

Annual | 2017



Ambient Air Monitoring Report

**Goldcorp Canada Ltd.
Porcupine Gold Mines
Hollinger Open Pit**

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Executive Summary

Porcupine Gold Mines is a subsidiary of Goldcorp Canada Ltd., situated in Timmins, Ontario.

In order to monitor potential air quality effects and ensure mitigation efforts are effective, Goldcorp has established an ambient air monitoring network. The data generated are used to assess the air quality where people live, measure compliance with provincial standards, compare changes to air quality over time, provide information about regional background levels of monitored pollutants, inform the public and raise awareness of local air quality.

The ambient air monitoring network has been approved by the Ministry of the Environment and Climate Change (MOECC) and will continue to operate throughout the life of the mining operations. In accordance with MOECC's reporting requirements, this is the Annual Ambient Air Monitoring Report for 2017.

Conclusions:

During 2017 there were:

- a) No exceedances of the continuous NO₂ 24 hour and 1 hour running average AAQCs or of the ½ hour running average O.Reg 419/05 standard.
- b) 24 exceedances of the continuous PM₁₀ 24 hour running average AAQC, 4 at STN72138, 7 at STN72139, 5 at STN72140 and 8 at STN72141.
- c) 2 exceedances of the non-continuous 24 hour clock TSP AAQC, 1 at STN72135 and 1 at STN72136.
- d) 5 exceedances of the non-continuous 24 hour clock PM₁₀ AAQC, 1 at STN72135, 2 at STN72136 and 2 at STN72137.
- e) No exceedances of the non-continuous 24 hour clock TSP or PM₁₀ Suspended Metals AAQCs, standards or guidelines.
- f) 12 exceedances of the non-continuous 30 day standard for Total Dustfall, 1 at STN72135, 1 at STN72141 and 10 at STN72143.
- g) A summary of exceedances potentially associated to the Hollinger Open Pit (HOP) operations can be found in Table 27.
- h) Network annual PM₁₀ averages were 9 µg/m³ at STN72135, 16 µg/m³ at STN72139, 11 µg/m³ at STN72140 and 8 µg/m³ at STN72141. No average was available from STN72138 due to the decommissioning of the site on June 7th.
- i) 36 calibrations were conducted on continuous samplers, all of which met criteria.
- j) The percentage of continuous valid pollutant data recovery was 96.0% for 2017, exceeding the ministry's minimum target of 90% and desirable target of 95%. The percent valid data recovery for non-continuous TSP, PM₁₀ and Total Dustfall was 100%.

1.0 Introduction

Porcupine Gold Mines is a subsidiary of Goldcorp Canada Ltd., situated in Timmins, Ontario.

In order to monitor potential air quality effects and ensure mitigation efforts are effective, Goldcorp has established an ambient air monitoring network. The network reports continuous and non-continuous measurements of air quality data at various sites located around Goldcorp's Porcupine mining operations. The data generated are used to assess the air quality where people live, measure compliance with provincial standards, compare changes to air quality over time, provide information about regional background levels of monitored pollutants, inform the public and raise awareness of local air quality.

The ambient air monitoring network has been approved by the Ministry of the Environment and Climate Change (MOECC) and will continue to operate throughout the life of the mining operations. In accordance with MOECC's reporting requirements, this is the Annual Ambient Air Monitoring Report for 2017.

2.0 Goldcorp - Ambient Air Monitoring Network

The ambient air monitoring network consists of a meteorological station and 5 continuous stations that report data for Total Suspended Particulate (TSP), Inhalable Particulate (PM₁₀) and Nitrogen Oxides (NO_x). In addition, there are 6 stations that collect non-continuous data for TSP, PM₁₀, metals, Total Dustfall, passive Sulphur Dioxide (SO₂) and passive Nitrogen Dioxide (NO₂).

2.1 Parameters Monitored

2.1.1 Particulate Matter (PM)

Particulate Matter (PM) consists of airborne particles in solid or liquid form, except pure water, that are microscopic in size. Particulate matter is classified according to its size. The MOECC identifies the following sizes of PM:

- 1) **Settleable Particulate Matter (Total Dustfall)** - Dustfall consists of very coarse particulate matter fractions that settle quickly under the influence of gravity.
- 2) **Suspended Particulate Matter (SP or TSP)** - airborne particulate matter with an upper size limit of approximately 44 micro metres (µm) in aerodynamic equivalent diameter.
- 3) **Particulate Matter < 10 microns (PM₁₀)** - airborne particulate matter with a mass median diameter less than 10 µm.
- 4) **Particulate Matter < 2.5 microns (PM_{2.5})** - airborne particulate matter with a mass median diameter less than 2.5 µm.

2.1.2 Metals

A number of trace metals which can cause human health impacts are present in airborne particulate matter. Concentrations of trace metals can be determined in a laboratory by analyzing the particulate matter collected on filters.

2.1.3 Nitrogen Oxides (NO, NO₂, NO_x)

Nitrogen Oxides (NO_x) are usually defined as the sum of Nitric Oxide (NO) and Nitrogen Dioxide (NO₂). NO₂ is a reddish brown gas with a pungent and irritating odour. It transforms in the air to form gaseous nitric acid and organic nitrates. NO₂ also plays a major role in atmospheric reactions that produce ground level ozone, a major component of smog.

In the case of air quality assessments, e.g. air quality reports such as the current report, NO₂, not NO_x, is the reference contaminant. NO_x Ambient Air Quality Criteria (AAQC) with 1 hour and 24 hour averaging times should only be compared to monitored NO₂ data.

2.1.4 Sulphur Dioxide (SO₂)

Sulphur Dioxide (SO₂) is a colourless gas that smells like burnt matches. SO₂ belongs to the family of sulphur oxide (SO_x) gases, these gases dissolve easily in water. Sulphur is prevalent in many raw materials. SO_x gases are formed when fuels containing sulphur are burned, when gasoline is extracted from oil or when metals are processed from sulphide ores.

2.2 Sampling Program Methodology

The Goldcorp ambient air monitoring network utilizes various types of sampling equipment. AirPointer® samplers measure continuous TSP, PM₁₀ and Nitrogen Oxides. Hivol, Dustfall and passive samplers are used to measure non-continuous TSP, PM₁₀, metals, Total Dustfall, SO₂ and NO₂ data. Station locations are illustrated in Figure 1. The parameters monitored are listed in Table 1 and station Universal Transverse Mercator (UTM) data are tabulated in Table 2.

- **AirPointer® - Continuous TSP**

TSP data is continuously monitored throughout the year by an Airpointer® system utilizing a Thermo Scientific model ADR1500 Dust Monitor. The ADR1500 utilizes light scattering photometer (nephelometer) technology to measure airborne particulate. The intensity of the light scattered by airborne particles passing through the sensing chamber is linearly proportional to their concentration. AirPointer® TSP measurements cannot be used to report exceedances because the measurement method is not officially designated. The collected TSP data is considered as “indicative” and should be used only for information purposes.

- **AirPointer® - Continuous PM₁₀**

PM₁₀ data is continuously monitored throughout the year by an AirPointer® system utilizing a Thermo Scientific model 5030 SHARP. The 5030 SHARP automatically measures and records airborne particulate concentration levels in micrograms per cubic metre (µg/m³) using a combination of beta attenuation and light scattering technology.

- **AirPointer® - Continuous Nitrogen Oxides**

NO, NO₂ and NO_x are continuously monitored throughout the year by an AirPointer® system utilizing a Thermo Scientific model 42i. The model 42i uses chemiluminescence technology to measure the amount of Nitrogen Oxides in the air.

- **Hivol - Non-continuous TSP and PM₁₀**

Non-continuous TSP and PM₁₀ samples are collected every 6 days according to the National Air Pollutant Surveillance (NAPS) schedule. Samples are collected on filter media for a 24 hour period from midnight to midnight. TSP samples are collected with a Tisch model 5170 Hivol sampler. PM₁₀ samples are collected with a Tisch model 6070 Hivol sampler.

Hivol samplers draw ambient air at a constant flow rate in order to collect suspended particulate matter onto a filter. Each filter is weighed before and after exposure to determine the total loading due to collected particulate.

Non-continuous TSP and PM₁₀ Hivol samplers meet US EPA and International Particulate Monitoring Regulations.

- **Hivol - Non-continuous Metals**

TSP Hivol filters are analyzed every 18 days (NAPS schedule) by an accredited laboratory for a specified list of metals. PM₁₀ Hivol filters are analyzed every 30 days. Metal concentrations are determined using Inductively Coupled Plasma Mass Spectrometry (ICP-MS). Results are reported in µg/m³, analyses include; Arsenic (As), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe, as Fe₂O₃), Lead (Pb), Magnesium (Mg, as MgO), Manganese (Mn), Nickel (Ni), Selenium (Se), Sulphur (S), Vanadium (V), Zinc (Zn) and Sulphate (SO₄).

- **Non-continuous Total Dustfall**

Containers (Dustfall jars) of a standard size and shape are set up at selected sampling sites so that particulate matter can settle into them for periods of about 30 days. The collected samples are then sent to an accredited laboratory for analyses of both soluble and insoluble portions which are combined to calculate the Total Dustfall. Results are reported as grams per square metre per 30 days (g/m²/30d).

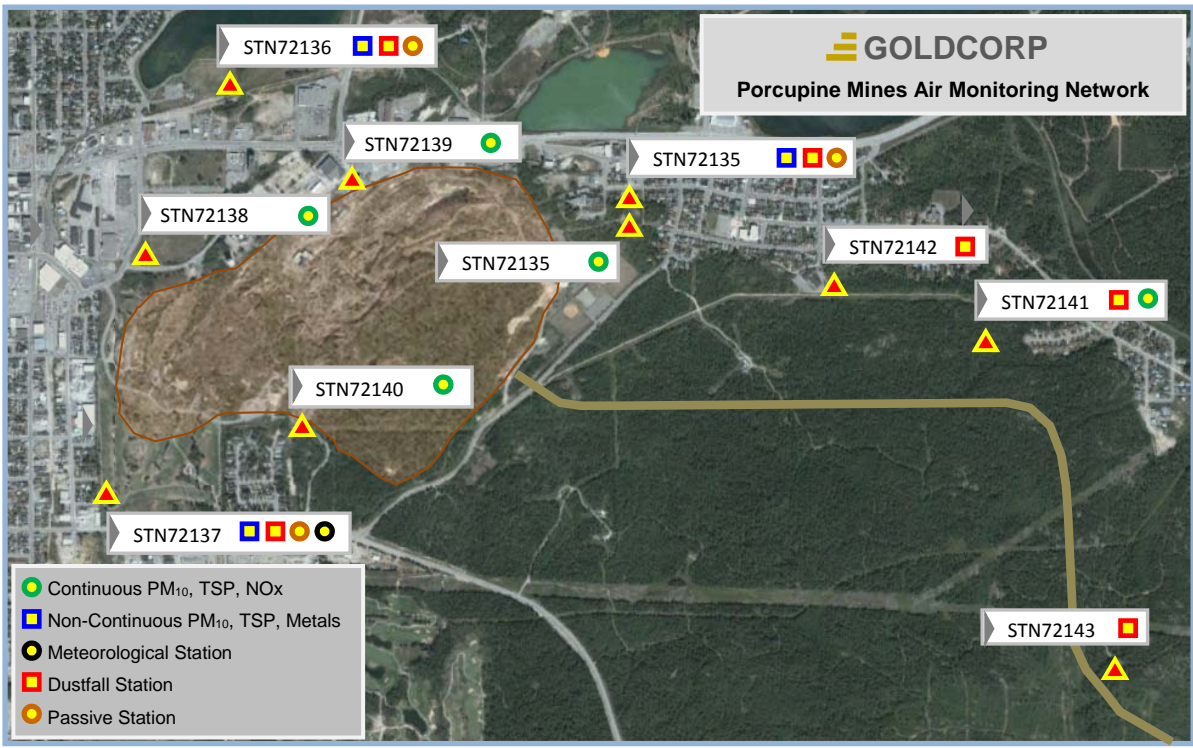
- **Non-continuous Passive SO₂ / NO₂**

Passive sampling utilizes laboratory prepared filter cartridges which are installed at selected sampling sites for exposure to ambient air for periods of about 30 days. After exposure the cartridges are removed and submitted to an accredited laboratory for analysis. The analysis provides an estimate of monthly average spatial concentrations for SO₂ and NO₂. SO₂ analysis is determined by ion chromatography and NO₂ analysis is determined by spectrophotometry.

• **Meteorological Data**

Meteorological data is monitored continuously throughout the year by a 5 metre meteorological station. Parameters monitored include; Wind Speed (WS), Wind Direction (WD), Ambient Temperature (AT), Relative Humidity (RH), Barometric Pressure (BP) and Precipitation (PRECP).

Goldcorp Air Monitoring Network Overview - Figure 1



Porcupine Gold Mines Ambient Air Monitoring Network		By : DC	Figure 1	
	True North	Approx. Scale :	1:14000	
Goldcorp - Porcupine Gold Mines - Timmins, Ontario	Date Revised :	01 March, 2016		

Parameters Monitored at Each Station - Table 1

Station Identifier	TSP	HiVol TSP	PM ₁₀	HiVol PM ₁₀	NO _x	Metals	Passive SO ₂	Passive NO ₂	Total Dustfall	MET
STN72135 - Hollinger Ext.	✓		✓		✓					
STN72138 - Hollinger Park	✓		✓		✓					
STN72139 - Hollinger Office	✓		✓		✓					
STN72140 - Goldmine Tour	✓		✓		✓					
STN72141 - Claimpost Trail	✓		✓		✓				✓	
STN72135 - Extendicare		✓		✓		✓	✓	✓	✓	
STN72136 - MRCA		✓		✓		✓	✓	✓	✓	
STN72137 - Shania Twain		✓		✓		✓	✓	✓	✓	✓
STN72142 - Aura Lake									✓	
STN72143 - Snowmobile Crossing									✓	

UTM Station Coordinates - Table 2

UTM Coordinate Datum					
Station Identifier		UTM Zone	Easting	Northing	Elevation
STN72135 - Hollinger Ext.	▶	17 U	477690.00	5369095.00	329 metres
STN72138 - Hollinger Park	▶	17 U	476172.60	5368991.69	318 metres
STN72139 - Hollinger Office	▶	17 U	476860.57	5369232.07	326 metres
STN72140 - Goldmine Tour	▶	17 U	476626.00	5368461.41	324 metres
STN72141 - Claimpost Trail	▶	17 U	478831.56	5368717.43	319 metres
STN72135 - Extendicare	▶	17 U	477683.00	5369104.00	327 metres
STN72136 - MRCA	▶	17 U	476416.81	5369518.75	312 metres
STN72137 - Shania Twain	▶	17 U	476064.20	5368291.07	314 metres
STN72142 - Aura Lake	▶	17 U	478337.11	5368893.25	333 metres
STN72143 - Snowmobile Crossing	▶	17 U	479158.24	5367586.26	323 metres

2.3 Summary of Network Operations

Air quality data and instrument performance are evaluated daily. Site visits to the non-continuous samplers are conducted weekly and continuous monitoring sites are visited as needed. Service logs, data and edit records are retained in a historical database.

STN72138 (Hollinger Park) was decommissioned on June 7th to accommodate construction activities that the City of Timmins is conducting at the public park. The station will be re-commissioned once the construction is complete.

During 2017 there were 36 calibrations on the continuous samplers, all of which met criteria. Details are found in Appendix C.

2.3.1 Continuous Data

Data loggers are programmed to continuously scan the outputs from each of the continuous analyzers and process both five minute and hourly data averages. The data loggers have the capability to store several years' worth of data.

An Envitech Envista Air Resource Manager (ARM) application is used to poll the station data loggers and retrieve the collected data on an hourly basis. The data are then verified, quality assured and archived in a central database. The central database is backed up daily for contingency.

2.3.2 Non-continuous Data

TSP and PM₁₀ samples are collected on filter media on a 6 day NAPS schedule. Gravimetric results (total loading) are calculated and reported for each filter. Metal analyses are conducted on every third TSP filter and every fifth PM₁₀ filter. Filters are removed as soon as possible after exposure and submitted to an accredited laboratory for analysis. Laboratory reports are quality assured and submitted to the MOECC.

Dustfall data is collected using Dustfall jars on a monthly schedule. At the end of each month the exposed jars are retrieved and submitted for analyses.

Passive SO₂ and NO₂ data are collected on passive filter cartridges on a monthly schedule. At the end of each month, exposed cartridges are retrieved and submitted for analyses.

2.3.3 Quality Assurance

Quality assurance measures are implemented to ensure data integrity. The operation, service and maintenance of the stations and sampling equipment are in accordance with the manufacturers' operations manuals and protocols as outlined in the MOECC's 'Operations Manual for Air Quality Monitoring in Ontario', March 2008.

3.0 MOECC - AAQCs, Standards and Guidelines

The MOECC's AAQCs, standards and guidelines are based on the best scientific information available and are set at a level that safeguards human health and the natural environment. The effects considered may be based on health, odour, vegetation, soiling, visibility, corrosion or other effects. The relevant continuous PM₁₀ and Nitrogen Oxides (as NO₂), AAQC and O. Reg 419/05

standards are summarized in Table 3. Non-continuous TSP, PM₁₀, Metals and Total Dustfall AAQCs, standards and guidelines are summarized in Tables 4, 5 and 6. There are no listed AAQCs, standards or guidelines for passive SO₂ / NO₂ monitoring.

Continuous Ambient Air Quality Criteria and Standards - Table 3

Contaminant Name	Criterion Type	Average Period	Average Type	Value	Units
Particulate Matter < 10µm – PM ₁₀	Interim AAQC	24 Hr	Running	50	µg/m ³
Nitrogen Dioxide – NO ₂	AAQC	24 Hr	Running	100	ppb
Nitrogen Dioxide – NO ₂	AAQC	1 Hr	Running	200	ppb
Nitrogen Dioxide – NO ₂	Standard	½ Hr	Running	250	ppb

Non-continuous TSP Ambient Air Quality Criteria and Standards - Table 4

Contaminant Name	Criterion Type	Average Period	Average Type	Value	Units
TSP	AAQC	24 Hr	Clock	120	µg/m ³
Arsenic (As)	AAQC	24 Hr	Clock	0.3	µg/m ³
Cadmium (Cd)	AAQC	24 Hr	Clock	0.025	µg/m ³
Chromium (Cr)	AAQC	24 Hr	Clock	0.5	µg/m ³
Cobalt (Co)	AAQC	24 Hr	Clock	0.1	µg/m ³
Copper (Cu)	AAQC	24 Hr	Clock	50	µg/m ³
Iron (Fe)	AAQC	24 Hr	Clock	25	µg/m ³
Lead (Pb)	AAQC	24 Hr	Clock	0.5	µg/m ³
Magnesium (Mg)	AAQC	24 Hr	Clock	120	µg/m ³
Manganese (Mn)	AAQC	24 Hr	Clock	0.4	µg/m ³
Nickel (Ni)	AAQC	24 Hr	Clock	0.2	µg/m ³
Selenium (Se)	AAQC	24 Hr	Clock	10	µg/m ³
Vanadium (V)	AAQC	24 Hr	Clock	2	µg/m ³
Zinc (Zn)	AAQC	24 Hr	Clock	120	µg/m ³

Non-continuous TSP Ambient Air Quality Criteria and Standards - Table 4 (cont.)

Contaminant Name	Criterion Type	Average Period	Average Type	Value	Units
Copper (Cu)	Standard	24 Hr	Clock	50	µg/m ³
Iron (Fe)	Standard	24 Hr	Clock	25	µg/m ³
Lead (Pb)	Standard	24 Hr	Clock	0.5	µg/m ³
Magnesium (Mg)	Standard	24 Hr	Clock	120	µg/m ³
Manganese (Mn)	Standard	24 Hr	Clock	0.4	µg/m ³
Nickel (Ni)	Standard	24 Hr	Clock	2	µg/m ³
Vanadium (V)	Standard	24 Hr	Clock	2	µg/m ³
Zinc (Zn)	Standard	24 Hr	Clock	120	µg/m ³
Arsenic (As)	Guideline	24 Hr	Clock	0.3	µg/m ³
Chromium (Cr)	Guideline	24 Hr	Clock	1.5	µg/m ³
Cobalt (Co)	Guideline	24 Hr	Clock	0.1	µg/m ³
Manganese (Mn)	Guideline	24 Hr	Clock	2.5	µg/m ³
Selenium (Se)	Guideline	24 Hr	Clock	10	µg/m ³

Non-continuous PM₁₀ Ambient Air Quality Criteria - Table 5

Contaminant Name	Criterion Type	Average Period	Average Type	Value	Units
PM ₁₀	Interim AAQC	24 Hr	Clock	50	µg/m ³
Manganese (Mn)	AAQC	24 Hr	Clock	0.2	µg/m ³
Nickel (Ni)	AAQC	24 Hr	Clock	0.1	µg/m ³

Non-continuous Total Dustfall Standard - Table 6

Contaminant Name	Criterion Type	Average Period	Average Type	Value	Units
Total Dustfall	Standard	30 days	Clock	7.0	g/m ² /30d

4.0 Continuous Data Statistics

The continuous data statistics are summarized in the accompanying tables and include:

- Maximum 24 hour running average
- Number of exceedances > 24 hour running average
- Number of valid clock hours
- Monthly and annual arithmetic means
- Overall percent valid data
- Maximum ½ hour running averages (NO₂ only)
- Maximum 1 hour running averages (NO₂ only)
- Number of exceedances > ½ hour running average (NO₂ only)
- Number of exceedances > 1 hour running average (NO₂ only)

STN72135 PM₁₀ Data Statistics Summary - Table 7

STN72135	Max 24 Hr Running Avg	Events > 24 Hr AAQC	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	PM ₁₀ µg/m ³	PM ₁₀ No.	PM ₁₀ Hrs	PM ₁₀ µg/m ³	PM ₁₀ %
January	33	0	743	7	99.9
February	20	0	665	8	99.0
March	49	0	744	14	100.0
April	23	0	710	9	98.6
May	12	0	738	7	99.2
June	29	0	719	9	99.9
July	25	0	744	12	100.0
August	17	0	739	9	99.3
September	24	0	719	10	99.9
October	45	0	743	9	99.9
November	23	0	715	8	99.3
December	20	0	739	6	99.3
Totals		0	8718		
Annual Mean				9	99.5

STN72138 PM₁₀ Data Statistics Summary - Table 8

STN72138	Max 24 Hr Running Avg	Events > 24 Hr AAQC	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	PM ₁₀	PM ₁₀	PM ₁₀	PM ₁₀	PM ₁₀
	µg/m ³	No.	Hrs	µg/m ³	%
January	15	0	744	7	100.0
February	23	0	663	8	98.7
March	54	1	744	23	100.0
April	77	2	716	20	99.4
May	56	1	736	16	98.9
June	31	0	150	ins*	20.8
July	ins*	n/a*	0	ins*	0.0
August	ins*	n/a*	0	ins*	0.0
September	ins*	n/a*	0	ins*	0.0
October	ins*	n/a*	0	ins*	0.0
November	ins*	n/a*	0	ins*	0.0
December	ins*	n/a*	0	ins*	0.0
Totals		4	3753		
Annual Mean				ins*	43.2

ins* - insufficient data to calculate mean. n/a* - not applicable.

STN72139 PM₁₀ Data Statistics Summary - Table 9

STN72139	Max 24 Hr Running Avg	Events > 24 Hr AAQC	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	PM ₁₀	PM ₁₀	PM ₁₀	PM ₁₀	PM ₁₀
	µg/m ³	No.	Hrs	µg/m ³	%
January	31	0	727	11	97.7
February	28	0	660	14	98.2
March	88	4	716	26	96.2
April	53	1	711	16	98.8
May	25	0	737	11	99.1
June	37	0	709	14	98.5
July	47	0	744	16	100.0
August	47	0	736	18	98.9
September	58	1	720	21	100.0
October	51	1	719	16	96.6
November	48	0	707	13	98.2
December	38	0	732	13	98.4
Totals		7	8618		
Annual Mean				16	98.4

STN72140 PM₁₀ Data Statistics Summary - Table 10

STN72140	Max 24 Hr Running Avg	Events > 24 Hr AAQC	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	PM ₁₀ µg/m ³	PM ₁₀ No.	PM ₁₀ Hrs	PM ₁₀ µg/m ³	PM ₁₀ %
January	29	0	740	9	99.5
February	32	0	664	9	98.8
March	99	5	744	23	100.0
April	32	0	714	10	99.2
May	39	0	738	9	99.2
June	30	0	717	10	99.6
July	34	0	744	15	100.0
August	20	0	735	10	98.8
September	25	0	716	11	99.4
October	27	0	725	8	97.4
November	34	0	720	9	100.0
December	23	0	735	7	98.8
Totals		5	8692		
Annual Mean				11	99.2

STN72141 PM₁₀ Data Statistics Summary - Table 11

STN72141	Max 24 Hr Running Avg	Events > 24 Hr AAQC	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	PM ₁₀ µg/m ³	PM ₁₀ No.	PM ₁₀ Hrs	PM ₁₀ µg/m ³	PM ₁₀ %
January	24	0	744	5	100.0
February	51	1	667	8	99.3
March	145	6	744	22	100.0
April	55	1	704	9	97.8
May	17	0	741	7	99.6
June	16	0	685	7	95.1
July	16	0	744	9	100.0
August	17	0	739	8	99.3
September	17	0	720	8	100.0
October	20	0	722	6	97.0
November	44	0	720	7	100.0
December	16	0	736	6	98.9
Totals		8	8666		
Annual Mean				8	98.9

STN72135 NO₂ Data Statistics Summary - Table 12

STN72135	Max 24 Hr Running Avg	Max 1 Hr Running Avg	Max ½ Hr Running Avg	Events > 24 Hr AAQC	Events > 1 Hr AAQC	Events > ½ Hr Standard	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂
	ppb	ppb	ppb	No.	No.	No.	Hrs	ppb	%
January	10	32	33	0	0	0	743	4	99.9
February	12	34	38	0	0	0	672	5	100.0
March	14	48	50	0	0	0	743	4	99.9
April	14	47	48	0	0	0	719	3	99.9
May	8	41	41	0	0	0	743	2	99.9
June	12	32	35	0	0	0	718	3	99.7
July	10	23	26	0	0	0	743	4	99.9
August	7	18	20	0	0	0	739	3	99.3
September	7	17	20	0	0	0	719	3	99.9
October	11	27	31	0	0	0	736	4	98.9
November	9	22	24	0	0	0	719	3	99.9
December	19	35	36	0	0	0	743	6	99.9
Totals				0	0	0	8737		
Annual Mean								4	99.7

STN72138 NO₂ Data Statistics Summary - Table 13

STN72138	Max 24 Hr Running Avg	Max 1 Hr Running Avg	Max ½ Hr Running Avg	Events > 24 Hr AAQC	Events > 1 Hr AAQC	Events > ½ Hr Standard	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂
	ppb	ppb	ppb	No.	No.	No.	Hrs	ppb	%
January	15	33	37	0	0	0	744	6	100.0
February	15	37	41	0	0	0	671	5	99.9
March	29	52	58	0	0	0	727	8	97.7
April	16	52	56	0	0	0	719	5	99.9
May	12	40	41	0	0	0	741	4	99.6
June	9	30	32	0	0	0	150	ins*	20.8
July	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
August	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
September	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
October	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
November	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
December	ins*	ins*	ins*	n/a*	n/a*	n/a*	0	ins*	0.0
Totals				0	0	0	3752		
Annual Mean								ins*	43.2

ins* - insufficient data to calculate mean. n/a* - not applicable.

STN72139 NO₂ Data Statistics Summary - Table 14

STN72139	Max 24 Hr Running Avg	Max 1 Hr Running Avg	Max ½ Hr Running Avg	Events > 24 Hr AAQC	Events > 1 Hr AAQC	Events > ½ Hr Standard	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂
	ppb	ppb	ppb	No.	No.	No.	Hrs	ppb	%
January	15	36	41	0	0	0	635	7	85.3
February	19	43	45	0	0	0	670	9	99.7
March	23	56	60	0	0	0	714	9	96.0
April	22	54	59	0	0	0	719	7	99.9
May	12	42	45	0	0	0	742	6	99.7
June	12	36	40	0	0	0	715	5	99.3
July	9	23	25	0	0	0	744	4	100.0
August	12	32	33	0	0	0	739	5	99.3
September	13	24	27	0	0	0	719	6	99.9
October	15	35	39	0	0	0	737	7	99.1
November	11	28	29	0	0	0	719	6	99.9
December	27	45	46	0	0	0	741	8	99.6
Totals				0	0	0	8594		
Annual Mean								7	98.1

STN72140 NO₂ Data Statistics Summary - Table 15

STN72140	Max 24 Hr Running Avg	Max 1 Hr Running Avg	Max ½ Hr Running Avg	Events > 24 Hr AAQC	Events > 1 Hr AAQC	Events > ½ Hr Standard	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂	NO ₂
	ppb	ppb	ppb	No.	No.	No.	Hrs	ppb	%
January	16	32	33	0	0	0	743	6	99.9
February	17	37	45	0	0	0	671	6	99.9
March	24	52	53	0	0	0	743	8	99.9
April	18	45	48	0	0	0	718	7	99.7
May	15	33	37	0	0	0	743	5	99.9
June	9	22	25	0	0	0	705	3	97.9
July	11	25	29	0	0	0	743	3	99.9
August	8	22	23	0	0	0	738	3	99.2
September	7	21	22	0	0	0	719	3	99.9
October	8	20	23	0	0	0	738	3	99.2
November	7	23	24	0	0	0	719	3	99.9
December	26	43	47	0	0	0	722	6	97.0
Totals				0	0	0	8702		
Annual Mean								5	99.3

STN72141 NO₂ Data Statistics Summary - Table 16

STN72141	Max 24 Hr Running Avg	Max 1 Hr Running Avg	Max ½ Hr Running Avg	Events > 24 Hr AAQC	Events > 1 Hr AAQC	Events > ½ Hr Standard	Valid Clock Hours	Monthly Mean	Percent Valid Data
Month	NO ₂ ppb	NO ₂ ppb	NO ₂ ppb	NO ₂ No.	NO ₂ No.	NO ₂ No.	NO ₂ Hrs	NO ₂ ppb	NO ₂ %
January	10	30	33	0	0	0	743	3	99.9
February	15	40	43	0	0	0	671	5	99.9
March	20	51	53	0	0	0	743	5	99.9
April	19	49	52	0	0	0	718	4	99.7
May	8	32	33	0	0	0	741	3	99.6
June	15	35	37	0	0	0	277	ins*	38.5
July	7	19	20	0	0	0	274	ins*	36.8
August	6	17	21	0	0	0	737	2	99.1
September	6	17	19	0	0	0	499	ins*	69.3
October	8	23	24	0	0	0	736	3	98.9
November	6	21	23	0	0	0	719	2	99.9
December	20	33	34	0	0	0	741	5	99.6
Totals				0	0	0	7599		
Annual Mean								4	86.7

ins* - insufficient data to calculate mean.

4.1 Year to Year Data Comparison Statistics - Table 17

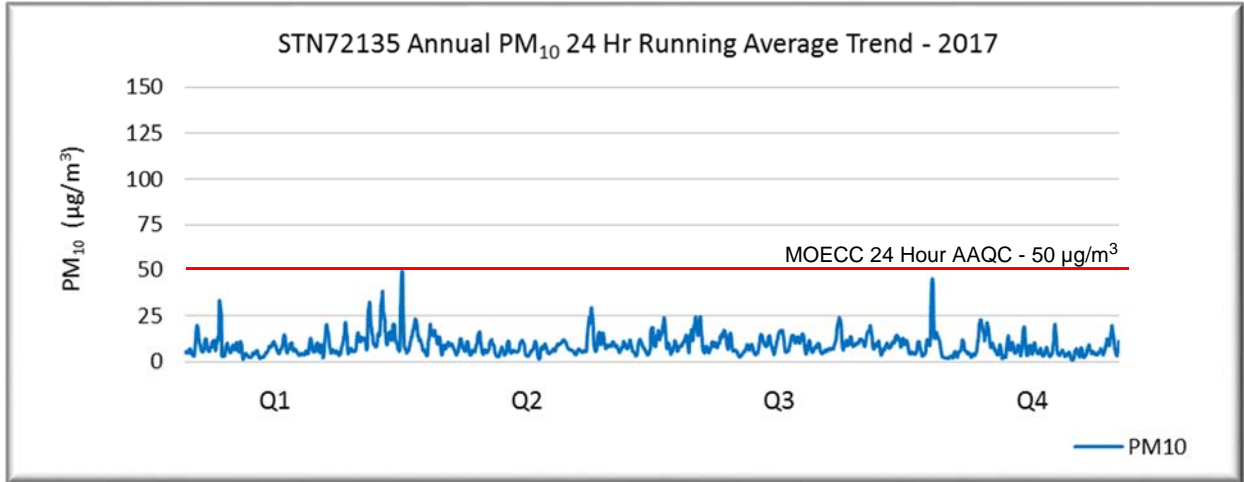
Station	Pollutant	Units	2015 Annual Mean	2016 Annual Mean	2017 Annual Mean
STN72135	PM ₁₀	µg/m ³	10	9	9
STN72138	PM ₁₀	µg/m ³	14	12	ins*
STN72139	PM ₁₀	µg/m ³	16	16	16
STN72140	PM ₁₀	µg/m ³	11	10	11
STN72141	PM ₁₀	µg/m ³	7	10	8
STN72135	TSP	µg/m ³	18	14	15
STN72138	TSP	µg/m ³	20	16	ins*
STN72139	TSP	µg/m ³	20	18	20
STN72140	TSP	µg/m ³	19	13	13
STN72141	TSP	µg/m ³	13	11	11
STN72135	NO ₂	ppb	3	3	4
STN72138	NO ₂	ppb	4	3	ins*
STN72139	NO ₂	ppb	5	5	7
STN72140	NO ₂	ppb	3	4	5
STN72141	NO ₂	ppb	2	3	4

ins* - insufficient data to calculate mean.

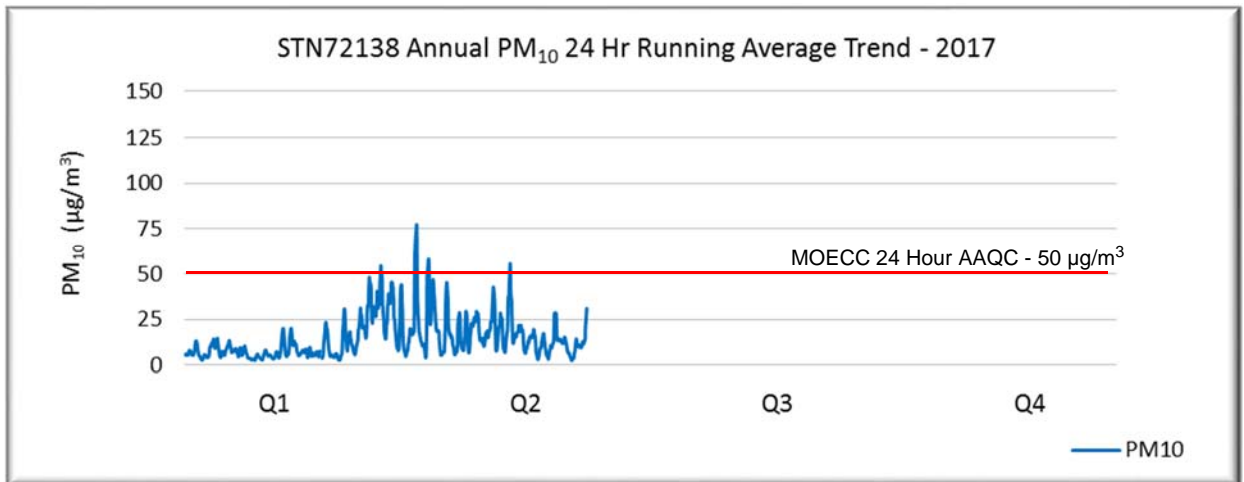
Table 17 represents the three year trend of the network annual mean concentrations.

4.2 Continuous PM₁₀ 24 Hr Running Average Trends

STN72135 PM₁₀ 24 Hr Running Average Trend - Figure 2

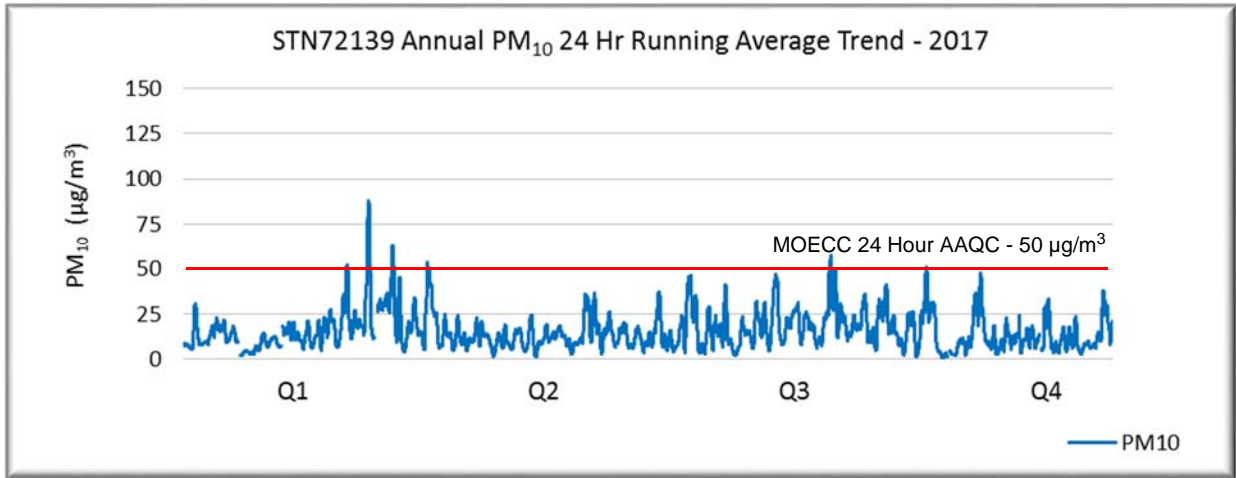


STN72138 PM₁₀ 24 Hr Running Average Trend - Figure 3

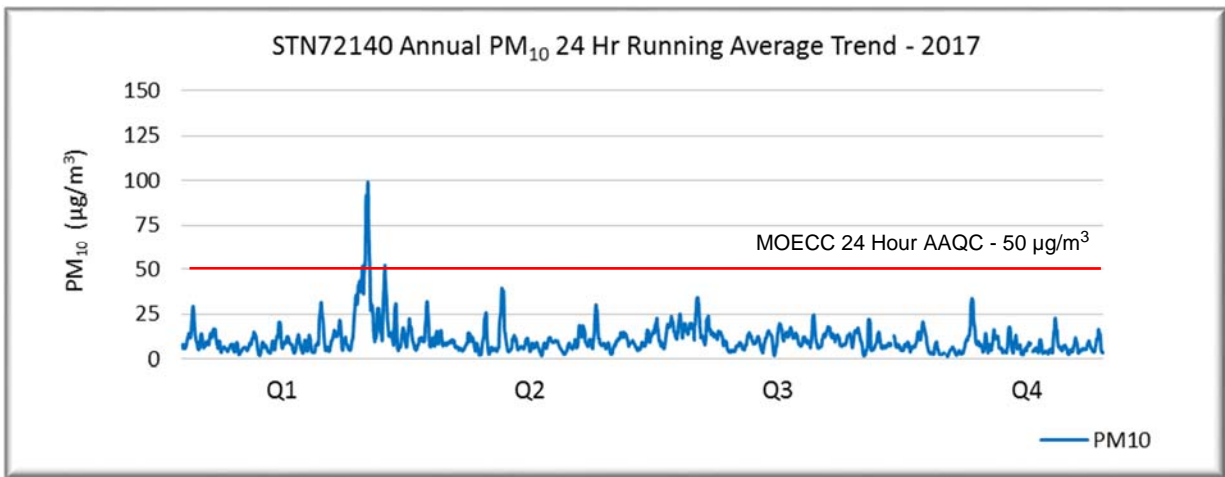


STN72138 Hollinger Park was decommissioned in June to accommodate construction activities by the City of Timmins at the public park. The station will be re-commissioned once construction is complete.

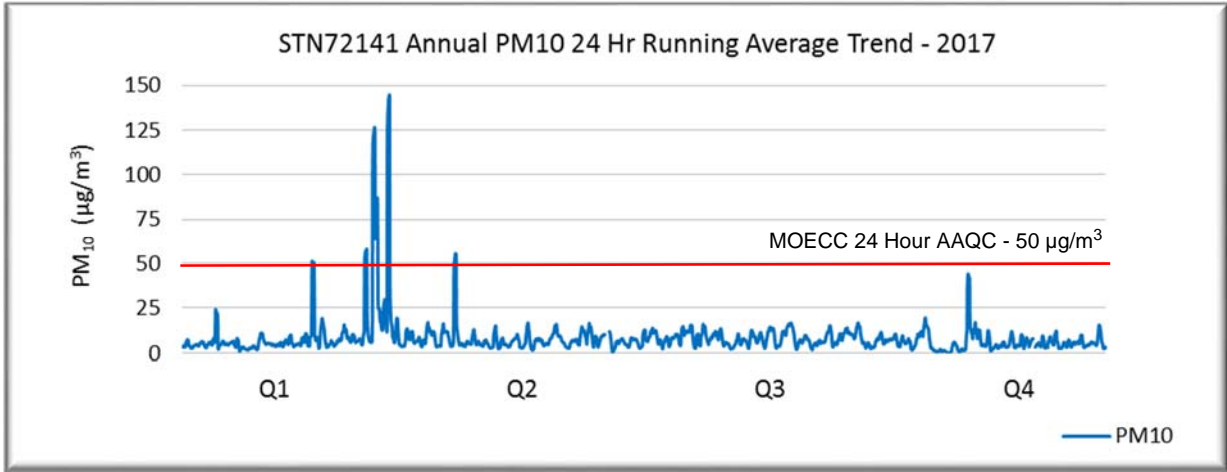
STN72139 PM₁₀ 24 Hr Running Average Trend - Figure 4



STN72140 PM₁₀ 24 Hr Running Average Trend - Figure 5

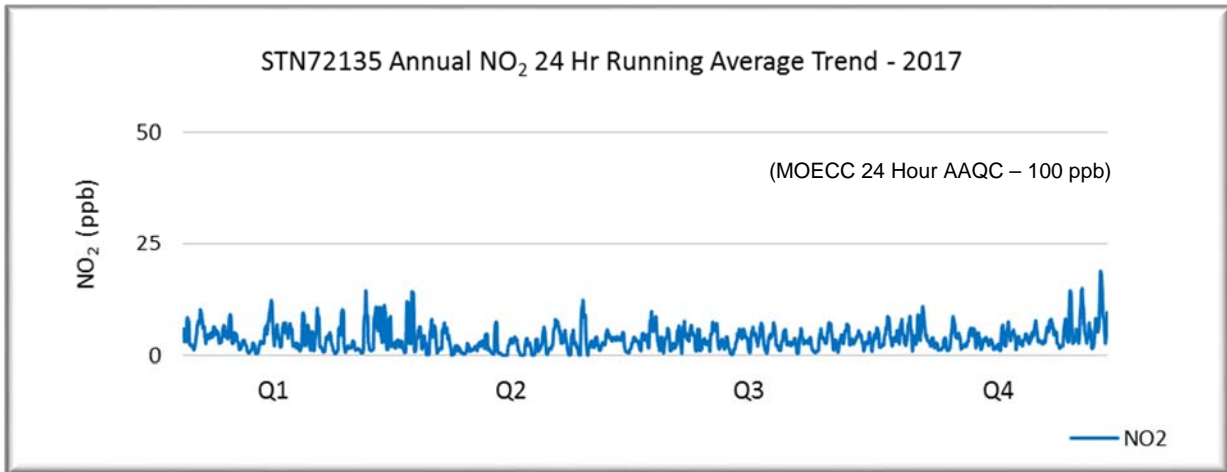


STN72141 PM₁₀ 24 Hr Running Average Trend - Figure 6

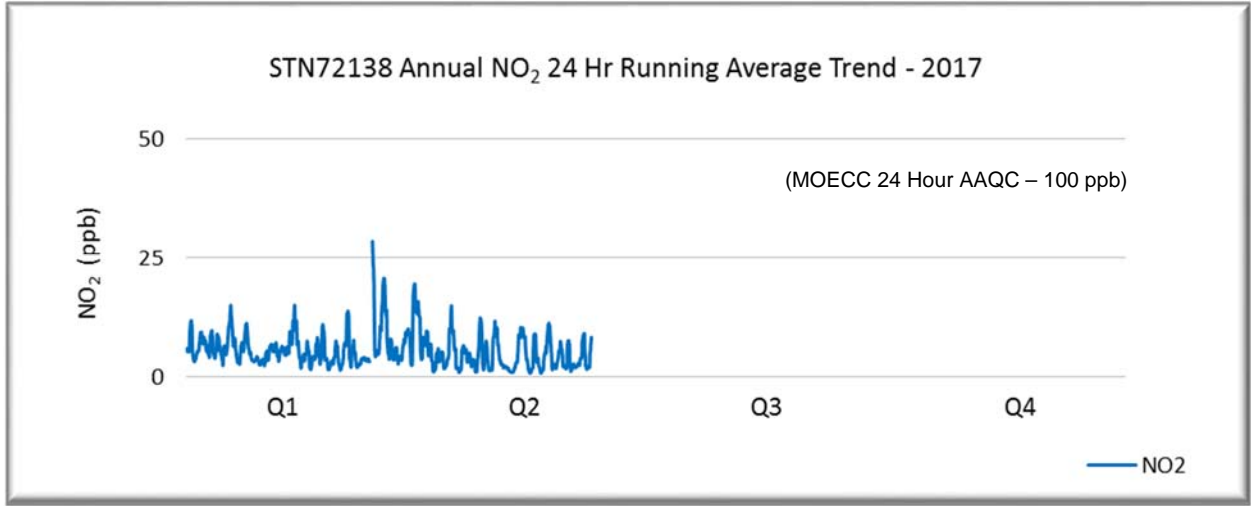


4.3 Continuous NO₂ 24 Hr Running Average Trends

STN72135 NO₂ 24 Hr Running Average Trend - Figure 7

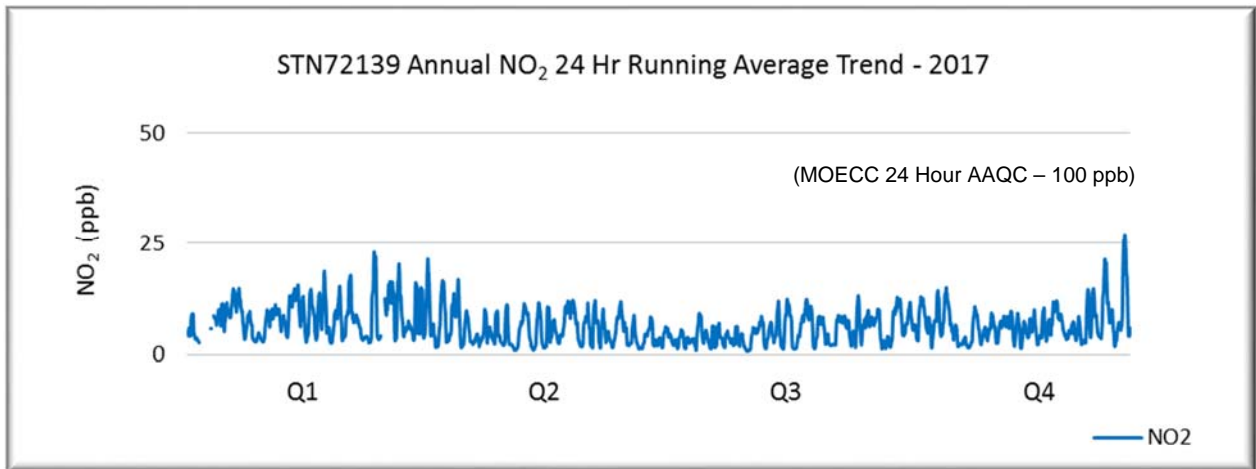


STN72138 NO₂ 24 Hr Running Average Trend - Figure 8

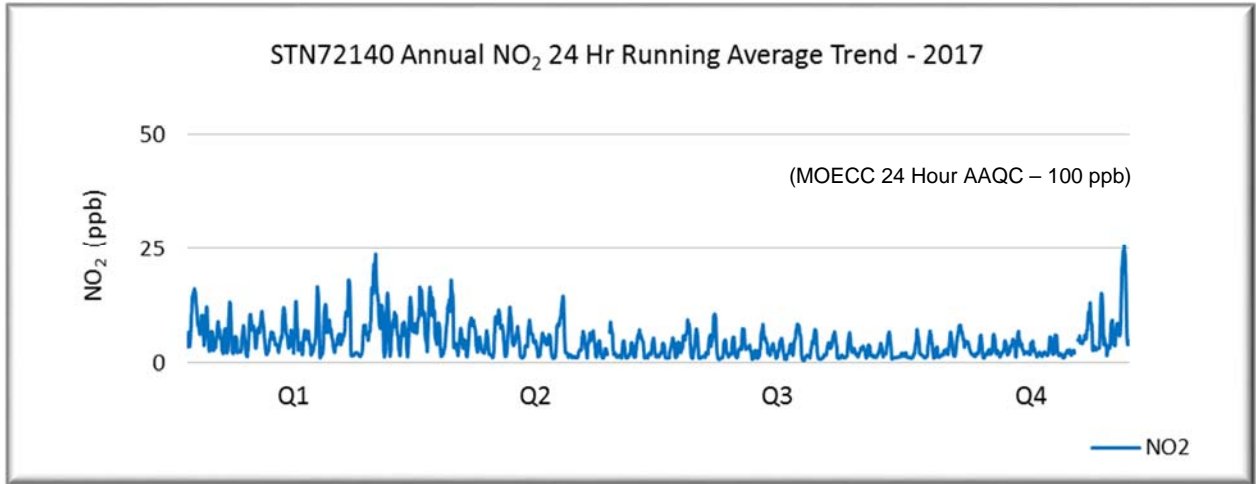


STN72138 Hollinger Park was decommissioned in June to accommodate construction activities by the City of Timmins at the public park. The station will be re-commissioned once construction is complete.

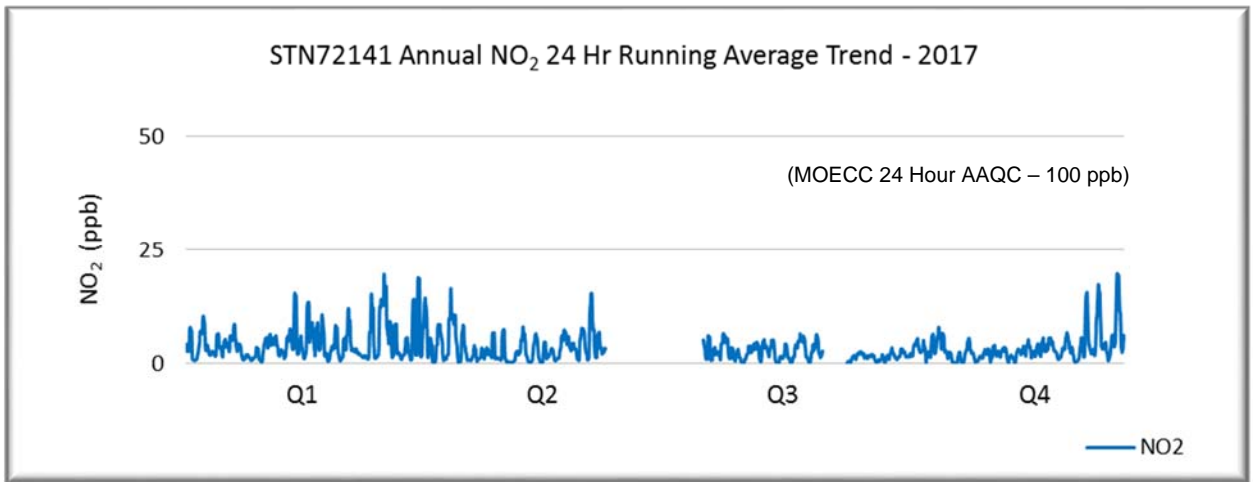
STN72139 NO₂ 24 Hr Running Average Trend - Figure 9



STN72140 NO₂ 24 Hr Running Average Trend - Figure 10



STN72141 NO₂ 24 Hr Running Average Trend - Figure 11



5.0 Non-continuous Data Statistics

Non-continuous TSP, PM₁₀ and suspended metal data statistics have been summarized in Tables 18 and 19 and include:

- Reportable Detection Limit (RDL)
- Annual Maximum 24 hour clock value
- Annual Average 24 hour clock arithmetic mean

Geometric means and additional information on non-continuous data can be found in Appendix B.

For statistic trending and as per MOECC guidelines, non-detect parameters are reported as half of the Reportable Detection Limit for all non-continuous parameters.

Non-continuous TSP Data Summary - Table 18

Station		STN72135 Extencicare		STN72136 MRCA		STN72137 Shania Twain	
Parameter	RDL µg/m ³	Annual Max µg/m ³	Annual Avg µg/m ³	Annual Max µg/m ³	Annual Avg µg/m ³	Annual Max µg/m ³	Annual Avg µg/m ³
TSP	3	130	28	128	33	100	30
Arsenic	0.0037	0.0084	0.0022	0.0061	0.0021	0.0051	0.0020
Cadmium	0.0012	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006
Chromium	0.0031	0.0255	0.0037	0.0158	0.0041	0.0275	0.0044
Cobalt	0.0012	0.0046	0.0008	0.0030	0.0008	0.0026	0.0008
Copper	0.0031	0.3080	0.1207	0.0924	0.0543	0.0970	0.0554
Iron	0.0310	8.2400	1.1434	4.9900	1.0847	5.0900	1.0626
Lead	0.0018	0.0216	0.0028	0.0106	0.0033	0.0211	0.0061
Magnesium	0.0310	3.0200	0.4205	1.8900	0.4427	1.9100	0.3958
Manganese	0.00061	0.1480	0.0238	0.0919	0.0230	0.0990	0.0217
Nickel	0.0018	0.0148	0.0023	0.0096	0.0024	0.0086	0.0022
Selenium	0.0061	0.0031	0.0031	0.0031	0.0031	0.0031	0.0031
Sulphur	0.0150	0.7590	0.2431	0.7150	0.2537	1.5700	0.3104
Vanadium	0.0031	0.0136	0.0023	0.0077	0.0021	0.0079	0.0020
Zinc	0.0031	0.0959	0.0193	0.0707	0.0216	0.0881	0.0224
Sulphate	0.0500	2.2700	0.7275	2.1400	0.7605	4.7100	0.9300

Non-continuous PM₁₀ Data Summary - Table 19

Station		STN72135 Extendicare		STN72136 MRCA		STN72137 Shania Twain	
Parameter	RDL µg/m ³	Annual Max µg/m ³	Annual Avg µg/m ³	Annual Max µg/m ³	Annual Avg µg/m ³	Annual Max µg/m ³	Annual Avg µg/m ³
PM ₁₀	3	55	12	70	17	59	16
Arsenic	0.0037	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019
Cadmium	0.0012	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006
Chromium	0.0031	0.0183	0.0030	0.0067	0.0023	0.0137	0.0030
Cobalt	0.0012	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006
Copper	0.0031	0.0595	0.0256	0.0594	0.0220	0.0329	0.0196
Iron	0.0310	1.0900	0.2426	1.6500	0.4238	1.0400	0.3304
Lead	0.0018	0.0053	0.0016	0.0091	0.0025	0.0193	0.0042
Magnesium	0.0310	0.3400	0.0852	0.8680	0.1893	0.5190	0.1303
Manganese	0.0006	0.0216	0.0052	0.0330	0.0090	0.0222	0.0070
Nickel	0.0018	0.0021	0.0010	0.0043	0.0014	0.0029	0.0012
Selenium	0.0061	0.0031	0.0031	0.0031	0.0031	0.0031	0.0031
Sulphur	0.0150	0.3980	0.2281	0.5480	0.2661	0.5720	0.2718
Vanadium	0.0031	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
Zinc	0.0031	0.0146	0.0092	0.0243	0.0129	0.0205	0.0117
Sulphate	0.0500	1.1900	0.6825	1.6400	0.7967	1.7100	0.8133

Non-continuous Total Dustfall and Passive SO₂ / NO₂ data statistics have been summarized in Tables 20 and 21.

Non-continuous Total Dustfall Data Summary - Table 20

Month	STN72135 Extendicare	STN72136 MRCA	STN72137 Shania Twain	STN72141 Claimpost	STN72142 Aura Lake	STN72143 Snowmobile Crossing
	g/m ² /30d	g/m ² /30d	g/m ² /30d	g/m ² /30d	g/m ² /30d	g/m ² /30d
January	0.64	0.44	0.45	0.66	0.59	3.50
February	0.95	1.10	1.00	1.10	1.20	6.20
March	2.30	2.00	1.50	7.00	2.10	22.00
April	2.50	2.60	2.20	9.40	3.00	17.00
May	2.50	2.40	3.20	5.60	3.40	19.00
June	3.70	3.10	3.50	4.30	3.10	24.00
July	6.50	1.90	3.60	3.70	2.50	37.00
August	9.10	3.40	1.80	3.20	2.20	16.00
September	1.70	1.50	2.30	3.00	1.50	24.00
October	2.20	2.20	1.40	2.70	1.70	19.00
November	1.50	1.10	0.72	3.00	1.40	24.00
December	1.60	0.92	0.98	1.50	1.00	16.00

Non-continuous Passive SO₂ / NO₂ Data Summary - Table 21

Month	STN72135 Extendicare	STN72136 MRCA	STN72137 Shania Twain	STN72135 Extendicare	STN72136 MRCA	STN72137 Shania Twain
	SO ₂	SO ₂	SO ₂	NO ₂	NO ₂	NO ₂
	ppb	ppb	ppb	ppb	ppb	ppb
January	0.05	0.10	0.11	2.83	3.26	3.12
February	0.05	0.05	0.05	3.49	3.06	3.07
March	0.05	0.05	0.05	3.17	5.16	3.11
April	0.12	0.05	0.05	2.64	2.77	2.89
May	0.12	0.05	0.11	2.53	2.14	2.45
June	0.05	0.05	0.10	2.57	0.96	0.85
July	0.05	0.05	0.05	2.94	1.50	1.64
August	3.93	0.51	0.38	3.02	1.89	1.61
September	0.74	0.61	0.48	0.63	0.83	0.59
October	0.18	0.31	0.22	1.23	1.90	1.42
November	0.15	0.15	0.16	0.95	1.90	0.91
December	0.20	0.20	0.10	4.00	5.00	3.80

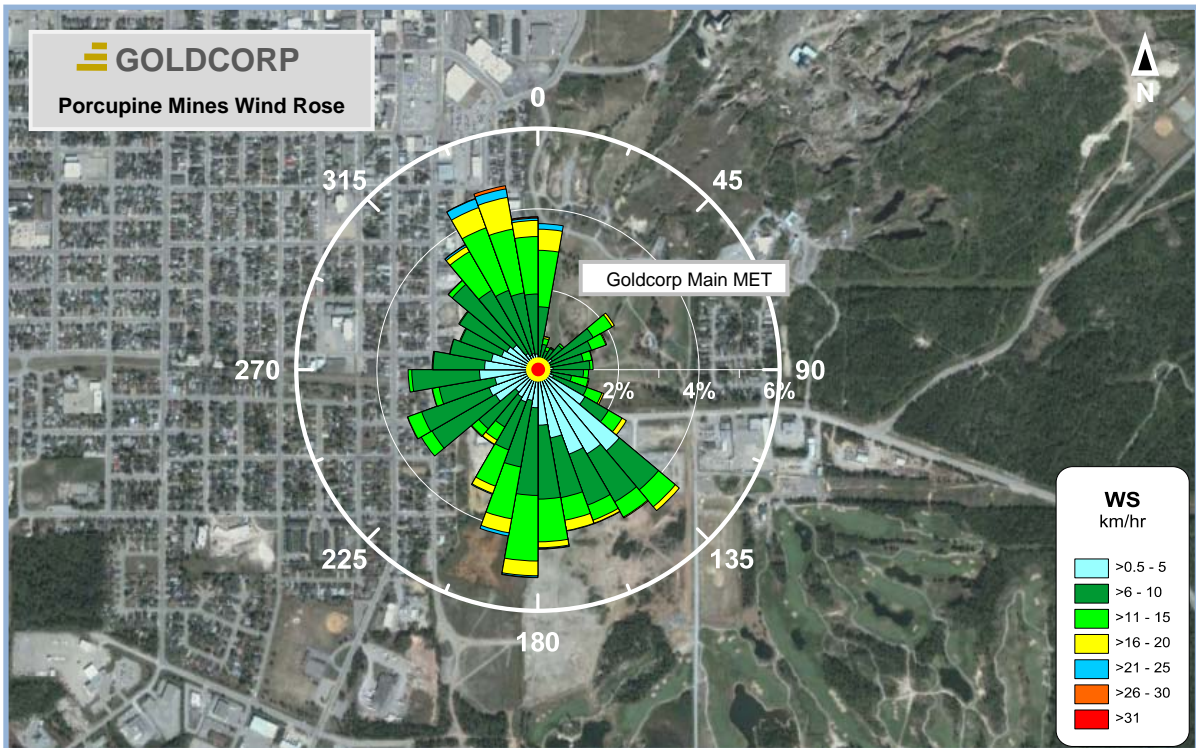
6.0 Wind Frequency Distribution



To illustrate wind frequency distribution information, distributions of wind speeds, and the frequency of the varying wind directions, we have included a wind rose graphic superimposed on an aerial view of the Goldcorp mine property.

Wind roses summarize the occurrence of winds at a location, showing their strength, direction and frequency. Each branch of the rose represents wind coming from that direction, with north to the top of the graphic. The branches are divided into segments of different colours, which represent wind speed ranges from that direction. The length of each segment within a branch is proportional to the frequency of winds blowing within the corresponding range of speeds from that direction.

The majority and magnitude of branches in the 2017 wind rose below indicate predominant wind directions out of the south and northwest (these branches represent the plot data when the wind was blowing from this vector). Table 22 summarizes the wind frequency distribution in tabular format.

Wind Frequency Distribution - Wind Rose - Figure 12



Wind Rose – Annual, 2017 Meteorological Station		By : BB	Figure 12	
	True North	Approx. Scale :	1:14000	
Goldcorp - Porcupine Gold Mines - Timmins, Ontario	Date Revised :	28 Mar, 2018		

Wind Frequency Distribution Table - Table 22

Wind Speed Class	0.5 - 5	6 - 10	11 - 15	16 - 20	21 - 25	26 - 30	> 31	All
	km/hr	km/hr	km/hr	km/hr	km/hr	km/hr	km/hr	
Wind Direction	%	%	%	%	%	%	%	%
N	1.46	5.17	4.95	1.94	0.58	0.11	0.01	14.22
NE	1.43	3.05	1.02	0.09	0.00	0.00	0.01	5.60
E	1.51	3.46	1.04	0.06	0.00	0.00	0.00	6.07
SE	8.41	4.99	1.84	0.33	0.00	0.00	0.01	15.58
S	5.56	7.92	4.95	1.23	0.17	0.01	0.01	19.85
SW	4.39	6.10	1.96	0.30	0.01	0.00	0.00	12.76
W	5.59	6.26	0.41	0.02	0.00	0.00	0.00	12.28
NW	3.18	7.22	2.58	0.51	0.11	0.00	0.02	13.62
All	31.53	44.17	18.75	4.48	0.87	0.12	0.06	100.00

7.0 Valid Data Percentages

Overall, the percentage of continuous valid pollutant data recovery was 96.0% for 2017, exceeding the Ministry's minimum target of 90% and desirable target of 95%. The percent valid data recovery for non-continuous TSP, PM₁₀ and Total Dustfall was 100%.

7.1 Invalid Data Summary

Data is reported in Eastern Standard Time (EST) time beginning. In this format, a value reported at 10:00 Hrs represents the data collected from 10:00 to 11:00 Hrs (EST).

Notwithstanding the minimum 90% valid data performance measure, emitters are to notify (as soon as practical) the MOECC of any system or equipment failures resulting in missing data of 24 hours or more in length and of the plans and schedule for repairing the failed system or equipment. Tables 23 and 24 detail problems that resulted in significant data losses along with remedial actions.

Invalid Continuous Data Summary - Table 23

Station	Parameter	Start Date	Start Time	End Date	End Time	Description	Corrective Action
			EST		EST		
STN72138	PM ₁₀	Jun 07	06:00	Dec 31	23:00	Site Decommissioned	Recommission Site
STN72138	TSP	Jun 07	06:00	Dec 31	23:00	Site Decommissioned	Recommission Site
STN72138	NO, NO ₂ , NO _x	Jun 07	06:00	Dec 31	23:00	Site Decommissioned	Recommission Site
STN72139	TSP	Jan 01	00:00	Jan 17	13:00	Optic Cell Failure	Replaced Optic Cell
STN72139	NO, NO ₂ , NO _x	Jan 05	03:00	Jan 09	02:00	Pump Failure	Repaired Pump
STN72139	PM ₁₀	Mar 16	11:00	Mar 17	13:00	Power Failure	Restored Power
STN72139	TSP	Mar 16	11:00	Mar 17	14:00	Power Failure	Restored Power
STN72139	NO, NO ₂ , NO _x	Mar 16	11:00	Mar 17	14:00	Power Failure	Restored Power
STN72141	NO, NO ₂ , NO _x	Jun 13	00:00	Jun 30	23:00	Optic Cell Failure	Repaired Optic Cell
STN72141	PM ₁₀	Jun 16	16:00	Jun 18	00:00	Unstable Response	Stabilized Response
STN72141	NO, NO ₂ , NO _x	Jul 01	00:00	Jul 20	13:00	Optic Cell Failure	Repaired Optic Cell
STN72141	NO, NO ₂ , NO _x	Sep 05	12:00	Sep 14	12:00	Unstable Response	Installed Spare Unit

STN72138 (Hollinger Park) was decommissioned on June 7th to accommodate construction activities that the City of Timmins is conducting at the public park. The station will be re-commissioned once the construction is complete.

Invalid Non-continuous Data Summary - Table 24

Station	Parameter	Start Date	Start Time	End Date	End Time	Description	Corrective Action
			EST		EST		
							None to report

8.0 Data Editing

A data validation process to filter out erroneous data is critical to maximize data integrity. Validation can be done using automated or manual procedures. Regardless of the process followed, judgment to accept or reject suspicious or unusual data is required. Many factors need to be considered during this process by qualified staff with an understanding of local pollutant and climatic conditions as well as knowledge of air monitoring principles and analyzer behaviour.

9.0 Exceedance Summary

This report summarizes the continuous and non-continuous monitoring results according to MOECC reporting requirements. The continuous and non-continuous data sets are provided in separate appendices to this report.

When reporting the number of continuous exceedances, there may be multiple consecutive running averages that exceed the AAQC or standard. If the consecutive averages occur within a single clock based averaging period, they are to be reported as a single exceedance. If they are spread across 2 clock based averaging periods and more than 24 consecutive hours, they are to be reported as 2 exceedances. The exceedance value reported is the highest recorded value during the exceedance episode.

A 24 hour clock average is defined as the midnight to midnight average. A 24 hour running average is the average of the current hour and the preceding 23 hours.

During 2017 there were:

- a) No exceedances of the continuous NO₂ 24 hour and 1 hour running average AAQCs or of the ½ hour running average O.Reg 419/05 standard.
- b) 24 exceedances of the continuous PM₁₀ 24 hour running average AAQC, 4 at STN72138, 7 at STN72139, 5 at STN72140 and 8 at STN72141.
- c) 2 exceedances of the non-continuous 24 hour clock TSP AAQC, 1 at STN72135 and 1 at STN72136.
- d) 5 exceedances of the non-continuous 24 hour clock PM₁₀ AAQC, 1 at STN72135, 2 at STN72136 and 2 at STN72137.
- e) No exceedances of the non-continuous 24 hour clock TSP or PM₁₀ Suspended Metals AAQCs, standards or guidelines.
- f) 12 exceedances of the non-continuous 30 day standard for Total Dustfall, 1 at STN72135, 1 at STN72141, and 10 at STN72143.

Continuous exceedances are summarized in Table 25. Non-continuous exceedances are summarized in Table 26. Not all exceedances can be attributed to the Hollinger Open Pit (HOP) operations. Exceedances potentially associated to HOP operations are listed in Table 27.

Continuous Parameter Exceedance Summary - Table 25

Station	Parameter	Criterion Exceeded	Exceedance Count	Start Date	Start Time	End Date	End Time	Exceedance Value	Figure Reference
STN72141	PM ₁₀	24 Hr Interim AAQC	1	Feb 21	03:00	Feb 21	05:00	51 µg/m ³	13
STN72139	PM ₁₀	24 Hr Interim AAQC	1	Mar 05	22:00	Mar 06	08:00	52 µg/m ³	14
STN72140	PM ₁₀	24 Hr Interim AAQC	1	Mar 13	09:00	Mar 13	12:00	52 µg/m ³	15
STN72141	PM ₁₀	24 Hr Interim AAQC	1	Mar 13	23:00	Mar 14	18:00	58 µg/m ³	16
STN72139	PM ₁₀	24 Hr Interim AAQC	2	Mar 14	03:00	Mar 15	04:00	88 µg/m ³	17
STN72140	PM ₁₀	24 Hr Interim AAQC	3	Mar 14	05:00	Mar 16	08:00	99 µg/m ³	18
STN72141	PM ₁₀	24 Hr Interim AAQC	3	Mar 17	01:00	Mar 19	03:00	126 µg/m ³	19
STN72138	PM ₁₀	24 Hr Interim AAQC	1	Mar 18	15:00	Mar 18	19:00	54 µg/m ³	20
STN72140	PM ₁₀	24 Hr Interim AAQC	1	Mar 22	07:00	Mar 22	08:00	52 µg/m ³	21
STN72141	PM ₁₀	24 Hr Interim AAQC	2	Mar 22	20:00	Mar 23	20:00	145 µg/m ³	22
STN72139	PM ₁₀	24 Hr Interim AAQC	1	Mar 23	16:00	Mar 24	11:00	63 µg/m ³	23
STN72138	PM ₁₀	24 Hr Interim AAQC	1	Apr 01	00:00	Apr 01	22:00	77 µg/m ³	24
STN72138	PM ₁₀	24 Hr Interim AAQC	1	Apr 05	23:00	Apr 06	15:00	58 µg/m ³	25
STN72139	PM ₁₀	24 Hr Interim AAQC	1	Apr 06	16:00	Apr 06	19:00	53 µg/m ³	26
STN72141	PM ₁₀	24 Hr Interim AAQC	1	Apr 18	10:00	Apr 19	02:00	55 µg/m ³	27
STN72138	PM ₁₀	24 Hr Interim AAQC	1	May 08	07:00	May 08	12:00	56 µg/m ³	28
STN72139	PM ₁₀	24 Hr Interim AAQC	1	Sep 11	22:00	Sep 12	11:00	58 µg/m ³	29
STN72139	PM ₁₀	24 Hr Interim AAQC	1	Oct 19	20:00	Oct 19	21:00	51 µg/m ³	30

Table 25 is a summary of the continuous exceedances which are graphically illustrated in Figures 13 to 30. Exceedances are calculated based on 24 hour running averages while pollution roses are generated using hourly values. For this reason, dates identified on the referenced pollution roses may not correspond to the exceedance start and end dates listed above.

Non-continuous Parameter Exceedance Summary - Table 26

Station	Parameter	Criterion Exceeded	Exceedance Count	Start Date	Start Time	End Date	End Time	Exceedance Value
STN72137	PM ₁₀	24 Hr Interim AAQC	1	Feb 24	00:00	Feb 24	23:00	59 µg/m ³
STN72143	Total Dustfall	30 day standard	1	Mar 01	00:00	Mar 31	23:00	22.0 g/m ² /30d
STN72137	PM ₁₀	24 Hr Interim AAQC	1	Mar 14	00:00	Mar 14	23:00	56 µg/m ³
STN72135	TSP	24 Hr AAQC	1	Mar 26	00:00	Mar 26	23:00	130 µg/m ³
STN72135	PM ₁₀	24 Hr Interim AAQC	1	Mar 26	00:00	Mar 26	23:00	55 µg/m ³
STN72141	Total Dustfall	30 day standard	1	Apr 01	00:00	Apr 30	23:00	9.4 g/m ² /30d
STN72143	Total Dustfall	30 day standard	1	Apr 01	00:00	Apr 30	23:00	17.0 g/m ² /30d
STN72136	PM ₁₀	24 Hr Interim AAQC	1	Apr 01	00:00	Apr 01	23:00	53 µg/m ³
STN72136	TSP	24 Hr AAQC	1	Apr 25	00:00	Apr 25	23:00	128 µg/m ³
STN72143	Total Dustfall	30 day standard	1	May 01	00:00	May 31	23:00	19.0 g/m ² /30d
STN72143	Total Dustfall	30 day standard	1	Jun 01	00:00	Jun 30	23:00	24.0 g/m ² /30d
STN72143	Total Dustfall	30 day standard	1	Jul 01	00:00	Jul 31	23:00	37.0 g/m ² /30d
STN72135	Total Dustfall	30 day standard	1	Aug 01	00:00	Aug 31	23:00	9.1 g/m ² /30d
STN72143	Total Dustfall	30 day standard	1	Aug 01	00:00	Aug 31	23:00	16.0 g/m ² /30d
STN72136	PM ₁₀	24 Hr Interim AAQC	1	Aug 29	00:00	Aug 29	23:00	70 µg/m ³
STN72143	Total Dustfall	30 day standard	1	Sep 01	00:00	Sep 30	23:00	24.0 g/m ² /30d
STN72143	Total Dustfall	30 day standard	1	Oct 01	00:00	Oct 31	23:00	19.0 g/m ² /30d
STN72143	Total Dustfall	30 day standard	1	Nov 01	00:00	Nov 30	23:00	24.0 g/m ² /30d
STN72143	Total Dustfall	30 day standard	1	Dec 01	00:00	Dec 31	23:00	16.0 g/m ² /30d

Table 26 is a summary of non-continuous exceedances. Non-continuous exceedances cannot be graphically illustrated by a pollution rose since the exceedance values consist of only a single data point.

Source Contribution Assessment of Exceedances - Table 27

Station	Parameter	Criterion Exceeded	Date	Exceedance Value	Potential Cause / Comments
STN72141	PM ₁₀	24 Hr Interim AAQC	Feb 21	51 µg/m ³	Offsite roads and Hollinger Haul Road
STN72137	PM ₁₀	24 Hr Interim AAQC	Feb 24	59 µg/m ³	Offsite roads, parking lots and possible HOP operations
STN72143	Total Dustfall	30 day standard	Mar 01	22.0 g/m ² /30d	Station located within Goldcorp property boundaries. Data used for process operations
STN72139	PM ₁₀	24 Hr Interim AAQC	Mar 05	52 µg/m ³	Offsite roads, parking lots and possible HOP operations
STN72140	PM ₁₀	24 Hr Interim AAQC	Mar 13	52 µg/m ³	Un-vegetated environmental control berm, offsite roads and possible HOP operations
STN72141	PM ₁₀	24 Hr Interim AAQC	Mar 13	58 µg/m ³	Offsite roads and Hollinger Haul Road
STN72137	PM ₁₀	24 Hr Interim AAQC	Mar 14	56 µg/m	Offsite activities and HOP operations is unlikely based on wind conditions
STN72139	PM ₁₀	24 Hr Interim AAQC	Mar 14	88 µg/m ³	Offsite roads, parking lots and possible HOP operations
STN72140	PM ₁₀	24 Hr Interim AAQC	Mar 14	99 µg/m ³	Un-vegetated environmental control berm, offsite roads and possible HOP operations
STN72141	PM ₁₀	24 Hr Interim AAQC	Mar 17	126 µg/m ³	Offsite roads and Hollinger Haul Road
STN72138	PM ₁₀	24 Hr Interim AAQC	Mar 18	54 µg/m ³	Offsite roads, parking lots and possible HOP operations
STN72140	PM ₁₀	24 Hr Interim AAQC	Mar 22	52 µg/m ³	Un-vegetated environmental control berm, offsite roads and possible HOP operations
STN72141	PM ₁₀	24 Hr Interim AAQC	Mar 22	145 µg/m ³	Offsite roads and Hollinger Haul Road
STN72139	PM ₁₀	24 Hr Interim AAQC	Mar 23	63 µg/m ³	Offsite roads, parking lots and possible HOP operations
STN72135	TSP	24 Hr AAQC	Mar 26	130 µg/m ³	Offsite roads and Hollinger Haul Road
STN72135	PM ₁₀	24 Hr Interim AAQC	Mar 26	55 µg/m ³	Offsite roads and Hollinger Haul Road
STN72141	Total Dustfall	30 day standard	Apr 01	9.4 g/m ² /30d	Winter sand from offsite roads and possibly the Hollinger Haul Road.
STN72143	Total Dustfall	30 day standard	Apr 01	17.0 g/m ² /30d	Station located within Goldcorp property boundaries. Data used for process operations
STN72136	PM ₁₀	24 Hr Interim AAQC	Apr 01	53 µg/m ³	Offsite roads, parking lots and possible HOP operations.
STN72138	PM ₁₀	24 Hr Interim AAQC	Apr 01	77 µg/m ³	Offsite roads, parking lots and possible HOP operations.
STN72138	PM ₁₀	24 Hr Interim AAQC	Apr 05	58 µg/m ³	Offsite roads, parking lots and possible HOP operations.
STN72139	PM ₁₀	24 Hr Interim AAQC	Apr 06	53 µg/m ³	Offsite roads, parking lots and possible HOP operations.
STN72141	PM ₁₀	24 Hr Interim AAQC	Apr 18	55 µg/m ³	Offsite roads and the Hollinger Haul Road.
STN72136	TSP	24 Hr AAQC	Apr 25	128 µg/m ³	Offsite roads, parking lots and possible HOP operations.
STN72143	Total Dustfall	30 day standard	May 01	19.0 g/m ² /30d	Station located within Goldcorp property boundaries. Data used for process operations
STN72138	PM ₁₀	24 Hr Interim AAQC	May 08	56 µg/m ³	Offsite roads and parking lots.
STN72143	Total Dustfall	30 day standard	Jun 01	24.0 g/m ² /30d	Station located within Goldcorp property boundaries. Data used for process operations

Source Contribution Assessment of Exceedances - Table 27 (Continued)

Station	Parameter	Criterion Exceeded	Date	Exceedance Value	Potential Cause / Comments
STN72143	Total Dustfall	30 day standard	Jul 01	37.0 g/m ² /30d	Station located within Goldcorp property boundaries. Data used for process operations.
STN72135	Total Dustfall	30 day standard	Aug 01	9.1 g/m ² /30d	Offsite roads and possible HOP operations.
STN72143	Total Dustfall	30 day standard	Aug 01	16.0 g/m ² /30d	Station located within Goldcorp property boundaries. Data used for process operations.
STN72136	PM ₁₀	24 Hr Interim AAQC	Aug 29	70 µg/m ³	Offsite roads, parking lots and possible HOP operations.
STN72143	Total Dustfall	30 day standard	Sep 01	24.0 g/m ² /30d	Station located within Goldcorp property boundaries. Data used for process operations.
STN72139	PM ₁₀	24 Hr Interim AAQC	Sep 11	58 µg/m ³	Offsite roads, parking lots and possible HOP operations.
STN72143	Total Dustfall	30 day standard	Oct 01	19.0 g/m ² /30d	Station located within Goldcorp property boundaries. Data used for process operations.
STN72139	PM ₁₀	24 Hr Interim AAQC	Oct 19	51 µg/m ³	Offsite roads, parking lots and possible HOP operations.
STN72143	Total Dustfall	30 day standard	Nov 01	24.0 g/m ² /30d	Station located within Goldcorp property boundaries. Data used for process operations.
STN72143	Total Dustfall	30 day standard	Dec 01	16.0 g/m ² /30d	Station located within Goldcorp property boundaries. Data used for process operations.

Note: Site STN72143 (Snowmobile Crossing) is located on Goldcorp property. The data are used as a control indicator for process operations. Values from this location are included in this report and intended for information purposes only.



10.0 Continuous PM₁₀ Exceedance Episode Pollution Roses

The following PM₁₀ pollution roses graphically illustrate the PM₁₀ exceedance episodes.

The rose branches show the percentage of time pollutants come from a particular direction. Branches should therefore point to the source of PM₁₀. The branches are divided into segments of different colours, with the colours representing PM₁₀ concentration ranges. The length of each segment within a branch is proportional to the frequency of PM₁₀ concentration ranges from that direction.

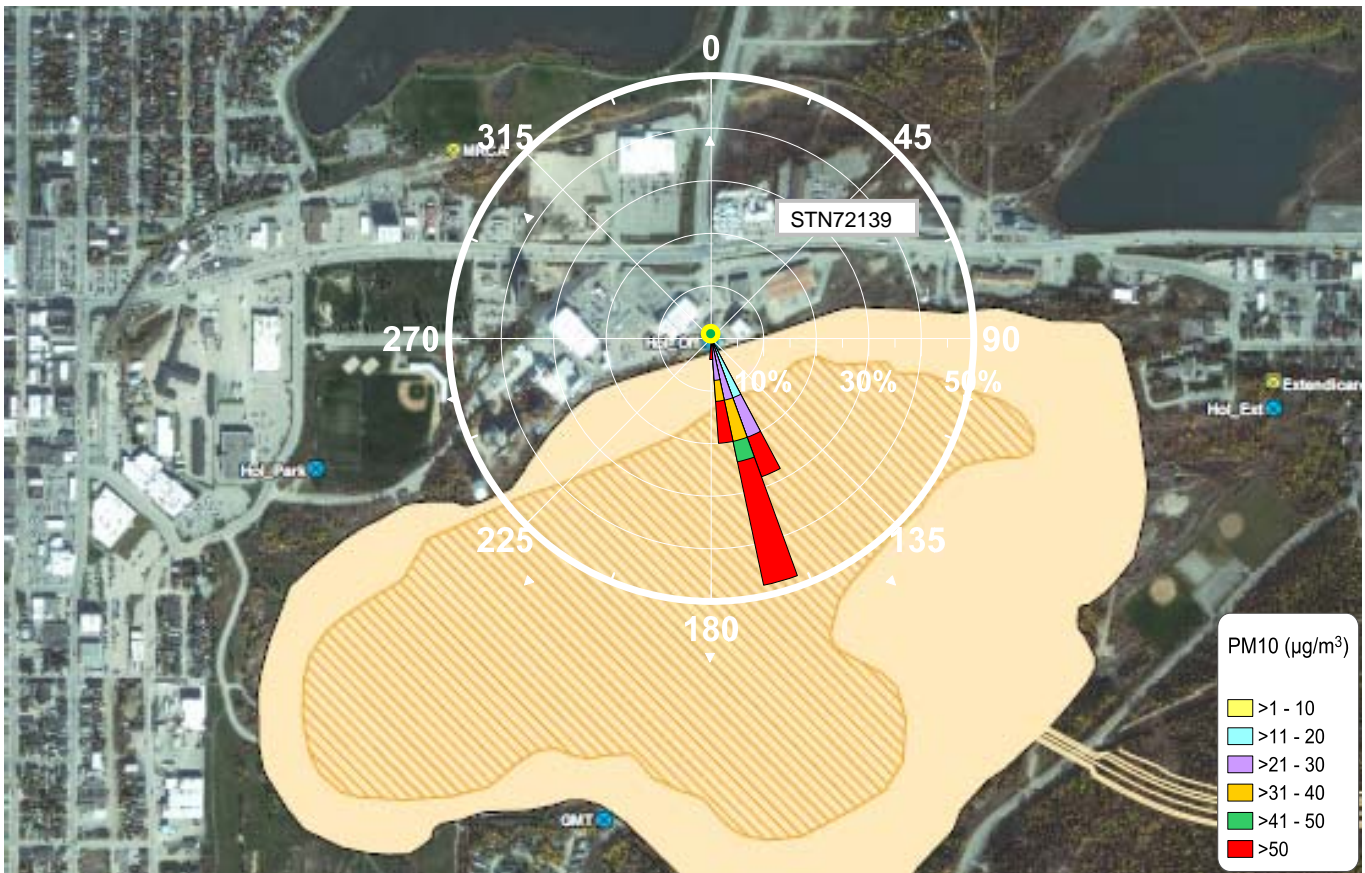
PM₁₀ Pollution Rose – STN72141 February 20th to 21st - Figure 13





STN72141 PM₁₀ Pollution Rose February 20 - 21, 2017		By : JP	Figure 13	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario	Date Revised :	01 May, 2017		

Exceedance is due to inhalable particulate (PM₁₀) levels from offsite roads and contribution from the Hollinger Haul Road operations. Wind speeds ranged from 1.8 to 19.2 km/h.

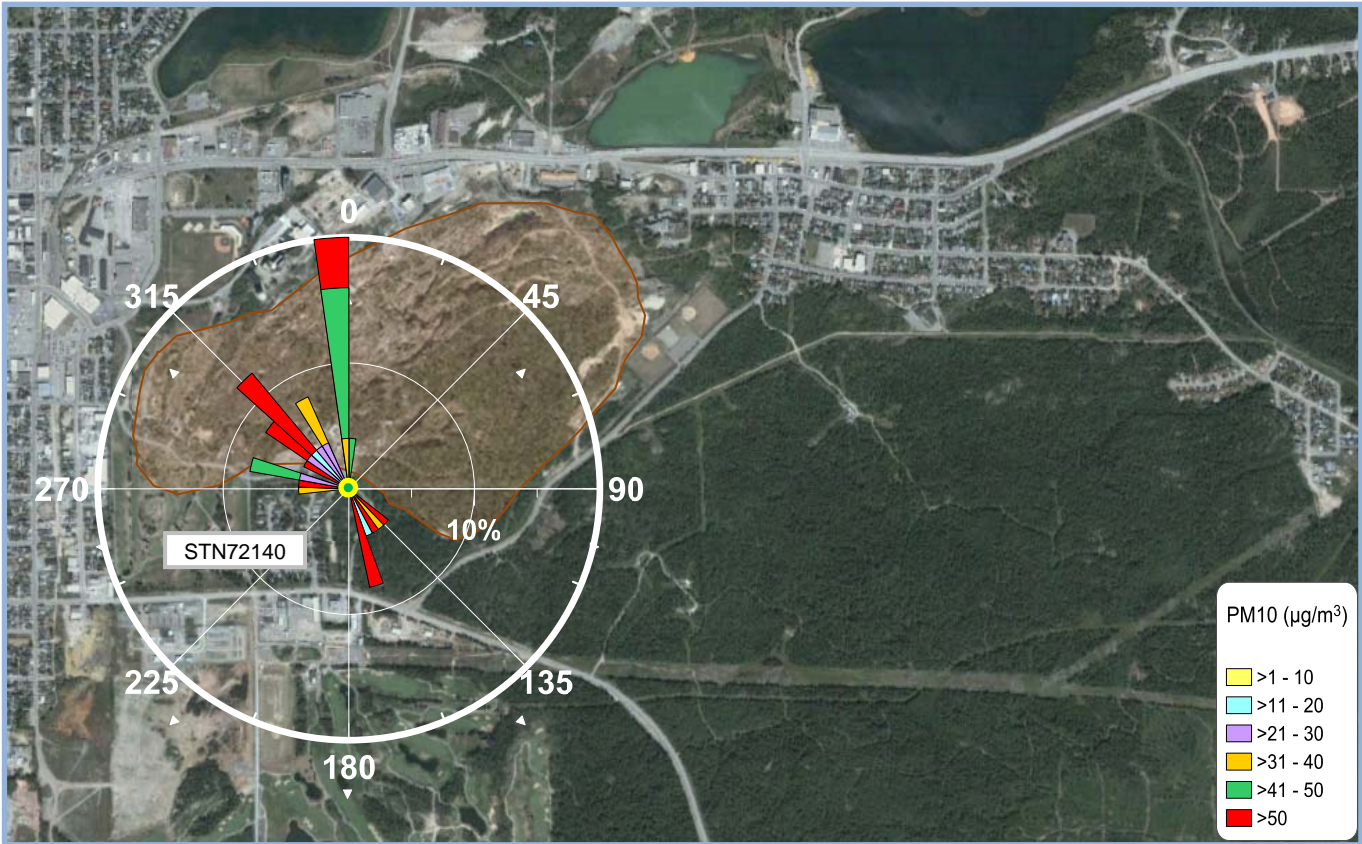
PM₁₀ Pollution Rose – STN72139 March 5th - Figure 14




STN72139 PM₁₀ Pollution Rose March 05, 2017		By : JP	Figure 14	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	01 May, 2017	

Exceedance is due to inhalable particulate (PM₁₀) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 7.2 to 18.1 km/h.

PM₁₀ Pollution Rose – STN72140 March 12th to 13th - Figure 15





STN72140 PM₁₀ Pollution Rose March 12 - 13, 2017		By : JP	Figure 15	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario	Date Revised :	01 May, 2017		

Exceedance is due to inhalable particulate (PM₁₀) levels from un-vegetated environmental control berm, offsite roads and possible contribution from HOP operations. Wind speeds ranged from 2.0 to 10.1 km/h.

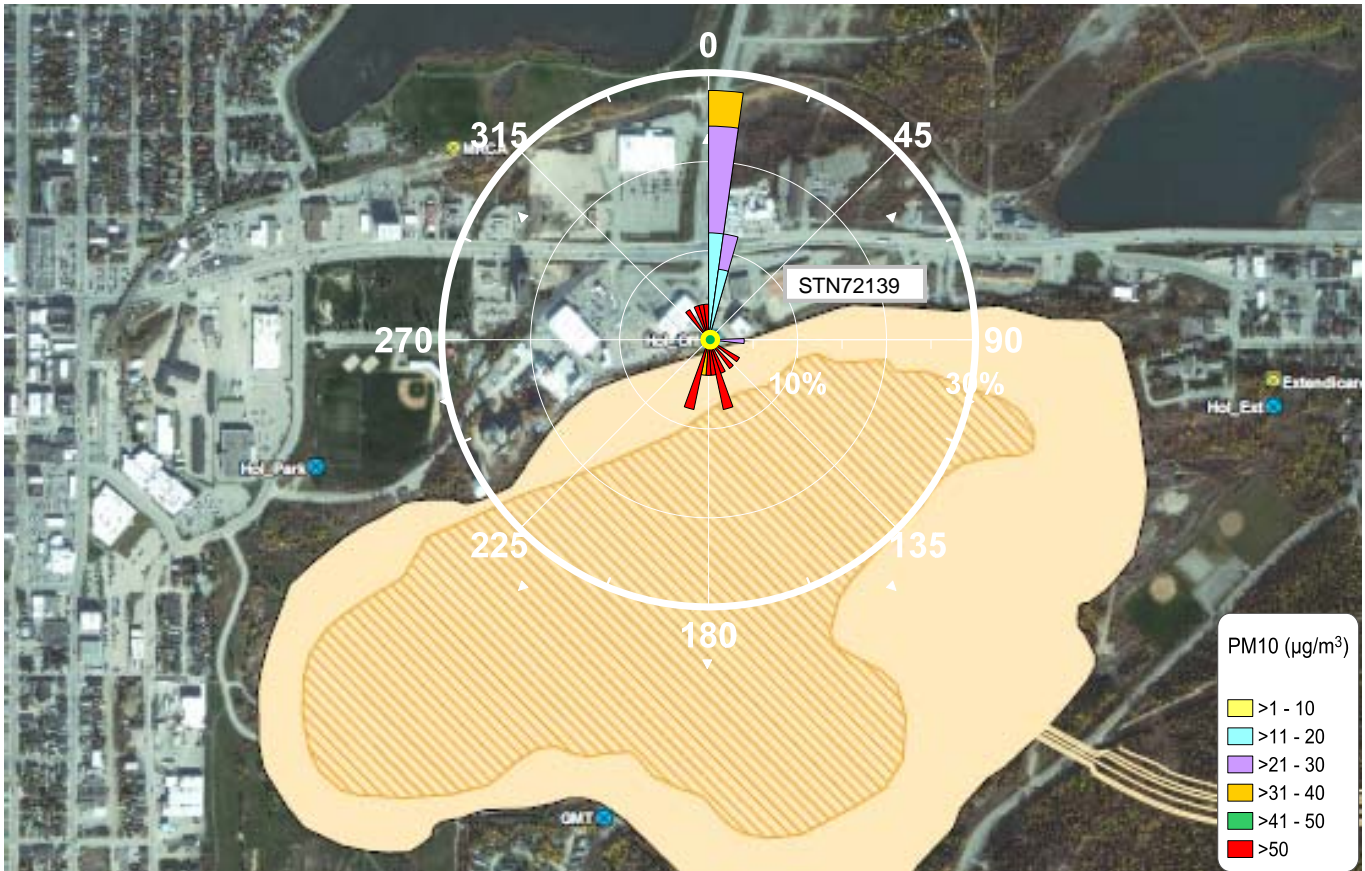
PM₁₀ Pollution Rose – STN72141 March 13th to 14th - Figure 16





STN72141 PM₁₀ Pollution Rose March 13 - 14, 2017		By : JP	Figure 16	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario	Date Revised :	01 May, 2017		

Exceedance is due to inhalable particulate (PM₁₀) levels from offsite roads and contribution from the Hollinger Haul Road operations. Wind speeds ranged from 1.8 to 7.8 km/h.

PM₁₀ Pollution Rose – STN72139 March 14th - Figure 17




STN72139 PM₁₀ Pollution Rose March 14, 2017		By : JP	Figure 17	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario	Date Revised :	01 May, 2017		

Exceedance is due to inhalable particulate (PM₁₀) levels from offsite roads, parking lots and possible contributions from HOP operations. Wind speeds ranged from 1.8 to 11.1 km/h.

PM₁₀ Pollution Rose – STN72140 March 13th to 15th - Figure 18



STN72140 PM₁₀ Pollution Rose March 13 - 15, 2017		By : JP	Figure 18	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario	Date Revised :	01 May, 2017		

Exceedance is due to inhalable particulate (PM₁₀) levels from un-vegetated environmental control berm, offsite roads and possible contribution from HOP operations. Wind speeds ranged from 1.9 to 20.4 km/h.

PM₁₀ Pollution Rose – STN72141 March 16th to 18th - Figure 19





STN72141 PM₁₀ Pollution Rose March 16 - 18, 2017		By : JP	Figure 19	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario	Date Revised :	01 May, 2017		

Exceedance is due to inhalable particulate (PM₁₀) levels from offsite roads and contribution from the Hollinger Haul Road operations. Wind speeds ranged from 1.4 to 8.9 km/h.

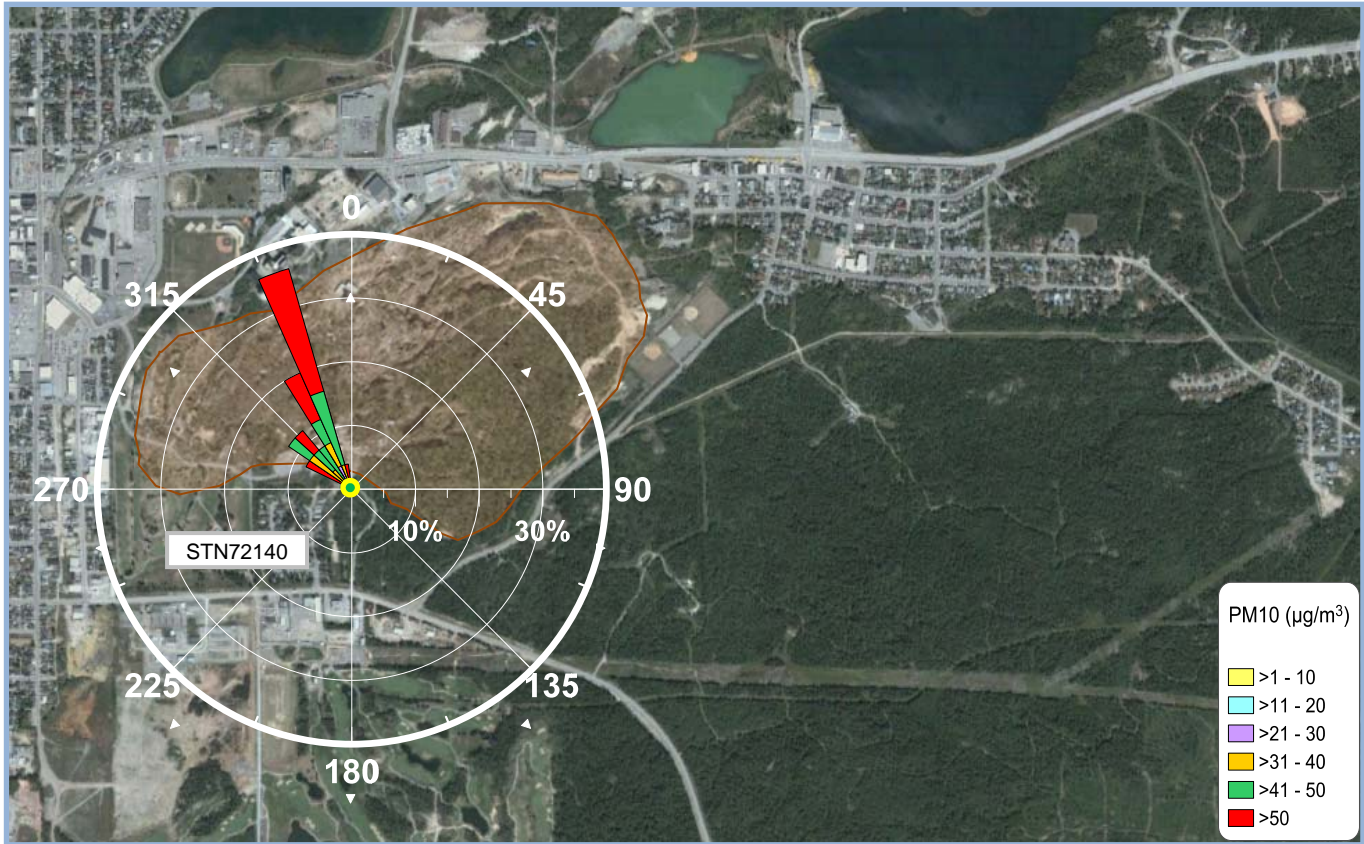
PM₁₀ Pollution Rose – STN72138 March 17th to 18th - Figure 20





STN72138 PM₁₀ Pollution Rose March 17 - 18, 2017		By : JP	Figure 20	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario	Date Revised :	01 May, 2017		

Exceedance is due to inhalable particulate (PM₁₀) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 3.9 to 8.5 km/h.

PM₁₀ Pollution Rose – STN72140 March 21st to 22nd - Figure 21




STN72140 PM₁₀ Pollution Rose March 21 - 22, 2017		By : JP	Figure 21	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario	Date Revised :	01 May, 2017		

Exceedance is due to inhalable particulate (PM₁₀) levels from un-vegetated environmental control berm, offsite roads and possible contribution from HOP operations. Wind speeds ranged from 3.7 to 22.2 km/h.

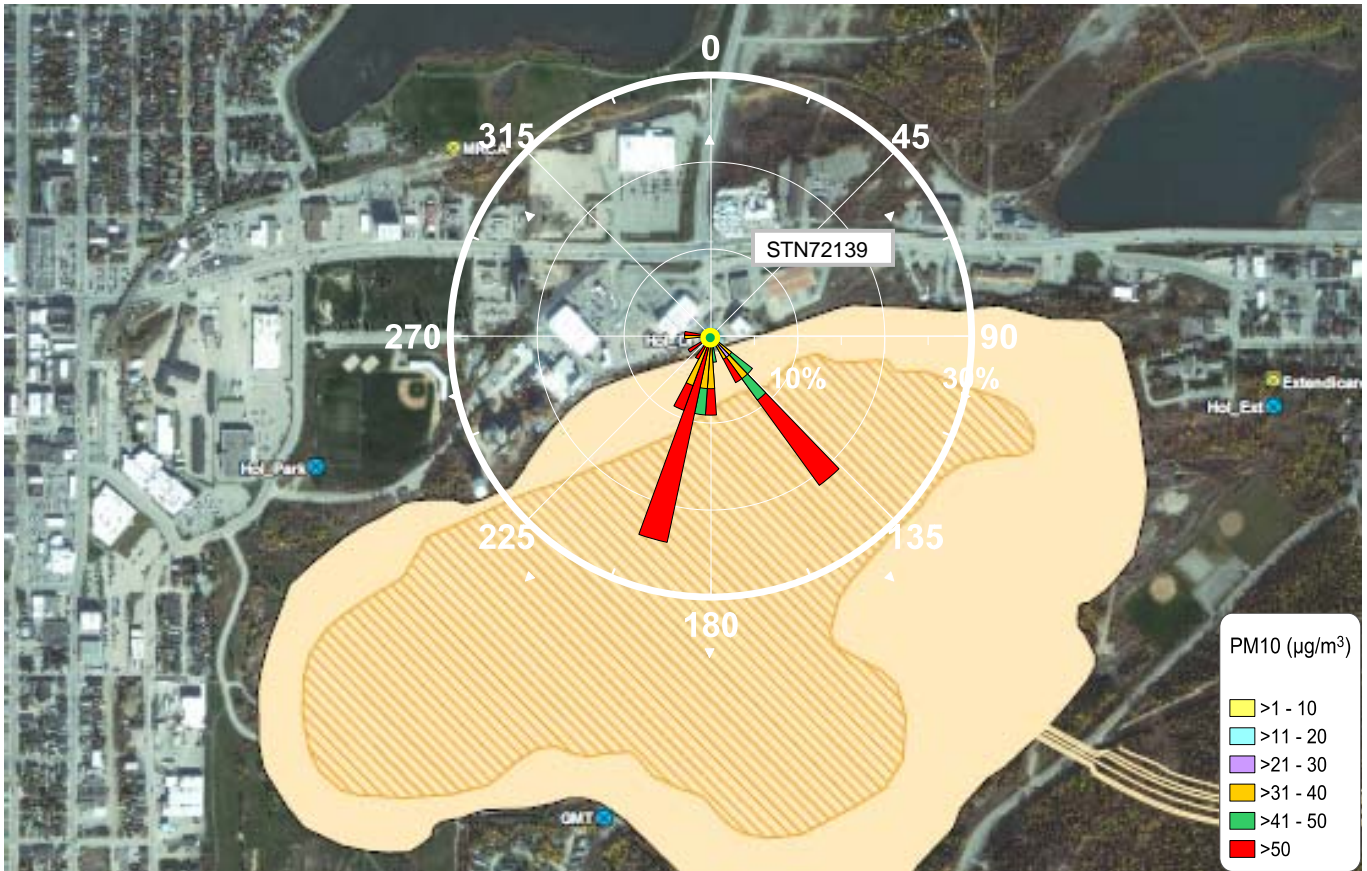
PM₁₀ Pollution Rose – STN72141 March 22nd to 23rd - Figure 22





STN72141 PM₁₀ Pollution Rose March 22 - 23, 2017		By : JP	Figure 22	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	01 May, 2017	

Exceedance is due to inhalable particulate (PM₁₀) levels from offsite roads and contribution from the Hollinger Haul Road operations. Wind speeds ranged from 1.1 to 7.4 km/h.

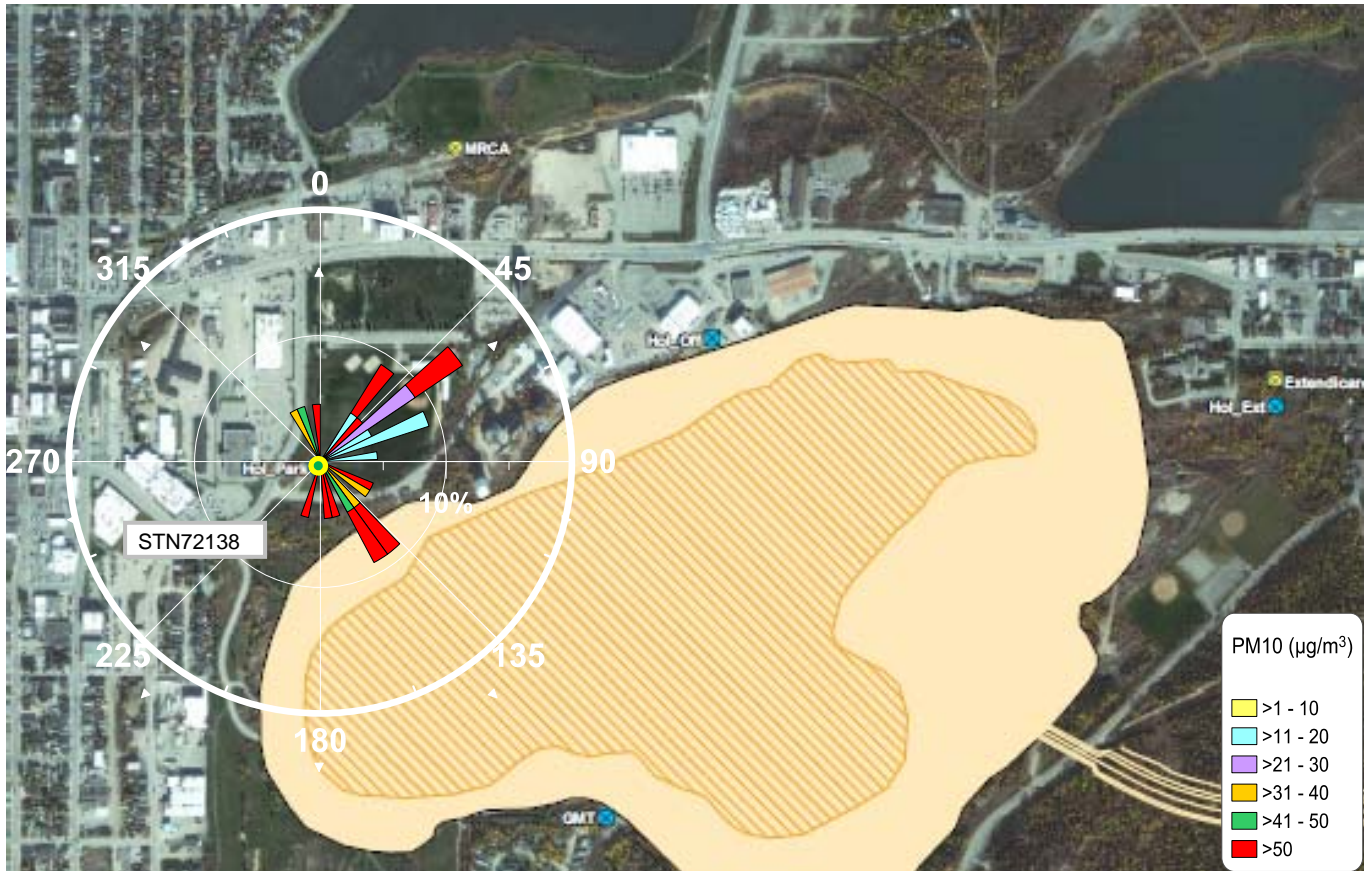
PM₁₀ Pollution Rose – STN72139 March 22nd to 23rd - Figure 23



STN72139 PM₁₀ Pollution Rose March 22 - 23, 2017		By : JP	Figure 23	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario	Date Revised :	01 May, 2017		

Exceedance is due to inhalable particulate (PM₁₀) levels from offsite roads, parking lots and possible contributions from HOP operations. Wind speeds ranged from 1.1 to 21.5 km/h.

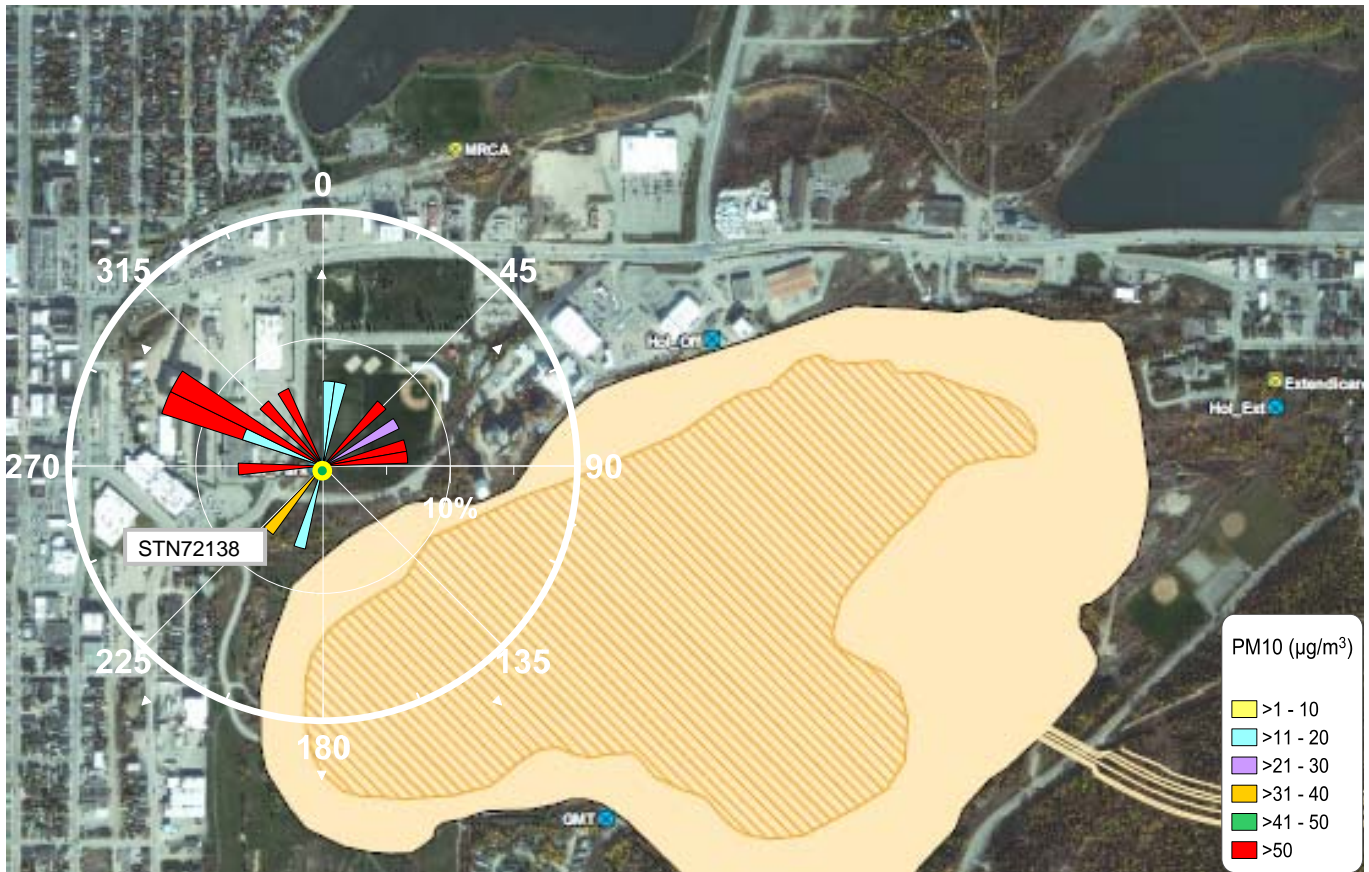
PM₁₀ Pollution Rose – STN72138 March 31st to April 1st - Figure 24



STN72138 PM₁₀ Pollution Rose March 31 - April 01, 2017		By : JP	Figure 24	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario	Date Revised :	31 July, 2017		

Exceedance is due to inhalable particulate (PM₁₀) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 1.1 to 9.3 km/h.

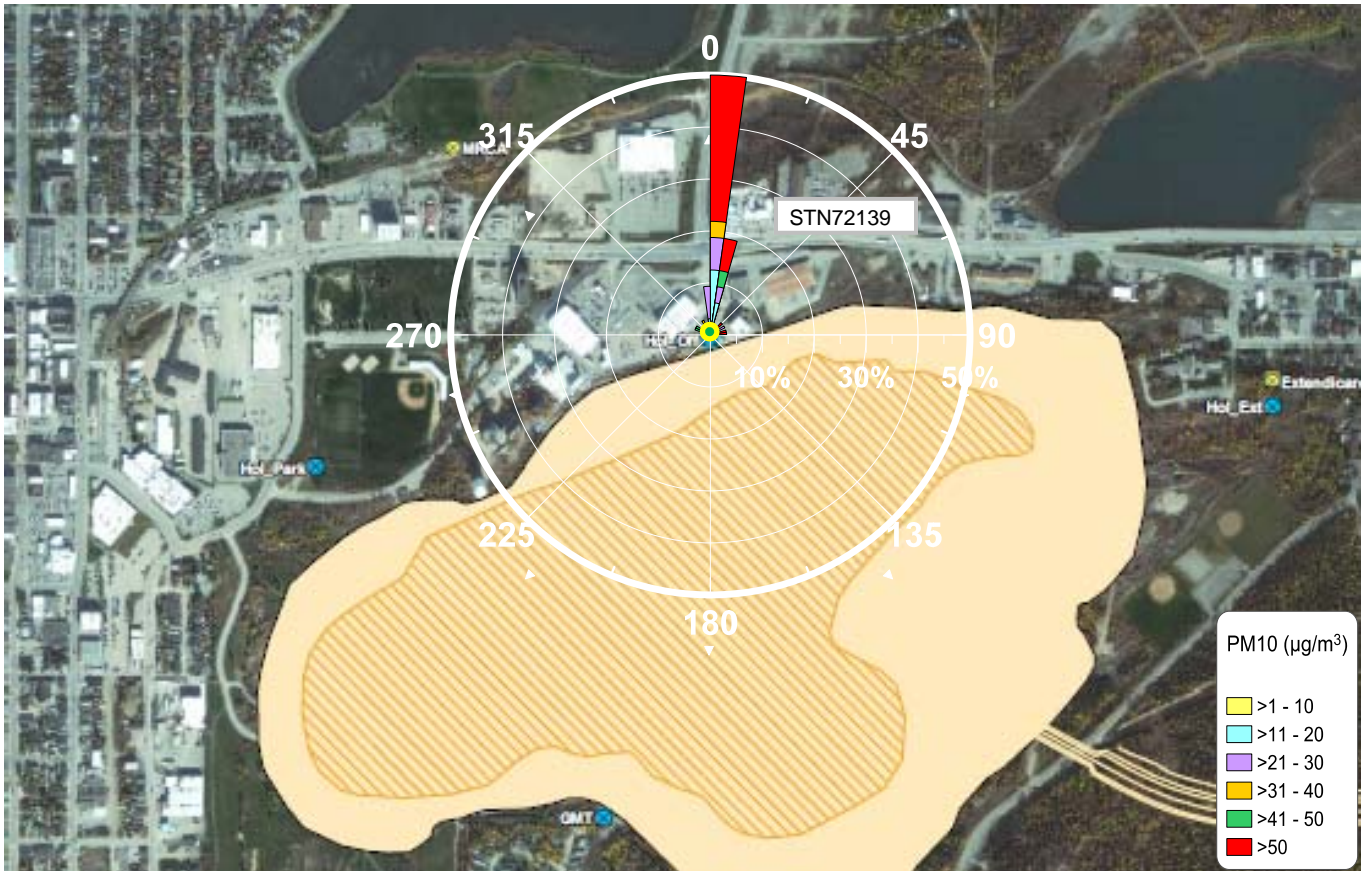
PM₁₀ Pollution Rose – STN72138 April 5th - Figure 25





STN72138 PM₁₀ Pollution Rose April 05, 2017		By : JP	Figure 25	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario	Date Revised :	31 July, 2017		

Exceedance is due to inhalable particulate (PM₁₀) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 1.5 to 12.6 km/h.

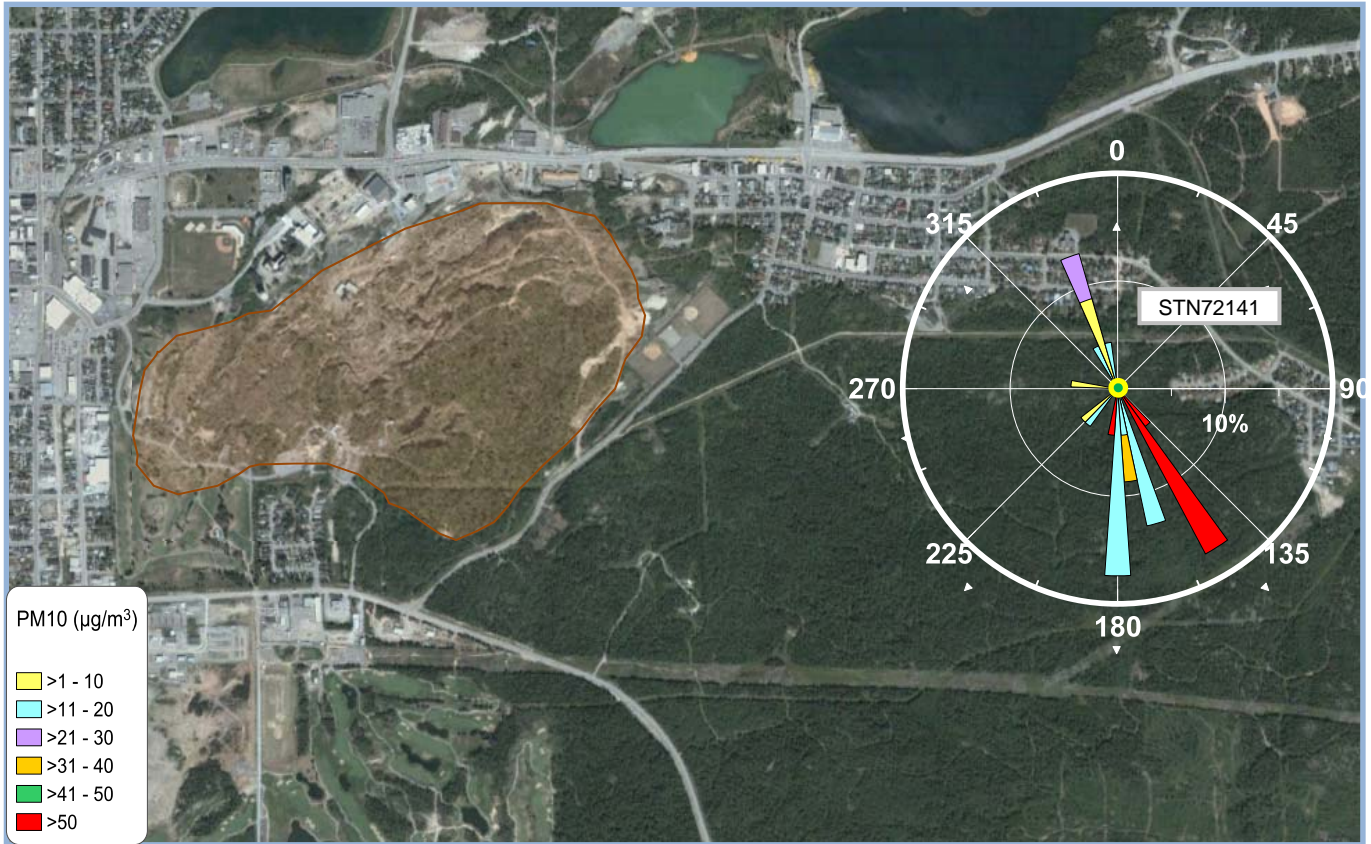
PM₁₀ Pollution Rose – STN72139 April 5th to April 6th - Figure 26





STN72139 PM₁₀ Pollution Rose April 05 - 06, 2017		By : JP	Figure 26	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario	Date Revised :	31 July, 2017		

Exceedance is due to inhalable particulate (PM₁₀) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 1.5 to 24.5 km/h.

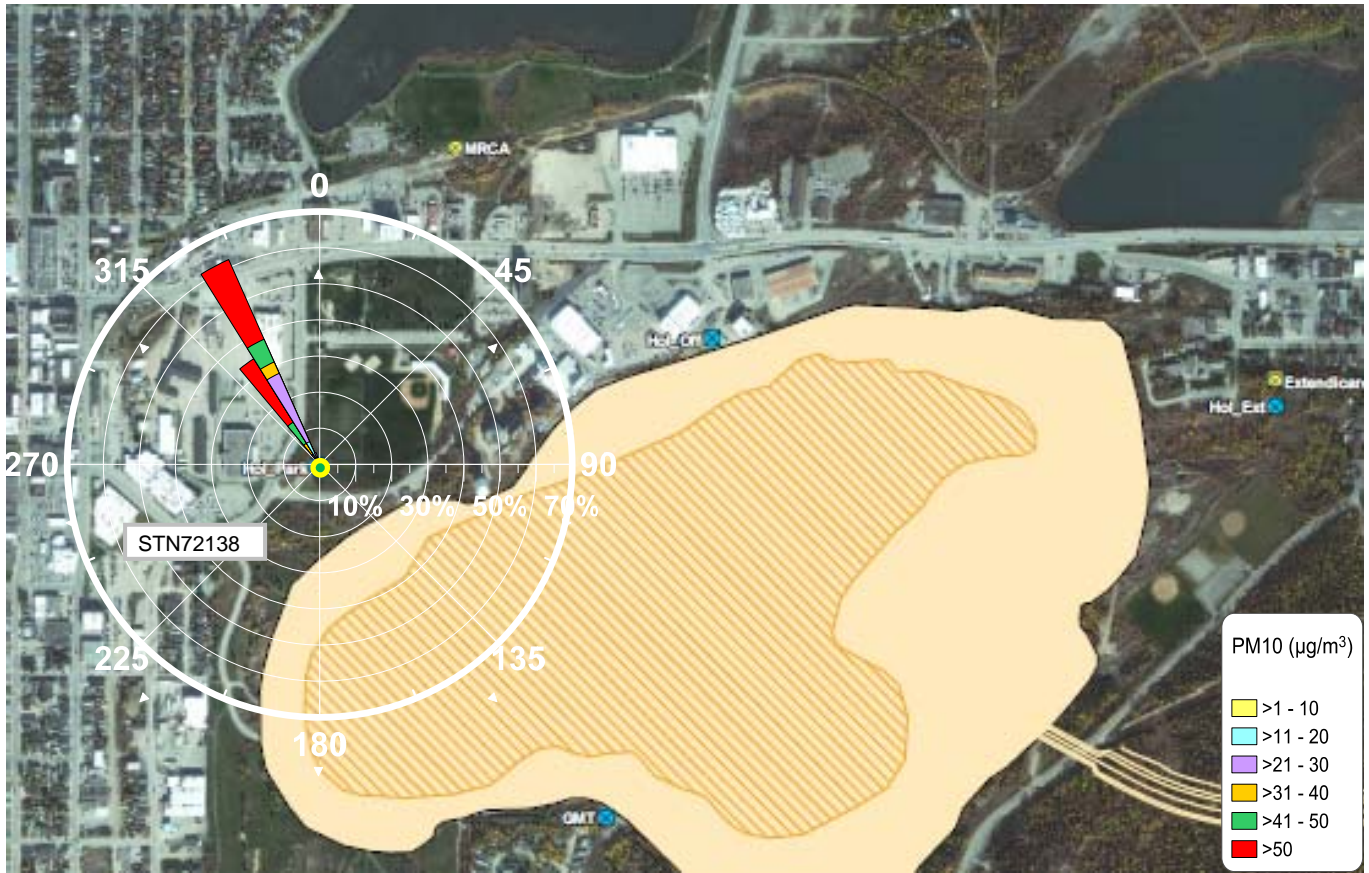
PM₁₀ Pollution Rose – STN72141 April 18th - Figure 27





STN72141 PM₁₀ Pollution Rose April 18, 2017		By : JP	Figure 27	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario	Date Revised :	31 July, 2017		

Exceedance is due to inhalable particulate (PM₁₀) levels from offsite roads and contribution from the Hollinger Haul Road operations. Wind speeds ranged from 1.2 to 15.1 km/h.

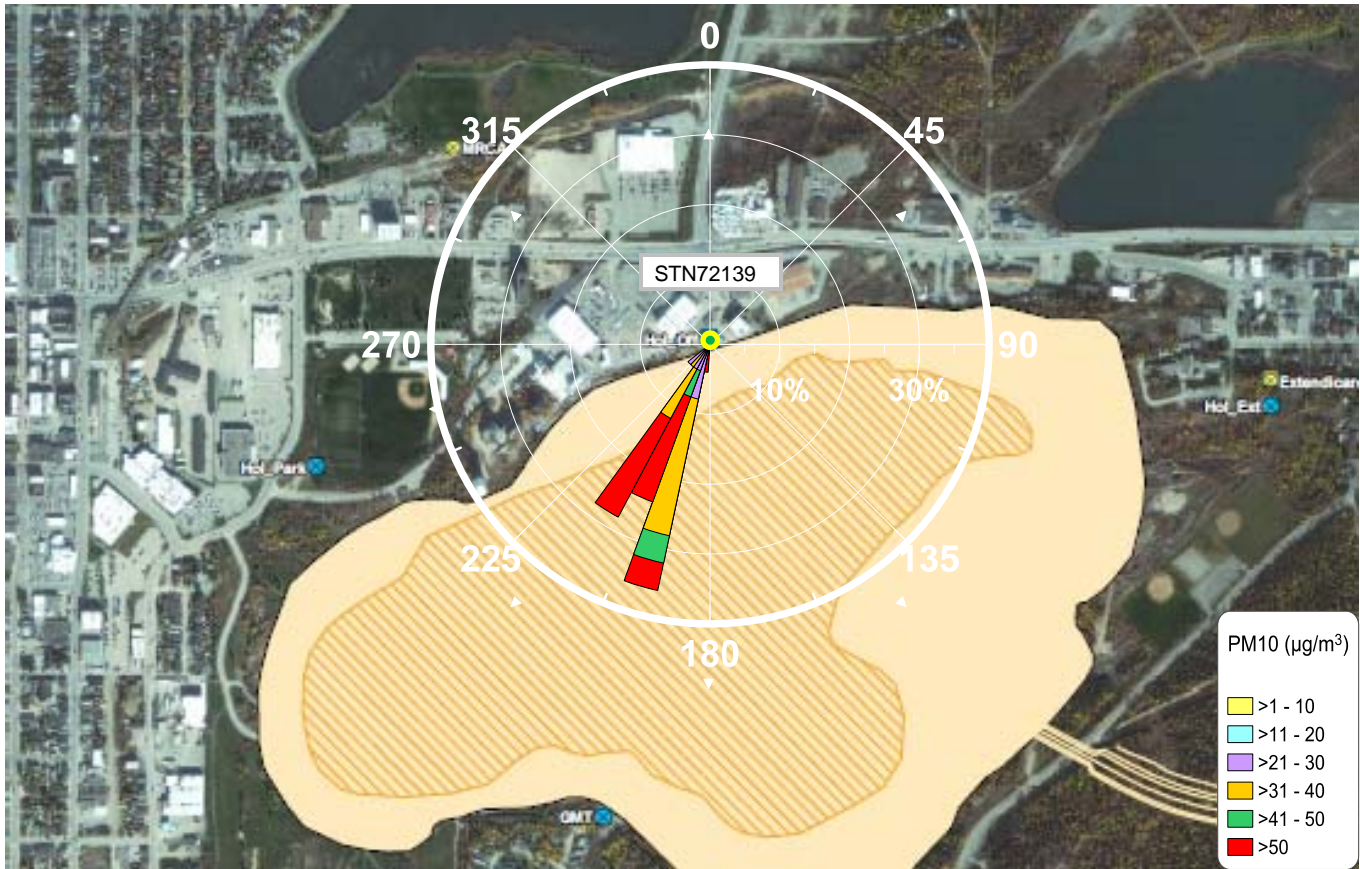
PM₁₀ Pollution Rose – STN72138 May 7th to May 8th - Figure 28





STN72138 PM₁₀ Pollution Rose May 07 - 08, 2017		By : JP	Figure 28	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario	Date Revised :	31 July, 2017		

Exceedance is due to inhalable particulate (PM₁₀) levels from offsite roads and parking lots. Wind speeds ranged from 10.6 to 21.9 km/h.

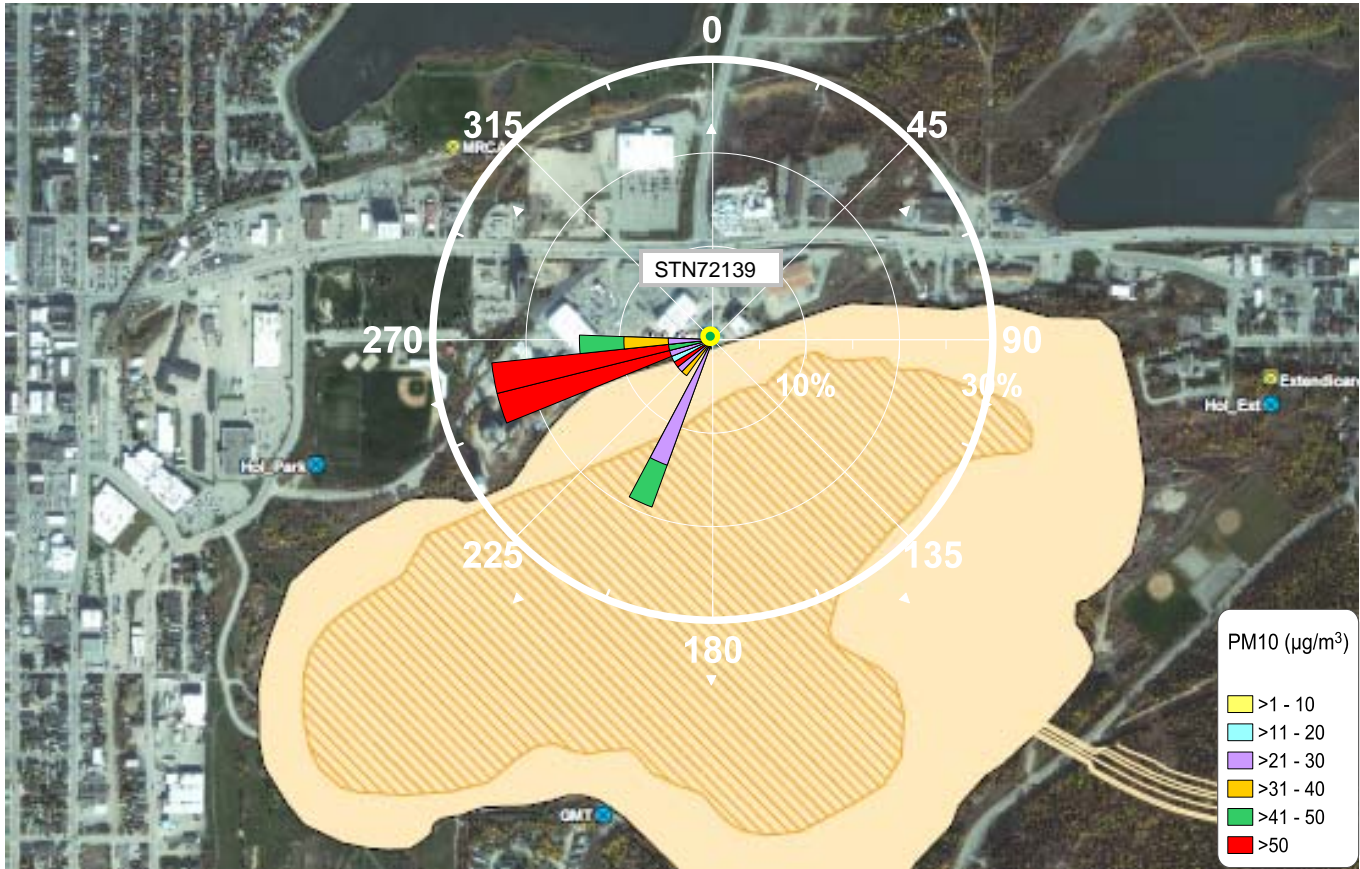
PM₁₀ Pollution Rose – STN72139 September 11th to 12th - Figure 29





STN72139 PM₁₀ Pollution Rose September 11 - 12, 2017	 True North	By : JP	Figure 29	
		Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario		Date Revised :	05 November, 2017	

Exceedance is due to inhalable particulate (PM₁₀) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 5.2 to 14.7 km/h.

PM₁₀ Pollution Rose – STN72139 October 19th - Figure 30



STN72139 PM₁₀ Pollution Rose October 19, 2017		By : JP	Figure 30	
	True North	Approx. Scale :	1:8525	
Goldcorp Porcupine Mines Timmins Ontario	Date Revised :	07 February, 2018		

Exceedance is due to inhalable particulate (PM₁₀) levels from offsite roads, parking lots and possible contribution from HOP operations. Wind speeds ranged from 3.7 to 15.4 km/h.

11.0 Conclusions

During 2017 there were:

- a) No exceedances of the continuous NO₂ 24 hour and 1 hour running average AAQCs or of the ½ hour running average O.Reg 419/05 standard.
- b) 24 exceedances of the continuous PM₁₀ 24 hour running average AAQC, 4 at STN72138, 7 at STN72139, 5 at STN72140 and 8 at STN72141.
- c) 2 exceedances of the non-continuous 24 hour clock TSP AAQC, 1 at STN72135 and 1 at STN72136.
- d) 5 exceedances of the non-continuous 24 hour clock PM₁₀ AAQC, 1 at STN72135, 2 at STN72136 and 2 at STN72137.
- e) No exceedances of the non-continuous 24 hour clock TSP or PM₁₀ Suspended Metals AAQCs, standards or guidelines.
- f) 12 exceedances of the non-continuous 30 day standard for Total Dustfall, 1 at STN72135, 1 at STN72141 and 10 at STN72143.
- g) A summary of exceedances potentially associated to the Hollinger Open Pit (HOP) operations can be found in Table 27.
- h) Network annual PM₁₀ averages were 9 µg/m³ at STN72135, 16 µg/m³ at STN72139, 11 µg/m³ at STN72140 and 8 µg/m³ at STN72141. No average was available from STN72138 due to the decommissioning of the site on June 7th.
- i) 36 calibrations were conducted on continuous samplers, all of which met criteria.
- j) The percentage of continuous valid pollutant data recovery was 96.0% for 2017, exceeding the ministry's minimum target of 90% and desirable target of 95%. The percent valid data recovery for non-continuous TSP, PM₁₀ and Total Dustfall was 100%.

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**Appendix A
Continuous Data Statistics**

2017 Data Statistics		Maximum 24 Hr Running Average			Maximum 1 Hr Running Average			Maximum ½ Hr Running Average		Maximum 24 Hr Clock Average		Maximum 1 Hr Clock Average		Monthly Mean					Percent Valid Data				
Station	Month	NO2	PM10	TSP	NO2	NO2	PM10	TSP	PM10	TSP	NO	NO2	NOX	PM10	TSP	NO	NO2	NOX	PM10	TSP			
		ppb	µg/m ³	µg/m ³			ppb	ppb	µg/m ³	µg/m ³	µg/m ³	µg/m ³	ppb	ppb	ppb	µg/m ³	µg/m ³	%	%	%	%	%	
STN72138	January	15	15	24	33	37	13	24	47	73	3	6	9	7	10	100.0	100.0	100.0	100.0	100.0			
	February	15	23	63	37	41	21	59	52	91	2	5	8	8	12	99.9	99.9	99.9	98.7	99.9			
	March	29	54	77	52	58	50	63	204	198	2	8	10	23	28	97.7	97.7	97.7	100.0	97.7			
	April	16	77	87	52	56	51	60	275	270	1	5	6	20	23	99.9	99.9	99.9	99.4	99.9			
	May	12	56	49	40	41	41	39	108	120	2	4	6	16	18	99.6	99.6	99.6	98.9	99.6			
	June	9	31	36	30	32	22	27	87	82	ins*	ins*	ins*	ins*	ins*	20.8	20.8	20.8	20.8	20.8			
	July	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0			
	August	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0			
	September	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0			
	October	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0			
	November	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0			
	December	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0			
Q1 Arithmetic Mean												2	6	9	13	17	99.2	99.2	99.2	99.6	99.2		
Q2 Arithmetic Mean												ins*	ins*	ins*	ins*	ins*	73.4	73.4	73.4	73.1	73.4		
Q3 Arithmetic Mean												ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0		
Q4 Arithmetic Mean												ins*	ins*	ins*	ins*	ins*	0.0	0.0	0.0	0.0	0.0		
Annual Arithmetic Mean												ins*	ins*	ins*	ins*	ins*	43.2	43.2	43.2	43.2	43.2		

Exceedance Summary STN72138																		
Parameter	Type	Averaging Type	Limit	Q1			Q2			Q3			Q4			Total		
				J	F	M	A	M	J	J	A	S	O	N	D			
Particulate Matter < 10 µm	PM10	AAQC	24 Hr Running	50 µg/m ³	0	0	1	2	1	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4
Nitrogen Dioxide	NO2	AAQC	24 Hr Running	100 ppb	0	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
Nitrogen Dioxide	NO2	AAQC	1 Hr Running	200 ppb	0	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
Nitrogen Dioxide	NO2	O. Reg 419/05	½ Hr Running	250 ppb	0	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0

ins* - insufficient data to calculate mean. n/a -not available. Site decommissioned on June 07 to accommodate upgrades to the park.

2017 Data Statistics		Maximum 24 Hr Running Average			Maximum 1 Hr Running Average		Maximum ½ Hr Running Average		Maximum 24 Hr Clock Average		Maximum 1 Hr Clock Average		Monthly Mean					Percent Valid Data				
Station	Month	NO2	PM10	TSP	NO2	NO2	PM10	TSP	PM10	TSP	NO	NO2	NOX	PM10	TSP	NO	NO2	NOX	PM10	TSP		
		ppb	µg/m ³	µg/m ³																	ppb	ppb
STN72139	January	15	31	28	36	41	22	22	47	59	4	7	12	11	ins	85.3	85.3	85.3	97.7	46.4		
	February	19	28	63	43	45	22	59	107	182	5	9	14	14	18	99.7	99.7	99.7	98.2	99.7		
	March	23	88	65	56	60	78	65	277	168	4	9	13	26	27	96.0	96.0	96.0	96.2	96.0		
	April	22	53	54	54	59	46	41	128	142	3	7	10	16	19	99.9	99.9	99.9	98.8	99.9		
	May	12	25	28	42	45	20	26	44	73	3	6	9	11	13	99.7	99.7	99.7	99.1	99.7		
	June	12	37	45	36	40	34	41	91	100	3	5	8	14	18	99.3	99.3	99.3	98.5	99.3		
	July	9	47	66	23	25	45	60	94	121	3	4	7	16	26	100.0	100.0	100.0	100.0	100.0		
	August	12	47	81	32	33	45	75	88	127	5	5	10	18	29	99.3	99.3	99.3	98.9	99.3		
	September	13	58	65	24	27	51	63	136	130	5	6	11	21	28	99.9	99.9	99.9	100.0	99.9		
	October	15	51	48	35	39	50	47	111	99	6	7	12	16	20	99.1	99.1	99.1	96.6	99.1		
	November	11	48	36	28	29	40	32	107	77	5	6	10	13	13	99.9	99.9	99.9	98.2	99.9		
	December	27	38	46	45	46	33	45	243	220	6	8	14	13	13	99.6	99.6	99.6	98.4	99.6		
Q1 Arithmetic Mean												5	8	13	17	22	93.7	93.7	93.7	97.4	80.7	
Q2 Arithmetic Mean												3	6	9	14	16	99.6	99.6	99.6	98.8	99.6	
Q3 Arithmetic Mean												4	5	9	18	27	99.7	99.7	99.7	99.6	99.7	
Q4 Arithmetic Mean												5	7	12	14	16	99.5	99.5	99.5	97.7	99.5	
Annual Arithmetic Mean												4	7	11	16	20	98.1	98.1	98.1	98.4	94.9	

Exceedance Summary STN72139																		
Parameter	Type	Averaging Type	Limit	Q1			Q2			Q3			Q4			Total		
				J	F	M	A	M	J	J	A	S	O	N	D			
Particulate Matter < 10 µm	PM10	AAQC	24 Hr Running	50 µg/m ³	0	0	4	1	0	0	0	0	0	1	1	0	0	7
Nitrogen Dioxide	NO2	AAQC	24 Hr Running	100 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrogen Dioxide	NO2	AAQC	1 Hr Running	200 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrogen Dioxide	NO2	O. Reg 419/05	½ Hr Running	250 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ins* - insufficient data to calculate mean

2017 Data Statistics		Maximum 24 Hr Running Average			Maximum 1 Hr Running Average			Maximum ½ Hr Running Average			Monthly Mean					Percent Valid Data				
Station	Month	NO2	PM10	TSP	NO2	NO2	PM10	TSP	PM10	TSP	NO	NO2	NOX	PM10	TSP	NO	NO2	NOX	PM10	TSP
		ppb	µg/m ³	µg/m ³	ppb	ppb	µg/m ³	µg/m ³	µg/m ³	µg/m ³	ppb	ppb	ppb	µg/m ³	µg/m ³	%	%	%	%	%
STN72141	January	10	24	41	30	33	24	39	169	314	2	3	5	5	7	99.9	99.9	99.9	100.0	99.9
	February	15	51	33	40	43	42	31	241	131	5	5	10	8	7	99.9	99.9	99.9	99.3	99.9
	March	20	145	95	51	53	126	85	1457	937	6	5	11	22	15	99.9	99.9	99.9	100.0	99.9
	April	19	55	51	49	52	55	50	414	337	3	4	7	9	10	99.7	99.7	99.7	97.8	99.9
	May	8	17	21	32	33	13	21	43	56	2	3	4	7	11	99.6	99.6	99.6	99.6	99.6
	June	15	16	29	35	37	14	28	41	58	ins*	ins*	ins*	7	13	38.5	38.5	38.5	95.1	98.6
	July	7	16	37	19	20	15	36	114	89	ins*	ins*	ins*	9	16	36.8	36.8	36.8	100.0	99.9
	August	6	17	38	17	21	15	35	25	53	4	2	6	8	15	99.1	99.1	99.1	99.3	99.2
	September	6	17	69	17	19	16	56	26	115	ins*	ins*	ins*	8	18	69.3	69.3	69.3	100.0	99.3
	October	8	20	24	23	24	15	21	36	36	1	3	4	6	9	98.9	98.9	98.9	97.0	98.9
	November	6	44	30	21	23	41	25	310	198	1	2	3	7	6	99.9	99.9	99.9	100.0	99.9
	December	20	16	15	33	34	12	15	54	50	2	5	7	6	6	99.6	99.6	99.6	98.9	99.6
Q1 Arithmetic Mean											4	4	9	12	10	99.9	99.9	99.9	99.8	99.9
Q2 Arithmetic Mean											2	3	6	7	11	79.3	79.3	79.3	97.5	99.4
Q3 Arithmetic Mean											ins*	ins*	ins*	8	16	68.4	68.4	68.4	99.8	99.5
Q4 Arithmetic Mean											1	3	5	6	7	99.5	99.5	99.5	98.7	99.5
Annual Arithmetic Mean											3	4	6	8	11	86.7	86.7	86.7	98.9	99.5

Exceedance Summary STN72141																		
Parameter	Type	Averaging Type	Limit	Q1			Q2			Q3			Q4			Total		
				J	F	M	A	M	J	J	A	S	O	N	D			
Particulate Matter < 10 µm	PM10	AAQC	24 Hr Running	50 µg/m ³	0	1	6	1	0	0	0	0	0	0	0	0	0	8
Nitrogen Dioxide	NO2	AAQC	24 Hr Running	100 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrogen Dioxide	NO2	AAQC	1 Hr Running	200 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrogen Dioxide	NO2	O. Reg 419/05	½ Hr Running	250 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ins* - insufficient data to calculate mean

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**Appendix B
Non-continuous Data Statistics**

06-Jul-17	64															
12-Jul-17	23	0.00185	0.0006	0.00420	0.0006	0.1730	0.9970	0.0009	0.4090	0.01940	0.0026	0.00305	0.1400	0.00155	0.0182	0.4200
18-Jul-17	80															
24-Jul-17	30															
30-Jul-17	59	0.00185	0.0006	0.00400	0.0006	0.1160	1.9000	0.0009	0.5990	0.04060	0.0025	0.00305	0.2040	0.00155	0.0125	0.6100
05-Aug-17	11															
11-Aug-17	20															
17-Aug-17	23	0.00185	0.0006	0.00320	0.0006	0.1370	0.7920	0.0025	0.2660	0.01720	0.0027	0.00305	0.2770	0.00155	0.0154	0.8300
23-Aug-17	16															
29-Aug-17	28															
04-Sep-17	35	0.00185	0.0006	0.00155	0.0006	0.1700	0.7680	0.0023	0.2560	0.01880	0.0009	0.00305	0.1850	0.00155	0.0087	0.5500
10-Sep-17	34															
16-Sep-17	22															
22-Sep-17	23	0.00185	0.0006	0.00155	0.0006	0.0651	0.4380	0.0009	0.1710	0.01200	0.0009	0.00305	0.7590	0.00155	0.0133	2.2700
28-Sep-17	31															
04-Oct-17	28															
10-Oct-17	20	0.00185	0.0006	0.00155	0.0006	0.1180	0.3680	0.0009	0.1360	0.00863	0.0009	0.00305	0.0630	0.00155	0.0070	0.1900
16-Oct-17	12															
22-Oct-17	31															
28-Oct-17	9	0.00185	0.0006	0.00155	0.0006	0.1370	0.1930	0.0009	0.0760	0.00425	0.0009	0.00305	0.0380	0.00155	0.0052	0.1100
03-Nov-17	17															
09-Nov-17	21															
15-Nov-17	8	0.00185	0.0006	0.00155	0.0006	0.0600	0.1330	0.0009	0.0510	0.00338	0.0009	0.00305	0.2830	0.00155	0.0084	0.8500
21-Nov-17	10															
27-Nov-17	13															
03-Dec-17	20	0.00185	0.0006	0.00155	0.0006	0.2240	0.4190	0.0043	0.1480	0.01100	0.0009	0.00305	0.3410	0.00155	0.0112	1.0200
09-Dec-17	19															
15-Dec-17	19															
21-Dec-17	20	0.00185	0.0006	0.00155	0.0006	0.1730	0.8230	0.0216	0.2200	0.01520	0.0009	0.00305	0.1510	0.00155	0.0959	0.4500
27-Dec-17	30															

Arithmetic Mean	28	0.00218	0.0006	0.00372	0.0008	0.1207	1.1434	0.0028	0.4205	0.02382	0.0023	0.00305	0.2431	0.00234	0.0193	0.7275
Geometric Mean	22	0.00200	0.0006	0.00254	0.0007	0.1044	0.7067	0.0016	0.2647	0.01586	0.0015	0.00305	0.1997	0.00187	0.0150	0.5967
Max	130	0.00840	0.0006	0.02550	0.0046	0.3080	8.2400	0.0216	3.0200	0.14800	0.0148	0.00305	0.7590	0.01360	0.0959	2.2700
Min	6	0.00185	0.0006	0.00155	0.0006	0.0471	0.1330	0.0009	0.0510	0.00338	0.0009	0.00305	0.0380	0.00155	0.0052	0.1100
No. of Samples	61	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
No. > AAQC	1	0	0	0	0	0	0	0	0	0	0	0	n/a	0	0	n/a
No. > Standard	0	n/a	n/a	n/a	n/a	0	0	0	0	0	0	n/a	n/a	0	0	n/a
No. > Guideline	0	0	n/a	0	0	n/a	n/a	n/a	n/a	0	n/a	0	n/a	n/a	n/a	n/a

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

06-Jul-17	57															
12-Jul-17	56	0.00185	0.0006	0.01140	0.0014	0.0555	2.6400	0.0036	0.9170	0.05450	0.0048	0.00305	0.1960	0.00155	0.0404	0.5900
18-Jul-17	58															
24-Jul-17	79															
30-Jul-17	29	0.00185	0.0006	0.00350	0.0006	0.0537	0.6890	0.0009	0.2630	0.01590	0.0009	0.00305	0.1900	0.00155	0.0163	0.5700
05-Aug-17	10															
11-Aug-17	16															
17-Aug-17	60	0.00185	0.0006	0.00570	0.0006	0.0750	2.5100	0.0100	0.9040	0.05280	0.0051	0.00305	0.3540	0.00430	0.0292	1.0600
23-Aug-17	11															
29-Aug-17	113															
04-Sep-17	31	0.00185	0.0006	0.00155	0.0006	0.0517	0.3970	0.0009	0.1660	0.00998	0.0009	0.00305	0.1790	0.00155	0.0114	0.5400
10-Sep-17	35															
16-Sep-17	32															
22-Sep-17	36	0.00185	0.0006	0.00310	0.0006	0.0529	0.6950	0.0106	0.2870	0.01470	0.0020	0.00305	0.7150	0.00155	0.0207	2.1400
28-Sep-17	21															
04-Oct-17	20															
10-Oct-17	17	0.00185	0.0006	0.00155	0.0006	0.0410	0.3560	0.0056	0.1430	0.00877	0.0009	0.00305	0.0810	0.00155	0.0101	0.2400
16-Oct-17	27															
22-Oct-17	60															
28-Oct-17	5	0.00185	0.0006	0.00155	0.0006	0.0463	0.0960	0.0009	0.0330	0.00255	0.0009	0.00305	0.0540	0.00155	0.0168	0.1600
03-Nov-17	9															
09-Nov-17	9															
15-Nov-17	17	0.00185	0.0006	0.00155	0.0006	0.0527	0.2520	0.0044	0.1270	0.00560	0.0020	0.00305	0.3350	0.00155	0.0126	1.0000
21-Nov-17	24															
27-Nov-17	27															
03-Dec-17	17	0.00185	0.0006	0.00155	0.0006	0.0759	0.1530	0.0009	0.0580	0.00407	0.0009	0.00305	0.3660	0.00155	0.0142	1.1000
09-Dec-17	9															
15-Dec-17	13															
21-Dec-17	19	0.00185	0.0006	0.00155	0.0006	0.0692	0.5340	0.0053	0.1770	0.00965	0.0009	0.00305	0.1030	0.00155	0.0707	0.3100
27-Dec-17	12															

Arithmetic Mean	33	0.00206	0.0006	0.00411	0.0008	0.0543	1.0847	0.0033	0.4427	0.02297	0.0024	0.00305	0.2537	0.00214	0.0216	0.7605
Geometric Mean	24	0.00196	0.0006	0.00278	0.0007	0.0510	0.6123	0.0022	0.2553	0.01405	0.0016	0.00305	0.2110	0.00186	0.0184	0.6324
Max	128	0.00610	0.0006	0.01580	0.0030	0.0924	4.9900	0.0106	1.8900	0.09190	0.0096	0.00305	0.7150	0.00770	0.0707	2.1400
Min	2	0.00185	0.0006	0.00155	0.0006	0.0228	0.0960	0.0009	0.0330	0.00255	0.0009	0.00305	0.0540	0.00155	0.0082	0.1600
No. of Samples	61	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
No. > AAQC	1	0	0	0	0	0	0	0	0	0	0	0	n/a	0	0	n/a
No. > Standard	0	n/a	n/a	n/a	n/a	0	0	0	0	0	0	n/a	n/a	0	0	n/a
No. > Guideline	0	0	n/a	0	0	n/a	n/a	n/a	n/a	0	n/a	0	n/a	n/a	n/a	n/a

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

06-Jul-17	56															
12-Jul-17	66	0.00185	0.0006	0.02750	0.0018	0.0848	4.4600	0.0095	1.2400	0.08440	0.0057	0.00305	0.2530	0.00440	0.0881	0.7600
18-Jul-17	72															
24-Jul-17	83															
30-Jul-17	27	0.00185	0.0006	0.00155	0.0006	0.0701	0.6380	0.0009	0.2560	0.01420	0.0009	0.00305	0.1900	0.00155	0.0119	0.5700
05-Aug-17	12															
11-Aug-17	24															
17-Aug-17	38	0.00185	0.0006	0.00520	0.0006	0.0743	1.2800	0.0208	0.4660	0.02320	0.0037	0.00305	0.3160	0.00155	0.0265	0.9500
23-Aug-17	17															
29-Aug-17	56															
04-Sep-17	27	0.00185	0.0006	0.00155	0.0006	0.0777	0.2920	0.0009	0.1110	0.00624	0.0009	0.00305	0.1610	0.00155	0.0130	0.4800
10-Sep-17	23															
16-Sep-17	29															
22-Sep-17	32	0.00185	0.0006	0.00450	0.0006	0.0523	0.6990	0.0108	0.2730	0.0161	0.0027	0.00305	0.7290	0.00155	0.0196	2.1900
28-Sep-17	30															
04-Oct-17	23															
10-Oct-17	30	0.00185	0.0006	0.00155	0.0006	0.0691	0.8570	0.0098	0.3240	0.01610	0.0020	0.00305	0.1070	0.00155	0.0185	0.3200
16-Oct-17	11															
22-Oct-17	27															
28-Oct-17	7	0.00185	0.0006	0.00155	0.0006	0.0603	0.2450	0.0009	0.0900	0.00513	0.0009	0.00305	0.0480	0.00155	0.0072	0.1400
03-Nov-17	9															
09-Nov-17	16															
15-Nov-17	8	0.00185	0.0006	0.00155	0.0006	0.0210	0.1760	0.0140	0.0640	0.00442	0.0009	0.00305	0.3200	0.00155	0.0119	0.9600
21-Nov-17	5															
27-Nov-17	9															
03-Dec-17	16	0.00185	0.0006	0.00155	0.0006	0.0533	0.1560	0.0050	0.0610	0.00459	0.0009	0.00305	0.3770	0.00155	0.0140	1.1300
09-Dec-17	8															
15-Dec-17	14															
21-Dec-17	12	0.00185	0.0006	0.00155	0.0006	0.0561	0.1440	0.0211	0.0320	0.00244	0.0009	0.00305	0.0840	0.00155	0.0250	0.2500
27-Dec-17	14															

Arithmetic Mean	30	0.00201	0.0006	0.00442	0.0008	0.0554	1.0626	0.0061	0.3958	0.02168	0.0022	0.00305	0.3104	0.00201	0.0224	0.9300
Geometric Mean	21	0.00195	0.0006	0.00277	0.0007	0.0499	0.5348	0.0035	0.1996	0.01139	0.0017	0.00305	0.2303	0.00177	0.0188	0.6886
Max	100	0.00510	0.0006	0.02750	0.0026	0.0970	5.0900	0.0211	1.9100	0.09900	0.0086	0.00305	1.5700	0.00790	0.0881	4.7100
Min	2	0.00185	0.0006	0.00155	0.0006	0.0145	0.0690	0.0009	0.0155	0.00164	0.0009	0.00305	0.0480	0.00155	0.0072	0.1400
No. of Samples	61	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
No. > AAQC	0	0	0	0	0	0	0	0	0	0	0	0	n/a	0	0	n/a
No. > Standard	0	n/a	n/a	n/a	n/a	0	0	0	0	0	0	n/a	n/a	0	0	n/a
No. > Guideline	0	0	n/a	0	0	n/a	n/a	n/a	n/a	0	n/a	0	n/a	n/a	n/a	n/a

Note: All non detectable results reported as 1/2 the Reportable Detection Limit (RDL).

06-Jul-17	26															
12-Jul-17	9															
18-Jul-17	27	0.00185	0.0006	0.00155	0.0006	0.0244	1.0900	0.0053	0.3400	0.02160	0.0021	0.00305	0.2380	0.00155	0.0146	0.7100
24-Jul-17	11															
30-Jul-17	21															
05-Aug-17	8															
11-Aug-17	12															
17-Aug-17	14	0.00185	0.0006	0.00155	0.0006	0.0395	0.2460	0.0025	0.0810	0.00509	0.0009	0.00305	0.2430	0.00155	0.0087	0.7300
23-Aug-17	10															
29-Aug-17	18															
04-Sep-17	21															
10-Sep-17	13															
16-Sep-17	8	0.00185	0.0006	0.00155	0.0006	0.0297	0.1090	0.0009	0.0400	0.00310	0.0009	0.00305	0.2510	0.00155	0.0084	0.7500
22-Sep-17	15															
28-Sep-17	15															
04-Oct-17	15															
10-Oct-17	7															
16-Oct-17	5	0.00185	0.0006	0.00155	0.0006	0.0376	0.0810	0.0009	0.0390	0.00236	0.0009	0.00305	0.1100	0.00155	0.0040	0.3300
22-Oct-17	12															
28-Oct-17	1.5															
03-Nov-17	6															
09-Nov-17	7															
15-Nov-17	5	0.00185	0.0006	0.00155	0.0006	0.0232	0.0410	0.0009	0.0155	0.00124	0.0009	0.00305	0.2770	0.00155	0.0084	0.8300
21-Nov-17	5															
27-Nov-17	10															
03-Dec-17	13															
09-Dec-17	10															
15-Dec-17	9	0.00185	0.0006	0.00155	0.0006	0.0385	0.2150	0.0021	0.0770	0.00443	0.0009	0.00305	0.0640	0.00155	0.0123	0.1900
21-Dec-17	11															
27-Dec-17	12															

Arithmetic Mean	12	0.00185	0.0006	0.00295	0.0006	0.0256	0.2426	0.0016	0.0852	0.00522	0.0010	0.00305	0.2281	0.00155	0.0092	0.6825
Geometric Mean	10	0.00185	0.0006	0.00190	0.0006	0.0212	0.1528	0.0013	0.0539	0.00364	0.0010	0.00305	0.2033	0.00155	0.0087	0.6081
Max	55	0.00185	0.0006	0.01830	0.0006	0.0595	1.0900	0.0053	0.3400	0.02160	0.0021	0.00305	0.3980	0.00155	0.0146	1.1900
Min	2	0.00185	0.0006	0.00155	0.0006	0.0085	0.0410	0.0009	0.0155	0.00124	0.0009	0.00305	0.0640	0.00155	0.0040	0.1900
No. of Samples	61	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
No. > AAQC	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	n/a	n/a	n/a	n/a	n/a

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

06-Jul-17	22															
12-Jul-17	18															
18-Jul-17	23	0.00185	0.0006	0.00155	0.0006	0.0078	0.6790	0.0009	0.2620	0.01400	0.0009	0.00305	0.2510	0.00155	0.0134	0.7500
24-Jul-17	26															
30-Jul-17	15															
05-Aug-17	6															
11-Aug-17	9															
17-Aug-17	25	0.00185	0.0006	0.00310	0.0006	0.0305	0.7670	0.0091	0.2910	0.01560	0.0028	0.00305	0.2640	0.00155	0.0139	0.7900
23-Aug-17	7															
29-Aug-17	70															
04-Sep-17	23															
10-Sep-17	22															
16-Sep-17	21	0.00185	0.0006	0.00155	0.0006	0.0594	0.4950	0.0021	0.2160	0.01140	0.0018	0.00305	0.3060	0.00155	0.0154	0.9200
22-Sep-17	25															
28-Sep-17	9															
04-Oct-17	13															
10-Oct-17	9															
16-Oct-17	12	0.00185	0.0006	0.00155	0.0006	0.0231	0.3310	0.0009	0.1370	0.00744	0.0009	0.00305	0.1180	0.00155	0.0074	0.3500
22-Oct-17	36															
28-Oct-17	1.5															
03-Nov-17	4															
09-Nov-17	9															
15-Nov-17	19	0.00185	0.0006	0.00155	0.0006	0.0438	0.2660	0.0035	0.1330	0.00595	0.0009	0.00305	0.2850	0.00155	0.0112	0.8500
21-Nov-17	17															
27-Nov-17	25															
03-Dec-17	15															
09-Dec-17	8															
15-Dec-17	10	0.00185	0.0006	0.00155	0.0006	0.0273	0.2260	0.0038	0.0800	0.00483	0.0009	0.00305	0.0730	0.00155	0.0151	0.2200
21-Dec-17	10															
27-Dec-17	9															

Arithmetic Mean	17	0.00185	0.0006	0.00232	0.0006	0.0220	0.4238	0.0025	0.1893	0.00901	0.0014	0.00305	0.2661	0.00155	0.0129	0.7967
Geometric Mean	12	0.00185	0.0006	0.00201	0.0006	0.0173	0.2862	0.0020	0.1216	0.00634	0.0012	0.00305	0.2365	0.00155	0.0123	0.7081
Max	70	0.00185	0.0006	0.00670	0.0006	0.0594	1.6500	0.0091	0.8680	0.03300	0.0043	0.00305	0.5480	0.00155	0.0243	1.6400
Min	2	0.00185	0.0006	0.00155	0.0006	0.0060	0.0850	0.0009	0.0400	0.00181	0.0009	0.00305	0.0730	0.00155	0.0074	0.2200
No. of Samples	61	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
No. > AAQC	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	n/a	n/a	n/a	n/a	n/a

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

06-Jul-17	24															
12-Jul-17	21															
18-Jul-17	27	0.00185	0.0006	0.01370	0.0006	0.0145	0.8360	0.0009	0.2920	0.01500	0.0020	0.00305	0.2310	0.00155	0.0108	0.6900
24-Jul-17	32															
30-Jul-17	13															
05-Aug-17	7															
11-Aug-17	14															
17-Aug-17	18	0.00185	0.0006	0.00155	0.0006	0.0284	0.4680	0.0193	0.1680	0.00850	0.0009	0.00305	0.2380	0.00155	0.0106	0.7100
23-Aug-17	8															
29-Aug-17	27															
04-Sep-17	18															
10-Sep-17	11															
16-Sep-17	10	0.00185	0.0006	0.00155	0.0006	0.0182	0.1460	0.0027	0.0550	0.00352	0.0009	0.00305	0.2450	0.00155	0.0088	0.7300
22-Sep-17	16															
28-Sep-17	11															
04-Oct-17	11															
10-Oct-17	13															
16-Oct-17	4	0.00185	0.0006	0.00155	0.0006	0.0097	0.1100	0.0009	0.0340	0.00212	0.0009	0.00305	0.0960	0.00155	0.0046	0.2900
22-Oct-17	13															
28-Oct-17	1.5															
03-Nov-17	1.5															
09-Nov-17	10															
15-Nov-17	5	0.00185	0.0006	0.00155	0.0006	0.0069	0.0530	0.0123	0.0155	0.00195	0.0009	0.00305	0.2890	0.00155	0.0080	0.8700
21-Nov-17	8															
27-Nov-17	9															
03-Dec-17	13															
09-Dec-17	10															
15-Dec-17	10	0.00185	0.0006	0.00155	0.0006	0.0090	0.2510	0.0022	0.0790	0.00560	0.0009	0.00305	0.0730	0.00155	0.0117	0.2200
21-Dec-17	10															
27-Dec-17	8															

Arithmetic Mean	16	0.00185	0.0006	0.00301	0.0006	0.0196	0.3304	0.0042	0.1303	0.00696	0.0012	0.00305	0.2718	0.00155	0.0117	0.8133
Geometric Mean	12	0.00185	0.0006	0.00220	0.0006	0.0173	0.2182	0.0023	0.0729	0.00489	0.0011	0.00305	0.2346	0.00155	0.0109	0.7026
Max	59	0.00185	0.0006	0.01370	0.0006	0.0329	1.0400	0.0193	0.5190	0.02220	0.0029	0.00305	0.5720	0.00155	0.0205	1.7100
Min	2	0.00185	0.0006	0.00155	0.0006	0.0069	0.0530	0.0009	0.0155	0.00151	0.0009	0.00305	0.0730	0.00155	0.0046	0.2200
No. of Samples	61	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
No. > AAQC	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	n/a	n/a	n/a	n/a	n/a

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

Reporting Period : 01 January to 31 December, 2017

Sampling Method : BRL SOP-00121

 Standard : 7.0 g/m²/30d

	STN72135 Extendicare			STN72136 MRCA			STN72137 Shania Twain Centre		
Units	g/m ² /30d			g/m ² /30d			g/m ² /30d		
RDL	0.01			0.01			0.01		
Month	Insoluble	Soluble	Total Dustfall	Insoluble	Soluble	Total Dustfall	Insoluble	Soluble	Total Dustfall
January	0.34	0.30	0.64	0.21	0.23	0.44	0.21	0.24	0.45
February	0.51	0.43	0.95	0.47	0.66	1.10	0.45	0.55	1.00
March	1.50	0.78	2.30	1.30	0.75	2.00	0.94	0.59	1.50
April	1.70	0.81	2.50	1.60	1.10	2.60	1.40	0.79	2.20
May	1.40	1.10	2.50	1.20	1.20	2.40	1.70	1.40	3.20
June	2.30	1.40	3.70	2.00	1.20	3.10	1.50	2.00	3.50
July	3.30	3.20	6.50	1.20	0.74	1.90	2.20	1.40	3.60
August	4.70	4.50	9.10	1.70	1.60	3.40	0.86	0.91	1.80
September	1.20	0.56	1.70	0.91	0.57	1.50	1.50	0.83	2.30
October	1.50	0.69	2.20	1.20	1.00	2.20	0.70	0.66	1.40
November	0.95	0.57	1.50	0.48	0.61	1.10	0.35	0.37	0.72
December	0.98	0.61	1.60	0.42	0.50	0.92	0.34	0.64	0.98
Annual Average	1.70	1.25	2.93	1.06	0.85	1.89	1.01	0.87	1.89
Annual Max	4.70	4.50	9.10	2.00	1.60	3.40	2.20	2.00	3.60
No. of Valid Samples	12	12	12	12	12	12	12	12	12
% Valid Data	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Samples > Standard	n/a	n/a	1	n/a	n/a	0	n/a	n/a	0

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

Reporting Period : 01 January to 31 December, 2017

Sampling Method : BRL SOP-00121

 Standard : 7.0 g/m²/30d

	STN72141 Claimpost Trail			STN72142 Aura Lake			STN72143 Snowmobile Crossing		
Units	g/m ² /30d			g/m ² /30d			g/m ² /30d		
RDL	0.01			0.01			0.01		
Month	Insoluble	Soluble	Total Dustfall	Insoluble	Soluble	Total Dustfall	Insoluble	Soluble	Total Dustfall
January	0.37	0.29	0.66	0.30	0.29	0.59	3.00	0.52	3.50
February	0.53	0.61	1.10	0.65	0.57	1.20	5.20	1.00	6.20
March	5.80	1.20	7.00	1.50	0.63	2.10	21.00	1.20	22.00
April	8.20	1.20	9.40	2.00	0.98	3.00	15.00	1.80	17.00
May	4.20	1.40	5.60	2.20	1.10	3.40	18.00	0.72	19.00
June	3.00	1.30	4.30	2.10	1.10	3.10	21.00	3.40	24.00
July	2.80	0.86	3.70	1.70	0.85	2.50	33.00	4.10	37.00
August	1.90	1.30	3.20	0.91	1.30	2.20	13.00	2.90	16.00
September	2.30	0.71	3.00	0.97	0.55	1.50	22.00	2.70	24.00
October	1.40	1.30	2.70	0.96	0.73	1.70	17.00	1.80	19.00
November	2.30	0.68	3.00	0.89	0.48	1.40	23.00	1.20	24.00
December	1.10	0.38	1.50	0.56	0.47	1.00	15.00	1.70	16.00
Annual Average	2.83	0.94	3.76	1.23	0.75	1.97	17.18	1.92	18.98
Annual Max	8.20	1.40	9.40	2.20	1.30	3.40	33.00	4.10	37.00
No. of Valid Samples	12	12	12	12	12	12	12	12	12
% Valid Data	91.7	91.7	91.7	100.0	100.0	100.0	100.0	100.0	100.0
No. of Samples > Standard	n/a	n/a	1	n/a	n/a	0	n/a	n/a	10

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

Goldcorp - Passive Sampling Report

Reporting Period : 01 January to 31 December 2017

Sampling Methods : Radiello F1 / APHA 4110

Parameter	STN72135 EXTENDICARE		STN72136 MRCA		STN72137 SHANIA TWAIN	
	SO ₂	NO ₂	SO ₂	NO ₂	SO ₂	NO ₂
Units	ppb	ppb	ppb	ppb	ppb	ppb
RDL	0.10	0.10	0.10	0.10	0.10	0.10
Month						
January	0.05	2.83	0.10	3.26	0.11	3.12
February	0.05	3.49	0.05	3.06	0.05	3.07
March	0.05	3.17	0.05	5.16	0.05	3.11
April	0.12	2.64	0.05	2.77	0.05	2.89
May	0.12	2.53	0.05	2.14	0.11	2.45
June	0.05	2.57	0.05	0.96	0.10	0.85
July	0.05	2.94	0.05	1.50	0.05	1.64
August	3.93	3.02	0.51	1.89	0.38	1.61
September	0.74	0.63	0.61	0.83	0.48	0.59
October	0.18	1.23	0.31	1.90	0.22	1.42
November	0.15	0.95	0.15	1.90	0.16	0.91
December	0.20	4.00	0.20	5.00	0.10	3.80
Annual Average	0.47	2.50	0.18	2.53	0.16	2.12
Annual Maximum	3.93	4.00	0.61	5.16	0.48	3.80
No. of Valid Samples	12	12	12	12	12	12
% Valid Data	100.0	100.0	100.0	100.0	100.0	100.0

Note: All non detectable results reported as ½ the Reportable Detection Limit (RDL).

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Ambient Air Monitoring Report

**Appendix C
Calibration Summary**

GOLDCORP CALIBRATION SUMMARY JUNE 2017

Station Identifier	STN72135	STN72138	STN72139	STN72140	STN72141
GC Serial Number	380	379	381	382	453
Station Name	Extendicare	Hollinger Park	Hollinger Office	Goldmine Tour	Claimpost Trail
Date	June 11, 2017	June 13, 2017	June 12, 2017	June 12, 2017	June 11, 2017
Time (EST)	14:30	N/A	10:00	15:00	11:45
SHARP Neph Zero response	6.5	N/A	15.6	1.0	5.9
SHARP Conc. Zero response	5.8	N/A	10.3	0.9	4.9
SHARP Zero reset	Yes	N/A	Yes	Yes	Yes
Flow rate response	Pass	N/A	Pass	Pass	Pass
Monitor calibration criteria	Pass	N/A	Pass	Pass	Pass
Date	June 11, 2017	June 13, 2017	June 12, 2017	June 12, 2017	June 11, 2017
Time (EST)	14:00	N/A	10:30	14:00	11:30
TSP Zero response	3.0	N/A	2.7	3.2	5.9
TSP Zero reset	Yes	N/A	Yes	Yes	Yes
Flow rate response	Pass	N/A	Pass	Pass	Pass
Monitor calibration criteria	Pass	N/A	Pass	Pass	Pass
Date	June 11, 2017	June 13, 2017	June 12, 2017	June 12, 2017	June 11, 2017
Time (EST)	14:00	N/A	10:00	13:00	10:00
NO / NOX Zero response	0.2 / 0.3	N/A	-0.4 / -0.6	0.0 / 0.0	2.1 / 2.5
NO / NOX Zero reset	No	N/A	Yes	No	Yes
NO / NOX Span input	710 / 711	N/A	710 / 711	710 / 711	710 / 711
NO / NOX Span response	688 / 688	N/A	779 / 781	733 / 735	700 / 715
NO / NOX Span tolerance	3.1 / 3.2	N/A	9.7 / 9.8	3.2 / 3.4	-1.4 / 0.6
NO / NOX Span reset	Yes	N/A	Yes	No	Yes
Monitor calibration criteria	Pass	N/A	Pass	Pass	Pass

GOLDCORP CALIBRATION SUMMARY AUGUST 2017

Station Identifier	STN72135	STN72138	STN72139	STN72140	STN72141
GC Serial Number	380	379	381	382	453
Station Name	Extendicare	Hollinger Park	Hollinger Office	Goldmine Tour	Claimpost Trail
Date	August 15, 2017	N/A	August 15, 2017	August 15, 2017	August 16, 2017
Time (EST)	10:30	N/A	15:45	10:00	15:30
SHARP Neph Zero response	1.7	N/A	7.3	0.6	1.0
SHARP Conc. Zero response	1.7	N/A	5.0	0.6	0.5
SHARP Zero reset	Yes	N/A	Yes	Yes	Yes
Flow rate response	Pass	N/A	Pass	Pass	Pass
Monitor calibration criteria	Pass	N/A	Pass	Pass	Pass
Date	August 15, 2017	N/A	August 15, 2017	August 16, 2017	August 16, 2017
Time (EST)	10:00	N/A	15:15	10:00	14:30
TSP Zero response	0.3	N/A	0.5	0.8	3.2
TSP Zero reset	No	N/A	No	No	Yes
Flow rate response	Pass	N/A	Pass	Pass	Pass
Monitor calibration criteria	Pass	N/A	Pass	Pass	Pass
Date	August 15, 2017	N/A	August 15, 2017	August 16, 2017	August 16, 2017
Time (EST)	10:00	N/A	15:30	9:30	14:00
NO / NOX Zero response	0.1 / 0.3	N/A	0.1 / 0.3	0.1 / 0.3	0.2 / 1.8
NO / NOX Zero reset	No	N/A	Yes	No	Yes
NO / NOX Span input	710 / 711	N/A	710 / 711	710 / 711	710 / 711
NO / NOX Span response	677 / 688	N/A	704 / 706	690 / 692	672 / 673
NO / NOX Span tolerance	-4.6 / -3.2	N/A	-0.8 / -0.7	-2.8 / -2.7	-5.4 / -5.3
NO / NOX Span reset	Yes	N/A	No	No	Yes
Monitor calibration criteria	Pass	N/A	Pass	Pass	Pass

GOLDCORP CALIBRATION SUMMARY OCTOBER 2017

Station Identifier	STN72135	STN72138	STN72139	STN72140	STN72141
GC Serial Number	380	379	381	382	453
Station Name	Extendicare	Hollinger Park	Hollinger Office	Goldmine Tour	Claimpost Trail
Date	October 16, 2017	N/A	October 17, 2017	October 18, 2017	October 19, 2017
Time (EST)	16:00	N/A	13:00	11:00	10:00
SHARP Neph Zero response	0.0	N/A	3.9	0.1	0.3
SHARP Conc. Zero response	0.0	N/A	5.2	0.1	0.3
SHARP Zero reset	No	N/A	Yes	No	No
Flow rate response	Pass	N/A	Pass	Pass	Pass
Monitor calibration criteria	Pass	N/A	Pass	Pass	Pass
Date	October 16, 2017	N/A	October 17, 2017	October 18, 2017	October 19, 2017
Time (EST)	13:00	N/A	12:30	10:00	9:00
TSP Zero response	3.3	N/A	-1.5	-0.5	1.5
TSP Zero reset	No	N/A	Yes	Yes	Yes
Flow rate response	Pass	N/A	Pass	Pass	Pass
Monitor calibration criteria	Pass	N/A	Pass	Pass	Pass
Date	October 16, 2017	N/A	October 17, 2017	October 18, 2017	October 18, 2017
Time (EST)	12:00	N/A	12:00	10:00	16:00
NO / NOX Zero response	0.3 / 1.1	N/A	0.0 / 0.1	0.1 / 0.3	0.1 / 0.1
NO / NOX Zero reset	Yes	N/A	No	No	No
NO / NOX Span input	710 / 711	N/A	710 / 711	710 / 711	710 / 711
NO / NOX Span response	672 / 673	N/A	704 / 706	649 / 651	699 / 701
NO / NOX Span tolerance	-5.4 / -5.3	N/A	-0.8 / -0.7	-8.6 / -8.4	-1.5 / -1.4
NO / NOX Span reset	No	N/A	No	Yes	No
Monitor calibration criteria	Pass	N/A	Pass	Pass	Pass