rundle Meterological Station Precipitation Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Monthly Mean | Total | % Valid Hours |
|---|---|---|---|---|---|
| Month | Precipitation | Precipitation | Precipitation | Precipitation | Precipitation |
| | (mm) | (mm) | (mm) | (mm) | % |
| January | 3.4 | 0.0 | 0.0 | 24.0 | 100.0 |
| February | 2.5 | 0.0 | 0.1 | 33.8 | 100.0 |
| March | 6.3 | 0.0 | 0.1 | 54.7 | 100.0 |

## Table A22: 2021 Q1 Courtice Meterological Station Pressure Data Summary

| MET Statistics | Maximum 1 hr Mean | Minimum 1 hr | Quarterly Mean | % Valid Hours |
|---|---|---|---|---|
| Month | Pressure | Pressure | Pressure | Pressure |
| | ("Hg) | ("Hg) | ("Hg) | (%) |
| January | 30.2 | 29.1 | 29.7 | 100.0 |
| February | 30.2 | 29.0 | 29.8 | 100.0 |
| March | 30.3 | 29.1 | 29.8 | 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 10, 2021 | L2548180-2 | 1440 | 301 | L2548180-1 | 1440 | 320 |
| February 3, 2021 | L2555839-1 | 1440 | 321 | L2555839-2 | 1440 | 331 |
| February 27, 2021 | L2563689-1 | 1440 | 291 | L2563689-2 | 1440 | 310 |
| March 23, 2021 | L2571239-1 | 1440 | 318 | L2571239-2 | 1440 | 341 |

**Table B2: 2021 Courtice Station Q1 Monitoring Results for Dioxins & Furans**

| Contaminant | Units | *MECP Criteria* | *HHRA Health Based Criteria* | 10-Jan-21 | 3-Feb-21 | 27-Feb-21 | 23-Mar-21 | MECP Criteria ($\mu g/m^3$) | 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 | $pg/m^3$ | - | - | 2.33E-03 | 2.49E-03 | 5.50E-04 | 5.66E-04 | - | - | 1.48E-03 | 5.50E-04 | 2.49E-03 | 2.33E-03 | 2.49E-03 | 5.66E-04 | 4 | 100 |
| 1,2,3,7,8-PeCDD | $pg/m^3$ | - | - | 2.89E-03 | 1.48E-03 | 7.90.E-04 | 1.35E-03 | - | - | 1.63E-03 | 7.90E-04 | 2.89E-03 | 2.89E-03 | 1.48E-03 | 1.35E-03 | 4 | 100 |
| 1,2,3,4,7,8-HxCDD | $pg/m^3$ | - | - | 4.72E-04 | 1.09E-04 | 2.06.E-04 | 1.73E-04 | - | - | 2.40E-04 | 1.09E-04 | 4.72E-04 | 4.72E-04 | 2.06E-04 | 1.73E-04 | 4 | 100 |
| 1,2,3,6,7,8-HxCDD | $pg/m^3$ | - | - | 7.74E-04 | 2.49E-04 | 5.09.E-04 | 3.62E-04 | - | - | 4.73E-04 | 2.49E-04 | 7.74E-04 | 7.74E-04 | 5.09E-04 | 3.62E-04 | 4 | 100 |
| 1,2,3,7,8,9-HxCDD | $pg/m^3$ | - | - | 4.45E-04 | 2.49E-04 | 7.35.E-04 | 1.03E-03 | - | - | 6.15E-04 | 2.49E-04 | 1.03E-03 | 4.45E-04 | 7.35E-04 | 1.03E-03 | 4 | 100 |
| 1,2,3,4,6,7,8-HpCDD | $pg/m^3$ | - | - | 6.21E-04 | 6.29E-04 | 2.92.E-04 | 9.43E-04 | - | - | 6.22E-04 | 2.92E-04 | 9.43E-04 | 6.21E-04 | 6.29E-04 | 9.43E-04 | 4 | 100 |
| OCDD | $pg/m^3$ | - | - | 5.30E-05 | 6.05E-05 | 1.56.E-04 | 1.19E-04 | - | - | 9.70E-05 | 5.30E-05 | 1.56E-04 | 5.30E-05 | 1.56E-04 | 1.19E-04 | 4 | 100 |
| 2,3,7,8-TCDF | $pg/m^3$ | - | - | 4.42E-04 | 2.80E-04 | 8.08.E-05 | 2.11E-04 | - | - | 2.53E-04 | 8.08E-05 | 4.42E-04 | 4.42E-04 | 2.80E-04 | 2.11E-04 | 4 | 100 |
| 1,2,3,7,8-PeCDF | $pg/m^3$ | - | - | 9.02E-05 | 4.67E-06 | 7.84.E-05 | 3.49E-05 | - | - | 5.20E-05 | 4.67E-06 | 9.02E-05 | 9.02E-05 | 7.84E-05 | 3.49E-05 | 4 | 100 |
| 2,3,4,7,8-PeCDF | $pg/m^3$ | - | - | 2.01E-03 | 3.40E-03 | 2.89.E-04 | 6.60E-04 | - | - | 1.59E-03 | 2.89E-04 | 3.40E-03 | 2.01E-03 | 3.40E-03 | 6.60E-04 | 4 | 100 |
| 1,2,3,4,7,8-HxCDF | $pg/m^3$ | - | - | 5.71E-04 | 2.96E-04 | 3.26.E-04 | 2.20E-04 | - | - | 3.53E-04 | 2.20E-04 | 5.71E-04 | 5.71E-04 | 3.26E-04 | 2.20E-04 | 4 | 100 |
| 1,2,3,6,7,8-HxCDF | $pg/m^3$ | - | - | 5.58E-04 | 5.86E-04 | 1.48.E-04 | 2.36E-04 | - | - | 3.82E-04 | 1.48E-04 | 5.86E-04 | 5.58E-04 | 5.86E-04 | 2.36E-04 | 4 | 100 |
| 2,3,4,6,7,8-HxCDF | $pg/m^3$ | - | - | 1.12E-03 | 1.43E-04 | 1.58.E-04 | 2.04E-04 | - | - | 4.06E-04 | 1.43E-04 | 1.12E-03 | 1.12E-03 | 1.58E-04 | 2.04E-04 | 4 | 100 |
| 1,2,3,7,8,9-HxCDF | $pg/m^3$ | - | - | 5.68E-04 | 1.71E-04 | 1.27.E-04 | 2.20E-04 | - | - | 2.72E-04 | 1.27E-04 | 5.68E-04 | 5.68E-04 | 1.71E-04 | 2.20E-04 | 4 | 100 |
| 1,2,3,4,6,7,8-HpCDF | $pg/m^3$ | - | - | 2.89E-04 | 1.06E-04 | 1.85.E-04 | 2.41E-04 | - | - | 2.05E-04 | 1.06E-04 | 2.89E-04 | 2.89E-04 | 1.85E-04 | 2.41E-04 | 4 | 100 |
| 1,2,3,4,7,8,9-HpCDF | $pg/m^3$ | - | - | 4.68E-05 | 9.35E-06 | 3.09.E-05 | 6.70E-05 | - | - | 3.85E-05 | 9.35E-06 | 6.70E-05 | 4.68E-05 | 3.09E-05 | 6.70E-05 | 4 | 100 |
| OCDF | $pg/m^3$ | - | - | 1.30E-05 | 6.54E-06 | 1.70.E-05 | 6.13E-06 | - | - | 1.07E-05 | 6.13E-06 | 1.70E-05 | 1.30E-05 | 1.70E-05 | 6.13E-06 | 4 | 100 |
| Total Toxic Equivalency | pg TEQ/$m^3$ | *0.1 1* [1] | - | 1.33E-02 | 1.03E-02 | 4.68E-03 | 6.64E-03 | 0.1 | 0 | 8.72E-03 | 4.68E-03 | 1.33E-02 | 1.33E-02 | 1.03E-02 | 6.64E-03 | 4 | 100 |

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: 2021 Rundle Station Q1 Monitoring Results for Dioxins & Furans**

| Contaminant | Units | *MECP Criteria* | *HHRA Health Based Criteria* | 10-Jan-21 | 3-Feb-21 | 27-Feb-21 | 23-Mar-21 | MECP Criteria (µg/m$^3$) | 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$^3$ | - | - | 1.20E-03 | 1.96E-03 | 6.36E-04 | 4.72E-04 | - | - | 1.07E-03 | 4.72E-04 | 1.96E-03 | 1.20E-03 | 1.96E-03 | 4.72E-04 | 4 | 100 |
| 1,2,3,7,8-PeCDD | pg/m$^3$ | - | - | 6.88E-04 | 1.03E-03 | 1.05E-03 | 1.73E-03 | - | - | 1.12E-03 | 6.88E-04 | 1.73E-03 | 6.88E-04 | 1.05E-03 | 1.73E-03 | 4 | 100 |
| 1,2,3,4,7,8-HxCDD | pg/m$^3$ | - | - | 9.06E-05 | 1.13E-04 | 2.23E-04 | 5.35E-04 | - | - | 2.40E-04 | 9.06E-05 | 5.35E-04 | 9.06E-05 | 2.23E-04 | 5.35E-04 | 4 | 100 |
| 1,2,3,6,7,8-HxCDD | pg/m$^3$ | - | - | 2.19E-04 | 1.03E-04 | 5.33E-04 | 7.58E-04 | - | - | 4.03E-04 | 1.03E-04 | 7.58E-04 | 2.19E-04 | 5.33E-04 | 7.58E-04 | 4 | 100 |
| 1,2,3,7,8,9-HxCDD | pg/m$^3$ | - | - | 3.97E-04 | 4.47E-04 | 3.09E-04 | 1.13E-03 | - | - | 5.71E-04 | 3.09E-04 | 1.13E-03 | 3.97E-04 | 4.47E-04 | 1.13E-03 | 4 | 100 |
| 1,2,3,4,6,7,8-HpCDD | pg/m$^3$ | - | - | 3.97E-04 | 2.88E-04 | 3.09E-04 | 8.93E-04 | - | - | 4.72E-04 | 2.88E-04 | 8.93E-04 | 3.97E-04 | 3.09E-04 | 8.93E-04 | 4 | 100 |
| OCDD | pg/m$^3$ | - | - | 1.73E-05 | 2.55E-05 | 1.11E-04 | 1.03E-04 | - | - | 6.42E-05 | 1.73E-05 | 1.11E-04 | 1.73E-05 | 1.11E-04 | 1.03E-04 | 4 | 100 |
| 2,3,7,8-TCDF | pg/m$^3$ | - | - | 5.31E-05 | 1.39E-04 | 6.01E-05 | 2.48E-04 | - | - | 1.25E-04 | 5.31E-05 | 2.48E-04 | 5.31E-05 | 1.39E-04 | 2.48E-04 | 4 | 100 |
| 1,2,3,7,8-PeCDF | pg/m$^3$ | - | - | 6.89E-05 | 2.18E-05 | 4.23E-05 | 3.63E-05 | - | - | 4.23E-05 | 2.18E-05 | 6.89E-05 | 6.89E-05 | 4.23E-05 | 3.63E-05 | 4 | 100 |
| 2,3,4,7,8-PeCDF | pg/m$^3$ | - | - | 7.29E-04 | 2.04E-04 | 3.40E-04 | 1.12E-03 | - | - | 5.99E-04 | 2.04E-04 | 1.12E-03 | 7.29E-04 | 3.40E-04 | 1.12E-03 | 4 | 100 |
| 1,2,3,4,7,8-HxCDF | pg/m$^3$ | - | - | 1.36E-04 | 5.29E-05 | 1.70E-04 | 5.60E-04 | - | - | 2.30E-04 | 5.29E-05 | 5.60E-04 | 1.36E-04 | 1.70E-04 | 5.60E-04 | 4 | 100 |
| 1,2,3,6,7,8-HxCDF | pg/m$^3$ | - | - | 1.11E-04 | 1.15E-04 | 1.12E-04 | 4.84E-04 | - | - | 2.05E-04 | 1.11E-04 | 4.84E-04 | 1.11E-04 | 1.15E-04 | 4.84E-04 | 4 | 100 |
| 2,3,4,6,7,8-HxCDF | pg/m$^3$ | - | - | 4.44E-04 | 5.59E-05 | 1.51E-04 | 2.52E-04 | - | - | 2.26E-04 | 5.59E-05 | 4.44E-04 | 4.44E-04 | 1.51E-04 | 2.52E-04 | 4 | 100 |
| 1,2,3,7,8,9-HxCDF | pg/m$^3$ | - | - | 3.53E-04 | 3.44E-04 | 6.87E-05 | 4.75E-04 | - | - | 3.10E-04 | 6.87E-05 | 4.75E-04 | 3.53E-04 | 3.44E-04 | 4.75E-04 | 4 | 100 |
| 1,2,3,4,6,7,8-HpCDF | pg/m$^3$ | - | - | 1.65E-04 | 2.27E-05 | 1.69E-04 | 2.21E-04 | - | - | 1.44E-04 | 2.27E-05 | 2.21E-04 | 1.65E-04 | 1.69E-04 | 2.21E-04 | 4 | 100 |
| 1,2,3,4,7,8,9-HpCDF | pg/m$^3$ | - | - | 4.22E-05 | 6.65E-06 | 8.08E-06 | 2.36E-05 | - | - | 2.01E-05 | 6.65E-06 | 4.22E-05 | 4.22E-05 | 8.08E-06 | 2.36E-05 | 4 | 100 |
| OCDF | pg/m$^3$ | - | - | 1.21E-05 | 2.11E-06 | 5.15E-06 | 1.07E-05 | - | - | 7.51E-06 | 2.11E-06 | 1.21E-05 | 1.21E-05 | 5.15E-06 | 1.07E-05 | 4 | 100 |
| Total Toxic Equivalency | pg TEQ/m$^3$ | *0.1 1* [1] | - | 5.13E-03 | 4.93E-03 | 4.30E-03 | 9.05E-03 | 0.1 | 0 | 5.85E-03 | 4.30E-03 | 9.05E-03 | 5.13E-03 | 4.93E-03 | 9.05E-03 | 4 | 100 |

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

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

**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 10, 2021 | L2548180-2 | 1440 | 301 | L2548180-1 | 1440 | 320 |
| January 22, 2021 | L2552026-1 | 1440 | 319 | L2552026-2 | 1440 | 335 |
| February 3, 2021 | L2555839-1 | 1440 | 321 | L2555839-2 | 1440 | 331 |
| February 15, 2021 | L2553488-3 | 1440 | 309 | L2553488-2 | 1440 | 313 |
| February 27, 2021 | L2558908-1 | 1440 | 291 | L2558908-2 | 1440 | 310 |
| March 11, 2021 | L2567745-1 | 1440 | 308 | L2567745-2 | 1440 | 324 |
| March 23, 2021 | L2571239-1 | 1440 | 318 | L2571239-2 | 1440 | 341 |

**Table B5: 2021 Courtice Station Q1 Monitoring Results for PAHs**

| Contaminant | Units | *MECP Criteria* | *HHRA Health Based Criteria* | 10 Jan-21 | 22 Jan-21 | 3-Feb-21 | 15 Feb-21 | 27 Feb-21 | 11 Mar 21 | 23 Mar 21 | 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* | - | 4.55 | 2.87 | 1.94 | 3.43 | 2.86 | 2.24 | 3.90 | 0 | 3.11E+00 | 1.94E+00 | 4.55E+00 | 4.55E+00 | 3.43E+00 | 3.90E+00 | 7 | 100 |
| 2-Methylnaphthalene | ng/m$^3$ | *10000* | - | 5.61 | 3.61 | 2.54 | 4.21 | 4.26 | 3.41 | 6.48 | 0 | 4.30E+00 | 2.54E+00 | 6.48E+00 | 5.61E+00 | 4.26E+00 | 6.48E+00 | 7 | 100 |
| Acenaphthene | ng/m$^3$ | - | - | 3.02E-01 | 1.95E-01 | 2.14E-01 | 3.10E-01 | 3.47E-01 | 4.42E-01 | 4.09E-01 | - | 3.17E-01 | 1.95E-01 | 4.42E-01 | 3.02E-01 | 3.47E-01 | 4.42E-01 | 7 | 100 |
| Acenaphthylene | ng/m$^3$ | *3500* | - | 2.81E-01 | 8.87E-02 | 7.48E-02 | 1.79E-01 | 5.50E-02 | 3.28E-02 | 7.86E-02 | 0 | 1.13E-01 | 3.28E-02 | 2.81E-01 | 2.81E-01 | 1.79E-01 | 7.86E-02 | 7 | 100 |
| Anthracene | ng/m$^3$ | *200* | - | 4.35E-02 | 2.95E-02 | 1.36E+00 | 5.83E-02 | 2.79E-02 | 1.89E-02 | 8.46E-02 | 0 | 2.32E-01 | 1.89E-02 | 1.36E+00 | 4.35E-02 | 1.36E+00 | 8.46E-02 | 7 | 100 |
| Benzo(a)Anthracene | ng/m$^3$ | - | - | 2.47E-02 | 7.59E-03 | 2.43E-02 | 2.15E-02 | 7.70E-03 | 2.73E-02 | 1.20E-01 | - | 3.33E-02 | 7.59E-03 | 1.20E-01 | 2.47E-02 | 2.43E-02 | 1.20E-01 | 7 | 100 |
| Benzo(a)fluorene | ng/m$^3$ | - | - | 4.72E-02 | 1.50E-02 | 1.50E-02 | 3.85E-02 | 2.20E-02 | 2.14E-02 | 9.34E-02 | - | 3.61E-02 | 1.50E-02 | 9.34E-02 | 4.72E-02 | 3.85E-02 | 9.34E-02 | 7 | 100 |
| Benzo(a)Pyrene (Historically High) | ng/m$^3$ | *0.05* [1] *5* [2] *1.1* [3] | *1* | 2.15E-02 | 1.05E-02 | 2.79E-02 | 2.93E-02 | 1.10E-02 | 4.55E-02 | 1.62E-01 | 1 | 4.40E-02 | 1.05E-02 | 1.62E-01 | 2.15E-02 | 2.93E-02 | 1.62E-01 | 7 | 100 |
| Benzo(b)Fluoranthene | ng/m$^3$ | - | - | 8.41E-02 | 2.98E-02 | 4.70E-02 | 9.64E-02 | 3.44E-02 | 8.08E-02 | 1.57E-01 | - | 7.56E-02 | 2.98E-02 | 1.57E-01 | 8.41E-02 | 9.64E-02 | 1.57E-01 | 7 | 100 |
| Benzo(b)fluorene | ng/m$^3$ | - | - | 3.15E-02 | 9.66E-03 | 4.08E-03 | 2.35E-02 | 1.19E-02 | 1.59E-02 | 6.42E-02 | - | 2.29E-02 | 4.08E-03 | 6.42E-02 | 3.15E-02 | 2.35E-02 | 6.42E-02 | 7 | 100 |
| Benzo(e)Pyrene | ng/m$^3$ | - | - | 6.31E-02 | 1.81E-02 | 4.08E-02 | 5.57E-02 | 2.26E-02 | 6.14E-02 | 1.55E-01 | - | 5.95E-02 | 1.81E-02 | 1.55E-01 | 6.31E-02 | 5.57E-02 | 1.55E-01 | 7 | 100 |
| Benzo(g,h,i)Perylene | ng/m$^3$ | - | - | 5.51E-02 | 1.76E-02 | 2.85E-02 | 4.95E-02 | 1.99E-02 | 5.97E-02 | 2.22E-01 | - | 6.47E-02 | 1.76E-02 | 2.22E-01 | 5.51E-02 | 4.95E-02 | 2.22E-01 | 7 | 100 |
| Benzo(k)Fluoranthene | ng/m$^3$ | - | - | 1.01E-01 | 2.73E-02 | 3.43E-02 | 1.06E-01 | 2.30E-02 | 7.27E-02 | 2.48E-01 | - | 8.76E-02 | 2.30E-02 | 2.48E-01 | 1.01E-01 | 1.06E-01 | 2.48E-01 | 7 | 100 |
| Biphenyl | ng/m$^3$ | - | - | 1.81E+00 | 1.35E+00 | 1.04E+00 | 1.80E+00 | 1.51E+00 | 1.49E+00 | 1.64E+00 | - | 1.52E+00 | 1.04E+00 | 1.81E+00 | 1.81E+00 | 1.80E+00 | 1.64E+00 | 7 | 100 |
| Chrysene | ng/m$^3$ | - | - | 1.04E-01 | 3.89E-02 | 6.85E-02 | 1.21E-01 | 5.95E-02 | 9.06E-02 | 2.97E-01 | - | 1.11E-01 | 3.89E-02 | 2.97E-01 | 1.04E-01 | 1.21E-01 | 2.97E-01 | 7 | 100 |
| Dibenzo(a,h)Anthracene | ng/m$^3$ | - | - | 5.75E-03 | 2.73E-02 | 3.12E-04 | 4.60E-03 | 4.26E-03 | 6.88E-03 | 2.29E-02 | - | 1.03E-02 | 3.12E-04 | 2.73E-02 | 2.73E-02 | 4.60E-03 | 2.29E-02 | 7 | 100 |
| Fluoranthene | ng/m$^3$ | - | - | 4.15E-01 | 2.05E-01 | 2.47E-01 | 4.40E-01 | 2.83E-01 | 2.76E-01 | 1.35E-01 | - | 2.86E-01 | 1.35E-01 | 4.40E-01 | 4.15E-01 | 4.40E-01 | 2.76E-01 | 7 | 100 |
| Fluorene | ng/m$^3$ | - | - | 5.68E-01 | 3.57E-01 | 3.71E-01 | 6.21E-01 | 6.01E-01 | 6.36E-01 | 3.14E-01 | - | 4.96E-01 | 3.14E-01 | 6.36E-01 | 5.68E-01 | 6.21E-01 | 6.36E-01 | 7 | 100 |
| Indeno(1,2,3-cd)Pyrene | ng/m$^3$ | - | - | 5.15E-02 | 1.48E-02 | 2.55E-02 | 5.34E-02 | 2.09E-02 | 6.40E-02 | 1.84E-01 | - | 5.92E-02 | 1.48E-02 | 1.84E-01 | 5.15E-02 | 5.34E-02 | 1.84E-01 | 7 | 100 |
| Naphthalene | ng/m$^3$ | *22500* | *22500* | 23.95 | 11.54 | 9.28 | 19.45 | 15.29 | 1.12E+01 | 2.08E+01 | 0 | 1.59E+01 | 9.28E+00 | 2.40E+01 | 2.40E+01 | 1.94E+01 | 2.08E+01 | 7 | 100 |
| o-Terphenyl | ng/m$^3$ | - | - | 6.78E-03 | 4.29E-03 | 5.14E-03 | 8.61E-03 | 8.59E-03 | 1.11E-02 | 9.81E-03 | - | 7.76E-03 | 4.29E-03 | 1.11E-02 | 6.78E-03 | 8.61E-03 | 1.11E-02 | 7 | 100 |
| Perylene | ng/m$^3$ | - | - | 4.02E-03 | 3.13E-04 | 1.92E-02 | 2.56E-03 | 3.44E-04 | 7.60E-03 | 3.52E-02 | - | 9.89E-03 | 3.13E-04 | 3.52E-02 | 4.02E-03 | 1.92E-02 | 3.52E-02 | 7 | 100 |
| Phenanthrene | ng/m$^3$ | - | - | 1.63E+00 | 8.68E-01 | 9.63E-01 | 1.87E+00 | 9.52E-01 | 8.64E-01 | 4.43E-01 | - | 1.08E+00 | 4.43E-01 | 1.87E+00 | 1.63E+00 | 1.87E+00 | 8.64E-01 | 7 | 100 |
| Pyrene | ng/m$^3$ | - | - | 2.54E-01 | 1.12E-01 | 1.47E-01 | 2.51E-01 | 1.29E-01 | 1.42E-01 | 5.72E-01 | - | 2.30E-01 | 1.12E-01 | 5.72E-01 | 2.54E-01 | 2.51E-01 | 5.72E-01 | 7 | 100 |
| Tetralin | ng/m$^3$ | - | - | 2.22 | 1.29 | 1.27 | 1.46 | 2.33 | 1.26 | 2.03 | - | 1.69E+00 | 1.26E+00 | 2.33E+00 | 2.22E+00 | 2.33E+00 | 2.03E+00 | 7 | 100 |
| Total PAH[4] | ng/m$^3$ | - | - | 42.25 | 22.72 | 19.79 | 34.68 | 28.89 | 22.58 | 0.00 | - | 2.44E+01 | 0.00E+00 | 4.23E+01 | 4.23E+01 | 3.47E+01 | 2.26E+01 | 7 | 100 |

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 B6: 2021 Rundle Station Q1 Monitoring Results for PAHs**

| Contaminant | Units | *MECP Criteria* | *HHRA Health Based Criteria* | 10-Jan-21 | 22-Jan-21 | 3-Feb-21 | 15-Feb-21 | 27-Feb-21 | 11-Mar-21 | 23-Mar-21 | 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* | - | 4.81 | 2.51 | 1.45 | 3.26 | 3.81 | 5.00 | 5.07 | 0 | 3.70E+00 | 1.45E+00 | 5.07E+00 | 4.81E+00 | 3.81E+00 | 5.07E+00 | 7 | 100 |
| 2-Methylnaphthalene | ng/m$^3$ | *10000* | - | 5.84 | 3.01 | 1.81 | 3.90 | 5.90 | 7.96 | 8.74 | 0 | 5.31E+00 | 1.81E+00 | 8.74E+00 | 5.84E+00 | 5.90E+00 | 8.74E+00 | 7 | 100 |
| Acenaphthene | ng/m$^3$ | - | - | 2.65E-01 | 1.71E-01 | 6.86E-02 | 1.45E-01 | 9.55E-01 | 1.66E+00 | 1.20E+00 | - | 6.38E-01 | 6.86E-02 | 1.66E+00 | 2.65E-01 | 9.55E-01 | 1.66E+00 | 7 | 100 |
| Acenaphthylene | ng/m$^3$ | *3500* | - | 1.70E-01 | 1.42E-01 | 5.86E-02 | 2.32E-01 | 1.27E-01 | 1.12E-01 | 8.97E-02 | 0 | 1.33E-01 | 5.86E-02 | 2.32E-01 | 1.70E-01 | 2.32E-01 | 1.12E-01 | 7 | 100 |
| Anthracene | ng/m$^3$ | *200* | - | 1.07E-01 | 3.88E-02 | 1.24E+00 | 7.48E-02 | 7.00E-02 | 7.84E-02 | 7.68E-02 | 0 | 2.40E-01 | 3.88E-02 | 1.24E+00 | 1.07E-01 | 1.24E+00 | 7.84E-02 | 7 | 100 |
| Benzo(a)Anthracene | ng/m$^3$ | - | - | 2.41E-02 | 7.82E-03 | 2.38E-02 | 2.27E-02 | 1.05E-02 | 4.32E-02 | 1.03E-01 | - | 3.36E-02 | 7.82E-03 | 1.03E-01 | 2.41E-02 | 2.38E-02 | 1.03E-01 | 7 | 100 |
| Benzo(a)fluorene | ng/m$^3$ | - | - | 4.56E-02 | 1.85E-02 | 1.43E-02 | 3.83E-02 | 2.75E-02 | 5.71E-02 | 1.16E-01 | - | 4.54E-02 | 1.43E-02 | 1.16E-01 | 4.56E-02 | 3.83E-02 | 1.16E-01 | 7 | 100 |
| Benzo(a)Pyrene (Historically High) | ng/m$^3$ | *0.05* [1] *5* [2] *1.1* [3] | *1* | 2.52E-02 | 1.03E-02 | 2.75E-02 | 4.54E-02 | 1.85E-02 | 7.62E-02 | 1.71E-01 | 2 | 5.34E-02 | 1.03E-02 | 1.71E-01 | 2.52E-02 | 4.54E-02 | 1.71E-01 | 7 | 100 |
| Benzo(b)Fluoranthene | ng/m$^3$ | - | - | 8.09E-02 | 4.30E-02 | 3.50E-02 | 9.68E-02 | 4.06E-02 | 1.40E-01 | 1.77E-01 | - | 8.76E-02 | 3.50E-02 | 1.77E-01 | 8.09E-02 | 9.68E-02 | 1.77E-01 | 7 | 100 |
| Benzo(b)fluorene | ng/m$^3$ | - | - | 3.01E-02 | 1.20E-02 | 5.17E-03 | 2.05E-02 | 1.40E-02 | 3.80E-02 | 7.07E-02 | - | 2.72E-02 | 5.17E-03 | 7.07E-02 | 3.01E-02 | 2.05E-02 | 7.07E-02 | 7 | 100 |
| Benzo(e)Pyrene | ng/m$^3$ | - | - | 6.19E-02 | 1.93E-02 | 3.35E-02 | 5.69E-02 | 3.77E-02 | 9.23E-02 | 1.45E-01 | - | 6.38E-02 | 1.93E-02 | 1.45E-01 | 6.19E-02 | 5.69E-02 | 1.45E-01 | 7 | 100 |
| Benzo(g,h,i)Perylene | ng/m$^3$ | - | - | 5.19E-02 | 1.81E-02 | 2.91E-02 | 4.95E-02 | 2.97E-02 | 8.40E-02 | 2.26E-01 | - | 6.97E-02 | 1.81E-02 | 2.26E-01 | 5.19E-02 | 4.95E-02 | 2.26E-01 | 7 | 100 |
| Benzo(k)Fluoranthene | ng/m$^3$ | - | - | 7.53E-02 | 3.37E-02 | 3.72E-02 | 8.15E-02 | 2.78E-02 | 1.20E-01 | 2.10E-01 | - | 8.36E-02 | 2.78E-02 | 2.10E-01 | 7.53E-02 | 8.15E-02 | 2.10E-01 | 7 | 100 |
| Biphenyl | ng/m$^3$ | - | - | 2.16E+00 | 1.38E+00 | 8.73E-01 | 1.72E+00 | 1.67E+00 | 2.32E+00 | 2.41E+00 | - | 1.79E+00 | 8.73E-01 | 2.41E+00 | 2.16E+00 | 1.72E+00 | 2.41E+00 | 7 | 100 |
| Chrysene | ng/m$^3$ | - | - | 1.04E-01 | 4.30E-02 | 5.83E-02 | 1.17E-01 | 6.19E-02 | 1.62E-01 | 2.81E-01 | - | 1.18E-01 | 4.30E-02 | 2.81E-01 | 1.04E-01 | 1.17E-01 | 2.81E-01 | 7 | 100 |
| Dibenzo(a,h)Anthracene | ng/m$^3$ | - | - | 5.84E-03 | 1.86E-02 | 3.93E-03 | 5.43E-03 | 4.61E-03 | 1.02E-02 | 2.53E-02 | - | 1.06E-02 | 3.93E-03 | 2.53E-02 | 1.86E-02 | 5.43E-03 | 2.53E-02 | 7 | 100 |
| Fluoranthene | ng/m$^3$ | - | - | 4.25E-01 | 2.21E-01 | 2.20E-01 | 4.31E-01 | 4.13E-01 | 5.83E-01 | 4.57E-01 | - | 3.93E-01 | 2.20E-01 | 5.83E-01 | 4.25E-01 | 4.31E-01 | 5.83E-01 | 7 | 100 |
| Fluorene | ng/m$^3$ | - | - | 5.69E-01 | 3.61E-01 | 2.94E-01 | 5.91E-01 | 1.08E+00 | 1.55E+00 | 1.01E+00 | - | 7.79E-01 | 2.94E-01 | 1.55E+00 | 5.69E-01 | 1.08E+00 | 1.55E+00 | 7 | 100 |
| Indeno(1,2,3-cd)Pyrene | ng/m$^3$ | - | - | 5.00E-02 | 2.29E-02 | 2.76E-02 | 5.30E-02 | 2.86E-02 | 8.58E-02 | 1.87E-01 | - | 6.50E-02 | 2.29E-02 | 1.87E-01 | 5.00E-02 | 5.30E-02 | 1.87E-01 | 7 | 100 |
| Naphthalene | ng/m$^3$ | *22500* | *22500* | 22.78 | 11.67 | 8.37 | 18.88 | 18.35 | 1.96E+01 | 2.51E+01 | 0 | 1.78E+01 | 8.37E+00 | 2.51E+01 | 2.28E+01 | 1.89E+01 | 2.51E+01 | 7 | 100 |
| o-Terphenyl | ng/m$^3$ | - | - | 7.34E-03 | 4.72E-03 | 3.41E-03 | 8.47E-03 | 8.42E-03 | 1.13E-02 | 8.59E-03 | - | 7.47E-03 | 3.41E-03 | 1.13E-02 | 7.34E-03 | 8.47E-03 | 1.13E-02 | 7 | 100 |
| Perylene | ng/m$^3$ | - | - | 4.47E-03 | 2.99E-04 | 8.52E-03 | 3.74E-03 | 4.61E-03 | 1.19E-02 | 3.14E-02 | - | 9.27E-03 | 2.99E-04 | 3.14E-02 | 4.47E-03 | 8.52E-03 | 3.14E-02 | 7 | 100 |
| Phenanthrene | ng/m$^3$ | - | - | 1.93E+00 | 9.49E-01 | 8.67E-01 | 1.98E+00 | 1.84E+00 | 2.72E+00 | 1.69E+00 | - | 1.71E+00 | 8.67E-01 | 2.72E+00 | 1.93E+00 | 1.98E+00 | 2.72E+00 | 7 | 100 |
| Pyrene | ng/m$^3$ | - | - | 2.57E-01 | 1.23E-01 | 1.27E-01 | 2.48E-01 | 1.85E-01 | 3.21E-01 | 5.66E-01 | - | 2.61E-01 | 1.23E-01 | 5.66E-01 | 2.57E-01 | 2.48E-01 | 5.66E-01 | 7 | 100 |
| Tetralin | ng/m$^3$ | - | - | 1.79 | 0.49 | 0.75 | 1.32 | 3.23 | 1.79 | 1.91 | - | 1.61E+00 | 4.90E-01 | 3.23E+00 | 1.79E+00 | 3.23E+00 | 1.91E+00 | 7 | 100 |
| Total PAH[4] | ng/m$^3$ | - | - | 41.68 | 21.32 | 16.43 | 33.38 | 37.94 | 44.60 | 0.00 | - | 2.79E+01 | 0.00E+00 | 4.46E+01 | 4.17E+01 | 3.79E+01 | 4.46E+01 | 7 | 100 |

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 4, 2021 | 741045 | 1440 | 1692 | 741044 | 1440 | 1639 |
| January 10, 2021 | 741150 | 1440 | 1677 | 741149 | 1440 | 1697 |
| January 16, 2021 | 741153 | 1440 | 1685 | 741152 | 1440 | 1653 |
| January 22, 2021 | 741155 | 1440 | 1691 | 741154 | 1440 | 1693 |
| January 28, 2021 | 741157 | 1440 | 1700 | 741156 | 1440 | 1747 |
| February 3, 2021 | 741159 | 1440 | 1697 | 741158 | 1440 | 1646 |
| February 9, 2021 | 741161 | 1440 | 1705 | 741160 | 1440 | 1688 |
| February 15, 2021 | 741163 | 1440 | 1714 | 741162 | 1440 | 1717 |
| February 21, 2021 | 741165 | 1440 | 1679 | 741164 | 1440 | 1709 |
| February 27, 2021 | 741167 | 1440 | 1664 | 741166 | 1440 | 1674 |
| March 5, 2021 | 741169 | 1440 | 1700 | 741170 | 1440 | 1713 |
| March 11, 2021 | 741196 | 1440 | 1634 | 741168 | 1440 | 1637 |
| March 17, 2021 | 741198 | 1440 | 1669 | 741197 | 1440 | 1663 |
| March 23, 2021 | 741355 | 1440 | 1642 | 741354 | 1440 | 1662 |
| March 29, 2021 | 741357 | 1440 | 1664 | 741356 | 1440 | 1667 |

**Table B8: 2021 Courtice Station Q1 Monitoring Results for TSP and Metals**

| Contaminant | Units | *MECP Criteria* | *HHRA Health Based Criteria* | 4-Jan-21 | 10-Jan-21 | 16-Jan-21 | 22-Jan-21 | 28-Jan-21 | 3-Feb-21 | 9-Feb-21 | 15-Feb-21 | 21-Feb-21 | 27-Feb-21 | 5-Mar-21 | 11-Mar-21 | 17-Mar-21 | 23-Mar-21 | 29-Mar-21 | 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* | 9.69 | 10.55 | 17.98 | 8.75 | 11.94 | 16.21 | 21.06 | 10.85 | 30.97 | 13.76 | 17.88 | 28.95 | 48.65 | 49.27 | 13.34 | *120* | 0 | 17.65 | 20.66 | 8.75 | 49.27 | 17.98 | 30.97 | 49.27 | 15 | 100 |
| Total Mercury (Hg) | $\mu g/m^3$ | *2* | *2* | 2.96E-06 | 2.98E-06 | 1.48E-06 | 6.51E-06 | 2.94E-06 | 2.95E-06 | 7.62E-06 | 2.92E-06 | 2.44E-05 | 9.62E-06 | 2.94E-06 | 6.73E-06 | 1.98E-05 | 2.68E-05 | 2.10E-05 | *2* | 0 | 6.24E-06 | 9.44E-06 | 1.48E-06 | 2.68E-05 | 6.51E-06 | 2.44E-05 | 2.68E-05 | 15 | 100 |
| Aluminum (Al) | $\mu g/m^3$ | *4.8* | - | 3.19E-02 | 2.86E-02 | 9.32E-02 | 4.26E-02 | 5.85E-02 | 1.39E-01 | 5.28E-02 | 4.10E-02 | 5.25E-02 | 4.95E-02 | 9.82E-02 | 1.27E-01 | 7.19E-01 | 4.28E-01 | 8.29E-02 | *4.8* | 0 | 8.22E-02 | 1.36E-01 | 2.86E-02 | 7.19E-01 | 9.32E-02 | 1.39E-01 | 7.19E-01 | 15 | 100 |
| Antimony (Sb) | $\mu g/m^3$ | *25* | *25* | 8.39E-04 | 3.58E-04 | 5.52E-04 | 2.25E-04 | 2.59E-04 | 2.12E-04 | 3.93E-04 | 2.39E-04 | 3.16E-03 | 7.09E-04 | 2.47E-04 | 6.98E-04 | 1.53E-03 | 1.94E-03 | 2.22E-04 | *25* | 0 | 5.16E-04 | 7.72E-04 | 2.12E-04 | 3.16E-03 | 8.39E-04 | 3.16E-03 | 1.94E-03 | 15 | 100 |
| Arsenic (As) | $\mu g/m^3$ | *0.3* | *0.3* | 8.87E-04 | 8.94E-04 | 8.90E-04 | 8.87E-04 | 8.82E-04 | 8.84E-04 | 8.80E-04 | 8.75E-04 | 8.93E-04 | 9.01E-04 | 8.82E-04 | 9.18E-04 | 8.99E-04 | 1.95E-03 | 9.01E-04 | *0.3* | 0 | 9.39E-04 | 9.62E-04 | 8.75E-04 | 1.95E-03 | 8.94E-04 | 9.01E-04 | 1.95E-03 | 15 | 100 |
| Barium (Ba) | $\mu g/m^3$ | *10* | *10* | 4.67E-03 | 3.16E-03 | 4.39E-03 | 3.08E-03 | 2.73E-03 | 3.74E-03 | 3.78E-03 | 2.15E-03 | 4.45E-03 | 4.16E-03 | 3.18E-03 | 4.55E-03 | 1.52E-02 | 1.97E-02 | 2.95E-03 | *10* | 0 | 4.36E-03 | 5.46E-03 | 2.15E-03 | 1.97E-02 | 4.67E-03 | 4.45E-03 | 1.97E-02 | 15 | 100 |
| Beryllium (Be) | $\mu g/m^3$ | *0.01* | *0.01* | 2.96E-05 | 2.98E-05 | 2.97E-05 | 2.96E-05 | 1.47E-05 | 4.48E-05 | 1.47E-05 | 1.46E-05 | 1.49E-05 | 1.50E-05 | 1.47E-05 | 1.53E-05 | 4.01E-05 | 1.52E-05 | 1.50E-05 | *0.01* | 0 | 2.06E-05 | 2.25E-05 | 1.46E-05 | 4.48E-05 | 2.98E-05 | 4.48E-05 | 4.01E-05 | 15 | 100 |
| Bismuth (Bi) | $\mu g/m^3$ | - | - | 5.32E-04 | 5.37E-04 | 5.34E-04 | 5.32E-04 | 5.29E-04 | 5.30E-04 | 5.28E-04 | 5.25E-04 | 5.36E-04 | 5.41E-04 | 5.29E-04 | 5.51E-04 | 5.39E-04 | 5.48E-04 | 5.41E-04 | - | - | 5.35E-04 | 5.36E-04 | 5.25E-04 | 5.51E-04 | 5.37E-04 | 5.41E-04 | 5.51E-04 | 15 | 100 |
| Boron (B) | $\mu g/m^3$ | *120* | - | 1.18E-02 | 1.19E-02 | 1.19E-02 | 1.18E-02 | 4.41E-03 | 4.42E-03 | 4.40E-03 | 4.38E-03 | 4.47E-03 | 4.51E-03 | 4.41E-03 | 4.59E-03 | 4.49E-03 | 4.57E-03 | 4.51E-03 | *120* | 0 | 5.80E-03 | 6.44E-03 | 4.38E-03 | 1.19E-02 | 1.19E-02 | 4.51E-03 | 4.59E-03 | 15 | 100 |
| Cadmium (Cd) | $\mu g/m^3$ | *0.025* | *0.025* | 5.91E-04 | 5.96E-04 | 5.93E-04 | 5.91E-04 | 1.68E-04 | 1.33E-04 | 7.80E-05 | 1.26E-04 | 3.14E-04 | 1.19E-04 | 5.00E-05 | 1.30E-04 | 1.75E-04 | 1.75E-04 | 4.99E-05 | *0.025* | 0 | 1.85E-04 | 2.59E-04 | 4.99E-05 | 5.96E-04 | 5.96E-04 | 3.14E-04 | 1.75E-04 | 15 | 100 |
| Chromium (Cr) | $\mu g/m^3$ | *0.5* | - | 3.96E-03 | 1.49E-03 | 1.48E-03 | 1.48E-03 | 2.41E-03 | 2.65E-03 | 2.29E-03 | 2.10E-03 | 3.10E-03 | 2.64E-03 | 2.65E-03 | 3.86E-03 | 5.69E-03 | 4.81E-03 | 1.02E-03 | *0.5* | 0 | 2.50E-03 | 2.78E-03 | 1.02E-03 | 5.69E-03 | 3.96E-03 | 3.10E-03 | 5.69E-03 | 15 | 100 |
| Cobalt (Co) | $\mu g/m^3$ | *0.1* | *0.1* | 5.91E-04 | 5.96E-04 | 5.93E-04 | 5.91E-04 | 8.65E-05 | 1.56E-04 | 1.20E-04 | 8.34E-05 | 1.54E-04 | 8.71E-05 | 1.34E-04 | 6.43E-04 | 9.77E-04 | 3.59E-04 | 9.13E-05 | *0.1* | 0 | 2.43E-04 | 3.51E-04 | 8.34E-05 | 9.77E-04 | 5.96E-04 | 1.56E-04 | 9.77E-04 | 15 | 100 |
| Copper (Cu) | $\mu g/m^3$ | *50* | - | 2.07E-02 | 2.43E-02 | 8.84E-03 | 1.53E-02 | 6.12E-03 | 8.43E-03 | 1.01E-02 | 6.83E-02 | 2.05E-02 | 9.74E-03 | 4.06E-03 | 1.60E-02 | 1.62E-02 | 7.73E-02 | 4.57E-03 | *50* | 0 | 1.41E-02 | 2.07E-02 | 4.06E-03 | 7.73E-02 | 2.43E-02 | 6.83E-02 | 7.73E-02 | 15 | 100 |
| Iron (Fe) | $\mu g/m^3$ | *4* | - | 1.73E-01 | 1.45E-01 | 2.31E-01 | 1.53E-01 | 1.66E-01 | 2.81E-01 | 1.78E-01 | 1.27E-01 | 2.57E-01 | 1.83E-01 | 2.68E-01 | 3.80E-01 | 1.02E+00 | 1.47E+00 | 2.26E-01 | *4* | 0 | 2.58E-01 | 3.51E-01 | 1.27E-01 | 1.47E+00 | 2.31E-01 | 2.81E-01 | 1.47E+00 | 15 | 100 |
| Lead (Pb) | $\mu g/m^3$ | *0.5* | *0.5* | 8.87E-04 | 8.94E-04 | 2.67E-03 | 8.87E-04 | 1.14E-03 | 3.18E-03 | 1.37E-03 | 1.39E-03 | 2.08E-03 | 2.20E-03 | 6.88E-04 | 2.78E-03 | 4.40E-03 | 5.07E-03 | 1.08E-03 | *2* | 0 | 1.70E-03 | 2.05E-03 | 6.88E-04 | 5.07E-03 | 2.67E-03 | 3.18E-03 | 5.07E-03 | 15 | 100 |
| Magnesium (Mg) | $\mu g/m^3$ | - | - | 2.96E-02 | 7.16E-02 | 1.25E-01 | 7.69E-02 | 9.53E-02 | 1.27E-01 | 1.21E-01 | 7.00E-02 | 1.68E-01 | 1.27E-01 | 2.14E-01 | 2.69E-01 | 5.85E-01 | 5.54E-01 | 1.76E-01 | - | - | 1.39E-01 | 1.87E-01 | 2.96E-02 | 5.85E-01 | 1.25E-01 | 1.68E-01 | 5.85E-01 | 15 | 100 |
| Manganese (Mn) | $\mu g/m^3$ | *0.4* | - | 2.90E-03 | 3.22E-03 | 8.19E-03 | 4.32E-03 | 3.84E-03 | 1.05E-02 | 4.75E-03 | 3.49E-03 | 8.04E-03 | 5.41E-03 | 8.35E-03 | 1.36E-02 | 2.25E-02 | 3.23E-02 | 6.43E-03 | *0.4* | 0 | 7.03E-03 | 9.19E-03 | 2.90E-03 | 3.23E-02 | 8.19E-03 | 1.05E-02 | 3.23E-02 | 15 | 100 |
| Molybdenum (Mo) | $\mu g/m^3$ | *120* | - | 1.71E-03 | 7.75E-04 | 7.12E-04 | 2.96E-04 | 4.82E-04 | 3.42E-04 | 7.16E-04 | 4.90E-04 | 1.18E-03 | 7.33E-04 | 4.12E-04 | 9.91E-04 | 1.54E-03 | 1.17E-03 | 2.94E-04 | *120* | 0 | 6.79E-04 | 7.90E-04 | 2.94E-04 | 1.71E-03 | 1.71E-03 | 1.18E-03 | 1.54E-03 | 15 | 100 |
| Nickel (Ni) | $\mu g/m^3$ | *0.2* | - | 2.36E-03 | 8.94E-04 | 8.90E-04 | 8.87E-04 | 1.27E-03 | 9.55E-04 | 1.11E-03 | 8.52E-04 | 3.03E-03 | 1.12E-03 | 1.58E-03 | 2.17E-03 | 3.51E-03 | 1.97E-03 | 7.57E-04 | *0.2* | 0 | 1.37E-03 | 1.56E-03 | 7.57E-04 | 3.51E-03 | 2.36E-03 | 3.03E-03 | 3.51E-03 | 15 | 100 |
| Phosphorus (P) | $\mu g/m^3$ | - | - | 2.22E-01 | 2.24E-01 | 2.23E-01 | 2.22E-01 | 2.21E-01 | 2.21E-01 | 2.20E-01 | 2.19E-01 | 5.06E-01 | 2.25E-01 | 2.21E-01 | 2.29E-01 | 2.25E-01 | 2.28E-01 | 2.25E-01 | - | - | 2.36E-01 | 2.42E-01 | 2.19E-01 | 5.06E-01 | 2.24E-01 | 5.06E-01 | 2.29E-01 | 15 | 100 |
| Selenium (Se) | $\mu g/m^3$ | *10* | *10* | 2.96E-03 | 2.98E-03 | 2.97E-03 | 2.96E-03 | 3.82E-04 | 3.83E-04 | 3.81E-04 | 3.79E-04 | 8.34E-04 | 9.01E-04 | 3.82E-04 | 3.98E-04 | 8.39E-04 | 3.96E-04 | 3.91E-04 | *10* | 0 | 7.80E-04 | 1.17E-03 | 3.79E-04 | 2.98E-03 | 2.98E-03 | 9.01E-04 | 8.39E-04 | 15 | 100 |
| Silver (Ag) | $\mu g/m^3$ | *1* | *1* | 2.96E-04 | 2.98E-04 | 2.97E-04 | 2.96E-04 | 2.65E-05 | 2.65E-05 | 2.64E-05 | 2.63E-05 | 2.68E-05 | 2.70E-05 | 2.65E-05 | 2.75E-05 | 1.11E-04 | 8.10E-05 | 2.70E-05 | *1* | 0 | 6.01E-05 | 1.08E-04 | 2.63E-05 | 2.98E-04 | 2.98E-04 | 2.70E-05 | 1.11E-04 | 15 | 100 |
| Strontium (Sr) | $\mu g/m^3$ | *120* | - | 8.87E-04 | 8.94E-04 | 2.20E-03 | 8.87E-04 | 2.47E-03 | 3.18E-03 | 2.52E-03 | 8.75E-04 | 4.59E-03 | 2.40E-03 | 4.24E-03 | 3.55E-03 | 1.37E-02 | 1.64E-02 | 3.73E-03 | *120* | 0 | 2.74E-03 | 4.17E-03 | 8.75E-04 | 1.64E-02 | 2.47E-03 | 4.59E-03 | 1.64E-02 | 15 | 100 |
| Thallium (Tl) | $\mu g/m^3$ | - | - | 2.66E-05 | 2.68E-05 | 2.67E-05 | 2.66E-05 | 2.65E-05 | 2.65E-05 | 2.64E-05 | 2.63E-05 | 2.68E-05 | 2.70E-05 | 2.65E-05 | 2.75E-05 | 2.70E-05 | 2.74E-05 | 2.70E-05 | - | - | 2.68E-05 | 2.68E-05 | 2.63E-05 | 2.75E-05 | 2.68E-05 | 2.70E-05 | 2.75E-05 | 15 | 100 |
| Tin (Sn) | $\mu g/m^3$ | *10* | *10* | 2.07E-03 | 2.98E-04 | 1.07E-03 | 2.96E-04 | 5.88E-04 | 8.07E-04 | 5.51E-04 | 3.62E-04 | 7.09E-04 | 1.11E-03 | 1.76E-04 | 6.12E-04 | 1.82E-03 | 1.78E-03 | 1.80E-04 | *10* | 0 | 6.27E-04 | 8.29E-04 | 1.76E-04 | 2.07E-03 | 2.07E-03 | 1.11E-03 | 1.82E-03 | 15 | 100 |
| Titanium (Ti) | $\mu g/m^3$ | *120* | - | 3.25E-03 | 3.28E-03 | 3.26E-03 | 3.25E-03 | 3.24E-03 | 7.07E-03 | 3.23E-03 | 3.21E-03 | 3.28E-03 | 3.31E-03 | 3.24E-03 | 3.37E-03 | 2.28E-02 | 2.38E-02 | 3.31E-03 | *120* | 0 | 4.47E-03 | 6.19E-03 | 3.21E-03 | 2.38E-02 | 3.28E-03 | 7.07E-03 | 2.38E-02 | 15 | 100 |
| Uranium (Ur) | $\mu g/m^3$ | *1.5* | - | 2.96E-05 | 2.98E-05 | 2.97E-05 | 2.96E-05 | 5.29E-06 | 4.06E-05 | 5.10E-06 | 1.38E-05 | 8.40E-06 | 6.73E-06 | 2.25E-05 | 1.95E-05 | 6.83E-05 | 9.20E-05 | 8.35E-06 | *1.5* | 0 | 1.90E-05 | 2.73E-05 | 5.10E-06 | 9.20E-05 | 2.98E-05 | 4.06E-05 | 9.20E-05 | 15 | 100 |
| Vanadium (V) | $\mu g/m^3$ | *2* | *1* | 1.48E-03 | 1.49E-03 | 1.48E-03 | 1.48E-03 | 1.47E-03 | 1.47E-03 | 1.47E-03 | 1.46E-03 | 1.49E-03 | 1.50E-03 | 1.47E-03 | 1.53E-03 | 1.50E-03 | 1.52E-03 | 1.50E-03 | *2* | 0 | 1.49E-03 | 1.49E-03 | 1.46E-03 | 1.53E-03 | 1.49E-03 | 1.50E-03 | 1.53E-03 | 15 | 100 |
| Zinc (Zn) | $\mu g/m^3$ | *120* | - | 2.33E-02 | 1.14E-02 | 2.65E-02 | 1.82E-02 | 2.30E-02 | 1.04E-02 | 2.35E-02 | 4.25E-02 | 1.49E-01 | 2.52E-02 | 1.08E-02 | 2.41E-02 | 3.29E-02 | 4.14E-02 | 1.82E-02 | *120* | 0 | 2.46E-02 | 3.20E-02 | 1.04E-02 | 1.49E-01 | 2.65E-02 | 1.49E-01 | 4.14E-02 | 15 | 100 |
| Zirconium (Zr) | $\mu g/m^3$ | *20* | - | 5.91E-04 | 5.96E-04 | 5.93E-04 | 5.91E-04 | 5.88E-04 | 5.89E-04 | 5.87E-04 | 5.83E-04 | 5.96E-04 | 6.01E-04 | 5.88E-04 | 6.12E-04 | 5.99E-04 | 6.09E-04 | 6.01E-04 | *20* | 0 | 5.95E-04 | 5.95E-04 | 5.83E-04 | 6.12E-04 | 5.96E-04 | 6.01E-04 | 6.12E-04 | 15 | 100 |

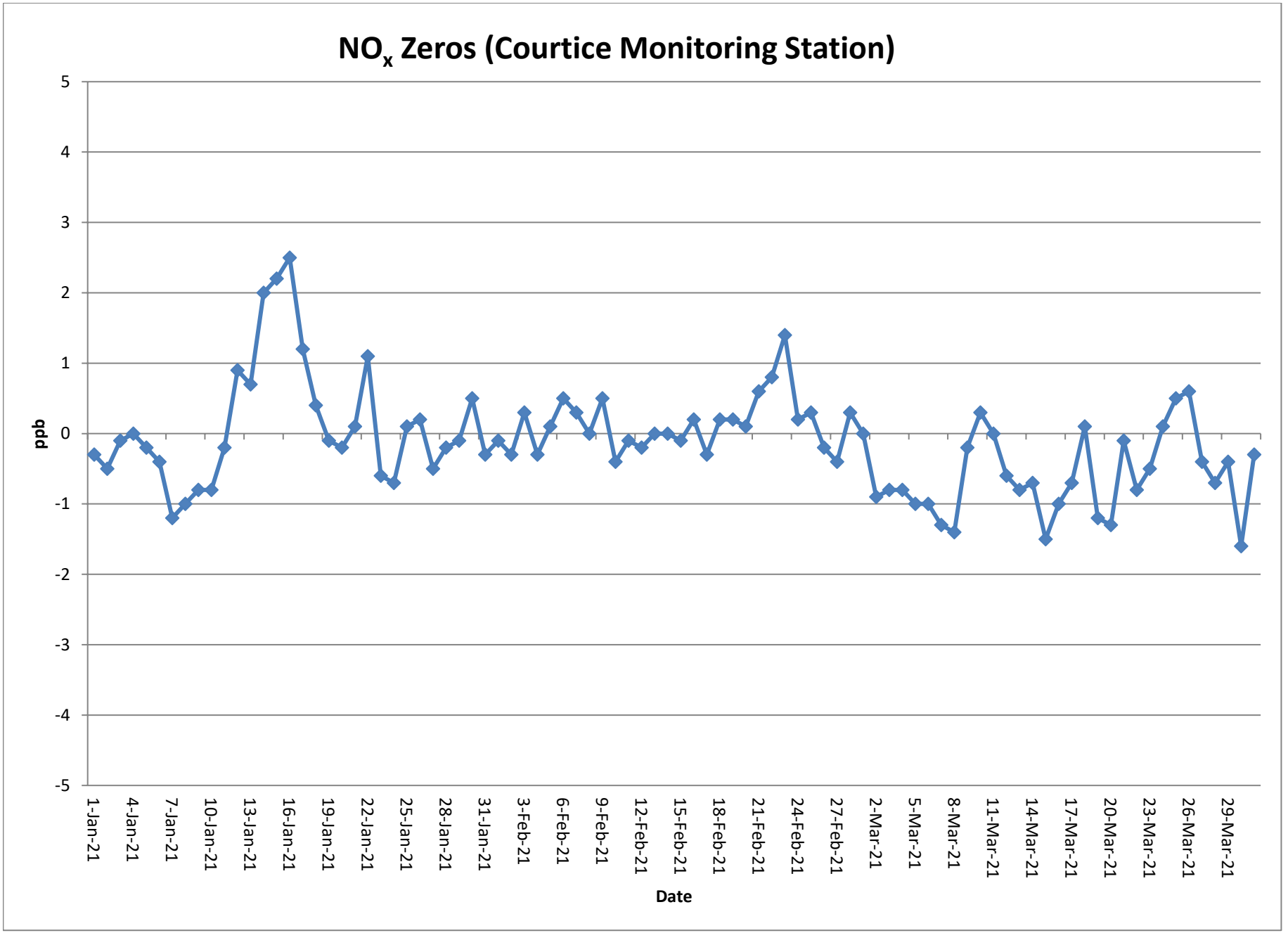
NOTE: All non-detectable results were reported as 1/2 of the detection limit

**Table B9: 2021 Rundle Station Q1 Monitoring Results for TSP and Metals**

| Contaminant | Units | *MECP Criteria* | *HHRA Health Based Criteria* | 4-Jan-21 | 10-Jan-21 | 16-Jan-21 | 22-Jan-21 | 28-Jan-21 | 3-Feb-21 | 9-Feb-21 | 15-Feb-21 | 21-Feb-21 | 27-Feb-21 | 5-Mar-21 | 11-Mar-21 | 17-Mar-21 | 23-Mar-21 | 29-Mar-21 | 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* | 11.23 | 10.19 | 20.51 | 10.93 | 17.74 | 18.10 | 23.70 | 11.18 | 31.60 | 17.74 | 47.75 | 18.02 | 47.99 | 41.70 | 18.42 | *120* | 0 | 20.2 | 23.1 | 10.2 | 48.0 | 20.5 | 31.6 | 48.0 | 15 | 100 |
| Mercury (Hg) | $\mu g/m^3$ | *2* | *2* | 3.05E-06 | 2.95E-06 | 1.51E-06 | 1.48E-06 | 2.86E-06 | 3.04E-06 | 8.89E-06 | 2.91E-06 | 1.58E-05 | 1.14E-05 | 7.59E-06 | 3.05E-06 | 1.68E-05 | 1.44E-05 | 2.10E-05 | *2* | 0 | 5.40E-06 | 7.78E-06 | 1.48E-06 | 2.10E-05 | 3.05E-06 | 1.58E-05 | 2.10E-05 | 15 | 100 |
| Aluminum (Al) | $\mu g/m^3$ | *4.8* | - | 3.36E-02 | 3.01E-02 | 1.17E-01 | 5.32E-02 | 8.59E-02 | 1.46E-01 | 7.52E-02 | 2.67E-02 | 5.77E-02 | 7.83E-02 | 3.08E-01 | 1.21E-01 | 5.60E-01 | 3.09E-01 | 1.01E-01 | *4.8* | 0 | 9.51E-02 | 1.40E-01 | 2.67E-02 | 5.60E-01 | 1.17E-01 | 1.46E-01 | 5.60E-01 | 15 | 100 |
| Antimony (Sb) | $\mu g/m^3$ | *25* | *25* | 3.48E-04 | 3.48E-04 | 6.11E-04 | 1.59E-04 | 7.16E-05 | 7.59E-05 | 3.44E-04 | 7.28E-05 | 5.32E-04 | 6.21E-04 | 7.41E-04 | 1.65E-04 | 1.22E-03 | 1.04E-03 | 2.10E-04 | *25* | 0 | 3.04E-04 | 4.37E-04 | 7.16E-05 | 1.22E-03 | 6.11E-04 | 6.21E-04 | 1.22E-03 | 15 | 100 |
| Arsenic (As) | $\mu g/m^3$ | *0.3* | *0.3* | 9.15E-04 | 8.84E-04 | 9.07E-04 | 8.86E-04 | 8.59E-04 | 9.11E-04 | 8.89E-04 | 8.74E-04 | 8.78E-04 | 8.96E-04 | 8.76E-04 | 9.16E-04 | 9.02E-04 | 9.03E-04 | 9.00E-04 | *0.3* | 0 | 8.93E-04 | 8.93E-04 | 8.59E-04 | 9.16E-04 | 9.15E-04 | 9.11E-04 | 9.16E-04 | 15 | 100 |
| Barium (Ba) | $\mu g/m^3$ | *10* | *10* | 3.05E-03 | 3.12E-03 | 4.84E-03 | 2.30E-03 | 2.12E-03 | 2.33E-03 | 3.47E-03 | 1.09E-03 | 3.74E-03 | 4.60E-03 | 6.54E-03 | 2.52E-03 | 1.35E-02 | 1.21E-02 | 3.43E-03 | *10* | 0 | 3.69E-03 | 4.59E-03 | 1.09E-03 | 1.35E-02 | 4.84E-03 | 4.60E-03 | 1.35E-02 | 15 | 100 |
| Beryllium (Be) | $\mu g/m^3$ | *0.01* | *0.01* | 3.05E-05 | 2.95E-05 | 3.02E-05 | 2.95E-05 | 1.43E-05 | 1.52E-05 | 1.48E-05 | 1.46E-05 | 1.46E-05 | 1.49E-05 | 1.46E-05 | 1.53E-05 | 1.50E-05 | 1.50E-05 | 1.50E-05 | *0.01* | 0 | 1.79E-05 | 1.89E-05 | 1.43E-05 | 3.05E-05 | 3.05E-05 | 1.52E-05 | 1.53E-05 | 15 | 100 |
| Bismuth (Bi) | $\mu g/m^3$ | - | - | 5.49E-04 | 5.30E-04 | 5.44E-04 | 5.32E-04 | 5.15E-04 | 5.47E-04 | 5.33E-04 | 5.24E-04 | 5.27E-04 | 5.38E-04 | 5.25E-04 | 5.50E-04 | 5.41E-04 | 5.42E-04 | 5.40E-04 | - | - | 5.36E-04 | 5.36E-04 | 5.15E-04 | 5.50E-04 | 5.49E-04 | 5.47E-04 | 5.50E-04 | 15 | 100 |
| Boron (B) | $\mu g/m^3$ | *120* | - | 1.22E-02 | 1.18E-02 | 1.21E-02 | 1.18E-02 | 4.29E-03 | 4.56E-03 | 4.44E-03 | 4.37E-03 | 4.39E-03 | 4.48E-03 | 4.38E-03 | 4.58E-03 | 4.51E-03 | 4.51E-03 | 4.50E-03 | *120* | 0 | 5.80E-03 | 6.46E-03 | 4.29E-03 | 1.22E-02 | 1.22E-02 | 4.56E-03 | 4.58E-03 | 15 | 100 |
| Cadmium (Cd) | $\mu g/m^3$ | *0.025* | *0.025* | 6.10E-04 | 5.89E-04 | 6.05E-04 | 5.91E-04 | 1.89E-04 | 2.28E-04 | 3.31E-04 | 2.25E-04 | 1.11E-04 | 1.14E-04 | 1.90E-04 | 1.37E-04 | 1.38E-04 | 1.00E-04 | 1.06E-04 | *0.025* | 0 | 2.26E-04 | 2.84E-04 | 1.00E-04 | 6.10E-04 | 6.10E-04 | 3.31E-04 | 1.90E-04 | 15 | 100 |
| Chromium (Cr) | $\mu g/m^3$ | *0.5* | - | 3.54E-03 | 1.47E-03 | 3.27E-03 | 1.48E-03 | 3.21E-03 | 2.19E-03 | 2.55E-03 | 1.98E-03 | 2.46E-03 | 2.63E-03 | 3.68E-03 | 2.38E-03 | 4.87E-03 | 3.19E-03 | 1.02E-03 | *0.5* | 0 | 2.47E-03 | 2.66E-03 | 1.02E-03 | 4.87E-03 | 3.54E-03 | 2.63E-03 | 4.87E-03 | 15 | 100 |
| Cobalt (Co) | $\mu g/m^3$ | *0.1* | *0.1* | 6.10E-04 | 5.89E-04 | 6.05E-04 | 5.91E-04 | 8.59E-05 | 1.13E-04 | 9.36E-05 | 6.58E-05 | 1.40E-04 | 9.20E-05 | 2.52E-04 | 1.32E-04 | 7.16E-04 | 2.92E-04 | 9.72E-05 | *0.1* | 0 | 2.10E-04 | 2.98E-04 | 6.58E-05 | 7.16E-04 | 6.10E-04 | 1.40E-04 | 7.16E-04 | 15 | 100 |
| Copper (Cu) | $\mu g/m^3$ | *50* | - | 4.58E-03 | 3.16E-02 | 4.90E-03 | 8.33E-03 | 3.09E-03 | 4.98E-03 | 6.16E-03 | 4.48E-03 | 9.95E-03 | 3.31E-02 | 3.99E-02 | 3.73E-03 | 1.06E-02 | 2.17E-02 | 5.70E-03 | *50* | 0 | 8.86E-03 | 1.29E-02 | 3.09E-03 | 3.99E-02 | 3.16E-02 | 3.31E-02 | 3.99E-02 | 15 | 100 |
| Iron (Fe) | $\mu g/m^3$ | *4* | - | 9.88E-02 | 1.41E-01 | 2.46E-01 | 9.45E-02 | 1.29E-01 | 2.27E-01 | 1.82E-01 | 5.71E-02 | 2.84E-01 | 2.62E-01 | 6.25E-01 | 2.36E-01 | 8.42E-01 | 8.84E-01 | 2.41E-01 | *4* | 0 | 2.25E-01 | 3.03E-01 | 5.71E-02 | 8.84E-01 | 2.46E-01 | 2.84E-01 | 8.84E-01 | 15 | 100 |
| Lead (Pb) | $\mu g/m^3$ | *0.5* | *0.5* | 9.15E-04 | 8.84E-04 | 2.42E-03 | 8.86E-04 | 8.47E-04 | 2.79E-03 | 2.20E-03 | 9.32E-04 | 1.82E-03 | 2.25E-03 | 2.99E-03 | 7.21E-04 | 3.14E-03 | 3.14E-03 | 1.09E-03 | *2* | 0 | 1.56E-03 | 1.80E-03 | 7.21E-04 | 3.14E-03 | 2.42E-03 | 2.79E-03 | 3.14E-03 | 15 | 100 |
| Magnesium (Mg) | $\mu g/m^3$ | - | - | 3.05E-02 | 8.25E-02 | 1.45E-01 | 7.68E-02 | 1.02E-01 | 1.16E-01 | 1.37E-01 | 5.53E-02 | 1.32E-01 | 1.38E-01 | 4.41E-01 | 2.34E-01 | 3.90E-01 | 3.74E-01 | 1.89E-01 | - | - | 1.38E-01 | 1.76E-01 | 3.05E-02 | 4.41E-01 | 1.45E-01 | 1.38E-01 | 4.41E-01 | 15 | 100 |
| Manganese (Mn) | $\mu g/m^3$ | *0.4* | - | 2.62E-03 | 2.59E-03 | 9.38E-03 | 2.78E-03 | 3.40E-03 | 7.90E-03 | 5.65E-03 | 1.35E-03 | 6.03E-03 | 5.70E-03 | 1.94E-02 | 7.64E-03 | 1.77E-02 | 1.77E-02 | 7.08E-03 | *0.4* | 0 | 5.94E-03 | 7.80E-03 | 1.35E-03 | 1.94E-02 | 9.38E-03 | 7.90E-03 | 1.94E-02 | 15 | 100 |
| Molybdenum (Mo) | $\mu g/m^3$ | *120* | - | 9.15E-04 | 2.95E-04 | 3.02E-04 | 2.95E-04 | 3.03E-04 | 2.67E-04 | 5.15E-04 | 3.44E-04 | 8.66E-04 | 5.44E-04 | 9.28E-04 | 2.87E-04 | 1.23E-03 | 7.22E-04 | 2.58E-04 | *120* | 0 | 4.64E-04 | 5.38E-04 | 2.58E-04 | 1.23E-03 | 9.15E-04 | 8.66E-04 | 1.23E-03 | 15 | 100 |
| Nickel (Ni) | $\mu g/m^3$ | *0.2* | - | 9.15E-04 | 8.84E-04 | 9.07E-04 | 8.86E-04 | 1.39E-03 | 8.75E-04 | 9.66E-04 | 8.33E-04 | 2.79E-03 | 1.09E-03 | 2.66E-03 | 1.40E-03 | 2.63E-03 | 1.40E-03 | 7.14E-04 | *0.2* | 0 | 1.22E-03 | 1.36E-03 | 7.14E-04 | 2.79E-03 | 1.39E-03 | 2.79E-03 | 2.66E-03 | 15 | 100 |
| Phosphorus (P) | $\mu g/m^3$ | - | - | 2.29E-01 | 2.21E-01 | 2.27E-01 | 2.22E-01 | 2.15E-01 | 2.28E-01 | 2.22E-01 | 2.18E-01 | 2.19E-01 | 2.24E-01 | 2.19E-01 | 2.29E-01 | 2.25E-01 | 2.26E-01 | 2.25E-01 | - | - | 2.23E-01 | 2.23E-01 | 2.15E-01 | 2.29E-01 | 2.29E-01 | 2.28E-01 | 2.29E-01 | 15 | 100 |
| Selenium (Se) | $\mu g/m^3$ | *10* | *10* | 3.05E-03 | 2.95E-03 | 3.02E-03 | 2.95E-03 | 3.72E-04 | 3.95E-04 | 3.85E-04 | 3.79E-04 | 3.80E-04 | 3.88E-04 | 3.79E-04 | 3.97E-04 | 3.91E-04 | 3.91E-04 | 3.90E-04 | *10* | 0 | 6.67E-04 | 1.08E-03 | 3.72E-04 | 3.05E-03 | 3.05E-03 | 3.95E-04 | 3.97E-04 | 15 | 100 |
| Silver (Ag) | $\mu g/m^3$ | *1* | *1* | 3.05E-04 | 2.95E-04 | 3.02E-04 | 2.95E-04 | 2.58E-05 | 2.73E-05 | 2.67E-05 | 2.62E-05 | 2.63E-05 | 2.69E-05 | 2.63E-05 | 2.75E-05 | 1.06E-04 | 2.71E-05 | 2.70E-05 | *1* | 0 | 5.58E-05 | 1.05E-04 | 2.58E-05 | 3.05E-04 | 3.05E-04 | 2.73E-05 | 1.06E-04 | 15 | 100 |
| Strontium (Sr) | $\mu g/m^3$ | *120* | - | 9.15E-04 | 8.84E-04 | 3.63E-03 | 1.89E-03 | 3.38E-03 | 3.28E-03 | 3.85E-03 | 8.74E-04 | 4.33E-03 | 3.70E-03 | 1.16E-02 | 5.13E-03 | 1.12E-02 | 1.21E-02 | 5.34E-03 | *120* | 0 | 3.50E-03 | 4.81E-03 | 8.74E-04 | 1.21E-02 | 3.63E-03 | 4.33E-03 | 1.21E-02 | 15 | 100 |
| Thallium (Tl) | $\mu g/m^3$ | - | - | 2.75E-05 | 2.65E-05 | 2.72E-05 | 2.66E-05 | 2.58E-05 | 2.73E-05 | 2.67E-05 | 2.62E-05 | 2.63E-05 | 2.69E-05 | 2.63E-05 | 2.75E-05 | 2.71E-05 | 7.40E-05 | 2.70E-05 | - | - | 2.86E-05 | 2.99E-05 | 2.58E-05 | 7.40E-05 | 2.75E-05 | 2.73E-05 | 7.40E-05 | 15 | 100 |
| Tin (Sn) | $\mu g/m^3$ | *10* | *10* | 3.05E-04 | 2.95E-04 | 1.21E-03 | 1.11E-02 | 1.72E-04 | 8.51E-04 | 5.45E-04 | 3.61E-04 | 6.32E-04 | 1.09E-03 | 7.36E-04 | 1.83E-04 | 1.39E-03 | 1.13E-03 | 3.90E-04 | *10* | 0 | 6.60E-04 | 1.36E-03 | 1.72E-04 | 1.11E-02 | 1.11E-02 | 1.09E-03 | 1.39E-03 | 15 | 100 |
| Titanium (Ti) | $\mu g/m^3$ | *120* | - | 3.36E-03 | 3.24E-03 | 3.33E-03 | 3.25E-03 | 3.15E-03 | 6.68E-03 | 3.26E-03 | 3.20E-03 | 3.22E-03 | 3.29E-03 | 9.34E-03 | 3.36E-03 | 1.92E-02 | 1.68E-02 | 3.30E-03 | *120* | 0 | 4.61E-03 | 5.87E-03 | 3.15E-03 | 1.92E-02 | 3.36E-03 | 6.68E-03 | 1.92E-02 | 15 | 100 |
| Uranium (Ur) | $\mu g/m^3$ | *1.5* | - | 3.05E-05 | 2.95E-05 | 3.02E-05 | 2.95E-05 | 1.10E-05 | 1.25E-05 | 8.12E-06 | 5.59E-06 | 5.32E-06 | 6.75E-06 | 2.42E-05 | 8.92E-06 | 4.41E-05 | 6.86E-05 | 8.94E-06 | *1.5* | 0 | 1.59E-05 | 2.16E-05 | 5.32E-06 | 6.86E-05 | 3.05E-05 | 1.25E-05 | 6.86E-05 | 15 | 100 |
| Vanadium (V) | $\mu g/m^3$ | *2* | *1* | 1.53E-03 | 1.47E-03 | 1.51E-03 | 1.48E-03 | 1.43E-03 | 1.52E-03 | 1.48E-03 | 1.46E-03 | 1.46E-03 | 1.49E-03 | 1.46E-03 | 1.53E-03 | 1.50E-03 | 1.50E-03 | 1.50E-03 | *2* | 0 | 1.49E-03 | 1.49E-03 | 1.43E-03 | 1.53E-03 | 1.53E-03 | 1.52E-03 | 1.53E-03 | 15 | 100 |
| Zinc (Zn) | $\mu g/m^3$ | *120* | - | 3.08E-02 | 8.78E-03 | 2.75E-02 | 9.98E-03 | 1.85E-02 | 8.26E-03 | 2.38E-02 | 1.68E-02 | 3.93E-02 | 6.93E-02 | 2.73E-02 | 1.11E-02 | 2.46E-02 | 2.25E-02 | 1.93E-02 | *120* | 0 | 2.03E-02 | 2.38E-02 | 8.26E-03 | 6.93E-02 | 3.08E-02 | 6.93E-02 | 2.73E-02 | 15 | 100 |
| Zirconium (Zr) | $\mu g/m^3$ | *20* | - | 6.10E-04 | 5.89E-04 | 6.05E-04 | 5.91E-04 | 5.72E-04 | 6.08E-04 | 5.92E-04 | 5.82E-04 | 5.85E-04 | 5.97E-04 | 5.84E-04 | 6.11E-04 | 6.01E-04 | 6.02E-04 | 6.00E-04 | *20* | 0 | 5.95E-04 | 5.95E-04 | 5.72E-04 | 6.11E-04 | 6.10E-04 | 6.08E-04 | 6.11E-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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2
1
0
-1
-2
-3
-4
-5
1-Jan-21
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7-Jan-21
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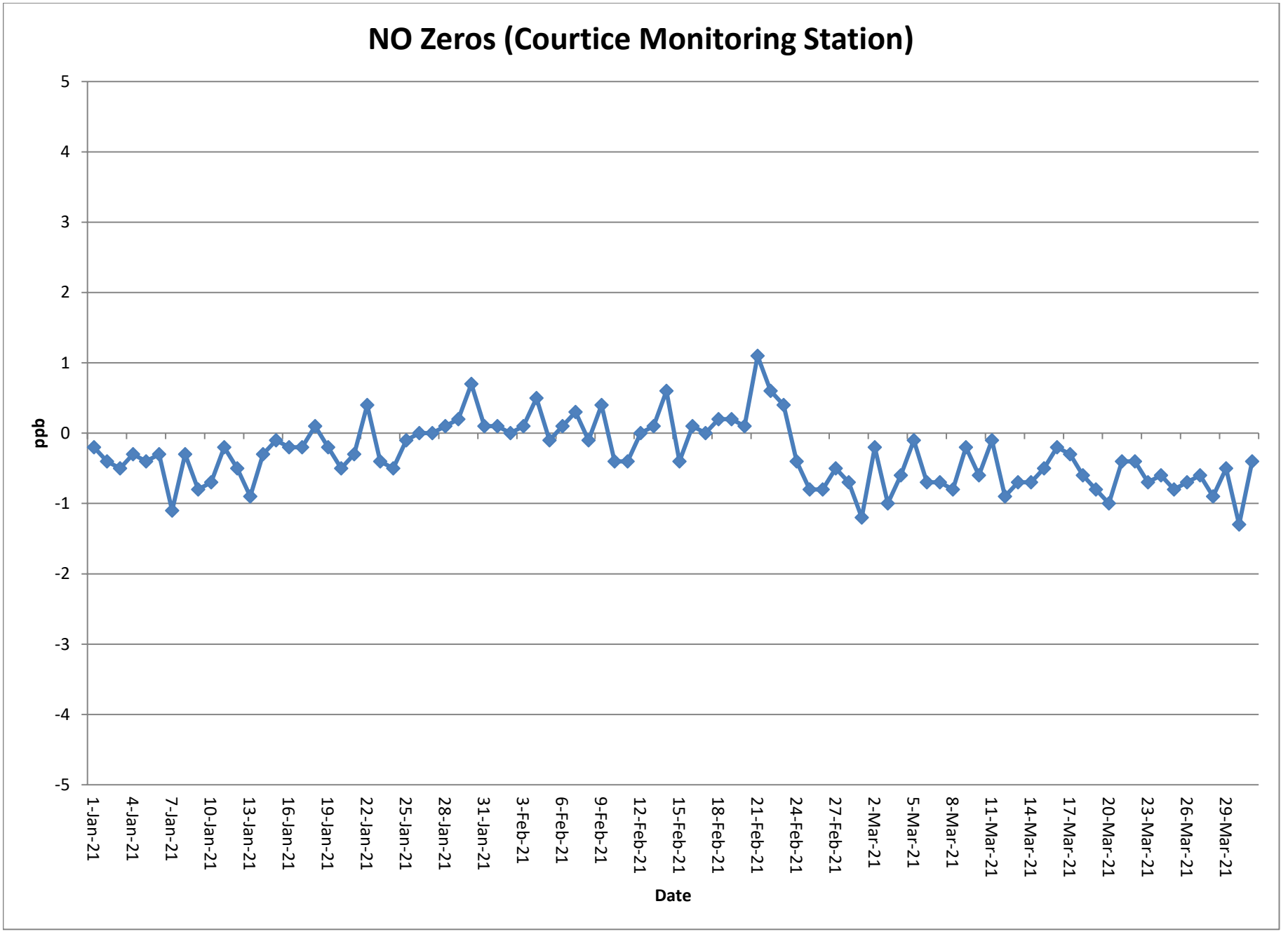
Date


NO Zeros (Courtice Monitoring Station)
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2
1
0
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-2
-3
-4
-5
1-Jan-21
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7-Jan-21
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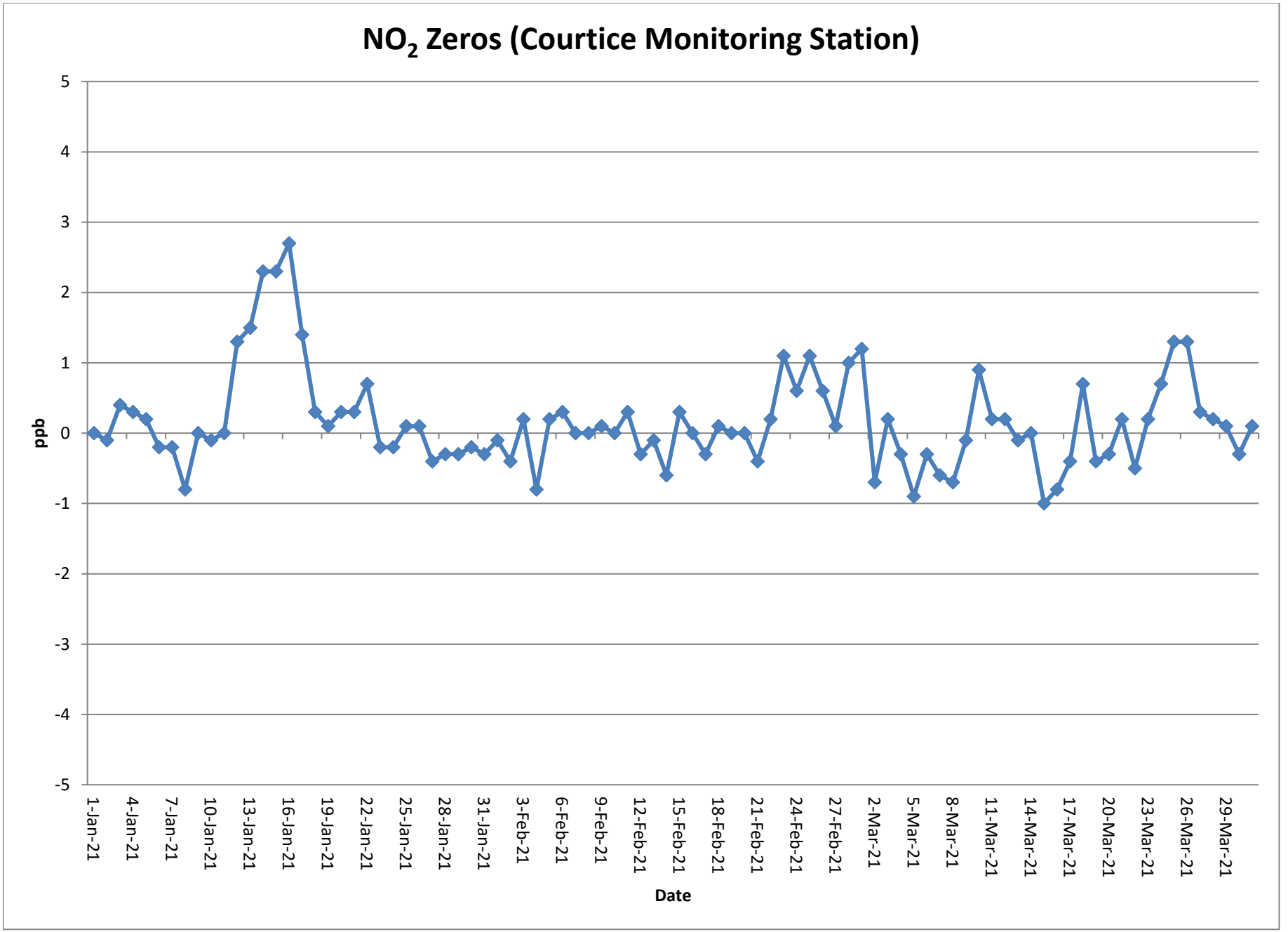
Date


NO2 Zeros (Courtice Monitoring Station)
ppb
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1
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-1
-2
-3
-4
-5
1-Jan-21
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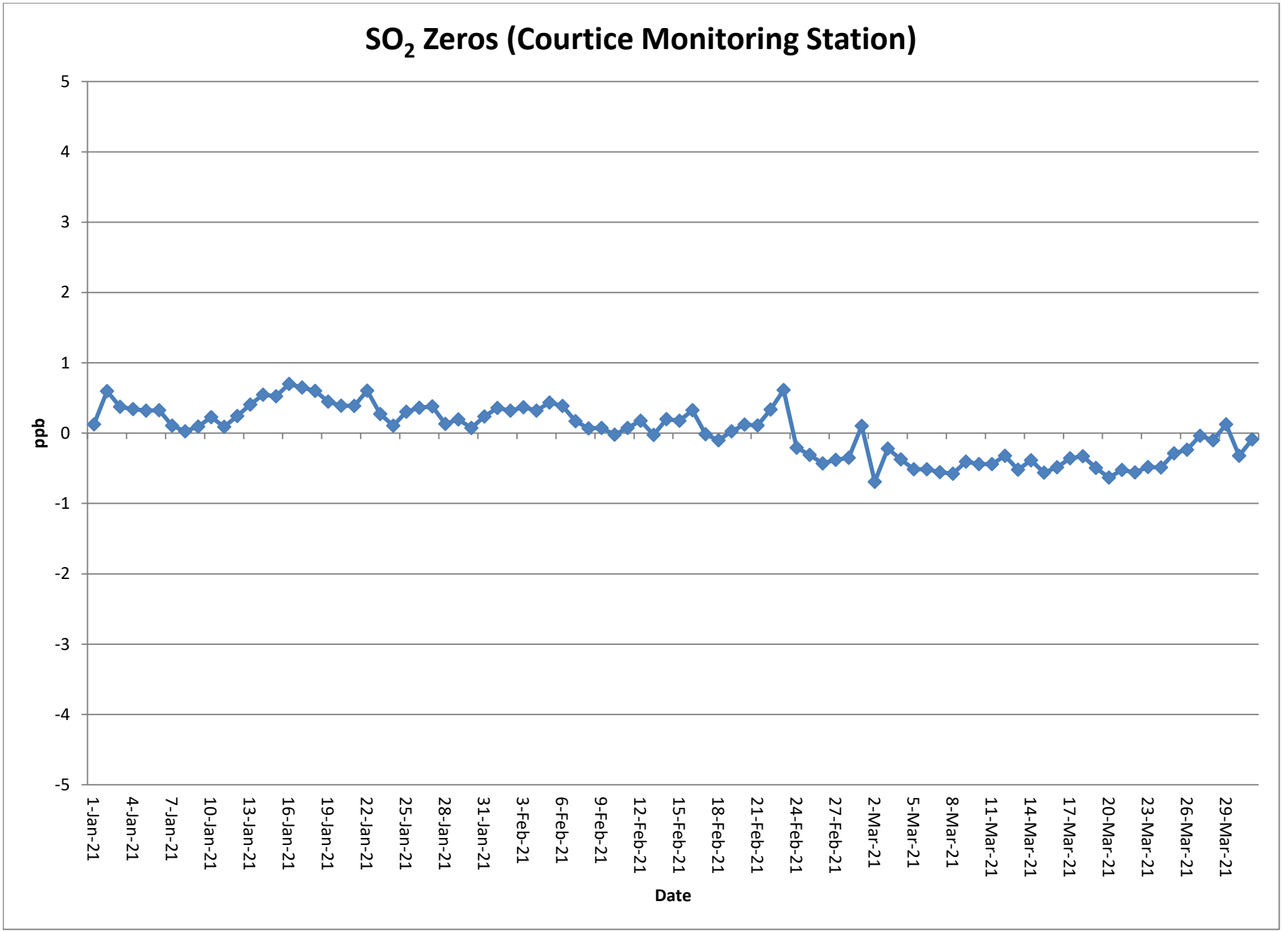
29-Mar-21
Date


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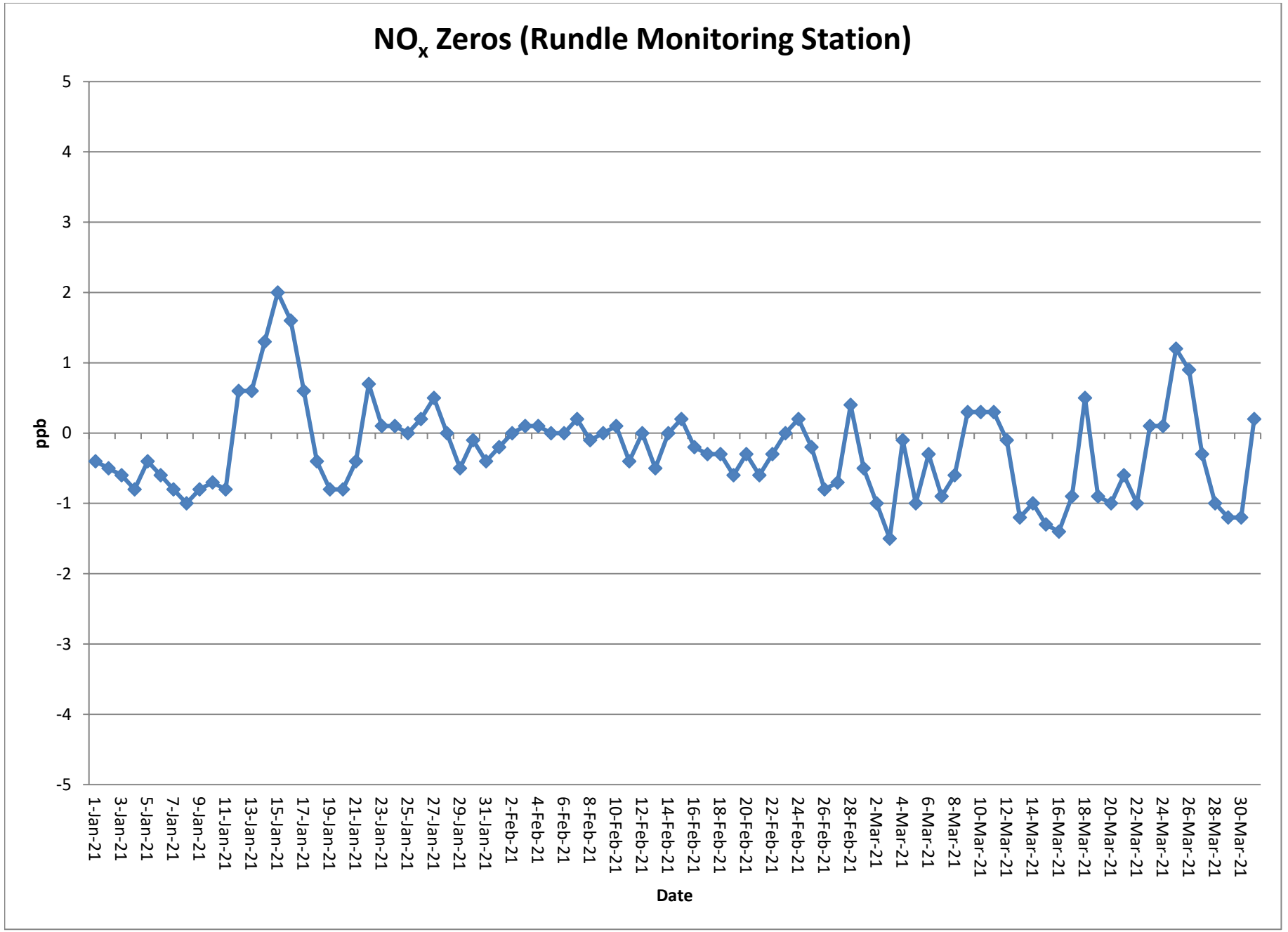
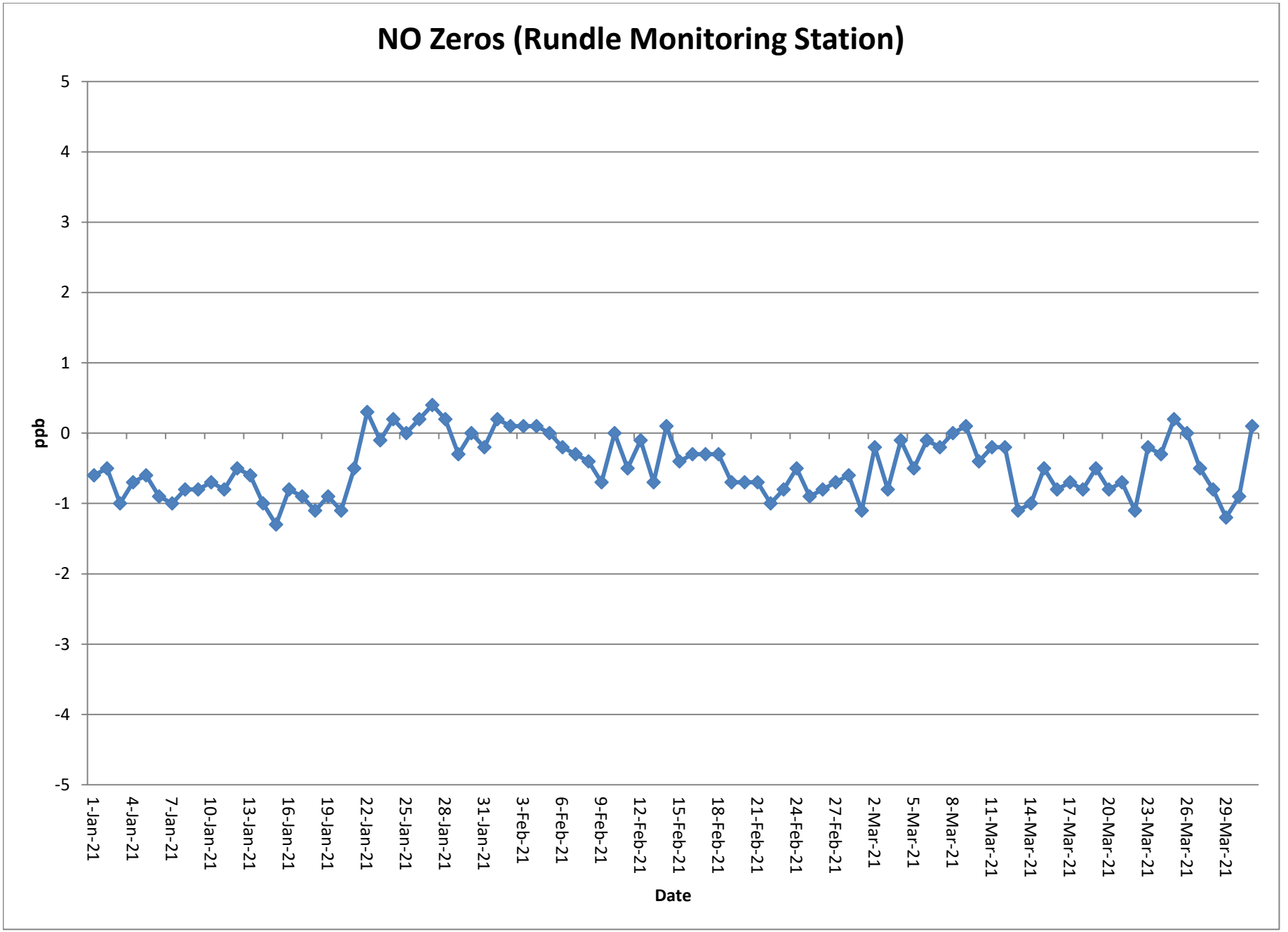
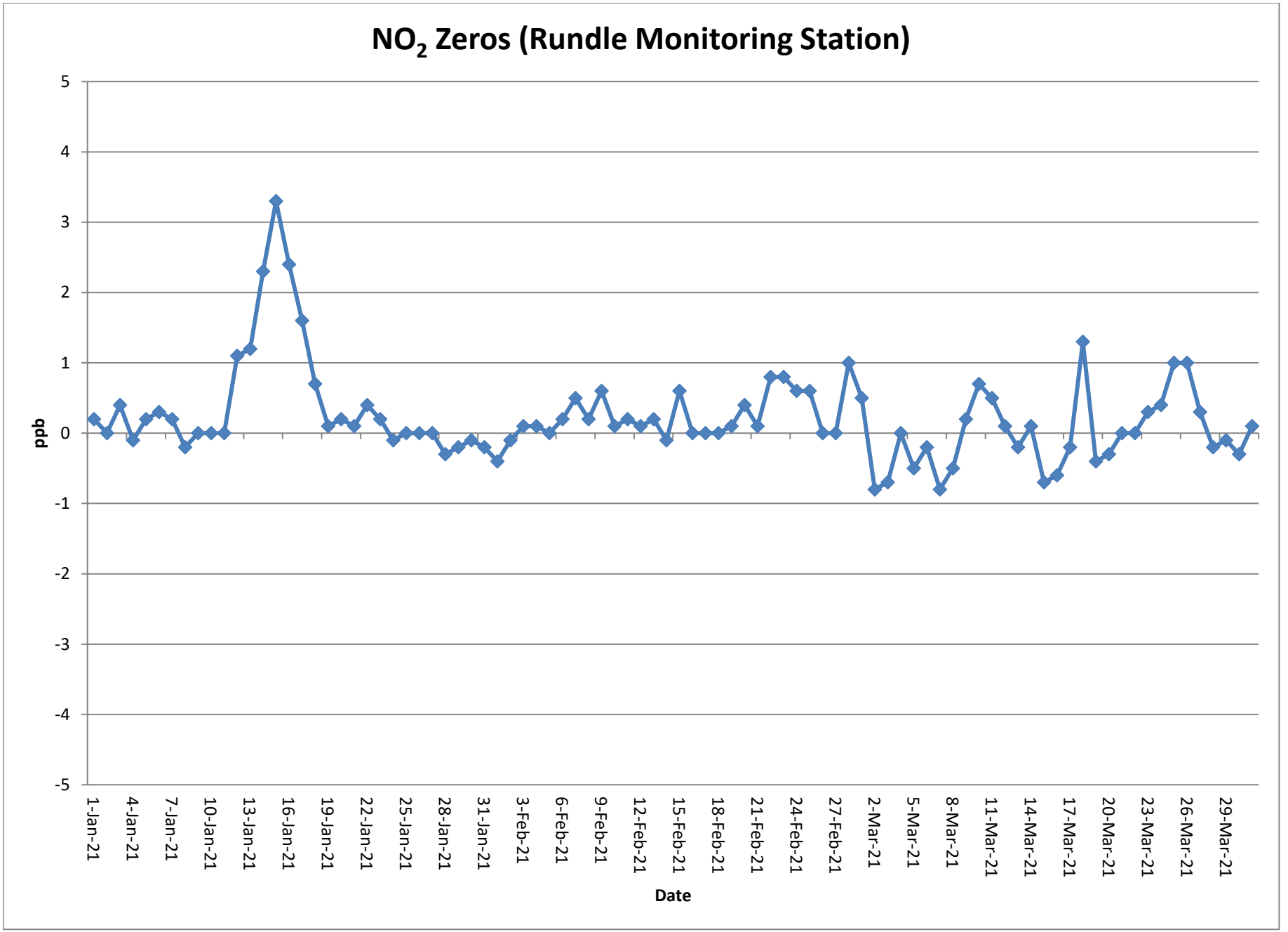
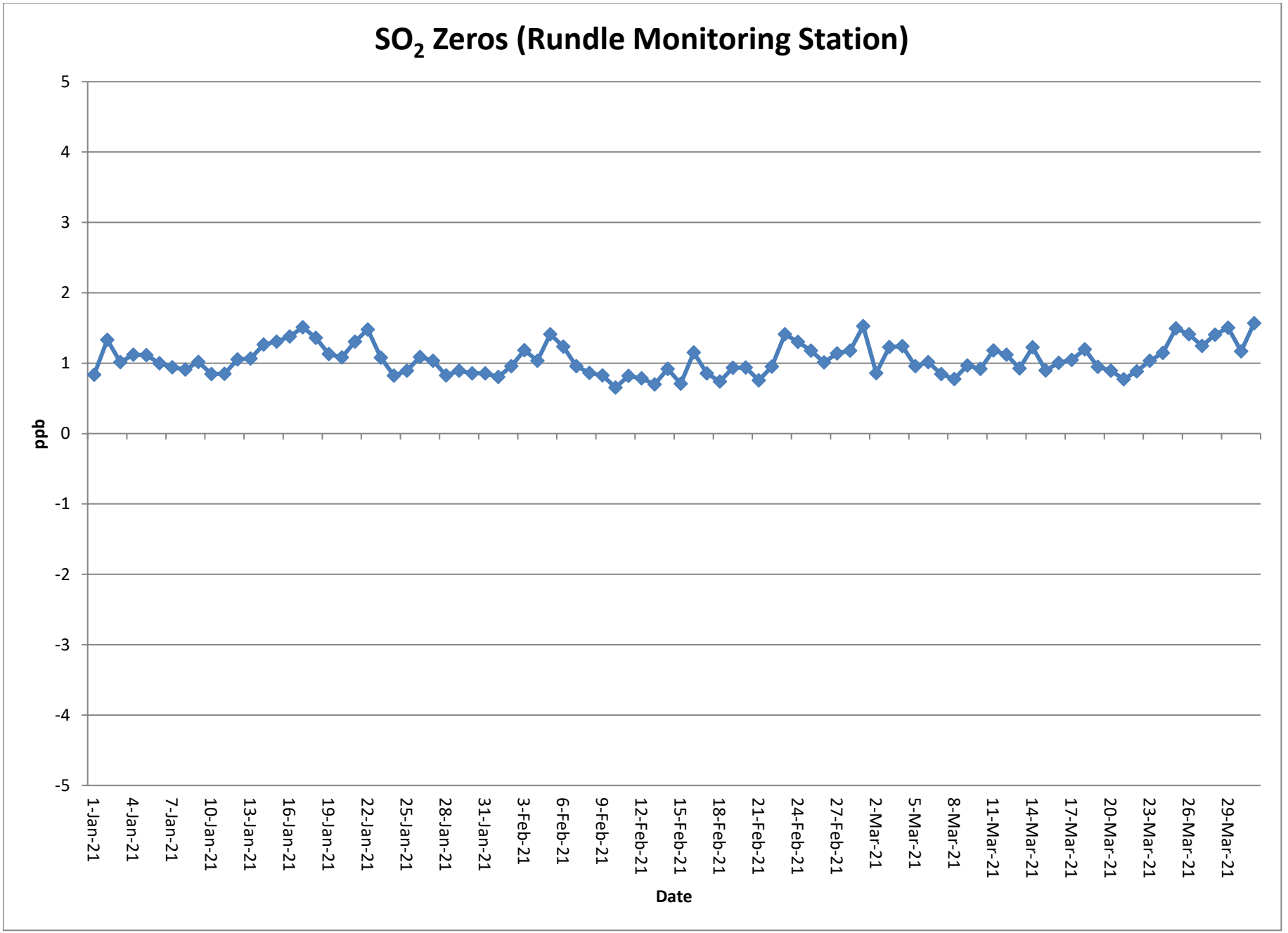
-1
-2
-3
-4
-5
1-Jan-21
4-Jan-21
7-Jan-21
10-Jan-21
13-Jan-21
16-Jan-21
19-Jan-21
22-Jan-21
25-Jan-21
28-Jan-21
31-Jan-21
3-Feb-21
6-Feb-21
9-Feb-21
12-Feb-21
15-Feb-21
18-Feb-21
21-Feb-21
24-Feb-21
27-Feb-21
2-Mar-21
5-Mar-21
8-Mar-21
11-Mar-21
14-Mar-21
17-Mar-21
20-Mar-21
23-Mar-21
26-Mar-21
29-Mar-21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


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


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


NO2 Zeros (Rundle Monitoring Station)
ppb
5
4
3
2
1
0
-1
-2
-3
-4
-5
1-Jan-21
4-Jan-21
7-Jan-21
10-Jan-21
13-Jan-21
16-Jan-21
19-Jan-21
22-Jan-21
25-Jan-21
28-Jan-21
31-Jan-21
3-Feb-21
6-Feb-21
9-Feb-21
12-Feb-21
15-Feb-21
18-Feb-21
21-Feb-21
24-Feb-21
27-Feb-21
2-Mar-21
5-Mar-21
8-Mar-21
11-Mar-21
14-Mar-21
17-Mar-21
20-Mar-21
23-Mar-21
26-Mar-21
29-Mar-21
Date


SO2 Zeros (Rundle Monitoring Station)
ppb
5
4
3
2
1
0
-1
-2
-3
-4
-5
1-Jan-21
4-Jan-21
7-Jan-21
10-Jan-21
13-Jan-21
16-Jan-21
19-Jan-21
22-Jan-21
25-Jan-21
28-Jan-21
31-Jan-21
3-Feb-21
6-Feb-21
9-Feb-21
12-Feb-21
15-Feb-21
18-Feb-21
21-Feb-21
24-Feb-21
27-Feb-21
2-Mar-21
5-Mar-21
8-Mar-21
11-Mar-21
14-Mar-21
17-Mar-21
20-Mar-21
23-Mar-21
26-Mar-21
29-Mar-21
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, 2021 | | End Date: March 31, 2021 | | | 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 | 20/01/2021 | SRS | Deleted Hours | 20/01/2021 | 13:00 | 20/01/2021 | 15:00 | 2 | Monthly Calibration |
| 2 | 12/02/2021 | MPA | Zero correction | 01/01/2021 | 00:00 | 31/01/2021 | 23:00 | - | Correcting values <0 to 0 |
| 3 | 23/02/2021 | SRS | Deleted Hours | 23/02/2021 | 13:00 | 23/02/2021 | 14:00 | 1 | Monthly Calibration |
| 4 | 09/03/2021 | MPA | Zero correction | 01/02/2021 | 00:00 | 01/03/2021 | 00:00 | - | Correcting values <0 to 0 |
| 5 | 30/03/2021 | SRS | Deleted Hours | 30/03/2021 | 11:00 | 30/03/2021 | 13:00 | 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, 2021 | | End Date: March 31, 2021 | | | 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 | 20/01/2021 | SRS | Deleted Hours | 20/01/2021 | 16:00 | 20/01/2021 | 17:00 | 1 | Monthly Calibration |
| 2 | 23/02/2021 | SRS | Deleted Hours | 23/02/2021 | 16:00 | 23/02/2021 | 17:00 | 1 | Monthly Calibration |
| 3 | 30/03/2021 | SRS | Deleted Hours | 30/03/2021 | 17:00 | 30/03/2021 | 18:00 | 1 | 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, 2021 | End Date: March 31, 2021 | | 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 | 12/02/2021 | MPA | Zero offset adjustment | 11/01/2021 | 02:00 | 17/01/2021 | 02:00 | - | Correcting zero drift |
| 2 | 20/01/2021 | SRS | Deleted Hours | 20/01/2021 | 11:00 | 20/01/2021 | 14:00 | 3 | Monthly Calibration |
| 3 | 12/02/2021 | MPA | Zero correction | 01/01/2021 | 00:00 | 01/02/2021 | 00:00 | - | Correcting values <0 to 0 |
| 4 | 23/02/2021 | SRS | Deleted Hours | 23/02/2021 | 12:00 | 23/02/2021 | 14:00 | 2 | Monthly Calibration |
| 5 | 09/03/2021 | MPA | Zero correction | 01/02/2021 | 00:00 | 01/03/2021 | 00:00 | - | Correcting values <0 to 0 |
| 6 | 30/03/2021 | SRS | Deleted Hours | 30/03/2021 | 11:00 | 30/03/2021 | 13:00 | 2 | Monthly Calibration |
| 7 | 12/04/2021 | MPA | Zero correction | 01/03/2021 | 00:00 | 01/04/2021 | 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, 2021 | End Date: March 31, 2021 | 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 | 12/02/2021 | MPA | Zero offset adjustment | 11/01/2021 | 02:00 | 17/01/2021 | 02:00 | - | Correcting zero drift |
| 2 | 20/01/2021 | SRS | Deleted Hours | 20/01/2021 | 15:00 | 20/01/2021 | 17:00 | 2 | Monthly Calibration |
| 3 | 12/02/2021 | MPA | Zero correction | 01/01/2021 | 00:00 | 01/02/2021 | 00:00 | - | Correcting values <0 to 0 |
| 4 | 23/02/2021 | SRS | Deleted Hours | 23/02/2021 | 15:00 | 23/02/2021 | 17:00 | 2 | Monthly Calibration |
| 5 | 09/03/2021 | MPA | Zero correction | 01/02/2021 | 00:00 | 01/03/2021 | 00:00 | - | Correcting values <0 to 0 |
| 6 | 30/03/2021 | SRS | Deleted Hours | 30/03/2021 | 15:00 | 30/03/2021 | 18:00 | 3 | Monthly Calibration |
| 7 | 12/04/2021 | MPA | Zero correction | 01/03/2021 | 00:00 | 01/04/2021 | 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, 2021 | | End Date: March 31, 2021 | | | 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 | 20/01/2021 | SRS | Deleted Hours | 20/01/2021 | 13:00 | 20/01/2021 | 15:00 | 2 | Monthly Calibration |
| 2 | 12/02/2021 | MPA | Zero correction | 01/01/2021 | 00:00 | 01/02/2021 | 00:00 | - | Correcting values <0 to 0 |
| 3 | 23/02/2021 | SRS | Deleted Hours | 23/02/2021 | 13:00 | 23/02/2021 | 15:00 | 2 | Monthly Calibration |
| 4 | 09/03/2021 | MPA | Zero correction | 01/02/2021 | 00:00 | 01/03/2021 | 00:00 | - | Correcting values <0 to 0 |
| 5 | 30/03/2021 | SRS | Deleted Hours | 30/03/2021 | 12:00 | 30/03/2021 | 14:00 | 2 | Monthly Calibration |
| 6 | 12/04/2021 | MPA | Zero correction | 01/03/2021 | 00:00 | 01/04/2021 | 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, 2021 | End Date: March 31, 2021 | | 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 | 20/01/2021 | SRS | Deleted Hours | 20/01/2021 | 16:00 | 20/01/2021 | 18:00 | 2 | Monthly Calibration |
| 2 | 12/02/2021 | MPA | Zero correction | 01/01/2021 | 00:00 | 31/01/2021 | 23:00 | - | Correcting values <0 to 0 |
| 3 | 23/02/2021 | SRS | Deleted Hours | 23/02/2021 | 16:00 | 23/02/2021 | 18:00 | 2 | Monthly Calibration |
| 4 | 09/03/2021 | MPA | Zero correction | 01/02/2021 | 00:00 | 01/03/2021 | 00:00 | - | Correcting values <0 to 0 |
| 5 | 30/03/2021 | SRS | Deleted Hours | 30/03/2021 | 17:00 | 30/03/2021 | 19:00 | 2 | Monthly Calibration |
| 6 | 12/04/2021 | MPA | Zero correction | 01/03/2021 | 00:00 | 01/04/2021 | 00:00 | - | Correcting values <0 to 0 |

**Table D7: Q1 Edit Log for Meteorological Parameters 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:** 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, 2021 | | End Date: March 31, 2021 | | | 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, 2021 | | End Date: March 31, 2021 | | | 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, 2021 | | End Date: March 31, 2021 | | | 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 D10: Q1 Edit Log for Discrete Sampling at Rundle Road 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, 2021 | | | End Date: March 31, 2021 | | | 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** | |
| - | - | - | - | - | - | - | - | | - |

# APPENDIX E

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:** | 2021-04-07 | **RWDI Reference No.:** 1803743 |
| **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:** | Claire Finoro | **EMAIL:** Claire.Finoro@rwdi.com |
| | John DeYoe | **EMAIL:** jd@rwdi.com |
| **RE:** | **Exceedance Report – Benzo(a)Pyrene March 11, 2021**<br>**Region of Durham, DYEC** | |

On March 31, 2021 the results from ALS Environmental were received regarding the PAH results from the March 11, 2021 sampling event. On April 1, 2021, the results were entered and assessed, and it was found that there was one (1) measured Benzo(a)Pyrene concentration in excess of the 24-hour AAQC on the March 11th sampling date.

March 11, 2021

On Thursday, March 11, 2021, there was one exceedance of the Benzo(a)Pyrene 24-hour AAQC, which occurred at the Rundle Road Station measured at the onsite PUF PS-1 sampler. Attached is a figure depicting the wind rose (indicating the wind speed and direction during the sampling day), and the location of the sampling station relative to the DYEC.

The following summarizes the BaP concentrations and onsite conditions during the March 11th sampling date:

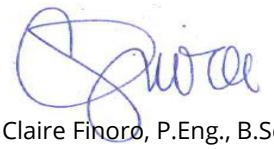
1. The guideline concentration for BaP is 0.00005 ug/m$^3$. The measured concentration at the Rundle Road sampler was 0.000076 µg/m$^3$. During the sampling day the wind was recorded predominantly from the WSW and SW as recorded at the Rundle Road Meteorological Tower. Wind speeds at Rundle tower ranged from 1.38 km/h to 27.94 km/h.
2. According to the Rundle meteorological data, the Rundle Road Station was downwind of the DYEC during part of the sampling period. Since the winds were predominantly coming from the West-southwest and Southwest, it is possible that the measured BaP exceedance is partially attributable to the DYEC, as well as off-site sources other than the Energy Centre operations. It should be noted that the Courtice station was completely upwind of the DYEC on the sample day and the BaP reading there was 90% of the AAQC. It is likely that the BaP background concentrations were elevated on March 11.

At the Rundle Road Station, the $NO_2$ hourly values were less than 7.25% of the criteria for the same period. The $PM_{2.5}$ 24-hour average value was 2.2 micrograms per cubic meter at the Rundle Road Station.

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

Respectfully submitted by:

RWDI



Claire Finoro, P.Eng., B.Sc.(Eng)
Project Manager

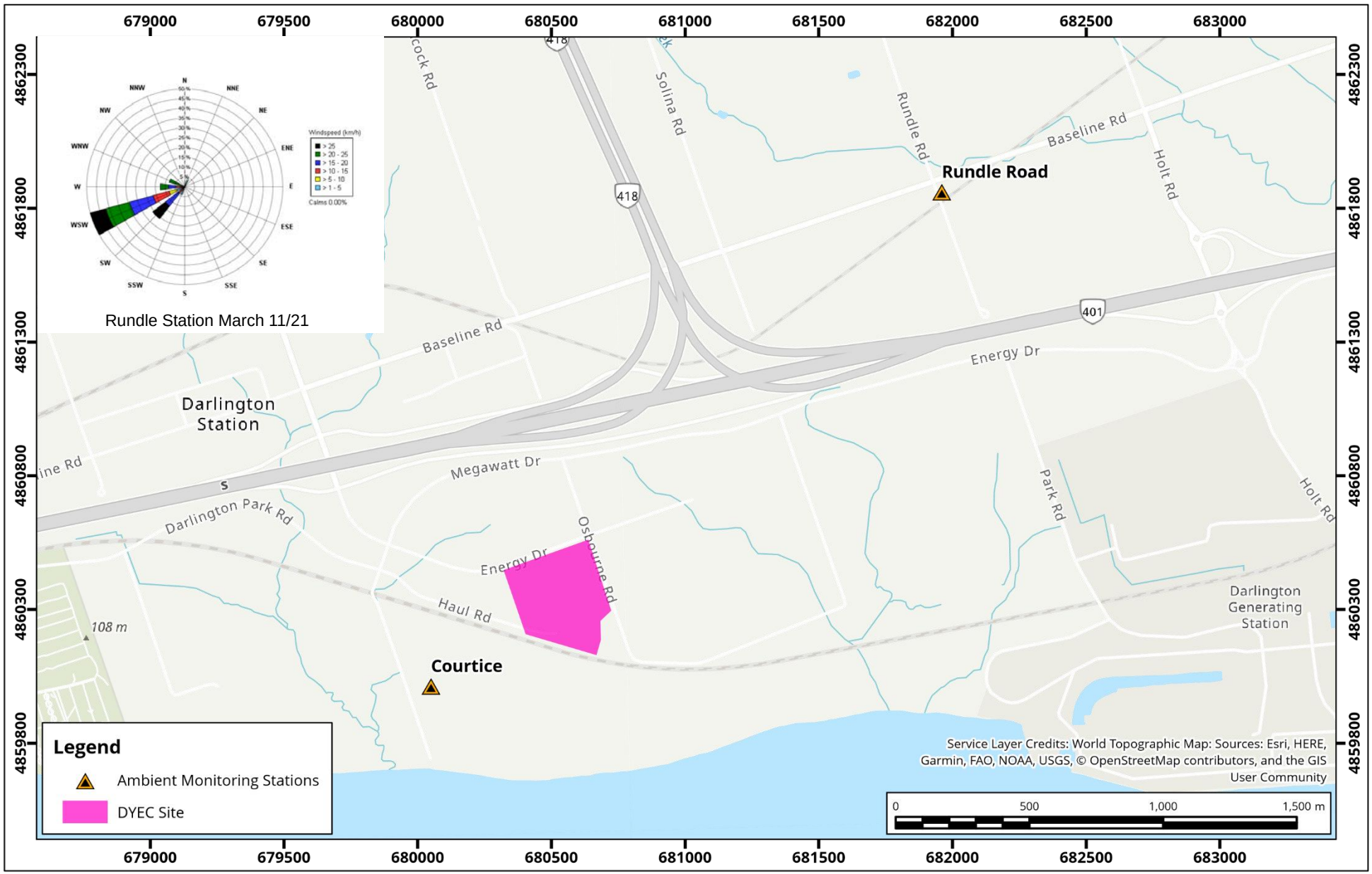
CIF/klm

Attach.

# ATTACHMENTS

**Table B6: 2021 Rundle Station Q1 Monitoring Results for PAHs**

| Contaminant | Units | *MECP Criteria* | 11 Mar 21 | No. > Criteria |
|---|---|---|---|---|
| 1-Methylnaphthalene | ng/m$^3$ | *12000* | 5.00 | 0 |
| 2-Methylnaphthalene | ng/m$^3$ | *10000* | 7.96 | 0 |
| Acenaphthene | ng/m$^3$ | - | 1.66E+00 | - |
| Acenaphthylene | ng/m$^3$ | *3500* | 1.12E-01 | 0 |
| Anthracene | ng/m$^3$ | *200* | 7.84E-02 | 0 |
| Benzo(a)Anthracene | ng/m$^3$ | - | 4.32E-02 | - |
| Benzo(a)fluorene | ng/m$^3$ | - | 5.71E-02 | - |
| Benzo(a)Pyrene (Historically High) | ng/m$^3$ | *0.05*[1] *5*[2] *1.1*[3] | 7.62E-02 | 1 |
| Benzo(b)Fluoranthene | ng/m$^3$ | - | 1.40E-01 | - |
| Benzo(b)fluorene | ng/m$^3$ | - | 3.80E-02 | - |
| Benzo(e)Pyrene | ng/m$^3$ | - | 9.23E-02 | - |
| Benzo(g,h,i)Perylene | ng/m$^3$ | - | 8.40E-02 | - |
| Benzo(k)Fluoranthene | ng/m$^3$ | - | 1.20E-01 | - |
| Biphenyl | ng/m$^3$ | - | 2.32E+00 | - |
| Chrysene | ng/m$^3$ | - | 1.62E-01 | - |
| Dibenzo(a,h)Anthracene | ng/m$^3$ | - | 1.02E-02 | - |
| Fluoranthene | ng/m$^3$ | - | 5.83E-01 | - |
| Fluorene | ng/m$^3$ | - | 1.55E+00 | - |
| Indeno(1,2,3-cd)Pyrene | ng/m$^3$ | - | 8.58E-02 | - |
| Naphthalene | ng/m$^3$ | *22500* | 1.96E+01 | 0 |
| o-Terphenyl | ng/m$^3$ | - | 1.13E-02 | - |
| Perylene | ng/m$^3$ | - | 1.19E-02 | - |
| Phenanthrene | ng/m$^3$ | - | 2.72E+00 | - |
| Pyrene | ng/m$^3$ | - | 3.21E-01 | - |
| Tetralin | ng/m$^3$ | - | 1.79 | - |
| Total PAH[4] | ng/m$^3$ | - | 44.60 | - |




# DYEC Site and Ambient Monitoring Station Locations

True North

Drawn by:

Figure: 1

Approx. Scale: 1:20,000

Date: Apı

Map Projection: NAD 1983 UTM Zone 17N

DYEC - Region of Durham, Ontario

Project #: 1803743

Map Document: C:\GIS Temp - Copy\1803743\1803743_Durham_Energy_Centre.aprx

Station: RofD Rundle  Daily: 11/03/2021  Type: AVG 1 Hr. [5 Mins.]

| Date & Time | PM2.5 | NO | NO2 | NOX | SO2 | Batt Min | Temp | Rain | Tr_Temp | RH AVG | Rain total | WS km/hr | WD | Hi-Vol P | PUF P | Temp | Hivol Flow | PUF Flow |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/m3 | ppb | ppb | ppb | ppb | Volts | C° | mm | C° | % | mm | km/hr | Deg | in H20 | in H20 | K | cfm | cfm |
| 11/03/2021 00:00 | 15.1 | -0.3 | 5.9 | 5.6 | 0.315 | 13.2 | 5.6 | 0 | 21.7 | 63.1 | 0 | 1.38 | 201.59 | 3.82 | 54.53 | 278.722 | 40.54 | 8.13 |
| 11/03/2021 01:00 | 18.1 | 0.4 | 6.2 | 6.5 | 0.356 | 13.2 | 6.2 | 0 | 21.9 | 61.7 | 0 | 2.88 | 13.23 | 3.83 | 55.03 | 279.305 | 40.56 | 8.16 |
| 11/03/2021 02:00 | 18.7 | -0.4 | 4 | 3.7 | 0.352 | 13.2 | 6.5 | 0 | 21.8 | 61.9 | 0 | 1.9 | 238.57 | 3.81 | 54.54 | 279.652 | 40.44 | 8.12 |
| 11/03/2021 03:00 | 18.8 | 0.8 | 14.5 | 15.3 | 0.621 | 13.2 | 10 | 0 | 21.4 | 51.1 | 0 | 5.81 | 236.86 | 3.73 | 53.47 | 283.112 | 39.73 | 8 |
| 11/03/2021 04:00 | 16.6 | -0.4 | 5.1 | 4.7 | 0.703 | 13.2 | 10.4 | 0 | 21.8 | 50.5 | 0 | 10.43 | 235.73 | 3.71 | 52.68 | 283.587 | 39.57 | 7.94 |
| 11/03/2021 05:00 | 15 | -0.2 | 4.8 | 4.5 | 0.627 | 13.2 | 10.4 | 0 | 22.2 | 51 | 0 | 13.87 | 241.41 | 3.74 | 52.14 | 283.544 | 39.76 | 7.9 |
| 11/03/2021 06:00 | 14.4 | 0.8 | 9.2 | 10.1 | 0.538 | 13.2 | 10.2 | 0 | 22.3 | 51.4 | 0 | 15.9 | 243.98 | 3.72 | 50.96 | 283.4 | 39.67 | 7.82 |
| 11/03/2021 07:00 | 14.6 | 0.7 | 10.6 | 11.3 | 0.728 | 13.2 | 10 | 0 | 22.3 | 53.8 | 0 | 13.76 | 244.45 | 3.75 | 50.33 | 283.103 | 39.86 | 7.78 |
| 11/03/2021 08:00 | 15 | 1.1 | 8.3 | 9.4 | 1.035 | 13.2 | 10.5 | 0 | 22.7 | 53.8 | 0 | 18.22 | 246.62 | 3.74 | 50.47 | 283.622 | 39.75 | 7.79 |
| 11/03/2021 09:00 | 14.5 | 3 | 9.2 | 12.2 | 0.643 | 13.2 | 10.1 | 0 | 23.4 | 58.2 | 0 | 17.7 | 243.93 | 3.73 | 50.64 | 283.277 | 39.72 | 7.8 |
| 11/03/2021 10:00 | 12.4 | 2.1 | 4.2 | 6.3 | 0.639 | 13.2 | 11.6 | 0 | 23.1 | 56.2 | 0 | 18.49 | 229.66 | 3.81 | 52.46 | 284.748 | 40.03 | 7.91 |
| 11/03/2021 11:00 | 13.1 | 0.4 | 4.1 | 4.5 | 0.482 | 13.2 | 11.8 | 0 | 22.9 | 56.4 | 0 | 21.7 | 238.23 | 3.83 | 51.76 | 284.99 | 40.13 | 7.86 |
| 11/03/2021 12:00 | 12.3 | 0.2 | 2.9 | 3.1 | 0.598 | 13.2 | 11.6 | 0 | 23.3 | 60.1 | 0 | 19.24 | 228.76 | 3.85 | 52.41 | 284.775 | 40.26 | 7.91 |
| 11/03/2021 13:00 | 12.4 | 0.4 | 3.5 | 3.9 | 0.617 | 13.2 | 12.2 | 0 | 23.2 | 62.4 | 0 | 27.94 | 235.55 | 3.84 | 52.63 | 285.383 | 40.17 | 7.92 |
| 11/03/2021 14:00 | 12 | 0.5 | 3.5 | 4 | 0.716 | 13.2 | 11.8 | 0 | 23.1 | 66.8 | 0 | 27.01 | 233.12 | 3.78 | 51.09 | 284.991 | 39.86 | 7.81 |
| 11/03/2021 15:00 | 12.4 | 0.2 | 3.5 | 3.7 | 0.684 | 13.2 | 12.3 | 0 | 23 | 64.3 | 0 | 25.9 | 236.57 | 3.87 | 49.71 | 285.44 | 40.32 | 7.71 |
| 11/03/2021 16:00 | 12.3 | 0.2 | 3.6 | 3.8 | 0.648 | 13.2 | 11.6 | 0 | 23.2 | 65.6 | 0 | 25.6 | 237.18 | 3.79 | 49.43 | 284.679 | 39.95 | 7.7 |
| 11/03/2021 17:00 | 10.2 | -0.1 | 4 | 4 | 0.538 | 13.2 | 10.2 | 0 | 22.5 | 71.2 | 0 | 24.84 | 238 | 3.89 | 48.85 | 283.383 | 40.57 | 7.67 |
| 11/03/2021 18:00 | 8.1 | 0.7 | 6.8 | 7.5 | 0.485 | 13.2 | 9.1 | 0.4 | 22.2 | 78.9 | 0.47 | 21.33 | 245.33 | 3.99 | 48.82 | 282.233 | 41.17 | 7.69 |
| 11/03/2021 19:00 | 5.4 | 0.1 | 4.6 | 4.7 | 0.44 | 13.2 | 11.9 | 0 | 22 | 59.5 | 0.07 | 18.83 | 258.78 | 3.97 | 47.94 | 285.028 | 40.89 | 7.59 |
| 11/03/2021 20:00 | 2.8 | -0.4 | 1.2 | 0.9 | 0.383 | 13.2 | 11.6 | 0 | 22 | 43.6 | 0 | 20.95 | 279.36 | 3.98 | 48.49 | 284.749 | 40.92 | 7.63 |
| 11/03/2021 21:00 | 1 | -0.5 | 0.7 | 0.3 | 0.348 | 13.2 | 9.8 | 0 | 21.7 | 46 | 0.1 | 24.64 | 287.98 | 4.03 | 49.21 | 282.889 | 41.32 | 7.71 |
| 11/03/2021 22:00 | 1.5 | -0.3 | 0.6 | 0.3 | 0.293 | 13.2 | 8.1 | 0 | 21.8 | 48.6 | 0.01 | 20.14 | 281.87 | 4.06 | 47.9 | 281.276 | 41.58 | 7.63 |
| 11/03/2021 23:00 | 1.2 | -0.4 | 0.5 | 0.2 | 0.279 | 13.2 | 7 | 0 | 21.8 | 51.2 | 0 | 14.05 | 278.66 | 4.06 | 48.39 | 280.143 | 41.71 | 7.68 |
| Minimum | 1 | -0.5 | 0.5 | 0.2 | 0.279 | 13.2 | 5.6 | 0 | 21.4 | 43.6 | 0 | 1.38 | 13.23 | 3.71 | 47.9 | 278.722 | 39.57 | 7.59 |
| MinDate | 21:00 | 21:00 | 23:00 | 23:00 | 23:00 | 00:00 | 00:00 | 00:00 | 03:00 | 20:00 | 00:00 | 00:00 | 01:00 | 04:00 | 22:00 | 00:00 | 04:00 | 19:00 |
| Maximum | 18.8 | 3 | 14.5 | 15.3 | 1.035 | 13.2 | 12.3 | 0.4 | 23.4 | 78.9 | 0.47 | 27.94 | 287.98 | 4.06 | 55.03 | 285.44 | 41.71 | 8.16 |
| MaxDate | 03:00 | 09:00 | 03:00 | 03:00 | 08:00 | 00:00 | 15:00 | 18:00 | 09:00 | 18:00 | 18:00 | 13:00 | 21:00 | 22:00 | 01:00 | 15:00 | 23:00 | 01:00 |
| Avg | 11.6 | 0.4 | 5.1 | 5.4 | 0.544 | 13.2 | 10 | 0.4 | 22.4 | 57.8 | 0.03 | 17.19 | 235.64 | 3.85 | 51 | 283.168 | 40.35 | 7.83 |
| Num | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| Data[%] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| STD | 5.4 | 0.8 | 3.3 | 3.8 | 0.2 | No Data | 1.9 | No Data | 0.6 | 8.1 | 0.1 | 7.7 | 50.2 | 0.1 | 2.1 | 2 | 0.6 | 0.2 |

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 Drive |
| **ALS WO#:** | L2567745 | | Guelph, ON N1G 4P6 |
| **Date of Report** | 31-Mar-21 | | Canada |
| **Date of Sample Receipt** | 17-Mar-21 | **Client Contact:** | Claire Finoro |
| | | **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 | | Method Blank | | COURTICE-PAH-MAR11 | | RUNDLE-PAH-MAR11 | | Laboratory Control Sample | |
|---|---|---|---|---|---|---|---|---|---|---|
| ALS Sample ID | WG3503806-1 | | WG3503806-4 | | L2567745-1 | | L2567745-2 | | WG3503806-2 | |
| Sample Size | 1 | | 1 | | 1 | | 1 | | 1 | |
| Sample units | Sample | | Sample | | Sample | | Sample | | LCS | |
| Moisture Content | n/a | | n/a | | n/a | | n/a | | n/a | |
| Matrix | MEDIA | | REAGENT | | Puf | | Puf | | MEDIA | |
| Sampling Date | n/a | | n/a | | 11-Mar-21 | | 11-Mar-21 | | n/a | |
| Extraction Date | 18-Mar-21 | | 18-Mar-21 | | 18-Mar-21 | | 18-Mar-21 | | 18-Mar-21 | |
| **Target Analytes** | **ng** | | **ng** | | **ng** | | **ng** | | **%** | |
| Naphthalene | 13.9 | R | 14.3 | | 3450 | | 6340 | | 104.0 | |
| 2-Methylnaphthalene | 3.61 | | 2.34 | | 1050 | | 2580 | | 103.4 | |
| 1-Methylnaphthalene | 2.07 | | 1.36 | | 689 | | 1620 | | 114.3 | |
| Acenaphthylene | 0.280 | R | 0.280 | R | 10.1 | R | 36.2 | M | 87.2 | |
| Acenaphthene | 2.12 | R | 0.0700 | M | 136 | | 537 | | 73.3 | |
| Fluorene | 0.420 | | 0.150 | | 196 | | 503 | | 66.0 | |
| Phenanthrene | 2.59 | | 0.670 | | 266 | | 881 | | 88.8 | |
| Anthracene | 0.180 | R | 0.0500 | R | 5.81 | | 25.4 | | 84.2 | |
| Fluoranthene | 1.15 | M | 0.220 | M | 85.1 | | 189 | | 85.8 | |
| Pyrene | 0.920 | M,R | 0.230 | | 43.7 | | 104 | | 83.8 | |
| Benzo(a)Anthracene | 0.260 | M | <0.020 | U | 8.42 | | 14.0 | | 91.3 | |
| Chrysene | 0.460 | M | <0.020 | U | 27.9 | | 52.4 | | 85.0 | |
| Benzo(b)Fluoranthene | 0.710 | M,R | 0.130 | MR | 24.9 | M | 45.3 | M | 81.5 | |
| Benzo(k)Fluoranthene | 0.490 | M | 0.0500 | MR | 22.4 | M | 38.8 | M | 84.7 | |
| Benzo(e)Pyrene | 0.410 | M | <0.020 | U | 18.9 | | 29.9 | | 101.2 | |
| Benzo(a)Pyrene | 0.940 | | <0.020 | U | 14.0 | M | 24.7 | | 88.2 | |
| Perylene | 0.240 | M | <0.020 | U | 2.34 | M,B | 3.84 | M | 90.6 | |
| Indeno(1,2,3-cd)Pyrene | 0.510 | M | <0.020 | U | 19.7 | | 27.8 | | 80.3 | |
| Dibenzo(a,h)Anthracene | 0.320 | | <0.020 | U | 2.12 | B | 3.31 | | 80.0 | |
| Benzo(g,h,i)Perylene | 0.350 | M | <0.020 | U | 18.4 | | 27.2 | | 83.8 | |
| **Additional Analytes** | | | | | | | | | | |
| Tetralin | 4.19 | | 2.05 | M | 388 | | 581 | | | |
| Biphenyl | 0.890 | | 0.590 | | 460 | | 751 | | | |
| o-Terphenyl | 0.0400 | | <0.020 | U | 3.42 | | 3.67 | | | |
| Benzo(a)fluorene | 0.120 | M | <0.020 | U | 6.58 | M | 18.5 | M | | |
| Benzo(b)fluorene | 0.0900 | | <0.020 | U | 4.91 | | 12.3 | | | |
| **Field Sampling Standards** | **% Rec** | | **% Rec** | | **% Rec** | | **% Rec** | | **% Rec** | |
| 1-Methylnaphthalene-D10 | NS | | NS | | 71.6 | | 94.3 | | NS | |
| Fluorene D10 | NS | | NS | | 60.1 | | 82.7 | | NS | |
| Terphenyl D14(Surr.) | NS | | NS | | 96.5 | | 98.3 | | NS | |
| **Extraction Standards** | **% Rec** | | **% Rec** | | **% Rec** | | **% Rec** | | **% Rec** | |
| Naphthalene D8 | 75.9 | | 53.3 | R | 100.5 | R | 88.5 | | 107.8 | R |
| 2-Methylnaphthalene-D10 | 54.3 | | 51.8 | | 71.8 | | 59.1 | | 76.8 | |
| Acenaphthylene D8 | 62.2 | | 68.8 | | 77.8 | | 74.3 | | 88.8 | |
| Phenanthrene D10 | 110.1 | | 125.1 | | 130.9 | | 114.1 | | 131.8 | |
| Anthracene-D10 | 103.5 | | 104.3 | | 87.7 | | 79.7 | | 123.9 | |
| Fluoranthene D10 | 128.4 | | 150.8 | | 141.3 | | 116.1 | | 149.2 | |
| Benz(a)Anthracene-D12 | 110.0 | | 115.1 | | 128.5 | | 126.5 | | 136.0 | |
| Chrysene D12 | 116.0 | | 138.1 | | 127.2 | | 113.7 | | 156.5 | |
| Benzo(b)Fluoranthene-D12 | 116.9 | | 130.8 | | 136.0 | | 112.0 | | 136.0 | |
| Benzo(k)Fluoranthene-D12 | 100.5 | | 121.8 | | 124.2 | | 101.5 | | 136.9 | |
| Benzo(a)Pyrene D12 | 84.0 | | 85.0 | | 86.1 | | 82.7 | | 123.6 | |
| Perylene D12 | 28.1 | | 106.1 | | 73.1 | | 77.4 | | 122.4 | |
| Indeno(1,2,3,cd)Pyrene-D12 | 77.6 | | 117.2 | | 87.6 | | 97.0 | | 99.9 | |
| Dibenz(a,h)Anthracene-D14 | 65.4 | | 87.8 | | 72.9 | | 76.9 | | 90.3 | |
| Benzo(g,h,i)Perylene D12 | 79.3 | | 119.4 | | 88.4 | | 88.5 | | 103.1 | |

| | |
|---|---|
| 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 this standard was not spiked to sample |

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

| | | | |
|---|---|---|---|
| **Sample Name** | **Method Blank** | Sampling Date | n/a |
| ALS Sample ID | WG3503806-1 | Extraction Date | 18-Mar-21 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | blank | | |
| Sample Matrix | MEDIA | | |
| Sample Size | 1 Sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3503806 |

Approved:
*T.Patterson*
--e-signature--
30-Mar-2021

| **Run Information** | **Run 1** |
|---|---|
| Filename | 210329A10.D |
| Run Date | 3/29/2021 16:57 |
| Final Volume | 0.01 mL |
| Dilution Factor | 1 |
| Analysis Units | ng |
| Instrument | MSD-5 |
| Column | HP5MS US1193225H |

| **Target Analytes** | **Ret. Time** | **Concentration ng** | **Flags** | |
|---|---|---|---|---|
| Naphthalene | 2.75 | 13.9 | | R |
| 2-Methylnaphthalene | 3.33 | 3.61 | | |
| 1-Methylnaphthalene | 3.44 | 2.07 | | |
| Acenaphthylene | 4.46 | 0.280 | | R |
| Acenaphthene | 4.73 | 2.12 | | R |
| Fluorene | 5.67 | 0.420 | | |
| Phenanthrene | 7.86 | 2.59 | | |
| Anthracene | 7.98 | 0.180 | | R |
| Fluoranthene | 11.27 | 1.15 | M | |
| Pyrene | 11.92 | 0.920 | M | R |
| Benzo(a)Anthracene | 15.84 | 0.260 | M | |
| Chrysene | 15.97 | 0.460 | M | |
| Benzo(b)Fluoranthene | 19.21 | 0.710 | M | R |
| Benzo(k)Fluoranthene | 19.25 | 0.490 | M | |
| Benzo(e)Pyrene | 19.95 | 0.410 | M | |
| Benzo(a)Pyrene | 20.08 | 0.940 | | |
| Perylene | 20.31 | 0.240 | M | |
| Indeno(1,2,3-cd)Pyrene | 23.78 | 0.510 | M | |
| Dibenzo(a,h)Anthracene | 24.06 | 0.320 | | |
| Benzo(g,h,i)Perylene | 24.78 | 0.350 | M | |
| **Additional Analytes** | | | | |
| Tetralin | 2.63 | 4.19 | | |
| Biphenyl | 3.86 | 0.890 | | |
| o-Terphenyl | 9.14 | 0.0400 | | |
| Benzo(a)fluorene | 13.10 | 0.120 | M | |
| Benzo(b)fluorene | 13.31 | 0.0900 | | |

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

| **Extraction Standards** | | | **% Rec** | **Limits** |
|---|---|---|---|---|
| Naphthalene D8 | 200 | 2.73 | 75.9 | 50-150 |
| 2-Methylnaphthalene-D10 | 200 | 3.29 | 54.3 | 50-150 |
| Acenaphthylene D8 | 200 | 4.44 | 62.2 | 50-150 |
| Phenanthrene D10 | 200 | 7.81 | 110.1 | 50-150 |
| Anthracene-D10 | 200 | 7.93 | 103.5 | 50-150 |
| Fluoranthene D10 | 200 | 11.23 | 128.4 | 50-150 |
| Benz(a)Anthracene-D12 | 200 | 15.78 | 110.0 | 50-150 |
| Chrysene D12 | 200 | 15.89 | 116.0 | 50-150 |
| Benzo(b)Fluoranthene-D12 | 200 | 19.14 | 116.9 | 50-150 |
| Benzo(k)Fluoranthene-D12 | 200 | 19.22 | 100.5 | 50-150 |
| Benzo(a)Pyrene D12 | 200 | 20.02 | 84.0 | 50-150 |
| Perylene D12 | 200 | 20.25 | 28.1 | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 200 | 23.71 | 77.6 | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 200 | 23.88 | 65.4 | 50-150 |
| Benzo(g,h,i)Perylene D12 | 200 | 24.68 | 79.3 | 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. |
| NS | Indicates that this standard was not spiked to sample |

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

| | | | |
|---|---|---|---|
| **Sample Name** | **Method Blank** | Sampling Date | n/a |
| ALS Sample ID | WG3503806-4 | Extraction Date | 18-Mar-21 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | blank | | |
| Sample Matrix | REAGENT | | |
| Sample Size | 1 Sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3503806 |

Approved:
*T.Patterson*
--e-signature--
30-Mar-2021

| **Run Information** | **Run 1** |
|---|---|
| Filename | 210329A11.D |
| Run Date | 3/29/2021 17:35 |
| Final Volume | 0.01 mL |
| Dilution Factor | 1 |
| Analysis Units | ng |
| Instrument | MSD-5 |
| Column | HP5MS US1193225H |

| **Target Analytes** | **Ret. Time** | **Concentration ng** | **Flags** |
|---|---|---|---|
| Naphthalene | 2.75 | 14.3 | |
| 2-Methylnaphthalene | 3.33 | 2.34 | |
| 1-Methylnaphthalene | 3.44 | 1.36 | |
| Acenaphthylene | 4.45 | 0.280 | R |
| Acenaphthene | 4.75 | 0.0700 | M |
| Fluorene | 5.67 | 0.150 | |
| Phenanthrene | 7.87 | 0.670 | |
| Anthracene | 7.98 | 0.0500 | R |
| Fluoranthene | 11.27 | 0.220 | M |
| Pyrene | 11.93 | 0.230 | |
| Benzo(a)Anthracene | NotFnd | <0.020 | U |
| Chrysene | NotFnd | <0.020 | U |
| Benzo(b)Fluoranthene | 19.21 | 0.130 | M R |
| Benzo(k)Fluoranthene | 19.27 | 0.0500 | M R |
| Benzo(e)Pyrene | NotFnd | <0.020 | U |
| Benzo(a)Pyrene | NotFnd | <0.020 | U |
| Perylene | NotFnd | <0.020 | U |
| Indeno(1,2,3-cd)Pyrene | NotFnd | <0.020 | U |
| Dibenzo(a,h)Anthracene | NotFnd | <0.020 | U |
| Benzo(g,h,i)Perylene | NotFnd | <0.020 | U |
| **Additional Analytes** | | | |
| Tetralin | 2.63 | 2.05 | M |
| Biphenyl | 3.86 | 0.590 | |
| o-Terphenyl | NotFnd | <0.020 | U |
| Benzo(a)fluorene | NotFnd | <0.020 | U |
| Benzo(b)fluorene | NotFnd | <0.020 | U |

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

| **Extraction Standards** | | | **% Rec** | | **Limits** |
|---|---|---|---|---|---|
| Naphthalene D8 | 200 | 2.73 | 53.3 | R | 50-150 |
| 2-Methylnaphthalene-D10 | 200 | 3.29 | 51.8 | | 50-150 |
| Acenaphthylene D8 | 200 | 4.44 | 68.8 | | 50-150 |
| Phenanthrene D10 | 200 | 7.81 | 125.1 | | 50-150 |
| Anthracene-D10 | 200 | 7.94 | 104.3 | | 50-150 |
| Fluoranthene D10 | 200 | 11.22 | 150.8 | | 50-150 |
| Benz(a)Anthracene-D12 | 200 | 15.79 | 115.1 | | 50-150 |
| Chrysene D12 | 200 | 15.89 | 138.1 | | 50-150 |
| Benzo(b)Fluoranthene-D12 | 200 | 19.14 | 130.8 | | 50-150 |
| Benzo(k)Fluoranthene-D12 | 200 | 19.22 | 121.8 | | 50-150 |
| Benzo(a)Pyrene D12 | 200 | 20.02 | 85.0 | | 50-150 |
| Perylene D12 | 200 | 20.26 | 106.1 | | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 200 | 23.71 | 117.2 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 200 | 23.87 | 87.8 | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 200 | 24.68 | 119.4 | | 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. |
| NS | Indicates that this standard was not spiked to sample |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| **Sample Name** | **COURTICE-PAH-MAR11** | Sampling Date | 11-Mar-21 |
| ALS Sample ID | L2567745-1 | Extraction Date | 18-Mar-21 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | Puf | | |
| Sample Size | 1 Sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3503806 |

Approved:
*T.Patterson*
--e-signature--
30-Mar-2021

| **Run Information** | **Run 1** | **Run 2** |
|---|---|---|
| Filename | 210329A19.D | 210329A17.D |
| Run Date | 3/29/2021 22:39 | 3/29/2021 21:23 |
| Final Volume | 0.01 mL | 1 mL |
| Dilution Factor | 1 | 10 |
| Analysis Units | ng | ng |
| Instrument | MSD-5 | MSD-5 |
| Column | HP5MS US1193225H | HP5MS US1193225H |

| **Target Analytes** | **Ret. Time** | **Concentration ng** | **Flags** | **Ret. Time.** | **Concentration ng** | **Flags** |
|---|---|---|---|---|---|---|
| Naphthalene | | | | 2.75 | 3450 | |
| 2-Methylnaphthalene | | | | 3.33 | 1050 | |
| 1-Methylnaphthalene | | | | 3.44 | 689 | |
| Acenaphthylene | 4.46 | 10.1 | R | | | |
| Acenaphthene | 4.76 | 136 | | | | |
| Fluorene | 5.67 | 196 | | | | |
| Phenanthrene | | | | 7.87 | 266 | |
| Anthracene | 7.99 | 5.81 | | | | |
| Fluoranthene | 11.27 | 85.1 | | | | |
| Pyrene | 11.93 | 43.7 | | | | |
| Benzo(a)Anthracene | 15.85 | 8.42 | | | | |
| Chrysene | 15.97 | 27.9 | | | | |
| Benzo(b)Fluoranthene | 19.21 | 24.9 | M | | | |
| Benzo(k)Fluoranthene | 19.24 | 22.4 | M | | | |
| Benzo(e)Pyrene | 19.96 | 18.9 | | | | |
| Benzo(a)Pyrene | 20.09 | 14.0 | M | | | |
| Perylene | 20.32 | 2.34 | M B | | | |
| Indeno(1,2,3-cd)Pyrene | 23.80 | 19.7 | | | | |
| Dibenzo(a,h)Anthracene | 24.00 | 2.12 | B | | | |
| Benzo(g,h,i)Perylene | 24.79 | 18.4 | | | | |
| **Additional Analytes** | | | | | | |
| Tetralin | | | | 2.63 | 388 | |
| Biphenyl | | | | 3.86 | 460 | |
| o-Terphenyl | 9.15 | 3.42 | | | | |
| Benzo(a)fluorene | 13.10 | 6.58 | M | | | |
| Benzo(b)fluorene | 13.31 | 4.91 | | | | |

| **Field Sampling Standards** | **ng spiked** | | **% Rec** |
|---|---|---|---|
| 1-Methylnaphthalene-D10 | 200 | 3.41 | 71.6 |
| Fluorene D10 | 200 | 5.62 | 60.1 |
| Terphenyl D14(Surr.) | 200 | 12.74 | 96.5 |

| **Extraction Standards** | | | **% Rec** | **Limits** | | **% Rec** | |
|---|---|---|---|---|---|---|---|
| Naphthalene D8 | 200 | | | 50-150 | 2.74 | 100.5 | R |
| 2-Methylnaphthalene-D10 | 200 | | | 50-150 | 3.29 | 71.8 | |
| Acenaphthylene D8 | 200 | 4.44 | 77.8 | 50-150 | | | |
| Phenanthrene D10 | 200 | | | 50-150 | 7.82 | 130.9 | |
| Anthracene-D10 | 200 | 7.94 | 87.7 | 50-150 | | | |
| Fluoranthene D10 | 200 | 11.22 | 141.3 | 50-150 | | | |
| Benz(a)Anthracene-D12 | 200 | 15.79 | 128.5 | 50-150 | | | |
| Chrysene D12 | 200 | 15.89 | 127.2 | 50-150 | | | |
| Benzo(b)Fluoranthene-D12 | 200 | 19.14 | 136.0 | 50-150 | | | |
| Benzo(k)Fluoranthene-D12 | 200 | 19.22 | 124.2 | 50-150 | | | |
| Benzo(a)Pyrene D12 | 200 | 20.02 | 86.1 | 50-150 | | | |
| Perylene D12 | 200 | 20.26 | 73.1 | 50-150 | | | |
| Indeno(1,2,3,cd)Pyrene-D12 | 200 | 23.71 | 87.6 | 50-150 | | | |
| Dibenz(a,h)Anthracene-D14 | 200 | 23.87 | 72.9 | 50-150 | | | |
| Benzo(g,h,i)Perylene D12 | 200 | 24.69 | 88.4 | 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. |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| **Sample Name** | **RUNDLE-PAH-MAR11** | Sampling Date | 11-Mar-21 |
| ALS Sample ID | L2567745-2 | Extraction Date | 18-Mar-21 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | Puf | | |
| Sample Size | 1 Sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3503806 |

Approved:
*T.Patterson*
--e-signature--
30-Mar-2021

| **Run Information** | **Run 1** | **Run 2** |
|---|---|---|
| Filename | 210329A20.D | 210329A18.D |
| Run Date | 3/29/2021 23:17 | 3/29/2021 22:01 |
| Final Volume | 0.01 mL | 1 mL |
| Dilution Factor | 1 | 10 |
| Analysis Units | ng | ng |
| Instrument | MSD-5 | MSD-5 |
| Column | HP5MS US1193225H | HP5MS US1193225H |

| **Target Analytes** | **Ret. Time** | **Concentration ng** | **Flags** | **Ret. Time.** | **Concentration ng** | **Flags** |
|---|---|---|---|---|---|---|
| Naphthalene | | | | 2.75 | 6340 | |
| 2-Methylnaphthalene | | | | 3.33 | 2580 | |
| 1-Methylnaphthalene | | | | 3.44 | 1620 | |
| Acenaphthylene | 4.46 | 36.2 | M | | | |
| Acenaphthene | | | | 4.76 | 537 | |
| Fluorene | | | | 5.67 | 503 | |
| Phenanthrene | | | | 7.87 | 881 | |
| Anthracene | 7.99 | 25.4 | | | | |
| Fluoranthene | 11.27 | 189 | | | | |
| Pyrene | 11.93 | 104 | | | | |
| Benzo(a)Anthracene | 15.85 | 14.0 | | | | |
| Chrysene | 15.97 | 52.4 | | | | |
| Benzo(b)Fluoranthene | 19.21 | 45.3 | M | | | |
| Benzo(k)Fluoranthene | 19.24 | 38.8 | M | | | |
| Benzo(e)Pyrene | 19.96 | 29.9 | | | | |
| Benzo(a)Pyrene | 20.09 | 24.7 | | | | |
| Perylene | 20.32 | 3.84 | M | | | |
| Indeno(1,2,3-cd)Pyrene | 23.80 | 27.8 | | | | |
| Dibenzo(a,h)Anthracene | 24.00 | 3.31 | | | | |
| Benzo(g,h,i)Perylene | 24.79 | 27.2 | | | | |
| **Additional Analytes** | | | | | | |
| Tetralin | | | | 2.63 | 581 | |
| Biphenyl | | | | 3.86 | 751 | |
| o-Terphenyl | 9.15 | 3.67 | | | | |
| Benzo(a)fluorene | 13.10 | 18.5 | M | | | |
| Benzo(b)fluorene | 13.31 | 12.3 | | | | |

| **Field Sampling Standards** | **ng spiked** | | **% Rec** |
|---|---|---|---|
| 1-Methylnaphthalene-D10 | 200 | 3.41 | 94.3 |
| Fluorene D10 | 200 | 5.61 | 82.7 |
| Terphenyl D14(Surr.) | 200 | 12.74 | 98.3 |

| **Extraction Standards** | | | **% Rec** | **Limits** | | **% Rec** |
|---|---|---|---|---|---|---|
| Naphthalene D8 | 200 | | | 50-150 | 2.74 | 88.5 |
| 2-Methylnaphthalene-D10 | 200 | | | 50-150 | 3.30 | 59.1 |
| Acenaphthylene D8 | 200 | 4.44 | 74.3 | 50-150 | | |
| Phenanthrene D10 | 200 | | | 50-150 | 7.81 | 114.1 |
| Anthracene-D10 | 200 | 7.94 | 79.7 | 50-150 | | |
| Fluoranthene D10 | 200 | 11.22 | 116.1 | 50-150 | | |
| Benz(a)Anthracene-D12 | 200 | 15.79 | 126.5 | 50-150 | | |
| Chrysene D12 | 200 | 15.89 | 113.7 | 50-150 | | |
| Benzo(b)Fluoranthene-D12 | 200 | 19.14 | 112.0 | 50-150 | | |
| Benzo(k)Fluoranthene-D12 | 200 | 19.22 | 101.5 | 50-150 | | |
| Benzo(a)Pyrene D12 | 200 | 20.03 | 82.7 | 50-150 | | |
| Perylene D12 | 200 | 20.26 | 77.4 | 50-150 | | |
| Indeno(1,2,3,cd)Pyrene-D12 | 200 | 23.72 | 97.0 | 50-150 | | |
| Dibenz(a,h)Anthracene-D14 | 200 | 23.88 | 76.9 | 50-150 | | |
| Benzo(g,h,i)Perylene D12 | 200 | 24.69 | 88.5 | 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

## Laboratory Control Sample Analysis Report

| | | | |
|---|---|---|---|
| **Sample Name** | **Laboratory Control Sample** | Sampling Date | n/a |
| ALS Sample ID | WG3503806-2 | Extraction Date | 18-Mar-21 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | LCS | | |
| Sample Matrix | MEDIA | | |
| Sample Size | 1 LCS | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3503806 |

Approved:
*T.Patterson*
--e-signature--
30-Mar-2021

| **Run Information** | **Run 1** |
|---|---|
| Filename | 210329A06.D |
| Run Date | 3/29/2021 14:25 |
| Final Volume | 1 mL |
| Dilution Factor | 1 |
| Analysis Units | % |
| Instrument | MSD-5 |
| Column | HP5MS US1193225H |

| **Target Analytes** | **ug spiked** | **Ret. Time** | **%** | **Flags** | **Limits** |
|---|---|---|---|---|---|
| Naphthalene | 100 | 2.75 | 104.0 | | 50-150 |
| 2-Methylnaphthalene | 100 | 3.32 | 103.4 | | 50-150 |
| 1-Methylnaphthalene | 100 | 3.44 | 114.3 | | 50-150 |
| Acenaphthylene | 100 | 4.45 | 87.2 | | 50-150 |
| Acenaphthene | 100 | 4.75 | 73.3 | | 50-150 |
| Fluorene | 100 | 5.67 | 66.0 | | 50-150 |
| Phenanthrene | 100 | 7.87 | 88.8 | | 50-150 |
| Anthracene | 100 | 7.98 | 84.2 | | 50-150 |
| Fluoranthene | 100 | 11.27 | 85.8 | | 50-150 |
| Pyrene | 100 | 11.93 | 83.8 | | 50-150 |
| Benzo(a)Anthracene | 100 | 15.84 | 91.3 | | 50-150 |
| Chrysene | 100 | 15.97 | 85.0 | | 50-150 |
| Benzo(b)Fluoranthene | 100 | 19.20 | 81.5 | | 50-150 |
| Benzo(k)Fluoranthene | 100 | 19.27 | 84.7 | | 50-150 |
| Benzo(e)Pyrene | 100 | 19.95 | 101.2 | | 50-150 |
| Benzo(a)Pyrene | 100 | 20.09 | 88.2 | | 50-150 |
| Perylene | 100 | 20.32 | 90.6 | | 50-150 |
| Indeno(1,2,3-cd)Pyrene | 100 | 23.79 | 80.3 | | 50-150 |
| Dibenzo(a,h)Anthracene | 100 | 24.00 | 80.0 | | 50-150 |
| Benzo(g,h,i)Perylene | 100 | 24.78 | 83.8 | | 50-150 |
| **Field Sampling Standards** | | | **% Rec** | | |
| 1-Methylnaphthalene-D10 | | | NS | | |
| Fluorene D10 | | | NS | | |
| Terphenyl D14(Surr.) | | | NS | | |
| **Extraction Standards** | | | **% Rec** | | **Limits** |
| Naphthalene D8 | 200 | 2.73 | 107.8 | R | 30-150 |
| 2-Methylnaphthalene-D10 | 200 | 3.29 | 76.8 | | 30-150 |
| Acenaphthylene D8 | 200 | 4.44 | 88.8 | | 30-150 |
| Phenanthrene D10 | 200 | 7.81 | 131.8 | | 50-150 |
| Anthracene-D10 | 200 | 7.93 | 123.9 | | 50-150 |
| Fluoranthene D10 | 200 | 11.22 | 149.2 | | 50-150 |
| Benz(a)Anthracene-D12 | 200 | 15.78 | 136.0 | | 50-150 |
| Chrysene D12 | 200 | 15.89 | 156.5 | | 50-150 |
| Benzo(b)Fluoranthene-D12 | 200 | 19.14 | 136.0 | | 50-150 |
| Benzo(k)Fluoranthene-D12 | 200 | 19.22 | 136.9 | | 50-150 |
| Benzo(a)Pyrene D12 | 200 | 20.02 | 123.6 | | 30-150 |
| Perylene D12 | 200 | 20.26 | 122.4 | | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 200 | 23.71 | 99.9 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 200 | 23.87 | 90.3 | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 200 | 24.68 | 103.1 | | 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. |
| NS | Indicates that this standard was not spiked to sample |

# Chain of Custody (COC) / Analytical Request

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2567745-COFC

L2567746-COFC

| 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): ☐ 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.

| 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 | L2562362-2 - Courtice | 308 | 11-Mar-21 | 24hr | Air | | X | | |
| 1 | [illegible] 741196 | 1634 | 11-Mar-21 | 24hr | Air | X | | | |
| 2 | [illegible] 741169 | 1700 | 05-Mar-21 | 24hr | Air | X | | | |
| 2 | L2562362-3 - Rundle | 324 | 11-Mar-21 | 24hr | Air | | X | | |
| 3 | [illegible] 741168 | 1637 | 05-Mar-21 | 24hr | Air | X | | | |
| 4 | [illegible] 741170 | 1713 | 11-Mar-21 | 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 | |
|---|---|---|---|
| 4.8°C | 14.8°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: |
| [signature] | 15-Mar-21 | 1345 | AARON BURTON | 17-march-2021 | 11:00 | | | |

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**.

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:** | 2021-05-03 | **RWDI Reference No.:** 1803743 |
| **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:** | Claire Finoro | **EMAIL:** Claire.Finoro@rwdi.com |
| | John DeYoe | **EMAIL:** jd@rwdi.com |
| **RE:** | **Exceedance Report – Benzo(a)Pyrene March 23, 2021**<br>**Region of Durham, DYEC** | |

On April 22, 2021 the results from ALS Environmental were received regarding the PAH results from the March 23, 2021 sampling event. On April 26, 2021, the results were entered and assessed, and it was found that there were two (2) measured Benzo(a)Pyrene (BaP) concentrations in excess of the 24-hour AAQC on the April 23rd sampling date.

March 23, 2021

On Tuesday, March 23, 2021, there was two (2) exceedances of the BaP 24-hour AAQC, which occurred at the Courtice and Rundle Road Stations, measured at the onsite PUF PS-1 samplers. Attached is a figure depicting the wind roses (indicating the wind speed and direction 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 23rd sampling date:

1. The guideline concentration for BaP is 0.00005 ug/m$^3$. The measured concentration at the Courtice and Rundle Road samplers was 0.000162 µg/m$^3$ and 0.000171 µg/m$^3$ respectively. During the sampling day the wind was recorded predominantly from the ENE to S as recorded at the Courtice Water Pollution Control Plant Meteorological Tower. Wind speeds at Courtice tower ranged from 1.05 km/h to 20.03 km/h. During the sampling day the wind was recorded predominantly from the NNE and ESE as recorded at the Rundle Road Meteorological Tower. Wind speeds at Rundle tower ranged from 0.20 km/h to 14.62 km/h.

2. According to the Courtice meteorological data, the Courtice Station was downwind of the DYEC for a portion of the March 23rd sampling period. According to the Courtice meteorological data, the winds were coming from the ENE-S and it is likely that the measured BaP exceedances may be attributed to industrial sources along the lakeshore with a possible contribution from DYEC in the ENE quadrant.

3. According to the Rundle meteorological data, the Rundle Road Station was upwind of the DYEC during the sampling period. Since the winds were predominantly coming from the NE and E, it is likely that the measured BaP exceedances may be attributed to sources other than the Energy Centre operations.

At the Courtice Station, the $NO_2$ hourly values were less than 15.8% of the criteria for the same period. The $PM_{2.5}$ 24-hour average value was 8.3 micrograms per cubic meter at the Courtice Station.

At the Rundle Road Station, the $NO_2$ hourly values were less than 5.9% of the criteria for the same period. The $PM_{2.5}$ 24-hour average value was 9.4 micrograms per cubic meter at the Rundle Road Station.

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

Respectfully submitted by:

**RWDI AIR Inc.**

Claire Finoro, P.Eng., B.Sc.(Eng)
Project Manager

CIF/kta

Attach.

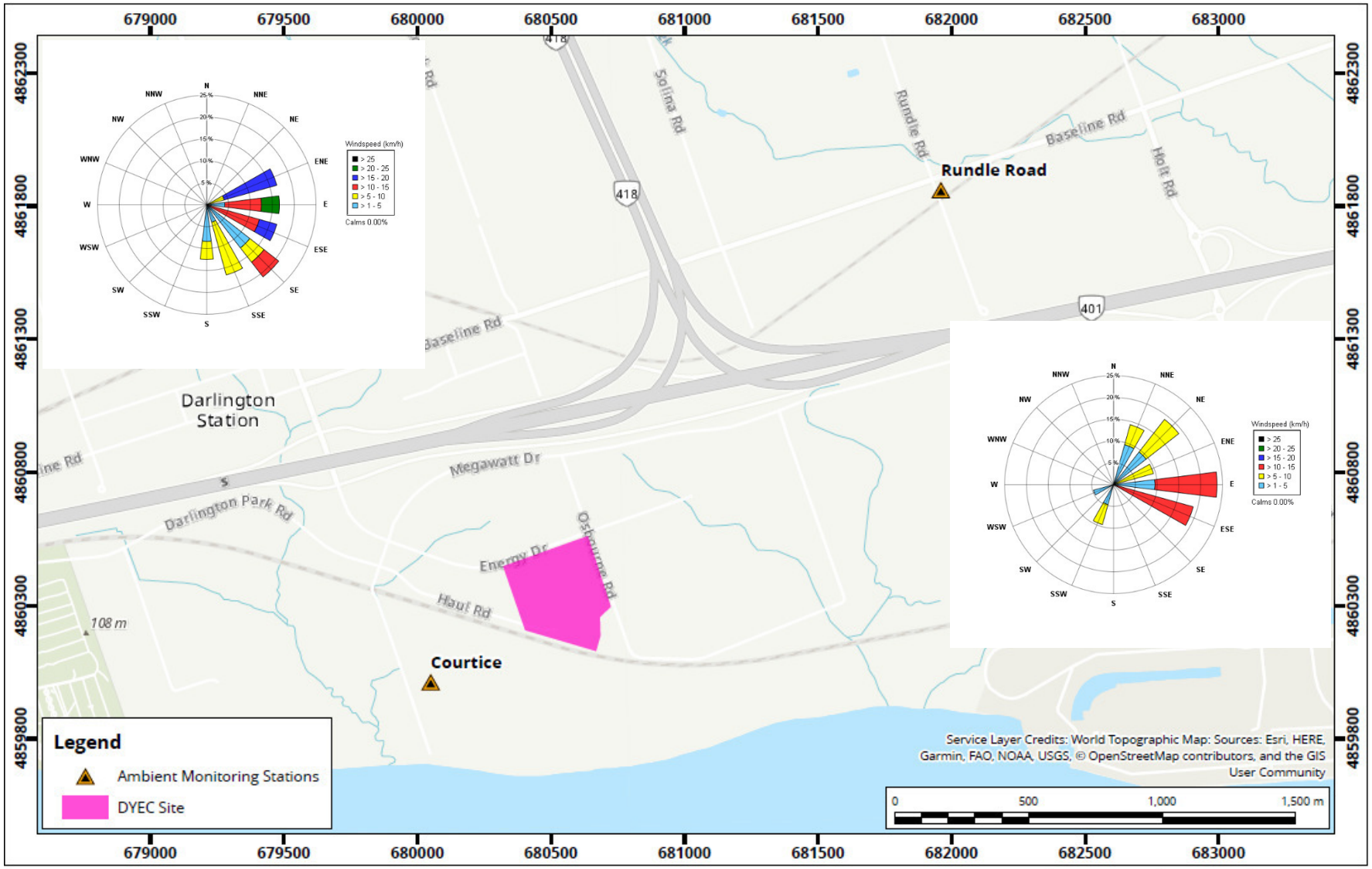
# ATTACHMENTS

**Table B5: 2021 Courtice Station Q1 Monitoring Results for PAHs**

| Contaminant | Units | *MECP Criteria* | 23-Mar 21 | No. > Criteria |
|---|---|---|---|---|
| 1-Methylnaphthalene | ng/m$^3$ | *12000* | 3.90 | 0 |
| 2-Methylnaphthalene | ng/m$^3$ | *10000* | 6.48 | 0 |
| Acenaphthene | ng/m$^3$ | - | 4.09E-01 | - |
| Acenaphthylene | ng/m$^3$ | *3500* | 7.86E-02 | 0 |
| Anthracene | ng/m$^3$ | *200* | 8.46E-02 | 0 |
| Benzo(a)Anthracene | ng/m$^3$ | - | 1.20E-01 | - |
| Benzo(a)fluorene | ng/m$^3$ | - | 9.34E-02 | - |
| Benzo(a)Pyrene (Historically High) | ng/m$^3$ | *0.05*[1] *5*[2] *1.1*[3] | 1.62E-01 | 1 |
| Benzo(b)Fluoranthene | ng/m$^3$ | - | 1.57E-01 | - |
| Benzo(b)fluorene | ng/m$^3$ | - | 6.42E-02 | - |
| Benzo(e)Pyrene | ng/m$^3$ | - | 1.55E-01 | - |
| Benzo(g,h,i)Perylene | ng/m$^3$ | - | 2.22E-01 | - |
| Benzo(k)Fluoranthene | ng/m$^3$ | - | 2.48E-01 | - |
| Biphenyl | ng/m$^3$ | - | 1.64E+00 | - |
| Chrysene | ng/m$^3$ | - | 2.97E-01 | - |
| Dibenzo(a,h)Anthracene | ng/m$^3$ | - | 2.29E-02 | - |
| Fluoranthene | ng/m$^3$ | - | 1.35E-01 | - |
| Fluorene | ng/m$^3$ | - | 3.14E-01 | - |
| Indeno(1,2,3-cd)Pyrene | ng/m$^3$ | - | 1.84E-01 | - |
| Naphthalene | ng/m$^3$ | *22500* | 2.08E+01 | 0 |
| o-Terphenyl | ng/m$^3$ | - | 9.81E-03 | - |
| Perylene | ng/m$^3$ | - | 3.52E-02 | - |
| Phenanthrene | ng/m$^3$ | - | 4.43E-01 | - |
| Pyrene | ng/m$^3$ | - | 5.72E-01 | - |
| Tetralin | ng/m$^3$ | - | 2.03 | - |
| Total PAH[4] | ng/m$^3$ | - | 38.63 | - |

**Table B6: 2021 Rundle Station Q1 Monitoring Results for PAHs**

| Contaminant | Units | *MECP Criteria* | 23-Mar-21 | No. > Criteria |
|---|---|---|---|---|
| 1-Methylnaphthalene | ng/m$^3$ | *12000* | 5.07 | 0 |
| 2-Methylnaphthalene | ng/m$^3$ | *10000* | 8.74 | 0 |
| Acenaphthene | ng/m$^3$ | - | 1.20E+00 | - |
| Acenaphthylene | ng/m$^3$ | *3500* | 8.97E-02 | 0 |
| Anthracene | ng/m$^3$ | *200* | 7.68E-02 | 0 |
| Benzo(a)Anthracene | ng/m$^3$ | - | 1.03E-01 | - |
| Benzo(a)fluorene | ng/m$^3$ | - | 1.16E-01 | - |
| Benzo(a)Pyrene (Historically High) | ng/m$^3$ | *0.05*[1] *5*[2] *1.1*[3] | 1.71E-01 | 1 |
| Benzo(b)Fluoranthene | ng/m$^3$ | - | 1.77E-01 | - |
| Benzo(b)fluorene | ng/m$^3$ | - | 7.07E-02 | - |
| Benzo(e)Pyrene | ng/m$^3$ | - | 1.45E-01 | - |
| Benzo(g,h,i)Perylene | ng/m$^3$ | - | 2.26E-01 | - |
| Benzo(k)Fluoranthene | ng/m$^3$ | - | 2.10E-01 | - |
| Biphenyl | ng/m$^3$ | - | 2.41E+00 | - |
| Chrysene | ng/m$^3$ | - | 2.81E-01 | - |
| Dibenzo(a,h)Anthracene | ng/m$^3$ | - | 2.53E-02 | - |
| Fluoranthene | ng/m$^3$ | - | 4.57E-01 | - |
| Fluorene | ng/m$^3$ | - | 1.01E+00 | - |
| Indeno(1,2,3-cd)Pyrene | ng/m$^3$ | - | 1.87E-01 | - |
| Naphthalene | ng/m$^3$ | *22500* | 2.51E+01 | 0 |
| o-Terphenyl | ng/m$^3$ | - | 8.59E-03 | - |
| Perylene | ng/m$^3$ | - | 3.14E-02 | - |
| Phenanthrene | ng/m$^3$ | - | 1.69E+00 | - |
| Pyrene | ng/m$^3$ | - | 5.66E-01 | - |
| Tetralin | ng/m$^3$ | - | 1.91 | - |
| Total PAH[4] | ng/m$^3$ | - | 50.05 | - |




# DYEC Site and Ambient Monitoring Station Locations

True North

Map Projection: NAD 1983 UTM Zone 17N

DYEC - Region of Durham, Ontario

Project #: 1803743

| | |
|---|---|
| Drawn by: | Figure: 1 |
| Approx. Scale: | 1:20,000 |
| Date Revised: | |

Station: RofD Courtice  Daily: 23/03/2021  Type: AVG 1 Hr. [5 Mins.]

| Date & Time | PM2.5 | NO | NO2 | NOX | SO2 | Batt Min | Temperature | Rain | Tr_Temp | RH AVG | Pressure | Rain total | Hi-Vol Pressure | PUF Pressure | Pressure | Temperature | Hivol Flow | PUF Flow |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/m3 | ppb | ppb | ppb | ppb | Volts | C | mm | C | % | in HG | mm | in H20 | in H20 | kPa | K | cfm | cfm |
| 23/03/2021 00:00 | 12.9 | 2.1 | 23.4 | 25.5 | 0.542 | 13.2 | 4.945 | 0 | 20.8 | 45.4 | 29.88 | 0 | 3.55 | 49.01 | 101.18 | 278.095 | 40.47 | 8.32 |
| 23/03/2021 01:00 | 12.1 | 2.7 | 21.8 | 24.3 | 2.134 | 13.2 | 4.145 | 0 | 20.3 | 51.1 | 29.88 | 0 | 3.53 | 49.34 | 101.19 | 277.295 | 40.4 | 8.36 |
| 23/03/2021 02:00 | 10.8 | 0.5 | 18.6 | 19 | 0.201 | 13.2 | 3.583 | 0 | 20 | 53.3 | 29.89 | 0 | 3.53 | 49.5 | 101.2 | 276.733 | 40.45 | 8.38 |
| 23/03/2021 03:00 | 10.3 | 0.6 | 19.4 | 19.9 | 1.886 | 13.2 | 3.351 | 0 | 19.4 | 51.9 | 29.88 | 0 | 3.53 | 49.18 | 101.19 | 276.501 | 40.49 | 8.36 |
| 23/03/2021 04:00 | 11 | 3.1 | 27.7 | 30.7 | 3.88 | 13.2 | 2.413 | 0 | 20.2 | 54.1 | 29.89 | 0 | 3.53 | 48.73 | 101.21 | 275.563 | 40.54 | 8.33 |
| 23/03/2021 05:00 | 11.5 | 12.2 | 31.4 | 43.6 | 0.611 | 13.2 | 1.646 | 0 | 19.9 | 56 | 29.88 | 0 | 3.54 | 48.55 | 101.21 | 274.796 | 40.69 | 8.33 |
| 23/03/2021 06:00 | 14.6 | 19.5 | 31.6 | 51.1 | 3.314 | 13.2 | 1.49 | 0 | 19.9 | 57.7 | 29.9 | 0 | 3.54 | 48.14 | 101.25 | 274.64 | 40.68 | 8.3 |
| 23/03/2021 07:00 | 14.2 | 18.6 | 28.5 | 47.1 | 0.944 | 13.2 | 5.763 | 0 | 19.9 | 48.5 | 29.91 | 0 | 3.53 | 46.96 | 101.28 | 278.913 | 40.3 | 8.15 |
| 23/03/2021 08:00 | 7.8 | 8.1 | 18.4 | 26.5 | 0.568 | 13.2 | 9.726 | 0 | 21.8 | 39.1 | 29.91 | 0 | 3.53 | 45.51 | 101.29 | 282.876 | 40.02 | 7.99 |
| 23/03/2021 09:00 | 5.5 | 3.4 | 10.7 | 14.1 | 0.261 | 13.1 | 10.34 | 0 | 24.1 | 36.5 | 29.9 | 0 | 3.57 | 45.4 | 101.27 | 283.49 | 40.19 | 7.97 |
| 23/03/2021 10:00 | 4.6 | 0.9 | 4.8 | 5.7 | 0.277 | 13.1 | 8.864 | 0 | 26 | 49.6 | 29.91 | 0 | 3.6 | 46.19 | 101.28 | 282.014 | 40.5 | 8.05 |
| 23/03/2021 11:00 | 4.7 | 0.1 | 2.7 | 2.4 | 0.129 | 13.1 | 8.949 | 0 | 26.2 | 48.8 | 29.9 | 0 | 3.59 | 46.22 | 101.27 | 282.099 | 40.46 | 8.06 |
| 23/03/2021 12:00 | 4.6 | 0 | 2.5 | 2.2 | 0.012 | 13.1 | 10.277 | 0 | 25.9 | 38.1 | 29.9 | 0 | 3.6 | 45.95 | 101.24 | 283.427 | 40.39 | 8.02 |
| 23/03/2021 13:00 | 5.3 | 0.3 | 4.7 | 4.9 | 0.009 | 13.1 | 12.044 | 0 | 26.2 | 31.7 | 29.86 | 0 | 3.58 | 45.31 | 101.12 | 285.194 | 40.13 | 7.94 |
| 23/03/2021 14:00 | 5.5 | 0.1 | 3.4 | 3.2 | 0.03 | 13.1 | 12.225 | 0 | 26 | 30.2 | 29.83 | 0 | 3.6 | 44.74 | 101.02 | 285.375 | 40.18 | 7.89 |
| 23/03/2021 15:00 | 6.6 | 0.3 | 4.1 | 4.3 | 0.083 | 13.1 | 11.984 | 0 | 25.8 | 28.9 | 29.8 | 0 | 3.62 | 44.92 | 100.93 | 285.134 | 40.32 | 7.9 |
| 23/03/2021 16:00 | 6.8 | 0.4 | 5.6 | 6 | 0.008 | 13.1 | 12.986 | 0 | 26 | 27 | 29.79 | 0 | 3.59 | 44.37 | 100.89 | 286.136 | 40.06 | 7.85 |
| 23/03/2021 17:00 | 5.3 | 0.1 | 8.6 | 8.5 | 0.034 | 13.1 | 13.79 | 0 | 26.1 | 24.8 | 29.79 | 0 | 3.56 | 44.14 | 100.88 | 286.94 | 39.83 | 7.82 |
| 23/03/2021 18:00 | 5 | 0 | 14 | 13.7 | 2.379 | 13.1 | 12.235 | 0 | 26 | 27 | 29.79 | 0 | 3.54 | 44.05 | 100.88 | 285.385 | 39.83 | 7.83 |
| 23/03/2021 19:00 | 8.3 | 0.6 | 25.8 | 26.3 | 7.224 | 13.1 | 10.72 | 0 | 25.5 | 31.1 | 29.77 | 0 | 3.57 | 44.15 | 100.83 | 283.87 | 40.06 | 7.85 |
| 23/03/2021 20:00 | 8 | 0 | 11.4 | 11 | 3.774 | 13.1 | 11.163 | 0 | 24.8 | 30.8 | 29.77 | 0 | 3.58 | 44.21 | 100.8 | 284.313 | 40.09 | 7.85 |
| 23/03/2021 21:00 | 7 | 1.4 | 14.2 | 15.6 | 0.133 | 13.1 | 11.567 | 0 | 24.5 | 31.2 | 29.75 | 0 | 3.59 | 44.56 | 100.76 | 284.717 | 40.12 | 7.87 |
| 23/03/2021 22:00 | 8.2 | 0.8 | 11.6 | 12.5 | 0.154 | 13.1 | 10.947 | 0 | 24.3 | 35.3 | 29.74 | 0 | 3.58 | 44.24 | 100.72 | 284.097 | 40.14 | 7.86 |
| 23/03/2021 23:00 | 8.3 | 1.2 | 18.7 | 19.8 | 2.385 | 13.1 | 10.389 | 0 | 24.2 | 39 | 29.75 | 0 | 3.57 | 44.14 | 100.74 | 283.539 | 40.07 | 7.85 |
| Minimum | 4.6 | 0 | 2.5 | 2.2 | 0.008 | 13.1 | 1.49 | 0 | 19.4 | 24.8 | 29.74 | 0 | 3.53 | 44.05 | 100.72 | 274.64 | 39.83 | 7.82 |
| MinDate | 10:00 | 12:00 | 12:00 | 12:00 | 16:00 | 09:00 | 06:00 | 00:00 | 03:00 | 17:00 | 22:00 | 00:00 | 01:00 | 18:00 | 22:00 | 06:00 | 17:00 | 17:00 |
| Maximum | 14.6 | 19.5 | 31.6 | 51.1 | 7.224 | 13.2 | 13.79 | 0 | 26.2 | 57.7 | 29.91 | 0 | 3.62 | 49.5 | 101.29 | 286.94 | 40.69 | 8.38 |
| MaxDate | 06:00 | 06:00 | 06:00 | 06:00 | 19:00 | 00:00 | 17:00 | 00:00 | 11:00 | 06:00 | 07:00 | 00:00 | 15:00 | 02:00 | 08:00 | 17:00 | 05:00 | 02:00 |
| Avg | 8.3 | 3.2 | 15.2 | 18.2 | 1.291 | 13.1 | 8.564 | 0 | 23.5 | 40.3 | 29.84 | 0 | 3.56 | 46.15 | 101.07 | 281.714 | 40.27 | 8.05 |
| Num | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| Data[%] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| STD | 3.1 | 5.5 | 9.4 | 13.8 | 1.8 | 0 | 3.9 | 0 | 2.6 | 10.4 | 0.1 | 0 | 0 | 1.9 | 0.2 | 3.9 | 0.2 | 0.2 |

Station: RofD Rundle  Daily: 23/03/2021  Type: AVG 1 Hr. [5 Mins.]

| Date & Time | PM2.5 | NO | NO2 | NOX | SO2 | Batt Min | Temperature | Rain | Tr_Temp | RH AVG | Rain total | WS km/hr | WD | Hi-Vol Pressure | PUF Pressure | Temperature | Hivol Flow | PUF Flow |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/m3 | ppb | ppb | ppb | ppb | Volts | C° | mm | C° | % | mm | km/hr | Deg | in H20 | in H20 | K | cfm | cfm |
| 23/03/2021 00:00 | 8.6 | 0 | 5.1 | 4.7 | 0.263 | 13.2 | 4.8 | 0 | 22 | 45.7 | 0 | 4.32 | 26.83 | 3.94 | 57.7 | 277.937 | 41.25 | 8.35 |
| 23/03/2021 01:00 | 9.6 | 0.4 | 4.6 | 4.5 | 0.215 | 13.2 | 2.8 | 0 | 21.9 | 55.5 | 0 | 1.74 | <Samp | 3.98 | 58.93 | 275.925 | 41.6 | 8.46 |
| 23/03/2021 02:00 | 12.7 | 0.9 | 6.5 | 7.2 | 0.212 | 13.2 | 2.2 | 0 | 21.9 | 58.4 | 0 | 1.72 | <Samp | 3.98 | 60.23 | 275.297 | 41.65 | 8.56 |
| 23/03/2021 03:00 | 12 | 0.1 | 3.6 | 3.2 | 0.199 | 13.2 | 1.4 | 0 | 21.8 | 60.7 | 0 | 3.77 | 99.57 | 4.01 | 61.49 | 274.535 | 41.83 | 8.65 |
| 23/03/2021 04:00 | 11.7 | 0 | 3.5 | 3.1 | 0.16 | 13.2 | 0.4 | 0 | 22 | 62.9 | 0 | 3.22 | 18.03 | 4.01 | 58.96 | 273.563 | 41.94 | 8.5 |
| 23/03/2021 05:00 | 11 | 0.2 | 3.9 | 3.8 | 0.156 | 13.2 | -0.4 | 0 | 22 | 67.1 | 0 | 3.32 | 39.78 | 4.02 | 58.23 | 272.719 | 42.03 | 8.46 |
| 23/03/2021 06:00 | 9.6 | 0.8 | 5.6 | 6.1 | 0.178 | 13.2 | -0.8 | 0 | 22 | 69.6 | 0 | 1.65 | 208.11 | 4.02 | 60.69 | 272.328 | 42.08 | 8.63 |
| 23/03/2021 07:00 | 7.7 | 0.6 | 3.9 | 4.5 | 0.139 | 13.2 | 4.2 | 0 | 21.5 | 57.5 | 0 | 0.2 | <Samp | 3.99 | 53.57 | 277.4 | 41.53 | 8.08 |
| 23/03/2021 08:00 | 7.5 | 2.2 | 9 | 11.1 | 0.357 | 13.2 | 11.9 | 0 | 22.6 | 32.3 | 0 | 3.65 | 241.94 | 3.83 | 52.11 | 285.028 | 40.11 | 7.88 |
| 23/03/2021 09:00 | 6.8 | 3.3 | 10.9 | 14.3 | 0.624 | 13.2 | 13.2 | 0 | 23 | 27.1 | 0 | 5.74 | 202.31 | 3.78 | 52.51 | 286.315 | 39.76 | 7.89 |
| 23/03/2021 10:00 | 9.4 | 1.9 | 7.1 | 9.1 | 0.314 | 13.2 | 10.3 | 0 | 22.8 | 43.5 | 0 | 10.3 | 111.7 | 3.84 | 55.71 | 283.468 | 40.29 | 8.14 |
| 23/03/2021 11:00 | 10.1 | 1.7 | 5.9 | 7.7 | 0.36 | 13.2 | 10.9 | 0 | 22.5 | 40.8 | 0 | 12.56 | 122.28 | 3.84 | 56.41 | 284.021 | 40.28 | 8.18 |
| 23/03/2021 12:00 | 10.3 | 0.4 | 4.5 | 4.9 | 0.322 | 13.2 | 11.1 | 0 | 22.7 | 37.7 | 0 | 11.73 | 108.37 | 3.83 | 55.77 | 284.245 | 40.21 | 8.14 |
| 23/03/2021 13:00 | 10.6 | 0.2 | 4.9 | 5 | 0.297 | 13.2 | 11.1 | 0 | 22.7 | 36.2 | 0 | 10.48 | 94.77 | 3.84 | 54.16 | 284.233 | 40.23 | 8.03 |
| 23/03/2021 14:00 | 10.1 | 0.3 | 5.2 | 5.5 | 0.307 | 13.2 | 12 | 0 | 22.8 | 30.1 | 0 | 13.3 | 101.73 | 3.83 | 51.7 | 285.191 | 40.14 | 7.84 |
| 23/03/2021 15:00 | 11 | 0.3 | 5.3 | 5.6 | 0.338 | 13.2 | 11.3 | 0 | 23 | 33 | 0 | 14.62 | 98.54 | 3.86 | 51.19 | 284.443 | 40.31 | 7.83 |
| 23/03/2021 16:00 | 10.5 | 0.2 | 7.9 | 8.1 | 0.325 | 13.2 | 12.2 | 0 | 22.9 | 32.2 | 0 | 10.3 | 95.02 | 3.85 | 52.81 | 285.328 | 40.22 | 7.93 |
| 23/03/2021 17:00 | 7.1 | 0.1 | 7.4 | 7.2 | 0.334 | 13.2 | 13.3 | 0 | 22.9 | 26.5 | 0 | 7.62 | 74.47 | 3.86 | 54.23 | 286.395 | 40.18 | 8.01 |
| 23/03/2021 18:00 | 7 | 0 | 4.1 | 3.7 | 0.242 | 13.2 | 11 | 0 | 23 | 31.6 | 0 | 4.37 | 92.38 | 3.86 | 57.34 | 284.126 | 40.38 | 8.25 |
| 23/03/2021 19:00 | 12 | 0 | 5 | 4.6 | 0.277 | 13.2 | 8.9 | 0 | 22.2 | 35.8 | 0 | 5.63 | 26.31 | 3.91 | 57.36 | 282.084 | 40.76 | 8.28 |
| 23/03/2021 20:00 | 9.1 | 0 | 4.9 | 4.4 | 0.239 | 13.2 | 8.8 | 0 | 21.7 | 35.9 | 0 | 5.41 | 41.28 | 3.88 | 57.06 | 281.967 | 40.61 | 8.26 |
| 23/03/2021 21:00 | 7.7 | 2.8 | 11.7 | 14.1 | 0.384 | 13.2 | 9.2 | 0 | 21.8 | 35.4 | 0 | 7.15 | 64.24 | 3.88 | 57.42 | 282.311 | 40.58 | 8.28 |
| 23/03/2021 22:00 | 7.1 | 0 | 4.7 | 4.2 | 0.374 | 13.2 | 8.4 | 0 | 21.9 | 39.5 | 0 | 5.38 | 53.32 | 3.93 | 53.97 | 281.544 | 40.88 | 8.05 |
| 23/03/2021 23:00 | 7.5 | 0 | 4.2 | 3.7 | 0.355 | 13.2 | 7.8 | 0 | 21.7 | 43.1 | 0 | 3.29 | 45.73 | 3.96 | 54.7 | 280.917 | 41.09 | 8.1 |
| Minimum | 6.8 | 0 | 3.5 | 3.1 | 0.139 | 13.2 | -0.8 | 0 | 21.5 | 26.5 | 0 | 0.2 | 18.03 | 3.78 | 51.19 | 272.328 | 39.76 | 7.83 |
| MinDate | 09:00 | 00:00 | 04:00 | 04:00 | 07:00 | 00:00 | 06:00 | 00:00 | 07:00 | 17:00 | 00:00 | 07:00 | 04:00 | 09:00 | 15:00 | 06:00 | 09:00 | 15:00 |
| Maximum | 12.7 | 3.3 | 11.7 | 14.3 | 0.624 | 13.2 | 13.3 | 0 | 23 | 69.6 | 0 | 14.62 | 241.94 | 4.02 | 61.49 | 286.395 | 42.08 | 8.65 |
| MaxDate | 02:00 | 09:00 | 21:00 | 09:00 | 09:00 | 00:00 | 17:00 | 00:00 | 09:00 | 06:00 | 00:00 | 15:00 | 08:00 | 05:00 | 03:00 | 17:00 | 06:00 | 03:00 |
| Avg | 9.4 | 0.7 | 5.8 | 6.3 | 0.29 | 13.2 | 7.8 | 0 | 22.3 | 43.3 | 0 | 6.31 | 93.65 | 3.91 | 56.01 | 280.888 | 40.83 | 8.2 |
| Num | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 21 | 24 | 24 | 24 | 24 | 24 |
| Data[%] | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 87.5 | 100 | 100 | 100 | 100 | 100 |
| STD | 1.8 | 0.9 | 2.1 | 3.1 | 0.1 | No Data | 4.5 | 0 | 0.5 | 12.9 | 0 | 4 | 59.3 | 0.1 | 2.9 | 4.5 | 0.7 | 0.2 |

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 Drive |
| **ALS WO#:** | L2571239 | | Guelph, ON N1G 4P6 |
| **Date of Report** | 22-Apr-21 | | Canada |
| **Date of Sample Receipt** | 29-Mar-21 | **Client Contact:** | Claire Finoro |
| | | **Client Project ID:** | DYEC |

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

Certified by:

Bradley Reimer
GC/MS Laboratory Senior Technical Specialist

Results in this certificate relate only to the samples as submitted to the laboratory.

# ALS Life Sciences

## Sample Analysis Summary Report

| Sample Name | Method Blank | | Method Blank | | COURTICE-DX/PAH-MAR23 | | RUNDLE-DX/PAH-MAR23 | | Laboratory Control Sample | |
|---|---|---|---|---|---|---|---|---|---|---|
| ALS Sample ID | WG3510016-1 | | WG3510016-4 | | L2571239-1 | | L2571239-2 | | WG3510016-2 | |
| Sample Size | 1 | | 1 | | 1 | | 1 | | 1 | |
| Sample units | Sample | | Sample | | Sample | | Sample | | LCS | |
| Moisture Content | n/a | | n/a | | n/a | | n/a | | n/a | |
| Matrix | QC | | QC | | Puf | | Puf | | QC | |
| Sampling Date | n/a | | n/a | | 23-Mar-21 | | 23-Mar-21 | | n/a | |
| Extraction Date | 30-Mar-21 | | 30-Mar-21 | | 30-Mar-21 | | 30-Mar-21 | | 30-Mar-21 | |
| **Target Analytes** | **ng** | | **ng** | | **ng** | | **ng** | | **%** | |
| Naphthalene | 33.7 | | 21.7 | | 6610 | | 8550 | | 101.6 | |
| 2-Methylnaphthalene | 4.21 | | 1.81 | | 2060 | | 2980 | | 103.3 | |
| 1-Methylnaphthalene | 2.46 | | 1.15 | | 1240 | | 1730 | | 105.9 | |
| Acenaphthylene | 1.23 | R | 0.960 | R | 25.0 | M,R | 30.6 | M,R | 96.3 | R |
| Acenaphthene | 1.46 | | 0.410 | | 130 | | 410 | | 80.3 | |
| Fluorene | 1.18 | | 0.460 | | 99.9 | | 344 | | 77.7 | |
| Phenanthrene | 4.44 | | 1.56 | | 141 | | 577 | | 99.9 | |
| Anthracene | 0.280 | R | 0.210 | | 26.9 | | 26.2 | | 86.1 | |
| Fluoranthene | 2.48 | | 2.52 | | 43.0 | | 156 | | 86.5 | |
| Pyrene | 2.93 | | 3.21 | R | 182 | | 193 | | 89 | |
| Benzo(a)Anthracene | 0.790 | R | 1.31 | R | 38.2 | | 35.1 | | 86.8 | |
| Chrysene | 1.13 | | 1.91 | | 94.4 | | 95.7 | | 90 | |
| Benzo(b)Fluoranthene | 0.660 | R | 0.860 | R | 49.8 | M | 60.4 | R | 79.7 | |
| Benzo(k)Fluoranthene | 0.740 | R | 1.15 | | 78.8 | M | 71.7 | M | 93 | |
| Benzo(e)Pyrene | <0.20 | U | <0.20 | U | 49.3 | | 49.4 | | 96.3 | |
| Benzo(a)Pyrene | 0.810 | R | 1.06 | | 51.5 | | 58.3 | | 85.8 | |
| Perylene | <0.20 | U | <0.20 | U | 11.2 | | 10.7 | | 94.8 | |
| Indeno(1,2,3-cd)Pyrene | 1.01 | M | 1.80 | R | 58.6 | | 63.7 | | 90 | |
| Dibenzo(a,h)Anthracene | 0.920 | | 2.29 | R | 7.28 | B | 8.63 | B | 88.9 | |
| Benzo(g,h,i)Perylene | 6.15 | | 12.5 | | 70.7 | | 77.0 | | 91.3 | |
| **Additional Analytes** | | | | | | | | | | |
| Tetralin | 10.4 | | 1.33 | | 644 | | 652 | | | |
| Biphenyl | 1.47 | | 0.660 | | 520 | | 821 | | | |
| o-Terphenyl | <0.20 | U | <0.20 | U | 3.12 | | 2.93 | | | |
| Benzo(a)fluorene | <0.20 | U | <0.20 | U | 29.7 | M | 39.7 | M | | |
| Benzo(b)fluorene | <0.20 | U | <0.20 | U | 20.4 | | 24.1 | | | |
| **Field Sampling Standards** | **% Rec** | | **% Rec** | | **% Rec** | | **% Rec** | | **% Rec** | |
| 1-Methylnaphthalene-D10 | NS | | NS | | 81.6 | | 85.8 | | NS | |
| Fluorene D10 | NS | | NS | | 83.2 | | 82.5 | | NS | |
| Terphenyl D14(Surr.) | NS | | NS | | 96 | | 100.3 | | NS | |
| **Extraction Standards** | **% Rec** | | **% Rec** | | **% Rec** | | **% Rec** | | **% Rec** | |
| Naphthalene D8 | 41.1 | | 42 | | 38.3 | R | 33.2 | | 47.1 | |
| 2-Methylnaphthalene-D10 | 42.7 | | 43.8 | | 48 | | 42.8 | | 50.1 | |
| Acenaphthylene D8 | 43.5 | | 41.8 | | 51.2 | | 48.4 | | 53.5 | |
| Phenanthrene D10 | 53.2 | | 51.5 | | 54.1 | | 47.8 | | 56.5 | |
| Anthracene-D10 | 51.1 | | 38.6 | | 46.5 | | 46.3 | | 59 | |
| Fluoranthene D10 | 63.7 | | 55 | | 70.5 | | 66.1 | | 70.9 | |
| Benz(a)Anthracene-D12 | 62.1 | | 46.5 | | 68.1 | | 91.9 | | 90.7 | |
| Chrysene D12 | 54.2 | | 41.7 | | 55.8 | | 60.4 | | 72.6 | |
| Benzo(b)Fluoranthene-D12 | 79.1 | | 68.7 | | 78 | | 81.7 | | 77.8 | |
| Benzo(k)Fluoranthene-D12 | 50.2 | | 41.2 | | 58.1 | | 56.4 | | 63.3 | |
| Benzo(a)Pyrene D12 | 59.6 | | 46.8 | | 49.4 | | 53.7 | | 76.3 | |
| Perylene D12 | 54.2 | | 20.7 | | 44.7 | | 51.6 | | 66.9 | |
| Indeno(1,2,3,cd)Pyrene-D12 | 56.4 | | 54.6 | | 62.9 | | 63.9 | | 59.3 | |
| Dibenz(a,h)Anthracene-D14 | 49.6 | | 47.6 | | 58.3 | | 59.8 | | 56.3 | |
| Benzo(g,h,i)Perylene D12 | 57 | | 55.5 | | 63.7 | | 62.9 | | 65.3 | |

| | |
|---|---|
| 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 this standard was not spiked to samples |

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

| | | | | | |
|---|---|---|---|---|---|
| **Sample Name** | **Method Blank** | | Sampling Date | n/a | |
| ALS Sample ID | WG3510016-1 | | Extraction Date | 30-Mar-21 | |
| Analysis Method | PAH by CARB 429 | | | | |
| Analysis Type | blank | | | | |
| Sample Matrix | QC | | | | Approved: |
| Sample Size | 1 | Sample | | | *T.Patterson* |
| Percent Moisture | n/a | | | | --e-signature-- |
| Split Ratio | 1 | | Workgroup | WG3510016 | 12-Apr-2021 |

| **Run Information** | **Run 1** |
|---|---|
| Filename | 210409A30.D |
| Run Date | 4/10/2021 9:11 |
| Final Volume | 0.1 mL |
| Dilution Factor | 1 |
| Analysis Units | ng |
| Instrument | MSD-5 |
| Column | HP5MS US1193225H |

| **Target Analytes** | **Ret. Time** | **Concentration ng** | **Flags** |
|---|---|---|---|
| Naphthalene | 2.76 | 33.7 | |
| 2-Methylnaphthalene | 3.34 | 4.21 | |
| 1-Methylnaphthalene | 3.46 | 2.46 | |
| Acenaphthylene | 4.48 | 1.23 | R |
| Acenaphthene | 4.78 | 1.46 | |
| Fluorene | 5.71 | 1.18 | |
| Phenanthrene | 7.92 | 4.44 | |
| Anthracene | 8.03 | 0.280 | R |
| Fluoranthene | 11.34 | 2.48 | |
| Pyrene | 12.00 | 2.93 | |
| Benzo(a)Anthracene | 15.93 | 0.790 | R |
| Chrysene | 16.06 | 1.13 | |
| Benzo(b)Fluoranthene | 19.30 | 0.660 | R |
| Benzo(k)Fluoranthene | 19.37 | 0.740 | R |
| Benzo(e)Pyrene | NotFnd | <0.20 | U |
| Benzo(a)Pyrene | 20.19 | 0.810 | R |
| Perylene | NotFnd | <0.20 | U |
| Indeno(1,2,3-cd)Pyrene | 23.95 | 1.01 | M |
| Dibenzo(a,h)Anthracene | 24.16 | 0.920 | |
| Benzo(g,h,i)Perylene | 24.98 | 6.15 | |
| **Additional Analytes** | | | |
| Tetralin | 2.64 | 10.4 | |
| Biphenyl | 3.88 | 1.47 | |
| o-Terphenyl | 9.20 | <0.20 | U |
| Benzo(a)fluorene | NotFnd | <0.20 | U |
| Benzo(b)fluorene | NotFnd | <0.20 | U |

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

| **Extraction Standards** | | | **% Rec** | **Limits** |
|---|---|---|---|---|
| Naphthalene D8 | 100 | 2.75 | 41.1 | 50-150 |
| 2-Methylnaphthalene-D10 | 100 | 3.31 | 42.7 | 50-150 |
| Acenaphthylene D8 | 100 | 4.46 | 43.5 | 50-150 |
| Phenanthrene D10 | 100 | 7.86 | 53.2 | 50-150 |
| Anthracene-D10 | 100 | 7.99 | 51.1 | 50-150 |
| Fluoranthene D10 | 100 | 11.30 | 63.7 | 50-150 |
| Benz(a)Anthracene-D12 | 100 | 15.87 | 62.1 | 50-150 |
| Chrysene D12 | 100 | 15.98 | 54.2 | 50-150 |
| Benzo(b)Fluoranthene-D12 | 100 | 19.24 | 79.1 | 50-150 |
| Benzo(k)Fluoranthene-D12 | 100 | 19.32 | 50.2 | 50-150 |
| Benzo(a)Pyrene D12 | 100 | 20.12 | 59.6 | 50-150 |
| Perylene D12 | 100 | 20.35 | 54.2 | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.87 | 56.4 | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 100 | 24.04 | 49.6 | 50-150 |
| Benzo(g,h,i)Perylene D12 | 100 | 24.86 | 57.0 | 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. |
| NS | Indicates that this standard was not spiked to sample |

# ALS Life Sciences

## Laboratory Method Blank Analysis Report

| | | | | | |
|---|---|---|---|---|---|
| **Sample Name** | **Method Blank** | | Sampling Date | n/a | |
| ALS Sample ID | WG3510016-4 | | Extraction Date | 30-Mar-21 | |
| Analysis Method | PAH by CARB 429 | | | | |
| Analysis Type | blank | | | | |
| Sample Matrix | QC | | | | Approved: |
| Sample Size | 1 | Sample | | | *T.Patterson* |
| Percent Moisture | n/a | | | | --e-signature-- |
| Split Ratio | 1 | | Workgroup | WG3510016 | 12-Apr-2021 |

| **Run Information** | **Run 1** |
|---|---|
| Filename | 210409A31.D |
| Run Date | 4/10/2021 9:49 |
| Final Volume | 0.1 mL |
| Dilution Factor | 1 |
| Analysis Units | ng |
| Instrument | MSD-5 |
| Column | HP5MS US1193225H |

| **Target Analytes** | **Ret. Time** | **Concentration ng** | **Flags** |
|---|---|---|---|
| Naphthalene | 2.76 | 21.7 | |
| 2-Methylnaphthalene | 3.34 | 1.81 | |
| 1-Methylnaphthalene | 3.46 | 1.15 | |
| Acenaphthylene | 4.48 | 0.960 | R |
| Acenaphthene | 4.78 | 0.410 | |
| Fluorene | 5.71 | 0.460 | |
| Phenanthrene | 7.92 | 1.56 | |
| Anthracene | 8.03 | 0.210 | |
| Fluoranthene | 11.34 | 2.52 | |
| Pyrene | 12.00 | 3.21 | R |
| Benzo(a)Anthracene | 15.93 | 1.31 | R |
| Chrysene | 16.06 | 1.91 | |
| Benzo(b)Fluoranthene | 19.30 | 0.860 | R |
| Benzo(k)Fluoranthene | 19.37 | 1.15 | |
| Benzo(e)Pyrene | NotFnd | <0.20 | U |
| Benzo(a)Pyrene | 20.19 | 1.06 | |
| Perylene | NotFnd | <0.20 | U |
| Indeno(1,2,3-cd)Pyrene | 23.95 | 1.80 | R |
| Dibenzo(a,h)Anthracene | 24.16 | 2.29 | R |
| Benzo(g,h,i)Perylene | 24.97 | 12.5 | |
| **Additional Analytes** | | | |
| Tetralin | 2.64 | 1.33 | |
| Biphenyl | 3.88 | 0.660 | |
| o-Terphenyl | NotFnd | <0.20 | U |
| Benzo(a)fluorene | NotFnd | <0.20 | U |
| Benzo(b)fluorene | NotFnd | <0.20 | U |

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

| **Extraction Standards** | | | **% Rec** | **Limits** |
|---|---|---|---|---|
| Naphthalene D8 | 100 | 2.74 | 42.0 | 50-150 |
| 2-Methylnaphthalene-D10 | 100 | 3.31 | 43.8 | 50-150 |
| Acenaphthylene D8 | 100 | 4.46 | 41.8 | 50-150 |
| Phenanthrene D10 | 100 | 7.86 | 51.5 | 50-150 |
| Anthracene-D10 | 100 | 7.99 | 38.6 | 50-150 |
| Fluoranthene D10 | 100 | 11.30 | 55.0 | 50-150 |
| Benz(a)Anthracene-D12 | 100 | 15.87 | 46.5 | 50-150 |
| Chrysene D12 | 100 | 15.98 | 41.7 | 50-150 |
| Benzo(b)Fluoranthene-D12 | 100 | 19.24 | 68.7 | 50-150 |
| Benzo(k)Fluoranthene-D12 | 100 | 19.32 | 41.2 | 50-150 |
| Benzo(a)Pyrene D12 | 100 | 20.11 | 46.8 | 50-150 |
| Perylene D12 | 100 | 20.35 | 20.7 | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.87 | 54.6 | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 100 | 24.04 | 47.6 | 50-150 |
| Benzo(g,h,i)Perylene D12 | 100 | 24.86 | 55.5 | 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 this standard was not spiked to sample |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| **Sample Name** | **COURTICE-DX/PAH-MAR23** | Sampling Date | 23-Mar-21 |
| ALS Sample ID | L2571239-1 | Extraction Date | 30-Mar-21 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | Puf | | |
| Sample Size | 1 Sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3510016 |

Approved:
*T.Patterson*
--e-signature--
12-Apr-2021

| **Run Information** | **Run 1** | **Run 2** |
|---|---|---|
| Filename | 210409A36.D | 210409A34.D |
| Run Date | 4/10/2021 12:59 | 4/10/2021 11:43 |
| Final Volume | 0.1 mL | 0.1 mL |
| Dilution Factor | 1 | 20 |
| Analysis Units | ng | ng |
| Instrument | MSD-5 | MSD-5 |
| Column | HP5MS US1193225H | HP5MS US1193225H |

| **Target Analytes** | **Ret. Time** | **Concentration ng** | **Flags** | **Ret. Time.** | **Concentration ng** | **Flags** |
|---|---|---|---|---|---|---|
| Naphthalene | | | | 2.76 | 6610 | |
| 2-Methylnaphthalene | | | | 3.35 | 2060 | |
| 1-Methylnaphthalene | | | | 3.46 | 1240 | |
| Acenaphthylene | 4.48 | 25.0 | M R | | | |
| Acenaphthene | | | | 4.79 | 130 | |
| Fluorene | | | | 5.71 | 99.9 | |
| Phenanthrene | | | | 7.92 | 141 | |
| Anthracene | 8.04 | 26.9 | | | | |
| Fluoranthene | | | | 11.34 | 43.0 | |
| Pyrene | 12.00 | 182 | | | | |
| Benzo(a)Anthracene | 15.94 | 38.2 | | | | |
| Chrysene | 16.06 | 94.4 | | | | |
| Benzo(b)Fluoranthene | 19.31 | 49.8 | M | | | |
| Benzo(k)Fluoranthene | 19.34 | 78.8 | M | | | |
| Benzo(e)Pyrene | 20.06 | 49.3 | | | | |
| Benzo(a)Pyrene | 20.19 | 51.5 | | | | |
| Perylene | 20.43 | 11.2 | | | | |
| Indeno(1,2,3-cd)Pyrene | 23.97 | 58.6 | | | | |
| Dibenzo(a,h)Anthracene | 24.17 | 7.28 | B | | | |
| Benzo(g,h,i)Perylene | 24.98 | 70.7 | | | | |
| **Additional Analytes** | | | | | | |
| Tetralin | | | | 2.64 | 644 | |
| Biphenyl | | | | 3.88 | 520 | |
| o-Terphenyl | 9.21 | 3.12 | | | | |
| Benzo(a)fluorene | 13.17 | 29.7 | M | | | |
| Benzo(b)fluorene | 13.40 | 20.4 | | | | |

| **Field Sampling Standards** | **ng spiked** | | **% Rec** |
|---|---|---|---|
| 1-Methylnaphthalene-D10 | 300 | 3.42 | 81.6 |
| Fluorene D10 | 300 | 5.65 | 83.2 |
| Terphenyl D14(Surr.) | 300 | 12.81 | 96 |

| **Extraction Standards** | | | **% Rec** | **Limits** | | **% Rec** |
|---|---|---|---|---|---|---|
| Naphthalene D8 | 100 | | | 50-150 | 2.75 | 34.8 |
| 2-Methylnaphthalene-D10 | 100 | | | 50-150 | 3.31 | 40.4 |
| Acenaphthylene D8 | 100 | 4.47 | 51.2 | 50-150 | | |
| Phenanthrene D10 | 100 | | | 50-150 | 7.87 | 85.4 |
| Anthracene-D10 | 100 | | | 50-150 | 7.99 | 64.1 |
| Fluoranthene D10 | 100 | | | 50-150 | 11.30 | 100.9 |
| Benz(a)Anthracene-D12 | 100 | 15.87 | 68.1 | 50-150 | | |
| Chrysene D12 | 100 | 15.98 | 55.8 | 50-150 | | |
| Benzo(b)Fluoranthene-D12 | 100 | 19.24 | 78.0 | 50-150 | | |
| Benzo(k)Fluoranthene-D12 | 100 | 19.32 | 58.1 | 50-150 | | |
| Benzo(a)Pyrene D12 | 100 | 20.12 | 49.4 | 50-150 | | |
| Perylene D12 | 100 | 20.36 | 44.7 | 50-150 | | |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.87 | 62.9 | 50-150 | | |
| Dibenz(a,h)Anthracene-D14 | 100 | 24.04 | 58.3 | 50-150 | | |
| Benzo(g,h,i)Perylene D12 | 100 | 24.88 | 63.7 | 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. |

# ALS Life Sciences

## Sample Analysis Report

| | | | |
|---|---|---|---|
| **Sample Name** | **RUNDLE-DX/PAH-MAR23** | Sampling Date | 23-Mar-21 |
| ALS Sample ID | L2571239-2 | Extraction Date | 30-Mar-21 |
| Analysis Method | PAH by CARB 429 | | |
| Analysis Type | sample | | |
| Sample Matrix | Puf | | |
| Sample Size | 1 Sample | | |
| Percent Moisture | n/a | | |
| Split Ratio | 1 | Workgroup | WG3510016 |

Approved:
*T.Patterson*
--e-signature--
12-Apr-2021

| **Run Information** | **Run 1** | **Run 2** |
|---|---|---|
| Filename | 210409A37.D | 210409A35.D |
| Run Date | 4/10/2021 13:37 | 4/10/2021 12:21 |
| Final Volume | 0.1 mL | 0.1 mL |
| Dilution Factor | 1 | 20 |
| Analysis Units | ng | ng |
| Instrument | MSD-5 | MSD-5 |
| Column | HP5MS US1193225H | HP5MS US1193225H |

| **Target Analytes** | **Ret. Time** | **Concentration ng** | **Flags** | **Ret. Time.** | **Concentration ng** | **Flags** |
|---|---|---|---|---|---|---|
| Naphthalene | | | | 2.76 | 8550 | |
| 2-Methylnaphthalene | | | | 3.35 | 2980 | |
| 1-Methylnaphthalene | | | | 3.46 | 1730 | |
| Acenaphthylene | 4.48 | 30.6 | M R | | | |
| Acenaphthene | | | | 4.78 | 410 | |
| Fluorene | | | | 5.71 | 344 | |
| Phenanthrene | | | | 7.92 | 577 | |
| Anthracene | 8.03 | 26.2 | | | | |
| Fluoranthene | | | | 11.34 | 156 | |
| Pyrene | 12.00 | 193 | | | | |
| Benzo(a)Anthracene | 15.94 | 35.1 | | | | |
| Chrysene | 16.06 | 95.7 | | | | |
| Benzo(b)Fluoranthene | 19.31 | 60.4 | R | | | |
| Benzo(k)Fluoranthene | 19.35 | 71.7 | M | | | |
| Benzo(e)Pyrene | 20.05 | 49.4 | | | | |
| Benzo(a)Pyrene | 20.19 | 58.3 | | | | |
| Perylene | 20.43 | 10.7 | | | | |
| Indeno(1,2,3-cd)Pyrene | 23.97 | 63.7 | | | | |
| Dibenzo(a,h)Anthracene | 24.17 | 8.63 | B | | | |
| Benzo(g,h,i)Perylene | 24.98 | 77.0 | | | | |
| **Additional Analytes** | | | | | | |
| Tetralin | | | | 2.64 | 652 | |
| Biphenyl | | | | 3.88 | 821 | |
| o-Terphenyl | 9.21 | 2.93 | | | | |
| Benzo(a)fluorene | 13.18 | 39.7 | M | | | |
| Benzo(b)fluorene | 13.39 | 24.1 | | | | |

| **Field Sampling Standards** | **ng spiked** | | **% Rec** | | | **% Rec** |
|---|---|---|---|---|---|---|
| 1-Methylnaphthalene-D10 | 300 | 3.42 | 85.8 | | | |
| Fluorene D10 | 300 | 5.65 | 82.5 | | | |
| Terphenyl D14(Surr.) | 300 | 12.81 | 100.3 | | | |

| **Extraction Standards** | | | **% Rec** | **Limits** | | **% Rec** |
|---|---|---|---|---|---|---|
| Naphthalene D8 | 100 | | | 50-150 | 2.75 | 38.5 |
| 2-Methylnaphthalene-D10 | 100 | | | 50-150 | 3.32 | 42.2 |
| Acenaphthylene D8 | 100 | 4.46 | 48.4 | 50-150 | | |
| Phenanthrene D10 | 100 | | | 50-150 | 7.86 | 79.3 |
| Anthracene-D10 | 100 | | | 50-150 | 8.00 | 58 |
| Fluoranthene D10 | 100 | | | 50-150 | 11.30 | 83.4 |
| Benz(a)Anthracene-D12 | 100 | 15.87 | 91.9 | 50-150 | | |
| Chrysene D12 | 100 | 15.98 | 60.4 | 50-150 | | |
| Benzo(b)Fluoranthene-D12 | 100 | 19.24 | 81.7 | 50-150 | | |
| Benzo(k)Fluoranthene-D12 | 100 | 19.32 | 56.4 | 50-150 | | |
| Benzo(a)Pyrene D12 | 100 | 20.12 | 53.7 | 50-150 | | |
| Perylene D12 | 100 | 20.36 | 51.6 | 50-150 | | |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.88 | 63.9 | 50-150 | | |
| Dibenz(a,h)Anthracene-D14 | 100 | 24.04 | 59.8 | 50-150 | | |
| Benzo(g,h,i)Perylene D12 | 100 | 24.88 | 62.9 | 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. |

# ALS Life Sciences

## Laboratory Control Sample Analysis Report

| | | | | | |
|---|---|---|---|---|---|
| **Sample Name** | **Laboratory Control Sample** | | Sampling Date | n/a | |
| ALS Sample ID | WG3510016-2 | | Extraction Date | 30-Mar-21 | |
| Analysis Method | PAH by CARB 429 | | | | |
| Analysis Type | LCS | | | | |
| Sample Matrix | QC | | | | Approved: |
| Sample Size | 1 | LCS | | | *T.Patterson* |
| Percent Moisture | n/a | | | | --e-signature-- |
| Split Ratio | 1 | | Workgroup | WG3510016 | 12-Apr-2021 |

| **Run Information** | **Run 1** |
|---|---|
| Filename | 210409A28.D |
| Run Date | 4/10/2021 7:55 |
| Final Volume | 0.1 mL |
| Dilution Factor | 1 |
| Analysis Units | % |
| Instrument | MSD-5 |
| Column | HP5MS US1193225H |

| **Target Analytes** | **ug spiked** | **Ret. Time** | **%** | **Flags** | **Limits** |
|---|---|---|---|---|---|
| Naphthalene | 100 | 2.74 | 101.6 | | 50-150 |
| 2-Methylnaphthalene | 100 | 3.33 | 103.3 | | 50-150 |
| 1-Methylnaphthalene | 100 | 3.45 | 105.9 | | 50-150 |
| Acenaphthylene | 100 | 4.48 | 96.3 | R | 50-150 |
| Acenaphthene | 100 | 4.77 | 80.3 | | 50-150 |
| Fluorene | 100 | 5.70 | 77.7 | | 50-150 |
| Phenanthrene | 100 | 7.92 | 99.9 | | 50-150 |
| Anthracene | 100 | 8.03 | 86.1 | | 50-150 |
| Fluoranthene | 100 | 11.34 | 86.5 | | 50-150 |
| Pyrene | 100 | 12.00 | 89 | | 50-150 |
| Benzo(a)Anthracene | 100 | 15.93 | 86.8 | | 50-150 |
| Chrysene | 100 | 16.06 | 90 | | 50-150 |
| Benzo(b)Fluoranthene | 100 | 19.30 | 79.7 | | 50-150 |
| Benzo(k)Fluoranthene | 100 | 19.37 | 93 | | 50-150 |
| Benzo(e)Pyrene | 100 | 20.05 | 96.3 | | 50-150 |
| Benzo(a)Pyrene | 100 | 20.19 | 85.8 | | 50-150 |
| Perylene | 100 | 20.43 | 94.8 | | 50-150 |
| Indeno(1,2,3-cd)Pyrene | 100 | 23.96 | 90 | | 50-150 |
| Dibenzo(a,h)Anthracene | 100 | 24.16 | 88.9 | | 50-150 |
| Benzo(g,h,i)Perylene | 100 | 24.98 | 91.3 | | 50-150 |

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

| **Extraction Standards** | | | **% Rec** | | **Limits** |
|---|---|---|---|---|---|
| Naphthalene D8 | 100 | 2.73 | 47.1 | | 30-150 |
| 2-Methylnaphthalene-D10 | 100 | 3.30 | 50.1 | | 30-150 |
| Acenaphthylene D8 | 100 | 4.46 | 53.5 | | 30-150 |
| Phenanthrene D10 | 100 | 7.86 | 56.5 | | 50-150 |
| Anthracene-D10 | 100 | 7.99 | 59.0 | | 50-150 |
| Fluoranthene D10 | 100 | 11.29 | 70.9 | | 50-150 |
| Benz(a)Anthracene-D12 | 100 | 15.87 | 90.7 | | 50-150 |
| Chrysene D12 | 100 | 15.98 | 72.6 | | 50-150 |
| Benzo(b)Fluoranthene-D12 | 100 | 19.24 | 77.8 | | 50-150 |
| Benzo(k)Fluoranthene-D12 | 100 | 19.32 | 63.3 | | 50-150 |
| Benzo(a)Pyrene D12 | 100 | 20.12 | 76.3 | | 30-150 |
| Perylene D12 | 100 | 20.35 | 66.9 | | 50-150 |
| Indeno(1,2,3,cd)Pyrene-D12 | 100 | 23.87 | 59.3 | | 50-150 |
| Dibenz(a,h)Anthracene-D14 | 100 | 24.04 | 56.3 | | 50-150 |
| Benzo(g,h,i)Perylene D12 | 100 | 24.86 | 65.3 | | 50-150 |

| | |
|---|---|
| R | Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion. |
| NS | Indicates that this standard was not spiked to sample |

L2571239-COFC

L2571242-COFC

# Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

| 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: | |

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

| 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 | |

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

## 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 |
|---|---|---|---|---|---|---|---|---|---|
| | L2522117-2 - Centre | 318 | 23-Mar-21 | 24hr | Air | | X | X | |
| | 741355 | 1642 | 23-Mar-21 | 24hr | Air | X | | | |
| | 741198 | 1669 | 17-Mar-21 | 24hr | Air | X | | | |
| | L2522117-3 - Rundle | 341 | 23-Mar-21 | 24hr | Air | | X | X | |
| | 741354 | 1662 | 23-Mar-21 | 24hr | Air | X | | | |
| | 741197 | 1663 | 17-Mar-21 | 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 | | | |
|---|---|---|---|---|---|---|---|
| 15.3°C | | | | | | | |

| SHIPMENT RELEASE (client use) | | |
|---|---|---|
| Released by: M Town | Date: 25-Mar-21 | Time: 12:30 |

| INITIAL SHIPMENT RECEPTION (lab use only) | | |
|---|---|---|
| Received by: BM | Date: 29 mar-21 | Time: 12:00 |

| FINAL SHIPMENT RECEPTION (lab use only) | | |
|---|---|---|
| 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**.