REPORT

DURHAM YORK ENERGY CENTRE

DURHAM, ONTARIO

2018 ANNUAL AMBIENT AIR QUALITY MONITORING REPORT: CONTINUOUS & PERIODIC MONITORING PROGRAM

RWDI # 1803743

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SUBMITTED TO

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1 INTRODUCTION

RWDI AIR Inc. (RWDI) was retained by The Regional Municipality of Durham (Region of Durham) to conduct continuous monitoring for Meteorological Parameters (wind speed, wind direction, ambient temperature, atmospheric pressure and relative humidity), Particulate Matter less than 2.5 microns ($PM_{2.5}$), Nitrogen Oxide (NO_X) and Sulfur Dioxide (SO_2) monitoring. In addition, periodic monitoring for Total Suspended Particulate (TSP), Metals, Dioxins and Furans (D&F) and Polycyclic Aromatic Hydrocarbons (PAHs) was conducted. The facility address is 1835 Energy Drive, Clarington, Ontario. The facility has three monitoring stations, respectively known as Courtice Station, Rundle Road Station and Fence Line Station. The monitoring station map (**Figure 1**) shows the location of the three (3) monitoring stations. Monitoring at the Courtice Station commenced in May 2013 and is ongoing with the following parameters: ambient temperature, relative humidity, precipitation, pressure, $PM_{2.5}$, NO_X, SO_2, TSP, Metals, D&F and PAHs. Monitoring at the Rundle Station commenced in May 2013 and is ongoing with the following parameters: wind speed, wind direction, ambient temperature, relative humidity, precipitation, $PM_{2.5}$, NO_X, SO_2, TSP, Metals, D&F and PAHs. Monitoring at the Fence Line Station commenced on February 6, 2016 and ceased on December 4, 2018. This location sampled for TSP and Metals.

On December 19, 2017, Region of Durham communicated its intention to modify the ambient monitoring program to discontinue the discrete sampling of TSP and Metals parameters at the Fence Line station. No further sampling would be conducted at the Fence Line station. On November 7, 2018 Region of Durham received a letter from the Ministry of the Environment, Conservation and Parks (MECP) confirming the fulfillment of a minimum of one year of monitoring as required by the plan. Since no exceedances had been reported for TSP or Metals at this station the requested change was approved. These changes took effect after December 4, 2018 and the station was decommissioned by the end of December 2018.

Periodic sampling at all three stations was concurrent with the National Air Pollution Surveillance (NAPS) schedule. Courtice, Rundle and Fence Line Stations were audited by the Ministry of Environment, Conservation and Parks (MECP) four times, which took place on March 22, June 6, September 26, and December 20, 2018.

2 BACKGROUND

Stantec provided Quarter 1 and Quarter 2 reports that were issued to the MECP by the Region of Durham. RWDI provided Quarter 3 and Quarter 4 reports that were issued to the MECP by the Region of Durham. A list of the quarterly reports can be found in the References section at the end of this report. This Annual Report presents the results from the ambient air monitoring from January 1, 2018 to December 31, 2018. For the 2018 year, the stations consisted of the Courtice Station, Rundle Station and the Fence Line Station.

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. Three (3) 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 purpose of the ambient air monitoring program is to:

1. 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 (Jacques Whitford, 2009a);
2. Monitor concentration levels of EFW-related air contaminants in nearby residential areas; and,
3. Quantify background ambient levels of air contaminants in the area.

3 METHODOLOGY

The following sections summarize the monitoring locations, instrumentation installed at each location, protocols followed to ensure the instrumentation operated properly during the monitoring program, and the analytical methods undertaken to assess ambient concentrations from each sample.

3.1 Monitoring Locations

The general area for the three (3) monitoring stations is shown on a map of DYEC in **Figure 1**, which also includes a yearly wind rose with data from January 1 to December 31, 2018 from the Courtice and Rundle meteorological stations. Photographs showing each station are presented below in **Figures 2, 3**, and **4**.

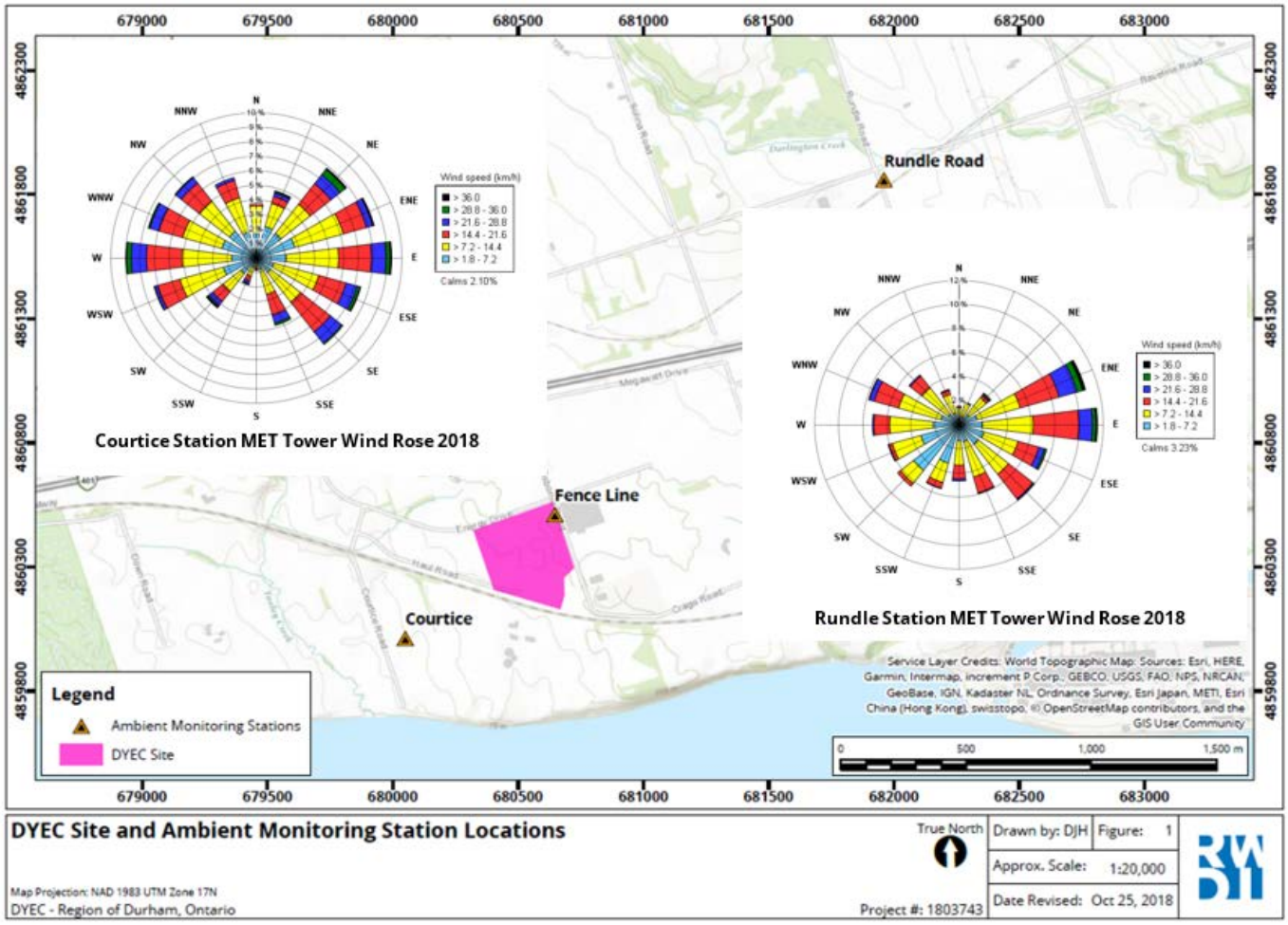


Figure 2. Rundle Road Station

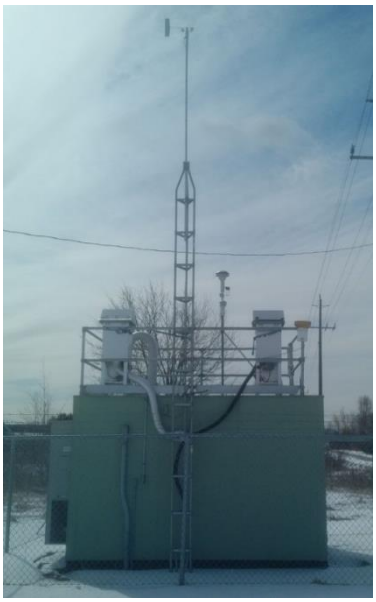


Figure 3. Courtice Station

Figure 4. Fence Line Station

3.2 Field Instrumentation

Monitoring at the Courtice and Rundle Stations for the calendar year 2018 commenced on January 1, 2018 for continuous and discrete sampling. Monitoring at the Fence Line Station for the calendar year 2018, commenced on January 1, 2018 for discrete sampling.

The two (2) continuous monitoring stations, Courtice and Rundle, are both equipped with the following continuous monitors: Teledyne T200 Nitrogen Oxide Analyzer Model (NO_X analyzer), Teledyne T100 Sulfur Dioxide Analyzer and Thermo Scientific Model 5030 SHARP Monitor (SHARP) with a $PM_{2.5}$ inlet head. Courtice and Rundle stations also have the following periodic monitors: High Volume (Hi-Vol) Air Sampler outfitted with a total suspended particulate (TSP) inlet capable of collecting particulate of all aerodynamic diameters and a Tisch TE-1000 sampler used to collect dioxins and furans (D&F) and polycyclic aromatic hydrocarbons (PAHs) using a polyurethane foam plug. The Fence Line Station has a Hi-Vol outfitted with a TSP inlet capable of collecting particulate of all aerodynamic diameters.

The two (2) continuous monitoring stations, Courtice and Rundle, also collect continuous meteorological parameters. Courtice is equipped with the following continuous monitors: Campbell Scientific Model HMP60 (temperature/relative humidity), Campbell Scientific Model CS106 (atmospheric pressure), Texas Electronic TE525M (precipitation). The Courtice Wastewater Treatment Plant collects wind speed and direction from the meteorological tower located adjacent to the Courtice Monitoring Station. The wind speed and direction data are provided to RWDI upon request from the Region of Durham. The Rundle Station is equipped with the following continuous monitors: Campbell Scientific Model HMP60 (temperature/relative humidity), Texas Electronic TE525M (precipitation) and Met One Instruments Inc. Model 034B (wind speed and direction). On December 20, 2018 the Met One Model 034B wind head, which malfunctioned, was replaced with a RM Young Model 05103-10 wind head.

3.3 Field Operations

RWDI representatives were responsible for completing the following:

- Day-to-day changing of the filters where applicable;
- Field notes and observations recording;
- General and preventative maintenance of the units (e.g., flow calibrations, motor replacements for repair purposes, etc.);
- Troubleshooting maintenance and repairs when problems were encountered;
- Routine cleaning of the SHARP sample lines;
- Completion of chain of custody forms for submission to ALS Laboratories in Burlington, ON; and
- Preparation of the media for shipment to ALS Laboratories using MECP accepted methods.

The samplers were operated according to the Operations Manual for Air Quality Monitoring in Ontario published by the MECP (January 2018) and the Ambient Air Quality Monitoring Plan. RWDI adhered to the manual for any operational changes conducted during the contract period.

3.4 Sample Schedules

Monitoring at the Courtice, Rundle and Fence Line Stations for the 2018 calendar year commenced on January 1, 2018 for continuous and discrete sampling. Discrete samplers for TSP and Metals operated on the six-day National Air Pollution Surveillance (NAPS) schedule that is approved by the MECP. Discrete samplers for PAHs and D&F operated on the twelve-day NAPS schedule that is approved by the MECP. Every twelve days, the PUF plugs and filters are analyzed for PAH's, and every twenty-four days they are analyzed for both PAHs and D&Fs. A copy of the schedule can be found in **Appendix A**. The individual sample duration was 24-hours (midnight to midnight).

3.5 Analytical Methods

3.5.1 Synchronized Hybrid Ambient Real-time Particulate Monitor (SHARP)

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.

3.5.2 Nitrogen Oxide Analyzer

The Teledyne T200 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.

3.5.3 Sulphur Dioxide Analyzer

The Teledyne T100 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.

3.5.4 High Volume Air Sampler (Hi-Vol)

The Tisch TE-5170 TSP Hi-Vol air samplers were outfitted with a TSP 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. The Hi-Vols have Teflon coated glass fibre filters that are outfitted at the top of the sampler, and air is drawn through the filter, thereby collecting all TSP. All of the TSP Hi-Vols operate on a six-day cycle, each consisting of 24-hour (midnight to midnight) samples, concurrent with the NAPS schedule. Each Hi-Vol is calibrated every three months (Quarterly) to ensure accuracy and validity of the volume of air drawn through the filter.

The Teflon coated glass fibre filter media is pre and post weighed by ALS Laboratories in Burlington, Ontario. The filters are then analyzed for total particulate weight, metals analysis and mercury. The specific list of metals analyzed can be found in Table 3 and the list and rationale is also provided in the Ambient Air Quality Monitoring Plan (Stantec, 2012).

3.5.5 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. At the start of August, the PUF media was changed to include two PUF plugs enclosing XAD material. This was a recommendation from ALS Laboratories to achieve lower detection limits due to the stability of the compounds being absorbed into the XAD material. 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. All PUF samplers operate on a twelve-day cycle, each consisting of 24-hour (midnight to midnight) samples, concurrent with the NAPS schedule. Every twelve days, the PUF plugs and filters are analyzed for PAH's, and every twenty-four days they are analyzed for both PAH's and D&F's. Each PUF sampler is calibrated every three months (Quarterly) to ensure accuracy and validity of the volume of air drawn through the filters.

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. The specific list of PAHs and D&F analyzed can be found in Tables 4 & 5 and the list and rationale is also provided in the Ambient Air Quality Monitoring Plan (Stantec, 2012).

3.6 Equipment Calibrations and Audits

Calibrations were performed every time equipment, such as motors and mass flow controllers, were replaced. After calibrating, when necessary, the units were slightly adjusted to ensure optimal performance and thus data accuracy. Non-continuous monitors were calibrated at a minimum quarterly. RWDI has implemented monthly calibrations for all non-continuous monitors. Continuous monitors were calibrated monthly. This meets the recommended calibration schedule outlined in the MECP Operations Manual for Air Quality Monitoring in Ontario (MECP, 2018).

Audits of the continuous monitoring equipment were completed quarterly, and discrete monitoring equipment audits were completed semi-annually for each station to ensure the equipment operated according to MECP requirements.

3.7 MECP Audits

A third party audit was completed on all continuous analyzers at the Courtice and Rundle Monitoring Stations on March 22nd, 2018 by Colman Wong from the MECP. Results from the audit indicated that all the equipment was working within MECP requirements at both Courtice and Rundle Monitoring Stations.

A second audit was completed on all continuous analyzers and periodic samplers at the Courtice, Rundle and Fence Line Monitoring Stations on June 6th, 2018 by Colman Wong from the MECP. Results from the audit indicated that all the equipment was working within MECP requirements at Courtice, Rundle and Fence Line Monitoring Stations.

A third audit was completed on all continuous analyzers at the Courtice and Rundle Monitoring Stations on September 26th, 2018 by Colman Wong from the MECP. Results from the audit indicated that all the equipment was working within MECP requirements at Courtice and Rundle Monitoring Stations.

The final Q4 audit was completed on all continuous analyzers and periodic samplers at the Courtice and Rundle Monitoring Stations on December 20, 2018 by Colman Wong from the MECP. Results from the audit indicated that all continuous analyzers, with the exception of the NO_X analyzers at Courtice and Rundle Stations was working within MECP requirements. Results from the audit indicated that all periodic samplers, with the exception of the Hi-Vol TSP sampler at Courtice Monitoring Station, was working within MECP requirements. The identified cause of the audit failure for the NO_X analyzers at both monitoring stations was due to a contaminated calibration cylinder. This issue was corrected on December 28, 2018 when the units were calibrated using a cylinder free of contamination. The MECP rechecked the NOx analyzers during the next audit on February 15th, 2019, this confirmed that the instruments were operating properly as per the noted correction made. The NO_X data affected by the contaminated cylinder had span adjustments applied and no data was lost. The failure of the

Hi-Vol TSP sampler at the Courtice Station was likely due to human error during the calibration on November 8, 2018. The Courtice Hi-Vol TSP sampler was re-calibrated on December 21, 2018. In consultation with the MECP, the flow controller was operating properly but was adjusted to a flow outside of the acceptable range (40cfm +/- 4 cfm). As a result, the MECP recommended that the sample volumes be corrected to account for the flow adjustment. As outlined in U.S EPA IO-2.1 the high-volume sampler was still operating within the acceptable range to collect total suspended particulate matter (39-60 cfm). The flow requirement of 40cfm (+/- 4 cfm) is an MECP requirement.

4 EQUIPMENT REPLACEMENT / FAILURES

4.1 Courtice Road Station

Stantec reported in Q1 "No issues were encountered with the continuous monitors during Q1 2018". However, issues were encountered with the non-continuous monitors at all three stations. The samples from February 25 to March 27, 2018 at Rundle Station were invalidated as the volumetric flow rate was determined to be outside of the acceptable range. The sample on February 13, 2018 at Courtice Station was invalidated as the volumetric flow rate was determined to be outside of the acceptable range.

Stantec reported in Q2 "No issues were encountered with the continuous monitors during Q2, 2018 except on April 14 through April 16, when a rain/ice storm caused the anemometer at Rundle Station and the rain gauges at both Rundle Road and Courtice Station to freeze." (Stantec, 2018). Therefore, the anemometer at Rundle Station and the rain gauges at Courtice Station were not operational."

Due to time based drift between the NO_X and SO_2 unit time prompting overnight IZS response and the datalogger time recording the response, the overnight IZS response periodically spanned over 15 min of the 23:00-00:00 or 00:00-01:00 hour. Since 75% valid data was not captured, there was not enough sample size required for the hour to be valid. This occurred periodically throughout Q3 until both times were synced up together.

On July 19, 2018 a takeout calibration was performed on the temporary NO_X analyzer at Courtice Station and was removed. The original NO_X analyzer was reinstalled and calibrated after service and maintenance was performed. A takeout calibration was performed on the original SO_2 analyzer and was removed for service and maintenance. A temporary analyzer was installed and calibrated in its place.

The TSP sample on July 19, 2018 was invalid due to what is believed to be poor filter condition issues noting water spots and 2 large tears around 2 edges by Stantec field staff.

On July 26, 2018 it was noted that there was a plant wide power shut down at the Courtice Wastewater Treatment Plant that resulted in one hour of station data loss from 09:00-10:00. On this day the temporary SO_2 analyzer was removed and the original analyzer was reinstalled after service and maintenance was performed.

Shortly after RWDI began operating the Region of Durham stations, the data plans associated with the modems installed at the stations were discontinued and new modems and SIM cards were to be installed. On August 20, 2018 new modems were being installed at the Courtice and Rundle Stations and there were short term power losses to the loggers associated with the installation, which subsequently corrupted the non-volatile memory of the CR1000 loggers. This should not have occurred with a logger with non-volatile memory, and after troubleshooting with Campbell Scientific to recover the data, all attempts at recovery were unsuccessful. Data was recovered from the unit DAS systems from the SHARP and Teledyne units which was successful, however it produced data at either 5 minute or 1 hour intervals, and did not show any of the IZS data. $PM_{2.5}$, NO_X and SO_2 data were inserted from the unit DAS between August 8, 2018 at 07:00 and August 20, 2018 at 12:00.

The PAH/D&F sample on August 30, 2018 was invalid as the GFI had tripped resulting in the PUF unit not running on that sample day.

On September 3, 2018, it was noted that the permeation device in the SO_2 unit at the station was depleting and was subsequently replaced on September 18, 2018.

On September 18, 2018 the overnight IZS sequence was changed from spanning from 23:45 (on one day) to 00:10 (on the following day), to 00:45 to 01:10 on the same day.

On September 20, 2018, there was a suspected loss of power to the entire station for one hour from 09:00-10:00.

Due to time based drift between the NO_X and SO_2 unit time prompting overnight IZS response and the datalogger time recording the response, the overnight IZS response periodically spanned over 15 min of the 00:00-01:00 or 01:00-02:00 hour. Since 75% valid data was not captured, there was not enough sample size required for the hour to be valid. This occurred periodically throughout Q4 until both times were synced up together. This issue was corrected by November 21, 2018.

On November 13 the $PM_{2.5}$, NO_X and SO_2 units were set up on a remote DAS. The SO_2 analyzer was changed out and replaced from the decommissioned Crago Station. The station did not record data from 09:00 to 15:00.

The PAH sample on November 22, 2018 was invalid due to a large sample volume collected.

On December 30th, 2018 the $PM_{2.5}$ unit had a tape break occur. The tape was replaced by 18:00 on January 3, 2019.

4.2 Rundle Road Station

Stantec reported in Q1 “No issues were encountered with the continuous monitors during Q1 2018”. However, issues were encountered with the non-continuous monitors at all three stations. An issue was encountered in which TSP/Metals Hi-Vol sampler mass flow controllers were incorrectly set for some samples, resulting in

volumetric flow rates that were outside their valid range. These samples were therefore considered invalid. The samples from February 25 to March 27, 2018 at Rundle Station were invalidated as the volumetric flow rate was determined to be outside of the acceptable range.

On January 8, 2018 the TSP sample was invalidated as a power failure occurred at the station.

On January 14, 2018 the PUF sample was invalidated due to a failure of the time recorder.

Stantec reported in Q2 "No issues were encountered with the continuous monitors during Q2, 2018 except on April 14 through April 16, when a rain/ice storm caused the anemometer at Rundle Station and the rain gauges at both Rundle Road and Courtice Station to freeze." (Stantec, 2018). The TSP samples from April 2 and April 8, 2018 were invalidated as the volumetric flow rate was determined to be outside of the acceptable range.

Due to time based drift between the SO_2 unit time prompting overnight IZS response and the datalogger time recording the response, the overnight IZS response periodically spanned over 15 min of the 23:00-00:00 or 00:00-01:00 hour. Since 75% valid data was not captured, there was not enough sample size required for the hour to be valid. This occurred periodically throughout Q3 until both times were synced up together.

On July 19, 2018 a takeout calibration was performed on the original NO_X analyzer at the station and was removed for service and maintenance. A temporary NO_X analyzer was installed and calibrated. A takeout calibration was performed on the temporary SO_2 analyzer and it was removed. The original analyzer was reinstalled after service and maintenance and was calibrated. During this day, the Meteorological tower onsite was lowered and the anemometer and wind vane was serviced by Stantec. The tower length was also increased to 10 meters. The wind vane required repair which was performed the morning of July 20, 2018 and was put online later that morning.

Shortly after RWDI began operating the Region of Durham stations, the data plans associated with the modems installed at the stations were discontinued and new modems and SIM cards were to be installed. On August 20, 2018 new modems were being installed at the Courtice and Rundle Stations and there were short term power losses to the loggers associated with the installation, which subsequently corrupted the non-volatile memory of the CR1000 loggers. This should not have occurred with a logger with non-volatile memory, and after troubleshooting with Campbell Scientific to recover the data, all attempts at recovery were unsuccessful. Data was recovered from the unit DAS systems from the SHARP and Teledyne units which was successful, however it produced data at either 5 minute or 1 hour intervals, and did not show any of the IZS data. $PM_{2.5}$, NO_X and SO_2 data were inserted from the unit DAS between August 8, 2018 at 07:00 and August 22, 2018 at 20:00. Some SO_2 data was not recoverable from the unit DAS system and is missing from August 8, 2018 at 07:00 to August 15, 2018 at 16:00.

On August 30-31, 2018 and September 11-13, 2018, the IZS sequence for the NO_X and SO_2 analyzers were disabled due to unknown causes.

On September 18, 2018 the overnight IZS sequence was changed from spanning from 23:45 (on one day) to 00:10 (on the following day), to 00:45 to 01:10 on the same day.

On September 20, 2018, there was a suspected loss of power to the entire station for one hour from 09:00-10:00.

Due to time based drift between the SO_2 unit time prompting overnight IZS response and the datalogger time recording the response, the overnight IZS response periodically spanned over 15 min of the 00:00-01:00 or 01:00-02:00 hour. Since 75% valid data was not captured, there was not enough sample size required for the hour to be valid. This occurred periodically throughout Q4 until both times were synced up together. This issue was corrected by November 21, 2018.

The TSP sample on November 10, 2018 was invalid due to a motor failure.

On November 13, 2018 the NO_X and SO_2 units were set up on a remote DAS. The station did not record data from 09:00 to 20:00. Although the Courtice Station began reporting again at 15:00 on November 13, 2018 the Rundle Station did not start until 20:00 on November 13, 2018 which is thought to be due to a communication error between the logger and computer that corrected itself.

From November 15, 2018 to December 12, 2018 the anemometer malfunctioned therefore the wind direction and speed for this time period was invalidated.

On November 21, 2018 there was a suspected power loss from 16:00 to 19:00.

On November 30, 2018 there was a suspected power loss from 15:00 to 16:00.

The TSP sample on December 10, 2018 was invalid due to an insufficient sample volume collected.

4.3 Fence Line Station

Stantec reported in Q1 "No issues were encountered with the continuous monitors during Q1 2018. However, issues were encountered with the non-continuous monitors at all three stations. An issue was encountered in which TSP/Metals Hi-Vol sampler mass flow controllers were incorrectly set for some samples, resulting in volumetric flow rates that were outside their valid range. These samples were therefore considered invalid. The samples on February 1, February 25, and March 3, 2018 at Fence Line Station were invalidated.

A Hi-Vol sampler motor failure at the Fence Line Station and improperly set mass flow controller at Fence Line Station were the only issues encountered in Q2 2018. On May 14, 2018 the TSP sample was invalidated due to the volumetric flow rate falling outside of the acceptable range. On May 26, 2018 the TSP sample was invalidated as a power failure occurred at the Fence Line station.

On July 25, 2018 the TSP sample was invalid as per Stantec field staff's notes due to a tripped GFI, resulting in the Hi-Vol unit not running on that sample day.

The TSP sampling ceased on December 4, 2018 at the Fence Line station therefore no samples were collected after this date.

5 RESULTS

Ambient air quality monitoring results of all contaminants sampled for the stations are discussed herein. The stations consisted of the Courtice Monitoring Station, Rundle Monitoring Station and Fence Line Monitoring Station for January 1 through December 31 of 2018.

Table 1 below presents the number and percentage of valid samples collected at each sampling site by monitoring equipment. Data recovery above 75% is considered acceptable. Data recovery was 82% or higher at each station for all contaminants.

Table 1: Summary of Data Recovery by Sampling Site and Monitoring Equipment

Station	Monitoring Equipment	Total Possible # of Hours or Samples	# of Valid Samples Collected	Percentage of Valid Samples (%)	Overall Percentage of Valid Samples for the Station (%)
Courtice Monitoring Station	$PM_{2.5}$	8760	8656	98.8	**97.1**
	NO_X	8760	8617	98.4	
	NO	8760	8617	98.4	
	NO_2	8760	8617	98.4	
	SO_2	8760	8618	98.4	
	TSP & Metals	61	59	96.7	
	PAHs	31	29	93.5	
	D&F	16	15	93.8	
Rundle Monitoring Station	$PM_{2.5}$	8760	8697	99.3	**96.5**
	NO_X	8760	8669	99.0	
	NO	8760	8669	99.0	
	NO_2	8760	8669	99.0	
	SO_2	8760	8466	96.6	
	TSP & Metals	61	50	82.0	
	PAHs	31	30	96.8	
	D&F	16	16	100.0	
Fence Line Monitoring Station	TSP & Metals	57[1]	51	89.5	**89.5**

Notes: [1] Fence Line Station has a total number of possible samples of 57 as it was decommissioned after the final December 4th, 2018 sample.

Table 2 presents a summary of the continuous sampling statistics at each station for the year 2018. Two sets of criteria were used for direct comparison to the 2018 air quality data. The first are regulatory limits, all results were compared to their applicable one-hour (1), twenty-four (24) hour, annual Schedule 3 Standards of O.Reg. 419/05, Schedule 6 Upper Risk Thresholds (URT) of O.Reg. 419/05, Ontario Ambient Air Quality Criteria (AAQC). SO_2 and NO_2 were also compared to the applicable one-hour (1) and annual Canadian Ambient Air Quality Standard (CAAQS) where possible. These standards were developed by the Canadian Council of Ministers of the Environment (CCME) and released in 2018. The second set were developed in the Human Health Risk Assessment (HHRA) which was required as part of the Environmental Assessment of the facility.

Table 2: Summary of Statistics for Continuous Sampling Contaminant Levels at Each Station for 2018

Station	Contaminant	Annual Arithmetic Mean	Annual AAQC / HHRA	Events > Annual AAQC / HRRA	Annual CAAQS	Events > Annual CAAQS	Max 1-hr	1-hr AAQC/ HHRA	Events > 1-hr AAQC / HHRA	1-hr CAAQS	Events > 1-hr CAAQS	Max 24-hr	24-hr AAQC / HHRA	Events > 24-hr AAQC / HHRA	98th Percentile [2]
Courtice Monitoring Station	$PM_{2.5}$ (µg/m^3)	6			10[3]	N/A [4]	65					35[1]	28[1]	N/A	19
	NO_X (ppb)	8					87					36			
	NO (ppb)	2					69					17			
	NO_2 (ppb)	6			17.0[5]	0	71	200	0	60	N/A [6]	21	100	0	
	SO_2 (ppb)	2.7	20 / 11	0	5.0[5]	0	96	250	0	70	N/A [6]	17	100	0	
Rundle Monitoring Station	$PM_{2.5}$ (µg/m^3)	6			10[3]	N/A [4]	68					31[1]	28[1]	N/A	19
	NO_X (ppb)	7					74					32			
	NO (ppb)	2					54					12			
	NO_2 (ppb)	5			17.0[5]	0	38	200	0	60	N/A [6]	21	100	0	
	SO_2 (ppb)	0.7	20 /11	0	5.0[5]	0	66	250	0	70	N/A [6]	8	100	0	

Notes:

[1] – The Canadian Ambient Air Quality Standard (CAAQS) requires averaging the 98th percentile daily average concentrations over three years which is not addressed in this report as it covers January 1st to December 31st, 2018.

[2] – This value is the 98th percentile of daily average levels for the 2018 year.

[3] – Annual CAAQ Standard for Respirable Particulate Matter, effective by 2015. The Respirable Particulate Matter Objective is referenced to the 3-year average of the annual average concentrations.

[4] - Annual $PM_{2.5}$ concentrations not compared to CAAQS as a 3-year average of the annual average concentrations compared to the 12-month period is required and this report covers January 1st to December 31, 2018.

[5] – The CCME developed Canadian Ambient Air Quality Standards (CAAQS) for SO_2 and NO_2 released in 2018 for 1-hour and annual averaging periods, effective by 2020.

[6] – To compare to the 1-hour Canadian Ambient Air Quality Standards (CAAQS) for SO_2 and NO_2 the 3-year average of the annual 98th percentile of the daily maximum 1-hour average concentrations is required. Since this report covers January 1st to December 31, 2018 this comparison is not provided.

Table 3 presents a summary of the discrete sampling statistics at each station for the 2018 year for TSP and Metals at all three (3) Monitoring Stations. All results were compared to the applicable twenty-four (24) hour AAQC.

Table 3: Summary of Statistics for Discrete Sampling of TSP and Metal Contaminant Levels at Courtice, Rundle and Fence Line Monitoring Stations for 2018

Contaminant	Units	AAQC	HHRA	Courtice Monitoring Station				Rundle Monitoring Station				Fence Line Monitoring Station			
				Geometric Mean	Arithmetic Mean	Maximum 24-hour	No. of Elevated Readings	Geometric Mean	Arithmetic Mean	Maximum 24-hour	No. of Elevated Readings	Geometric Mean	Arithmetic Mean	Maximum 24-hour	No. of Elevated Readings
Particulate (TSP)	µg/m³	120	120	20.4	24.3	84.7	0	39.0	53.0	203.6	4	30.6	36.4	93.6	0
Total Mercury (Hg)	µg/m³	2	2	7.56E-06	9.92E-06	4.19E-05	0	8.01E-06	1.20E-05	9.83E-05	0	1.02E-05	1.53E-04	7.20E-03	0
Aluminum (Al)	µg/m³	4.8	-	9.91E-02	1.32E-01	8.95E-01	0	1.99E-01	3.03E-01	1.42E+00	0	1.48E-01	2.06E-01	9.27E-01	0
Antimony (Sb)	µg/m³	25	25	1.73E-03	2.37E-03	7.14E-03	0	1.47E-03	2.68E-03	2.64E-02	0	1.91E-03	2.37E-03	4.14E-03	0
Arsenic (As)	µg/m³	0.3	0.3	1.50E-03	1.65E-03	4.29E-03	0	1.50E-03	1.91E-03	2.06E-02	0	1.45E-03	1.55E-03	2.48E-03	0
Barium (Ba)	µg/m³	10	10	6.01E-03	6.90E-03	1.89E-02	0	7.73E-03	9.11E-03	2.58E-02	0	8.27E-03	9.50E-03	2.31E-02	0
Beryllium (Be)	µg/m³	0.01	0.001	1.40E-04	2.69E-04	1.56E-03	0	1.33E-04	2.61E-04	1.81E-03	0	1.45E-04	2.74E-04	1.73E-03	0
Bismuth (Bi)	µg/m³	-	-	1.17E-03	1.46E-03	4.29E-03	-	1.11E-03	1.35E-03	2.63E-03	-	1.17E-03	1.40E-03	2.48E-03	-
Boron (B)	µg/m³	120	-	4.42E-03	6.28E-03	1.31E-02	0	4.86E-03	6.91E-03	1.33E-02	0	4.40E-03	6.53E-03	2.60E-02	0
Cadmium (Cd)	µg/m³	0.025	0.025	6.63E-04	6.83E-04	1.90E-03	0	6.72E-04	7.29E-04	4.73E-03	0	6.63E-04	6.75E-04	1.59E-03	0
Chromium (Cr)	µg/m³	0.5	-	2.61E-03	3.15E-03	9.50E-03	0	3.00E-03	3.58E-03	8.20E-03	0	3.65E-03	4.56E-03	1.17E-02	0
Cobalt (Co)	µg/m³	0.1	0.1	6.51E-04	6.62E-04	1.43E-03	0	6.45E-04	6.47E-04	8.77E-04	0	6.41E-04	6.43E-04	8.27E-04	0
Copper (Cu)	µg/m³	50	-	1.70E-02	1.98E-02	4.55E-02	0	1.51E-02	1.84E-02	6.15E-02	0	1.48E-02	1.83E-02	7.23E-02	0
Iron (Fe)	µg/m³	4	-	2.91E-01	3.82E-01	2.53E+00	0	4.50E-01	6.16E-01	2.97E+00	0	3.82E-01	4.97E-01	1.80E+00	0
Lead (Pb)	µg/m³	0.5	0.5	1.68E-03	2.15E-03	1.43E-02	0	2.05E-03	1.02E-02	3.96E-01	0	2.17E-03	2.76E-03	8.66E-03	0
Magnesium (Mg)	µg/m³	-	-	1.41E-01	1.86E-01	1.21E+00	-	2.75E-01	3.97E-01	2.10E+00	-	2.27E-01	3.00E-01	1.31E+00	-
Manganese (Mn)	µg/m³	0.4	-	7.86E-03	1.05E-02	7.25E-02	0	1.25E-02	1.87E-02	1.13E-01	0	1.27E-02	1.84E-02	7.81E-02	0
Molybdenum (Mo)	µg/m³	120	-	1.01E-03	1.24E-03	7.69E-03	0	8.97E-04	1.07E-03	6.26E-03	0	1.15E-03	1.47E-03	1.07E-02	0
Nickel (Ni)	µg/m³	0.2	-	1.04E-03	1.10E-03	3.85E-03	0	1.15E-03	1.26E-03	3.26E-03	0	1.13E-03	1.23E-03	3.50E-03	0
Phosphorus (P)	µg/m³	-	-	6.77E-02	1.92E-01	1.08E+00	-	1.06E-01	2.49E-01	1.75E+00	-	7.68E-02	2.30E-01	1.57E+00	-
Selenium (Se)	µg/m³	10	10	3.26E-03	3.31E-03	7.14E-03	0	3.23E-03	3.24E-03	4.39E-03	0	3.21E-03	3.22E-03	4.14E-03	0
Silver (Ag)	µg/m³	1	1	8.23E-04	1.16E-03	3.57E-03	0	8.00E-04	1.23E-03	1.06E-02	0	8.26E-04	1.11E-03	2.07E-03	0
Strontium (Sr)	µg/m³	120	-	3.45E-03	4.39E-03	1.73E-02	0	9.29E-03	1.43E-02	5.82E-02	0	6.28E-03	8.17E-03	2.93E-02	0
Thallium (Tl)	µg/m³	-	-	4.43E-04	2.07E-03	7.14E-03	-	3.69E-04	1.83E-03	4.39E-03	-	4.61E-04	1.98E-03	4.14E-03	-
Tin (Sn)	µg/m³	10	10	1.80E-03	2.41E-03	7.14E-03	0	1.64E-03	2.74E-03	3.09E-02	0	1.89E-03	2.37E-03	4.14E-03	0
Titanium (Ti)	µg/m³	120	-	4.90E-03	6.28E-03	3.19E-02	0	8.99E-03	1.32E-02	5.57E-02	0	7.01E-03	1.00E-02	4.29E-02	0
Uranium (Ur)	µg/m³	0.3	-	7.88E-05	1.25E-04	1.64E-03	0	7.68E-05	9.88E-05	1.97E-04	0	8.13E-05	1.03E-04	1.86E-04	0
Vanadium (V)	µg/m³	2	1	1.63E-03	1.66E-03	3.57E-03	0	1.73E-03	2.02E-03	1.88E-02	0	1.68E-03	1.95E-03	1.90E-02	0
Zinc (Zn)	µg/m³	120	-	2.77E-02	3.45E-02	1.86E-01	0	2.57E-02	3.12E-02	1.12E-01	0	2.65E-02	3.08E-02	1.55E-01	0
Zirconium (Zr)	µg/m³	20	-	1.13E-03	1.30E-03	3.57E-03	0	1.06E-03	1.19E-03	2.19E-03	0	1.14E-03	1.26E-03	2.07E-03	0

Table 4 presents a summary of the discrete sampling statistics at Courtice and Rundle Stations for the 2018 year for PAHs. All results were compared to the applicable twenty-four (24) hour AAQC.

Table 4: Summary of Statistics for Discrete Sampling of PAH Contaminant Levels at Courtice and Rundle Stations for 2018

Contaminant	Units	AAQC	HHRA	Courtice Monitoring Station			Rundle Monitoring Station		
				Arithmetic Mean	Maximum 24-hour	No. of Elevated Readings	Arithmetic Mean	Maximum 24-hour	No. of Elevated Readings
1-Methylnaphthalene	ng/m^3	12000	-	3.77E+00	2.18E+01	0	6.44E+00	2.66E+01	0
2-Methylnaphthalene	ng/m^3	10000	-	6.41E+00	3.99E+01	0	1.23E+01	5.41E+01	0
Acenaphthene	ng/m^3	-	-	2.22E+00	2.02E+01	-	6.37E+00	4.04E+01	-
Acenaphthylene	ng/m^3	3500	-	1.75E-01	5.62E-01	-	2.11E-01	6.27E-01	0
Anthracene	ng/m^3	200	-	1.54E-01	7.72E-01	0	4.09E-01	2.62E+00	0
Benzo(a)Anthracene	ng/m^3	-	-	6.86E-02	1.22E-01	-	7.21E-02	1.46E-01	-
Benzo(a)fluorene	ng/m^3	-	-	1.36E-01	2.43E-01	-	1.51E-01	2.91E-01	-
Benzo(a)Pyrene	ng/m^3	0.05 [1] 5 [2] 1.1 [3]	1	3.20E-02	1.81E-01	5	3.39E-02	1.39E-01	7
Benzo(b)Fluoranthene	ng/m^3	-	-	8.19E-02	2.90E-01	-	8.13E-02	1.46E-01	-
Benzo(b)fluorene	ng/m^3	-	-	1.33E-01	2.43E-01	-	1.39E-01	2.91E-01	-
Benzo(e)Pyrene	ng/m^3	-	-	1.38E-01	2.43E-01	-	1.43E-01	2.91E-01	-
Benzo(g,h,i)Perylene	ng/m^3	-	-	7.42E-02	1.22E-01	-	7.96E-02	1.46E-01	-
Benzo(k)Fluoranthene	ng/m^3	-	-	7.09E-02	1.22E-01	-	7.91E-02	1.46E-01	-
Biphenyl	ng/m^3	-	-	1.99E+00	1.01E+01	-	3.14E+00	1.32E+01	-
Chrysene	ng/m^3	-	-	9.76E-02	3.02E-01	-	9.88E-02	2.37E-01	-
Dibenzo(a,h)Anthracene	ng/m^3	-	-	6.47E-02	1.22E-01	-	6.60E-02	1.46E-01	-
Fluoranthene	ng/m^3	-	-	7.36E-01	3.28E+00	-	2.13E+00	1.35E+01	-
Indeno(1,2,3-cd)Pyrene	ng/m^3	-	-	7.23E-02	1.22E-01	-	8.05E-02	1.46E-01	-
Naphthalene	ng/m^3	22500	22500	1.98E+01	7.78E+01	0	2.45E+01	7.42E+01	0
o-Terphenyl	ng/m^3	-	-	1.30E-01	2.43E-01	-	1.33E-01	2.91E-01	-
Perylene	ng/m^3	-	-	1.25E-01	2.43E-01	-	1.27E-01	2.91E-01	-
Phenanthrene	ng/m^3	-	-	3.30E+00	2.16E+01	-	9.53E+00	5.81E+01	-
Pyrene	ng/m^3	-	-	3.34E-01	1.35E+00	-	8.93E-01	5.38E+00	-
Tetralin	ng/m^3	-	-	1.68E+00	4.64E+00	-	1.99E+00	7.67E+00	-
Total PAH [4]	ng/m^3	-	-	4.19E+01	2.04E+02	-	6.93E+01	2.92E+02	-

Notes:
[1] – Ontario Ambient Air Quality Criteria. The Standard for benzo(a)Pyrene (B(a)P) is for B(a)P as a surrogate for PAHs.
[2] – O.Reg. 419/05 Schedule 6 Upper Risk Thresholds
[3]- O.Reg. 419/05 24 Hour Guideline

Table 5 presents a summary of the discrete sampling statistics at Courtice and Rundle Stations for the 2018 year for D&F. All results were compared to the applicable twenty-four (24) hour AAQC.

Table 5: Summary of Statistics for Discrete Sampling of D&F Contaminant Levels at Courtice and Rundle Stations for 2018

Contaminant	Units	AAQC	HHRA	Courtice Monitoring Station			Rundle Monitoring Station		
				Arithmetic Mean	Maximum 24-hour	Number of Elevated Readings	Arithmetic Mean	Maximum 24-hour	Number of Elevated Readings
2,3,7,8-TCDD	pg/m^3	-	-	3.34E-03	5.81E-03	-	3.58E-03	6.90E-03	-
1,2,3,7,8-PeCDD	pg/m^3		-	4.01E-03	9.14E-03	-	4.47E-03	1.57E-02	-
1,2,3,4,7,8-HxCDD	pg/m^3		-	1.61E-03	8.23E-03	-	1.70E-03	8.96E-03	-
1,2,3,6,7,8-HxCDD	pg/m^3	-	-	2.07E-03	1.06E-02	-	1.83E-03	7.46E-03	-
1,2,3,7,8,9-HxCDD	pg/m^3	-	-	1.88E-03	9.22E-03	-	2.26E-03	7.84E-03	-
1,2,3,4,6,7,8-HpCDD	pg/m^3	-	-	1.79E-02	1.07E-01	-	2.13E-02	1.42E-01	-
OCDD	pg/m^3	-	-	5.19E-02	3.10E-01	-	6.33E-02	3.93E-01	-
2,3,7,8-TCDF	pg/m^3	-	-	2.44E-03	1.98E-02	-	2.20E-03	1.41E-02	-
1,2,3,7,8-PeCDF	pg/m^3	-	-	1.60E-03	1.16E-02	-	1.42E-03	7.84E-03	-
2,3,4,7,8-PeCDF	pg/m^3	-	-	4.24E-03	2.87E-02	-	3.81E-03	2.72E-02	-
1,2,3,4,7,8-HxCDF	pg/m^3	-	-	2.47E-03	1.83E-02	-	2.25E-03	1.38E-02	-
1,2,3,6,7,8-HxCDF	pg/m^3	-	-	1.67E-03	8.28E-03	-	1.98E-03	8.92E-03	-
2,3,4,6,7,8-HxCDF	pg/m^3		-	2.49E-03	9.47E-03	-	2.00E-03	8.21E-03	-
1,2,3,7,8,9-HxCDF	pg/m^3		-	2.05E-03	1.11E-02	-	2.00E-03	9.70E-03	-
1,2,3,4,6,7,8-HpCDF	pg/m^3	-	-	3.67E-03	1.94E-02	-	5.76E-03	6.10E-02	-
1,2,3,4,7,8,9-HpCDF	pg/m^3	-	-	1.60E-03	1.01E-02	-	1.44E-03	1.06E-02	-
OCDF	pg/m^3	-	-	2.63E-03	1.29E-02	-	3.01E-03	2.62E-02	-
Total Toxic Equivalency	pg/m^3	0.1 [1] 1 [2]	-	1.91E-02	1.09E-01	1	1.90E-02	9.13E-02	0

Notes:

[1] – O.Reg. 419/05 Schedule 3 Standard phased in after July 1, 2016

[2] – O.Reg.419/05 Schedule 6 Upper Risk Thresholds

Detailed results of the all continuous and discrete sampling throughout the year are included in **Appendix B** and **C**, respectively.

5.1 Courtice Monitoring Station

Courtice Monitoring Station had no exceedances for TSP or Metals over the daily AAQC during the 2018 year.

Courtice Monitoring Station observed five (5) exceedances over the daily AAQC for Benzo(a)pyrene of 0.05 ng/m^3 during the 2018 year. The exceedances occurred on January 2, February 7, May 2, May 26, and December 4, 2018 with respective 24-hour average values of 5.42E-02 ng/m^3, 7.39E-02, 5.75E-02 ng/m^3, 1.81E-01 ng/m^3 and 6.72E-02 ng/m^3. The percentage above the applicable criteria and predominant wind direction is detailed below in Table 6. Courtice Monitoring Station had no other PAH exceedances, with the exception of Benzo(a)pyrene, over the daily AAQC during the 2018 year.

Table 6: Percentage Above Criteria and Wind Direction for BaP Exceedances at Courtice Station for 2018

Date	Percentage above the BaP Criteria	Wind Direction	Potential Source Contributions
January 2, 2018	8.4	West	Land use in this direction is primarily agricultural, when the winds are out of the west the Courtice Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance event.
February 7, 2018	59	South-southeast	The lake is to the south-southeast of Courtice Station. This is likely a regional air quality issue. When the winds are out of the south-southeast the Courtice Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance event.
May 2, 2018	14.9	West	Land use in this direction is primarily agricultural, when the winds are out of the west the Courtice Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance event.
May 26, 2018	261	West-southwest	Land use in this direction is primarily agricultural, when the winds are out of the west-southwest the Courtice Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance event.
December 4, 2018	34	North-northwesterly	Highway 401, Roadway Construction and a CP Railway are to the north-northwesterly direction. When the winds are from the north-northwesterly direction the Courtice Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance event.

Notes:

The data from Q1 and Q2 was taken from Stantec's Q1 and Q2 reports (Stantec, 2018) which covers any exceedances from January 1st, 2018 to June 30th, 2018.

Courtice Monitoring Station observed one (1) exceedance over the daily AAQC for D&F of 0.1 pg TEQ/m^3. The exceedance occurred on May 26, 2018 with a respective 24-hour average value of 1.09E-01 pg TEQ/m^3. The percentage above the applicable criteria and predominant wind direction is detailed below in Table 7.

Table 7: Percentage Above Criteria and Wind Direction for D&F Exceedance at Courtice Station for 2018

Date	Percentage above the D&F Criteria	Wind Direction	Potential Source Contributions
May 26, 2018	9	Southwesterly	The lake is in the southwesterly direction of the Courtice Station. This is likely a regional air quality issue. When the winds are out of the southwesterly direction the Courtice Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance event.

Notes:

The data from Q1 and Q2 was taken from Stantec's Q1 and Q2 reports (Stantec, 2018) which covers any exceedances from January 1st, 2018 to June 30th, 2018.

There were no measured levels above their respective limits for NO_2 or SO_2 at the Courtice Monitoring Station in 2018.

The maximum 24-hour average $PM_{2.5}$ concentration measured at the Courtice Monitoring Station was 35 µg/m^3. The 98th percentile of the daily average $PM_{2.5}$ concentration was 19 µg/m^3 for the 2018 year. With Stantec's 98th percentiles (Stantec, 2018) of the daily average $PM_{2.5}$ concentrations and the 2018 value the three (3) year average was determined to be 20 µg/m^3 for the Courtice Station for 2016 to 2018.

5.2 Rundle Monitoring Station

Rundle Monitoring Station observed four (4) exceedances over the daily AAQC for TSP of 120 µg/m^3 during the 2018 year. The exceedances occurred on May 2, May 14, June 1, June 19, 2018 with respective 24-hour average values of 204 µg/m^3, 135 µg/m^3, 137 µg/m^3 and 163 µg/m^3. The percentage above the applicable criteria and predominant wind direction is detailed below in Table 8. Rundle Station had no exceedances for Metals over the daily AAQC during the 2018 year.

Table 8: Percentage Above Criteria and Wind Direction for TSP Exceedances at Rundle Station for 2018

Date	Percentage above the MECP TSP Criteria	Wind Direction	Potential Source Contributions
May 2, 2018	70	Westerly	Land use in this direction is primarily agricultural, industrial properties, unpaved road and truck traffic were also to the west. When the winds are westerly the Rundle Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance event.
		West	Land use in this direction is primarily agricultural and industrial properties, when the winds are out of the west the Rundle Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance event.
May 14, 2018	13	Westerly	Land use in this direction is primarily agricultural, industrial properties, unpaved road and truck traffic were also to the west. When the winds are westerly the Rundle Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance.
June 1, 2018	14	Westerly	Land use in this direction is primarily agricultural, industrial properties, unpaved road and truck traffic were also to the west. When the winds are westerly the Rundle Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance.
		North-northwesterly	Land use in this direction is primarily agricultural and residential properties, when the winds are out of the north-northwest the Rundle Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance event.
June 19,2018	35	West-northwesterly	Land use in this direction is primarily agricultural and residential properties, when the winds are out of the north-northwest the Rundle Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance event.

Notes:

The data from Q1 and Q2 was taken from Stantec's Q1 and Q2 reports (Stantec, 2018) which covers any exceedances from January 1st, 2018 to June 30th, 2018.

Rundle Monitoring Station observed seven (7) exceedances over the daily AAQC for Benzo(a)pyrene of 0.05 ng/m^3 during the 2018 year. The exceedances occurred on January 2, January 26, February 7, May 2, May 26, December 4, and December 16, 2018 with respective 24-hour average values of 6.20E-02 ng/m^3, 1.26E-01 ng/m^3, 6.86E-02 ng/m^3, 5.18E-02 ng/m^3, 1.39E-01 ng/m^3, 7.62E-02 ng/m^3, 6.06E-02 ng/m^3. The percentage above the applicable criteria and predominant wind direction is detailed below in Table 9. Rundle Monitoring Station had no other PAH exceedances, with the exception of Benzo(a)pyrene, over the daily AAQC during the 2018 year.

Table 9: Percentage Above Criteria and Wind Direction for BaP Exceedances at Rundle Station for 2018

Date	Percentage above the BaP Criteria	Wind Direction	Potential Source Contributions
January 2, 2018	24	West	Land use in this direction is primarily agricultural and industrial properties, when the winds are out of the west the Rundle Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance event.
January 26, 2018	152	East	Land use in this direction is primarily agricultural and residential properties, when the winds are out of the east the Rundle Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance event.
February 7, 2018	37	North	Land use in this direction is primarily agricultural and residential properties, when the winds are out of the north the Rundle Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance event.
May 2, 2018	3.6	West	Land use in this direction is primarily agricultural and industrial properties, when the winds are out of the west the Rundle Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance event.
May 26, 2018	178	West-southwest	Rundle Station is downwind of the DYEC. In addition to DYEC: Highway 401, Roadway Construction and a CP Railway are downwind of Rundle Station. DYEC may be a potential contributor to the exceedance event. Courtice station also had an elevated BaP concentration but based on the predominant wind direction DYEC was not a contributor to the exceedance at Courtice Station. These exceedances may be due to a regional air quality issue.
December 4, 2018	52	North-north-westerly	Land use in this direction is primarily agricultural and residential properties, when the winds are out of the north-north-west the Rundle Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance event.
December 16, 2018	21	North-north-easterly	Land use in this direction is primarily agricultural properties, when the winds are out of the north-north-east the Rundle Station is not downwind of the DYEC, the DYEC is not a contributor to this exceedance event.

Notes:

The data from Q1 and Q2 was taken from Stantec's Q1 and Q2 reports (Stantec, 2018) which covers any exceedances from January 1st, 2018 to June 30th, 2018.

Rundle Monitoring Station had no exceedances for D&F over the daily AAQC during the 2018 year.

There were no measured levels above their respective limits for NO_2 or SO_2 at the Rundle Monitoring Station in 2018.

The maximum 24-hour average $PM_{2.5}$ concentration measured at the Rundle Monitoring Station was 31 µg/m^3. The 98th percentile of the daily average $PM_{2.5}$ concentration was 19 µg/m^3 for the 2018 year. With Stantec's 98th percentiles (Stantec, 2018) of the daily average $PM_{2.5}$ concentrations from 2016 and 2017 and the 2018 value the three (3) year average was determined to be 24 µg/m^3 for Rundle Station for 2016 to 2018.

5.3 Fence Line Monitoring Station

The Fence Line monitoring station had no observed exceedances over the daily AAQC for TSP or metals during the 2018 year. The last sample collected at the Fence Line station was on December 4, 2018.

6 AMBIENT AIR QUALITY TRENDS

Ambient air quality measurements from the Courtice, Rundle and Fence Line Monitoring Stations from 2013 to 2018 are compared where applicable. Stantec collected and reported the data from 2013 until the end of Quarter 2 of 2018. RWDI is now responsible for collecting and reporting the data from Quarter 3 of 2018 to present. The data from 2013 to 2017 was obtained from Stantec's 2017 Annual Ambient Air Quality Monitoring Report for the Durham York Energy Centre (Stantec, 2018).

The continuously monitored parameters were below the applicable AAQC from 2013 to 2018 for both the Courtice and Rundle Monitoring Stations.

In 2017 there were two (2) TSP exceedances of the AAQC. In 2018 there were four (4) exceedances of the TSP AAQC. No other exceedances of TSP or Metals have occurred at the Courtice or Rundle Monitoring Stations from 2013 to 2018. From 2016 to 2018 there have been no TSP or Metals exceedances of the AAQC at the Fence Line Monitoring Station.

The maximum measured concentration of PAHs, except Benzo(a)Pyrene, were well below the applicable AAQC from 2013-2018. There have been twenty-four (24) exceedances of Benzo(a)Pyrene above the applicable AAQC from 2013-2018 at the Courtice Monitoring Station. There have been twenty-nine (29) exceedances of Benzo(a)Pyrene above the applicable AAQC from 2013-2018 at the Courtice Monitoring Station.

The maximum measured toxic equivalent of D&F concentrations at Courtice Station were below the AAQC from 2013-2017. There was one exceedance of the AAQC for D&F at the Courtice Monitoring Station in 2018. The maximum measured toxic equivalent of D&F concentrations at Rundle station was below the AAQC from 2013-2018.

The year to year fluctuations in continuous data for SO_2, NO_2 and $PM_{2.5}$ concentrations can be seen in Figures 5 to 7 for hourly, annual and annual averaging periods.

Figure 5 Maximum Measured SO_2 Concentrations by Year (2013 – 2018)

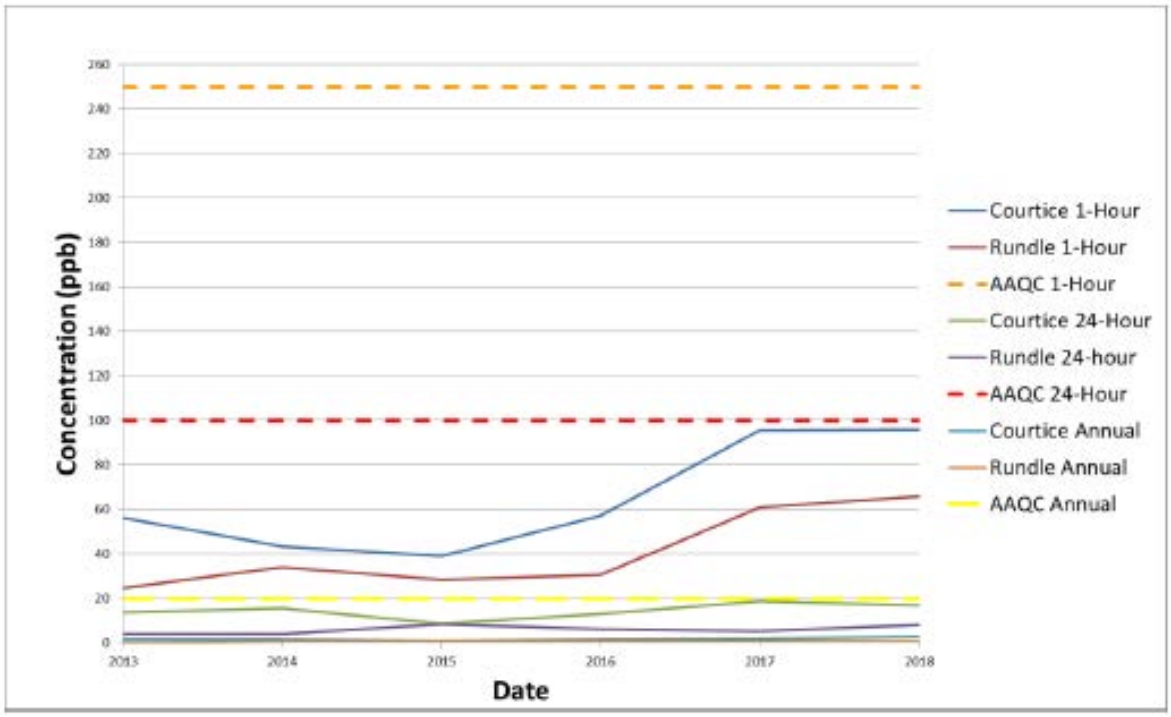


Figure 6 Maximum Measured NO_2 Concentrations by Year (2013 – 2018)

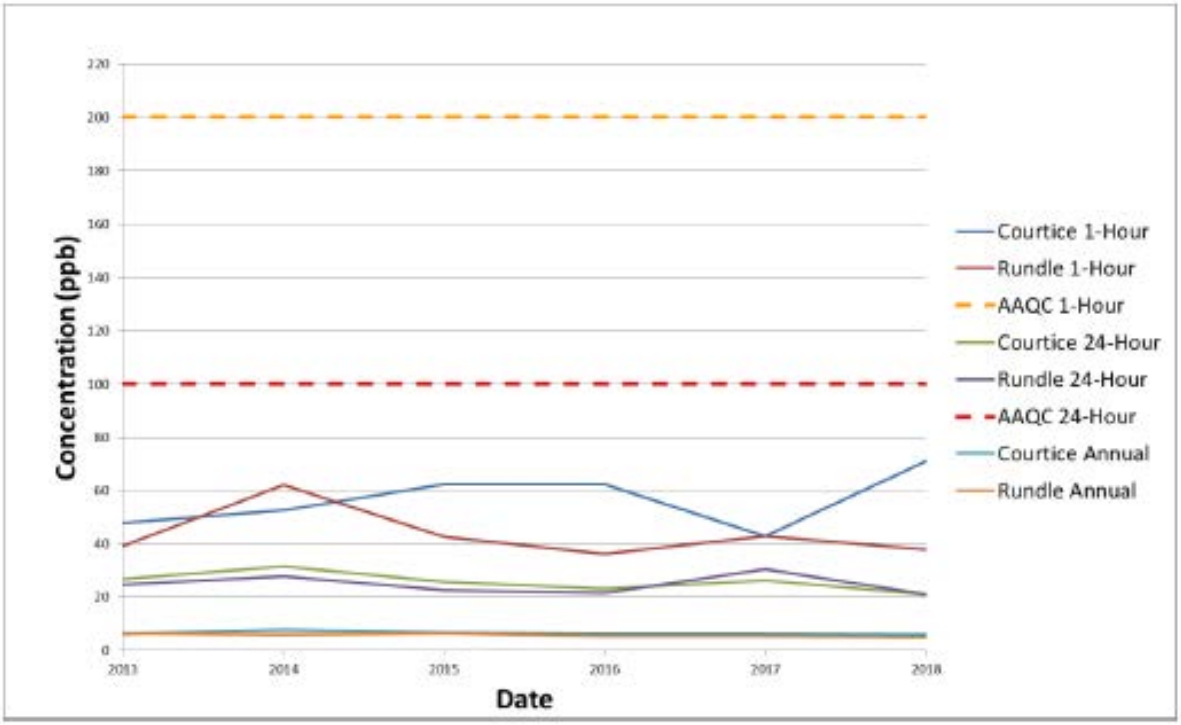
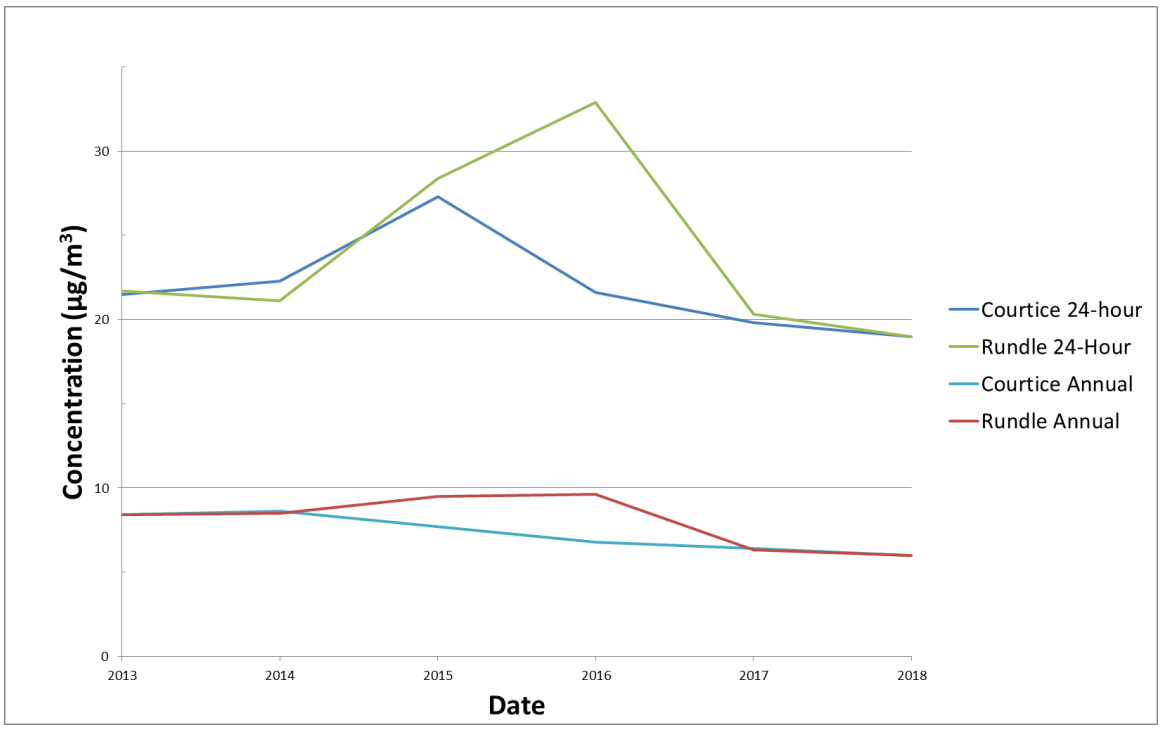


Figure 7 Maximum Measured $PM_{2.5}$ Concentrations by Year (2013 – 2018)



Daily $PM_{2.5}$ concentrations were not compared to the CAAQS in Figure 7 as it requires averaging the 98th percentile concentrations over three consecutive years, as compared to the 12-month period covered by this report. Annual $PM_{2.5}$ concentrations were not compared to the CAAQS in Figure 7 as it requires a three-year average of the annual average concentrations over three consecutive years, as compared to the 12-month period covered by this report.

A summary of maximum, arithmetic means and the number of exceedances and relative AAQC for continuous parameters at each station from 2013 to 2017 is presented in **Appendix D** for Courtice. As per Stantec's comment in the 2017 Annual Report the following data should be reviewed with caution "the data from 2013 are not directly comparable to 2014 to 2017, as 2013 measurements did not encompass a full year including winter months (during which time there is a normally a higher percentage of stable meteorological conditions) (Stantec, 2018)".

A summary of the maximum measured daily average TSP and Metal concentrations and percentage of the applicable AAQC criteria from 2013, 2014, and 2016-2017 is presented in **Appendix D** for Courtice, Rundle and Fence Line Monitoring Stations. As per Stantec's comment in the 2017 Annual Report the following data should be reviewed with caution "Since the measurement period in 2013 was eight months (April-December), six months (January-June) in 2014, and 11 months (February-December) in 2016, due to the non-continuous monitoring being temporarily discontinued as per the ambient monitoring plan, caution should be exercised in comparing the data as the measurement period lengths were different and cover different periods of each year (with different meteorological conditions) (Stantec, 2018)."

A summary of the maximum measured daily average PAH concentrations and percentage of the applicable AAQC criteria from 2013, 2014, and 2016-2017 is presented in **Appendix D** for both Courtice and Rundle Monitoring Stations. As per Stantec's comment in the 2017 Annual Report the following data should be reviewed with caution "As with TSP, since the measurement periods are not the same in each year, the data are not directly comparable (Stantec, 2018)"

The maximum measured ambient toxic equivalent D&F concentrations from 2013 – 2017 and their specific measurement period is presented in **Appendix D** for both Courtice and Rundle Monitoring Stations. As per Stantec's comment in the 2017 Annual Report the following data should be reviewed with caution "as the measurement periods were different and cover different periods of each year (with different meteorological conditions). Only the 2017 measurements encompassed a full year as previous years sampling were dependent on the star-up date of the DYEC. (Stantec, 2018)".

7 CONCLUSIONS

DYEC's ambient air monitoring program for 2018 resulted in four (4) TSP, twelve (12) Benzo(a)pyrene, and one (1) D&F daily average concentrations above the applicable limits at the Courtice and Rundle Monitoring Stations. No exceedances were observed at the Fence Line Station.

Throughout the 2018 year, there were a few minor issues with equipment failures and malfunctions. These were addressed as soon as they were identified and preventive actions were put in place to prevent reoccurrences.

Data recovery was 82.0% or higher at each station for all contaminants which exceeds the MECP's requirement of 75% of collected readings to be considered valid. The overall data recovery for the Courtice Monitoring Station was 97.1%, 96.5% for the Rundle Monitoring Station, and 89.5% for the Fence Line Monitoring Station.

8 REFERENCES

1. Jacques Whitford, (2009). Final Environmental Assessment, December 4, 2009.

2. Stantec Consulting Ltd., (2012). Ambient Air Quality Monitoring Plan, Durham York Residual Waste Study, May 8, 2012.

3. Stantec Consulting Ltd., (2018). 2017 Annual Ambient Air Quality Monitoring Report for the Durham York Energy Centre.

4. Stantec Consulting Ltd., (2018). Q1 2018 Ambient Air Quality Monitoring Report for the Durham York Energy Centre.

5. Stantec Consulting Ltd., (2018a). Quarterly Ambient Air Quality Monitoring Report for the Durham York Energy Centre – January to March 2018.

6. Stantec Consulting Ltd., (2018b). Quarterly Ambient Air Quality Monitoring Report for the Durham York Energy Centre – April to June 2018.

7. RWDI, (2018a). Q3 Ambient Air Quality Monitoring Report.

8. RWDI, (2018b). Q4 Ambient Air Quality Monitoring Report.

APPENDIX A

EPA Sampling Schedule 2018

Important Dates

Notes

3-Day schedule is shown in orange, green, and purple

6-Day schedule is shown in green and purple

12-Day schedule is shown in purple

January

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

February

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

March

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

April

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

May

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

June

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

July

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

August

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

September

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

October

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

November

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

December

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

APPENDIX B

Table B1: 2018 Monitoring Summary Results for $PM_{2.5}$ at Courtice Station

Data Statistics	Events > CAAQ Standard [1]	Annual Geometric Mean	Annual Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Mean	98th Percentile [2]	Number of valid Hours	% valid data
Compound	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$
	No.	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	No.	%
2018	N/A	N/A	6	65	35	19	8656	98.8

[1] - The Canadian Ambient Air Quality Standard (CAAQS) requires averaging the 98th percentile daily average concentrations over three years which is not addressed in this report as it covers January 1st to December 31st, 2018.

[2] - This value is the 98th percentile of daily average levels for the 2018 year.

Table B2: 2018 Monitoring Summary Results for $PM_{2.5}$ at Rundle Station

Data Statistics	Events > CAAQ Standard [1]	Annual Geometric Mean	Annual Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Mean	98th Percentile [2]	Number of valid Hours	% valid data
Compound	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$
	No.	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	(ug/m^3)	No.	%
2018	N/A	N/A	6	68	31	19	8697	99.3

[1] - The Canadian Ambient Air Quality Standard (CAAQS) requires averaging the 98th percentile daily average concentrations over three years which is not addressed in this report as it covers January 1st to December 31st, 2018.

[2] - This value is the 98th percentile of daily average levels for the 2018 year.

Table B3: 2018 Monitoring Summary Results for NOx at Courtice Station

Data Statistics	Events > 1 hr AAQC	Events > 24 hr AAQC	Annual Geometric Mean	Annual Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Mean	Number of valid Hours	% valid data
Compound	NO_x	NO_x	NO_x	NO_x	NO_x	NO_x	NO_x	NO_x
	No.	No.	(ppb)	(ppb)	(ppb)	(ppb)	No.	%
2018	N/A	N/A	N/A	8	87	36	8617	98.4

Table B4: 2018 Monitoring Summary Results for NOx at Rundle Station

Data Statistics	Events > 1 hr AAQC	Events > 24 hr AAQC	Annual Geometric Mean	Annual Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Mean	Number of valid Hours	% valid data
Compound	NO_x	NO_x	NO_x	NO_x	NO_x	NO_x	NO_x	NO_x
	No.	No.	(ppb)	(ppb)	(ppb)	(ppb)	No.	%
2018	N/A	N/A	N/A	7	74	32	8669	99.0

Table B5: 2018 Monitoring Summary Results for NO at Courtice Station

Data Statistics	Events > 1 hr AAQC	Events > 24 hr AAQC	Annual Geometric Mean	Annual Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Mean	Number of valid Hours	% valid data
Compound	NO	NO	NO	NO	NO	NO	NO	NO
	No.	No.	(ppb)	(ppb)	(ppb)	(ppb)	No.	%
2018	N/A	N/A	N/A	2	69	17	8617	98.4

Table B6: 2018 Monitoring Summary Results for NO at Rundle Station

Data Statistics	Events > 1 hr AAQC	Events > 24 hr AAQC	Annual Geometric Mean	Annual Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Mean	Number of valid Hours	% valid data
Compound	NO	NO	NO	NO	NO	NO	NO	NO
	No.	No.	(ppb)	(ppb)	(ppb)	(ppb)	No.	%
2018	N/A	N/A	N/A	2	54	12	8669	99.0

Table B7: 2018 Monitoring Summary Results for NO_2 at Courtice Station

Data Statistics	Events > 1 hr AAQC	Events > 24 hr AAQC	Events > 1 hr CAAQS	Events > Annual CAAQS	Annual Geometric Mean	Annual Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Mean	Number of valid Hours	% valid data
Compound	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2
	No.	No.	No.	No.	(ppb)	(ppb)	(ppb)	(ppb)	No.	%
2018	0	0	N/A[1]	0	N/A	6	71	21	8617	98.4

[1] - The Canadian Ambient Air Quality Standard (CAAQS) requires averaging the 98th percentile daily average concentrations over three years which is not addressed in this report as it covers January 1st to December 31st, 2018.

Table B8: 2018 Monitoring Summary Results for NO_2 at Rundle Station

Data Statistics	Events > 1 hr AAQC	Events > 24 hr AAQC	Events > 1 hr CAAQS	Events > Annual CAAQS	Annual Geometric Mean	Annual Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Mean	Number of valid Hours	% valid data
Compound	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2
	No.	No.	No.	No.	(ppb)	(ppb)	(ppb)	(ppb)	No.	%
2018	0	0	N/A[1]	0	N/A	5	38	21	8669	99.0

[1] - The Canadian Ambient Air Quality Standard (CAAQS) requires averaging the 98th percentile daily average concentrations over three years which is not addressed in this report as it covers January 1st to December

Table B9: 2018 Monitoring Summary Results for SO_2 at Courtice Station

Data Statistics	Events > 1 hr AAQC	Events > 24 hr AAQC	Events > Annual AAQC	Events > 1 hr CAAQS	Events > Annual CAAQS	Annual Geometric Mean	Annual Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Mean	Number of valid Hours	% valid data
Compound	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2
	No.	No.	No.	No.	No.	(ppb)	(ppb)	(ppb)	(ppb)	No.	%
2018	0	0	0	N/A[1]	0	N/A	2.7	96	17	8618	98.4

[1] - The Canadian Ambient Air Quality Standard (CAAQS) requires averaging the 98th percentile daily average concentrations over three years which is not addressed in this report as it covers January 1st to December 31st, 2018.

Table B10: 2018 Monitoring Summary Results for SO_2 at Rundle Station

Data Statistics	Events > 1 hr AAQC	Events > 24 hr AAQC	Events > Annual AAQC	Events > 1 hr CAAQS	Events > Annual CAAQS	Annual Geometric Mean	Annual Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Mean	Number of valid Hours	% valid data
Compound	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2
	No.	No.	No.	No.	No.	(ppb)	(ppb)	(ppb)	(ppb)	No.	%
2018	0	0	0	N/A[1]	0	N/A	0.7	66	8	8466	96.6

[1] - The Canadian Ambient Air Quality Standard (CAAQS) requires averaging the 98th percentile daily average concentrations over three years which is not addressed in this report as it covers January 1st to December 31st, 2018.

APPENDIX C

Table C1: 2018 Courtice Station Monitoring Results for TSP and Metals

DYEC AAQM Courtice Station Monitoring Results for Total Suspended Particulate and Metals										
Contaminant	**Units**	***MECP Criteria***	***HHRA Health Based Criteria***	**No. > AAQC**	**Geometric Mean**	**Arithmetic Mean**	**Maximum Concentration**	**Minimum Concentration**	**Number of Valid Samples**	**% Valid data**
Particulate (TSP)	µg/m^3	*120*	*120*	0	20.4	24.3	84.7	4.6	59	96.7
Total Mercury (Hg)	µg/m^3	*2*	*2*	0	7.56E-06	9.92E-06	4.19E-05	7.36E-07	59	96.7
Aluminum (Al)	µg/m^3	*4.8*	-	0	9.91E-02	1.32E-01	8.95E-01	1.72E-02	59	96.7
Antimony (Sb)	µg/m^3	*25*	*25*	0	1.73E-03	2.37E-03	7.14E-03	2.45E-04	59	96.7
Arsenic (As)	µg/m^3	*0.3*	*0.3*	0	1.50E-03	1.65E-03	4.29E-03	7.72E-04	59	96.7
Barium (Ba)	µg/m^3	*10*	*10*	0	6.01E-03	6.90E-03	1.89E-02	2.03E-03	59	96.7
Beryllium (Be)	µg/m^3	*0.01*	*0.01*	0	1.40E-04	2.69E-04	1.56E-03	2.57E-05	59	96.7
Bismuth (Bi)	µg/m^3	-	-	-	1.17E-03	1.46E-03	4.29E-03	4.63E-04	59	96.7
Boron (B)	µg/m^3	*120*	-	0	4.42E-03	6.28E-03	1.31E-02	1.84E-03	59	96.7
Cadmium (Cd)	µg/m^3	*0.025*	*0.025*	0	6.63E-04	6.83E-04	1.90E-03	5.15E-04	59	96.7
Chromium (Cr)	µg/m^3	*0.5*	-	0	2.61E-03	3.15E-03	9.50E-03	1.30E-03	59	96.7
Cobalt (Co)	µg/m^3	*0.1*	*0.1*	0	6.51E-04	6.62E-04	1.43E-03	5.15E-04	59	96.7
Copper (Cu)	µg/m^3	*50*	-	0	1.70E-02	1.98E-02	4.55E-02	1.64E-03	59	96.7
Iron (Fe)	µg/m^3	*4*	-	0	2.91E-01	3.82E-01	2.53E+00	8.41E-02	59	96.7
Lead (Pb)	µg/m^3	*0.5*	*0.5*	0	1.68E-03	2.15E-03	1.43E-02	7.72E-04	59	96.7
Magnesium (Mg)	µg/m^3	-	-	-	1.41E-01	1.86E-01	1.21E+00	1.77E-02	59	96.7
Manganese (Mn)	µg/m^3	*0.4*	-	0	7.86E-03	1.05E-02	7.25E-02	6.28E-04	59	96.7
Molybdenum (Mo)	µg/m^3	*120*	-	0	1.01E-03	1.24E-03	7.69E-03	2.60E-04	59	96.7
Nickel (Ni)	µg/m^3	*0.2*	-	0	1.04E-03	1.10E-03	3.85E-03	7.72E-04	59	96.7
Phosphorus (P)	µg/m^3	-	-	-	6.77E-02	1.92E-01	1.08E+00	8.19E-03	59	96.7
Selenium (Se)	µg/m^3	*10*	*10*	0	3.26E-03	3.31E-03	7.14E-03	2.57E-03	59	96.7
Silver (Ag)	µg/m^3	*1*	*1*	0	8.23E-04	1.16E-03	3.57E-03	2.57E-04	59	96.7
Strontium (Sr)	µg/m^3	*120*	-	0	3.45E-03	4.39E-03	1.73E-02	7.80E-04	59	96.7
Thallium (Tl)	µg/m^3	-	-	-	4.43E-04	2.07E-03	7.14E-03	2.32E-05	59	96.7
Tin (Sn)	µg/m^3	*10*	*10*	0	1.80E-03	2.41E-03	7.14E-03	2.60E-04	59	96.7
Titanium (Ti)	µg/m^3	*120*	-	0	4.90E-03	6.28E-03	3.19E-02	2.86E-03	59	96.7
Uranium (Ur)	µg/m^3	*0.3*	-	0	7.88E-05	1.25E-04	1.64E-03	2.57E-05	59	96.7
Vanadium (V)	µg/m^3	*2*	*1*	0	1.63E-03	1.66E-03	3.57E-03	1.29E-03	59	96.7
Zinc (Zn)	µg/m^3	*120*	-	0	2.77E-02	3.45E-02	1.86E-01	7.28E-03	59	96.7
Zirconium (Zr)	µg/m^3	*20*	-	0	1.13E-03	1.30E-03	3.57E-03	5.20E-04	59	96.7

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

Table C2: 2018 Rundle Station Monitoring Results for TSP and Metals

DYEC AAQM Rundle Station Monitoring Results for Total Suspended Particulate and Metals										
Contaminant	**Units**	***MECP Criteria***	***HHRA Health Based Criteria***	**No. > AAQC**	**Geometric Mean**	**Arithmetic Mean**	**Maximum Concentration**	**Minimum Concentration**	**Number of Valid Samples**	**% Valid data**
Particulate (TSP)	µg/m^3	*120*	*120*	4	39.0	53.0	203.6	5.3	50	82.0
Total Mercury (Hg)	µg/m^3	*2*	*2*	0	8.01E-06	1.20E-05	9.83E-05	1.53E-06	50	82.0
Aluminum (Al)	µg/m^3	*4.8*	-	0	1.99E-01	3.03E-01	1.42E+00	1.21E-02	50	82.0
Antimony (Sb)	µg/m^3	*25*	*25*	0	1.47E-03	2.68E-03	2.64E-02	7.68E-05	50	82.0
Arsenic (As)	µg/m^3	*0.3*	*0.3*	0	1.50E-03	1.91E-03	2.06E-02	8.91E-04	50	82.0
Barium (Ba)	µg/m^3	*10*	*10*	0	7.73E-03	9.11E-03	2.58E-02	2.00E-03	50	82.0
Beryllium (Be)	µg/m^3	*0.01*	*0.01*	0	1.33E-04	2.61E-04	1.81E-03	2.97E-05	50	82.0
Bismuth (Bi)	µg/m^3	-	-	-	1.11E-03	1.35E-03	2.63E-03	5.35E-04	50	82.0
Boron (B)	µg/m^3	*120*	-	0	4.86E-03	6.91E-03	1.33E-02	1.84E-03	50	82.0
Cadmium (Cd)	µg/m^3	*0.025*	*0.025*	0	6.72E-04	7.29E-04	4.73E-03	5.94E-04	50	82.0
Chromium (Cr)	µg/m^3	*0.5*	-	0	3.00E-03	3.58E-03	8.20E-03	1.51E-03	50	82.0
Cobalt (Co)	µg/m^3	*0.1*	*0.1*	0	6.45E-04	6.47E-04	8.77E-04	5.94E-04	50	82.0
Copper (Cu)	µg/m^3	*50*	-	0	1.51E-02	1.84E-02	6.15E-02	5.10E-03	50	82.0
Iron (Fe)	µg/m^3	*4*	-	0	4.50E-01	6.16E-01	2.97E+00	1.12E-01	50	82.0
Lead (Pb)	µg/m^3	*0.5*	*0.5*	0	2.05E-03	1.02E-02	3.96E-01	9.16E-04	50	82.0
Magnesium (Mg)	µg/m^3	-	-	-	2.75E-01	3.97E-01	2.10E+00	3.02E-02	50	82.0
Manganese (Mn)	µg/m^3	*0.4*	-	0	1.25E-02	1.87E-02	1.13E-01	3.27E-04	50	82.0
Molybdenum (Mo)	µg/m^3	*120*	-	0	8.97E-04	1.07E-03	6.26E-03	3.02E-04	50	82.0
Nickel (Ni)	µg/m^3	*0.2*	-	0	1.15E-03	1.26E-03	3.26E-03	8.91E-04	50	82.0
Phosphorus (P)	µg/m^3	-	-	-	1.06E-01	2.49E-01	1.75E+00	8.31E-03	50	82.0
Selenium (Se)	µg/m^3	*10*	*10*	0	3.23E-03	3.24E-03	4.39E-03	2.97E-03	50	82.0
Silver (Ag)	µg/m^3	*1*	*1*	0	8.00E-04	1.23E-03	1.06E-02	2.97E-04	50	82.0
Strontium (Sr)	µg/m^3	*120*	-	0	9.29E-03	1.43E-02	5.82E-02	9.06E-04	50	82.0
Thallium (Tl)	µg/m^3	-	-	-	3.69E-04	1.83E-03	4.39E-03	2.67E-05	50	82.0
Tin (Sn)	µg/m^3	*10*	*10*	0	1.64E-03	2.74E-03	3.09E-02	3.07E-04	50	82.0
Titanium (Ti)	µg/m^3	*120*	-	0	8.99E-03	1.32E-02	5.57E-02	3.27E-03	50	82.0
Uranium (Ur)	µg/m^3	*0.3*	-	0	7.68E-05	9.88E-05	1.97E-04	2.97E-05	50	82.0
Vanadium (V)	µg/m^3	*2*	*1*	0	1.73E-03	2.02E-03	1.88E-02	1.49E-03	50	82.0
Zinc (Zn)	µg/m^3	*120*	-	0	2.57E-02	3.12E-02	1.12E-01	8.64E-03	50	82.0
Zirconium (Zr)	µg/m^3	*20*	-	0	1.06E-03	1.19E-03	2.19E-03	5.94E-04	50	82.0

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

Table C3: 2018 Fenceline Station Monitoring Results for TSP and Metals

DYEC AAQM Fenceline Station Monitoring Results for Total Suspended Particulate and Metals										
Contaminant	**Units**	***MECP Criteria***	***HHRA Health Based Criteria***	**No. > AAQC**	**Geometric Mean**	**Arithmetic Mean**	**Maximum Concentration**	**Minimum Concentration**	**Number of Valid Samples**	**% Valid data**
Particulate (TSP)	µg/m^3	*120*	*120*	0	30.6	36.4	93.6	8.2	51	89.5
Total Mercury (Hg)	µg/m^3	*2*	*2*	0	1.02E-05	1.53E-04	7.20E-03	7.36E-07	51	89.5
Aluminum (Al)	µg/m^3	*4.8*	-	0	1.48E-01	2.06E-01	9.27E-01	1.57E-02	51	89.5
Antimony (Sb)	µg/m^3	*25*	*25*	0	1.91E-03	2.37E-03	4.14E-03	2.70E-04	51	89.5
Arsenic (As)	µg/m^3	*0.3*	*0.3*	0	1.45E-03	1.55E-03	2.48E-03	8.52E-04	51	89.5
Barium (Ba)	µg/m^3	*10*	*10*	0	8.27E-03	9.50E-03	2.31E-02	2.28E-03	51	89.5
Beryllium (Be)	µg/m^3	*0.01*	*0.01*	0	1.45E-04	2.74E-04	1.73E-03	2.84E-05	51	89.5
Bismuth (Bi)	µg/m^3	-	-	-	1.17E-03	1.40E-03	2.48E-03	5.11E-04	51	89.5
Boron (B)	µg/m^3	*120*	-	0	4.40E-03	6.53E-03	2.60E-02	1.83E-03	51	89.5
Cadmium (Cd)	µg/m^3	*0.025*	*0.025*	0	6.63E-04	6.75E-04	1.59E-03	5.68E-04	51	89.5
Chromium (Cr)	µg/m^3	*0.5*	-	0	3.65E-03	4.56E-03	1.17E-02	1.42E-03	51	89.5
Cobalt (Co)	µg/m^3	*0.1*	*0.1*	0	6.41E-04	6.43E-04	8.27E-04	5.68E-04	51	89.5
Copper (Cu)	µg/m^3	*50*	-	0	1.48E-02	1.83E-02	7.23E-02	4.72E-03	51	89.5
Iron (Fe)	µg/m^3	*4*	-	0	3.82E-01	4.97E-01	1.80E+00	9.07E-02	51	89.5
Lead (Pb)	µg/m^3	*0.5*	*0.5*	0	2.17E-03	2.76E-03	8.66E-03	8.52E-04	51	89.5
Magnesium (Mg)	µg/m^3	-	-	-	2.27E-01	3.00E-01	1.31E+00	1.57E-02	51	89.5
Manganese (Mn)	µg/m^3	*0.4*	-	0	1.27E-02	1.84E-02	7.81E-02	7.40E-04	51	89.5
Molybdenum (Mo)	µg/m^3	*120*	-	0	1.15E-03	1.47E-03	1.07E-02	2.88E-04	51	89.5
Nickel (Ni)	µg/m^3	*0.2*	-	0	1.13E-03	1.23E-03	3.50E-03	8.52E-04	51	89.5
Phosphorus (P)	µg/m^3	-	-	-	7.68E-02	2.30E-01	1.57E+00	7.69E-03	51	89.5
Selenium (Se)	µg/m^3	*10*	*10*	0	3.21E-03	3.22E-03	4.14E-03	2.84E-03	51	89.5
Silver (Ag)	µg/m^3	*1*	*1*	0	8.26E-04	1.11E-03	2.07E-03	2.84E-04	51	89.5
Strontium (Sr)	µg/m^3	*120*	-	0	6.28E-03	8.17E-03	2.93E-02	1.38E-03	51	89.5
Thallium (Tl)	µg/m^3	-	-	-	4.61E-04	1.98E-03	4.14E-03	2.56E-05	51	89.5
Tin (Sn)	µg/m^3	*10*	*10*	0	1.89E-03	2.37E-03	4.14E-03	2.88E-04	51	89.5
Titanium (Ti)	µg/m^3	*120*	-	0	7.01E-03	1.00E-02	4.29E-02	3.08E-03	51	89.5
Uranium (Ur)	µg/m^3	*1.5*	-	0	8.13E-05	1.03E-04	1.86E-04	2.84E-05	51	89.5
Vanadium (V)	µg/m^3	*2*	*1*	0	1.68E-03	1.95E-03	1.90E-02	1.42E-03	51	89.5
Zinc (Zn)	µg/m^3	*120*	-	0	2.65E-02	3.08E-02	1.55E-01	9.90E-03	51	89.5
Zirconium (Zr)	µg/m^3	*20*	-	0	1.14E-03	1.26E-03	2.07E-03	5.68E-04	51	89.5

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

Table C4: 2018 Courtice Station Monitoring Results for PAHs

DYEC AAQM Courtice Station Monitoring Results for Polycyclic Aromatic Hydrocarbons									
Contaminant	**Units**	***MECP Criteria***	***HHRA Health Based Criteria***	**No. > AAQC**	**Arithmetic Mean**	**Maximum Concentration**	**Minimum Concentration**	**Number of Valid Samples**	**% Valid data**
1-Methylnaphthalene	ng/m^3	*12000*	-	0	3.77E+00	2.18E+01	9.52E-01	29	93.5
2-Methylnaphthalene	ng/m^3	*10000*	-	0	6.41E+00	3.99E+01	1.40E+00	29	93.5
Acenaphthene	ng/m^3	-	-	-	2.22E+00	2.02E+01	7.94E-02	29	93.5
Acenaphthylene	ng/m^3	*3500*	-	0	1.75E-01	5.62E-01	4.06E-02	29	93.5
Anthracene	ng/m^3	*200*	-	0	1.54E-01	7.72E-01	2.15E-02	29	93.5
Benzo(a)Anthracene	ng/m^3	-	-	-	6.86E-02	1.22E-01	5.76E-03	29	93.5
Benzo(a)fluorene	ng/m^3	-	-	-	1.36E-01	2.43E-01	1.62E-03	29	93.5
Benzo(a)Pyrene	ng/m^3	*0.05* [1] *5* [2] *1.1* [3]	*1*	-	3.20E-02	1.81E-01	2.77E-03	29	93.5
Benzo(b)Fluoranthene	ng/m^3	-	-	-	8.19E-02	2.90E-01	2.95E-04	29	93.5
Benzo(b)fluorene	ng/m^3	-	-	-	1.33E-01	2.43E-01	1.62E-03	29	93.5
Benzo(e)Pyrene	ng/m^3	-	-	-	1.38E-01	2.43E-01	1.30E-02	29	93.5
Benzo(g,h,i)Perylene	ng/m^3	-	-	-	7.42E-02	1.22E-01	1.76E-02	29	93.5
Benzo(k)Fluoranthene	ng/m^3	-	-	-	7.09E-02	1.22E-01	2.95E-04	29	93.5
Biphenyl	ng/m^3	-	-	-	1.99E+00	1.01E+01	4.14E-01	29	93.5
Chrysene	ng/m^3	-	-	-	9.76E-02	3.02E-01	2.74E-02	29	93.5
Dibenzo(a,h)Anthracene	ng/m^3	-	-	-	6.47E-02	1.22E-01	7.40E-04	29	93.5
Fluoranthene	ng/m^3	-	-	-	7.36E-01	3.28E+00	7.94E-02	29	93.5
Indeno(1,2,3-cd)Pyrene	ng/m^3	-	-	-	7.23E-02	1.22E-01	2.96E-03	29	93.5
Naphthalene	ng/m^3	*22500*	*22500*	0	1.98E+01	7.78E+01	5.45E+00	29	93.5
o-Terphenyl	ng/m^3	-	-	-	1.30E-01	2.43E-01	4.41E-03	29	93.5
Perylene	ng/m^3	-	-	-	1.25E-01	2.43E-01	2.95E-04	29	93.5
Phenanthrene	ng/m^3	-	-	-	3.30E+00	2.16E+01	6.12E-01	29	93.5
Pyrene	ng/m^3	-	-	-	3.34E-01	1.35E+00	7.79E-02	29	93.5
Tetralin	ng/m^3	-	-	-	1.68E+00	4.64E+00	1.28E-01	29	93.5
Total PAH[4]	ng/m^3	-	-	-	4.19E+01	2.04E+02	1.34E+01	29	93.5

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

[1] AAQC

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

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

[4] Total PAH sums all PAH contaminants

Table C5: 2018 Rundle Station Monitoring Results for PAHs

DYEC AAQM Rundle Station Monitoring Results for Polycyclic Aromatic Hydrocarbons										
Contaminant	**Units**	***MECP Criteria***	***HHRA Health Based Criteria***	**No. > AAQC**	**Geometric Mean**	**Arithmetic Mean**	**Maximum Concentration**	**Minimum Concentration**	**Number of Valid Samples**	**% Valid data**
1-Methylnaphthalene	ng/m^3	*12000*	-	0	4.22E+00	6.44E+00	2.66E+01	7.94E-01	30	96.8
2-Methylnaphthalene	ng/m^3	*10000*	-	0	7.45E+00	1.23E+01	5.41E+01	1.19E+00	30	96.8
Acenaphthene	ng/m^3	-	-	-	1.73E+00	6.37E+00	4.04E+01	8.78E-02	30	96.8
Acenaphthylene	ng/m^3	*3500*	-	0	1.68E-01	2.11E-01	6.27E-01	7.78E-02	30	96.8
Anthracene	ng/m^3	*200*	-	0	1.80E-01	4.09E-01	2.62E+00	3.64E-02	30	96.8
Benzo(a)Anthracene	ng/m^3	-	-	-	5.01E-02	7.21E-02	1.46E-01	6.41E-03	30	96.8
Benzo(a)fluorene	ng/m^3	-	-	-	9.35E-02	1.51E-01	2.91E-01	1.63E-03	30	96.8
Benzo(a)Pyrene	ng/m^3	*0.05* [1] *5* [2] *1.1* [3]	*1*	7	2.28E-02	3.39E-02	1.39E-01	2.49E-03	30	96.8
Benzo(b)Fluoranthene	ng/m^3	-	-	-	5.88E-02	8.13E-02	1.46E-01	3.11E-04	30	96.8
Benzo(b)fluorene	ng/m^3	-	-	-	7.67E-02	1.39E-01	2.91E-01	1.63E-03	30	96.8
Benzo(e)Pyrene	ng/m^3	-	-	-	8.81E-02	1.43E-01	2.91E-01	7.42E-04	30	96.8
Benzo(g,h,i)Perylene	ng/m^3	-	-	-	6.49E-02	7.96E-02	1.46E-01	1.31E-02	30	96.8
Benzo(k)Fluoranthene	ng/m^3	-	-	-	5.40E-02	7.91E-02	1.46E-01	3.11E-04	30	96.8
Biphenyl	ng/m^3	-	-	-	2.08E+00	3.14E+00	1.32E+01	4.21E-01	30	96.8
Chrysene	ng/m^3	-	-	-	9.01E-02	9.88E-02	2.37E-01	2.93E-02	30	96.8
Dibenzo(a,h)Anthracene	ng/m^3	-	-	-	2.79E-02	6.60E-02	1.46E-01	7.42E-04	30	96.8
Fluoranthene	ng/m^3	-	-	-	8.60E-01	2.13E+00	1.35E+01	8.78E-02	30	96.8
Indeno(1,2,3-cd)Pyrene	ng/m^3	-	-	-	6.37E-02	8.05E-02	1.46E-01	7.39E-03	30	96.8
Naphthalene	ng/m^3	*22500*	*22500*	0	1.92E+01	2.45E+01	7.42E+01	5.16E+00	30	96.8
o-Terphenyl	ng/m^3	-	-	-	5.75E-02	1.33E-01	2.91E-01	4.51E-03	30	96.8
Perylene	ng/m^3	-	-	-	2.43E-02	1.27E-01	2.91E-01	3.11E-04	30	96.8
Phenanthrene	ng/m^3	-	-	-	3.93E+00	9.53E+00	5.81E+01	7.28E-01	30	96.8
Pyrene	ng/m^3	-	-	-	4.46E-01	8.93E-01	5.38E+00	8.78E-02	30	96.8
Tetralin	ng/m^3	-	-	-	1.72E+00	1.99E+00	7.67E+00	4.92E-01	30	96.8
Total PAH[4]	ng/m^3	-	-	-	4.76E+01	6.93E+01	2.92E+02	1.16E+01	30	96.8

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

[1] AAQC

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

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

[4] Total PAH sums all PAH contaminants

Table C6: 2018 Courtice Station Monitoring Results for Dioxins & Furans

DYEC AAQM Courtice Station Monitoring Results for Dioxins & Furans										
Contaminant	**Units**	**MECP Criteria**	**HHRA Health Based Criteria**	**AACQ Criteria ($\mu g/m^3$)**	**No. > AAQC**	**Arithmetic Mean**	**Maximum Concentration**	**Minimum Concentration**	**Number of Valid Samples**	**% Valid data**
2,3,7,8-TCDD	pg/m^3	-	-	-	-	3.34E-03	5.81E-03	3.21E-04	15	93.8
1,2,3,7,8-PeCDD	pg/m^3	-	-	-	-	4.01E-03	9.14E-03	2.07E-04	15	93.8
1,2,3,4,7,8-HxCDD	pg/m^3	-	-	-	-	1.61E-03	8.23E-03	4.83E-04	15	93.8
1,2,3,6,7,8-HxCDD	pg/m^3	-	-	-	-	2.07E-03	1.06E-02	4.87E-04	15	93.8
1,2,3,7,8,9-HxCDD	pg/m^3	-	-	-	-	1.88E-03	9.22E-03	4.39E-04	15	93.8
1,2,3,4,6,7,8-HpCDD	pg/m^3	-	-	-	-	1.79E-02	1.07E-01	5.19E-05	15	93.8
OCDD	pg/m^3	-	-	-	-	5.19E-02	3.10E-01	2.73E-06	15	93.8
2,3,7,8-TCDF	pg/m^3	-	-	-	-	2.44E-03	1.98E-02	5.77E-05	15	93.8
1,2,3,7,8-PeCDF	pg/m^3	-	-	-	-	1.60E-03	1.16E-02	7.40E-05	15	93.8
2,3,4,7,8-PeCDF	pg/m^3	-	-	-	-	4.24E-03	2.87E-02	5.10E-04	15	93.8
1,2,3,4,7,8-HxCDF	pg/m^3	-	-	-	-	2.47E-03	1.83E-02	3.65E-04	15	93.8
1,2,3,6,7,8-HxCDF	pg/m^3	-	-	-	-	1.67E-03	8.28E-03	3.50E-04	15	93.8
2,3,4,6,7,8-HxCDF	pg/m^3	-	-	-	-	2.49E-03	9.47E-03	3.96E-04	15	93.8
1,2,3,7,8,9-HxCDF	pg/m^3	-	-	-	-	2.05E-03	1.11E-02	4.11E-04	15	93.8
1,2,3,4,6,7,8-HpCDF	pg/m^3	-	-	-	-	3.67E-03	1.94E-02	3.73E-05	15	93.8
1,2,3,4,7,8,9-HpCDF	pg/m^3	-	-	-	-	1.60E-03	1.01E-02	4.58E-05	15	93.8
OCDF	pg/m^3	-	-	-	-	2.63E-03	1.29E-02	1.54E-06	15	93.8
Total Toxic Equivalency	$pg\ TEQ/m^3$	0.1 1[1]	-	0.1	1	1.91E-02	1.09E-01	1.51E-03	15	93.8

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

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

Table C7: 2018 Rundle Station Monitoring Results for Dioxins & Furans

DYEC AAQM										
Rundle Station Monitoring Results for Dioxins & Furans										
Contaminant	**Units**	***MECP Criteria***	***HHRA Health Based Criteria***	**AAQC ($\mu g/m^3$)**	**No. > AAQC**	**Arithmetic Mean**	**Maximum Concentration**	**Minimum Concentration**	**Number of Valid Samples**	**% Valid data**
2,3,7,8-TCDD	pg/m^3	-	-	-	-	3.58E-03	6.90E-03	2.52E-04	16	100.0
1,2,3,7,8-PeCDD	pg/m^3	-	-	-	-	4.47E-03	1.57E-02	2.52E-04	16	100.0
1,2,3,4,7,8-HxCDD	pg/m^3	-	-	-	-	1.70E-03	8.96E-03	3.02E-04	16	100.0
1,2,3,6,7,8-HxCDD	pg/m^3	-	-	-	-	1.83E-03	7.46E-03	2.85E-04	16	100.0
1,2,3,7,8,9-HxCDD	pg/m^3	-	-	-	-	2.26E-03	7.84E-03	3.02E-04	16	100.0
1,2,3,4,6,7,8-HpCDD	pg/m^3	-	-	-	-	2.13E-02	1.42E-01	5.22E-05	16	100.0
OCDD	pg/m^3	-	-	-	-	6.33E-02	3.93E-01	7.88E-06	16	100.0
2,3,7,8-TCDF	pg/m^3	-	-	-	-	2.20E-03	1.41E-02	2.96E-04	16	100.0
1,2,3,7,8-PeCDF	pg/m^3	-	-	-	-	1.42E-03	7.84E-03	1.46E-04	16	100.0
2,3,4,7,8-PeCDF	pg/m^3	-	-	-	-	3.81E-03	2.72E-02	4.09E-04	16	100.0
1,2,3,4,7,8-HxCDF	pg/m^3	-	-	-	-	2.25E-03	1.38E-02	4.30E-04	16	100.0
1,2,3,6,7,8-HxCDF	pg/m^3	-	-	-	-	1.98E-03	8.92E-03	4.40E-04	16	100.0
2,3,4,6,7,8-HxCDF	pg/m^3	-	-	-	-	2.00E-03	8.21E-03	3.38E-04	16	100.0
1,2,3,7,8,9-HxCDF	pg/m^3	-	-	-	-	2.00E-03	9.70E-03	5.16E-04	16	100.0
1,2,3,4,6,7,8-HpCDF	pg/m^3	-	-	-	-	5.76E-03	6.10E-02	3.49E-05	16	100.0
1,2,3,4,7,8,9-HpCDF	pg/m^3	-	-	-	-	1.44E-03	1.06E-02	4.25E-05	16	100.0
OCDF	pg/m^3	-	-	-	-	3.01E-03	2.62E-02	1.52E-06	16	100.0
Total Toxic Equivalency	$pg\ TEQ/m^3$	*0.1* *1* [1]	-	0.1	0	1.90E-02	9.13E-02	1.55E-03	16	100.0

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

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

APPENDIX D

Table D1: 2013 - 2018 Courtice and Rundle Monitoring Station Results for Continuous Parameters

Contaminant	Statistic	Courtice Station						Rundle Station					
		2013 [1]	2014 [1]	2015 [1]	2016 [1]	2017 [1]	2018	2013 [1]	2014 [1]	2015 [1]	2016 [1]	2017 [1]	2018
$PM_{2.5}$ (µg/m^3)	Annual Arithmetic Mean	8.4	8.6	7.7	6.8	6.4	6	8.4	8.5	9.5	9.6	6.3	6
	Annual AAQC	10 [5]	10 [5]	10 [5]	10 [5]	10 [5]	10 [5]	10 [5]	10 [5]	10 [5]	10 [5]	10 [5]	10 [5]
	Events > Annual AAQC	N/A [6]	N/A [6]	N/A [6]	N/A [6]	N/A [6]	N/A [6]	N/A [6]	N/A [6]	N/A [6]	N/A [6]	N/A [6]	N/A [6]
	Maximum 1-hour						65						68
	1-hour AAQC												
	Events > 1-hourAAQC												
	Maximum 24-hour	27	43.2	59.6	34.7	70.6	35	50.6	41.3	64.7	43.1	35.8	31
	24-hour AAQC	28[2]	28[2]	28[2]	28[2]	28[2]	28[2]	28[2]	28[2]	28[2]	28[2]	28[2]	28[2]
	Events > 24-hour AAQC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	98th Percentile [3]	21.5	22.3	27.3	21.6	19.8	19	21.7	21.1	28.4	32.9	20.3	19
NO_x (ppb)	Annual Arithmetic Mean	9.6	10.8	9.1	8.8	9	8	8	7.8	8.2	7.1	7.2	7
	Annual AAQC												
	Events > Annual AAQC												
	Maximum 1-hour	151.3	122.2	148.5	97.1	146.9	87	68.5	70	102	71.3	89.3	74
	1-hour AAQC												
	Events > 1-hour AAQC												
	Maximum 24-hour	49.6	52.1	42.6	44.7	45	36	34.9	38.6	31.9	28.3	35.5	32
	24-hour AAQC												
	Events > 24-hour AAQC												
NO (ppb)	Annual Arithmetic Mean						2						2
	Annual AAQC												
	Events > Annual AAQC												
	Maximum 1-hour	111.1	79.1	88.5	69.5	128.9	69	40.7	38.2	90.9	42.8	88.5	54
	1-hour AAQC												
	Events > 1-hour AAQC												
	Maximum 24-hour	22.9	21.7	22.3	21.9	25.1	17	10.6	11.2	15.9	9.2	7.9	12
	24-hour AAQC												
	Events > 24-hour AAQC												
NO_2 (ppb)	Annual Arithmetic Mean	6.4	8	6.8	6.4	6.4	6	6.5	6.1	6.6	5.4	5.5	5
	Annual AAQC												
	Events > Annual AAQC												
	Maximum 1-hour	48	52.7	62.3	62.4	42.8	71	39.3	62.2	42.6	36.2	42.9	38
	1-hour AAQC	200	200	200	200	200	200	200	200	200	200	200	200
	Events > 1-hourAAQC	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum 24-hour	26.8	31.7	25.9	23.1	26.4	21	24.7	28	22.6	21.5	30.5	21
	24-hour AAQC	100	100	100	100	100	100	100	100	100	100	100	100
	Events > 24-hourAAQC	0	0	0	0	0	0	0	0	0	0	0	0
SO_2 (ppb)	Annual Arithmetic Mean	1.6	1.5	1	1.7	1.8	2.7	0	0.7	0.7	0.8	0.6	0.7
	Annual AAQC	20	20	20	20	20	20	20	20	20	20	20	20
	Events > Annual AAQC	N/A [4]	0	0	0	0	0	N/A	0	0	0	0	0
	Maximum 1-hour	56.3	43.3	39	57.1	95.6	96	24.8	34.1	28.3	30.7	61	66
	1-hour AAQC	250	250	250	250	250	250	250	250	250	250	250	250
	Events > 1-hourAAQC	0	0	0	0	0	0	0	0	0	0	0	0
	Maximum 24-hour	13.8	15.6	8.8	13	18.7	17	3.9	4.2	8.3	6.2	5.2	8
	24-hour AAQC	100	100	100	100	100	100	100	100	100	100	100	100
	Events > 24-hourAAQC	0	0	0	0	0	0	0	0	0	0	0	0

Notes:

[1] - 2013 to 2017 Data taken from Stantec's 2017 Annual Report (Stantec, 2018)

[2] – The Canadian Ambient Air Quality Standard (CAAQS) requires averaging the 98th percentile daily average concentrations over three years which is not addressed in this report as it covers January 1st to December 31st, 2018.

[3] – This value is the 98th percentile of daily average levels for the year.

[4] – Length of measurement period for 2013 <9 months therefore could not be compared to annual MECP criteria.

[5] – Annual CAAQ Standard for Respirable Particulate Matter, effective by 2015. The Respirable Particulate Matter Objective is referenced to the 3-year average of the annual average concentrations.

[6] - Annual PM2.5 concentrations not compared to CAAQS as a 3-year average of the annual average concentrations compared to the 12-month period is required and this report covers January 1st to December 31, 2018.

Table D2: 2013 - 2018 Courtice, Rundle and Fenceline Monitoring Station Results for TSP and Metals

					Courtice Monitoring Station												Rundle Monitoring Station												Fence Line Monitoring Station					
					Maximum Concentration						Percentage of Criteria						Maximum Concentration						Percentage of Criteria						Maximum Concentration			Percentage of Criteria		
Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	AAQC (µg/m^3)	2013 [1]	2014 [1]	2015 [1]	2016 [1]	2017 [1]	2018	2013 [1]	2014 [1]	2015 [1]	2016 [1]	2017 [1]	2018	2013 [1]	2014 [1]	2015 [1]	2016 [1]	2017 [1]	2018	2013 [1]	2014 [1]	2015 [1]	2016 [1]	2017 [1]	2018	2013 [1]	2014 [1]	2015 [1]	2016 [1]	2017 [1]	2018
Particulate (TSP)	µg/m^3	*120*	*120*	120	62.0	57.0		94.7	59.6	84.7	51.7%	47.5%		78.9%	49.7%	70.6%	78.0	59.0		97.1	232	203.6	65.0%	49.2%		80.9%	193.3%	169.7%	80.2	86.1	93.6	66.8%	71.8%	78.0%
Total Mercury (Hg)	µg/m^3	*2*	*2*	2	3.12E-05	2.15E-05		3.62E-05	3.60E-05	4.19E-05	0.0%	0.0%		0.0%	0.0%	0.0%	5.14E-05	2.94E-05		2.50E-05	4.80E-05	9.83E-05	0.0%	0.0%		0.0%	0.0%	0.0%	4.79E-05	7.40E-05	7.20E-03	0.0%	0.0%	0.4%
Aluminum (Al)	µg/m^3	*4.8*	-	4.8	3.34E-01	3.57E-01		6.78E-01	4.49E-01	8.95E-01	7.0%	7.4%		14.1%	9.4%	18.6%	4.54E-01	2.90E-01		7.86E-01	1.08E+00	1.42E+00	9.5%	6.0%		16.4%	22.5%	29.6%	7.07E-01	5.83E-01	9.27E-01	14.7%	12.1%	19.3%
Antimony (Sb)	µg/m^3	*25*	*25*	25	2.69E-03	3.91E-03		3.67E-03	3.73E-03	7.14E-03	0.0%	0.0%		0.0%	0.0%	0.0%	2.86E-03	3.41E-03		3.57E-03	3.69E-03	2.64E-02	0.0%	0.0%		0.0%	0.0%	0.1%	3.53E-03	3.49E-03	4.14E-03	0.0%	0.0%	0.0%
Arsenic (As)	µg/m^3	*0.3*	*0.3*	0.3	3.79E-03	2.35E-03		2.20E-03	4.14E-03	4.29E-03	1.3%	0.8%		0.7%	1.4%	1.4%	1.76E-03	2.05E-03		4.72E-03	2.21E-03	2.06E-02	0.6%	0.7%		1.6%	0.7%	6.9%	2.12E-03	2.10E-03	2.48E-03	0.7%	0.7%	0.8%
Barium (Ba)	µg/m^3	*10*	*10*	10	1.58E-02	1.90E-02		3.39E-02	2.05E-02	1.89E-02	0.2%	0.2%		0.3%	0.2%	0.2%	1.61E-02	1.18E-02		2.37E-02	3.20E-02	2.58E-02	0.2%	0.1%		0.2%	0.3%	0.3%	2.29E-02	2.76E-02	2.31E-02	0.2%	0.3%	0.2%
Beryllium (Be)	µg/m^3	*0.01*	*0.01*	0.01	2.69E-04	3.91E-04		3.67E-04	3.73E-04	1.56E-03	2.7%	3.9%		3.7%	3.7%	15.6%	2.86E-04	3.41E-04		3.57E-04	3.69E-04	1.81E-03	2.9%	3.4%		3.6%	3.7%	18.1%	3.53E-04	3.49E-04	1.73E-03	3.5%	3.5%	17.3%
Bismuth (Bi)	µg/m^3	-	-	-	1.66E-03	2.35E-03		2.20E-03	2.24E-03	4.29E-03	-	-		-	-	-	1.76E-03	2.05E-03		2.14E-03	2.21E-03	2.63E-03	-	-		-	-	-	2.12E-03	2.10E-03	2.48E-03	-	-	-
Boron (B)	µg/m^3	*120*	-	120	1.13E-02	5.61E-03		8.50E-03	5.39E-03	1.31E-02	0.0%	0.0%		0.0%	0.0%	0.0%	1.45E-02	4.43E-03		7.45E-03	6.12E-03	1.33E-02	0.0%	0.0%		0.0%	0.0%	0.0%	8.49E-03	6.67E-03	2.60E-02	0.0%	0.0%	0.0%
Cadmium (Cd)	µg/m^3	*0.025*	*0.025*	0.025	5.59E-04	1.18E-03		7.34E-04	7.45E-04	1.90E-03	2.2%	4.7%		2.9%	3.0%	7.6%	8.99E-04	6.83E-04		7.13E-04	7.38E-04	4.73E-03	3.6%	2.7%		2.9%	3.0%	18.9%	1.13E-02	2.69E-03	1.59E-03	45.2%	10.8%	6.3%
Chromium (Cr)	µg/m^3	*0.5*	-	0.5	3.82E-03	6.29E-03		7.74E-03	1.03E-02	9.50E-03	0.8%	1.3%		1.5%	2.1%	1.9%	1.78E-02	4.75E-03		7.93E-03	1.75E-02	8.20E-03	3.6%	1.0%		1.6%	3.5%	1.6%	8.22E-03	7.67E-02	1.17E-02	1.6%	15.3%	2.3%
Cobalt (Co)	µg/m^3	*0.1*	*0.1*	0.1	5.59E-04	7.83E-04		7.34E-04	7.45E-04	1.43E-03	0.6%	0.8%		0.7%	0.7%	1.4%	5.95E-04	6.83E-04		2.78E-03	7.38E-04	8.77E-04	0.6%	0.7%		2.8%	0.7%	0.9%	7.07E-04	6.99E-04	8.27E-04	0.7%	0.7%	0.8%
Copper (Cu)	µg/m^3	*50*	-	50	7.68E-02	5.95E-02		1.27E-01	9.85E-02	4.55E-02	0.2%	0.1%		0.3%	0.2%	0.1%	2.36E-01	1.93E-01		1.16E-01	2.29E-01	6.15E-02	0.5%	0.4%		0.2%	0.5%	0.1%	7.70E-02	1.02E-01	7.23E-02	0.2%	0.2%	0.1%
Iron (Fe)	µg/m^3	*4*	-	4	9.90E-01	9.26E-01		1.58E+00	1.01E+00	2.53E+00	24.8%	23.2%		39.5%	25.3%	63.3%	1.31E+00	9.30E-01		1.83E+00	2.26E+00	2.97E+00	32.8%	23.3%		45.8%	56.5%	74.1%	1.36E+00	1.66E+00	1.80E+00	34.0%	41.5%	45.0%
Lead (Pb)	µg/m^3	*0.5*	*0.5*	2	6.47E-03	5.50E-03	N/A	7.52E-03	1.09E-02	1.43E-02	0.3%	0.3%	N/A	0.4%	0.5%	0.7%	6.80E-03	7.34E-03	N/A	7.25E-03	1.30E-02	3.96E-01	0.3%	0.4%	N/A	0.4%	0.7%	19.8%	1.02E-02	1.04E-02	8.66E-03	0.5%	0.5%	0.4%
Magnesium (Mg)	µg/m^3	-	-	-	5.71E-01	4.13E-01		1.14E+00	5.61E-01	1.21E+00	-	-		-	-	-	6.76E-01	2.97E-01		1.10E+00	1.76E+00	2.10E+00	-	-		-	-	-	1.01E+00	1.07E+00	1.31E+00	-	-	-
Manganese (Mn)	µg/m^3	*0.4*	-	0.4	3.31E-02	3.08E-02		4.86E-02	5.25E-02	7.25E-02	8.3%	7.7%		12.2%	13.1%	18.1%	1.02E-01	2.60E-02		6.56E-02	7.74E-02	1.13E-01	25.5%	6.5%		16.4%	19.4%	28.1%	4.65E-02	9.69E-02	7.81E-02	11.6%	24.2%	19.5%
Molybdenum (Mo)	µg/m^3	*120*	-	120	1.65E-03	2.36E-03		3.15E-03	4.44E-03	7.69E-03	0.0%	0.0%		0.0%	0.0%	0.0%	3.79E-03	2.76E-03		6.24E-03	3.13E-02	6.26E-03	0.0%	0.0%		0.0%	0.0%	0.0%	5.25E-03	3.49E-03	1.07E-02	0.0%	0.0%	0.0%
Nickel (Ni)	µg/m^3	*0.2*	-	0.2	4.35E-03	2.78E-03		2.40E-03	3.95E-03	3.85E-03	2.2%	1.4%		1.2%	2.0%	1.9%	4.67E-03	4.58E-03		1.94E-02	3.62E-03	3.26E-03	2.3%	2.3%		9.7%	1.8%	1.6%	3.39E-03	1.24E-02	3.50E-03	1.7%	6.2%	1.8%
Phosphorus (P)	µg/m^3	-	-	-	1.45E-01	1.05E-01		4.60E-01	9.76E-02	1.08E+00	-	-		-	-	-	1.59E-01	1.85E-01		1.03E-01	1.45E-01	1.75E+00	-	-		-	-	-	3.34E-01	1.07E-01	1.57E+00	-	-	-
Selenium (Se)	µg/m^3	*10*	*10*	10	2.69E-03	3.91E-03		3.67E-03	3.73E-03	7.14E-03	0.0%	0.0%		0.0%	0.0%	0.1%	2.86E-03	3.41E-03		3.57E-03	3.69E-03	4.39E-03	0.0%	0.0%		0.0%	0.0%	0.0%	3.53E-03	3.49E-03	4.14E-03	0.0%	0.0%	0.0%
Silver (Ag)	µg/m^3	*1*	*1*	1	1.89E-03	1.96E-03		1.83E-03	1.86E-03	3.57E-03	0.2%	0.2%		0.2%	0.2%	0.4%	2.33E-03	1.71E-03		1.78E-03	1.85E-03	1.06E-02	0.2%	0.2%		0.2%	0.2%	1.1%	1.77E-03	1.75E-03	2.07E-03	0.2%	0.2%	0.2%
Strontium (Sr)	µg/m^3	*120*	-	120	1.10E-02	1.34E-02		1.86E-02	1.38E-02	1.73E-02	0.0%	0.0%		0.0%	0.0%	0.0%	1.95E-02	1.09E-02		2.11E-02	7.54E-02	5.82E-02	0.0%	0.0%		0.0%	0.1%	0.0%	1.86E-02	2.60E-02	2.93E-02	0.0%	0.0%	0.0%
Thallium (Tl)	µg/m^3	-	-	-	2.69E-03	3.91E-03		3.67E-03	3.73E-03	7.14E-03	-	-		-	-	-	2.86E-03	3.41E-03		3.57E-03	3.69E-03	4.39E-03	-	-		-	-	-	3.53E-03	3.49E-03	4.14E-03	-	-	-
Tin (Sn)	µg/m^3	*10*	*10*	10	4.79E-03	3.91E-03		3.67E-03	3.73E-03	7.14E-03	0.0%	0.0%		0.0%	0.0%	0.1%	2.86E-03	3.41E-03		4.12E-02	3.69E-03	3.09E-02	0.0%	0.0%		0.4%	0.0%	0.3%	3.53E-03	3.49E-03	4.14E-03	0.0%	0.0%	0.0%
Titanium (Ti)	µg/m^3	*120*	-	120	1.73E-02	2.26E-02		2.82E-02	2.08E-02	3.19E-02	0.0%	0.0%		0.0%	0.0%	0.0%	2.40E-02	1.71E-02		3.50E-02	6.46E-02	5.57E-02	0.0%	0.0%		0.0%	0.1%	0.0%	4.63E-02	3.35E-02	4.29E-02	0.0%	0.0%	0.0%
Uranium (Ur)	µg/m^3	*0.3*	-	0.3	1.24E-04	1.76E-04		1.65E-04	1.68E-04	3.57E-03	0.0%	0.1%		0.1%	0.1%	1.2%	1.32E-04	1.54E-04		1.60E-04	1.66E-04	1.97E-04	0.0%	0.1%		0.1%	0.1%	0.1%	1.59E-04	1.57E-04	1.86E-04	0.1%	0.1%	0.1%
Vanadium (V)	µg/m^3	*2*	*1*	2	6.50E-02	1.14E-01		9.54E-02	2.46E-01	3.57E-03	3.3%	5.7%		4.8%	12.3%	0.2%	7.43E-02	1.24E-01		6.66E-02	2.95E-01	1.88E-02	3.7%	6.2%		3.3%	14.8%	0.9%	7.96E-02	1.83E-01	1.90E-02	4.0%	9.2%	1.0%
Zinc (Zn)	µg/m^3	*120*	-	120	1.39E-03	1.96E-03		1.83E-03	1.86E-03	1.86E-01	0.0%	0.0%		0.0%	0.0%	0.2%	1.48E-03	1.71E-03		1.78E-03	1.85E-03	1.12E-01	0.0%	0.0%		0.0%	0.0%	0.1%	1.77E-03	1.75E-03	1.55E-01	0.0%	0.0%	0.1%
Zirconium (Zr)	µg/m^3	*20*	-	20	1.92E-03	1.96E-03		1.83E-03	1.86E-03	1.64E-03	0.0%	0.0%		0.0%	0.0%	0.0%	3.22E-03	1.71E-03		3.14E-03	3.43E-03	2.19E-03	0.0%	0.0%		0.0%	0.0%	0.0%	1.77E-03	1.75E-03	2.07E-03	0.0%	0.0%	0.0%

NOTE: [1] Results from 2013 - 2014 obtained from Stantec's 2017 Annual Ambient Air Quality Monitoring Report for the Durham York Energy Centre (Stantec, 2018)

Table D3: 2013 - 2018 Courtice and Rundle Monitoring Station Results for PAHs

					Courtice Monitoring Station																		Rundle Monitoring Station																	
					Maximum Concentration						Percentage of Criteria						No. of Exceedances						Maximum Concentration						Percentage of Criteria						No. of Exceedances					
Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	AAQC ($\mu g/m^3$)	2013 [1]	2014 [1]	2015 [1]	2016 [1]	2017 [1]	2018	2013 [1]	2014 [1]	2015 [1]	2016 [1]	2017 [1]	2018	2013 [1]	2014 [1]	2015 [1]	2016 [1]	2017 [1]	2018	2013 [1]	2014 [1]	2015 [1]	2016 [1]	2017 [1]	2018	2013 [1]	2014 [1]	2015 [1]	2016 [1]	2017 [1]	2018	2013 [1]	2014 [1]	2015 [1]	2016 [1]	2017 [1]	2018
1-Methylnaphthalene	ng/m^3	*12000*	-	12000	27.2	8.2		24.0	19.7	21.8	0.2%	0.1%		0.2%	0.2%	0.2%	0	0		0	0	0	26.6	10.8		238.2	29.4	26.6	0.2%	0.1%		2.0%	0.2%	0.2%	0	0		0	0	0
2-Methylnaphthalene	ng/m^3	*10000*	-	10000	54.3	13.9		50.4	33.5	39.9	0.5%	0.1%		0.5%	0.3%	0.4%	0	0		0	0	0	45.4	18.7		502.5	69.2	54.1	0.5%	0.2%		5.0%	0.7%	0.5%	0	0		0	0	0
Acenaphthene	ng/m^3	-	-	-	38.7	11.8		29.6	17.0	20.2	-	-		-	-	-	-	-		-	-	-	18.9	8.1		303.2	44.1	40.4	-	-		-	-		-	-		-	-	-
Acenaphthylene	ng/m^3	*3500*	-	3500	1.1	0.4		0.3	0.8	0.6	0.0%	0.0%		0.0%	0.0%	0.0%	0	0		0	0	0	1.6	2.0		3.3	1.2	0.6	0.1%	0.1%		0.1%		0.0%	0	0		0	0	0
Anthracene	ng/m^3	*200*	-	200	13.1	1.1		0.5	0.6	0.8	6.6%	0.6%		0.3%	0.3%	0.4%	0	0		0	0	0	1.5	0.7		7.5	3.1	2.6	0.8%	0.4%		3.8%		1.3%	0	0		0	0	0
Benzo(a)Anthracene	ng/m^3	-	-	-	0.2	0.2		0.1	0.1	0.1	-	-		-	-	-	-	-		-	-	-	0.5	0.2		0.2	0.1	0.1	-	-		-	-		-	-		-	-	-
Benzo(a)fluorene	ng/m^3	-	-	-	0.3	0.3		0.2	0.2	0.2	-	-		-	-	-	-	-		-	-	-	0.6	0.3		0.4	0.4	0.3	-	-					-	-		-	-	-
Benzo(a)Pyrene	ng/m^3	*0.05* [2] *5* [3] *1.1* [4]	*1*	0.05	0.1	0.1		0.1	0.1	0.2	129.6%	264%		207%	176%	361%	1	3		5	4	5	0.4	0.3		0.2	0.2	0.1	826%	576%		415%	316%	278%	3	4		7	8	7
Benzo(b)Fluoranthene	ng/m^3	-	-	-	0.4	0.6		2.5	0.1	0.3	-	-		-	-	-	-	-		-	-	-	1.0	0.7		0.5	0.4	0.1	-	-		-	-	-	-	-		-	-	-
Benzo(b)fluorene	ng/m^3	-	-	-	0.3	0.3		0.2	0.2	0.2	-	-		-	-	-	-	-		-	-	-	0.5	0.3		0.2	0.3	0.3	-	-		-	-	-	-	-		-	-	-
Benzo(e)Pyrene	ng/m^3	-	-	-	0.3	0.3		0.2	0.2	0.2	-	-		-	-	-	-	-		-	-	-	0.5	0.3		0.2	0.3	0.3	-	-		-	-	-	-	-		-	-	-
Benzo(g,h,i)Perylene	ng/m^3	-	-	-	0.4	0.3	N/A	2.5	0.1	0.1	-	-	N/A	-	-	-	-	-	N/A	-	-	-	0.6	0.3		0.1	0.1	0.1	-	-	N/A	-	-	-	-	-		-	-	-
Benzo(k)Fluoranthene	ng/m^3	-	-	-	0.4	0.3		2.5	0.1	0.1	-	-		-	-	-	-	-		-	-	-	0.3	0.2		0.1	0.1	0.1	-	-		-	-	-	-	-		-	-	-
Biphenyl	ng/m^3	-	-	-	14.9	4.5		11.1	9.7	10.1	-	-		-	-	-	-	-		-	-	-	7.4	5.8		125.9	14.2	13.2	-	-		-	-	-	-	-		-	-	-
Chrysene	ng/m^3	-	-	-	0.2	0.5		0.2	0.1	0.3	-	-		-	-	-	-	-		-	-	-	0.9	0.7		0.4	0.1	0.2	-	-		-	-	-	-	-		-	-	-
Dibenzo(a,h)Anthracene	ng/m^3	-	-	-	0.3	0.5		2.8	0.1	0.1	-	-		-	-	-	-	-		-	-	-	0.2	0.2		0.1	0.1	0.1	-	-		-	-	-	-	-		-	-	-
Fluoranthene	ng/m^3	-	-	-	4.5	4.0		3.2	2.6	3.3	-	-		-	-	-	-	-		-	-	-	7.7	3.5		14.7	13.9	13.5	-	-		-	-	-	-	-		-	-	-
Indeno(1,2,3-cd)Pyrene	ng/m^3	-	-	-	0.4	0.5		2.8	0.1	0.1	-	-		-	-	-	-	-		-	-	-	0.5	0.3		0.2	0.1	0.1	-	-		-	-	-	-	-		-	-	-
Naphthalene	ng/m^3	*22500*	*22500*	22500	143.0	38.7		60.9	92.2	77.8	0.6%	0.2%		0.3%	0.4%	0.3%	0	0		0	0	0	94.1	92.6		294.6	85.4	74.2	0.4%	0.4%		1.3%	0.4%	0.3%	0	0		0	0	0
o-Terphenyl	ng/m^3	-	-	-	0.3	0.3		0.2	0.2	0.2	-	-		-	-	-	-	-		-	-	-	0.5	0.3		0.2	0.3	0.3	-	-		-	-	-	-	-		-	-	-
Perylene	ng/m^3	-	-	-	0.3	0.3		0.2	0.2	0.2	-	-		-	-	-	-	-		-	-	-	0.5	0.3		0.2	0.3	0.3	-	-		-	-	-	-	-		-	-	-
Phenanthrene	ng/m^3	-	-	-	33.9	14.2		23.1	16.4	21.6	-	-		-	-	-	-	-		-	-	-	29.4	13.0		209.7	69.8	58.1	-	-		-	-	-	-	-		-	-	-
Pyrene	ng/m^3	-	-	-	1.7	2.5		1.3	1.2	1.4	-	-		-	-	-	-	-		-	-	-	3.2	1.9		6.6	5.6	5.4	-	-		-	-	-	-	-		-	-	-
Tetralin	ng/m^3	-	-	-	5.8	25.3		3.8	4.9	4.6	-	-		-	-	-	-	-		-	-	-	5.1	4.0		4.4	3.8	7.7	-	-		-	-	-	-	-		-	-	-
Total PAH[5]	ng/m^3	-	-	-	327.0	95.0		208.7	200.0	203.6	-	-		-	-	-	-	-		-	-	-	165.0	153.9		1710.2	309.0	292.1	-	-		-	-	-	-	-		-	-	-

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

[1] Results from 2013 - 2014 obtained from Stantec's 2017 Annual Ambient Air Quality Monitoring Report for the Durham York Energy Centre (Stantec, 2018)

[2] AAQC

[3] O. Reg. 419/05 Schedule Upper Risk Thesholds

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

[5] Total PAH sums all PAH contaminants

Table D4: 2013 - 2018 Courtice and Rundle Monitoring Station Results for D&F

Year	Sampling Period Throughout Year	Courtice Station		Rundle Station	
		Maximum Concentration (pg TEQ/m^3)	No. of Exceedances	Maximum Concentration (pg TEQ/m^3)	No. of Exceedances
2013 [1]	May - December	0.036	0	0.029	0
2014 [1]	January - June	0.038	0	0.065	0
2015 [1]	October - December	0.017	0	0.021	0
2016 [1]	February - December	0.044	0	0.026	0
2017 [1]	January – December	0.052	0	0.065	0
2018	January - December	0.109	1	0.091	0

NOTE: [1] Results from 2013 - 2014 obtained from Stantec's 2017 Annual Ambient Air Quality Monitoring Report for the Durham York Energy Centre (Stantec, 2018)