REPORT

DURHAM YORK ENERGY CENTRE

COURTICE, ONTARIO

2020 Q3 AMBIENT AIR QUALITY MONITORING REPORT

RWDI #1803743

November 11, 2020

SUBMITTED TO:

The Director, Legislative Services-Regional Clerk or Designate,

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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:

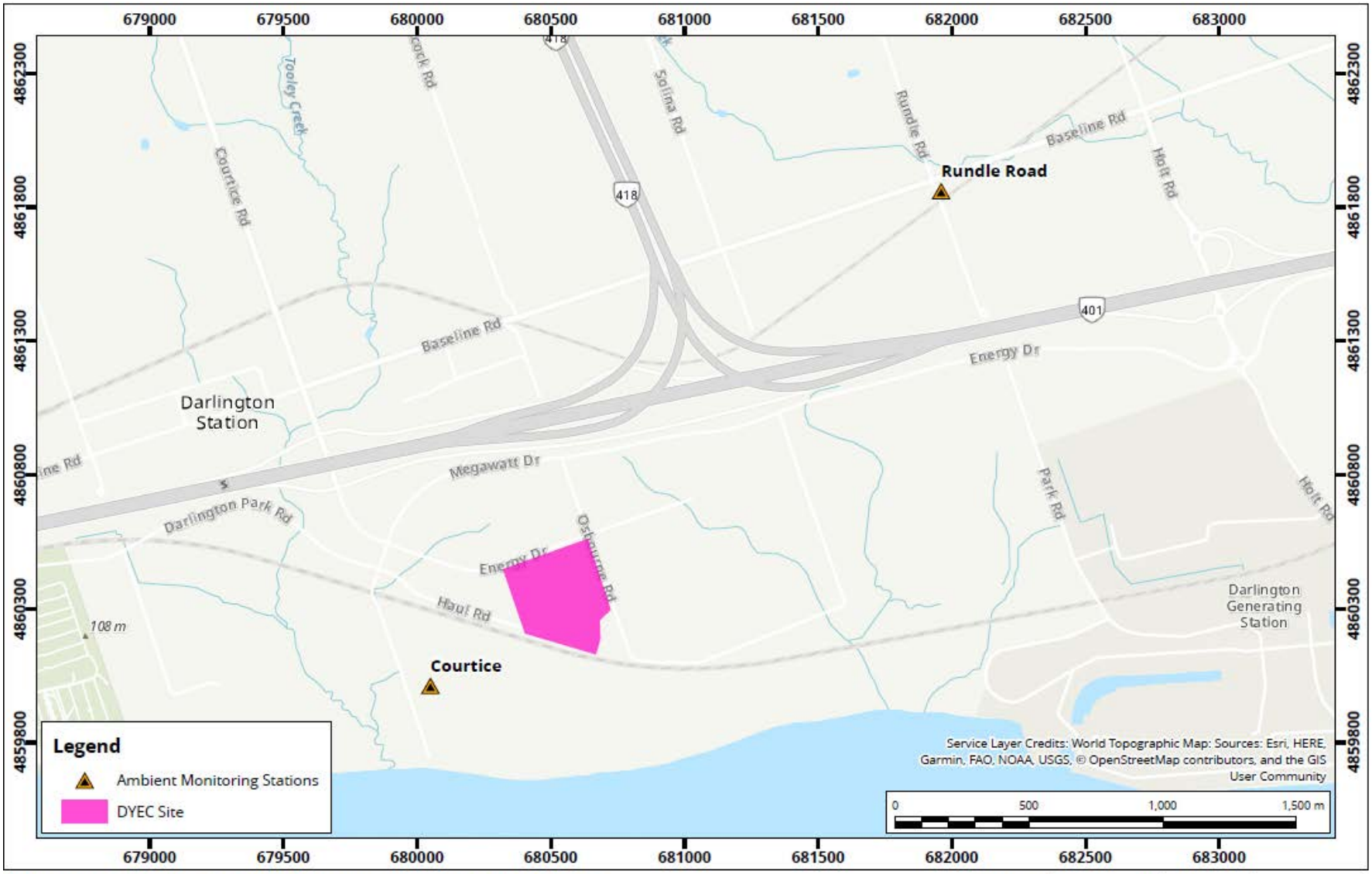
- Quantify any measurable ground level concentrations resulting from emissions from the DYEC cumulative to local air quality, including validating the predicted concentrations from the dispersion modelling conducted in the Environmental Assessment (2009a);
- Monitor concentration levels of EFW-related 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 two (2) exceedances of the AAQC for Benzo(a) Pyrene which occurred on September 24th at the Courtice and Rundle Road Stations, there were two (2) exceedance events of the rolling 10-minute SO_2 AAQC and two (2) exceedance events of the rolling 1-hour SO_2 AAQC at the Courtice Station, and there was one (1) exceedance event of the rolling SO_2 10-minute AAQC and one (1) exceedance event of the rolling 1-hour SO_2 AAQC at the Rundle Road Station. Data recovery rates were acceptable and valid for all measured Q3 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. There is no longer a 24-hour rolling average AAQC for SO_2.

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 98th 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 98th 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 99th 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 98th 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 Q3.

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 July to September 2020 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 99.9% of data collection for all of the parameters measured during Q3. Calibrations were performed on the meteorological instrumentation at the Courtice Station, as well as the Courtice WWTP wind head on August 20th, 2020. Hourly statistics from the meteorological station are presented in **Table 2**. A wind rose showing trends in wind speed and wind direction during Q3 is provided in **Figure 4**.

Figure 4. Wind Roses of Hourly Wind Speed and Wind Direction – July to September 2020

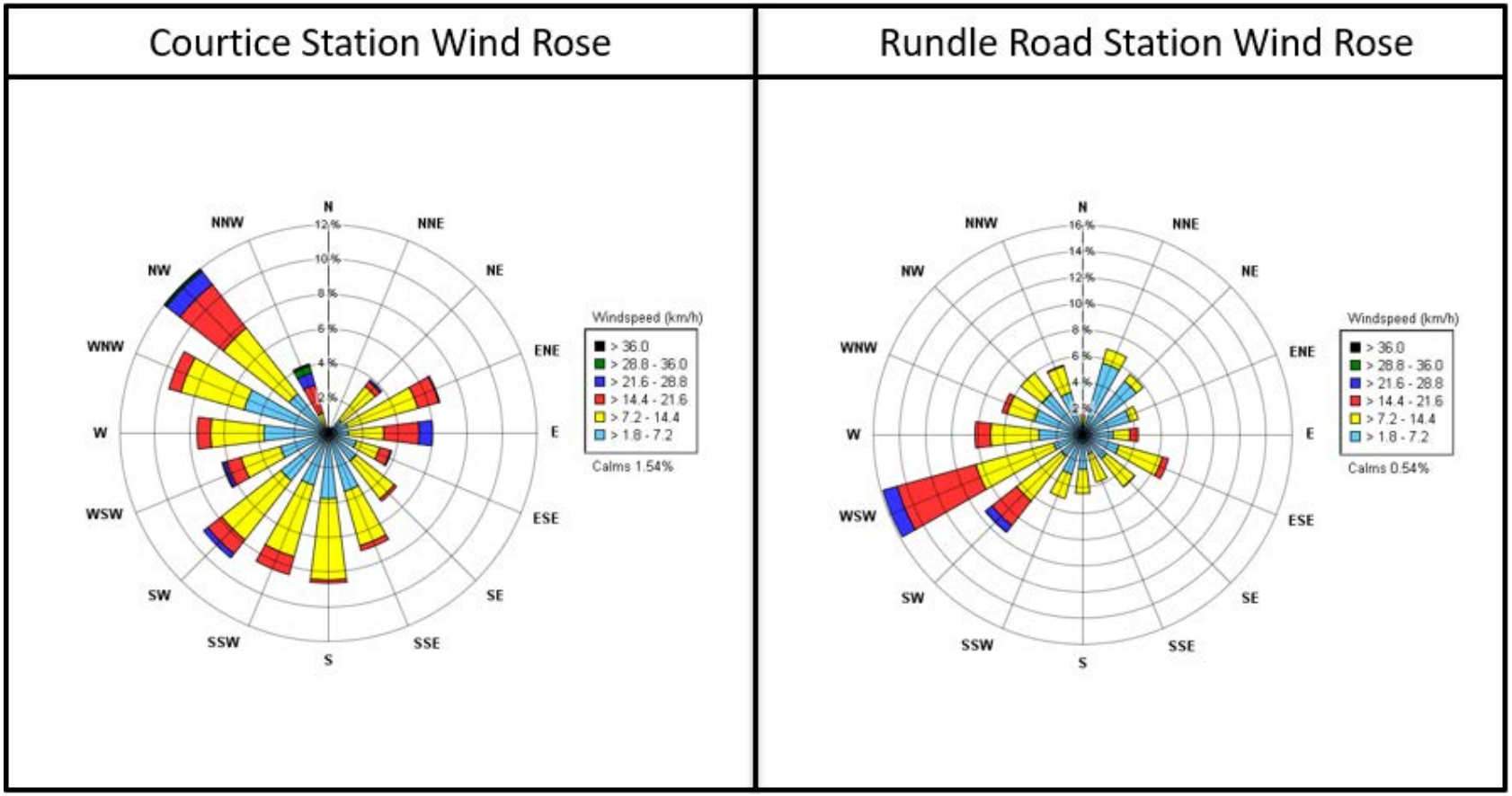


Table 2: Hourly Statistics from the Courtice Station and WPCP (WS and WD) Meteorological Station

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	(%)					
July	24	33	98	29.9	5.9	0	16	34	29.3	0.0	9	23	74	29.6	0.0	33.9	100.0	100.0	99.7	99.7	99.7	99.7
August	38	29	98	29.9	16.1	0	11	36	29.1	0.0	10	21	73	29.6	0.1	98.7	99.6	99.6	100.0	100.0	100.0	100.0
September	38	25	97	30.3	6.1	1	3	32	29.2	0.0	11	16	72	29.8	0.1	39.3	100.0	100.0	100.0	100.0	100.0	100.0
Q3 Arithmetic Mean											10	20	73	29.7	0.1	171.9	99.9	99.9	99.9	99.9	99.9	99.9

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 92.2% data collection for all of the meteorological parameters measured during Q3. Calibrations were performed on the meteorological instrumentation at the Rundle Station on August 20th, 2020. Hourly statistics from the meteorological station is presented in **Table 3**. A wind rose showing trends in wind speed and wind direction during Q3 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	(%)				
July	27	34	96	5.7	0	15	33	0.0	8	23	71	0.0	31.9	100.0	91.8	100.0	100.0	100.0
August	26	29	99	9.4	0	9	35	0.0	8	21	73	0.1	83.8	99.6	88.6	99.6	99.6	99.7
September	32	26	100	6.1	0	1	33	0.0	8	16	73	0.1	45.9	100.0	96.4	100.0	100.0	100.0
Q3 Arithmetic Mean									8	20	72	0.1	161.6	99.9	92.2	99.9	99.9	99.9

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 two (2) exceedance events of the rolling 10-minute SO_2 AAQC and two (2) exceedance events of the rolling 1-hour SO_2 AAQC at the Courtice Station, and there was one (1) exceedance event of the rolling SO_2 10-minute AAQC and one (1) exceedance event of the rolling 1-hour SO_2 AAQC at the Rundle Road Station in Q3.

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											
July	20.1	42.7	34.9	14.9	28.3	13.9	14.6	9.4	2.8	7.7	1.8	6.2	3.7	0.6	3.2	0.3	99.6	99.7	99.7	99.7	99.5
August	109.7	22.5	39.9	29.2	26.1	54.2	14.0	15.3	7.1	9.5	5.0	5.4	4.7	1.0	3.7	1.5	99.6	98.3	98.3	98.3	99.6
September	55.0	39.5	62.8	37.5	38.6	39.6	16.9	16.2	3.9	14.7	8.3	5.0	4.7	1.0	3.7	2.1	99.7	99.7	99.7	99.7	99.6
Q3 Arithmetic Mean												5.5	4.4	0.9	3.5	1.3	99.6	99.2	99.2	99.2	99.5

[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											
July	4.6	28.3	21.3	11.0	13.9	3.6	11.8	6.6	1.5	5.4	1.2	5.1	3.0	0.6	2.6	0.3	99.7	99.7	99.7	99.7	99.7
August	34.3	23.1	30.5	16.8	17.7	22.8	13.2	9.2	2.1	7.6	1.7	4.4	3.2	0.8	2.5	0.4	99.9	99.5	99.5	99.5	99.9
September	67.8	30.6	34.9	19.9	20.7	41.5	13.6	9.0	2.5	6.8	4.6	4.0	3.0	0.7	2.6	0.3	99.7	99.6	99.6	99.6	99.0
Q3 Arithmetic Mean												4.5	3.1	0.7	2.6	0.3	99.8	99.6	99.6	99.6	99.5

[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.		
July	0	0		0	0		0	0	N/A	0		N/A	0	
August	2	0		0	2		0	0	N/A	0		N/A	0	
September	0	1		0	0		0	1	N/A	0		N/A	0	
Q3 Total	2	1		0	2		0	1	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 (99.2% 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 38.6 ppb, which is 19.3% of the AAQC. The highest NO_2 value seen among the rolling 24-hour averages was 14.7 ppb, which is 14.7% of the AAQC. The measurements are summarized in **Table 4** above. A pollution rose is presented in **Figure 5** for the Courtice Station during Q3 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.

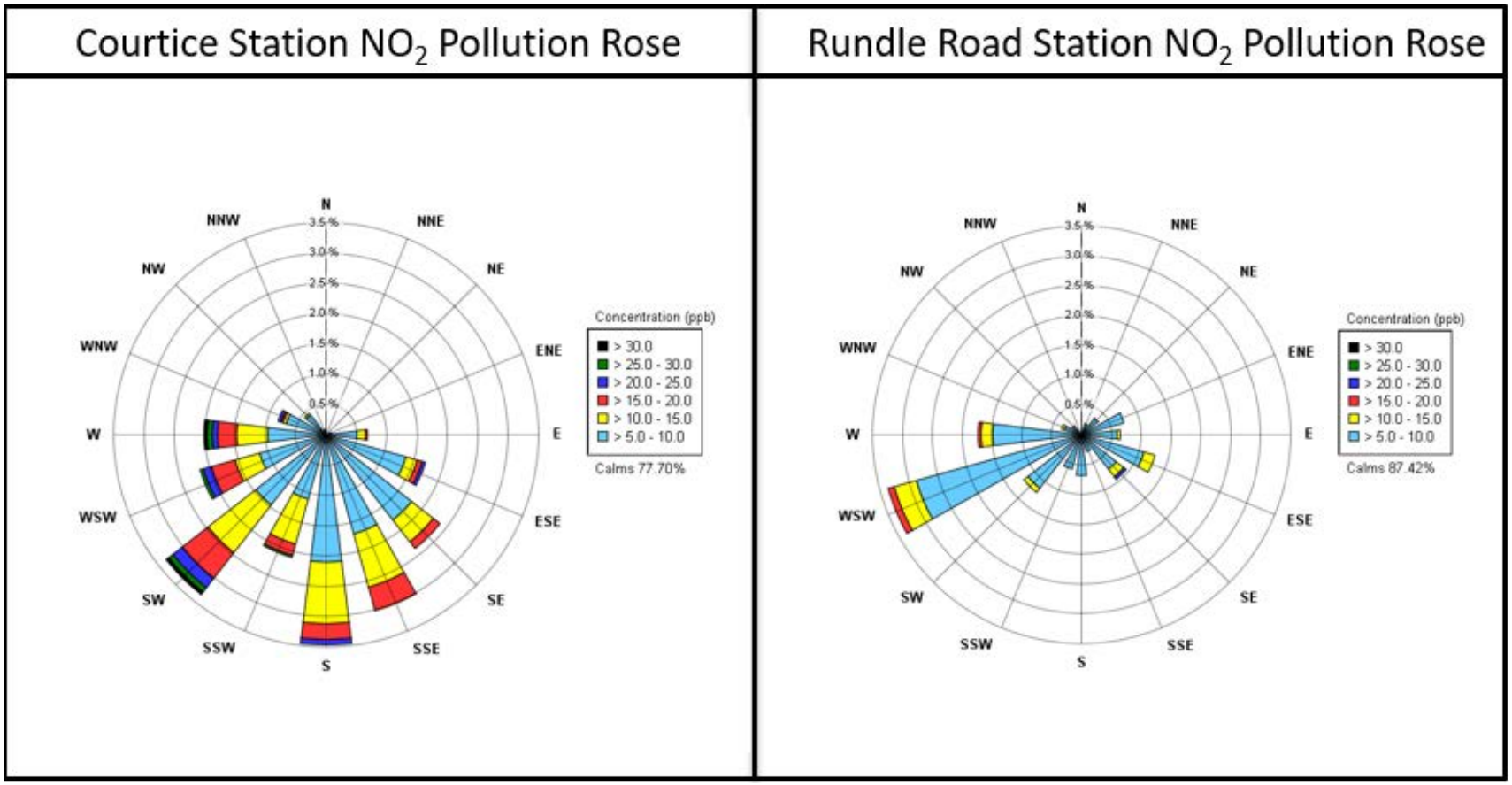
The Courtice Station pollution rose in **Figure 5** shows the majority of the NO_2 impacts were largely between the ESE and W directions. The Station would be downwind of the DYEC if winds were from the northeast and east-northeast components, which happened to be very minimal, therefore it is unlikely that any significant impact came from the DYEC. There are larger impacts from the ESE which indicates likely impacts from the surrounding industry along the lakeshore, and from the SE-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 (99.6% valid data). There were no exceedances above the AAQC values for the entirety of the sampling period for rolling 1-hour and 24-hour averaged data. The highest NO_2 value seen among the 1-hour rolling averages was 20.7 ppb, which is 10.4% of the AAQC. The highest NO_2 value seen among the rolling 24-hour averages was 7.6 ppb, which is 7.6% 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 Q3 composed of hourly average NO_2 concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 ppb were omitted from the graphic wind rose representation.

The Rundle Road Station pollution rose in **Figure 5** shows that the majority of elevated NO_2 events at the Rundle Road Station occurred when winds were from the west and west-southwest 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 – July to September 2020



5.4 Sulphur Dioxide Results

5.4.1 Courtice Station Results

Data recovery levels were high for sulphur dioxide (99.5% valid data). Monitoring results were compared to the AAQC for 10-minute and 1-hour rolling average periods. In 2020, there have been more frequent SO_2 concentrations elevated above the AAQC's than in previous years due to the new limits imposed at the start of 2020. The highest SO_2 value seen among the 10-min rolling averages was 109.7 ppb, which is 163.7% of the AAQC. The highest SO_2 value seen among the 1-hour rolling averages was 54.2 ppb, which is 135.5% of the AAQC. There were two (2) exceedance events of the rolling 10-minute AAQC and two (2) exceedance events of the rolling 1-hour AAQC. Tables outlining the interpretation of each exceedance period can be found in **Appendix E.**

The SO_2 statistical results are summarized in **Table 4** above. A pollution rose is presented in **Figure 6** for the Courtice Station during Q3 composed of hourly average SO_2 concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 ppb were omitted from the graphic wind rose representation. A pollution rose is presented in **Figure 7** for the Courtice Station during Q3 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 SSE to S directions. The events were possibly a result of emissions from long range transport across the lake and a small contribution from the ESE 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 0.03% of the 5-min SO_2 events which are elevated >67 ppb occurred from the WSW S, SSE, ESE and E directions. The conclusion about the sources is the same as **Figure 6** and it is unlikely that any significant contribution of measured SO_2 came from the DYEC.

Durham Region staff have provided a Technical Memorandum summarizing the DYEC SO_2 continuous emissions monitoring system (CEMS) data during the exceedance events recorded at the Courtice and Rundle Road Ambient Monitoring Stations for Q3, which is included in **Appendix F**. The Memorandum indicates that based on the in-stack concentration levels measured by the CEMS, that there were no unusual levels in SO_2 emissions during the ambient Station exceedance events and that the facility's contribution to ambient air quality would be expected to be quite low.

5.4.2 Rundle Road Station Results

Data recovery levels were high for sulphur dioxide (99.5% 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 67.8 ppb, which is 101.2% of the AAQC. The highest SO_2 value seen among the 1-hour rolling averages was 41.5 ppb, which is 103.8% of the AAQC. There was one (1) exceedance event of the rolling 10-minute AAQC and one (1) exceedance event of the rolling 1-hour AAQC. Tables outlining the interpretation of each exceedance period can be found in **Appendix E.** Other meteorological and exceedance analysis can be provided upon request but is outside the scope of the current program.

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 Q3 composed of hourly average SO_2 concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 ppb were omitted from the graphic wind rose representation. A pollution rose is presented in **Figure 7** for the Rundle Road Station during Q3 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 to SSE. 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 <0.01% of the 5-min SO_2 events which are elevated >67 ppb occurred from the ESE direction. The conclusion about the sources is the same as **Figure 6** and it is unlikely that any significant contribution of measured SO_2 came from the DYEC.

Figure 6. Pollution Roses of Hourly Average SO_2 Concentrations – July to September 2020

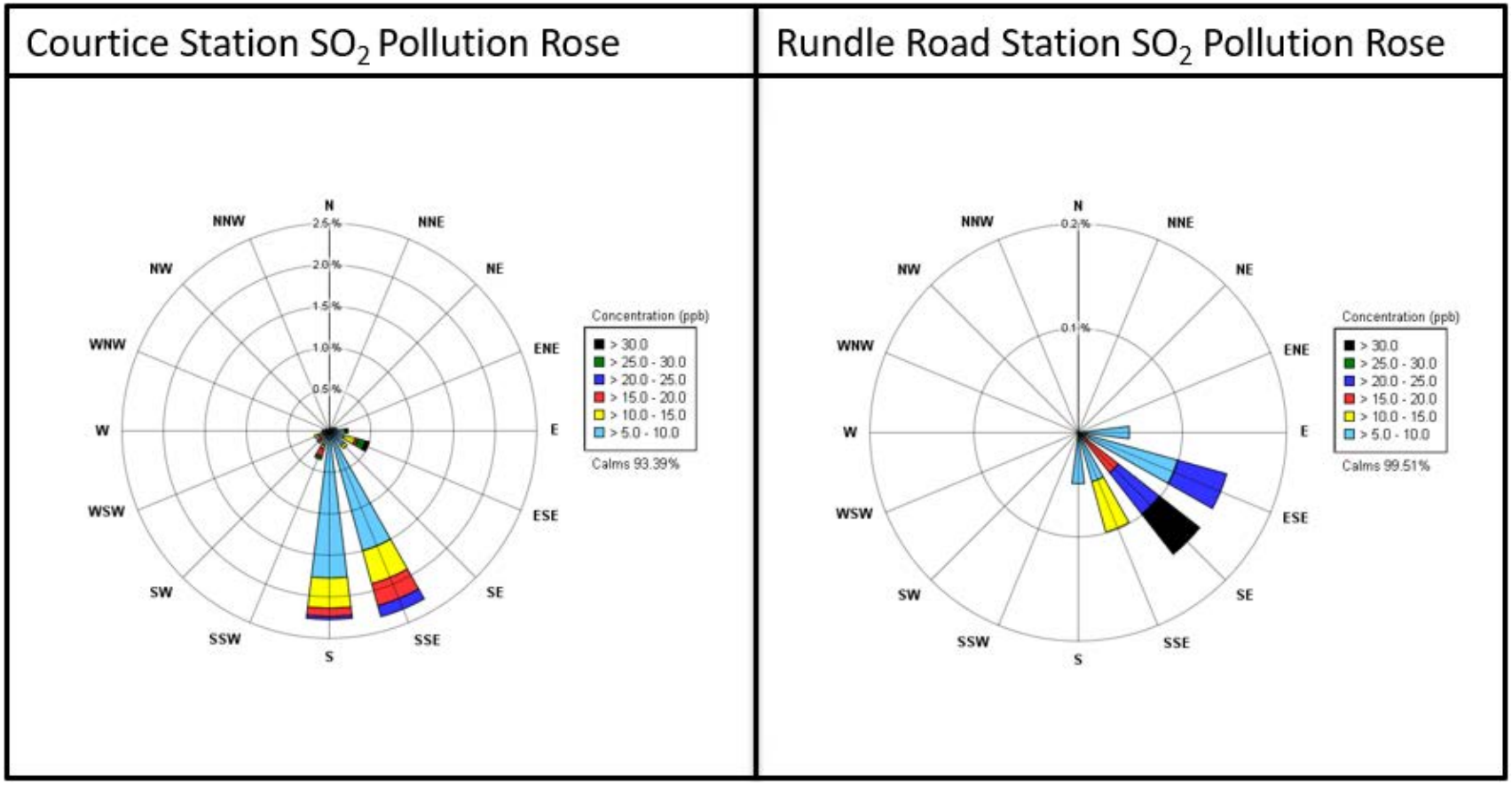
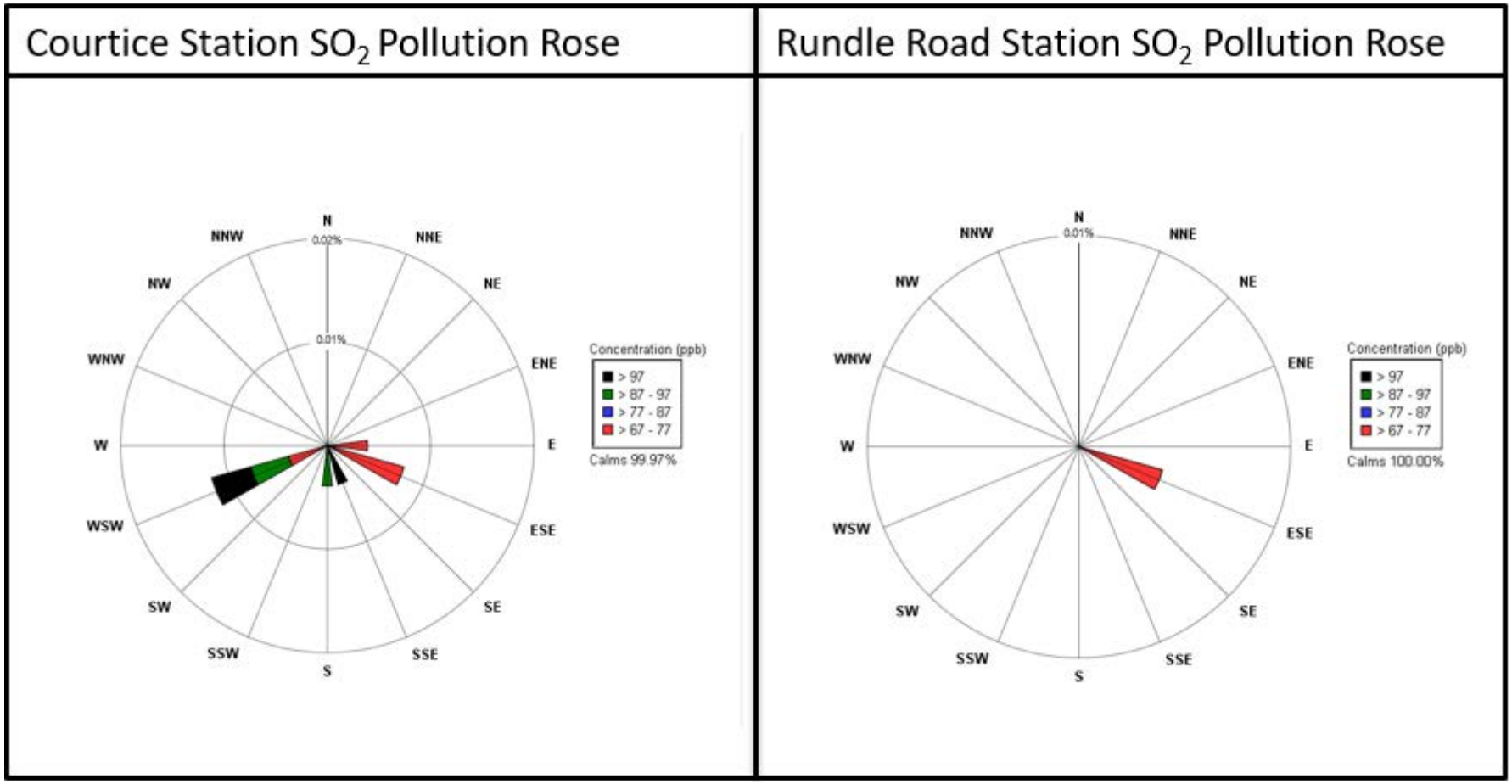


Figure 7. Pollution Roses of 5-minute Average SO_2 Concentrations >67 ppb – July to September 2020



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 (99.6% valid data). There is no 1-hour AAQC or standard for $PM_{2.5}$, but there is a 24-hour CAAQS of 27 µg/m^3 for the 3-year average of the annual 98th percentile 24-hour concentrations, and 8.8 µg/m^3 for the 3-year average of the annual average concentrations (in effect as of 2020). Note that since the reported data is only quarterly and the CAAQS is applicable to the 3-year average, the CAAQS' for $PM_{2.5}$ was not applicable to the data. The highest $PM_{2.5}$ value seen among the 1-hour rolling averages was 42.7 µg/m^3 and the highest value seen among the 24-hour rolling averages was 16.9 µg/m^3. The results are summarized in **Table 4** above. A pollution rose is presented in **Figure 8** for the Courtice Station during Q3 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.

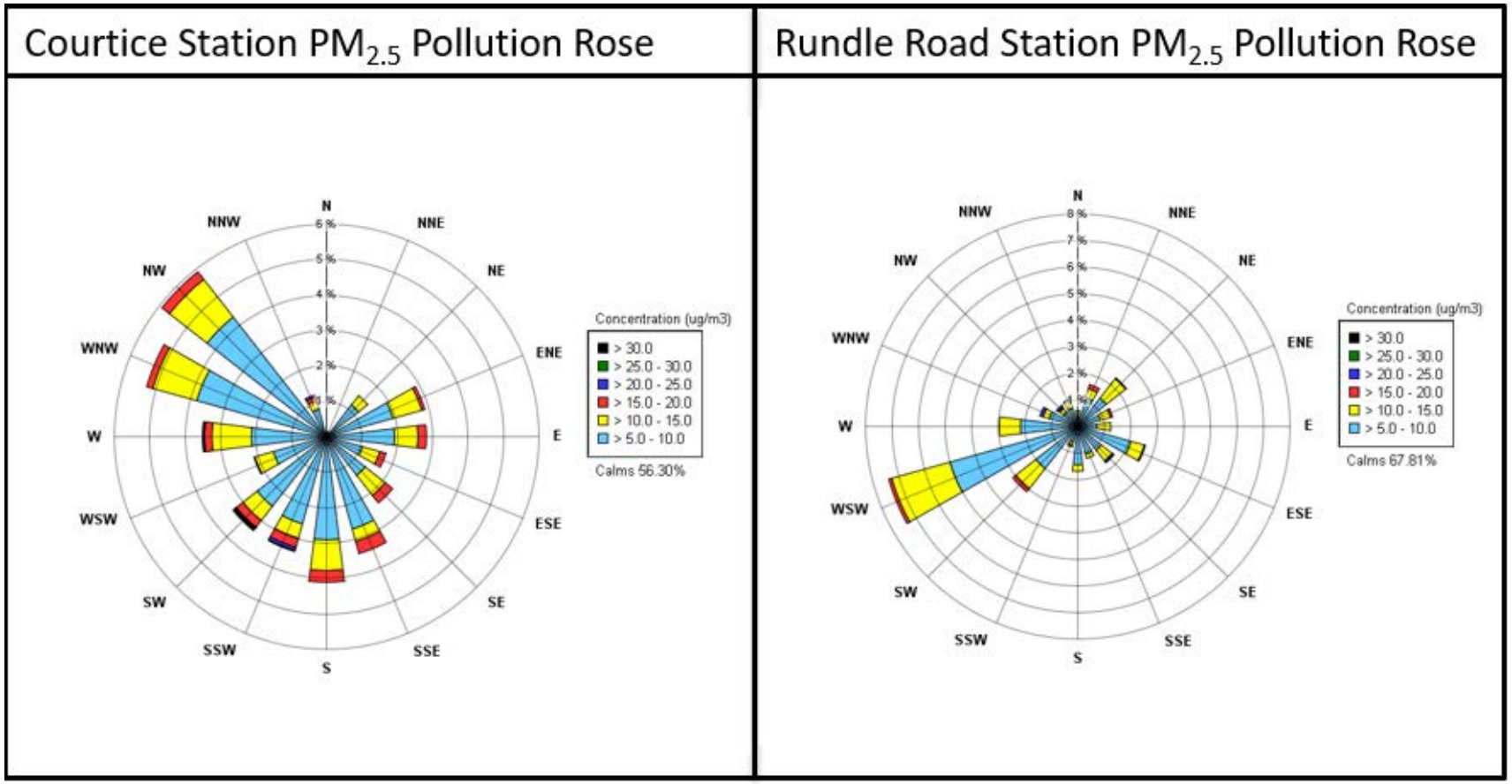
The Courtice Station pollution rose in **Figure 8** shows that the majority of elevated $PM_{2.5}$ events at Courtice were largely from the WNW-NW. Elevated $PM_{2.5}$ measurements were likely related to urban background, roadway emissions and other nearby industrial sources.

5.5.2 Rundle Road Station Results

Data recovery levels were high for particulate matter less than 2.5 microns (99.8% valid data). The highest $PM_{2.5}$ value seen among the 1-hour rolling averages was 30.6 µg/m^3 and the highest value seen among the 24-hour rolling averages was 13.6 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 Q3 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 WSW, which is in line with high traffic areas and urban background, with a possible contribution from DYEC in the WSW quadrant.

Figure 8. Pollution Roses of Hourly Average $PM_{2.5}$ Concentrations – July to September 2020



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 Q3 with the sample days being: July 2, 8, 14, 20, 26, August 1, 7, 13, 19, 25, 31 and September 6, 12, 18, 24, 30.

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 Q3. **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	Q3 Minimum Concentration	Q3 Maximum Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
Particulate (TSP)	µg/m³	*120*	*120*	0	26.07	29.55	11.59	69.66	69.66	36.85	52.51	16	100
Total Mercury (Hg)	µg/m³	*2*	*2*	0	9.58E-06	1.17E-05	2.94E-06	4.00E-05	1.34E-05	4.00E-05	1.31E-05	16	100
Aluminum (Al)	µg/m³	*4.8*	-	0	1.62E-01	1.93E-01	7.16E-02	5.00E-01	3.55E-01	3.62E-01	5.00E-01	16	100
Antimony (Sb)	µg/m³	*25*	*25*	0	7.38E-04	7.79E-04	4.78E-04	1.44E-03	1.35E-03	9.29E-04	1.44E-03	16	100
Arsenic (As)	µg/m³	*0.3*	*0.3*	0	9.53E-04	9.89E-04	8.59E-04	2.36E-03	9.77E-04	8.93E-04	2.36E-03	16	100
Barium (Ba)	µg/m³	*10*	*10*	0	7.36E-03	8.15E-03	3.47E-03	1.55E-02	1.55E-02	1.29E-02	1.15E-02	16	100
Beryllium (Be)	µg/m³	*0.01*	*0.01*	0	2.99E-05	2.99E-05	2.86E-05	3.26E-05	3.26E-05	2.98E-05	2.98E-05	16	100
Bismuth (Bi)	µg/m³	-	-	-	5.38E-04	5.38E-04	5.15E-04	5.86E-04	5.86E-04	5.36E-04	5.37E-04	16	100
Boron (B)	µg/m³	*120*	-	0	1.19E-02	1.20E-02	1.15E-02	1.30E-02	1.30E-02	1.19E-02	1.19E-02	16	100
Cadmium (Cd)	µg/m³	*0.025*	*0.025*	0	5.97E-04	5.98E-04	5.73E-04	6.51E-04	6.51E-04	5.96E-04	5.97E-04	16	100
Chromium (Cr)	µg/m³	*0.5*	-	0	1.59E-03	1.67E-03	1.43E-03	4.43E-03	4.43E-03	1.49E-03	1.49E-03	16	100
Cobalt (Co)	µg/m³	*0.1*	*0.1*	0	5.97E-04	5.98E-04	5.73E-04	6.51E-04	6.51E-04	5.96E-04	5.97E-04	16	100
Copper (Cu)	µg/m³	*50*	-	0	1.26E-02	1.42E-02	6.79E-03	3.37E-02	3.37E-02	2.27E-02	3.06E-02	16	100
Iron (Fe)	µg/m³	*4*	-	0	4.41E-01	4.88E-01	2.54E-01	1.26E+00	1.26E+00	7.63E-01	6.84E-01	16	100
Lead (Pb)	µg/m³	*0.5*	*0.5*	0	1.95E-03	2.34E-03	8.63E-04	7.81E-03	7.81E-03	2.17E-03	4.25E-03	16	100
Magnesium (Mg)	µg/m³	-	-	-	2.33E-01	2.74E-01	1.41E-01	8.98E-01	8.98E-01	3.93E-01	3.83E-01	16	100
Manganese (Mn)	µg/m³	*0.4*	-	0	1.19E-02	1.36E-02	6.13E-03	3.69E-02	3.69E-02	2.34E-02	2.07E-02	16	100
Molybdenum (Mo)	µg/m³	*120*	-	0	4.06E-04	4.64E-04	2.86E-04	1.24E-03	1.24E-03	7.10E-04	8.26E-04	16	100
Nickel (Ni)	µg/m³	*0.2*	-	0	9.38E-04	9.62E-04	8.59E-04	2.02E-03	2.02E-03	8.93E-04	8.95E-04	16	100
Phosphorus (P)	µg/m³	-	-	-	2.24E-01	2.24E-01	2.15E-01	2.44E-01	2.44E-01	2.23E-01	2.24E-01	16	100
Selenium (Se)	µg/m³	*10*	*10*	0	2.99E-03	2.99E-03	2.86E-03	3.26E-03	3.26E-03	2.98E-03	2.98E-03	16	100
Silver (Ag)	µg/m³	*1*	*1*	0	2.99E-04	2.99E-04	2.86E-04	3.26E-04	3.26E-04	2.98E-04	2.98E-04	16	100
Strontium (Sr)	µg/m³	*120*	-	0	6.40E-03	7.52E-03	2.51E-03	2.08E-02	2.08E-02	9.80E-03	1.23E-02	16	100
Thallium (Tl)	µg/m³	-	-	-	2.69E-05	2.69E-05	2.58E-05	2.93E-05	2.93E-05	2.68E-05	2.68E-05	16	100
Tin (Sn)	µg/m³	*10*	*10*	0	7.41E-04	8.51E-04	2.88E-04	1.89E-03	1.43E-03	1.89E-03	1.59E-03	16	100
Titanium (Ti)	µg/m³	*120*	-	0	7.67E-03	9.34E-03	3.23E-03	2.07E-02	1.95E-02	1.82E-02	2.07E-02	16	100
Uranium (Ur)	µg/m³	*1.5*	-	0	2.99E-05	2.99E-05	2.86E-05	3.26E-05	3.26E-05	2.98E-05	2.98E-05	16	100
Vanadium (V)	µg/m³	*2*	*1*	0	1.49E-03	1.49E-03	1.43E-03	1.63E-03	1.63E-03	1.49E-03	1.49E-03	16	100
Zinc (Zn)	µg/m³	*120*	-	0	3.14E-02	3.35E-02	1.44E-02	6.36E-02	6.36E-02	5.87E-02	3.60E-02	16	100
Zirconium (Zr)	µg/m³	*20*	-	0	5.97E-04	5.98E-04	5.73E-04	6.51E-04	6.51E-04	5.96E-04	5.97E-04	16	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 (81% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for TSP, mercury or metals during Q3. **Table 8** is a summary of the statistics for this station.

Table 8: Summary of TSP Sampler Rundle Road Station

Contaminant	Units	MECP Criteria	HHRA Health Based Criteria	No. > Criteria	Geometric Mean	Arithmetic Mean	Q3 Minimum Concentration	Q3 Maximum Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
Particulate (TSP)	µg/m^3	*120*	*120*	0	24.1	26.1	13.7	43.9	41.7	33.9	43.9	13	81
Total Mercury (Hg)	µg/m^3	*2*	*2*	0	6.96E-06	9.53E-06	2.85E-06	3.13E-05	1.96E-05	3.13E-05	7.68E-06	13	81
Aluminum (Al)	µg/m^3	*4.8*	-	0	1.59E-01	1.76E-01	8.17E-02	3.01E-01	2.85E-01	2.67E-01	3.01E-01	13	81
Antimony (Sb)	µg/m^3	*25*	*25*	0	5.48E-04	6.11E-04	2.45E-04	1.33E-03	1.33E-03	6.05E-04	1.03E-03	13	81
Arsenic (As)	µg/m^3	*0.3*	*0.3*	0	9.97E-04	1.06E-03	8.71E-04	2.79E-03	1.01E-03	9.29E-04	2.79E-03	13	81
Barium (Ba)	µg/m^3	*10*	*10*	0	6.84E-03	7.80E-03	3.25E-03	1.97E-02	1.97E-02	1.00E-02	9.51E-03	13	81
Beryllium (Be)	µg/m^3	*0.01*	*0.01*	0	3.03E-05	3.04E-05	2.85E-05	3.37E-05	3.37E-05	3.10E-05	3.01E-05	13	81
Bismuth (Bi)	µg/m^3	-	-	-	5.46E-04	5.47E-04	5.13E-04	6.07E-04	6.07E-04	5.57E-04	5.42E-04	13	81
Boron (B)	µg/m^3	*120*	-	0	1.21E-02	1.21E-02	1.14E-02	1.35E-02	1.35E-02	1.24E-02	1.20E-02	13	81
Cadmium (Cd)	µg/m^3	*0.025*	*0.025*	0	6.07E-04	6.07E-04	5.69E-04	6.74E-04	6.74E-04	6.19E-04	6.02E-04	13	81
Chromium (Cr)	µg/m^3	*0.5*	-	0	1.62E-03	1.69E-03	1.42E-03	3.98E-03	3.98E-03	1.55E-03	1.50E-03	13	81
Cobalt (Co)	µg/m^3	*0.1*	*0.1*	0	6.07E-04	6.07E-04	5.69E-04	6.74E-04	6.74E-04	6.19E-04	6.02E-04	13	81
Copper (Cu)	µg/m^3	*50*	-	0	3.36E-02	3.64E-02	1.48E-02	5.74E-02	5.74E-02	5.72E-02	4.04E-02	13	81
Iron (Fe)	µg/m^3	*4*	-	0	3.78E-01	4.16E-01	1.66E-01	8.83E-01	8.83E-01	7.06E-01	4.96E-01	13	81
Lead (Pb)	µg/m^3	*0.5*	*0.5*	0	1.84E-03	2.22E-03	8.71E-04	5.93E-03	5.93E-03	3.03E-03	3.13E-03	13	81
Magnesium (Mg)	µg/m^3	-	-	-	1.99E-01	2.22E-01	9.87E-02	4.72E-01	4.72E-01	3.10E-01	3.07E-01	13	81
Manganese (Mn)	µg/m^3	*0.4*	-	0	1.07E-02	1.21E-02	5.46E-03	2.62E-02	2.62E-02	1.95E-02	1.87E-02	13	81
Molybdenum (Mo)	µg/m^3	*120*	-	0	1.21E-03	1.38E-03	2.90E-04	2.90E-03	2.90E-03	1.93E-03	1.44E-03	13	81
Nickel (Ni)	µg/m^3	*0.2*	-	0	9.10E-04	9.11E-04	8.54E-04	1.01E-03	1.01E-03	9.29E-04	9.03E-04	13	81
Phosphorus (P)	µg/m^3	-	-	-	2.28E-01	2.28E-01	2.14E-01	2.53E-01	2.53E-01	2.32E-01	2.26E-01	13	81
Selenium (Se)	µg/m^3	*10*	*10*	0	3.03E-03	3.04E-03	2.85E-03	3.37E-03	3.37E-03	3.10E-03	3.01E-03	13	81
Silver (Ag)	µg/m^3	*1*	*1*	0	3.03E-04	3.04E-04	2.85E-04	3.37E-04	3.37E-04	3.10E-04	3.01E-04	13	81
Strontium (Sr)	µg/m^3	*120*	-	0	4.78E-03	5.29E-03	2.56E-03	1.21E-02	1.21E-02	8.11E-03	6.14E-03	13	81
Thallium (Tl)	µg/m^3	-	-	-	2.73E-05	2.73E-05	2.56E-05	3.03E-05	3.03E-05	2.79E-05	2.71E-05	13	81
Tin (Sn)	µg/m^3	*10*	*10*	0	6.38E-04	8.76E-04	2.85E-04	2.89E-03	2.89E-03	6.81E-04	1.38E-03	13	81
Titanium (Ti)	µg/m^3	*120*	-	0	7.69E-03	8.89E-03	3.19E-03	1.62E-02	1.62E-02	1.42E-02	1.38E-02	13	81
Uranium (Ur)	µg/m^3	*1.5*	-	0	3.03E-05	3.04E-05	2.85E-05	3.37E-05	3.37E-05	3.10E-05	3.01E-05	13	81
Vanadium (V)	µg/m^3	*2*	*1*	0	1.52E-03	1.52E-03	1.42E-03	1.69E-03	1.69E-03	1.55E-03	1.50E-03	13	81
Zinc (Zn)	µg/m^3	*120*	-	0	2.76E-02	3.40E-02	8.58E-03	1.05E-01	4.89E-02	1.05E-01	5.77E-02	13	81
Zirconium (Zr)	µg/m^3	*20*	-	0	6.07E-04	6.07E-04	5.69E-04	6.74E-04	6.74E-04	6.19E-04	6.02E-04	13	81

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 Q3 with the sample days being: July 2, 14, 26, August 7, 19, 31 and September 12 and 24, 2020.

5.7.1 Courtice Station Results

Data recovery levels were acceptable for the PAH results at the Courtice Station (75% valid data). There was one (1) exceedance of the Benzo(a) Pyrene AAQC on September 24th. There were no other exceedances of any of the AAQC's or HHRA Criteria. According to the Courtice meteorological data, the Courtice Station was downwind of the DYEC part of the time during the September 24th sampling period. According to the Courtice meteorological data, the winds were coming from the NE-SSW 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 NE-ENE quadrant. 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 Q3 Concentration	Maximum Q3 Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
1-Methylnaphthalene	ng/m³	12000	0	6.04E+00	3.82E+00	1.01E+01	5.64E+00	1.01E+01	8.11E+00	6	75
2-Methylnaphthalene	ng/m³	10000	0	9.76E+00	6.57E+00	1.73E+01	1.01E+01	1.73E+01	1.07E+01	6	75
Acenaphthene	ng/m³	-	-	6.60E+00	3.15E+00	1.43E+01	6.79E+00	1.43E+01	3.44E+00	6	75
Acenaphthylene	ng/m³	3500	0	1.62E-01	3.81E-02	3.48E-01	2.51E-01	3.48E-01	1.44E-01	6	75
Anthracene	ng/m³	200	0	3.06E-01	1.50E-01	5.13E-01	3.68E-01	5.13E-01	2.08E-01	6	75
Benzo(a)Anthracene	ng/m³	-	-	2.05E-02	7.27E-03	3.68E-02	1.79E-02	3.61E-02	3.68E-02	6	75
Benzo(a)fluorene	ng/m³	-	-	4.93E-02	2.73E-02	7.31E-02	6.64E-02	7.31E-02	5.76E-02	6	75
Benzo(a)Pyrene (Historically High)	ng/m³	0.05	1	2.28E-02	6.08E-03	5.50E-02	3.14E-02	2.08E-02	5.50E-02	6	75
Benzo(b)Fluoranthene	ng/m³	-	-	3.70E-02	1.20E-02	8.91E-02	3.87E-02	3.80E-02	8.91E-02	6	75
Benzo(b)fluorene	ng/m³	-	-	3.43E-02	1.58E-02	7.12E-02	3.74E-02	4.15E-02	7.12E-02	6	75
Benzo(e)Pyrene	ng/m³	-	-	2.89E-02	9.12E-03	5.56E-02	3.33E-02	3.35E-02	5.56E-02	6	75
Benzo(g,h,i)Perylene	ng/m³	-	-	2.50E-02	1.17E-02	5.30E-02	2.73E-02	2.00E-02	5.30E-02	6	75
Benzo(k)Fluoranthene	ng/m³	-	-	3.86E-02	1.05E-02	7.48E-02	4.34E-02	5.57E-02	7.48E-02	6	75
Biphenyl	ng/m³	-	-	2.73E+00	1.74E+00	4.34E+00	2.33E+00	4.34E+00	3.34E+00	6	75
Chrysene	ng/m³	-	-	8.36E-02	4.05E-02	1.51E-01	9.75E-02	9.81E-02	1.51E-01	6	75
Dibenzo(a,h)Anthracene	ng/m³	-	-	2.65E-03	3.14E-04	8.25E-03	1.88E-03	2.72E-03	8.25E-03	6	75
Fluoranthene	ng/m³	-	-	1.11E+00	3.87E-01	1.67E+00	1.62E+00	1.67E+00	7.73E-01	6	75
Fluorene	ng/m³	-	-	3.86E+00	2.19E+00	7.12E+00	4.34E+00	7.12E+00	2.41E+00	6	75
Indeno(1,2,3-cd)Pyrene	ng/m³	-	-	2.46E-02	1.04E-02	4.70E-02	3.00E-02	2.85E-02	4.70E-02	6	75
Naphthalene	ng/m³	22500	0	3.11E+01	1.31E+01	5.54E+01	2.69E+01	5.54E+01	5.46E+01	6	75
o-Terphenyl	ng/m³	-	-	1.53E-02	1.02E-02	3.44E-02	1.06E-02	1.27E-02	3.44E-02	6	75
Perylene	ng/m³	-	-	1.83E-03	3.14E-04	5.23E-03	2.05E-03	1.90E-03	5.23E-03	6	75
Phenanthrene	ng/m³	-	-	6.11E+00	3.02E+00	1.10E+01	7.39E+00	1.10E+01	3.88E+00	6	75
Pyrene	ng/m³	-	-	6.03E-01	3.64E-01	8.52E-01	8.52E-01	8.07E-01	5.23E-01	6	75
Tetralin	ng/m³	-	-	2.56E+00	1.38E+00	4.17E+00	2.76E+00	3.20E+00	4.17E+00	6	75
Total PAH	ng/m³	-	-	7.13E+01	4.53E+01	1.27E+02	6.45E+01	1.27E+02	9.17E+01	6	75

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 (88% valid data). There was one (1) exceedance of the Benzo(a) Pyrene AAQC on September 24th. There were no other exceedances of any of the AAQC's or HHRA Criteria. 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 Northeast and South, it is likely that the measured BaP exceedances may be attributed to sources other 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/m³)	No. > Criteria	Arithmetic Mean	Minimum Q3 Concentration	Maximum Q3 Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
1-Methylnaphthalene	ng/m³	*12000*	0	8.62E+00	1.90E+00	1.59E+01	8.18E+00	1.59E+01	1.48E+01	7	88
2-Methylnaphthalene	ng/m³	*10000*	0	1.51E+01	3.01E+00	3.10E+01	1.54E+01	3.10E+01	2.06E+01	7	88
Acenaphthene	ng/m³	-	-	1.10E+01	9.93E-01	2.69E+01	1.37E+01	2.69E+01	8.91E+00	7	88
Acenaphthylene	ng/m³	*3500*	0	1.49E-01	6.47E-02	2.92E-01	2.56E-01	2.92E-01	1.16E-01	7	88
Anthracene	ng/m³	*200*	0	8.60E-01	8.40E-02	2.12E+00	1.33E+00	2.12E+00	4.01E-01	7	88
Benzo(a)Anthracene	ng/m³	-	-	1.69E-02	7.58E-03	2.59E-02	2.59E-02	1.91E-02	2.50E-02	7	88
Benzo(a)fluorene	ng/m³	-	-	8.66E-02	2.56E-02	2.03E-01	2.03E-01	1.43E-01	5.00E-02	7	88
Benzo(a)Pyrene (Historically High)	ng/m³	*0.05*	1	1.92E-02	7.00E-03	6.12E-02	2.19E-02	1.28E-02	6.12E-02	7	88
Benzo(b)Fluoranthene	ng/m³	-	-	4.11E-02	1.48E-02	9.67E-02	3.09E-02	9.67E-02	6.81E-02	7	88
Benzo(b)fluorene	ng/m³	-	-	5.34E-02	1.39E-02	1.25E-01	1.25E-01	7.09E-02	7.30E-02	7	88
Benzo(e)Pyrene	ng/m³	-	-	2.14E-02	1.06E-02	3.59E-02	2.14E-02	2.32E-02	3.59E-02	7	88
Benzo(g,h,i)Perylene	ng/m³	-	-	2.83E-02	1.19E-02	7.61E-02	2.01E-02	7.61E-02	4.21E-02	7	88
Benzo(k)Fluoranthene	ng/m³	-	-	3.21E-02	1.09E-02	5.69E-02	3.85E-02	5.69E-02	4.67E-02	7	88
Biphenyl	ng/m³	-	-	3.53E+00	8.73E-02	7.45E+00	4.09E+00	7.45E+00	4.54E+00	7	88
Chrysene	ng/m³	-	-	1.07E-01	4.31E-02	2.20E-01	2.20E-01	1.45E-01	1.11E-01	7	88
Dibenzo(a,h)Anthracene	ng/m³	-	-	2.30E-03	3.38E-04	6.74E-03	1.51E-03	2.68E-03	6.74E-03	7	88
Fluoranthene	ng/m³	-	-	3.00E+00	4.02E-01	6.18E+00	5.84E+00	6.18E+00	1.50E+00	7	88
Fluorene	ng/m³	-	-	7.19E+00	8.63E-01	1.65E+01	1.08E+01	1.65E+01	4.77E+00	7	88
Indeno(1,2,3-cd)Pyrene	ng/m³	-	-	2.14E-02	9.56E-03	3.21E-02	2.04E-02	3.00E-02	3.21E-02	7	88
Naphthalene	ng/m³	*22500*	0	3.24E+01	7.52E+00	8.39E+01	2.21E+01	5.98E+01	8.39E+01	7	88
o-Terphenyl	ng/m³	-	-	1.71E-02	8.76E-03	3.98E-02	1.09E-02	2.10E-02	3.98E-02	7	88
Perylene	ng/m³	-	-	1.55E-03	3.38E-04	2.61E-03	8.72E-04	2.61E-03	2.34E-03	7	88
Phenanthrene	ng/m³	-	-	1.34E+01	1.83E+00	3.06E+01	2.17E+01	3.06E+01	7.57E+00	7	88
Pyrene	ng/m³	-	-	1.35E+00	2.14E-01	2.74E+00	2.74E+00	2.61E+00	6.63E-01	7	88
Tetralin	ng/m³	-	-	3.46E+00	1.12E+00	1.29E+01	2.63E+00	2.85E+00	1.29E+01	7	88
Total PAH	ng/m³	-	-	1.00E+02	1.85E+01	2.03E+02	9.99E+01	2.03E+02	1.61E+02	7	88

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 Q3 with the sample days being: July 2, July 26, August 19 and September 12, 2020.

5.8.1 Courtice Station Results

Data recovery levels were low for the D&F results at the Courtice Station (50% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for any of the D&F's during Q3. **Table 11** is a summary of the statistics for this station.

Table 11: Courtice Station Q3 Monitoring Results for Dioxins and Furans

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	No. > Criteria	Arithmetic Mean	Q3 Minimum Concentration	Q3 Maximum Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
2,3,7,8-TCDD	pg/m^3	-	-	-	-	7.23E-04	9.27E-04	7.23E-04	-	9.27E-04	2	50
1,2,3,7,8-PeCDD	pg/m^3	-	-	-	-	6.82E-04	1.67E-03	1.67E-03	-	6.82E-04	2	50
1,2,3,4,7,8-HxCDD	pg/m^3	-	-	-	-	4.72E-05	1.15E-04	4.72E-05	-	1.15E-04	2	50
1,2,3,6,7,8-HxCDD	pg/m^3	-	-	-	-	1.01E-04	2.08E-04	2.08E-04	-	1.01E-04	2	50
1,2,3,7,8,9-HxCDD	pg/m^3	-	-	-	-	2.01E-04	3.71E-04	2.01E-04	-	3.71E-04	2	50
1,2,3,4,6,7,8-HpCDD	pg/m^3	-	-	-	-	1.40E-04	2.35E-04	2.35E-04	-	1.40E-04	2	50
OCDD	pg/m^3	-	-	-	-	2.15E-05	3.21E-05	3.21E-05	-	2.15E-05	2	50
2,3,7,8-TCDF	pg/m^3	-	-	-	-	3.93E-05	1.12E-04	3.93E-05	-	1.12E-04	2	50
1,2,3,7,8-PeCDF	pg/m^3	-	-	-	-	1.98E-05	3.04E-05	1.98E-05	-	3.04E-05	2	50
2,3,4,7,8-PeCDF	pg/m^3	-	-	-	-	1.75E-04	5.24E-04	1.75E-04	-	5.24E-04	2	50
1,2,3,4,7,8-HxCDF	pg/m^3	-	-	-	-	1.22E-04	1.32E-04	1.32E-04	-	1.22E-04	2	50
1,2,3,6,7,8-HxCDF	pg/m^3	-	-	-	-	4.25E-05	8.39E-05	4.25E-05	-	8.39E-05	2	50
2,3,4,6,7,8-HxCDF	pg/m^3	-	-	-	-	2.11E-04	3.71E-04	2.11E-04	-	3.71E-04	2	50
1,2,3,7,8,9-HxCDF	pg/m^3	-	-	-	-	1.32E-04	1.75E-04	1.32E-04	-	1.75E-04	2	50
1,2,3,4,6,7,8-HpCDF	pg/m^3	-	-	-	-	4.69E-05	8.57E-05	4.69E-05	-	8.57E-05	2	50
1,2,3,4,7,8,9-HpCDF	pg/m^3	-	-	-	-	8.33E-06	1.24E-05	8.33E-06	-	1.24E-05	2	50
OCDF	pg/m^3	-	-	-	-	2.75E-06	3.46E-06	2.75E-06	-	3.46E-06	2	50
Total Toxic Equivalency	pg TEQ/m^3	*0.1 1*[1]	-	0	-	3.88E-03	3.92E-03	3.92E-03	-	3.88E-03	2	50

Note: All non-detectable results were reported as 1/2 of the detection limit
[1] O. Reg. 419/05 Schedule Upper Risk Thresholds
Arithmetic mean is not provided as data validity criteria were not met

5.8.2 Rundle Road Station Results

Data recovery levels were acceptable for the D&F results at the Rundle Road Station (75% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for any of the D&F's during Q3. **Table 12** is a summary of the statistics for this station.

Table 12: Rundle Road Station Q3 Monitoring Results for Dioxins and Furans

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	No. > Criteria	Arithmetic Mean	Q3 Minimum Concentration	Q3 Maximum Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
2,3,7,8-TCDD	pg/m^3	-	-	-	8.67E-04	4.56E-04	1.21E-03	4.56E-04	1.21E-03	9.36E-04	3	75
1,2,3,7,8-PeCDD	pg/m^3	-	-	-	1.30E-03	7.52E-04	2.33E-03	2.33E-03	7.52E-04	8.05E-04	3	75
1,2,3,4,7,8-HxCDD	pg/m^3	-	-	-	1.33E-04	1.05E-04	1.49E-04	1.49E-04	1.05E-04	1.46E-04	3	75
1,2,3,6,7,8-HxCDD	pg/m^3	-	-	-	2.70E-04	7.35E-05	4.16E-04	3.21E-04	7.35E-05	4.16E-04	3	75
1,2,3,7,8,9-HxCDD	pg/m^3	-	-	-	1.20E-04	9.31E-05	1.72E-04	9.46E-05	9.31E-05	1.72E-04	3	75
1,2,3,4,6,7,8-HpCDD	pg/m^3	-	-	-	1.70E-04	4.74E-05	3.17E-04	3.17E-04	4.74E-05	1.46E-04	3	75
OCDD	pg/m^3	-	-	-	3.03E-05	5.88E-06	4.78E-05	4.78E-05	5.88E-06	3.71E-05	3	75
2,3,7,8-TCDF	pg/m^3	-	-	-	8.53E-05	5.07E-05	1.10E-04	5.07E-05	9.48E-05	1.10E-04	3	75
1,2,3,7,8-PeCDF	pg/m^3	-	-	-	5.11E-05	1.82E-05	1.09E-04	1.82E-05	2.60E-05	1.09E-04	3	75
2,3,4,7,8-PeCDF	pg/m^3	-	-	-	2.76E-04	2.43E-04	3.26E-04	2.43E-04	2.60E-04	3.26E-04	3	75
1,2,3,4,7,8-HxCDF	pg/m^3	-	-	-	1.12E-04	6.21E-05	1.42E-04	1.42E-04	6.21E-05	1.33E-04	3	75
1,2,3,6,7,8-HxCDF	pg/m^3	-	-	-	6.52E-05	4.58E-05	9.74E-05	5.24E-05	4.58E-05	9.74E-05	3	75
2,3,4,6,7,8-HxCDF	pg/m^3	-	-	-	1.48E-04	6.54E-05	2.06E-04	1.72E-04	6.54E-05	2.06E-04	3	75
1,2,3,7,8,9-HxCDF	pg/m^3	-	-	-	1.90E-04	8.33E-05	3.71E-04	1.15E-04	8.33E-05	3.71E-04	3	75
1,2,3,4,6,7,8-HpCDF	pg/m^3	-	-	-	5.25E-05	1.69E-05	1.12E-04	1.69E-05	2.81E-05	1.12E-04	3	75
1,2,3,4,7,8,9-HpCDF	pg/m^3	-	-	-	1.32E-05	5.39E-06	2.20E-05	2.20E-05	5.39E-06	1.22E-05	3	75
OCDF	pg/m^3	-	-	-	1.88E-06	4.12E-07	3.20E-06	2.02E-06	4.12E-07	3.20E-06	3	75
Total Toxic Equivalency	pg TEQ/m^3	*0.1* *1*[1]	-	0	3.88E-03	2.96E-03	4.55E-03	4.55E-03	2.96E-03	4.14E-03	3	75

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**.

6.1 Continuous Monitoring

The concrete base for the new Rundle Road Meteorological tower was poured on August 9, 2020. Installation of the new tower and the migration of the existing meteorological equipment occurred on August 20th. All of the instrumentation was calibrated and passed the respective validation criteria. Calibrations were also performed on the meteorological instrumentation at the Courtice Station, as well as the Courtice WWTP wind head on August 20th. All of the meteorological instrumentation at the Courtice Station met the respective validation criteria; however, the WWTP wind head was found to report slightly lower wind speed than expected during the calibration. It was recommended that WWTP instrumentation personnel further look into the issue.

On August 27, 2020, RWDI personnel responded to an observed reduction in ozone flow rate and drifting overnight span on the NOx analyzer at the Courtice station. While calibration checks confirmed that the unit was still running well within specifications, it was decided to remove the analyzer for further troubleshooting, and a replacement unit was installed.

On August 27, 2020, the NOx pump at the Rundle Road Station was replaced with a rebuilt spare pump.

On September 2, 2020, annual maintenance was performed on the Rundle Road SO_2 unit, including a pump rebuild and maintenance of the critical flow orifices.

6.2 Discrete Monitoring

The PUF samples taken at Courtice and Rundle Road Stations on July 26, 2020 and Courtice Station on August 19th were invalidated due to volume sampled <300m^3 based on MECP criteria. New motors were installed on August 9th to try to overcome this issue. A very slight improvement in the PS-1 flow rates resulted from installation of the new blower motors, however it was confirmed that the flow restriction is being caused by the sampling media itself. After discussion with the ALS Laboratory Special Chemistries and Air Toxics Director it was confirmed that due to the combined polyurethane foam and the resin media creating increased resistance that it would be hard to consistently achieve a sampled volume of 300 m^3. It was his belief that the combined media had advantages over the PUF only

cartridge and switching to achieve the MECP minimum sample volume would compromise the capture efficiency of the low molecular weight PAH's including naphthalene and biphenyl. He confirmed that the lab can get a sufficient sample for BaP from the combined cartridge with a sample size as low as 200 m^3. Given this information, and since the detection limits were being met for all of the PAH's for samples submitted that were less than 300 m^3, the samples <300 m^3 on the September 12th sample date were submitted and reported as valid samples.

The Rundle Road TSP samples taken on July 20th and August 1st were invalid as birds had damaged the filters. Chicken wire was installed between the gabled roof and hivol body to prevent birds from getting in and onto the filter.

The Rundle Road TSP sample taken on September 6th was invalidated as excessive volume was captured during the run period.

7 CONCLUSIONS

This Q3 report provides a summary of the ambient air quality data collected at the Courtice and Rundle Road Stations. Throughout this monitoring period there were two (2) exceedances of the AAQC for Benzo(a) Pyrene which occurred on September 24th at the Courtice and Rundle Road Stations, there were two (2) exceedance events of the rolling 10-minute SO_2 AAQC and two (2) exceedance events of the rolling 1-hour SO_2 AAQC at the Courtice Station, and there was one (1) exceedance event of the rolling SO_2 10-minute AAQC and one (1) exceedance event of the rolling 1-hour SO_2 AAQC at the Rundle Road Station. Data recovery rates were acceptable and valid for all measured Q3 continuous parameters and all discrete parameters with the exception of dioxin and furan results .

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
2020 Q3 STATISTICS

Table A1: 2020 Summary Statistics for Q3

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											
July	20.1	42.7	34.9	14.9	28.3	13.9	14.6	9.4	2.8	7.7	1.8	6.2	3.7	0.6	3.2	0.3	99.6	99.7	99.7	99.7	99.5
August	109.7	22.5	39.9	29.2	26.1	54.2	14.0	15.3	7.1	9.5	5.0	5.4	4.7	1.0	3.7	1.5	99.6	98.3	98.3	98.3	99.6
September	55.0	39.5	62.8	37.5	38.6	39.6	16.9	16.2	3.9	14.7	8.3	5.0	4.7	1.0	3.7	2.1	99.7	99.7	99.7	99.7	99.6
Q3 Arithmetic Mean												5.5	4.4	0.9	3.5	1.3	99.6	99.2	99.2	99.2	99.5

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											
July	4.6	28.3	21.3	11.0	13.9	3.6	11.8	6.6	1.5	5.4	1.2	5.1	3.0	0.6	2.6	0.3	99.7	99.7	99.7	99.7	99.7
August	34.3	23.1	30.5	16.8	17.7	22.8	13.2	9.2	2.1	7.6	1.7	4.4	3.2	0.8	2.5	0.4	99.9	99.5	99.5	99.5	99.9
September	67.8	30.6	34.9	19.9	20.7	41.5	13.6	9.0	2.5	6.8	4.6	4.0	3.0	0.7	2.6	0.3	99.7	99.6	99.6	99.6	99.0
Q3 Arithmetic Mean												4.5	3.1	0.7	2.6	0.3	99.8	99.6	99.6	99.6	99.5

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.		
July	0	0		0	0		0	0	N/A	0		N/A	0	
August	2	0		0	2		0	0	N/A	0		N/A	0	
September	0	1		0	0		0	1	N/A	0		N/A	0	
Q3 Total	2	1		0	2		0	1	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	(%)					
July	24	33	98	29.9	5.9	0	16	34	29.3	0.0	9	23	74	29.6	0.0	33.9	100.0	100.0	99.7	99.7	99.7	99.7
August	38	29	98	29.9	16.1	0	11	36	29.1	0.0	10	21	73	29.6	0.1	98.7	99.6	99.6	100.0	100.0	100.0	100.0
September	38	25	97	30.3	6.1	1	3	32	29.2	0.0	11	16	72	29.8	0.1	39.3	100.0	100.0	100.0	100.0	100.0	100.0
Q3 Arithmetic Mean											10	20	73	29.7	0.1	171.9	99.9	99.9	99.9	99.9	99.9	99.9

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	(%)				
July	27	34	96	5.7	0	15	33	0.0	8	23	71	0.0	31.9	100.0	91.8	100.0	100.0	100.0
August	26	29	99	9.4	0	9	35	0.0	8	21	73	0.1	83.8	99.6	88.6	99.6	99.6	99.7
September	32	26	100	6.1	0	1	33	0.0	8	16	73	0.1	45.9	100.0	96.4	100.0	100.0	100.0
Q3 Arithmetic Mean									8	20	72	0.1	161.6	99.9	92.2	99.9	99.9	99.9

Table A2: 2020 Q3 Station Courtice Monitoring Results for $PM_{2.5}$

Data Statistics	Rolling Mean > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Rolling Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$
	No.	(ug/m^3)	(ug/m^3)	(ug/m^3)	No.	%
July	N/A	6.2	42.7	14.6	741	99.6
August	N/A	5.4	22.5	14.0	741	99.6
September	N/A	5.0	39.5	16.9	718	99.7

Table A3: 2020 Q3 Station Rundle Monitoring Results for $PM_{2.5}$

Data Statistics	Rolling Mean > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr 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.	%
July	N/A	5.1	28.3	11.8	742	99.7
August	N/A	4.4	23.1	13.2	743	99.9
September	N/A	4.0	30.6	13.6	718	99.7

Table A4: 2020 Q3 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.	%
July	N/A	N/A	3.7	34.9	9.4	742	99.7
August	N/A	N/A	4.7	39.9	15.3	731	98.3
September	N/A	N/A	4.7	62.8	16.2	718	99.7

Table A5: 2020 Q3 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.	%
July	N/A	N/A	3.0	21.3	6.6	742	99.7
August	N/A	N/A	3.2	30.5	9.2	740	99.5
September	N/A	N/A	3.0	34.9	9.0	717	99.6

Table A6: 2020 Q3 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.	%
July	N/A	N/A	0.6	14.9	2.8	742	99.7
August	N/A	N/A	1.0	29.2	7.1	731	98.3
September	N/A	N/A	1.0	37.5	3.9	718	99.7

Table A7: 2020 Q3 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.	%
July	N/A	N/A	0.6	11.0	1.5	742	99.7
August	N/A	N/A	0.8	16.8	2.1	740	99.5
September	N/A	N/A	0.7	19.9	2.5	717	99.6

Table A8: 2020 Q3 Station Courtice Monitoring Results for NO_2

Data Statistics	Events > 1 hr AAQC	Rolling Mean > 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.	%
July	0	0	3.2	28.3	7.7	742	99.7
August	0	0	3.7	26.1	9.5	731	98.3
September	0	0	3.7	38.6	14.7	718	99.7

Table A9: 2020 Q3 Station Rundle Monitoring Results for NO_2

Data Statistics	Events > 1 hr AAQC	Rolling Mean > 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.	%
July	0	0	2.6	13.9	5.4	742	99.7
August	0	0	2.5	17.7	7.6	740	99.5
September	0	0	2.6	20.7	6.8	717	99.6

Table A10: 2020 Q3 Station Courtice Monitoring Results for SO_2

Data Statistics	Events > 10 min AAQC	Events > 1 hr AAQC	Arithmetic Mean	Maximum 10 min Rolling Mean	Maximum 1 hr Rolling Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2
	No.	No.	(ppb)	(ppb)	(ppb)	(ppb)	No.	%
July	0	0	0.3	20.1	13.9	1.8	740	99.5
August	2	2	1.5	109.7	54.2	5.0	741	99.6
September	0	0	2.1	55.0	39.6	8.3	717	99.6

Table A11: 2020 Q3 Station Rundle Monitoring Results for SO_2

Data Statistics	Events > 10 min AAQC	Events > 1 hr AAQC	Arithmetic Mean	Maximum 10 min Rolling Mean	Maximum 1 hr Rolling Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2
	No.	No.	(ppb)	(ppb)	(ppb)	(ppb)	No.	%
July	0	0	0.3	4.6	3.6	1.2	742	99.7
August	0	0	0.4	34.3	22.8	1.7	743	99.9
September	1	1	0.3	67.8	41.5	4.6	713	99.0

Table A12: 2020 Q3 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)	(%)
July	24.1	0.5	8.6	100.0
August	37.8	0.4	9.7	99.6
September	38.3	1.3	11.2	100.0

Table A13: 2020 Q3 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)	(%)
July	27.5	0.0	8.1	100.0
August	26.1	0.1	7.5	99.6
September	31.5	0.1	8.1	100.0

Table A14: 2020 Q3 Courtice Meterological Station Wind Direction Data Summary

MET Statistics	% valid hours
Month	Wind Direction
	(%)
July	100.0
August	99.6
September	100.0

Table A15: 2020 Q3 Rundle Meterological Station Wind Direction Data Summary

MET Statistics	% valid hours
Month	Wind Direction
	(%)
July	91.8
August	88.6
September	96.4

Table A16: 2020 Q3 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)	(%)
July	33.2	16.0	22.8	99.7
August	28.9	11.2	21.0	100.0
September	25.5	3.3	16.3	100.0

Table A17: 2020 Q3 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)	(%)
July	34.2	14.9	23.2	100.0
August	29.2	9.0	20.7	99.6
September	25.6	0.6	15.9	100.0

Table A18: 2020 Q3 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
	(%)	(%)	(%)	(%)
July	98.1	33.6	73.9	99.7
August	97.8	36.0	73.0	100.0
September	97.3	31.5	71.9	100.0

Table A19: 2020 Q3 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
	(%)	(%)	(%)	(%)
July	96.1	32.9	70.7	100.0
August	98.8	34.9	72.7	99.6
September	100.0	32.5	73.2	100.0

Table A20: 2020 Q3 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)	(mm)
July	5.9	0.0	0.0	33.9	99.7
August	16.1	0.0	0.1	98.7	100.0
September	6.1	0.0	0.1	39.3	100.0

Table A21: 2020 Q3 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)	(mm)
July	5.7	0.0	0.0	31.9	100.0
August	9.4	0.0	0.1	83.8	99.7
September	6.1	0.0	0.1	45.9	100.0

Table A22: 2020 Q3 Courtice Meterological Station Pressure Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Quarterly Mean	% valid hours
Month	Pressure	Pressure	Pressure	Pressure
	(mmHg)	(mmHg)	(mmHg)	(%)
July	29.9	29.3	29.6	99.7
August	29.9	29.1	29.6	100.0
September	30.3	29.2	29.8	100.0

APPENDIX B
2020 Q3 MONITORING RESULTS

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)
July 2, 2020	L2471865-2	1441	318	L2471865-1	1441	296
July 26, 2020	Invalid Sample			Invalid Sample		
August 19, 2020	Invalid Sample			L2485239-3	1440	306
September 12, 2020	L2496545-3	1440	286	L2496545-2	1440	267

Table B2: 2020 Courtice Station Q3 Monitoring Results for Dioxins & Furans

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	2-Jul 20	26-Jul 20	19-Aug 20	12-Sep 20	No. > Criteria	Arithmetic Mean	Q3 Minimum Concentration	Q3 Maximum Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
2,3,7,8-TCDD	pg/m^3	-	-	7.23E-04	Invalid Sample	Invalid Sample	9.27E-04	-	-	7.23E-04	9.27E-04	7.23E-04	-	9.27E-04	2	50
1,2,3,7,8-PeCDD	pg/m^3	-	-	1.67E-03			6.82E-04	-	-	6.82E-04	1.67E-03	1.67E-03	-	6.82E-04	2	50
1,2,3,4,7,8-HxCDD	pg/m^3	-	-	4.72E-05			1.15E-04	-	-	4.72E-05	1.15E-04	4.72E-05	-	1.15E-04	2	50
1,2,3,6,7,8-HxCDD	pg/m^3	-	-	2.08E-04			1.01E-04	-	-	1.01E-04	2.08E-04	2.08E-04	-	1.01E-04	2	50
1,2,3,7,8,9-HxCDD	pg/m^3	-	-	2.01E-04			3.71E-04	-	-	2.01E-04	3.71E-04	2.01E-04	-	3.71E-04	2	50
1,2,3,4,6,7,8-HpCDD	pg/m^3	-	-	2.35E-04			1.40E-04	-	-	1.40E-04	2.35E-04	2.35E-04	-	1.40E-04	2	50
OCDD	pg/m^3	-	-	3.21E-05			2.15E-05	-	-	2.15E-05	3.21E-05	3.21E-05	-	2.15E-05	2	50
2,3,7,8-TCDF	pg/m^3	-	-	3.93E-05			1.12E-04	-	-	3.93E-05	1.12E-04	3.93E-05	-	1.12E-04	2	50
1,2,3,7,8-PeCDF	pg/m^3	-	-	1.98E-05			3.04E-05	-	-	1.98E-05	3.04E-05	1.98E-05	-	3.04E-05	2	50
2,3,4,7,8-PeCDF	pg/m^3	-	-	1.75E-04			5.24E-04	-	-	1.75E-04	5.24E-04	1.75E-04	-	5.24E-04	2	50
1,2,3,4,7,8-HxCDF	pg/m^3	-	-	1.32E-04			1.22E-04	-	-	1.22E-04	1.32E-04	1.32E-04	-	1.22E-04	2	50
1,2,3,6,7,8-HxCDF	pg/m^3	-	-	4.25E-05			8.39E-05	-	-	4.25E-05	8.39E-05	4.25E-05	-	8.39E-05	2	50
2,3,4,6,7,8-HxCDF	pg/m^3	-	-	2.11E-04			3.71E-04	-	-	2.11E-04	3.71E-04	2.11E-04	-	3.71E-04	2	50
1,2,3,7,8,9-HxCDF	pg/m^3	-	-	1.32E-04			1.75E-04	-	-	1.32E-04	1.75E-04	1.32E-04	-	1.75E-04	2	50
1,2,3,4,6,7,8-HpCDF	pg/m^3	-	-	4.69E-05			8.57E-05	-	-	4.69E-05	8.57E-05	4.69E-05	-	8.57E-05	2	50
1,2,3,4,7,8,9-HpCDF	pg/m^3	-	-	8.33E-06			1.24E-05	-	-	8.33E-06	1.24E-05	8.33E-06	-	1.24E-05	2	50
OCDF	pg/m^3	-	-	2.75E-06			3.46E-06	-	-	2.75E-06	3.46E-06	2.75E-06	-	3.46E-06	2	50
Total Toxic Equivalency	pg TEQ/m^3	*0.1* *1* [1]	-	3.92E-03			3.88E-03	0	-	3.88E-03	3.92E-03	3.92E-03	-	3.88E-03	2	50

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

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

Arithmetic mean not available as >75% data validity was not met

Table B3: 2020 Rundle Station Q3 Monitoring Results for Dioxins & Furans

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	2-Jul-20	26-Jul-20	19-Aug-20	12-Sep-20	No. > Criteria	Arithmetic Mean	Q3 Minimum Concentration	Q3 Maximum Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
2,3,7,8-TCDD	pg/m^3	-	-	4.56E-04	Invalid Sample	1.21E-03	9.36E-04	-	8.67E-04	4.56E-04	1.21E-03	4.56E-04	1.21E-03	9.36E-04	3	75
1,2,3,7,8-PeCDD	pg/m^3	-	-	2.33E-03		7.52E-04	8.05E-04	-	1.30E-03	7.52E-04	2.33E-03	2.33E-03	7.52E-04	8.05E-04	3	75
1,2,3,4,7,8-HxCDD	pg/m^3	-	-	1.49E-04		1.05E-04	1.46E-04	-	1.33E-04	1.05E-04	1.49E-04	1.49E-04	1.05E-04	1.46E-04	3	75
1,2,3,6,7,8-HxCDD	pg/m^3	-	-	3.21E-04		7.35E-05	4.16E-04	-	2.70E-04	7.35E-05	4.16E-04	3.21E-04	7.35E-05	4.16E-04	3	75
1,2,3,7,8,9-HxCDD	pg/m^3	-	-	9.46E-05		9.31E-05	1.72E-04	-	1.20E-04	9.31E-05	1.72E-04	9.46E-05	9.31E-05	1.72E-04	3	75
1,2,3,4,6,7,8-HpCDD	pg/m^3	-	-	3.17E-04		4.74E-05	1.46E-04	-	1.70E-04	4.74E-05	3.17E-04	3.17E-04	4.74E-05	1.46E-04	3	75
OCDD	pg/m^3	-	-	4.78E-05		5.88E-06	3.71E-05	-	3.03E-05	5.88E-06	4.78E-05	4.78E-05	5.88E-06	3.71E-05	3	75
2,3,7,8-TCDF	pg/m^3	-	-	5.07E-05		9.48E-05	1.10E-04	-	8.53E-05	5.07E-05	1.10E-04	5.07E-05	9.48E-05	1.10E-04	3	75
1,2,3,7,8-PeCDF	pg/m^3	-	-	1.82E-05		2.60E-05	1.09E-04	-	5.11E-05	1.82E-05	1.09E-04	1.82E-05	2.60E-05	1.09E-04	3	75
2,3,4,7,8-PeCDF	pg/m^3	-	-	2.43E-04		2.60E-04	3.26E-04	-	2.76E-04	2.43E-04	3.26E-04	2.43E-04	2.60E-04	3.26E-04	3	75
1,2,3,4,7,8-HxCDF	pg/m^3	-	-	1.42E-04		6.21E-05	1.33E-04	-	1.12E-04	6.21E-05	1.42E-04	1.42E-04	6.21E-05	1.33E-04	3	75
1,2,3,6,7,8-HxCDF	pg/m^3	-	-	5.24E-05		4.58E-05	9.74E-05	-	6.52E-05	4.58E-05	9.74E-05	5.24E-05	4.58E-05	9.74E-05	3	75
2,3,4,6,7,8-HxCDF	pg/m^3	-	-	1.72E-04		6.54E-05	2.06E-04	-	1.48E-04	6.54E-05	2.06E-04	1.72E-04	6.54E-05	2.06E-04	3	75
1,2,3,7,8,9-HxCDF	pg/m^3	-	-	1.15E-04		8.33E-05	3.71E-04	-	1.90E-04	8.33E-05	3.71E-04	1.15E-04	8.33E-05	3.71E-04	3	75
1,2,3,4,6,7,8-HpCDF	pg/m^3	-	-	1.69E-05		2.81E-05	1.12E-04	-	5.25E-05	1.69E-05	1.12E-04	1.69E-05	2.81E-05	1.12E-04	3	75
1,2,3,4,7,8,9-HpCDF	pg/m^3	-	-	2.20E-05		5.39E-06	1.22E-05	-	1.32E-05	5.39E-06	2.20E-05	2.20E-05	5.39E-06	1.22E-05	3	75
OCDF	pg/m^3	-	-	2.02E-06		4.12E-07	3.20E-06	-	1.88E-06	4.12E-07	3.20E-06	2.02E-06	4.12E-07	3.20E-06	3	75
Total Toxic Equivalency	pg TEQ/m^3	*0.1* *1* [1]	-	4.55E-03		2.96E-03	4.14E-03	0	3.88E-03	2.96E-03	4.55E-03	4.55E-03	2.96E-03	4.14E-03	3	75

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)
July 2, 2020	L2471865-2	1441	318	L2471865-1	1441	296
July 14, 2020	L2473009-3	1440	303	L2473009-2	1441	298
July 26, 2020	Invalid Sample			Invalid Sample		
August 7, 2020	L2483555-2	1440	316	L2483555-3	1441	306
August 19, 2020	Invalid Sample			L2485239-3	1440	306
August 31, 2020	L2499246-1	1440	306	L2499246-2	1440	322
September 12, 2020	L2496545-3	1440	286	L2496545-2	1440	267
September 24, 2020	L2503479-3	1440	302	L2503479-2	1440	304

Table B5: 2020 Courtice Station Q3 Monitoring Results for PAHs

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	2-Jul-20	14-Jul-20	26-Jul-20	7-Aug-20	19-Aug-20	31-Aug-20	12-Sep-20	24-Sep-20	No. > Criteria	Arithmetic Mean	Minimum Q3 Concentration	Maximum Q3 Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
1-Methylnaphthalene	ng/m^3	*12000*	-	4.03E+00	5.64E+00	Invalid Sample	1.01E+01	Invalid Sample	3.82E+00	4.51E+00	8.11E+00	0	6.04E+00	3.82E+00	1.01E+01	5.64E+00	1.01E+01	8.11E+00	6	75
2-Methylnaphthalene	ng/m^3	*10000*	-	7.08E+00	1.01E+01		1.73E+01		6.76E+00	6.57E+00	1.07E+01	0	9.76E+00	6.57E+00	1.73E+01	1.01E+01	1.73E+01	1.07E+01	6	75
Acenaphthene	ng/m^3	-	-	6.79E+00	5.64E+00		1.43E+01		6.27E+00	3.15E+00	3.44E+00	-	6.60E+00	3.15E+00	1.43E+01	6.79E+00	1.43E+01	3.44E+00	6	75
Acenaphthylene	ng/m^3	*3500*	-	1.24E-01	2.51E-01		3.48E-01		6.86E-02	3.81E-02	1.44E-01	0	1.62E-01	3.81E-02	3.48E-01	2.51E-01	3.48E-01	1.44E-01	6	75
Anthracene	ng/m^3	*200*	-	3.68E-01	3.16E-01		5.13E-01		2.83E-01	1.50E-01	2.08E-01	0	3.06E-01	1.50E-01	5.13E-01	3.68E-01	5.13E-01	2.08E-01	6	75
Benzo(a)Anthracene	ng/m^3	-	-	1.62E-02	1.79E-02		3.61E-02		8.69E-03	7.27E-03	3.68E-02	-	2.05E-02	7.27E-03	3.68E-02	1.79E-02	3.61E-02	3.68E-02	6	75
Benzo(a)fluorene	ng/m^3	-	-	6.64E-02	4.26E-02		7.31E-02		2.91E-02	2.73E-02	5.76E-02	-	4.93E-02	2.73E-02	7.31E-02	6.64E-02	7.31E-02	5.76E-02	6	75
Benzo(a)Pyrene (Historically High)	ng/m^3	*0.05* [1] *5* [2] *1.1* [3]	*1*	3.14E-02	1.61E-02		2.08E-02		7.42E-03	6.08E-03	5.50E-02	1	2.28E-02	6.08E-03	5.50E-02	3.14E-02	2.08E-02	5.50E-02	6	75
Benzo(b)Fluoranthene	ng/m^3	-	-	3.87E-02	2.63E-02		3.80E-02		1.20E-02	1.81E-02	8.91E-02	-	3.70E-02	1.20E-02	8.91E-02	3.87E-02	3.80E-02	8.91E-02	6	75
Benzo(b)fluorene	ng/m^3	-	-	3.74E-02	2.40E-02		4.15E-02		1.58E-02	1.60E-02	7.12E-02	-	3.43E-02	1.58E-02	7.12E-02	3.74E-02	4.15E-02	7.12E-02	6	75
Benzo(e)Pyrene	ng/m^3	-	-	3.33E-02	1.97E-02		3.35E-02		9.12E-03	2.20E-02	5.56E-02	-	2.89E-02	9.12E-03	5.56E-02	3.33E-02	3.35E-02	5.56E-02	6	75
Benzo(g,h,i)Perylene	ng/m^3	-	-	2.73E-02	2.49E-02		2.00E-02		1.17E-02	1.31E-02	5.30E-02	-	2.50E-02	1.17E-02	5.30E-02	2.73E-02	2.00E-02	5.30E-02	6	75
Benzo(k)Fluoranthene	ng/m^3	-	-	4.34E-02	3.11E-02		5.57E-02		1.05E-02	1.59E-02	7.48E-02	-	3.86E-02	1.05E-02	7.48E-02	4.34E-02	5.57E-02	7.48E-02	6	75
Biphenyl	ng/m^3	-	-	2.25E+00	2.33E+00		4.34E+00		1.74E+00	2.36E+00	3.34E+00	-	2.73E+00	1.74E+00	4.34E+00	2.33E+00	4.34E+00	3.34E+00	6	75
Chrysene	ng/m^3	-	-	9.75E-02	6.63E-02		9.81E-02		4.05E-02	4.83E-02	1.51E-01	-	8.36E-02	4.05E-02	1.51E-01	9.75E-02	9.81E-02	1.51E-01	6	75
Dibenzo(a,h)Anthracene	ng/m^3	-	-	3.14E-04	1.88E-03		2.72E-03		1.63E-03	1.08E-03	8.25E-03	-	2.65E-03	3.14E-04	8.25E-03	1.88E-03	2.72E-03	8.25E-03	6	75
Fluoranthene	ng/m^3	-	-	1.62E+00	1.02E+00		1.67E+00		1.20E+00	7.73E-01	3.87E-01	-	1.11E+00	3.87E-01	1.67E+00	1.62E+00	1.67E+00	7.73E-01	6	75
Fluorene	ng/m^3	-	-	4.34E+00	3.40E+00		7.12E+00		3.73E+00	2.41E+00	2.19E+00	-	3.86E+00	2.19E+00	7.12E+00	4.34E+00	7.12E+00	2.41E+00	6	75
Indeno(1,2,3-cd)Pyrene	ng/m^3	-	-	3.00E-02	1.76E-02		2.85E-02		1.04E-02	1.43E-02	4.70E-02	-	2.46E-02	1.04E-02	4.70E-02	3.00E-02	2.85E-02	4.70E-02	6	75
Naphthalene	ng/m^3	*22500*	*22500*	1.31E+01	2.69E+01		5.54E+01		1.77E+01	1.89E+01	5.46E+01	0	3.11E+01	1.31E+01	5.54E+01	2.69E+01	5.54E+01	5.46E+01	6	75
o-Terphenyl	ng/m^3	-	-	1.02E-02	1.06E-02		1.27E-02		1.05E-02	1.32E-02	3.44E-02	-	1.53E-02	1.02E-02	3.44E-02	1.06E-02	1.27E-02	3.44E-02	6	75
Perylene	ng/m^3	-	-	3.14E-04	2.05E-03		1.90E-03		3.27E-04	1.19E-03	5.23E-03	-	1.83E-03	3.14E-04	5.23E-03	2.05E-03	1.90E-03	5.23E-03	6	75
Phenanthrene	ng/m^3	-	-	7.39E+00	5.35E+00		1.10E+01		6.01E+00	3.88E+00	3.02E+00	-	6.11E+00	3.02E+00	1.10E+01	7.39E+00	1.10E+01	3.88E+00	6	75
Pyrene	ng/m^3	-	-	8.52E-01	5.28E-01		8.07E-01		5.46E-01	3.64E-01	5.23E-01	-	6.03E-01	3.64E-01	8.52E-01	8.52E-01	8.07E-01	5.23E-01	6	75
Tetralin	ng/m^3	-	-	1.88E+00	2.76E+00		3.20E+00		1.38E+00	2.00E+00	4.17E+00	-	2.56E+00	1.38E+00	4.17E+00	2.76E+00	3.20E+00	4.17E+00	6	75
Total PAH[4]	ng/m^3	-	-	5.03E+01	6.45E+01		1.27E+02		4.97E+01	4.53E+01	9.17E+01	-	7.13E+01	4.53E+01	1.27E+02	6.45E+01	1.27E+02	9.17E+01	6	75

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: 2020 Rundle Station Q3 Monitoring Results for PAHs

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	2-Jul-20	14-Jul-20	26-Jul-20	7-Aug-20	19-Aug-20	31-Aug-20	12-Sep-20	24-Sep-20	No. > Criteria	Arithmetic Mean	Minimum Q3 Concentration	Maximum Q3 Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
1-Methylnaphthalene	ng/m^3	*12000*	-	8.18E+00	7.38E+00	Invalid Sample	1.59E+01	1.90E+00	6.49E+00	5.73E+00	1.48E+01	0	8.62E+00	1.90E+00	1.59E+01	8.18E+00	1.59E+01	1.48E+01	7	88
2-Methylnaphthalene	ng/m^3	*10000*	-	1.54E+01	1.31E+01		3.10E+01	3.01E+00	1.31E+01	9.74E+00	2.06E+01	0	1.51E+01	3.01E+00	3.10E+01	1.54E+01	3.10E+01	2.06E+01	7	88
Acenaphthene	ng/m^3	-	-	1.37E+01	7.55E+00		2.69E+01	9.93E-01	1.15E+01	7.12E+00	8.91E+00	-	1.10E+01	9.93E-01	2.69E+01	1.37E+01	2.69E+01	8.91E+00	7	88
Acenaphthylene	ng/m^3	*3500*	-	2.56E-01	1.64E-01		2.92E-01	6.47E-02	8.39E-02	6.67E-02	1.16E-01	0	1.49E-01	6.47E-02	2.92E-01	2.56E-01	2.92E-01	1.16E-01	7	88
Anthracene	ng/m^3	*200*	-	1.33E+00	7.32E-01		2.12E+00	8.40E-02	9.66E-01	3.82E-01	4.01E-01	0	8.60E-01	8.40E-02	2.12E+00	1.33E+00	2.12E+00	4.01E-01	7	88
Benzo(a)Anthracene	ng/m^3	-	-	2.59E-02	1.27E-02		1.91E-02	7.58E-03	1.59E-02	1.24E-02	2.50E-02	-	1.69E-02	7.58E-03	2.59E-02	2.59E-02	1.91E-02	2.50E-02	7	88
Benzo(a)fluorene	ng/m^3	-	-	2.03E-01	6.48E-02		1.43E-01	2.56E-02	7.67E-02	4.27E-02	5.00E-02	-	8.66E-02	2.56E-02	2.03E-01	2.03E-01	1.43E-01	5.00E-02	7	88
Benzo(a)Pyrene (Historically High)	ng/m^3	*0.05* [1] *5* [2] *1.1* [3]	*1*	2.19E-02	1.16E-02		1.28E-02	9.22E-03	1.07E-02	7.00E-03	6.12E-02	1	1.92E-02	7.00E-03	6.12E-02	2.19E-02	1.28E-02	6.12E-02	7	88
Benzo(b)Fluoranthene	ng/m^3	-	-	3.09E-02	1.48E-02		3.06E-02	9.67E-02	2.59E-02	2.09E-02	6.81E-02	-	4.11E-02	1.48E-02	9.67E-02	3.09E-02	9.67E-02	6.81E-02	7	88
Benzo(b)fluorene	ng/m^3	-	-	1.25E-01	3.46E-02		7.09E-02	1.39E-02	3.32E-02	2.38E-02	7.30E-02	-	5.34E-02	1.39E-02	1.25E-01	1.25E-01	7.09E-02	7.30E-02	7	88
Benzo(e)Pyrene	ng/m^3	-	-	2.14E-02	1.06E-02		2.32E-02	1.84E-02	1.34E-02	2.73E-02	3.59E-02	-	2.14E-02	1.06E-02	3.59E-02	2.14E-02	2.32E-02	3.59E-02	7	88
Benzo(g,h,i)Perylene	ng/m^3	-	-	2.01E-02	1.19E-02		1.99E-02	7.61E-02	1.42E-02	1.37E-02	4.21E-02	-	2.83E-02	1.19E-02	7.61E-02	2.01E-02	7.61E-02	4.21E-02	7	88
Benzo(k)Fluoranthene	ng/m^3	-	-	3.85E-02	1.09E-02		2.31E-02	5.69E-02	2.07E-02	2.76E-02	4.67E-02	-	3.21E-02	1.09E-02	5.69E-02	3.85E-02	5.69E-02	4.67E-02	7	88
Biphenyl	ng/m^3	-	-	4.09E+00	2.91E+00		7.45E+00	8.73E-02	3.11E+00	2.54E+00	4.54E+00	-	3.53E+00	8.73E-02	7.45E+00	4.09E+00	7.45E+00	4.54E+00	7	88
Chrysene	ng/m^3	-	-	2.20E-01	8.46E-02		1.45E-01	4.31E-02	8.70E-02	5.88E-02	1.11E-01	-	1.07E-01	4.31E-02	2.20E-01	2.20E-01	1.45E-01	1.11E-01	7	88
Dibenzo(a,h)Anthracene	ng/m^3	-	-	3.38E-04	1.51E-03		2.68E-03	8.50E-04	2.48E-03	1.50E-03	6.74E-03	-	2.30E-03	3.38E-04	6.74E-03	1.51E-03	2.68E-03	6.74E-03	7	88
Fluoranthene	ng/m^3	-	-	5.84E+00	2.82E+00		6.18E+00	4.02E-01	3.23E+00	1.50E+00	1.04E+00	-	3.00E+00	4.02E-01	6.18E+00	5.84E+00	6.18E+00	1.50E+00	7	88
Fluorene	ng/m^3	-	-	1.08E+01	5.70E+00		1.65E+01	8.63E-01	7.20E+00	4.49E+00	4.77E+00	-	7.19E+00	8.63E-01	1.65E+01	1.08E+01	1.65E+01	4.77E+00	7	88
Indeno(1,2,3-cd)Pyrene	ng/m^3	-	-	2.04E-02	9.56E-03		2.45E-02	3.00E-02	1.76E-02	1.54E-02	3.21E-02	-	2.14E-02	9.56E-03	3.21E-02	2.04E-02	3.00E-02	3.21E-02	7	88
Naphthalene	ng/m^3	*22500*	*22500*	1.35E+01	2.21E+01		5.98E+01	7.52E+00	1.73E+01	2.27E+01	8.39E+01	0	3.24E+01	7.52E+00	8.39E+01	2.21E+01	5.98E+01	8.39E+01	7	88
o-Terphenyl	ng/m^3	-	-	1.09E-02	9.30E-03		1.78E-02	2.10E-02	8.76E-03	1.19E-02	3.98E-02	-	1.71E-02	8.76E-03	3.98E-02	1.09E-02	2.10E-02	3.98E-02	7	88
Perylene	ng/m^3	-	-	3.38E-04	8.72E-04		2.61E-03	1.47E-03	1.74E-03	1.46E-03	2.34E-03	-	1.55E-03	3.38E-04	2.61E-03	8.72E-04	2.61E-03	2.34E-03	7	88
Phenanthrene	ng/m^3	-	-	2.17E+01	1.11E+01		3.06E+01	1.83E+00	1.38E+01	7.04E+00	7.57E+00	-	1.34E+01	1.83E+00	3.06E+01	2.17E+01	3.06E+01	7.57E+00	7	88
Pyrene	ng/m^3	-	-	2.74E+00	1.34E+00		2.61E+00	2.14E-01	1.40E+00	6.63E-01	4.77E-01	-	1.35E+00	2.14E-01	2.74E+00	2.74E+00	2.61E+00	6.63E-01	7	88
Tetralin	ng/m^3	-	-	1.63E+00	2.63E+00		2.85E+00	1.12E+00	1.21E+00	1.84E+00	1.29E+01	-	3.46E+00	1.12E+00	1.29E+01	2.63E+00	2.85E+00	1.29E+01	7	88
Total PAH[4]	ng/m^3	-	-	9.99E+01	7.79E+01		2.03E+02	1.85E+01	7.97E+01	6.41E+01	1.61E+02	-	1.00E+02	1.85E+01	2.03E+02	9.99E+01	2.03E+02	1.61E+02	7	88

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)
July 2, 2020	738889	1441	1549	738888	1441	1511
July 8, 2020	738891	1440	1536	738890	1441	1483
July 14, 2020	738893	1440	1645	738892	1441	1659
July 20, 2020	738895	1440	1653	Invalid Sample		
July 26, 2020	738897	1440	1746	738896	1441	1620
August 1, 2020	738898	1440	1697	Invalid Sample		
August 7, 2020	738900	1440	1700	738899	1441	1662
August 13, 2020	738901	1440	1704	740824	1441	1615
August 19, 2020	740826	1440	1690	740825	1440	1713
August 25, 2020	740828	1440	1679	740827	1440	1654
August 31, 2020	740830	1440	1691	740829	1440	1699
September 6, 2020	740832	1440	1702	Invalid Sample		
September 12, 2020	740833	1440	1696	740834	1440	1722
September 18, 2020	740836	1440	1738	740835	1440	1756
September 24, 2020	740838	1440	1695	740837	1440	1662
September 30, 2020	740840	1440	1676	740839	1441	1692

Table B8: 2020 Courtice Station Q3 Monitoring Results for TSP and Metals

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	2-Jul-20	8-Jul-20	14-Jul-20	20-Jul-20	26-Jul-20	1-Aug-20	7-Aug-20	13-Aug-20	19-Aug-20	25-Aug-20	31-Aug-20	6-Sep-20	12-Sep-20	18-Sep-20	24-Sep-20	30-Sep-20	MECP Criteria ($\mu g/m^3$)	No. > Criteria	Geometric Mean	Arithmetic Mean	Q3 Minimum Concentration	Q3 Maximum Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
Particulate (TSP)	$\mu g/m^3$	*120*	*120*	48.29	69.66	22.13	24.56	37.97	21.57	23.88	36.85	17.10	21.44	11.59	16.75	18.46	36.13	52.51	13.84	*120*	0	26.07	29.55	11.59	69.66	69.66	36.85	52.51	16	100
Total Mercury (Hg)	$\mu g/m^3$	*2*	*2*	1.03E-05	1.24E-05	1.34E-05	1.09E-05	1.32E-05	1.24E-05	4.00E-05	1.12E-05	2.96E-06	1.37E-05	2.96E-06	2.94E-06	8.84E-06	8.06E-06	1.12E-05	1.31E-05	*2*	0	9.58E-06	1.17E-05	2.94E-06	4.00E-05	1.34E-05	4.00E-05	1.31E-05	16	100
Aluminum (Al)	$\mu g/m^3$	*4.8*	-	2.81E-01	3.55E-01	1.23E-01	1.26E-01	1.44E-01	1.28E-01	1.16E-01	3.62E-01	1.17E-01	1.09E-01	1.01E-01	9.05E-02	1.33E-01	5.00E-01	3.32E-01	7.16E-02	*4.8*	0	1.62E-01	1.93E-01	7.16E-02	5.00E-01	3.55E-01	3.62E-01	5.00E-01	16	100
Antimony (Sb)	$\mu g/m^3$	*25*	*25*	5.42E-04	1.35E-03	9.18E-04	4.78E-04	8.59E-04	7.13E-04	7.82E-04	8.74E-04	9.29E-04	7.03E-04	5.62E-04	5.82E-04	5.60E-04	4.89E-04	1.44E-03	6.80E-04	*25*	0	7.38E-04	7.79E-04	4.78E-04	1.44E-03	1.35E-03	9.29E-04	1.44E-03	16	100
Arsenic (As)	$\mu g/m^3$	*0.3*	*0.3*	9.68E-04	9.77E-04	9.12E-04	9.07E-04	8.59E-04	8.84E-04	8.82E-04	8.80E-04	8.88E-04	8.93E-04	8.87E-04	8.81E-04	8.84E-04	8.63E-04	2.36E-03	8.95E-04	*0.3*	0	9.53E-04	9.89E-04	8.59E-04	2.36E-03	9.77E-04	8.93E-04	2.36E-03	16	100
Barium (Ba)	$\mu g/m^3$	*10*	*10*	1.19E-02	1.55E-02	1.10E-02	6.11E-03	6.64E-03	3.95E-03	8.35E-03	1.29E-02	9.53E-03	6.67E-03	3.73E-03	3.47E-03	3.77E-03	8.23E-03	1.15E-02	7.22E-03	*10*	0	7.36E-03	8.15E-03	3.47E-03	1.55E-02	1.55E-02	1.29E-02	1.15E-02	16	100
Beryllium (Be)	$\mu g/m^3$	*0.01*	*0.01*	3.23E-05	3.26E-05	3.04E-05	3.02E-05	2.86E-05	2.95E-05	2.94E-05	2.93E-05	2.96E-05	2.98E-05	2.96E-05	2.94E-05	2.95E-05	2.88E-05	2.95E-05	2.98E-05	*0.01*	0	2.99E-05	2.99E-05	2.86E-05	3.26E-05	3.26E-05	2.98E-05	2.98E-05	16	100
Bismuth (Bi)	$\mu g/m^3$	-	-	5.81E-04	5.86E-04	5.47E-04	5.44E-04	5.15E-04	5.30E-04	5.29E-04	5.28E-04	5.33E-04	5.36E-04	5.32E-04	5.29E-04	5.31E-04	5.18E-04	5.31E-04	5.37E-04	-	-	5.38E-04	5.38E-04	5.15E-04	5.86E-04	5.86E-04	5.36E-04	5.37E-04	16	100
Boron (B)	$\mu g/m^3$	*120*	-	1.29E-02	1.30E-02	1.22E-02	1.21E-02	1.15E-02	1.18E-02	1.18E-02	1.17E-02	1.18E-02	1.19E-02	1.18E-02	1.18E-02	1.18E-02	1.15E-02	1.18E-02	1.19E-02	*120*	0	1.19E-02	1.20E-02	1.15E-02	1.30E-02	1.30E-02	1.19E-02	1.19E-02	16	100
Cadmium (Cd)	$\mu g/m^3$	*0.025*	*0.025*	6.46E-04	6.51E-04	6.08E-04	6.05E-04	5.73E-04	5.89E-04	5.88E-04	5.87E-04	5.92E-04	5.96E-04	5.91E-04	5.88E-04	5.90E-04	5.75E-04	5.90E-04	5.97E-04	*0.025*	0	5.97E-04	5.98E-04	5.73E-04	6.51E-04	6.51E-04	5.96E-04	5.97E-04	16	100
Chromium (Cr)	$\mu g/m^3$	*0.5*	-	1.61E-03	4.43E-03	1.52E-03	1.51E-03	1.43E-03	1.47E-03	1.47E-03	1.47E-03	1.48E-03	1.49E-03	1.48E-03	1.47E-03	1.47E-03	1.44E-03	1.47E-03	1.49E-03	*0.5*	0	1.59E-03	1.67E-03	1.43E-03	4.43E-03	4.43E-03	1.49E-03	1.49E-03	16	100
Cobalt (Co)	$\mu g/m^3$	*0.1*	*0.1*	6.46E-04	6.51E-04	6.08E-04	6.05E-04	5.73E-04	5.89E-04	5.88E-04	5.87E-04	5.92E-04	5.96E-04	5.91E-04	5.88E-04	5.90E-04	5.75E-04	5.90E-04	5.97E-04	*0.1*	0	5.97E-04	5.98E-04	5.73E-04	6.51E-04	6.51E-04	5.96E-04	5.97E-04	16	100
Copper (Cu)	$\mu g/m^3$	*50*	-	1.12E-02	3.37E-02	1.59E-02	8.35E-03	9.62E-03	9.61E-03	1.53E-02	1.34E-02	2.27E-02	9.89E-03	1.08E-02	9.87E-03	6.96E-03	6.79E-03	3.06E-02	1.28E-02	*50*	0	1.26E-02	1.42E-02	6.79E-03	3.37E-02	3.37E-02	2.27E-02	3.06E-02	16	100
Iron (Fe)	$\mu g/m^3$	*4*	-	5.81E-01	1.26E+00	4.46E-01	3.43E-01	3.76E-01	4.33E-01	5.24E-01	7.63E-01	3.57E-01	2.79E-01	2.93E-01	2.54E-01	3.18E-01	6.04E-01	6.84E-01	2.90E-01	*4*	0	4.41E-01	4.88E-01	2.54E-01	1.26E+00	1.26E+00	7.63E-01	6.84E-01	16	100
Lead (Pb)	$\mu g/m^3$	*0.5*	*0.5*	1.94E-03	7.81E-03	2.80E-03	2.12E-03	2.81E-03	2.06E-03	8.82E-04	2.17E-03	8.88E-04	1.91E-03	8.87E-04	1.94E-03	2.12E-03	8.63E-04	4.25E-03	1.97E-03	*2*	0	1.95E-03	2.34E-03	8.63E-04	7.81E-03	7.81E-03	2.17E-03	4.25E-03	16	100
Magnesium (Mg)	$\mu g/m^3$	-	-	3.87E-01	8.98E-01	2.25E-01	2.00E-01	2.92E-01	1.53E-01	1.82E-01	3.93E-01	1.54E-01	1.61E-01	1.48E-01	1.41E-01	1.42E-01	3.68E-01	3.83E-01	1.49E-01	-	-	2.33E-01	2.74E-01	1.41E-01	8.98E-01	8.98E-01	3.93E-01	3.83E-01	16	100
Manganese (Mn)	$\mu g/m^3$	*0.4*	-	1.90E-02	3.69E-02	1.23E-02	1.09E-02	1.32E-02	7.78E-03	1.12E-02	2.34E-02	8.46E-03	8.40E-03	6.39E-03	6.82E-03	6.13E-03	1.77E-02	2.07E-02	8.65E-03	*0.4*	0	1.19E-02	1.36E-02	6.13E-03	3.69E-02	3.69E-02	2.34E-02	2.07E-02	16	100
Molybdenum (Mo)	$\mu g/m^3$	*120*	-	3.23E-04	1.24E-03	7.29E-04	3.02E-04	2.86E-04	2.95E-04	2.94E-04	6.46E-04	7.10E-04	2.98E-04	2.96E-04	2.94E-04	2.95E-04	2.88E-04	8.26E-04	2.98E-04	*120*	0	4.06E-04	4.64E-04	2.86E-04	1.24E-03	1.24E-03	7.10E-04	8.26E-04	16	100
Nickel (Ni)	$\mu g/m^3$	*0.2*	-	9.68E-04	2.02E-03	9.12E-04	9.07E-04	8.59E-04	8.84E-04	8.82E-04	8.80E-04	8.88E-04	8.93E-04	8.87E-04	8.81E-04	8.84E-04	8.63E-04	8.85E-04	8.95E-04	*0.2*	0	9.38E-04	9.62E-04	8.59E-04	2.02E-03	2.02E-03	8.93E-04	8.95E-04	16	100
Phosphorus (P)	$\mu g/m^3$	-	-	2.42E-01	2.44E-01	2.28E-01	2.27E-01	2.15E-01	2.21E-01	2.21E-01	2.20E-01	2.22E-01	2.23E-01	2.22E-01	2.20E-01	2.21E-01	2.16E-01	2.21E-01	2.24E-01	-	-	2.24E-01	2.24E-01	2.15E-01	2.44E-01	2.44E-01	2.23E-01	2.24E-01	16	100
Selenium (Se)	$\mu g/m^3$	*10*	*10*	3.23E-03	3.26E-03	3.04E-03	3.02E-03	2.86E-03	2.95E-03	2.94E-03	2.93E-03	2.96E-03	2.98E-03	2.96E-03	2.94E-03	2.95E-03	2.88E-03	2.95E-03	2.98E-03	*10*	0	2.99E-03	2.99E-03	2.86E-03	3.26E-03	3.26E-03	2.98E-03	2.98E-03	16	100
Silver (Ag)	$\mu g/m^3$	*1*	*1*	3.23E-04	3.26E-04	3.04E-04	3.02E-04	2.86E-04	2.95E-04	2.94E-04	2.93E-04	2.96E-04	2.98E-04	2.96E-04	2.94E-04	2.95E-04	2.88E-04	2.95E-04	2.98E-04	*1*	0	2.99E-04	2.99E-04	2.86E-04	3.26E-04	3.26E-04	2.98E-04	2.98E-04	16	100
Strontium (Sr)	$\mu g/m^3$	*120*	-	1.38E-02	2.08E-02	5.59E-03	4.36E-03	9.45E-03	4.60E-03	5.47E-03	9.80E-03	5.44E-03	3.81E-03	4.26E-03	4.52E-03	4.19E-03	1.23E-02	9.50E-03	2.51E-03	*120*	0	6.40E-03	7.52E-03	2.51E-03	2.08E-02	2.08E-02	9.80E-03	1.23E-02	16	100
Thallium (Tl)	$\mu g/m^3$	-	-	2.91E-05	2.93E-05	2.74E-05	2.72E-05	2.58E-05	2.65E-05	2.65E-05	2.64E-05	2.66E-05	2.68E-05	2.66E-05	2.64E-05	2.65E-05	2.59E-05	2.65E-05	2.68E-05	-	-	2.69E-05	2.69E-05	2.58E-05	2.93E-05	2.93E-05	2.68E-05	2.68E-05	16	100
Tin (Sn)	$\mu g/m^3$	*10*	*10*	3.23E-04	1.43E-03	8.51E-04	6.05E-04	1.03E-03	1.89E-03	8.24E-04	9.98E-04	6.51E-04	6.55E-04	2.96E-04	7.64E-04	5.90E-04	2.88E-04	1.59E-03	8.35E-04	*10*	0	7.41E-04	8.51E-04	2.88E-04	1.89E-03	1.43E-03	1.89E-03	1.59E-03	16	100
Titanium (Ti)	$\mu g/m^3$	*120*	-	1.42E-02	1.95E-02	7.29E-03	3.33E-03	6.87E-03	7.66E-03	6.47E-03	1.82E-02	7.10E-03	3.28E-03	3.25E-03	3.23E-03	7.08E-03	2.07E-02	1.47E-02	6.56E-03	*120*	0	7.67E-03	9.34E-03	3.23E-03	2.07E-02	1.95E-02	1.82E-02	2.07E-02	16	100
Uranium (Ur)	$\mu g/m^3$	*1.5*	-	3.23E-05	3.26E-05	3.04E-05	3.02E-05	2.86E-05	2.95E-05	2.94E-05	2.93E-05	2.96E-05	2.98E-05	2.96E-05	2.94E-05	2.95E-05	2.88E-05	2.95E-05	2.98E-05	*1.5*	0	2.99E-05	2.99E-05	2.86E-05	3.26E-05	3.26E-05	2.98E-05	2.98E-05	16	100
Vanadium (V)	$\mu g/m^3$	*2*	*1*	1.61E-03	1.63E-03	1.52E-03	1.51E-03	1.43E-03	1.47E-03	1.47E-03	1.47E-03	1.48E-03	1.49E-03	1.48E-03	1.47E-03	1.47E-03	1.44E-03	1.47E-03	1.49E-03	*2*	0	1.49E-03	1.49E-03	1.43E-03	1.63E-03	1.63E-03	1.49E-03	1.49E-03	16	100
Zinc (Zn)	$\mu g/m^3$	*120*	-	2.81E-02	6.36E-02	3.23E-02	4.30E-02	3.33E-02	2.81E-02	2.91E-02	3.43E-02	2.00E-02	5.87E-02	2.58E-02	3.60E-02	2.03E-02	1.44E-02	3.59E-02	3.31E-02	*120*	0	3.14E-02	3.35E-02	1.44E-02	6.36E-02	6.36E-02	5.87E-02	3.60E-02	16	100
Zirconium (Zr)	$\mu g/m^3$	*20*	-	6.46E-04	6.51E-04	6.08E-04	6.05E-04	5.73E-04	5.89E-04	5.88E-04	5.87E-04	5.92E-04	5.96E-04	5.91E-04	5.88E-04	5.90E-04	5.75E-04	5.90E-04	5.97E-04	*20*	0	5.97E-04	5.98E-04	5.73E-04	6.51E-04	6.51E-04	5.96E-04	5.97E-04	16	100

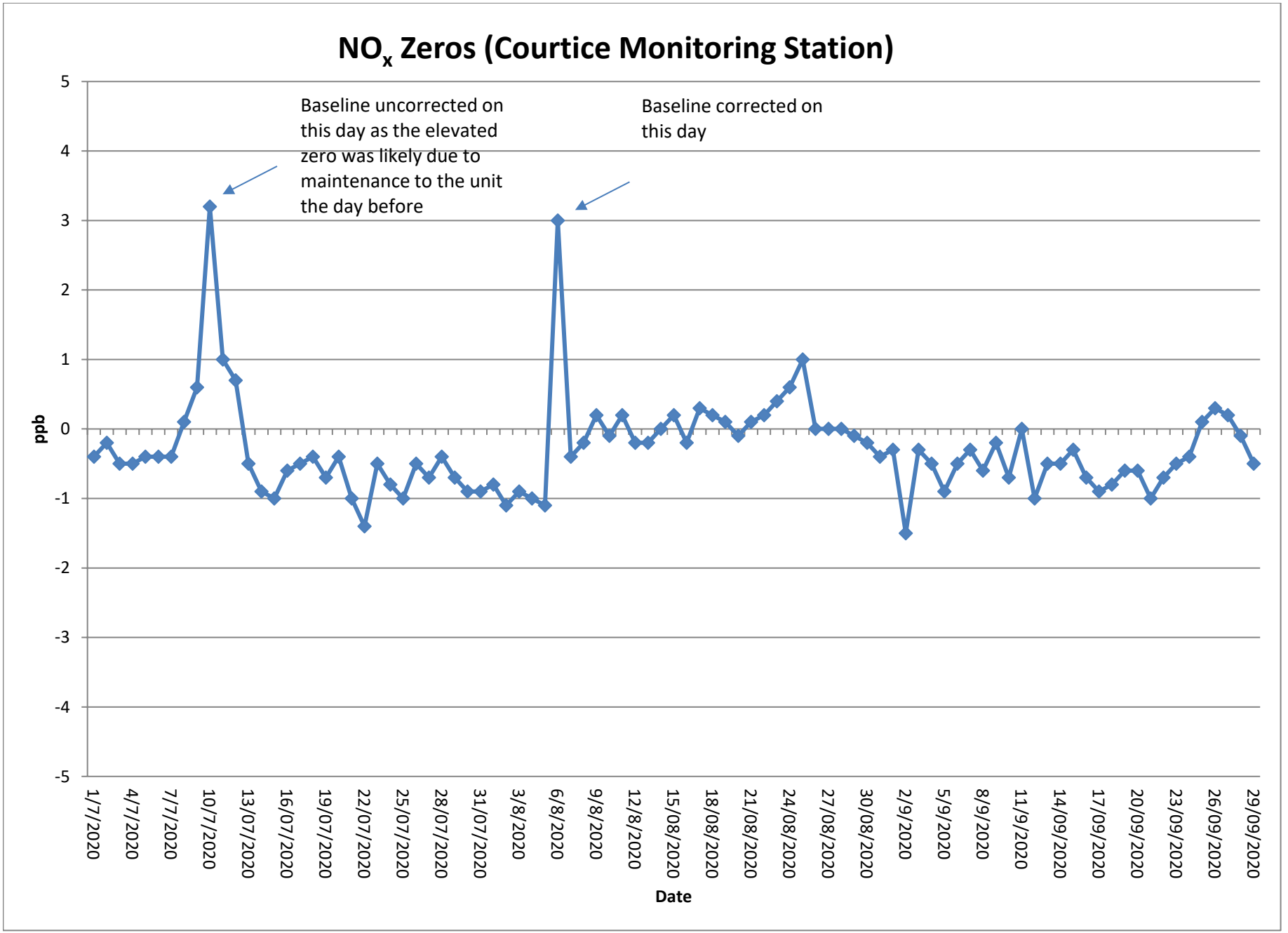
NOTE: All non-detectable results were reported as 1/2 of the detection limit

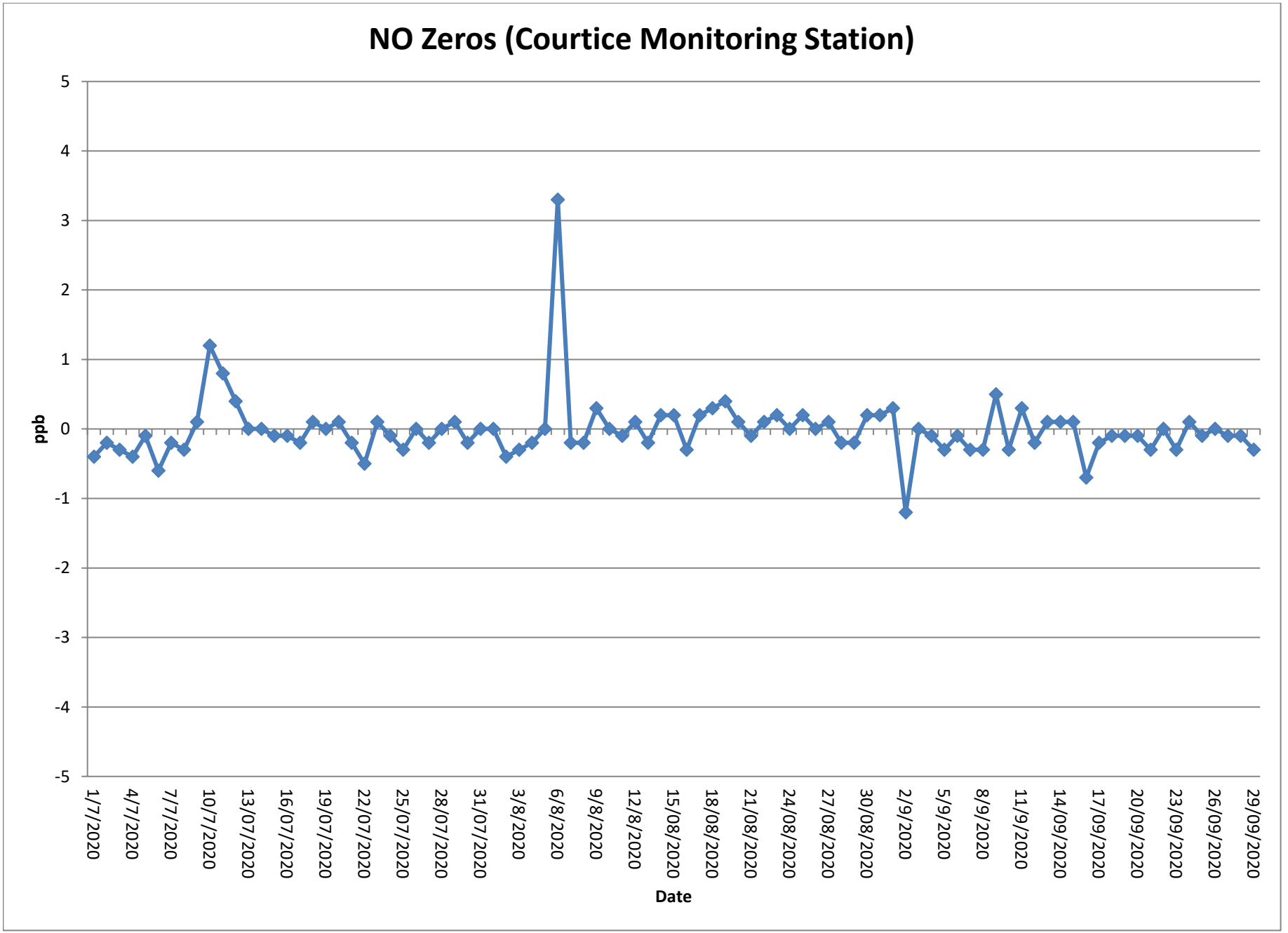
Table B9: 2020 Rundle Station Q3 Monitoring Results for TSP and Metals

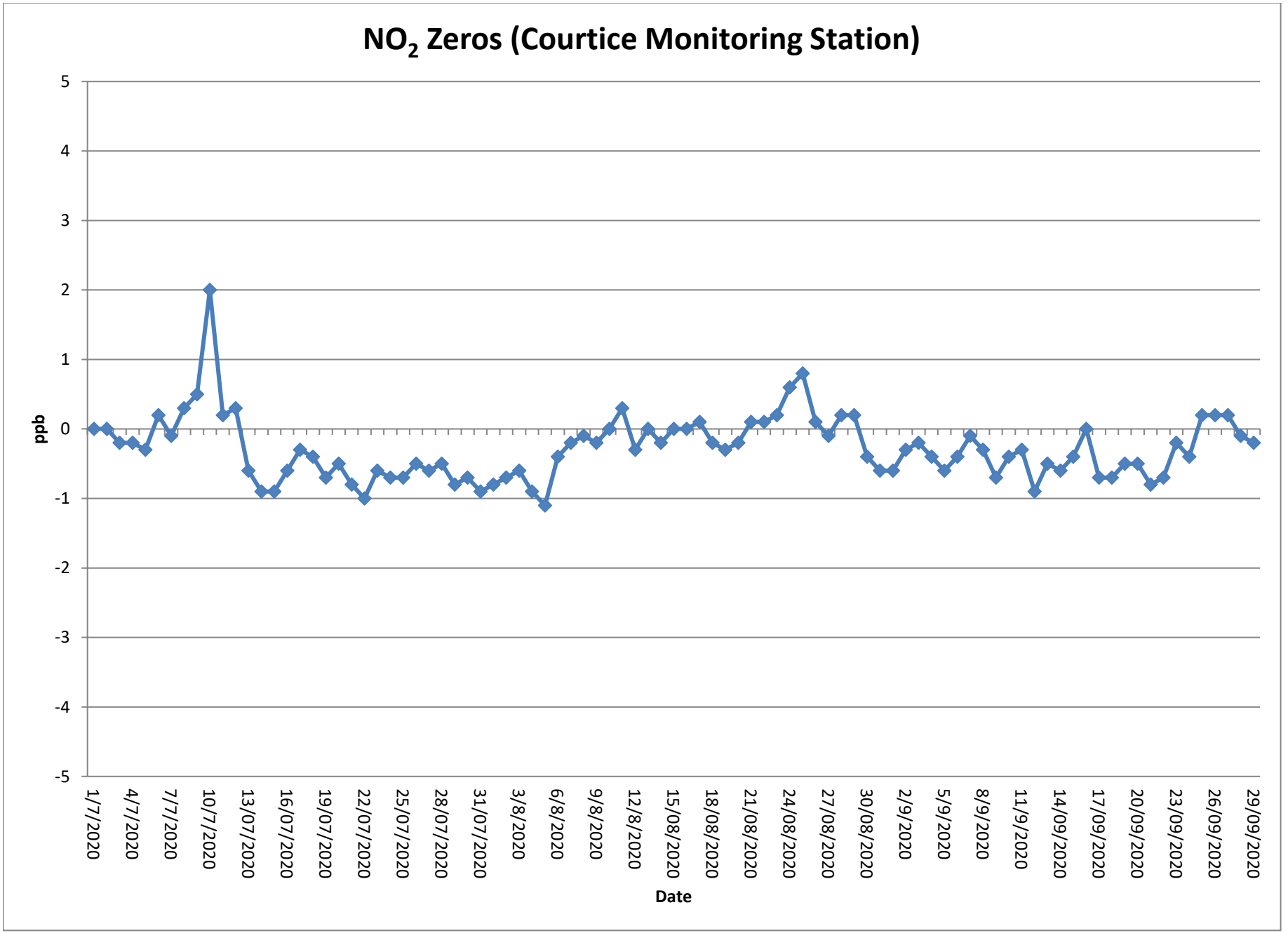
Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	2-Jul-20	8-Jul-20	14-Jul-20	20-Jul-20	26-Jul-20	1-Aug-20	7-Aug-20	13-Aug-20	19-Aug-20	25-Aug-20	31-Aug-20	6-Sep-20	12-Sep-20	18-Sep-20	24-Sep-20	30-Sep-20	MECP Criteria (µg/m³)	No. > Criteria	Geometric Mean	Arithmetic Mean	Q3 Minimum Concentration	Q3 Maximum Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
Particulate (TSP)	µg/m³	*120*	*120*	33.62	41.74	22.36	Invalid Sample	30.12	Invalid Sample	19.98	33.93	13.72	33.49	15.54	Invalid Sample	15.45	16.12	43.86	18.85	*120*	0	24.1	26.1	13.7	43.9	41.7	33.9	43.9	13	81
Mercury (Hg)	µg/m³	*2*	*2*	9.27E-06	1.96E-05	1.39E-05		1.30E-05		3.13E-05	7.43E-06	2.92E-06	3.02E-06	2.94E-06		2.90E-06	2.85E-06	7.22E-06	7.68E-06	*2*	0	6.96E-06	9.53E-06	2.85E-06	3.13E-05	1.96E-05	3.13E-05	7.68E-06	13	81
Aluminum (Al)	µg/m³	*4.8*	-	2.29E-01	2.85E-01	1.57E-01		1.49E-01		1.41E-01	2.67E-01	8.17E-02	2.45E-01	1.24E-01		9.00E-02	1.31E-01	3.01E-01	8.22E-02	*4.8*	0	1.59E-01	1.76E-01	8.17E-02	3.01E-01	2.85E-01	2.67E-01	3.01E-01	13	81
Antimony (Sb)	µg/m³	*25*	*25*	5.10E-04	1.33E-03	7.11E-04		7.84E-04		3.79E-04	5.57E-04	2.45E-04	6.05E-04	4.24E-04		4.94E-04	2.51E-04	1.03E-03	6.26E-04	*25*	0	5.48E-04	6.11E-04	2.45E-04	1.33E-03	1.33E-03	6.05E-04	1.03E-03	13	81
Arsenic (As)	µg/m³	*0.3*	*0.3*	9.93E-04	1.01E-03	9.04E-04		9.26E-04		9.03E-04	9.29E-04	8.76E-04	9.07E-04	8.83E-04		8.71E-04	2.79E-03	9.03E-04	8.87E-04	*0.3*	0	9.97E-04	1.06E-03	8.71E-04	2.79E-03	1.01E-03	9.29E-04	2.79E-03	13	81
Barium (Ba)	µg/m³	*10*	*10*	1.09E-02	1.97E-02	9.16E-03		6.17E-03		5.17E-03	1.00E-02	3.97E-03	8.52E-03	4.18E-03		3.66E-03	3.25E-03	9.51E-03	7.21E-03	*10*	0	6.84E-03	7.80E-03	3.25E-03	1.97E-02	1.97E-02	1.00E-02	9.51E-03	13	81
Beryllium (Be)	µg/m³	*0.01*	*0.01*	3.31E-05	3.37E-05	3.01E-05		3.09E-05		3.01E-05	3.10E-05	2.92E-05	3.02E-05	2.94E-05		2.90E-05	2.85E-05	3.01E-05	2.96E-05	*0.01*	0	3.03E-05	3.04E-05	2.85E-05	3.37E-05	3.37E-05	3.10E-05	3.01E-05	13	81
Bismuth (Bi)	µg/m³	-	-	5.96E-04	6.07E-04	5.42E-04		5.56E-04		5.42E-04	5.57E-04	5.25E-04	5.44E-04	5.30E-04		5.23E-04	5.13E-04	5.42E-04	5.32E-04	-	-	5.46E-04	5.47E-04	5.13E-04	6.07E-04	6.07E-04	5.57E-04	5.42E-04	13	81
Boron (B)	µg/m³	*120*	-	1.32E-02	1.35E-02	1.21E-02		1.23E-02		1.20E-02	1.24E-02	1.17E-02	1.21E-02	1.18E-02		1.16E-02	1.14E-02	1.20E-02	1.18E-02	*120*	0	1.21E-02	1.21E-02	1.14E-02	1.35E-02	1.35E-02	1.24E-02	1.20E-02	13	81
Cadmium (Cd)	µg/m³	*0.025*	*0.025*	6.62E-04	6.74E-04	6.03E-04		6.17E-04		6.02E-04	6.19E-04	5.84E-04	6.05E-04	5.89E-04		5.81E-04	5.69E-04	6.02E-04	5.91E-04	*0.025*	0	6.07E-04	6.07E-04	5.69E-04	6.74E-04	6.74E-04	6.19E-04	6.02E-04	13	81
Chromium (Cr)	µg/m³	*0.5*	-	1.65E-03	3.98E-03	1.51E-03		1.54E-03		1.50E-03	1.55E-03	1.46E-03	1.51E-03	1.47E-03		1.45E-03	1.42E-03	1.50E-03	1.48E-03	*0.5*	0	1.62E-03	1.69E-03	1.42E-03	3.98E-03	3.98E-03	1.55E-03	1.50E-03	13	81
Cobalt (Co)	µg/m³	*0.1*	*0.1*	6.62E-04	6.74E-04	6.03E-04		6.17E-04		6.02E-04	6.19E-04	5.84E-04	6.05E-04	5.89E-04		5.81E-04	5.69E-04	6.02E-04	5.91E-04	*0.1*	0	6.07E-04	6.07E-04	5.69E-04	6.74E-04	6.74E-04	6.19E-04	6.02E-04	13	81
Copper (Cu)	µg/m³	*50*	-	1.98E-02	5.74E-02	3.88E-02		4.14E-02		5.72E-02	4.79E-02	4.76E-02	2.99E-02	1.95E-02		1.48E-02	2.35E-02	4.04E-02	3.51E-02	*50*	0	3.36E-02	3.64E-02	1.48E-02	5.74E-02	5.74E-02	5.72E-02	4.04E-02	13	81
Iron (Fe)	µg/m³	*4*	-	4.41E-01	8.83E-01	3.72E-01		3.56E-01		3.06E-01	7.06E-01	1.66E-01	4.27E-01	4.06E-01		3.03E-01	1.82E-01	4.96E-01	3.65E-01	*4*	0	3.78E-01	4.16E-01	1.66E-01	8.83E-01	8.83E-01	7.06E-01	4.96E-01	13	81
Lead (Pb)	µg/m³	*0.5*	*0.5*	9.93E-04	5.93E-03	3.01E-03		2.65E-03		2.05E-03	3.03E-03	8.76E-04	9.07E-04	8.83E-04		8.71E-04	1.82E-03	3.13E-03	2.72E-03	*2*	0	1.84E-03	2.22E-03	8.71E-04	5.93E-03	5.93E-03	3.03E-03	3.13E-03	13	81
Magnesium (Mg)	µg/m³	-	-	2.78E-01	4.72E-01	2.17E-01		2.47E-01		1.32E-01	3.10E-01	1.11E-01	2.84E-01	1.29E-01		9.87E-02	1.25E-01	3.07E-01	1.71E-01	-	-	1.99E-01	2.22E-01	9.87E-02	4.72E-01	4.72E-01	3.10E-01	3.07E-01	13	81
Manganese (Mn)	µg/m³	*0.4*	-	1.47E-02	2.62E-02	1.17E-02		1.01E-02		7.04E-03	1.95E-02	5.66E-03	1.38E-02	5.94E-03		5.46E-03	6.66E-03	1.87E-02	1.21E-02	*0.4*	0	1.07E-02	1.21E-02	5.46E-03	2.62E-02	2.62E-02	1.95E-02	1.87E-02	13	81
Molybdenum (Mo)	µg/m³	*120*	-	8.60E-04	2.90E-03	1.57E-03		1.67E-03		1.93E-03	1.80E-03	1.52E-03	1.03E-03	7.06E-04		2.90E-04	9.11E-04	1.44E-03	1.30E-03	*120*	0	1.21E-03	1.38E-03	2.90E-04	2.90E-03	2.90E-03	1.93E-03	1.44E-03	13	81
Nickel (Ni)	µg/m³	*0.2*	-	9.93E-04	1.01E-03	9.04E-04		9.26E-04		9.03E-04	9.29E-04	8.76E-04	9.07E-04	8.83E-04		8.71E-04	8.54E-04	9.03E-04	8.87E-04	*0.2*	0	9.10E-04	9.11E-04	8.54E-04	1.01E-03	1.01E-03	9.29E-04	9.03E-04	13	81
Phosphorus (P)	µg/m³	-	-	2.48E-01	2.53E-01	2.26E-01		2.31E-01		2.26E-01	2.32E-01	2.19E-01	2.27E-01	2.21E-01		2.18E-01	2.14E-01	2.26E-01	2.22E-01	-	-	2.28E-01	2.28E-01	2.14E-01	2.53E-01	2.53E-01	2.32E-01	2.26E-01	13	81
Selenium (Se)	µg/m³	*10*	*10*	3.31E-03	3.37E-03	3.01E-03		3.09E-03		3.01E-03	3.10E-03	2.92E-03	3.02E-03	2.94E-03		2.90E-03	2.85E-03	3.01E-03	2.96E-03	*10*	0	3.03E-03	3.04E-03	2.85E-03	3.37E-03	3.37E-03	3.10E-03	3.01E-03	13	81
Silver (Ag)	µg/m³	*1*	*1*	3.31E-04	3.37E-04	3.01E-04		3.09E-04		3.01E-04	3.10E-04	2.92E-04	3.02E-04	2.94E-04		2.90E-04	2.85E-04	3.01E-04	2.96E-04	*1*	0	3.03E-04	3.04E-04	2.85E-04	3.37E-04	3.37E-04	3.10E-04	3.01E-04	13	81
Strontium (Sr)	µg/m³	*120*	-	6.29E-03	1.21E-02	5.00E-03		3.46E-03		3.55E-03	8.11E-03	3.27E-03	7.44E-03	3.88E-03		2.56E-03	3.59E-03	6.14E-03	3.37E-03	*120*	0	4.78E-03	5.29E-03	2.56E-03	1.21E-02	1.21E-02	8.11E-03	6.14E-03	13	81
Thallium (Tl)	µg/m³	-	-	2.98E-05	3.03E-05	2.71E-05		2.78E-05		2.71E-05	2.79E-05	2.63E-05	2.72E-05	2.65E-05		2.61E-05	2.56E-05	2.71E-05	2.66E-05	-	-	2.73E-05	2.73E-05	2.56E-05	3.03E-05	3.03E-05	2.79E-05	2.71E-05	13	81
Tin (Sn)	µg/m³	*10*	*10*	3.31E-04	1.55E-03	2.89E-03		1.36E-03		3.01E-04	6.81E-04	2.92E-04	6.65E-04	2.94E-04		2.90E-04	2.85E-04	1.38E-03	1.06E-03	*10*	0	6.38E-04	8.76E-04	2.85E-04	2.89E-03	2.89E-03	6.81E-04	1.38E-03	13	81
Titanium (Ti)	µg/m³	*120*	-	1.32E-02	1.62E-02	8.44E-03		6.79E-03		6.62E-03	1.42E-02	3.21E-03	1.27E-02	7.06E-03		3.19E-03	6.83E-03	1.38E-02	3.25E-03	*120*	0	7.69E-03	8.89E-03	3.19E-03	1.62E-02	1.62E-02	1.42E-02	1.38E-02	13	81
Uranium (Ur)	µg/m³	*1.5*	-	3.31E-05	3.37E-05	3.01E-05		3.09E-05		3.01E-05	3.10E-05	2.92E-05	3.02E-05	2.94E-05		2.90E-05	2.85E-05	3.01E-05	2.96E-05	*1.5*	0	3.03E-05	3.04E-05	2.85E-05	3.37E-05	3.37E-05	3.10E-05	3.01E-05	13	81
Vanadium (V)	µg/m³	*2*	*1*	1.65E-03	1.69E-03	1.51E-03		1.54E-03		1.50E-03	1.55E-03	1.46E-03	1.51E-03	1.47E-03		1.45E-03	1.42E-03	1.50E-03	1.48E-03	*2*	0	1.52E-03	1.52E-03	1.42E-03	1.69E-03	1.69E-03	1.55E-03	1.50E-03	13	81
Zinc (Zn)	µg/m³	*120*	-	1.47E-02	4.89E-02	2.80E-02		2.07E-02		1.05E-01	3.60E-02	8.58E-03	3.40E-02	2.60E-02		1.88E-02	1.38E-02	2.98E-02	5.77E-02	*120*	0	2.76E-02	3.40E-02	8.58E-03	1.05E-01	4.89E-02	1.05E-01	5.77E-02	13	81
Zirconium (Zr)	µg/m³	*20*	-	6.62E-04	6.74E-04	6.03E-04		6.17E-04		6.02E-04	6.19E-04	5.84E-04	6.05E-04	5.89E-04		5.81E-04	5.69E-04	6.02E-04	5.91E-04	*20*	0	6.07E-04	6.07E-04	5.69E-04	6.74E-04	6.74E-04	6.19E-04	6.02E-04	13	81

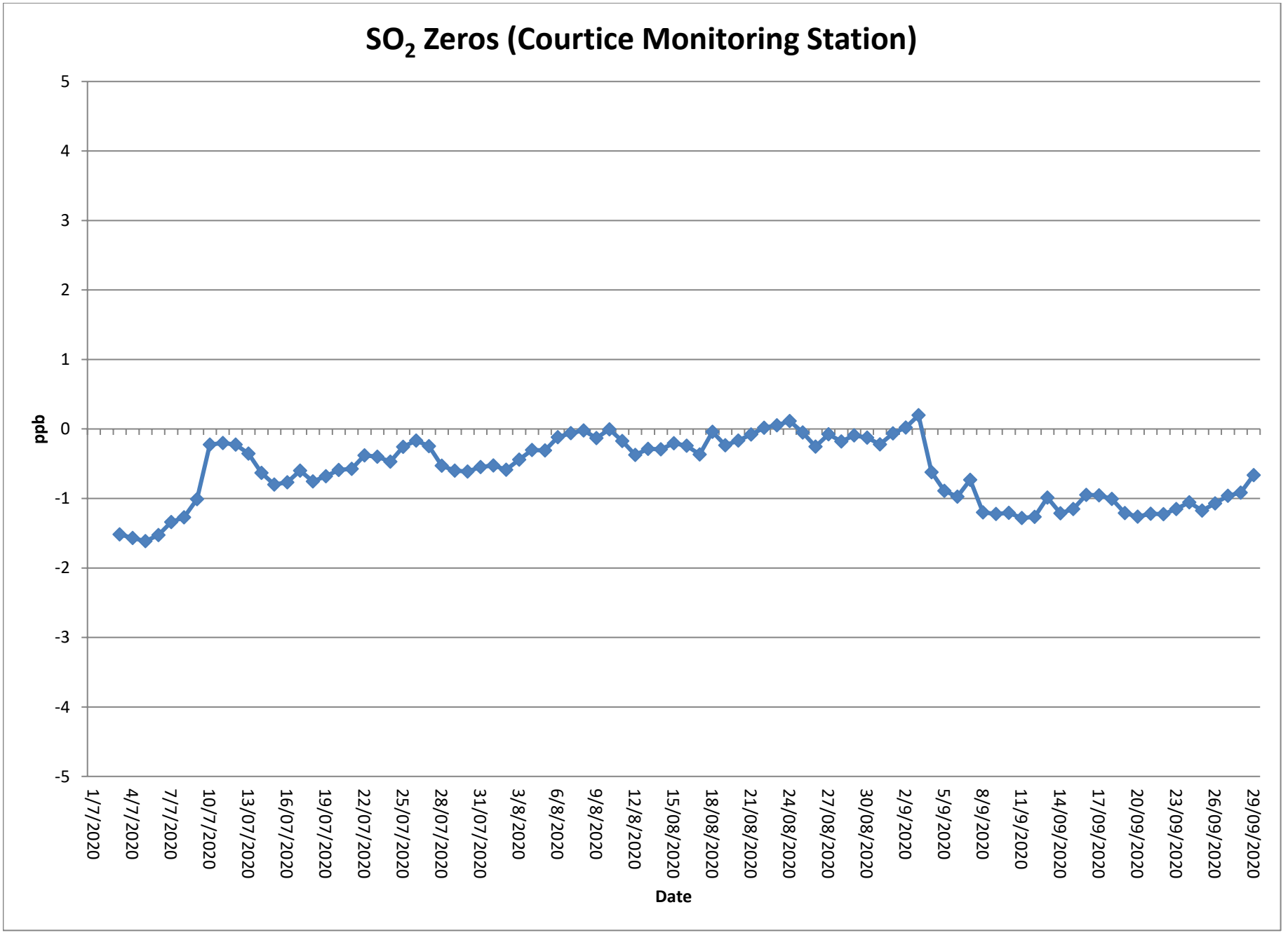
NOTE: All non-detectable results were reported as 1/2 of the detection limit

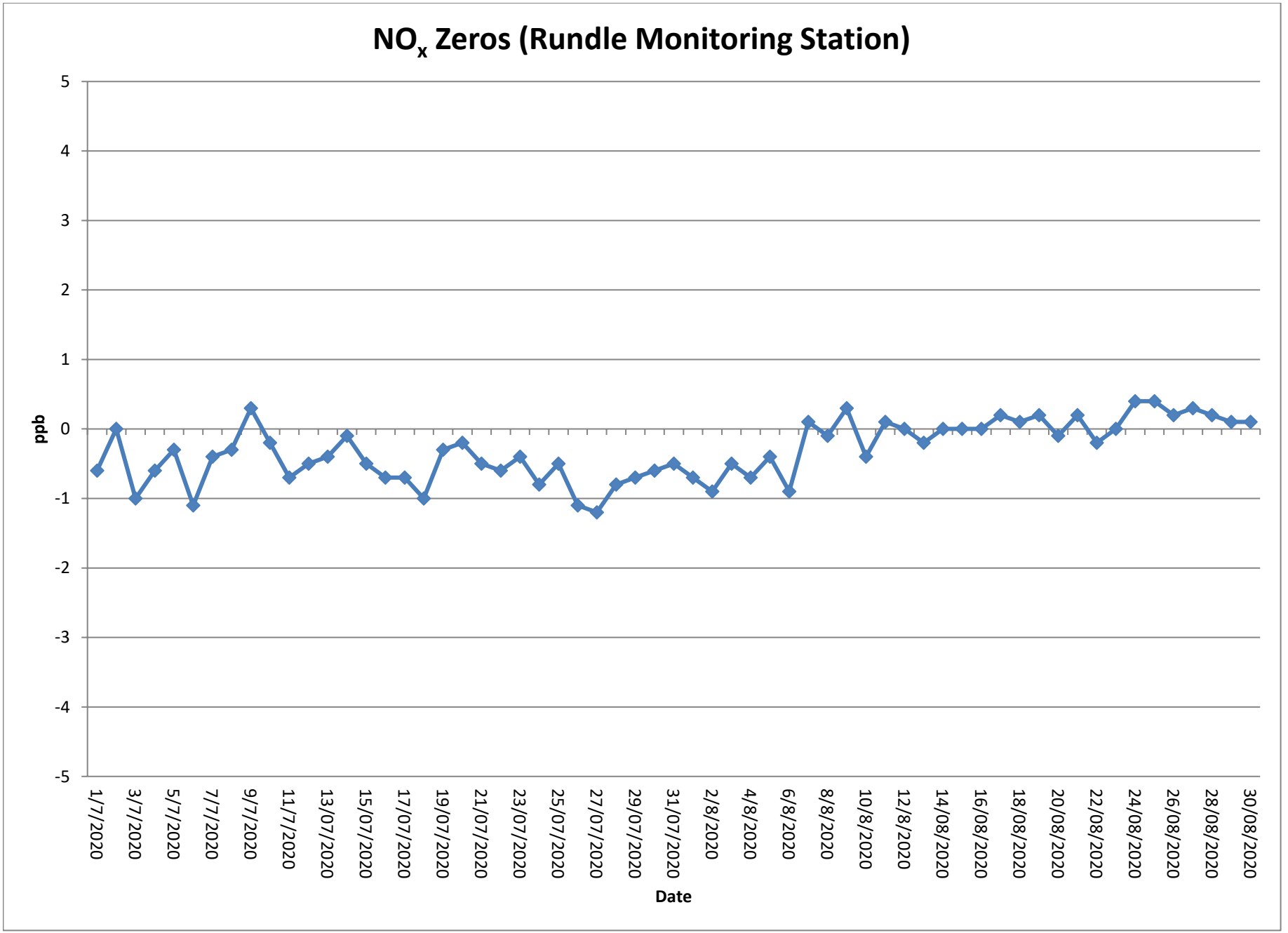
APPENDIX C
COURTICE AND RUNDLE ROAD STATIONS ZERO GRAPHS

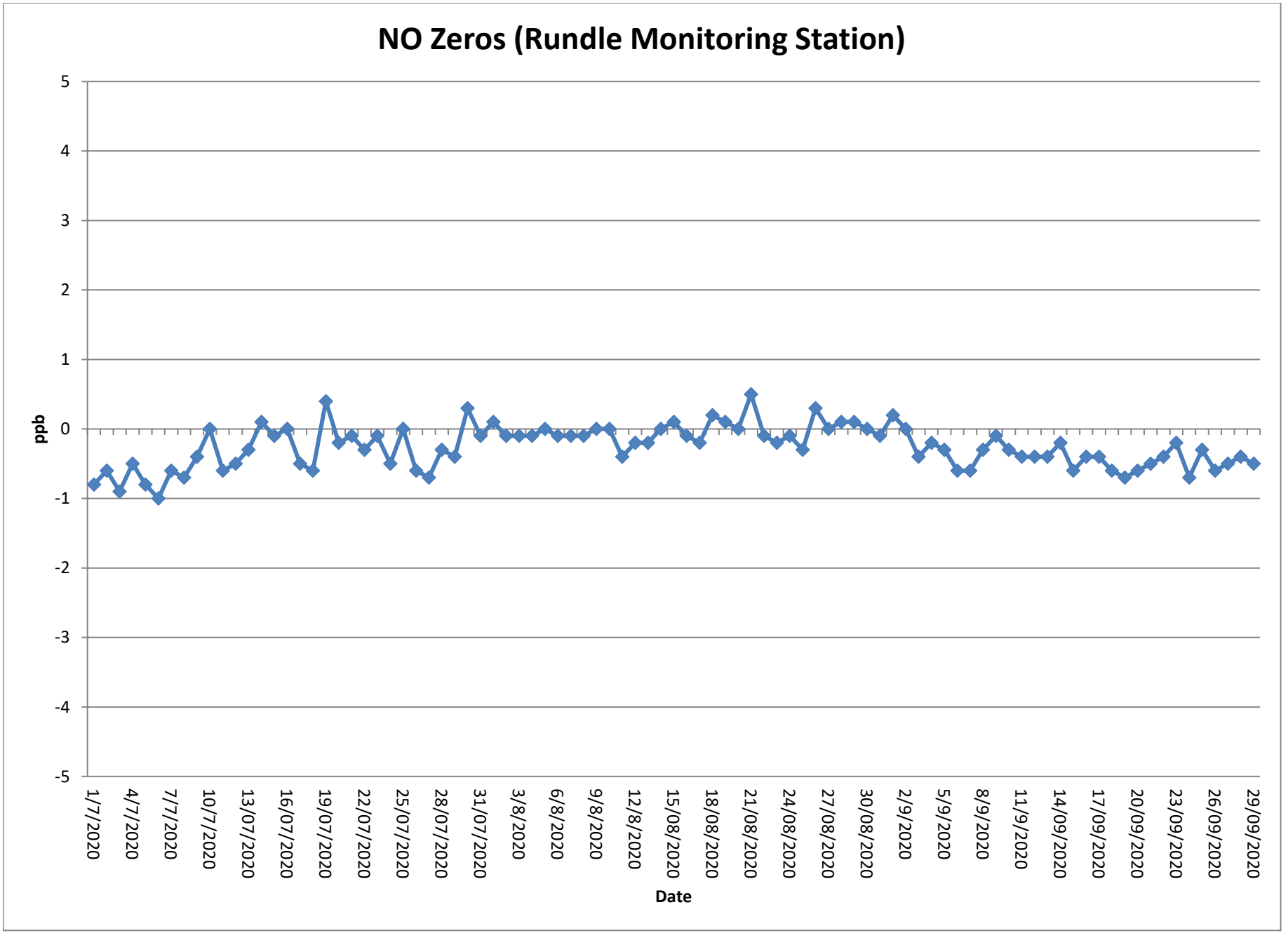

NOx Zeros (Courtice Monitoring Station)
Baseline uncorrected on this day as the elevated zero was likely due to maintenance to the unit the day before
Baseline corrected on this day
ppb
5
4
3
2
1
0
-1
-2
-3
-4
-5
1/7/2020
4/7/2020
7/7/2020
10/7/2020
13/07/2020
16/07/2020
19/07/2020
22/07/2020
25/07/2020
28/07/2020
31/07/2020
3/8/2020
6/8/2020
9/8/2020
12/8/2020
15/08/2020
18/08/2020
21/08/2020
24/08/2020
27/08/2020
30/08/2020
2/9/2020
5/9/2020
8/9/2020
11/9/2020
14/09/2020
17/09/2020
20/09/2020
23/09/2020
26/09/2020
29/09/2020
Date

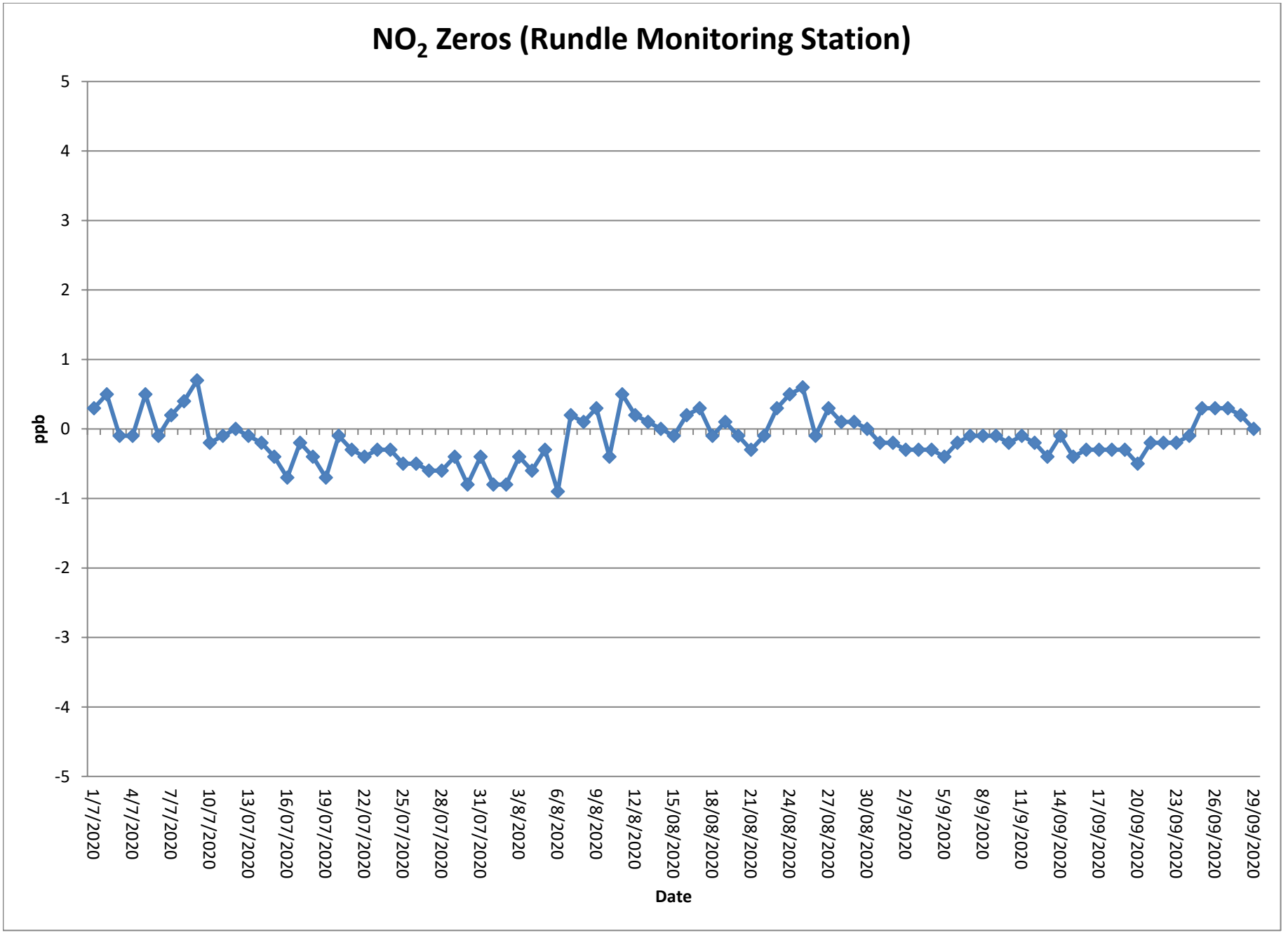

NO Zeros (Courtice Monitoring Station)
ppb
5
4
3
2
1
0
-1
-2
-3
-4
-5
1/7/2020
4/7/2020
7/7/2020
10/7/2020
13/07/2020
16/07/2020
19/07/2020
22/07/2020
25/07/2020
28/07/2020
31/07/2020
3/8/2020
6/8/2020
9/8/2020
12/8/2020
15/08/2020
18/08/2020
21/08/2020
24/08/2020
27/08/2020
30/08/2020
2/9/2020
5/9/2020
8/9/2020
11/9/2020
14/09/2020
17/09/2020
20/09/2020
23/09/2020
26/09/2020
29/09/2020
Date

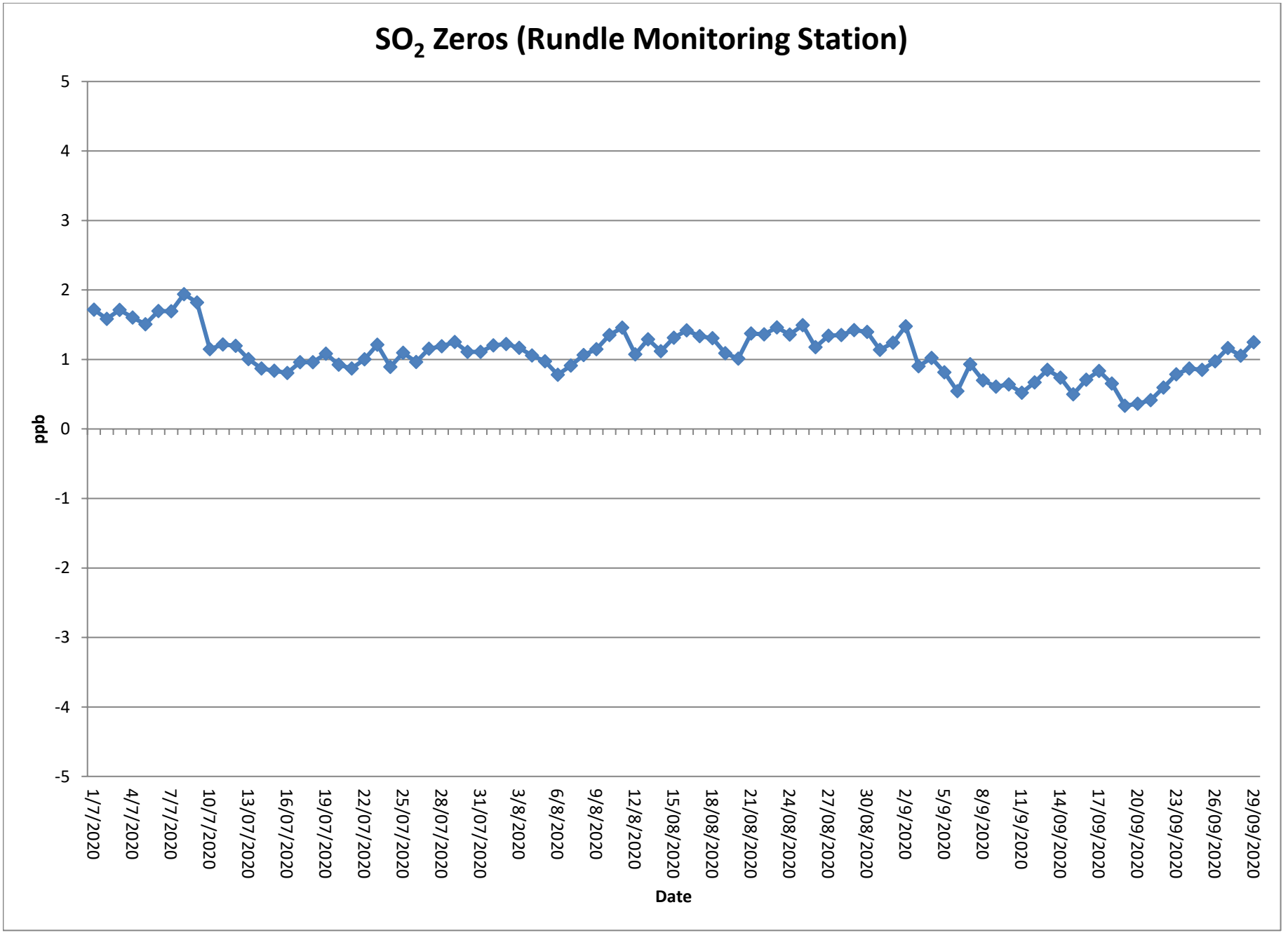

NO2 Zeros (Courtice Monitoring Station)
5
4
3
2
1
0
-1
-2
-3
-4
-5
ppb
1/7/2020
4/7/2020
7/7/2020
10/7/2020
13/07/2020
16/07/2020
19/07/2020
22/07/2020
25/07/2020
28/07/2020
31/07/2020
3/8/2020
6/8/2020
9/8/2020
12/8/2020
15/08/2020
18/08/2020
21/08/2020
24/08/2020
27/08/2020
30/08/2020
2/9/2020
5/9/2020
8/9/2020
11/9/2020
14/09/2020
17/09/2020
20/09/2020
23/09/2020
26/09/2020
29/09/2020
Date


SO2 Zeros (Courtice Monitoring Station)
5
4
3
2
1
0
-1
-2
-3
-4
-5
ppb
1/7/2020
4/7/2020
7/7/2020
10/7/2020
13/07/2020
16/07/2020
19/07/2020
22/07/2020
25/07/2020
28/07/2020
31/07/2020
3/8/2020
6/8/2020
9/8/2020
12/8/2020
15/08/2020
18/08/2020
21/08/2020
24/08/2020
27/08/2020
30/08/2020
2/9/2020
5/9/2020
8/9/2020
11/9/2020
14/09/2020
17/09/2020
20/09/2020
23/09/2020
26/09/2020
29/09/2020
Date


NOx Zeros (Rundle Monitoring Station)
ppb
5
4
3
2
1
0
-1
-2
-3
-4
-5
1/7/2020
3/7/2020
5/7/2020
7/7/2020
9/7/2020
11/7/2020
13/07/2020
15/07/2020
17/07/2020
19/07/2020
21/07/2020
23/07/2020
25/07/2020
27/07/2020
29/07/2020
31/07/2020
2/8/2020
4/8/2020
6/8/2020
8/8/2020
10/8/2020
12/8/2020
14/08/2020
16/08/2020
18/08/2020
20/08/2020
22/08/2020
24/08/2020
26/08/2020
28/08/2020
30/08/2020
Date


NO Zeros (Rundle Monitoring Station)
ppb
5
4
3
2
1
0
-1
-2
-3
-4
-5
1/7/2020
4/7/2020
7/7/2020
10/7/2020
13/07/2020
16/07/2020
19/07/2020
22/07/2020
25/07/2020
28/07/2020
31/07/2020
3/8/2020
6/8/2020
9/8/2020
12/8/2020
15/08/2020
18/08/2020
21/08/2020
24/08/2020
27/08/2020
30/08/2020
2/9/2020
5/9/2020
8/9/2020
11/9/2020
14/09/2020
17/09/2020
20/09/2020
23/09/2020
26/09/2020
29/09/2020
Date


NO_2 Zeros (Rundle Monitoring Station)
ppb
5
4
3
2
1
0
-1
-2
-3
-4
-5
1/7/2020
4/7/2020
7/7/2020
10/7/2020
13/07/2020
16/07/2020
19/07/2020
22/07/2020
25/07/2020
28/07/2020
31/07/2020
3/8/2020
6/8/2020
9/8/2020
12/8/2020
15/08/2020
18/08/2020
21/08/2020
24/08/2020
27/08/2020
30/08/2020
2/9/2020
5/9/2020
8/9/2020
11/9/2020
14/09/2020
17/09/2020
20/09/2020
23/09/2020
26/09/2020
29/09/2020
Date


SO2 Zeros (Rundle Monitoring Station)
5
4
3
2
1
0
-1
-2
-3
-4
-5
ppb
1/7/2020
4/7/2020
7/7/2020
10/7/2020
13/07/2020
16/07/2020
19/07/2020
22/07/2020
25/07/2020
28/07/2020
31/07/2020
3/8/2020
6/8/2020
9/8/2020
12/8/2020
15/08/2020
18/08/2020
21/08/2020
24/08/2020
27/08/2020
30/08/2020
2/9/2020
5/9/2020
8/9/2020
11/9/2020
14/09/2020
17/09/2020
20/09/2020
23/09/2020
26/09/2020
29/09/2020
Date

APPENDIX D 2020
Q3 EDIT LOGS

Table D1: 3rd Quarter Edit Log for PM2.5 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: July 1, 2020		End Date: September 30, 2020			All testing done in EST	
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	09/07/2020	SRS	Deleted Hours	09/07/2020	09:00	09/07/2020	12:00	Monthly Calibration
2	05/08/2020	SRS	Deleted Hours	05/08/2020	12:00	05/08/2020	15:00	Monthly Calibration
3	03/09/2020	SRS	Deleted Hours	03/09/2020	13:00	03/09/2020	15:00	Monthly Calibration

Table D2: 3rd Quarter Edit Log for PM2.5 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: July 1, 2020		End Date: September 30, 2020			All testing done in EST	
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	09/07/2020	SRS	Deleted Hours	09/07/2020	14:00	09/07/2020	16:00	Monthly Calibration
2	18/08/2020	VML	Zero correction	01/07/2020	00:00	31/07/2020	23:00	Correcting values <0 to 0
3	06/08/2020	SRS	Deleted Hours	06/08/2020	19:00	06/08/2020	20:00	Monthly Calibration
4	21/09/2020	VML	Zero correction	01/08/2020	00:00	31/08/2020	23:00	Correcting values <0 to 0
5	02/09/2020	SRS	Deleted Hours	02/09/2020	14:00	02/09/2020	16:00	Monthly Calibration
6	19/10/2020	VML	Zero correction	01/09/2020	00:00	30/09/2020	23:00	Correcting values <0 to 0

Table D3: 3rd Quarter Edit Log for NOx 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: July 1, 2020		End Date: September 30, 2020		All testing done in EST		
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	09/07/2020	SRS	Deleted Hours	09/07/2020	09:00	09/07/2020	11:00	Monthly Calibration
2	18/08/2020	VML	Zero correction	01/07/2020	00:00	31/07/2020	23:00	Correcting values <0 to 0
3	05/08/2020	SRS	Deleted Hours	05/08/2020	11:00	05/08/2020	17:00	Monthly Calibration, Maintenance and GPT
4	06/08/2020	SRS	Deleted Hours	06/08/2020	14:00	06/08/2020	16:00	Calibration Check after Maintenance
5	21/09/2020	VML	Zero offset adjustment	05/08/2020	17:00	06/08/2020	14:00	Correcting zero offset based on takeout calibration
6	27/08/2020	SRS	Deleted Hours	27/08/2020	11:00	27/08/2020	16:00	Calibration check after remote observation of a reduction in ozone flow and drifting overnight span. The unit was performing within specification, however it was removed and replaced with a spare unit to further troubleshoot the reduction in ozone flow.
7	21/09/2020	VML	Zero correction	01/08/2020	00:00	31/08/2020	23:00	Correcting values <0 to 0
8	03/09/2020	SRS	Deleted Hours	03/09/2020	11:00	03/09/2020	13:00	Monthly Calibration
9	19/10/2020	VML	Zero correction	01/09/2020	00:00	30/09/2020	23:00	Correcting values <0 to 0

Table D4: 3rd Quarter Edit Log for NOx 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: July 1, 2020			End Date: September 30, 2020		All testing done in EST		
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	09/07/2020	SRS	Deleted Hours	09/07/2020	15:00	09/07/2020	17:00	Monthly Calibration
2	18/08/2020	VML	Zero correction	01/07/2020	00:00	31/07/2020	23:00	Correcting values <0 to 0
3	06/08/2020	SRS	Deleted Hours	06/08/2020	17:00	06/08/2020	19:00	Monthly Calibration and GPT
4	27/08/2020	SRS	Deleted Hours	27/08/2020	11:00	27/08/2020	16:00	Maintenance: Rebuilt pump was reinstalled, and a calibration was performed after
5	21/09/2020	VML	Zero correction	01/08/2020	00:00	31/08/2020	23:00	Correcting values <0 to 0
6	02/09/2020	SRS	Deleted Hours	02/09/2020	12:00	02/09/2020	15:00	Monthly Calibration
7	19/10/2020	VML	Zero correction	01/09/2020	00:00	30/09/2020	23:00	Correcting values <0 to 0

Table D5: 3rd Quarter Edit Log for SO2 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: July 1, 2020			End Date: September 30, 2020			All testing done in EST	
Edit #	**Edit Date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	09/07/2020	SRS	Deleted Hours	09/07/2020	08:00	09/07/2020	12:00	Monthly Calibration
2	18/08/2020	VML	Zero offset adjustment	01/07/2020	00:00	09/07/2020	08:00	Correcting zero drift based on takeout calibration
3	18/08/2020	VML	Zero correction	01/07/2020	00:00	31/07/2020	23:00	Correcting values <0 to 0
4	05/08/2020	SRS	Deleted Hours	05/08/2020	13:00	05/08/2020	16:00	Monthly Calibration
5	21/09/2020	VML	Zero correction	01/08/2020	00:00	31/08/2020	23:00	Correcting values <0 to 0
6	03/09/2020	SRS	Deleted Hours	03/09/2020	12:00	03/09/2020	15:00	Monthly Calibration
7	19/10/2020	VML	Zero correction	01/09/2020	00:00	30/09/2020	23:00	Correcting values <0 to 0

Table D6: 3rd Quarter Edit Log for SO2 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: July 1, 2020		End Date: September 30, 2020		All testing done in EST		
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	09/07/2020	SRS	Deleted Hours	09/07/2020	14:00	09/07/2020	16:00	Monthly Calibration
2	18/08/2020	VML	Zero correction	01/07/2020	00:00	31/07/2020	23:00	Correcting values <0 to 0
3	06/08/2020	SRS	Deleted Hours	06/08/2020	19:00	06/08/2020	20:00	Monthly Calibration
4	21/09/2020	VML	Zero correction	01/08/2020	00:00	31/08/2020	23:00	Correcting values <0 to 0
5	02/09/2020	SRS	Deleted Hours	02/09/2020	12:00	02/09/2020	19:00	Monthly Calibration and Annual Maintenance
6	19/10/2020	VML	Zero correction	01/09/2020	00:00	30/09/2020	23:00	Correcting values <0 to 0

Table D7: 3rd Quarter Edit Log for Meteorological Parameters at Courtice Road Station

Emitter's Name: Durham York Energy Centre								
Contact	**Name:** Ms. Lyndsay Waller		**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca			
Station Number: 45201				**Station Name:** Courtice Station				
Station Address: 100 Osbourne Road				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: WS, WD, Ambient T, P, RH and Rain			**Instrument Make & Model:** Miscellaneous Meterological Instrumentation				**s/n:** N/A	
Data Edit Period		Start Date: July 1, 2020		End Date: September 30, 2020			All testing done in EST	
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	21/09/2020	VML	Deleted Hours	20/08/2020	08:00	20/08/2020	11:00	Annual Calibration

Table D8: 3rd Quarter 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: July 1, 2020		End Date: September 30, 2020			All testing done in EST	
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	21/09/2020	VML	Deleted Hours	20/08/2020	10:00	20/08/2020	13:00	Removal of old tower and installation/calibration of meterological equipment on the new tower

Table D9: 3rd Quarter 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: July 1, 2020		End Date: September 30, 2020			All testing done in EST		
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	18/08/2020	VML	Invalidated Sample (PS1)	26/07/2020	00:00	26/07/2020	23:59	Invalid PS1 Sample on July 26: Media caused excessive flow restriction
2	21/09/2020	VML	Invalidated Sample (PS1)	19/08/2020	00:00	19/08/2020	23:59	Invalid PS1 Sample on Aug. 19: Media caused excessive flow restriction

Table D10: 3rd Quarter Edit Log for Discrete Sampling at Rundle Station

Emitter's Name: Durham York Energy Center								
Contact	**Name:** Ms. Lyndsay Waller	**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca				
Station Number: 45200				**Station Name:** Rundle Station				
Station Address: Rundle Rd				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: N/A		**Instrument Make & Model:** N/A					**s/n:**	
Data Edit Period	Start Date: July 1, 2020			End Date: September 30, 2020			All testing done in EST	
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	18/08/2020	VML	Invalidated Sample (TSP)	20/07/2020	00:00	20/07/2020	23:59	Invalid TSP Sample on July 20: Bird damaged the filter
2	18/08/2020	VML	Invalidated Sample (PS1)	26/07/2020	00:00	26/07/2020	23:59	Invalid PS1 Sample on July 26: Media caused excessive flow restriction
3	21/09/2020	VML	Invalidated Sample (TSP)	01/08/2020	00:00	01/08/2020	23:59	Invalid TSP Sample on August 1: Bird damaged the filter
4	19/10/2020	VML	Invalidated Sample (TSP)	06/09/2020	00:00	06/09/2020	23:59	Invalid TSP Sample on Sept. 6: Excessive volume sampled

APPENDIX E
2020 Q3 EXCEEDANCE INFORMATION

APPENDIX E1
TABLES E1 THROUGH E3 - 10 MINUTE SO_2 RUNNING AVERAGES

Table E1. SO_2 Courtice Monitoring Station 10-min Running Average Exceedance Period on August 15, 2020

Date & Time	Wind Direction	SO_2 5-min Avg.	SO_2 10-min Running Avg.	
EST	°	ppb	ppb	
15/08/2020 09:15	98.22	52.828	62.223	
15/08/2020 09:20	91.4	54.49	53.659	
15/08/2020 09:25		64.883	59.686	
15/08/2020 09:30	101.76	70.336	**67.61**	1
15/08/2020 09:35		55.01	62.673	
15/08/2020 09:40	95.44	46.932	50.971	
15/08/2020 09:45		50.913	48.923	
15/08/2020 09:50	95.91	34.911	42.912	
15/08/2020 09:55		12.772	23.842	
15/08/2020 10:00	92.19	10.547	11.66	

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

Table E2. SO_2 Courtice Monitoring Station 10-min Running Average Exceedance Period on August 25, 2020

Date & Time	Wind Direction	SO_2 5-min Avg.	SO_2 10-min Running Avg.	
EST	°	ppb	ppb	
25/08/2020 23:25	181.84	1.516	1.787	
25/08/2020 23:30	176.74	0.956	1.236	
25/08/2020 23:35		17.434	9.195	
25/08/2020 23:40	166.87	167.617	92.526	2
25/08/2020 23:45		51.863	**109.74**	
25/08/2020 23:50	159.62	8.271	30.067	
25/08/2020 23:55		4.267	6.269	
26/08/2020 00:00	185.24	2.624	3.446	
26/08/2020 00:05		2.012	2.318	
26/08/2020 00:10	189.53	1.731	1.872	

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

Table E3. SO_2 Rundle Monitoring Station 10-min Running Average Exceedance Period on September 25, 2020

Date & Time	Wind Direction	SO_2 5-min Avg.	SO_2 10-min Running Avg.
EST	°	ppb	ppb
25/09/2020 12:35	128.04	43.509	39.717
25/09/2020 12:40	126.41	42.485	42.997
25/09/2020 12:45	121.86	66.08	54.283
25/09/2020 12:50	114.79	69.609	**67.845**
25/09/2020 12:55	126.56	47.978	58.793
25/09/2020 13:00	129.3	40.145	44.062
25/09/2020 13:05	154.16	29.568	34.857
25/09/2020 13:10	165.53	17.376	23.472
25/09/2020 13:15	156.93	15.59	16.483
25/09/2020 13:20	164.01	10.188	12.889

1

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

APPENDIX E2
TABLES E4 THROUGH E6 - 60 MINUTE SO2 RUNNING AVERAGES

Table E4. SO_2 Courtice Monitoring Station 1-Hour Running Average Exceedance Periods on August 15, 2020

Date & Time	**Wind Direction**	SO_2 5-min Avg.	SO_2 1-hr Running Avg.
EST	°	ppb	ppb
15/08/2020 08:15	115.64	20.756	4.213
15/08/2020 08:20	120.16	18.64	5.704
15/08/2020 08:25		17.07	7.081
15/08/2020 08:30	120.74	26.327	9.227
15/08/2020 08:35		30.694	11.745
15/08/2020 08:40	113.34	44.253	15.397
15/08/2020 08:45		55.944	20.022
15/08/2020 08:50	117.7	43.625	23.606
15/08/2020 08:55		44.664	27.254
15/08/2020 09:00	98.96	57.078	31.929
15/08/2020 09:05		33.068	34.494
15/08/2020 09:10	98.22	71.618	38.645
15/08/2020 09:15		52.828	41.317
15/08/2020 09:20	91.4	54.49	44.305
15/08/2020 09:25		64.883	48.289
15/08/2020 09:30	101.76	70.336	51.957
15/08/2020 09:35		55.01	53.983
15/08/2020 09:40	95.44	46.932	**54.206**
15/08/2020 09:45		50.913	53.787
15/08/2020 09:50	95.91	34.911	53.061
15/08/2020 09:55		12.772	50.403
15/08/2020 10:00	92.19	10.547	46.526
15/08/2020 10:05		9.687	44.577
15/08/2020 10:10	96.46	6.053	39.114
15/08/2020 10:15		9.142	35.473
15/08/2020 10:20	102.1	6.986	31.514
15/08/2020 10:25		3.617	26.409
15/08/2020 10:30	94.1	3.709	20.857
15/08/2020 10:35		2.659	16.494

1

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

Table E5. SO_2 Courtice Monitoring Station 1-Hour Running Average Exceedance Periods on August 30, 2020

Date & Time	**Wind Direction**	SO_2 5-min Avg.	SO_2 1-hr Running Avg.
EST	°	ppb	ppb
30/08/2020 19:15	259.51	1.36	0.664
30/08/2020 19:20	227.35	48.528	4.655
30/08/2020 19:25		28.774	7.004
30/08/2020 19:30	186.25	51.248	11.228
30/08/2020 19:35		53.613	15.646
30/08/2020 19:40	171.06	60.105	20.588
30/08/2020 19:45		61.183	25.635
30/08/2020 19:50	164.87	15.966	26.918
30/08/2020 19:55		9.74	27.688
30/08/2020 20:00	171.99	53.658	32.116
30/08/2020 20:05		55.84	36.721
30/08/2020 20:10	164.91	37.672	39.807
30/08/2020 20:15		22.865	**41.599**
30/08/2020 20:20	158.23	7.722	38.199
30/08/2020 20:25		3.583	36.1
30/08/2020 20:30	168.83	2.934	32.073
30/08/2020 20:35		3.161	27.869
30/08/2020 20:40	170.55	7.234	23.463
30/08/2020 20:45		15.103	19.623
30/08/2020 20:50	164.59	5.938	18.788
30/08/2020 20:55		3.618	18.277
30/08/2020 21:00	171.08	2.766	14.036
30/08/2020 21:05		1.881	9.54
30/08/2020 21:10	178.33	2.8	6.634
30/08/2020 21:15		5.754	5.208
30/08/2020 21:20	172.3	37.024	7.65
30/08/2020 21:25		31.844	10.005
30/08/2020 21:30	140.88	9.479	10.55
30/08/2020 21:35		4.027	10.622

2

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

Table E6. SO_2 Rundle Monitoring Station 1-Hour Running Average Exceedance Periods on September 25, 2020

Date & Time	**Wind Direction**	SO_2 5-min Avg.	SO_2 1-hr Running Avg.
EST	°	ppb	ppb
25/09/2020 12:00	134.97	16.461	16.548
25/09/2020 12:05	122.73	31.138	18.631
25/09/2020 12:10	130.88	26.727	19.923
25/09/2020 12:15	128.26	20.532	20.292
25/09/2020 12:20	132.56	35.926	21.833
25/09/2020 12:25	135.09	37.407	23.068
25/09/2020 12:30	133.06	35.924	24.511
25/09/2020 12:35	128.04	43.509	26.071
25/09/2020 12:40	126.41	42.485	27.684
25/09/2020 12:45	121.86	66.08	32.144
25/09/2020 12:50	114.79	69.609	36.819
25/09/2020 12:55	126.56	47.978	39.481
25/09/2020 13:00	129.3	40.145	**41.455**
25/09/2020 13:05	154.16	29.568	41.324
25/09/2020 13:10	165.53	17.376	40.545
25/09/2020 13:15	156.93	15.59	40.133
25/09/2020 13:20	164.01	10.188	37.988
25/09/2020 13:25	132.29	7.73	35.515
25/09/2020 13:30	156.83	8.065	33.194
25/09/2020 13:35	147.35	5.275	30.007
25/09/2020 13:40	146.48	4.896	26.875
25/09/2020 13:45	152.59	5.352	21.814
25/09/2020 13:50	151.15	3.588	16.313
25/09/2020 13:55	156.08	3.684	12.621
25/09/2020 14:00	152.36	4.078	9.616
25/09/2020 14:05	157.99	2.706	7.377
25/09/2020 14:10	145.71	3.049	6.183
25/09/2020 14:15	150.05	3.128	5.145
25/09/2020 14:20	134.69	2.161	4.476

1

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

APPENDIX E3
SEPTEMBER 24, 2020
EXCEEDANCE
DOCUMENTATION

Ontario
Ministry of the Environment

Notification of Exceedence – Regulation 419/05
General Information and Instructions

General Information

Information requested in this notification form is collected under the authority of the *Environmental Protection Act,* R.S.O. 1990 (EPA) and O. Reg. 419/05 and will be used to collect information relating to a measured or modelled air related exceedence as required by s.25(9), s.28(1) and s.30(3) of O. Reg. 419/05. The Ministry of the Environment (MOE) may also request additional information.

1. Questions regarding completion and submission of this notification form should be directed to your local MOE District Office. A list of these District Offices (including fax numbers) is available on the Ministry of the Environment Internet site at http://www.ene.gov.on.ca/envision/org/op.htm#Reg/Dist. A copy of this form may be acquired through the MOE public web site (www.ene.gov.on.ca) or by contacting any MOE office.

2. For notification under s.25(9) or 28(1), the completed notification form should be faxed, as soon as practicable, to the local Ministry of Environment (MOE) District Office which has jurisdiction over the area in which the facility is located.

3. For notification under s. 30, the completed notification form should be immediately faxed to the local Ministry of Environment (MOE) District Office which has jurisdiction over the area which the facility is located. If the exceedance is determined outside of the business hours of the District Office then the completed notification form should be faxed to the Spills Action Center (1-800-268-6061).

4. Information contained in this notification form may not be considered confidential and may be made available to the public upon request. Information may be claimed as confidential but will be subject to the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *EBR*. If you do not claim confidentiality at the time of submitting the information, the Ministry of the Environment may make the information available to the public without further notice to you.

Instructions

This form should be used to notify the MOE of a measured or modeled air related exceedence as required under O. Reg. 419/05. Failure to notify the MOE as required by regulation constitutes an offence under the O. Reg. 419/05 and the EPA.

The generic term "limits" in the context of this form means any numerical Point of Impingement Concentration limit set by the MOE including standards in O. Reg. 419/05 and guidelines provided by the MOE (Ministry POI Limits). For a comprehensive list of MOE POI Limits please refer to the publication titled “Summary of O. Reg. 419/05 Standards, Point of Impingement Guidelines, and Ambient Air Quality Criteria (AAQC’s)” available on the Ministry of the Environment Internet site at http://www.ene.gov.on.ca/envision/gp/2424e01.htm. Note that contaminants that have guidelines limits or recommended levels for chemicals with no standard or guideline may be considered “contaminants not listed in any of Schedules 1, 2 and 3 and discharges of the contaminant may cause an adverse effect” as this language appears in O. Reg. 419/05.

This form may be used for notification of exceedences of more than one contaminant; Table 1 (or equvalent) should be completed for each contaminant. If this notification is made pursuant to s. 30 in combination with ss. 25(9) or 28(1) then this form must be submitted immediately in accordance with s.30.

Regulatory Authority

28. (1) A person who discharges or causes or permits the discharge of a contaminant shall, as soon as practicable, notify a provincial officer in writing if,

- *(a) the person uses an approved dispersion model to predict concentrations of the contaminant that result from the discharges and,*
  - *(i) the use of the model indicates that discharges of the contaminant may result in a contravention of section 18, 19 or 20, or*
  - *(ii) the contaminant is not listed in any of Schedules 1, 2 and 3 and the use of the model indicates that discharges of the contaminant may cause an adverse effect;*
- *(b) measurements of air samples indicate that discharges of the contaminant may result in a contravention of section 18, 19 or 20; or*
- *(c) the contaminant is not listed in any of Schedules 1, 2 and 3 and measurements of air samples indicate that discharges of the contaminant may cause an adverse effect.*

25. (9) A person who is required under subsection (8) to complete the update of a report not later than March 31 in a year shall, as soon as practicable after that date, notify a provincial officer in writing if the person has started to use an approved dispersion model with respect to a contaminant for the purpose of completing the update but has not yet complied with section 12, and,

- *(a) the use of the model indicates that discharges of the contaminant may result in a contravention of section 18, 19 or 20; or*
- *(b) the contaminant is not listed in any of Schedules 1, 2 and 3 and the use of the model indicates that discharges of the contaminant may cause an adverse effect.*

30. (1) A person who discharges or causes or permits the discharge of a contaminant listed in Schedule 6 into the air shall comply with subsections (3) and (4) if there is reason to believe, based on any relevant information, that discharges of the contaminant may result in the concentration of the contaminant exceeding the half hour upper risk threshold or other time period upper risk threshold set out for that contaminant in Schedule 6 at a point of impingement.

(2) Without limiting the generality of subsection (1), the reference in that subsection to relevant information includes relevant information from predictions of a dispersion model, including,

- *(a) an approved dispersion model or other dispersion model; or*
- *(b) a dispersion model that is not used in accordance with this Regulation.*

(3) If subsection (1) applies to a discharge, the person who discharged or caused or permitted the discharge of the contaminant shall immediately notify the Director in writing.

Ontario
Ministry of the Environment

Notification of Exceedence – Regulation 419/05

1. Ministry of the Environment District Office Information

Date Form Submitted (Faxed)	Date Exceedednce Determined
	October 23, 2020
District Office	Fax Number
York-Durham District Office	(905) 427-5602

Supporting information attached? ☒ Yes ☐ No

If yes, number of pages: 2

2. Site Information

Name of Person Making the Notification	Business Name
Lyndsay Waller	Durham York Energy Centre

North American Industry Classification System (NAICS) Code	Business Activity Description *(a description of the business endeavour, this may include products sold, services provided, equipment used, etc.)*
562210	Waste Treatment and Disposal

Site Name	MOE District Office
Courtice AQ Station And Rundle AQ Station	York-Durham District Office

Address Information:

Site Address - Street information *(address that has civic numbering and street information includes street number, name, type and direction)*: 1835 Energy Drive

Unit Identifier *(i.e. suite or apartment number)*:

Survey Address *(used for a rural location specified for a subdivided township, an unsubdivided township or unsurveyed territory)*

Lot and Conc.: used to indicate location within a subdivided township and consists of a lot number and a concession number

Lot: | Conc.:

Part and Reference: used to indicate location within an unsubdivided township or unsurveyed territory, and consists of a part and a reference plan number indicating the location within that plan. Attach copy of the plan

Part: | Reference Plan:

Non Address Information *(includes any additional information to clarify applicants' physical location)*

Municipality/Unorganized Township	County/District	Postal Code
Courtice	York-Durham	L1E2R2

Geo Reference

Map Datum	Zone	Accuracy Estimate	Geo Referencing Method	UTM Easting	UTM Northing

Certificate of Approval Number (s) – *attach a separate list if more space is required*

7306-8FDKNX		

3. Type of Notification: Limit Exceedence – *Table 1 or Table 2 should be completed and submitted with this notification of exceedence.*

☒ This is a notification under Section 28(1) – Notice to Provincial Officer as a result of modelling or measurements relating to an exceedence of: (select all that apply)

☐ Schedule 1 ☐ Schedule 2 ☐ Schedule 3 ☐ POI Guideline ☒ Ambient Air Quality Criteria

☐ Other Limit (explain): _____

☐ This is a notification under Section 25 (9) – Notice to Provincial Officer as a result an update of an Emission Summary and Dispersion Modelling Report (select all that apply)

☐ Schedule 1 ☐ Schedule 2 ☐ Schedule 3 ☐ POI Guideline ☐ Ambient Air Quality Criteria

☐ Other Limit (explain): _____

Date that Refinement is anticipated to be complete (dd/mm/yyyy): _____

☐ This is a notification under Section 30 (3) – Notice to the Director as a result of an exceedence of Upper Risk Thresholds (Schedule 6)

☐ Yes ☐ No

4. Follow-Up Action

Section 28 Notifications

Will an Abatement Plan be submitted to the Ministry within 30 days of this notice as per s.29?

☐ Yes

☐ No If No, please provide the following:

Type of Previously Approved Abatement Plan	Date Approved under s.29 of O. Reg. 419/05 (dd/mm/yyyy)

Section 30 (3) Notifications for URT exceedence

Has an Emission Summary and Dispersion Modelling (ESDM) Report been prepared in accordance with s.30(4) and submitted to the Ministry?

☐ Yes

☐ No If No, what is the anticipated submission date for the ESDM* (dd/mm/yyyy)? _____

** Note: The ESDM must be submitted within three months of the discharge*

5. Model Based Assessment – *please complete this section if notifying of a modelled exceedence (complete Table 1)*

Was an ESDM Report prepared in accordance with s.26 O. Reg. 419/05?

☐ Yes ☐ No

If yes, was the ESDM Report prepared to fulfill *(select all that apply):*

- ☐ s.22 of O. Reg. 419/05 - Application for Certificate of Approval under section 9 of the *Environmental Protection Act*
- ☐ s.23 of O. Reg. 419/05 - Requirement for Schedule 4 or 5 sector facilities
- ☐ s.24 of O. Reg. 419/05 - Notice issued by Director
- ☐ s.25 of O. Reg. 419/05 - Requirement for updating ESDM Report
- ☐ s.30(4) of O. Reg 419/05 – Required as result of URT exceedence
- ☐ s.32(13) of O. Reg. 419/05 – Required as part of a Request for Alternative Standard
- ☐ Other (please specify): _____

Was the approved dispersion model refined as required by s.12 O. Reg. 419/05 (i.e. operating conditions, emission rates)?

☐ Yes ☐ No

Have you modelled for additional receptor locations other than the maximum POI? *(please include figure showing maximum POI location)*

☐ Yes ☐ No

If Yes, specify additional locations (i.e., land use) at which the exceedence may occur (*select all that apply – please include figure showing additional modelled locations*):

☐ Health Care ☐ Seniors Residence / Long Term Care Facility ☐ Child Care Facility ☐ Educational Facility ☐ Dwelling ☐ Unknown

☐ Location Specified by The Director (explain): _____ ☐ Other Location (explain): _____

6. Measurement Based Assessment – *please complete this section if notifying of a measured exceedence (Complete Table 2 or equivalent)*

Type of Monitor / Measurement Type	Date of Exceedence (dd/mm/yyyy)	Duration of Exceedence
PS-1 Air Samplers	24/09/2020	2 Event (24 hours)

Is the monitoring approved by the Ministry of the Environment?

☒ Yes 7306-8FDKNX

☐ No

Monitoring Reference Number: (if available)

Specify the location (i.e., land use) at which the exceedence did occur *(select all that apply)*:

☐ Health Care ☐ Seniors Residence / Long Term Care Facility ☐ Child Care Facility ☐ Educational Facility ☐ Dwelling ☐ Unknown

☐ Location Specified by The Director (explain): _____ ☒ Other Location (explain): Courtice and Rundle AQ Stations

7. Statement of Company Official

I, the undersigned hereby declare that, to the best of my knowledge:

- The information contained herein and the information submitted is complete and accurate in every way and I am aware of the penalties against providing false information as per s.184(2) of the *Environmental Protection Act.*
- I have been authorized to act on behalf of the company identified in this form for the purpose of providing this notification of exceedence under O.Reg 419/05 to the Ministry of the Environment
- I have used the most recent notification form (as obtained from the Ministry of the Environment Internet site at http://www.ene.gov.on.ca/envision/gp/index.htm#PartAir or from my local Ministry District Office and I have included all necessary information required by O. Reg. 419/05 and identified on this form.

Name of Signing Authority *(please print)*	Title
Lyndsay Waller	Operations Technician

Civic Address *(address that has civic numbering and street information includes street number, name, type and direction)*	Unit Identifier *(i.e. suite or apartment number)*
1835 Energy Dr	

Delivery Designator:
If signing authority mailing address is a Rural Route, Suburban Service, Mobile Route or General Delivery *(i.e., RR#3)* _____

Municipality	Postal Station	Province/State	Country	Postal Code
Courtice		Ontario	Canada	L1E 2R2

Telephone Number *(including area code & extension)*	Fax Number *(including area code)*	E-mail Address
905-404-0888 x 4107		lyndsay.waller@durham.ca

Signature	Date *(dd/mm/yyyy)*

Table 1 - Information About Modelled Air Limit Exceedence – Contaminant Information

Location of Maximum POI Concentration (e.g. UTM, street address, etc.)	Land Use at Maximum Point of Impingement (if known)

1									
3									
5									
7									
9									
11									
13									
15									
17									
19									
21									
22									

Notes:

(a) Proper Chemical Name should be given (Abbreviations, acronyms, numeric codes, trade names and mixtures NOT ACCEPTABLE).

(b) CAS Number : Chemical Abstracts Services Number (UNIQUE Identifier for a chemical)

(c) POI Concentration : Point of Impingement Concentration

Table 2 - Information About Measured Air Limit Exceedence – Contaminant Information

Location of Monitor (Describe)	Date (dd/mm/yyyy)	Time	Sampling Period	Land Use at Monitor
1. Courtice Station 2. Rundle Road Station	24/09/2020	N/A	24-Hours	On-site at waste water facility/Offsite North

1	Benzo(a)Pyrene	50-32-8	PUF	0.000055	24	0.00005	Health	AAQS	110%
	E		F	(	2	(	H	A	1
3									
5									
7									
9									
11									
13									
15									
17									
19									

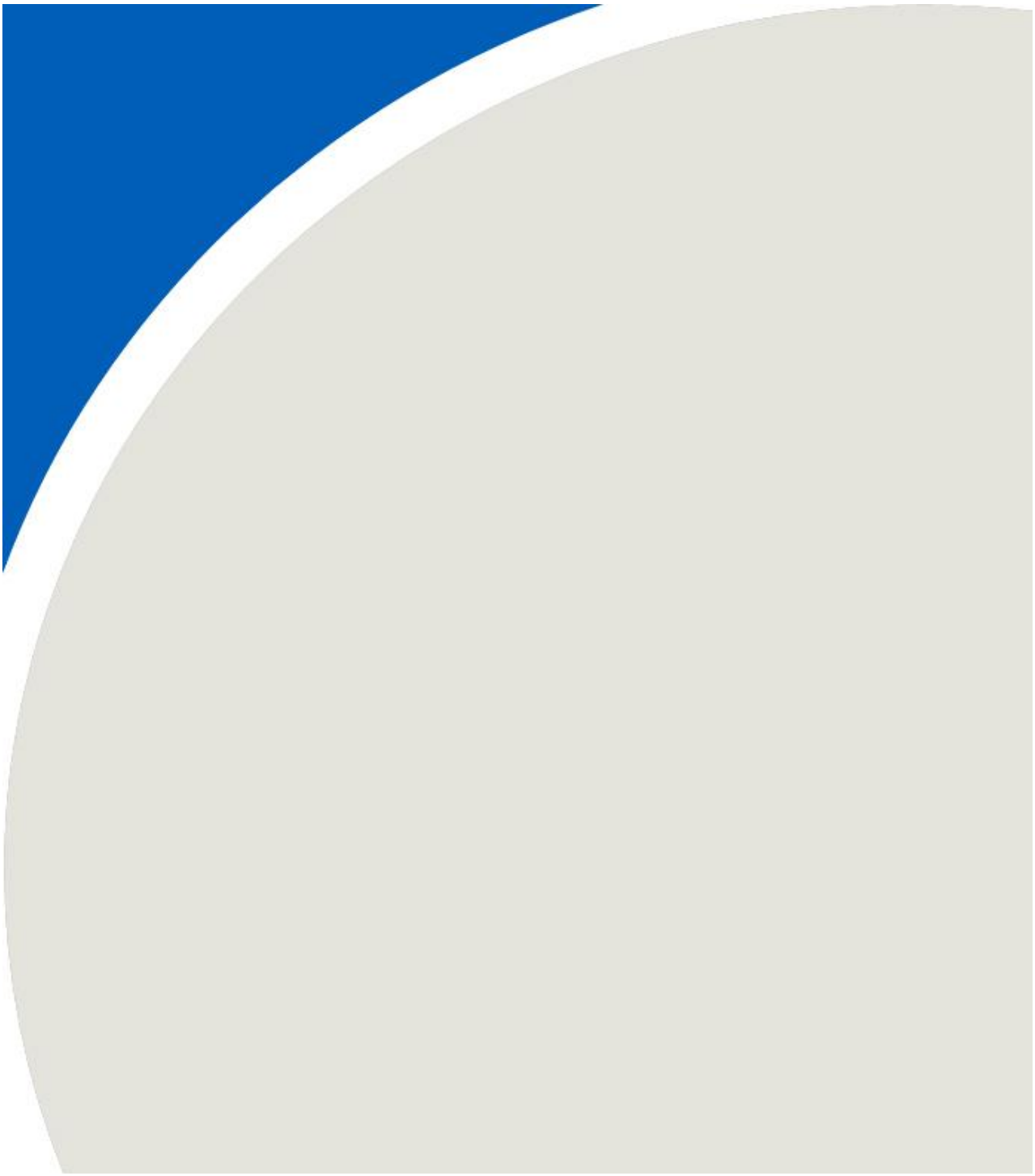
**** For additional measurement locations / sampling times, please included additional tables***
***** If you are reporting more than one exceedence, include the time of the exceedence in the contaminant column***

Notes:
(a) Proper Chemical Name should be given (Abbreviations, acronyms, numeric codes, trade names and mixtures NOT ACCEPTABLE).

(b) CAS Number : Chemical Abstracts Services Number (UNIQUE Identifier for a chemical)

(c) POI Concentration : Point of Impingement Concentration

MEMO



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:	2020-11-02	**RWDI Reference No.:** 1803743
TO:	Lyndsay Waller	**EMAIL:** Lyndsay.Waller@Durham.ca
CC:	Andrew Evans	**EMAIL:** Andrew.Evans@Durham.ca
CC:	Gioseph Anello	**EMAIL:** Gioseph.Anello@Durham.ca
FROM:	John DeYoe	**EMAIL:** jd@rwdi.com
RE:	**Exceedance Report – Benzo(a)Pyrene September 24, 2020 Region of Durham, DYEC**	

On October 23, 2020 the results from ALS Environmental were received regarding the PAH results from the September 24, 2020 sampling event. On October 29, 2020, the results were entered and assessed, and it was found that there were two (2) measured Benzo(a)Pyrene concentrations in excess of the 24-hour AAQC on the September 24th sampling date. Attached is the Exceedance Form PIBS 5354e for your reference. Below is a summary of the event.

<u>September 24, 2020</u>

On Thursday, September 24, 2020, there were two exceedances of the Benzo(a)Pyrene 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 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 September 24th 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 0.000055 µg/m^3 and 0.000061 µg/m^3 respectively. During the sampling day the wind was recorded predominantly from the NE to SSW as recorded at the Courtice WPCP Meteorological Tower. Wind speeds at Courtice tower ranged from 2.86 km/h to 8.44 km/h. During the sampling day the wind was recorded predominantly from the NE and S as recorded at the Rundle Road Meteorological Tower. Wind speeds at Rundle tower ranged from 0.24 km/h to 6.07 km/h.

2. According to the Courtice meteorological data, the Courtice Station was downwind of the DYEC part of the time during the September 24th sampling period. According to the Courtice

meteorological data, the winds were coming from the NE-SSW 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 NE-ENE quadrants.

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 Northeast and South, 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 11.75% of the criteria for the same period. The $PM_{2.5}$ 24-hour average value was 16.9 micrograms per cubic meter at the Courtice Station. At the Rundle Road Station, the NO_2 hourly values were less than 4.55% of the criteria for the same period. The $PM_{2.5}$ 24-hour average value was 12.6 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:

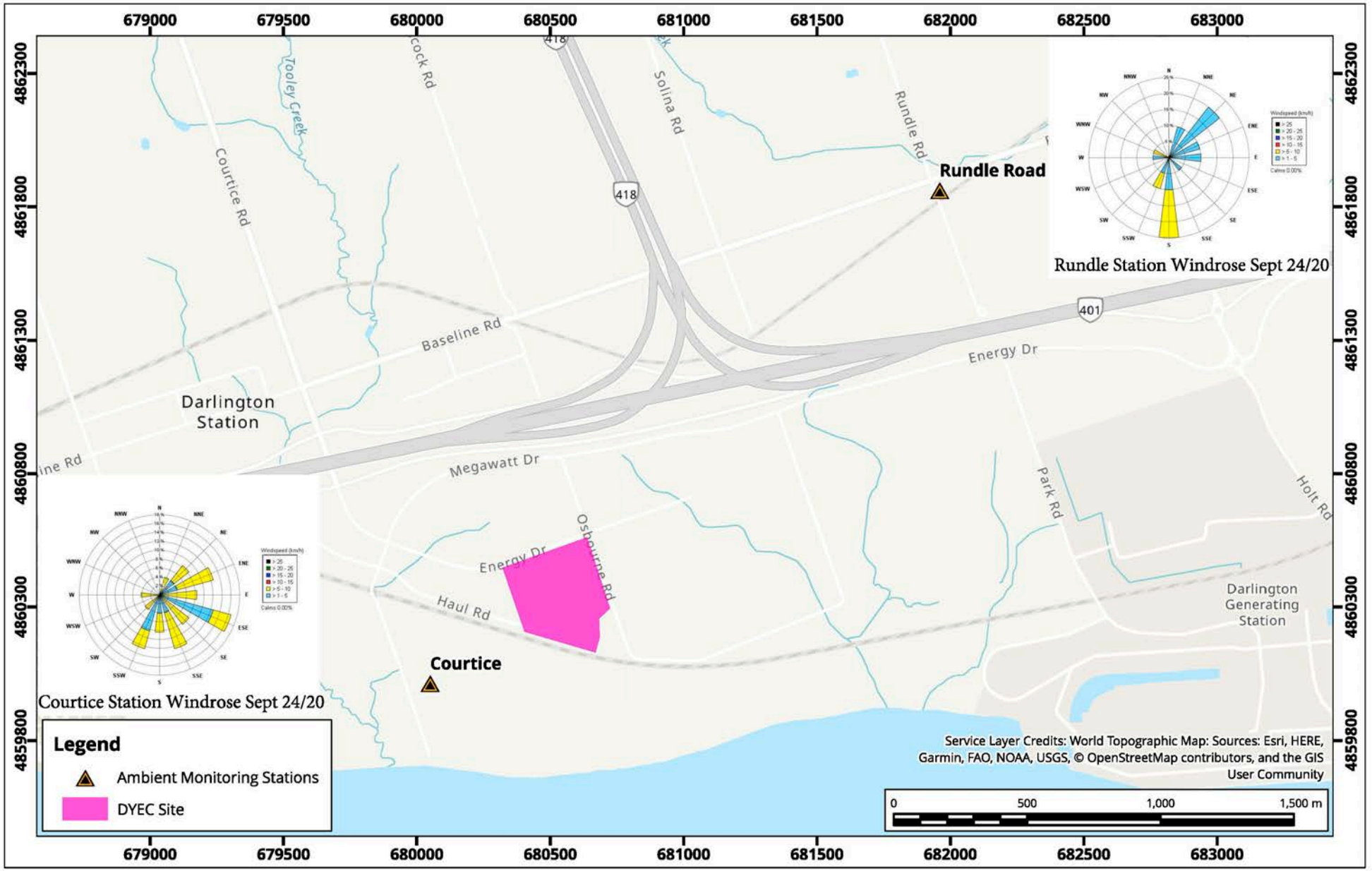
RWDI AIR Inc.

John DeYoe, B.A.
Senior Consultant / Principal

JD

Attach.

FIGURE



DYEC Site and Ambient Monitoring Station Locations

True North

Drawn by: DJH | Figure: 1

Approx. Scale: 1:20,000

Date Revised: Nov.2/20

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

SUPPORTING DATA

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#:	L2510222		Guelph, ON N1G 4P6
Date of Report	23-Oct-20		Canada
Date of Sample Receipt	30-Sep-20	**Client Contact:**	John DeYoe
		Client Project ID:	DYEC

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

Sample data as provided are not blank corrected.
There was significant and uncharacteristically high laboratory and/or media background with the analysis of this batch of samples. The benzo(a)pyrene values as reported are slightly above the MECP 24 hour criterion. With media blank correction of these data, the benzo(a)pyrene values are below the limits.

LCS recoveries are not blank corrected. High LCS recoveries for fluorene, acenaphthene and phenanthrene are attributable to the high media background.

Certified by:

Claire Kocharakkal
Account Manager

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Method Media Blank		Method Reagent Blank		COURTICE-PAH-SEP24		RUNDLE-PAH-SEP24		Laboratory Control Sample	
ALS Sample ID	WG3415590-1		WG3415590-4		L2510222-1		L2510222-2		WG3415590-2	
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		QC	
Sampling Date	n/a		n/a		24-Sep-20		24-Sep-20		n/a	
Extraction Date	1-Oct-20		1-Oct-20		1-Oct-20		1-Oct-20		1-Oct-20	
Target Analytes	**ng**		**ng**		**ng**		**ng**		**%**	
Naphthalene	54.2		45.6	M	16500		25500		109.4	
2-Methylnaphthalene	95.5		36.6		3240		6250		131.0	
1-Methylnaphthalene	72.4		24.9		2450		4500		144.8	
Acenaphthylene	3.81	M,R	4.78	M,R	43.6	M	35.2	M	96.7	
Acenaphthene	211		13.0		1040		2710		253.3	
Fluorene	126		11.7		662		1450		158.7	
Phenanthrene	319		34.1		913		2300		236.5	
Anthracene	15.0		7.23		62.8		122		95.2	
Fluoranthene	4.76		1.48		117		316		88.5	
Pyrene	3.85		1.31	R	158		145		88.9	
Benzo(a)Anthracene	0.790	M,R	0.860	M,R	11.1		7.60	R	83.8	
Chrysene	0.780	M	2.14	M	45.6	R	33.6	R	99.1	
Benzo(b)Fluoranthene	14.7	M,R	1.17	R	26.9		20.7	M,R	83.7	
Benzo(k)Fluoranthene	<0.20	U	2.50	M	22.6	M	14.2	M,R	105.2	
Benzo(e)Pyrene	1.55	R	0.820	M	16.8		10.9	R	85.0	
Benzo(a)Pyrene	3.68	M,R	0.680	M,R	16.6		18.6	M,R	100.7	
Perylene	5.46	M	0.680	M,R	1.58		0.710	M,R	107.3	
Indeno(1,2,3-cd)Pyrene	24.1	R	1.52	R	14.2	M	9.75	M,R	95.2	
Dibenzo(a,h)Anthracene	0.610	M,R	1.59	M	2.49	M,R	2.05	M,R	87.4	M
Benzo(g,h,i)Perylene	<0.20	U	0.740	M,R	16.0	M	12.8		98.9	M
Additional Analytes										
Tetralin	4.10	M	<0.20	U	1260		3930		NS	
Biphenyl	71.7		42.0		1010		1380		NS	
o-Terphenyl	1.35	M	1.48		10.4		12.1	M	NS	
Benzo(a)fluorene	<0.20	U	1.15		17.4	M	15.2	M	NS	
Benzo(b)fluorene	<0.20	U	1.12		21.5	R	22.2	R	NS	
Field Sampling Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
1-Methylnaphthalene-D10	NS		NS		89.8		86.1		NS	
Fluorene D10	NS		NS		96.0		94.2		NS	
Terphenyl D14(Surr.)	NS		NS		91.5	M	76.1	M	NS	
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Naphthalene D8	32.2	R	23.1	M,R	17.4	R	23.5	R	46.1	M
2-Methylnaphthalene-D10	55.7		58.4		38.4		57.8		70.9	
Acenaphthylene D8	56.6		53.3		45.1		43.3		71.6	
Phenanthrene D10	58.5		34.2		56.7		64.7		71.6	
Anthracene-D10	65.1		29.0		74.9		77.9		78.1	
Fluoranthene D10	65.9		65.1		72.4		73.2		82.0	
Benz(a)Anthracene-D12	77.0	R	66.1		87.3		83.5	R	96.2	
Chrysene D12	57.5		60.7		70.4		73.3		76.0	
Benzo(b)Fluoranthene-D12	99.1	R	102.5		110.8		113.7	M,R	125.1	M,R
Benzo(k)Fluoranthene-D12	61.0	R	63.9		73.5	R	108.0	M,R	79.9	R
Benzo(a)Pyrene D12	71.3		74.4		81.8		52.9	R	94.0	M
Perylene D12	79.2		70.5		94.4		99.0		109.7	
Indeno(1,2,3,cd)Pyrene-D12	117.8		113.9	M	144.1		138.2		165.6	
Dibenz(a,h)Anthracene-D14	101.5	M	100.3	M	115.4	M	93.0		136.9	M
Benzo(g,h,i)Perylene D12	87.3	M	94.4	M	104.3	M	88.7		121.5	M

U	Indicates that this compound was not detected above the LOD.
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

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a
ALS Sample ID	WG3415590-1	Extraction Date	1-Oct-20
Analysis Method	PAH by CARB 429		
Analysis Type	blank		
Sample Matrix	MEDIA		
Sample Size	1 Sample		
Percent Moisture	n/a		
Split Ratio	1	Workgroup	WG3415590

Approved:
T.Patterson
--e-signature--
22-Oct-2020

Run Information	**Run 1**
Filename	201015A21.D
Run Date	10/16/2020 3:14
Final Volume	0.1 mL
Dilution Factor	1
Analysis Units	ng
Instrument	MSD-5
Column	HP5MS USO179454H

Target Analytes	**Ret. Time**	**Concentration ng**	**Flags**
Naphthalene	2.92	54.2	
2-Methylnaphthalene	3.55	95.5	
1-Methylnaphthalene	3.68	72.4	
Acenaphthylene	4.74	3.81	M R
Acenaphthene	5.05	211	
Fluorene	5.99	126	
Phenanthrene	8.21	319	
Anthracene	8.32	15.0	
Fluoranthene	11.61	4.76	
Pyrene	12.26	3.85	
Benzo(a)Anthracene	16.16	0.790	M R
Chrysene	16.29	0.780	M
Benzo(b)Fluoranthene	19.49	14.7	M R
Benzo(k)Fluoranthene	NotFnd	<0.20	U
Benzo(e)Pyrene	20.27	1.55	R
Benzo(a)Pyrene	20.44	3.68	M R
Perylene	20.70	5.46	M
Indeno(1,2,3-cd)Pyrene	24.15	24.1	R
Dibenzo(a,h)Anthracene	24.24	0.610	M R
Benzo(g,h,i)Perylene	25.05	<0.20	U
Additional Analytes			
Tetralin	2.79	4.10	M
Biphenyl	4.12	71.7	
o-Terphenyl	9.50	1.35	M
Benzo(a)fluorene	NotFnd	<0.20	U
Benzo(b)fluorene	NotFnd	<0.20	U

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

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	200	2.91	32.2	R	50-150
2-Methylnaphthalene-D10	200	3.52	55.7		50-150
Acenaphthylene D8	200	4.72	56.6		50-150
Phenanthrene D10	200	8.15	58.5		50-150
Anthracene-D10	200	8.28	65.1		50-150
Fluoranthene D10	200	11.56	65.9		50-150
Benz(a)Anthracene-D12	200	16.10	77.0	R	50-150
Chrysene D12	200	16.22	57.5		50-150
Benzo(b)Fluoranthene-D12	200	19.45	99.1	R	50-150
Benzo(k)Fluoranthene-D12	200	19.53	61.0	R	50-150
Benzo(a)Pyrene D12	200	20.32	71.3		50-150
Perylene D12	200	20.55	79.2		50-150
Indeno(1,2,3,cd)Pyrene-D12	200	23.99	117.8		50-150
Dibenz(a,h)Anthracene-D14	200	24.15	101.5	M	50-150
Benzo(g,h,i)Perylene D12	200	24.96	87.3	M	50-150

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

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a
ALS Sample ID	WG3415590-4	Extraction Date	1-Oct-20
Analysis Method	PAH by CARB 429		
Analysis Type	blank		
Sample Matrix	REAGENT		
Sample Size	1 Sample		
Percent Moisture	n/a		
Split Ratio	1	Workgroup	WG3415590

Approved:
T.Patterson
--e-signature--
22-Oct-2020

Run Information	**Run 1**
Filename	201021A08.D
Run Date	10/22/2020 3:08
Final Volume	0.1 mL
Dilution Factor	1
Analysis Units	ng
Instrument	MSD-5
Column	HP5MS USO179454H

Target Analytes	**Ret. Time**	**Concentration ng**	**Flags**	
Naphthalene	2.93	45.6	M	
2-Methylnaphthalene	3.56	36.6		
1-Methylnaphthalene	3.68	24.9		
Acenaphthylene	4.75	4.78	M	R
Acenaphthene	5.05	13.0		
Fluorene	5.99	11.7		
Phenanthrene	8.20	34.1		
Anthracene	8.32	7.23		
Fluoranthene	11.61	1.48		
Pyrene	12.25	1.31		R
Benzo(a)Anthracene	16.17	0.860	M	R
Chrysene	16.27	2.14	M	
Benzo(b)Fluoranthene	19.49	1.17		R
Benzo(k)Fluoranthene	19.55	2.50	M	
Benzo(e)Pyrene	20.25	0.820	M	
Benzo(a)Pyrene	20.39	0.680	M	R
Perylene	20.62	0.680	M	R
Indeno(1,2,3-cd)Pyrene	24.12	1.52		R
Dibenzo(a,h)Anthracene	24.28	1.59	M	
Benzo(g,h,i)Perylene	25.05	0.740	M	R
Additional Analytes				
Tetralin	NotFnd	<0.20	U	
Biphenyl	4.12	42.0		
o-Terphenyl	9.49	1.48		
Benzo(a)fluorene	13.44	1.15		
Benzo(b)fluorene	13.64	1.12		

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

Extraction Standards			**% Rec**			**Limits**
Naphthalene D8	200	2.92	23.1	M	R	50-150
2-Methylnaphthalene-D10	200	3.53	58.4			50-150
Acenaphthylene D8	200	4.72	53.3			50-150
Phenanthrene D10	200	8.15	34.2			50-150
Anthracene-D10	200	8.27	29.0			50-150
Fluoranthene D10	200	11.56	65.1			50-150
Benz(a)Anthracene-D12	200	16.09	66.1			50-150
Chrysene D12	200	16.21	60.7			50-150
Benzo(b)Fluoranthene-D12	200	19.44	102.5			50-150
Benzo(k)Fluoranthene-D12	200	19.52	63.9			50-150
Benzo(a)Pyrene D12	200	20.32	74.4			50-150
Perylene D12	200	20.55	70.5			50-150
Indeno(1,2,3,cd)Pyrene-D12	200	24.00	113.9	M		50-150
Dibenz(a,h)Anthracene-D14	200	24.17	100.3	M		50-150
Benzo(g,h,i)Perylene D12	200	24.96	94.4	M		50-150

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

ALS Life Sciences

Sample Analysis Report

Sample Name	**COURTICE-PAH-SEP24**	Sampling Date	24-Sep-20 00:00
ALS Sample ID	L2510222-1	Extraction Date	1-Oct-20
Analysis Method	PAH by CARB 429		
Analysis Type	Sample		
Sample Matrix	Puf		
Sample Size	1 Sample		
Percent Moisture	n/a		
Split Ratio	1	Workgroup	WG3415590

Approved:
T.Patterson
--e-signature--
22-Oct-2020

Run Information	**Run 1**	**Run 2**
Filename	201015A25.D	201015A23.D
Run Date	10/16/2020 5:37	10/16/2020 4:26
Final Volume	0.1 mL	0.1 mL
Dilution Factor	1	20
Analysis Units	ng	ng
Instrument	MSD-5	MSD-5
Column	HP5MS USO179454H	HP5MS USO179454H

Target Analytes	**Ret. Time**	**Concentration ng**	**Flags**	**Ret. Time.**	**Concentration ng**	**Flags**
Naphthalene				2.93	16500	
2-Methylnaphthalene				3.56	3240	
1-Methylnaphthalene				3.68	2450	
Acenaphthylene	4.75	43.6	M			
Acenaphthene				5.05	1040	
Fluorene				5.99	662	
Phenanthrene				8.21	913	
Anthracene	8.32	62.8				
Fluoranthene				11.62	117	
Pyrene	12.26	158				
Benzo(a)Anthracene	16.17	11.1				
Chrysene	16.28	45.6	R			
Benzo(b)Fluoranthene	19.51	26.9				
Benzo(k)Fluoranthene	19.56	22.6	M			
Benzo(e)Pyrene	20.25	16.8				
Benzo(a)Pyrene	20.38	16.6				
Perylene	20.62	1.58				
Indeno(1,2,3-cd)Pyrene	24.08	14.2	M			
Dibenzo(a,h)Anthracene	24.27	2.49	M R			
Benzo(g,h,i)Perylene	25.05	16.0	M			
Additional Analytes						
Tetralin				2.80	1260	
Biphenyl				4.12	1010	
o-Terphenyl	9.50	10.4				
Benzo(a)fluorene	13.43	17.4	M			
Benzo(b)fluorene	13.65	21.5	R			

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	200	3.64	89.8
Fluorene D10	200	5.93	96
Terphenyl D14(Surr.)	200	13.06	91.5 M

Extraction Standards			**% Rec**		**Limits**		**% Rec**	
Naphthalene D8	200				50-150	2.91	17.4	R
2-Methylnaphthalene-D10	200				50-150	3.52	38.4	
Acenaphthylene D8	200	4.73	45.1		50-150			
Phenanthrene D10	200				50-150	8.15	56.7	
Anthracene-D10	200	8.28	74.9		50-150			
Fluoranthene D10	200				50-150	11.56	72.4	
Benz(a)Anthracene-D12	200	16.10	87.3		50-150			
Chrysene D12	200	16.21	70.4		50-150			
Benzo(b)Fluoranthene-D12	200	19.45	110.8		50-150			
Benzo(k)Fluoranthene-D12	200	19.52	73.5	R	50-150			
Benzo(a)Pyrene D12	200	20.32	81.8		50-150			
Perylene D12	200	20.56	94.4		50-150			
Indeno(1,2,3,cd)Pyrene-D12	200	23.99	144.1		50-150			
Dibenz(a,h)Anthracene-D14	200	24.15	115.4	M	50-150			
Benzo(g,h,i)Perylene D12	200	24.95	104.3	M	50-150			

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

ALS Life Sciences

Sample Analysis Report

Sample Name	**RUNDLE-PAH-SEP24**	Sampling Date	24-Sep-20 00:00
ALS Sample ID	L2510222-2	Extraction Date	1-Oct-20
Analysis Method	PAH by CARB 429		
Analysis Type	Sample		
Sample Matrix	Puf		
Sample Size	1 Sample		
Percent Moisture	n/a		
Split Ratio	1	Workgroup	WG3415590

Approved:
T.Patterson
--e-signature--
22-Oct-2020

Run Information	**Run 1**	**Run 2**
Filename	201015A26.D	201015A24.D
Run Date	10/16/2020 6:12	10/16/2020 5:01
Final Volume	0.1 mL	0.1 mL
Dilution Factor	1	20
Analysis Units	ng	ng
Instrument	MSD-5	MSD-5
Column	HP5MS USO179454H	HP5MS USO179454H

Target Analytes	**Ret. Time**	**Concentration ng**	**Flags**	**Ret. Time.**	**Concentration ng**	**Flags**
Naphthalene				2.93	25500	
2-Methylnaphthalene				3.56	6250	
1-Methylnaphthalene				3.68	4500	
Acenaphthylene	4.75	35.2 M				
Acenaphthene				5.05	2710	
Fluorene				5.99	1450	
Phenanthrene				8.21	2300	
Anthracene	8.32	122				
Fluoranthene				11.62	316	
Pyrene				12.26	145	
Benzo(a)Anthracene	16.17	7.60	R			
Chrysene	16.29	33.6	R			
Benzo(b)Fluoranthene	19.52	20.7 M	R			
Benzo(k)Fluoranthene	19.55	14.2 M	R			
Benzo(e)Pyrene	20.26	10.9	R			
Benzo(a)Pyrene	20.39	18.6 M	R			
Perylene	20.62	0.710 M	R			
Indeno(1,2,3-cd)Pyrene	24.10	9.75 M	R			
Dibenzo(a,h)Anthracene	24.27	2.05 M	R			
Benzo(g,h,i)Perylene	25.06	12.8				
Additional Analytes						
Tetralin				2.80	3930	
Biphenyl				4.12	1380	
o-Terphenyl	9.50	12.1 M				
Benzo(a)fluorene	13.43	15.2 M				
Benzo(b)fluorene	13.65	22.2	R			

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	200	3.64	86.1
Fluorene D10	200	5.93	94.2
Terphenyl D14(Surr.)	200	13.06	76.1 M

Extraction Standards			**% Rec**		**Limits**		**% Rec**	
Naphthalene D8	200				50-150	2.91	23.5	R
2-Methylnaphthalene-D10	200				50-150	3.52	57.8	
Acenaphthylene D8	200	4.73	43.3		50-150			
Phenanthrene D10	200				50-150	8.15	64.7	
Anthracene-D10	200	8.28	77.9		50-150			
Fluoranthene D10	200				50-150	11.56	73.2	
Benz(a)Anthracene-D12	200	16.11	83.5	R	50-150			
Chrysene D12	200	16.22	73.3		50-150			
Benzo(b)Fluoranthene-D12	200	19.45	113.7 M	R	50-150			
Benzo(k)Fluoranthene-D12	200	19.54	108.0 M	R	50-150			
Benzo(a)Pyrene D12	200	20.32	52.9	R	50-150			
Perylene D12	200	20.55	99.0		50-150			
Indeno(1,2,3,cd)Pyrene-D12	200	24.00	138.2		50-150			
Dibenz(a,h)Anthracene-D14	200	24.15	93.0		50-150			
Benzo(g,h,i)Perylene D12	200	24.96	88.7		50-150			

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

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a
ALS Sample ID	WG3415590-2	Extraction Date	1-Oct-20
Analysis Method	PAH by CARB 429		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1 LCS		
Percent Moisture	n/a		
Split Ratio	1	Workgroup	WG3415590

Approved:
T.Patterson
--e-signature--
22-Oct-2020

Run Information	**Run 1**
Filename	201015A19.D
Run Date	10/16/2020 2:03
Final Volume	0.1 mL
Dilution Factor	1
Analysis Units	%
Instrument	MSD-5
Column	HP5MS USO179454H

Target Analytes	**ug spiked**	**Ret. Time**	**%**	**Flags**	**Limits**
Naphthalene	100	2.93	109.4		50-150
2-Methylnaphthalene	100	3.55	131.0		50-150
1-Methylnaphthalene	100	3.68	144.8		50-150
Acenaphthylene	100	4.74	96.7		50-150
Acenaphthene	100	5.05	253.3		50-150
Fluorene	100	5.99	158.7		50-150
Phenanthrene	100	8.21	236.5		50-150
Anthracene	100	8.32	95.2		50-150
Fluoranthene	100	11.61	88.5		50-150
Pyrene	100	12.26	88.9		50-150
Benzo(a)Anthracene	100	16.17	83.8		50-150
Chrysene	100	16.29	99.1		50-150
Benzo(b)Fluoranthene	100	19.51	83.7		50-150
Benzo(k)Fluoranthene	100	19.58	105.2		50-150
Benzo(e)Pyrene	100	20.25	85.0		50-150
Benzo(a)Pyrene	100	20.38	100.7		50-150
Perylene	100	20.62	107.3		50-150
Indeno(1,2,3-cd)Pyrene	100	24.07	95.2		50-150
Dibenzo(a,h)Anthracene	100	24.27	87.4	M	50-150
Benzo(g,h,i)Perylene	100	25.05	98.9	M	50-150

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

Extraction Standards			**% Rec**			**Limits**
Naphthalene D8	200	2.91	46.1	M		30-150
2-Methylnaphthalene-D10	200	3.52	70.9			30-150
Acenaphthylene D8	200	4.72	71.6			30-150
Phenanthrene D10	200	8.15	71.6			50-150
Anthracene-D10	200	8.28	78.1			50-150
Fluoranthene D10	200	11.56	82.0			50-150
Benz(a)Anthracene-D12	200	16.10	96.2			50-150
Chrysene D12	200	16.21	76.0			50-150
Benzo(b)Fluoranthene-D12	200	19.45	125.1	M	R	50-150
Benzo(k)Fluoranthene-D12	200	19.52	79.9		R	50-150
Benzo(a)Pyrene D12	200	20.32	94.0	M		30-150
Perylene D12	200	20.55	109.7			50-150
Indeno(1,2,3,cd)Pyrene-D12	200	23.99	165.6			50-150
Dibenz(a,h)Anthracene-D14	200	24.14	136.9	M		50-150
Benzo(g,h,i)Perylene D12	200	24.95	121.5	M		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 Re

L2510222-COFC

L2510225-COFC

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:	

Report Format / Distribution

Select Report Format: ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)

Quality Control (QC) Report with Report ☐ YES ☐ NO

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: Matt.Lantz@rwdi.com

Email 2:

Email 3:

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax:

Email 2:

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

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

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

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

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

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:		AFE/Cost Center:	PO#:
Job #:	DYEC	Major/Minor Code:	Routing Code:
PO / AFE:	1803743 Phase 1000	Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):		ALS Contact:	Sampler: Martin Town

Analysis Request

NUMBER OF CONTAINERS — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Sample Air Volume (m3)	Date (dd-mmm-yy)	Sample Period	Sample Type	TSP, ICP on Hi-Vol Filter	PAH	DX	SAMPLES ON HOLD
1	L2503479-3 - Curtice	302	24-Sep-20	24hr	Air		X		
1	740836	1738	18-Sep-20	24hr	Air	X			
2	740838	1695	24-Sep-20	24hr	Air	X			
2	L2503479-2 - Rundle	304	24-Sep-20	24hr	Air		X		
3	740835	1756	18-Sep-20	24hr	Air	X			
4	740837	1662	24-Sep-20	24hr	Air	X			
				24hr	Air				
				24hr	Air				
				24hr	Air				
				24hr	Air				
				24hr	Air				
				24hr	Air				

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

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

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

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

Samples are 10 day TAT

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ ☒

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

Cooling Initiated ☑

INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C			
3.8°C	17.3°C				

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: 29-Sep-20	Time: 11:15	Received by: AARON BURTON	Date: 30-Sept-2020	Time: 11:20	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**.

Table B5: 2020 Courtice Station Q3 Monitoring Results for PAHs

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	24-Sep-20
1-Methylnaphthalene	ng/m^3	*12000*	-	8.11E+00
2-Methylnaphthalene	ng/m^3	*10000*	-	1.07E+01
Acenaphthene	ng/m^3	-	-	3.44E+00
Acenaphthylene	ng/m^3	*3500*	-	1.44E-01
Anthracene	ng/m^3	*200*	-	2.08E-01
Benzo(a)Anthracene	ng/m^3	-	-	3.68E-02
Benzo(a)fluorene	ng/m^3	-	-	5.76E-02
Benzo(a)Pyrene (Historically High)	ng/m^3	*0.05* [1] *5* [2] *1.1* [3]	*1*	5.50E-02
Benzo(b)Fluoranthene	ng/m^3	-	-	8.91E-02
Benzo(b)fluorene	ng/m^3	-	-	7.12E-02
Benzo(e)Pyrene	ng/m^3	-	-	5.56E-02
Benzo(g,h,i)Perylene	ng/m^3	-	-	5.30E-02
Benzo(k)Fluoranthene	ng/m^3	-	-	7.48E-02
Biphenyl	ng/m^3	-	-	3.34E+00
Chrysene	ng/m^3	-	-	1.51E-01
Dibenzo(a,h)Anthracene	ng/m^3	-	-	8.25E-03
Fluoranthene	ng/m^3	-	-	3.87E-01
Fluorene	ng/m^3	-	-	2.19E+00
Indeno(1,2,3-cd)Pyrene	ng/m^3	-	-	4.70E-02
Naphthalene	ng/m^3	*22500*	*22500*	5.46E+01
o-Terphenyl	ng/m^3	-	-	3.44E-02
Perylene	ng/m^3	-	-	5.23E-03
Phenanthrene	ng/m^3	-	-	3.02E+00
Pyrene	ng/m^3	-	-	5.23E-01
Tetralin	ng/m^3	-	-	4.17E+00
Total PAH[4]	ng/m^3	-	-	9.17E+01

Table B6: 2020 Rundle Station Q3 Monitoring Results for PAHs

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	24-Sep-20
1-Methylnaphthalene	ng/m^3	*12000*	-	1.48E+01
2-Methylnaphthalene	ng/m^3	*10000*	-	2.06E+01
Acenaphthene	ng/m^3	-	-	8.91E+00
Acenaphthylene	ng/m^3	*3500*	-	1.16E-01
Anthracene	ng/m^3	*200*	-	4.01E-01
Benzo(a)Anthracene	ng/m^3	-	-	2.50E-02
Benzo(a)fluorene	ng/m^3	-	-	5.00E-02
Benzo(a)Pyrene (Historically High)	ng/m^3	*0.05* [1] *5* [2] *1.1* [3]	*1*	6.12E-02
Benzo(b)Fluoranthene	ng/m^3	-	-	6.81E-02
Benzo(b)fluorene	ng/m^3	-	-	7.30E-02
Benzo(e)Pyrene	ng/m^3	-	-	3.59E-02
Benzo(g,h,i)Perylene	ng/m^3	-	-	4.21E-02
Benzo(k)Fluoranthene	ng/m^3	-	-	4.67E-02
Biphenyl	ng/m^3	-	-	4.54E+00
Chrysene	ng/m^3	-	-	1.11E-01
Dibenzo(a,h)Anthracene	ng/m^3	-	-	6.74E-03
Fluoranthene	ng/m^3	-	-	1.04E+00
Fluorene	ng/m^3	-	-	4.77E+00
Indeno(1,2,3-cd)Pyrene	ng/m^3	-	-	3.21E-02
Naphthalene	ng/m^3	*22500*	*22500*	8.39E+01
o-Terphenyl	ng/m^3	-	-	3.98E-02
Perylene	ng/m^3	-	-	2.34E-03
Phenanthrene	ng/m^3	-	-	7.57E+00
Pyrene	ng/m^3	-	-	4.77E-01
Tetralin	ng/m^3	-	-	1.29E+01
Total PAH[4]	ng/m^3	-	-	1.61E+02

Station: RofD Courtice Daily: 24/09/2020 Type: AVG 1 Hr. [5 Mins.]

Date & Time	PM2.5	NO	NO2	NOX	SO2	Batt Min	Temperature - Ambient	Rain	Tr_Temp	RH AVG	Pressure	Rain total	Hi-Vol Pressure	PUF Pressure	Pressure	Temperature - Ambient	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
24/09/2020 00:00	17.9	0.9	9.7	10.6	0.425	13.1	14.137	0	27.3	79.7	29.63	0	3.37	37.35	100.33	287.287	40.24	7.23
24/09/2020 01:00	21.6	0.3	15.7	16	0.447	13.1	13.339	0	26.8	82.3	29.63	0	3.49	39.16	100.33	286.489	41.04	7.4
24/09/2020 02:00	25.7	0.6	13.5	14.1	2.488	13.1	11.69	0	27.2	89.3	29.62	0	3.47	39.63	100.31	284.84	41.04	7.46
24/09/2020 03:00	21.1	6.8	16.7	23.5	7.482	13.1	10.67	0	27.1	94.3	29.63	0	3.49	40.12	100.33	283.82	41.25	7.51
24/09/2020 04:00	18.4	8.2	17.2	25.4	2.043	13.1	10.774	0	26.9	94.2	29.62	0	3.49	40.01	100.31	283.924	41.23	7.5
24/09/2020 05:00	16.8	9.1	18	27.1	4.418	13.1	10.739	0	26.7	93.3	29.62	0	3.49	40.32	100.32	283.889	41.25	7.53
24/09/2020 06:00	16.1	29.5	23.5	53	11.103	13.1	10.845	0	26.5	92	29.63	0	3.49	40.2	100.33	283.995	41.28	7.51
24/09/2020 07:00	15.7	22.9	19.8	42.7	9.006	13.1	14.375	0	27	82.3	29.64	0	3.5	39.42	100.36	287.525	41.07	7.41
24/09/2020 08:00	14	5.3	10.7	16	3.622	13.1	18.107	0	26.8	71.2	29.65	0	3.51	39.91	100.41	291.257	40.88	7.41
24/09/2020 09:00	14.3	1.3	4.4	5.7	1.505	13.1	18.231	0	26.6	76.4	29.66	0	3.53	40.76	100.44	291.381	41.01	7.48
24/09/2020 10:00	14.7	0.9	3.3	4.2	1.178	13.1	18.103	0	26.3	80.1	29.66	0	3.53	41	100.45	291.253	41.02	7.5
24/09/2020 11:00	15.9	0.5	2.4	2.9	1.072	13.1	18.5	0	26.5	82.6	29.66	0	3.53	40.74	100.44	291.65	40.97	7.48
24/09/2020 12:00	14.9	0.2	2	2.2	1.017	13.1	19.162	0	26.5	80	29.65	0	3.53	40.17	100.4	292.312	40.91	7.42
24/09/2020 13:00	14.4	0.1	1.8	1.9	1.055	13.1	19.267	0	26.4	80.5	29.64	0	3.53	40.14	100.36	292.417	40.9	7.41
24/09/2020 14:00	14.1	0.1	2.1	2.2	1.06	13.1	19.344	0	26.2	79.1	29.62	0	3.53	40.28	100.32	292.494	40.85	7.42
24/09/2020 15:00	13.6	0	2.2	1.8	1.268	13.1	20.022	0	26.4	73.5	29.62	0	3.53	40.35	100.3	293.172	40.84	7.42
24/09/2020 16:00	15.2	0.1	3.5	3.4	0.975	13.1	19.342	0	26.3	81	29.62	0	3.53	40.54	100.32	292.492	40.9	7.44
24/09/2020 17:00	16.7	0.1	3.4	3.4	1.106	13.1	19.233	0	26.8	78.7	29.63	0	3.54	41.13	100.34	292.383	40.98	7.5
24/09/2020 18:00	16.2	0	5.9	5.8	1.209	13.1	18.782	0	26.7	85.6	29.64	0	3.53	41.22	100.37	291.932	40.95	7.51
24/09/2020 19:00	16.8	0.2	7.8	8	2.05	13.1	18.259	0	26.8	85.3	29.65	0	3.53	41.58	100.4	291.409	40.98	7.55
24/09/2020 20:00	19.6	0.2	17.7	17.8	2.222	13.1	17.732	0	26.9	85.5	29.66	0	3.52	41.14	100.43	290.882	40.95	7.52
24/09/2020 21:00	19.7	0.3	19	19.3	3.66	13.1	17.332	0	27	83.7	29.66	0	3.52	41.57	100.45	290.482	40.97	7.56
24/09/2020 22:00	16.5	1	14.2	15.2	3.63	13.1	17.255	0	26.8	81.3	29.67	0	3.52	41.36	100.48	290.405	40.99	7.54
24/09/2020 23:00	16.7	0.4	11.6	12.1	2.933	13.1	17.641	0	26.8	81	29.67	0	3.53	41.19	100.48	290.791	41.03	7.52
Minimum	13.6	0	1.8	1.8	0.425	13.1	10.67	0	26.2	71.2	29.62	0	3.37	37.35	100.3	283.82	40.24	7.23
MinDate	15:00	15:00	13:00	15:00	00:00	00:00	03:00	00:00	14:00	08:00	02:00	00:00	00:00	00:00	15:00	03:00	00:00	00:00
Maximum	25.7	29.5	23.5	53	11.103	13.1	20.022	0	27.3	94.3	29.67	0	3.54	41.58	100.48	293.172	41.28	7.56
MaxDate	02:00	06:00	06:00	06:00	06:00	00:00	15:00	00:00	00:00	03:00	22:00	00:00	17:00	19:00	22:00	15:00	06:00	21:00
Avg	16.9	3.7	10.3	13.9	2.791	13.1	16.37	0	26.7	83	29.64	0	3.51	40.39	100.38	289.52	40.98	7.47
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	2.8	7.3	6.9	12.9	2.7	No Data	3.2	0	0.3	6	0	0	0	0.9	0.1	3.2	0.2	0.1

Station: RofD Rundle Daily: 24/09/2020 Type: AVG 1 Hr. [5 Mins.]

Date & Time	PM2.5	NO	NO2	NOX	SO2	Batt Min	Temperature - Ambient	Rain	Tr_Temp	RH AVG	Rain total	WS km/hr	WD	Hi-Vol Pressure	PUF Pressure	Temperature - Ambient	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
24/09/2020 00:00	13.6	0	1.9	1.4	0	13.2	13.8	0	23.1	80	0	5.01	284.01	4.08	50.33	286.975	42.25	7.73
24/09/2020 01:00	12.8	0	1.7	1.2	0	13.2	12.4	0	23.3	84.9	0	2.65	280.57	4.07	49.53	285.489	42.32	7.7
24/09/2020 02:00	12.1	0	1	0.8	0	13.2	10.1	0	22.7	90.9	0	0.61	<Samp	4.12	49.48	283.26	42.78	7.72
24/09/2020 03:00	12.6	0.3	1.2	1.4	0	13.2	8.9	0	22	96.7	0	0.24	<Samp	4.15	49.45	282.064	43.01	7.73
24/09/2020 04:00	13.3	0.7	1.1	1.5	0	13.2	8.4	0	21.4	98	0	0.55	<Samp	4.15	49.07	281.571	43.06	7.71
24/09/2020 05:00	14.3	0.1	0.9	0.7	0	13.2	8.2	0	21.7	98.7	0	1.58	<Samp	4.15	48.81	281.282	43.08	7.7
24/09/2020 06:00	14.4	0.4	1.9	2.2	0	13.2	8.2	0	21.7	99.2	0	1.9	55.43	4.12	48.31	281.377	42.94	7.66
24/09/2020 07:00	12.8	0.7	2.6	3.3	0	13.2	12.3	0	22.3	93.1	0	2.86	64.4	4.02	47.1	285.487	42.02	7.52
24/09/2020 08:00	10.8	1.9	5.1	7	0.036	13.2	17.7	0	23.1	73.9	0	1.82	35.42	3.86	45.28	290.841	40.74	7.33
24/09/2020 09:00	9.7	2.7	8.7	11.4	0.131	13.2	20	0	23	67.1	0	2.32	213.28	3.69	44.89	293.171	39.63	7.27
24/09/2020 10:00	10.5	1.1	6.3	7.5	0.088	13.2	19.7	0	23.2	69.7	0	6.07	185.62	3.68	44.79	292.832	39.59	7.27
24/09/2020 11:00	11.4	2.6	5.2	7.8	0.071	13.2	20.2	0	23	70.4	0	5.74	186.03	3.66	44.58	293.319	39.46	7.25
24/09/2020 12:00	11.5	0.5	5.3	5.9	0.141	13.2	21	0	23	65.5	0	5.22	196.81	3.65	43.9	294.145	39.31	7.19
24/09/2020 13:00	9.4	0.1	3.5	3.5	0.287	13.2	21.8	0	23.1	59.6	0	5.11	186.41	3.63	43.68	294.931	39.13	7.16
24/09/2020 14:00	9.5	0.2	5.4	5.5	0.446	13.2	21.5	0	23.1	60.2	0	3.94	181.76	3.66	43.65	294.68	39.36	7.16
24/09/2020 15:00	9.1	0.1	5.9	5.9	0.465	13.2	21.8	0	23.2	53.9	0	3.08	184.11	3.7	43.47	294.964	39.55	7.15
24/09/2020 16:00	11.3	0	7.2	6.9	0.368	13.2	20.7	0	23.2	63.8	0	4.07	132.3	3.75	43.66	293.836	39.9	7.18
24/09/2020 17:00	13.8	0	9.1	8.6	0.22	13.2	19.2	0	23.1	77	0	3.21	86.79	3.8	44.33	292.323	40.32	7.24
24/09/2020 18:00	14.2	0	9.1	8.6	0.146	13.2	18.4	0	23.2	84.5	0	2.39	85.31	3.8	44.37	291.568	40.39	7.25
24/09/2020 19:00	14.8	0	6.2	5.6	0.12	13.2	17.3	0	23.1	86.5	0	3.09	50.69	3.84	44.77	290.443	40.66	7.3
24/09/2020 20:00	16	1.3	6.9	7.9	0.172	13.2	15.7	0	23.3	92.3	0	2.42	58.45	3.87	44.91	288.838	40.96	7.32
24/09/2020 21:00	15.9	0	5.4	4.8	0.103	13.2	15.2	0	23	95	0	3.96	17.78	3.88	45.52	288.341	41.06	7.37
24/09/2020 22:00	14.8	0	5.5	4.9	0.081	13.2	16	0	23.2	88.2	0	4.08	25.18	3.86	45	289.185	40.86	7.33
24/09/2020 23:00	14.2	0	4.7	4	0.214	13.2	16.2	0	23.2	82.7	0	4.14	34.68	3.8	44.27	289.395	40.54	7.27
Minimum	9.1	0	0.9	0.7	0	13.2	8.2	0	21.4	53.9	0	0.24	17.78	3.63	43.47	281.282	39.13	7.15
MinDate	15:00	00:00	05:00	05:00	00:00	00:00	05:00	00:00	04:00	15:00	00:00	03:00	21:00	13:00	15:00	05:00	13:00	15:00
Maximum	16	2.7	9.1	11.4	0.465	13.2	21.8	0	23.3	99.2	0	6.07	284.01	4.15	50.33	294.964	43.08	7.73
MaxDate	20:00	09:00	17:00	09:00	15:00	00:00	13:00	00:00	01:00	06:00	00:00	10:00	00:00	03:00	00:00	15:00	05:00	00:00
Avg	12.6	0.5	4.7	4.9	0.129	13.2	16	0	22.8	80.5	0	3.17	127.25	3.87	45.96	289.18	40.96	7.4
Num	24	24	24	24	24	24	24	24	24	24	24	24	20	24	24	24	24	24
Data[%]	100	100	100	100	100	100	100	100	100	100	100	100	83.3	100	100	100	100	100
STD	2	0.8	2.6	2.9	0.1	No Data	4.6	0	0.6	13.7	0	1.6	83.5	0.2	2.3	4.6	1.3	0.2

APPENDIX F
DURHAM YORK ENGERGY CENTRE AMBIENT AIR Q3 SO_2 EMISSIONS TECHNICAL MEMO

Technical Memorandum

Date: November 5, 2020

To: John DeYoe, Project Manager, RWDI

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

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

Subject: Durham York Energy Centre (DYEC)
2020 Ambient Air Q3 Sulphur Dioxide Emissions

In support of the 2020 Q3 Ambient Air Quality Monitoring Report prepared by RWDI Inc., the following information is provided in relation to the performance of the DYEC during the periods of elevated sulphur dioxide (SO_2) concentrations observed at the facility's Courtice and Rundle Road ambient air monitoring stations.

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

According to the DYEC's continuous emissions monitoring system (CEMS), measured in-stack SO_2 stack concentrations were recorded at 0 mg/m^3 throughout the periods in Q3 2020 when ambient SO_2 standards were exceeded. At these measured in-stack concentration levels, the facility's contribution to ambient air quality would be expected to be less than 1% of the new standard.

In each instance where the Courtice station experienced an exceedance of either the 10 minute or 1 hour rolling average, the wind was found to be originating from an ESE, S and WSW directions. The DYEC is situated NE-ENE from the Courtice station. For every 10 minute and 1 hour period where the ambient standard was exceeded at the Courtice station, the DYEC was operational and the reported SO_2 CEMS in stack concentrations recorded 0 mg/Rm^3.

In each instance where the Rundle Road station experienced an exceedance the wind was found to be originating from an ENE direction. Exceedances noted in the Q2 report were also found to have occurred when wind direction originated from the ENE direction. The DYEC is situated SW of the Rundle Road station. For every 10 minute and 1 hour period where the ambient standard was exceeded at the Rundle Road station, the DYEC was operational and the reported SO_2 CEMS in stack concentrations equal to or below 1 mg/Rm^3.

Considering both the wind direction and the SO_2 concentrations measured in the stack, it is unlikely that the DYEC contributed significantly to elevated ambient SO_2 concentrations during these events. It is more likely that ambient concentrations were attributable to other industrial sources in the lakeshore area or long range transport from across Lake Ontario.