

10 February 2012

AMEC Project No.: TC81525A

Goldcorp Canada Limited
Porcupine Gold Mines
4315 Gold Mine Road
Timmins, ON
P0N 1H0

Attention: Mr. Peter W. Andrews, P. Eng.
Senior Project Engineer

Dear Mr. Andrews

**Re: Baseline Air Quality Monitoring Program
Annual Summary Report – 2011
Timmins, Ontario**


AMEC Environment and Infrastructure, a division of AMEC Americas Limited (AMEC), is pleased to submit to Goldcorp Canada Limited (Goldcorp) the annual summary report for the data collected in 2011 from the baseline air quality monitoring program undertaken in the City of Timmins at the following sampling locations: near the Extendicare Facility in Schumacher, the Mattagami River Conservation Area office and the Shania Twain Tourist Centre in Timmins.

These sampling stations were operated and maintained by Goldcorp in 2011.

Please contact Ray Potvin at your convenience if you have any questions about the report.

Sincerely,

**AMEC Environment and Infrastructure,
A Division of AMEC Americas Limited**



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Air Quality Specialist



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Senior Air Quality Management Specialist



**BASELINE AIR QUALITY MONITORING PROGRAM
ANNUAL 2011 REPORT
CITY OF TIMMINS, ONTARIO**

Submitted to:

Goldcorp Canada Limited
Porcupine Gold Mines
4315 Gold Mine Road
Timmins, ON
P0N 1H0

Submitted by:

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10 February 2012
AMEC Project No.: **TC81525A**

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1.0 INTRODUCTION

AMEC Environment and Infrastructure, a division of AMEC Americas Limited (AMEC) is pleased to provide a summary of the 2011 results for the baseline air quality monitoring program undertaken in the City of Timmins for Goldcorp Canada Limited (Goldcorp) in relation to the Hollinger mine project. As in 2010, Goldcorp staff operated and maintained the sampling stations and AMEC provided technical guidance to Goldcorp field staff and liaison with the laboratories as required, and prepared data summary reports.

This report summarizes the results obtained in 2011 at sampling stations in the vicinity of the Extendicare Facility, Mattagami River Conservation Area Office and Shania Twain Tourist Centre.

2.0 BACKGROUND

As part of the Hollinger Open Pit Mine Project in South Porcupine, AMEC provided to Goldcorp and to the Ministry of the Environment (Ministry) a monitoring plan to collect baseline air quality data near the mine site (hereafter called the Site). The plan was approved in late summer of 2009 and the air quality sampling stations were commissioned in November 2009.

The purpose of the baseline monitoring program is to obtain an air quality data base near residential areas adjacent to the Site prior to the commencement of activities expected sometime in 2012.

3.0 METHODOLOGY

3.1 Sampling Locations

The locations of the three (3) sampling stations are shown on the aerial photo in Appendix A. The monitoring locations were chosen so as to 'triangulate' the sectors near the Site and thus provide optimum coverage of the most populated areas, and also taking into consideration the prevailing wind patterns.

The chosen locations for the three sampling stations are as follows:

1. West Station: on the Shania Twain Road and just west, northwest of the Shania Twain Tourist Centre.
2. Northeast Station: just south of the Extendicare Facility located in the community of Schumacher.
3. Northwest Station: south of Gilles Lake near the Mattagami River Conservation Authority (MRCA) office.

Photos of the sampling stations are provided in Appendix B.

3.2 Field Sampling Methods and Instrumentation

3.2.1 Total Suspended and Inhalable Particulates

Particulate samples for Total Suspended Particulates (TSP), defined as the size fraction of particles with equivalent aerodynamic diameters from 44 microns and smaller, were obtained with a standard hi-vol sampler equipped with a mass flow controller, a mechanical timer and an elapsed time indicator. Inhalable Particulate (PM₁₀), defined as the size fraction of particles with equivalent aerodynamic diameters from 10 microns and smaller, were collected with a standard hi-vol equipped with a Tisch Environmental PM₁₀ size selective inlet head (model #TE-6001), a mass flow controller, a mechanical timer and elapsed time indicator. Both samplers were set to operate at a flow rate of 1.13 m³/min (40 cfm) and with 200 mm x 250 mm quartz filters as the particulate collection medium. At this flow rate, the sample volume is about 1630 m³ over a 24 hour period.

All samplers were operated to collect particulate samples every sixth day, following the North American standard particulate sampling schedule. On sampling days, particulate matter was collected over a 24-hour period, from midnight to midnight. The TSP and PM₁₀ filters were analyzed at the Mississauga Ontario Maxxam Analytics Inc. Laboratory for total particulate loading. For the purposes of the baseline study, a subset of the filters was analyzed for the following elements: arsenic (As), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), manganese (Mn), lead (Pb), nickel (Ni), selenium (Se) and sulphur (S). Sulphur was also expressed as sulphate (SO₄), on the assumption that all the sulphur was in the sulphate form. The results were all reported in units of microgram per cubic metre of air sampled (µg/m³).

3.2.2 Total Dustfall

Total dustfall samples, comprising water soluble and insoluble particulate matter, were collected with standard plastic dustfall jars lined with 4 mil thick polyethylene liners and exposed without the addition of water or ethylene glycol. The jars are exposed to the atmosphere for 30 days. The results are expressed in grams per square meter per 30 days (g/m²/30 days). At the end of each exposure period, the polyethylene liners are removed from the jars, heat sealed and sent to the Maxxam Analytics Inc. laboratory for analysis.

3.2.3 Sulphur dioxide and Nitrogen Dioxide

Monthly average concentrations of sulphur dioxide (SO₂) and nitrogen dioxide (NO₂) were determined using passive samplers. Permeation filters treated with chemicals to adsorb these compounds are exposed to the atmosphere for 30 days.

Since there are no standards and guidelines for results obtained from passive sampling of SO₂ and NO₂ and since the method is not recognized by the MOE as a Standard Operating Procedure (SOP), the data is only being used for screening purposes and for comparison with concentrations measured during the baseline, construction and operational phases of the mining project.

Each station was equipped with a hi-vol TSP and PM₁₀ sampler, as well as a dustfall and passive SO₂ and NO₂ samplers.

3.3 Analytical Methods

3.3.1 Total Suspended and Inhalable Particulates

In order to determine the particulate loadings, the filters were pre-weighed and post-weighed with a '3-point balance' with an accuracy of 1 mg. For TSP and PM₁₀ samples, this amounted to a reportable detection limit of 5 mg or about 3 µg/m³ for the expected air sample volume of about 1630 m³ (flow rate of 1.13 m³/min for 24 hours).

The metals scan was done by ICP/AES. The iron was reported by the laboratory as total iron. However it is highly unlikely that it remains in the pure metallic form due to its progressive oxidation in the air. Hence the results are reported as ferric oxide (Fe₂O₃). This is a conservative assumption since presumably the iron may not all be in this oxide form. The detection limits for the metals ranged from 0.0003 to 0.0031 µg/m³ and are shown for each element in the results spreadsheets in Appendix C-1.

3.3.2 Total Dustfall

The soluble and insoluble portions of the dustfall samples were determined using ASTM method D-1739-98 and MOE method DF-E3043A (September 8, 1995) by Maxxam Analytics.

3.3.3 Sulphur dioxide and Nitrogen Dioxide

The exposed filters are removed from the stations at the end of the exposure period, placed in a sealed container and sent to the AMEC laboratory located in Edmonton for analysis. They are analyzed with the methodology that was developed, approved and validated by Alberta Environment with the support of the Alberta Research Council, the Clean Air Strategic Alliance of Alberta, and the National Research Council of Canada.

Since the sample uptake is dependent on temperature, relative humidity and wind speed, the analytical results need to be adjusted for these meteorological parameters measured during the exposure period (monthly averages). The method detection limit is in the order of 0.1 parts per billion (ppb) for both SO₂ and NO₂. Validation tests conducted in Alberta show that results from passive sampling are typically within 10% of those obtained from sampling with continuous analyzers for 30-day exposure periods.

3.4 Field Operations

For routine operations, the sites were visited for each filter change to meet the requirements of the 1 in 6 day sampling schedule. Additional visits were made to change hi-vol motors for re-brushing, resolve instrumentation issues, perform flow calibration checks and preventative maintenance, and witness audits performed by the Ministry.

3.4.1 Extendicare Facility Station

The hi-vol TSP and PM₁₀ motors were changed three times in 2011 (26 May, 5 August and 23 November) with re-brushed units.

Flow calibration checks were performed on the TSP and PM₁₀ samplers by Goldcorp staff on 23 November coinciding with the motor changes. These were performed with a certified direct reading electronic flow calibrator. In every instance, the flow calibration was within 10% of the required flow rate of 40 cfm (1.13 m³/min). The actual flow rates were adjusted to be within about 1 cfm of the required flow rate of 40 cfm. The Ministry audited the flow calibrations on 26 May and 10 August. On 26 May, the flow of the PM₁₀ sampler was determined to be too high by 26.4%. The required data corrections were performed back to 1 January. On 10 August, the flow of the PM₁₀ sampler was determined to be too low by 11.0%. The required data corrections were performed back to 2 June.

Due to hi-vol motor problems, sampling could not be done from 3 May to 21 May with the TSP sampler and on 21 May with the PM₁₀ sampler. The June dustfall sample was spoiled (dead bird found in dustfall jar) and not submitted for analysis.

3.4.2 MRCA Office Station

The hi-vol TSP and PM₁₀ motors were changed three times in 2011 (26 May, 5 August and 23 November) with re-brushed units.

Flow calibration checks were performed on the TSP and PM₁₀ samplers by Goldcorp staff on 23 November coinciding with the motor changes. These were performed with a certified direct reading electronic flow calibrator. In every instance, the flow calibration was within 10% of the required flow rate of 40 cfm (1.13 m³/min). The actual flow rates were adjusted to be within about 1 cfm of the required flow rate of 40 cfm. The Ministry audited the flow calibrations on 26 May and 10 August. The flow calibrations were within 10% of the required value of 40 cfm and data corrections were not required.

Due to heavy rains and high winds, the 21 May filter was damaged by water and not submitted for analysis.

3.4.3 Shania Twain Road Station

The hi-vol TSP and PM₁₀ motors were changed three times in 2011 (26 May, 5 August and 23 November) with re-brushed units.

Flow calibration checks were performed on the TSP and PM₁₀ samplers by Goldcorp staff on 23 November coinciding with the motor changes. These were performed with a certified direct reading electronic flow calibrator. In every instance, the flow calibration was within 10% of the required flow rate of 40 cfm (1.13 m³/min). The actual flow rates were adjusted to be within about 1 cfm of the required flow rate of 40 cfm. The Ministry audited the flow calibrations on 26 May and 10 August. The flow calibrations were within 10% of the required value of 40 cfm and data corrections were not required.

The November dustfall samples from the three (3) sites were inadvertently sent to the wrong lab and discarded.

4.0 RESULTS

The results for the 2011 sampling program are presented in Appendix C-1 for the hi-vol data, Appendix C-2 for the dustfall data and Appendix C-3 for the passive SO₂ and NO₂ data. By convention, all results below the analytical detection limit were reported at half the detection limit. Iron (Fe) in the TSP and PM₁₀ particulate samples is reported conservatively as ferric oxide (Fe₂O₃) and some of the iron may not be in the form of ferric oxide. As indicated earlier, sulphur was also expressed as sulphate (SO₄), on the assumption that all the sulphur was in the sulphate form. This again is a conservative estimate.

For comparison purposes, the O. Reg.419/05 Schedule 3 Standard values are presented. Schedule 3 values came into effect on February 1, 2010 for the mining and smelting sectors. As of that date, the standard for lead (Pb) in TSP was lowered from 2 to 0.5 µg/m³. Section 20 guidelines under O.Reg. 419/05 for 24-hour averages, are also presented. The Ministry has an interim Ambient Air Quality Criterion (AAQC) for PM₁₀, but does not yet have standards or guidelines for metals in PM₁₀.

A summary of the statistical analysis for 2011 for the TSP and PM₁₀ particulate concentrations and of the exceedences is presented in Table 1 below. In 2011, the 1 in 6 day hi-vol sampling schedule comprised a possible total of 61 samples. The results for 2010 are also shown in Table 1 for comparison.

A summary of the statistical analysis for 2010 and 2011 for total dustfall and passive SO₂ and NO₂ is presented respectively in Tables 2 and 3 below.

4.1 Total Suspended and Inhalable Particulates

The highest geometric mean TSP concentration in 2011 was measured at the MRCA office station (20 µg/m³) and the lowest at the Extendicare facility station (14 µg/m³). Hence there were no exceedences of the Ministry annual Ambient Air Quality Criterion of 60 µg/m³ (geometric mean). The higher TSP concentrations at the MRCA office station likely reflect particulate matter contributions from nearby sources in the commercial area south of the sampling location. These include traffic and significant open spaces and parking lots from which dust re-suspension could occur under dry and windy conditions. There were no exceedences of the 24-hour Schedule 3 standard of 120 µg/m³.

The MRCA office site also recorded the highest PM₁₀ annual average concentrations (10 µg/m³) and had two (2) exceedences of the PM₁₀ interim AAQC (50 µg/m³) with maximum 24-hour concentrations of 59 µg/m³.

The annual average TSP and PM₁₀ concentrations were lower in 2011 than in 2010 at the three (3) sites.

Since there was no construction activity at the Hollinger pit site in 2010 and 2011, these TSP and PM₁₀ results are believed to represent background concentrations near the sampling stations with their inherent variability.

The valid data record for TSP and PM₁₀ ranged from 93% to 100% which is above the Ministry minimum target of 90% and desirable target of 95%.

Approximately one third of the TSP samples and over one fifth of the PM₁₀ samples were analyzed for the elements listed in section 3.2.1. All elemental results are presented in Appendix C-1. At the three (3) sampling locations, the following elements were usually reported below their method detection limit: As, Cd, Co, Ni, Se and V. Cr was detected for 20% to 50% of the samples, whereas Pb was detected at slightly over half the samples. Cu, Fe, Mn, S and Zn were usually above their detection limit. Cu is known to be emitted from the armature of the hi-vol motors with brushes whereas Fe, S and Zn are naturally occurring crustal elements. However the 'detectable' elements such as Cr, Pb, Cu, Fe (expressed as ferric oxide) and Mn had 24-hour maximum concentrations much lower than the Ministry standards and guidelines. Annual average concentrations were not reported for the elements with 50% or more of the results below the method detection limit.

As expected, the concentrations of elements in PM₁₀ were always lower than in the TSP samples. At this time, the Ministry has not formally established 24-hour standards or guidelines for elements in PM₁₀, However in the not too distant future, the Ministry is expected to apply the draft standards posted on the Environmental Bill of Rights (EBR).

Table 1: Summary Statistics for the 2010 and 2011 TSP and PM₁₀ Particulate Data

Statistic	Extendicare Facility				MRCA Site				Shania Twain Site			
	TSP		PM ₁₀		TSP		PM ₁₀		TSP		PM ₁₀	
	2010	2011	2010	2011	2010	2011	2010	2011	2010	2011	2010	2011
Annual geometric mean (µg/m ³)	20	14	11	8	28	20	14	10	25	16	14	6
Annual arithmetic mean (µg/m ³)	25	18	13	13	34	27	18	15	31	21	17	11
Maximum 24 hour (µg/m ³)	110	78	49	44	88	86	53	59	121	65	57	46
No. of valid samples	59	57	60	60	59	60	61	61	61	61	59	61
% valid data	97	93	98	98	97	98	100	100	100	100	97	100
No. samples > Sch. 3 value (particulate)	nil	nil	-	-	nil	nil	-	-	1	nil	-	-
No. samples > Sch. 3 value (elements)	nil	nil	-	-	nil	nil	-	-	nil	nil	-	-
No. samples > Section 20 guideline (elements)	nil	nil	-	-	nil	nil	-	-	nil	nil	-	-
No. samples > Annual AAQC (TSP)	nil	nil	-	-	nil	nil	-	-	nil	nil	-	-
No. samples > Annual AAQC (PM ₁₀)	-	-	nil	nil	-	-	1	2	-	-	1	nil

4.2 Total Dustfall

As shown in Table 2, the annual average total dustfall values varied from 1.4 g/m²/30 days at the Extencicare Facility site to 2.6 g/m²/30 days at the MRCA Office site. On average, the insoluble portion (such as road dust and other inorganic particulate matter not readily soluble in water) comprised about one third of the total dustfall material collected. The insoluble portion at the MRCA station was the highest of the three stations at 42%. Much of the soluble portion of dustfall, which in 2011 comprised over more than half of the total dustfall could be particulate sulphate and nitrate compounds which are well known components of acid rain and acid deposition and are transported large distances from outside the area. There likely are other particulate materials contributing to the soluble fraction such as biological matter. The total dustfall levels were generally higher at the three stations during the period April to October (see Appendix C-2) when the potential for dusting is greater from exposed ground surfaces such as parking lots, streets and parklands.

There was only one (1) exceedence of the Ministry monthly standard (7.0 g/m²/30 days). This exceedence occurred for the June sample at the MRCA station with a value of 7.8 g/m²/30 days. Approximately two thirds of this sample was in the insoluble fraction.

As explained earlier, there were sample losses during the year such that the overall % valid data collection was 86% (31 of 36 possible samples).

Table 2: Summary Statistics for the 2011 Total Dustfall Data

Statistic	Extencicare Facility			MRCA Site			Shania Twain Site		
	Insoluble	Soluble	Total	Insoluble	Soluble	Total	Insoluble	Soluble	Total
Mean (g/m ² /30d)	0.37	1.07	1.4	1.06	1.53	2.6	0.71	1.51	2.2
Max. (g/m ² /30d)	0.82	3.95	4.4	5.00	3.71	7.8 (June)	2.44	5.53	6.5
No.>Sch.3 Std	-	-	nil	-	-	1	-	-	nil
No.valid samples	10	10	10	10	10	10	11	11	11
% Valid data	83	83	83	83	83	83	92	92	92

Table 3: Summary Statistics for the 2010 and 2011 Total Dustfall Data

Statistic	Extendicare Facility		MRCA Site		Shania Twain Site	
	Total Dustfall		Total Dustfall		Total Dustfall	
	2010	2011	2010	2011	2010	2011
Mean(g/m ² /30days)	2.1	1.4	2.9	2.6	2.8	2.2
Max. (g/m ² /30days)	7.3	4.4	7.8	7.8	13.1	6.5
No. > Sch. 3 Std	1 (Dec)	nil	1 (July)	1 (June)	1 (June)	nil
No. valid samples	11	10	10	10	11	11
% Valid data	92	83	83	83	92	92

Table 3 shows that the total dustfall was lower in 2011 than in 2010 at the three sampling locations. This is consistent with the results for TSP and PM₁₀, and again is felt to represent background levels and their inherent variability due to meteorological conditions and other natural factors.

4.3 Passive SO₂ and NO₂

The annual mean SO₂ concentration, as noted in Table 4, was essentially identical at all stations with a value of 0.3 and 0.4 ppb. The method detection limit is 0.1 ppb such the mean concentrations determined in 2011, as in 2010, represent very low background values. The annual means were comparable to those reported in 2010. As seen in Appendix C-3, in most instances the background SO₂ concentrations were typically somewhat higher during the colder months presumably due to the combustion of sulphur-bearing heating fuels.

The average NO₂ concentrations, as shown in Table 4, were higher at the MRCA Office station (3.2 ppb), probably due to vehicular traffic emissions, followed by the results from the Shania Twain Road (2.6 ppb) and Extendicare Facility station (1.6 ppb). This was also the case in 2010. The NO₂ concentrations were more variable than SO₂ with the seasons and the variability was site-dependent. However, some of the higher values were recorded in the colder months, suggesting some seasonal dependency to the heating seasons. In addition to emissions from heating sources, traffic emissions are also felt to have contributed to the background levels. This could explain the higher annual average concentrations measured at the MRCA and Shania Twain sites. The annual means were comparable to those reported in 2010.

As indicated earlier, there are no Ministry standards, guidelines or AAQCs for SO₂ and NO₂ data obtained from passive samplers. The data will be used for trend analysis and as a screening tool to assess whether continuous sampling of these substances could be warranted in the future.

Table 4: Summary Statistics for the 2010 and 2011 Passive SO₂ and NO₂ Data

Statistic	Extendicare Facility				MRCA Site				Shania Twain Site			
	SO ₂		NO ₂		SO ₂		NO ₂		SO ₂		NO ₂	
	2010	2011	2010	2011	2010	2011	2010	2011	2010	2011	2010	2011
Mean (ppb)	0.2	0.3	1.7	1.6	0.2	0.3	3.5	3.2	0.2	0.4	2.6	2.6
Max. (ppb)	0.4	0.7	2.6 (Jan & Feb)	3.6 (Jan)	0.3	0.9	4.2 (Dec)	5.9 (Sept)	0.4	1.1	4.3 (Jan)	7.3 (Jan)
No. valid samples	12	12	12	12	12	12	12	12	11	12	11	12
% Valid data	100	100	100	100	100	100	100	100	92	100	92	100

5.0 CONCLUSIONS

The data collected in 2011 serve to add to the data base for determining background air quality in the communities of Schumacher and South Porcupine near the proposed Hollinger mine project site. This data can later be used to assess changes in air quality as the project moves from the construction to the operational phases.

The results show that as in 2010, the concentrations of particulate matter, as determined from measurements of TSP, PM₁₀ and dustfall can be impacted by existing background sources to the point where at times, Ministry standards and/or guidelines are marginally exceeded. Overall, the average background levels of TSP, PM₁₀ and total dustfall were lower at all sites in 2011 compared to 2010.

As in 2010, the concentration of elements, such as heavy metals, were observed to be quite low in both the TSP and PM₁₀ samples and well below Ministry standards and guidelines. A number of the elements analyzed had concentrations consistently below their method detection limit.

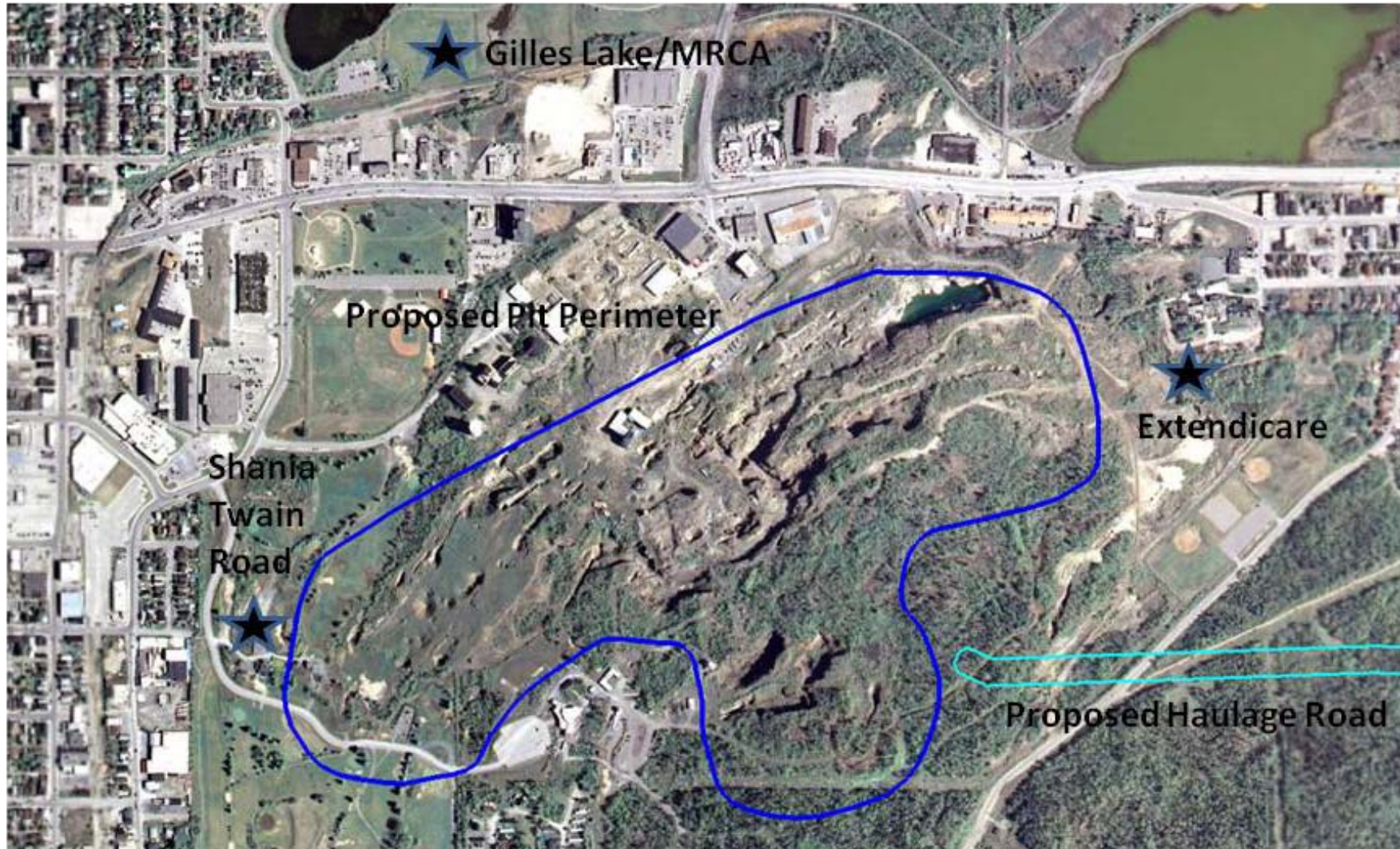
The concentrations of SO₂ and NO₂, determined from passive sampling, reflected the low background values in the area. The levels of NO₂ were consistently higher than those of SO₂ and some most instances displayed a seasonal pattern with higher values during the heating seasons. Traffic emissions and emissions from other sources in the commercial area near the MRCA Office station and near the Shania Twain Centre are believed to be the main contributors to the NO₂ concentrations measured at these sites.

Goldcorp Canada Limited
Baseline Air Quality Monitoring Program
Annual 2011 Report
Timmins, Ontario
February 2012



APPENDIX A

Aerial Photo of the Sampling Program Area



★ Location of Air Quality Sampling Stations

Goldcorp Canada Limited
Baseline Air Quality Monitoring Program
Annual 2011 Report
Timmins, Ontario
February 2012



APPENDIX B

Photos of the Sampling Stations



Figure 1: Photo of Air Sampling Station at the MRCA Office Site



Figure 2: Photo of Air Sampling Station at the Shania Twain Road Site



Figure 3: Photo of Air Sampling Station at the Extendicare Facility Site

APPENDIX C

Appendix C-1: TSP and PM₁₀ Sampling Results

Appendix C-2: Total Dustfall Sampling Results

Appendix C-3: SO₂ and NO₂ Passive Sampling Results

Goldcorp Canada Limited
Baseline Air Quality Monitoring Program
Annual 2011 Report
Timmins, Ontario
February 2012



Appendix C-1

TSP and PM₁₀ Sampling Results



Extencicare Home Monitoring Results for TSP and Metals (2011)
 (results expressed in $\mu\text{g}/\text{m}^3$)

Date	TSP	As	Cd	Cr	Co	Cu	Fe(Fe_2O_3)	Pb	Mn	Ni	Se	S	V	Zn	SO ₄
January 3, 2011	38														
January 9, 2011	7														
January 15, 2011	9														
January 21, 2011	9														
January 27, 2011	8														
February 2, 2011	8	0.0003	0.0002	0.0015	0.0003	0.034	0.732	0.0043	0.0036	0.0009	0.0003	0.297	0.0006	0.0321	0.89
February 8, 2011	6														
February 14, 2011	8														
February 20, 2011	8	0.0003	0.0002	0.0003	0.0003	0.026	0.155	0.0006	0.0013	0.0009	0.0003	0.275	0.0006	0.0407	0.83
February 26, 2011	15														
March 4, 2011	11														
March 10, 2011	8	0.0003	0.0002	0.0028	0.0003	0.082	0.389	0.0031	0.0031	0.0020	0.0003	0.573	0.0006	0.0214	1.72
March 16, 2011	12														
March 22, 2011	24														
March 28, 2011	30	0.0003	0.0002	0.0025	0.0003	0.018	1.942	0.0006	0.0127	0.0025	0.0003	0.359	0.0013	0.0236	1.08
April 3, 2011	8														
April 9, 2011	10														
April 15, 2011	39	0.0003	0.0002	0.004	0.0003	0.036	3.203	0.004	0.0214	0.003	0.0003	0.514	0.001	0.045	1.54
April 21, 2011	23														
April 27, 2011	10														
May 3, 2011	no sample														
May 9, 2011	no sample														
May 15, 2011	no sample														
May 21, 2011	no sample														
May 27, 2011	18	0.0003	0.0002	0.002	0.0003	0.024	1.035	0.0006	0.0071	0.0009	0.0003	0.190	0.0006	0.018	0.57
June 2, 2011	29														
June 8, 2011	37														
June 14, 2011	34	0.0003	0.0002	0.002	0.0003	0.045	1.659	0.0006	0.0110	0.0009	0.0003	0.259	0.0006	0.030	0.78
June 20, 2011	20														
June 26, 2011	18														
July 2, 2011	29	0.0003	0.0002	0.0013	0.0003	0.026	0.678	0.0006	0.00595	0.0022	0.0003	0.892	0.0006	0.0119	2.68
July 8, 2011	24														
July 14, 2011	30														
July 20, 2011	48	0.0003	0.0002	0.0019	0.0003	0.034	1.150	0.0031	0.0100	0.0009	0.0003	0.728	0.0006	0.0178	2.18
July 26, 2011	20														
August 1, 2011	25														
August 7, 2011	16														
August 13, 2011	13														
August 19, 2011	22														
August 25, 2011	13	0.0003	0.0002	0.0013	0.0003	0.0170	0.626	0.0006	0.00512	0.0009	0.0003	0.087	0.0006	0.0093	0.26
August 31, 2011	15														



Extencare Home Monitoring Results for TSP and Metals (2011)
 (results expressed in $\mu\text{g}/\text{m}^3$)

Date	TSP	As	Cd	Cr	Co	Cu	Fe(Fe ₂ O ₃)	Pb	Mn	Ni	Se	S	V	Zn	SO ₄
September 6, 2011	12														
September 12, 2011	16	0.0003	0.0002	0.0003	0.0003	0.0163	0.818	0.0006	0.00695	0.0009	0.0003	0.239	0.0006	0.0096	0.72
September 18, 2011	30														
September 24, 2011	14														
September 30, 2011	10	0.0003	0.0002	0.0003	0.0003	0.0110	0.395	0.0006	0.00254	0.0009	0.0003	0.067	0.0006	0.0055	0.20
October 6, 2011	17														
October 12, 2011	28														
October 18, 2011	10	0.0003	0.0002	0.0003	0.0003	0.0100	0.423	0.0006	0.00267	0.0009	0.0003	0.025	0.0006	0.0065	0.08
October 24, 2011	13														
October 30, 2011	11														
November 5, 2011	5														
November 11, 2011	4														
November 17, 2011	8														
November 23, 2011	5	0.0003	0.0002	0.0014	0.0003	0.0204	0.518	0.0043	0.00303	0.0040	0.0003	0.632	0.0006	0.0134	1.90
November 29, 2011	9														
December 5, 2011	0.15														
December 11, 2011	19	0.0003	0.0002	0.0044	0.0003	0.0077	2.105	0.0021	0.0216	0.0030	0.0003	0.755	0.0006	0.0159	2.27
December 17, 2011	78														
December 23, 2011	9														
December 29, 2011	12	0.0003	0.0002	0.0023	0.0003	0.0091	0.598	0.0006	0.00530	0.0009	0.0003	0.183	0.0006	0.0193	0.55
Geometric mean	13.6	n/r	n/r	0.0013	n/r	0.021	0.784	n/r	0.0058	n/r	n/r	0.271	n/r	0.0169	0.81
Arithmetic mean	17.8	n/r	n/r	0.0018	n/r	0.026	1.027	n/r	0.0077	n/r	n/r	0.380	n/r	0.0200	1.14
Max. concentration	78.0	n/r	n/r	0.0044	n/r	0.082	3.203	0.0043	0.0216	n/r	n/r	0.892	n/r	0.0446	2.68
Min. concentration	0.15	n/r	n/r	0.0003	n/r	0.008	0.155	n/r	0.0013	n/r	n/r	0.025	n/r	0.0055	0.08
90th percentile	31.6														
95th percentile	38.2														
Standard*	120	n/a	0.25*	n/a	n/a	50	25	n/a	n/a	0.5	n/a	n/a	2	120	n/a
No. > Sch. 3 value*	0	n/a	0	n/a	n/a	0.000	0	n/a	n/a	0	n/a	n/a	0	0	n/a
Guideline	n/a	0.3	n/a	1.5	0.1	n/a	n/a	0.5	2.5	n/a	10.0	n/a	n/a	n/a	n/a
No. > guideline	n/a	0	n/a	0	0	n/a	n/a	0	0	n/a	0	n/a	n/a	n/a	n/a
No. of valid samples	57	16	16	16	16	16	16	16	16	16	16	16	16	16	16
No. samples < mdl	1	16	16	4	16	0	0	10	0	10	16	0	14	0	0
Detection limit	0.3	0.0006	0.0003	0.0006	0.0006	0.0006	0.0012	0.0012	0.0006	0.0018	0.0006	0.0031	0.0012	0.003	0.0031
Half detection limit	0.15	0.0003	0.0002	0.0003	0.0003	0.0003	0.0006	0.0006	0.0003	0.0009	0.0003	0.0016	0.0006	0.0015	0.0016
% < detection limit	2	100	100	25	100	0	0	63	0	63	100	0	88	0	0
% valid data	93														

Notes:

- All non detectable results were reported as 1/2 the detection limit
- * O. Reg.419/05 schedule 3, 24-hour standard; note that for cadmium and its compounds, 0.25 $\mu\text{g}/\text{m}^3$ is the URT under schedule 6
- n/r: Statistics not reported due to high % of values < detection limit
- Total Fe expressed as Fe₂O₃
- Total S assumed to be all in SO₄ form



Extencicare Home Monitoring Results for PM₁₀ and Metals (2011)
 (results expressed in µg/m³)

Date	PM ₁₀	As	Cd	Cr	Co	Cu	Fe(Fe ₂ O ₃)	Pb	Mn	Ni	Se	S	V	Zn	SO ₄
January 3, 2011	14														
January 9, 2011	7														
January 15, 2011	8														
January 21, 2011	10														
January 27, 2011	8														
February 2, 2011	8	0.0003	0.0002	0.0003	0.0003	0.010	0.233	0.006	0.002	0.0009	0.0003	0.414	0.0006	0.045	1.23
February 8, 2011	8														
February 14, 2011	7														
February 20, 2011	8														
February 26, 2011	12	0.0003	0.0002	0.0003	0.0003	0.007	0.331	0.003	0.002	0.0009	0.0003	0.346	0.0006	0.015	1.04
March 4, 2011	10														
March 10, 2011	6														
March 16, 2011	11														
March 22, 2011	14	0.0003	0.0002	0.0003	0.0003	0.011	0.911	0.002	0.006	0.0009	0.0003	0.833	0.0006	0.051	2.49
March 28, 2011	19														
April 3, 2011	7														
April 9, 2011	12														
April 15, 2011	25	0.0003	0.0002	0.004	0.0003	0.016	1.873	0.005	0.0105	0.003	0.0003	0.583	0.001	0.029	1.75
April 21, 2011	17														
April 27, 2011	7														
May 3, 2011	23	0.0003	0.0002	0.003	0.0003	0.012	1.388	0.0006	0.0067	0.001	0.0003	0.373	0.001	0.038	1.12
May 9, 2011	21	0.0003	0.0002	0.002	0.0003	0.005	1.283	0.0006	0.0065	0.001	0.0003	0.412	0.001	0.012	1.23
May 15, 2011	8														
May 21, 2011	no sample														
May 27, 2011	10														
June 2, 2011	12														
June 8, 2011	23	0.0003	0.0002	0.0003	0.0003	0.005	0.246	0.0006	0.0034	0.001	0.0003	0.707	0.001	0.035	2.12
June 14, 2011	23														
June 20, 2011	19														
June 26, 2011	16														
July 2, 2011	24														
July 8, 2011	19	0.0003	0.0002	0.0003	0.0003	0.005	0.234	0.0006	0.00191	0.0009	0.0003	0.182	0.0006	0.0075	0.55
July 14, 2011	20														
July 20, 2011	44														
July 26, 2011	15														
August 1, 2011	18														
August 7, 2011	17														
August 13, 2011	10														
August 19, 2011	13														
August 25, 2011	7														
August 31, 2011	8														



Extendicare Home Monitoring Results for PM₁₀ and Metals (2011)
 (results expressed in µg/m³)

Date	PM ₁₀	As	Cd	Cr	Co	Cu	Fe(Fe ₂ O ₃)	Pb	Mn	Ni	Se	S	V	Zn	SO ₄
September 6, 2011	9	0.0003	0.0002	0.0018	0.0003	0.007	0.346	0.0051	0.00237	0.0009	0.0003	0.087	0.0006	0.0112	0.26
September 12, 2011	9														
September 18, 2011	16														
September 24, 2011	12														
September 30, 2011	8														
October 6, 2010	14	0.0003	0.0002	0.0021	0.0003	0.005	0.849	0.0023	0.00647	0.0024	0.0003	0.275	0.0006	0.0065	0.83
October 12, 2010	22														
October 18, 2010	8														
October 24, 2010	11														
October 30, 2010	12														
November 5, 2011	7	0.0003	0.0002	0.0013	0.0003	0.003	0.157	0.0006	0.00146	0.0024	0.0003	0.248	0.0006	0.0062	0.74
November 11, 2011	0.15														
November 17, 2011	0.15														
November 23, 2011	0.15														
November 29, 2011	0.15														
December 5, 2011	0.15	0.0003	0.0002	0.0016	0.0003	0.006	0.138	0.0006	0.00159	0.0009	0.0003	0.079	0.0006	0.0299	0.24
December 11, 2011	7														
December 17, 2011	33														
December 23, 2011	6														
December 29, 2011	7														
Geometric mean	8.4	n/r	n/r	0.0009	n/r	0.009	0.5	0.0	0.0	n/r	n/r	0.305	n/r	0.0185	0.91
Arithmetic mean	12.5	n/r	n/r	0.0014	n/r	0.009	0.7	0.0	0.0	n/r	n/r	0.378	n/r	0.0239	1.13
Max. concentration	44.0	n/r	n/r	0.0036	n/r	0.011	1.9	0.0	0.0	n/r	n/r	0.833	n/r	0.0513	2.49
Min. concentration	0.2	n/r	n/r	0.0003	n/r	0.007	0.1	0.0	0.0	n/r	n/r	0.079	n/r	0.0062	0.24
90th percentile	22.8														
95th percentile	23.7														
AAQC	50*	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Number > AAQC	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
No. of valid samples	60	12	12	12	12	12	12	12	12	12	12	12	12	12	12
No. samples < mdl	5	12	12	5	12	0	0	6	0	9	12	0	12	0	0
Detection limit	0.3	0.0006	0.0003	0.0006	0.0006	0.0006	0.0012	0.0012	0.0006	0.0018	0.0006	0.0031	0.0012	0.003	0.045
Half detection limit	0.15	0.0003	0.0002	0.0003	0.0003	0.0003	0.0006	0.0006	0.0003	0.0009	0.0003	0.0016	0.0006	0.0015	0.023
% < detection limit	8	100	100	42	100	0	0	50	0	75	100	0	100	0	0
% valid data	98														

Notes:

All non detectable results were reported as 1/2 the detection limit

* O. Reg.419/05 schedule 3, 24-hour standard

n/r: Statistics not reported due to high % of values < detection limit

Total Fe expressed as Fe₂O₃

Total S assumed to be all in SO₄ form

Based on the May 26 MOE audit, values for January, February and March were increased by 13.2%, 16.5% and 19.8% respectively

Based on the May 26 MOE audit, values for April and May were increased by 23.1% and 26.4% respectively up to May 21 inclusively

Based on the August 10 MOE audit, values for June, July and August were decreased by 3.7%, 7.4% and 11% respectively up to August 7 inclusively



MRCA Office Monitoring Results for TSP and Metals (2011)
 (results expressed in $\mu\text{g}/\text{m}^3$)

Date	TSP	As	Cd	Cr	Co	Cu	Fe(Fe_2O_3)	Pb	Mn	Ni	Se	S	V	Zn	SO ₄
January 3, 2011	55														
January 9, 2011	6														
January 15, 2011	5														
January 21, 2011	8														
January 27, 2011	15														
February 2, 2011	12	0.0003	0.0002	0.0003	0.0003	0.035	0.478	0.0044	0.0037	0.0009	0.0003	0.324	0.0006	0.0319	0.97
February 8, 2011	7														
February 14, 2011	6														
February 20, 2011	6	0.0003	0.0002	0.0003	0.0003	0.007	0.154	0.0025	0.0015	0.0009	0.0003	0.287	0.0006	0.0094	0.86
February 26, 2011	54														
March 4, 2011	31														
March 10, 2011	8	0.0003	0.0002	0.0021	0.0003	0.012	0.332	0.0021	0.0027	0.0009	0.0003	0.541	0.0006	0.0147	1.62
March 16, 2011	30														
March 22, 2011	11														
March 28, 2011	29	0.0003	0.0002	0.0028	0.0003	0.018	2.013	0.0006	0.0132	0.0022	0.0003	0.360	0.0015	0.0153	1.08
April 3, 2011	41														
April 9, 2011	58														
April 15, 2011	35	0.0003	0.0002	0.0043	0.0003	0.031	2.917	0.0059	0.0179	0.0031	0.0003	0.560	0.0020	0.0552	1.68
April 21, 2011	56														
April 27, 2011	21														
May 3, 2011	17	0.0003	0.0002	0.0019	0.0003	0.018	0.972	0.0006	0.0065	0.0009	0.0003	0.261	0.0006	0.0178	0.78
May 9, 2011	47														
May 15, 2011	13														
May 21, 2011	no sample														
May 27, 2011	25	0.0003	0.0002	0.0025	0.0003	0.026	1.307	0.0006	0.0094	0.0009	0.0003	0.336	0.0006	0.0196	1.01
June 2, 2011	48														
June 8, 2011	18														
June 14, 2011	32	0.0003	0.0002	0.0019	0.0003	0.043	1.682	0.0006	0.0107	0.0009	0.0003	0.239	0.0006	0.0261	0.72
June 20, 2011	40														
June 26, 2011	42														
July 2, 2011	42	0.0003	0.0002	0.0020	0.0003	0.028	1.693	0.0025	0.0129	0.0020	0.0003	1.040	0.0006	0.0243	3.12
July 8, 2011	27														
July 14, 2011	48														
July 20, 2011	86	0.0003	0.0002	0.0048	0.0003	0.058	5.491	0.0069	0.0337	0.0039	0.0003	0.952	0.0026	0.103	2.86
July 26, 2011	22														
August 1, 2011	26														
August 7, 2011	21														
August 13, 2011	13														
August 19, 2011	58														
August 25, 2011	18	0.0003	0.0002	0.0021	0.0003	0.0135	1.09538	0.0006	0.00757	0.0009	0.0003	0.107	0.0006	0.0138	0.32
August 31, 2011	52														



MRCA Office Monitoring Results for TSP and Metals (2011)
 (results expressed in $\mu\text{g}/\text{m}^3$)

Date	TSP	As	Cd	Cr	Co	Cu	Fe(Fe_2O_3)	Pb	Mn	Ni	Se	S	V	Zn	SO ₄
September 6, 2011	30														
September 12, 2011	39														
September 18, 2011	37														
September 24, 2011	24														
September 30, 2011	9	0.0003	0.0002	0.0003	0.0003	0.003	0.277	0.0006	0.00194	0.0009	0.0003	0.072	0.0006	0.0057	0.22
October 6, 2011	44														
October 12, 2011	69														
October 18, 2011	7	0.0003	0.0002	0.0015	0.0003	0.005	0.392	0.0006	0.00253	0.0009	0.0003	0.024	0.0006	0.0061	0.07
October 24, 2011	9														
October 30, 2011	19														
November 5, 2011	28														
November 11, 2011	21														
November 17, 2011	7														
November 23, 2011	16	0.0003	0.0002	0.0018	0.0003	0.049	0.681	0.0059	0.00610	0.0046	0.0003	0.559	0.0006	0.136	1.68
November 29, 2011	5														
December 5, 2011	9														
December 11, 2011	10	0.0003	0.0002	0.0003	0.0003	0.017	0.398	0.0024	0.00590	0.0009	0.0003	0.751	0.0006	0.0130	2.25
December 17, 2011	9														
December 23, 2011	8														
December 29, 2011	12	0.0003	0.0002	0.0014	0.0003	0.015	0.375	0.0006	0.00322	0.0009	0.0003	0.183	0.0006	0.0290	0.55
Geometric mean	20.3	n/r	n/r	0.0014	n/r	0.018	0.810	n/r	0.0061	n/r	n/r	0.293	n/r	0.0215	0.88
Arithmetic mean	26.7	n/r	n/r	0.0019	n/r	0.024	1.266	n/r	0.0087	n/r	n/r	0.412	n/r	0.0326	1.24
Max. concentration	86.0	n/r	n/r	0.0048	n/r	0.058	5.491	0.0069	0.0337	n/r	n/r	1.040	n/r	0.1360	3.12
Min. concentration	5.0	n/r	n/r	0.0003	n/r	0.003	0.154	n/r	0.0015	n/r	n/r	0.024	n/r	0.0057	0.07
90th percentile	54.1														
95th percentile	58.0														
Standard*	120	n/a	0.25*	n/a	n/a	50	25	n/a	n/a	0.5	n/a	n/a	2	120	n/a
No. > Sch. 3 value*	0	n/a	0	n/a	n/a	0.000	0	n/a	n/a	0	n/a	n/a	0	0	n/a
Guideline	n/a	0.3	n/a	1.5	0.1	n/a	n/a	0.5	2.5	n/a	10.0	n/a	n/a	n/a	n/a
No. > guideline	n/a	0	n/a	0	0	n/a	n/a	0	0	n/a	0	n/a	n/a	n/a	n/a
No. of valid samples	60	16	16	16	16	16	16	16	16	16	16	16	16	16	16
No. samples < mdl	0	16	16	4	16	0	0	8	0	11	16	0	13	0	0
Detection limit	0.3	0.0006	0.0003	0.0006	0.0006	0.0006	0.0012	0.0012	0.0006	0.0018	0.0006	0.0031	0.0012	0.003	0.0031
Half detection limit	0.15	0.0003	0.0002	0.0003	0.0003	0.0003	0.0006	0.0006	0.0003	0.0009	0.0003	0.0016	0.0006	0.0015	0.0016
% < detection limit	0	100	100	25	100	0	0	50	0	69	100	0	81	0	0
% valid data	98														

Notes:

All non detectable results were reported as 1/2 the detection limit

* O. Reg. 419/05 schedule 3, 24-hour standard; note that for cadmium and its compounds, 0.25 $\mu\text{g}/\text{m}^3$ is the URT under schedule 6

n/r: Statistics not reported due to high % of values < detection limit

Total Fe expressed as Fe_2O_3

Total S assumed to be all in SO_4 form



MRCA Office Monitoring Results for PM₁₀ and Metals (2011)
 (results expressed in µg/m³)

Date	PM ₁₀	As	Cd	Cr	Co	Cu	Fe(Fe ₂ O ₃)	Pb	Mn	Ni	Se	S	V	Zn	SO ₄
January 3, 2011	59	0.0003	0.0002	0.0045	0.0003	0.016	3.003	0.0024	0.0186	0.0031	0.0003	0.421	0.0019	0.0314	1.26
January 9, 2011	5	0.0003	0.0002	0.0003	0.0003	0.000	0.072	0.0006	0.0003	0.0009	0.0003	0.142	0.0006	0.0086	0.43
January 15, 2011	5														
January 21, 2011	7	0.0003	0.0002	0.0003	0.0003	0.004	0.140	0.0006	0.0013	0.0009	0.0003	0.232	0.0006	0.0093	0.70
January 27, 2011	8														
February 2, 2011	9	0.0003	0.0002	0.0003	0.0003	0.010	0.323	0.0038	0.0027	0.0009	0.0003	0.300	0.0006	0.0302	0.90
February 8, 2011	6														
February 14, 2011	5														
February 20, 2011	5														
February 26, 2011	25	0.0003	0.0002	0.0019	0.0003	0.007	0.881	0.0006	0.0059	0.0009	0.0003	0.306	0.0006	0.0191	0.92
March 4, 2011	13														
March 10, 2011	4														
March 16, 2011	12														
March 22, 2011	7	0.0003	0.0002	0.0003	0.0003	0.004	0.199	0.0006	0.0018	0.0009	0.0003	0.455	0.0006	0.0054	1.37
March 28, 2011	13														
April 3, 2011	18														
April 9, 2011	23														
April 15, 2011	16	0.0003	0.0002	0.0016	0.0003	0.014	1.470	0.0049	0.0089	0.0020	0.0003	0.463	0.0006	0.0324	1.39
April 21, 2011	23														
April 27, 2011	5														
May 3, 2011	10														
May 9, 2011	22	0.0003	0.0002	0.0027	0.0003	0.008	2.071	0.0030	0.0133	0.0020	0.0003	0.346	0.0006	0.0152	1.04
May 15, 2011	9														
May 21, 2011	19														
May 27, 2011	13														
June 2, 2011	15														
June 8, 2011	25	0.0003	0.0002	0.0017	0.0003	0.005	0.460	0.0006	0.0046	0.0009	0.0003	0.737	0.0006	0.0310	2.21
June 14, 2011	22														
June 20, 2011	19														
June 26, 2011	25														
July 2, 2011	27														
July 8, 2011	20	0.0003	0.0002	0.0003	0.0003	0.005	0.300	0.0006	0.0024	0.0009	0.0003	0.209	0.0006	0.0088	0.63
July 14, 2011	26														
July 20, 2011	55														
July 26, 2011	14														
August 1, 2011	18														
August 7, 2011	14														
August 13, 2011	9														
August 19, 2011	24														
August 25, 2011	9														
August 31, 2011	23														



MRCA Office Monitoring Results for PM₁₀ and Metals (2011)
 (results expressed in µg/m³)

Date	PM ₁₀	As	Cd	Cr	Co	Cu	Fe(Fe ₂ O ₃)	Pb	Mn	Ni	Se	S	V	Zn	SO ₄
September 6, 2011	15	0.0003	0.0002	0.0019	0.0003	0.009	0.884	0.0046	0.0059	0.0009	0.0003	0.093	0.0006	0.0173	0.28
September 12, 2011	19	0.0003	0.0002	0.0014	0.0003	0.008	0.558	0.0020	0.0045	0.0009	0.0003	0.213	0.0006	0.0093	0.64
September 18, 2011	20														
September 24, 2011	16														
September 30, 2011	6														
October 6, 2011	21	0.0003	0.0002	0.0041	0.0003	0.012	1.882	0.0034	0.0121	0.0032	0.0003	0.269	0.0006	0.0160	0.81
October 12, 2011	35														
October 18, 2011	6														
October 24, 2011	11														
October 30, 2011	13														
November 5, 2011	7	0.0003	0.0002	0.0020	0.0003	0.009	0.827	0.0006	0.0051	0.0027	0.0003	0.236	0.0006	0.0124	0.71
November 11, 2011	4														
November 17, 2011	0.15														
November 23, 2011	7														
November 29, 2011	0.15														
December 5, 2011	0.15	0.0003	0.0002	0.0003	0.0003	0.002	0.182	0.0006	0.0011	0.0009	0.0003	0.100	0.0006	0.0042	0.30
December 11, 2011	5														
December 17, 2011	6														
December 23, 2011	4														
December 29, 2011	8														
Geometric mean	9.9	n/r	n/r	0.0010	n/r	0.004	0.541	n/r	0.0038	n/r	n/r	0.261	n/r	0.0139	0.78
Arithmetic mean	14.6	n/r	n/r	0.0016	n/r	0.007	0.883	n/r	0.0059	n/r	n/r	0.301	n/r	0.0167	0.90
Max. concentration	59.0	n/r	n/r	0.0045	n/r	0.016	3.003	0.0049	0.0186	0.0032	n/r	0.737	n/r	0.0324	2.21
Min. concentration	0.2	n/r	n/r	0.0003	n/r	0.000	0.072	n/r	0.0003	n/r	n/r	0.093	n/r	0.0042	0.28
90th percentile	25.0														
95th percentile	27.0														
AAQC	50*	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Number > AAQC	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
No. of valid samples	61	15	15	15	15	15	15	15	15	15	15	15	15	15	15
No. samples < mdl	3	15	15	6	15	1	0	8	1	10	15	0	14	0	0
Detection limit	0.3	0.0006	0.0003	0.0006	0.0006	0.0006	0.0012	0.0012	0.0006	0.0018	0.0006	0.0031	0.0012	0.003	0.0031
Half detection limit	0.15	0.0003	0.0002	0.0003	0.0003	0.0003	0.0006	0.0006	0.0003	0.0009	0.0003	0.0016	0.0006	0.0015	0.0016
% < detection limit	5	100	100	40	100	7	0	53	7	67	100	0	93	0	0
% valid data	100														

Notes:

- █ All non detectable results were reported as 1/2 the detection limit
- * O. Reg.419/05 schedule 3, 24-hour standard
- n/r: Statistics not reported due to high % of values < detection limit
- Total Fe expressed as Fe₂O₃
- Total S assumed to be all in SO₄ form



Shania Twain Rd Monitoring Results for TSP and Metals (2011)
 (results expressed in $\mu\text{g}/\text{m}^3$)

Date	TSP	As	Cd	Cr	Co	Cu	Fe(Fe ₂ O ₃)	Pb	Mn	Ni	Se	S	V	Zn	SO ₄
January 3, 2011	34	0.0003	0.0002	0.0042	0.0003	0.017	2.328	0.0031	0.0162	0.0035	0.0003	0.291	0.0006	0.0266	0.87
January 9, 2011	5														
January 15, 2011	7	0.0003	0.0002	0.0017	0.0003	0.006	0.227	0.0006	0.0017	0.0009	0.0003	0.161	0.0006	0.0087	0.48
January 21, 2011	10														
January 27, 2011	7	0.0003	0.0002	0.0003	0.0003	0.011	0.142	0.0055	0.0012	0.0009	0.0003	0.332	0.0006	0.0081	1.00
February 2, 2011	10	0.0003	0.0002	0.0003	0.0003	0.020	0.480	0.0027	0.0044	0.0009	0.0003	0.289	0.0006	0.0385	0.87
February 8, 2011	7														
February 14, 2011	7														
February 20, 2011	6	0.0003	0.0002	0.0013	0.0003	0.008	0.149	0.0006	0.0013	0.0009	0.0003	0.294	0.0006	0.0129	0.88
February 26, 2011	13														
March 4, 2011	11														
March 10, 2011	8	0.0003	0.0002	0.0023	0.0003	0.008	0.349	0.0029	0.0026	0.0009	0.0003	0.536	0.0006	0.0124	1.61
March 16, 2011	25														
March 22, 2011	17														
March 28, 2011	44	0.0003	0.0002	0.0031	0.0003	0.013	2.840	0.0023	0.0188	0.0029	0.0003	0.382	0.0018	0.0200	1.15
April 3, 2011	14														
April 9, 2011	29														
April 15, 2011	22	0.0003	0.0002	0.0024	0.0003	0.017	1.399	0.0043	0.0101	0.0023	0.0003	0.424	0.0006	0.0263	1.27
April 21, 2011	55														
April 27, 2011	18														
May 3, 2011	22	0.0003	0.0002	0.0019	0.0003	0.016	1.376	0.0006	0.0086	0.0019	0.0003	0.286	0.0006	0.0222	0.86
May 9, 2011	23														
May 15, 2011	18														
May 21, 2011	32														
May 27, 2011	18	0.0003	0.0002	0.0020	0.0003	0.012	0.881	0.0029	0.0063	0.0009	0.0003	0.192	0.0006	0.0175	0.58
June 2, 2011	32														
June 8, 2011	40														
June 14, 2011	38	0.0003	0.0002	0.0031	0.0003	0.032	2.440	0.0006	0.0149	0.0023	0.0003	0.250	0.0014	0.0381	0.75
June 20, 2011	35														
June 26, 2011	28														
July 2, 2011	34	0.0003	0.0002	0.0003	0.0003	0.021	1.044	0.0006	0.00859	0.0009	0.0003	0.861	0.0006	0.0155	2.58
July 8, 2011	29														
July 14, 2011	33														
July 20, 2011	65	0.0003	0.0002	0.0061	0.0039	0.030	5.148	0.0035	0.0253	0.0106	0.0003	0.800	0.0025	0.0565	2.40
July 26, 2011	23														
August 1, 2011	31														
August 7, 2011	17														
August 13, 2011	11														
August 19, 2011	51														
August 25, 2011	10														
August 31, 2011	21														



Shania Twain Rd Monitoring Results for TSP and Metals (2011)
 (results expressed in $\mu\text{g}/\text{m}^3$)

Date	TSP	As	Cd	Cr	Co	Cu	Fe(Fe_2O_3)	Pb	Mn	Ni	Se	S	V	Zn	SO ₄
September 6, 2011	20														
September 12, 2011	23	0.0003	0.0002	0.0016	0.0003	0.008	1.487	0.0020	0.0111	0.0020	0.0003	0.249	0.0006	0.0127	0.75
September 18, 2011	20														
September 24, 2011	21														
September 30, 2011	12	0.0003	0.0002	0.0003	0.0003	0.006	0.549	0.0006	0.00362	0.0009	0.0003	0.069	0.0006	0.0075	0.21
October 6, 2011	25														
October 12, 2011	49														
October 18, 2011	13	0.0003	0.0002	0.0019	0.0003	0.009	0.669	0.0006	0.00477	0.0009	0.0003	0.026	0.0006	0.0071	0.08
October 24, 2011	12														
October 30, 2011	13														
November 5, 2011	10														
November 11, 2011	8														
November 17, 2011	9														
November 23, 2011	5	0.0003	0.0002	0.0013	0.0003	0.012	0.268	0.0325	0.00195	0.0033	0.0003	0.575	0.0006	0.0073	1.73
November 29, 2011	11														
December 5, 2011	5														
December 11, 2011	12	0.0003	0.0002	0.0017	0.0003	0.005	0.272	0.0023	0.00513	0.0009	0.0003	0.685	0.0006	0.0134	2.06
December 17, 2011	8														
December 23, 2011	8														
December 29, 2011	5	0.0003	0.0002	0.0015	0.0003	0.005	0.139	0.0006	0.00142	0.0009	0.0003	0.136	0.0006	0.0052	0.41
Geometric mean	16.4	n/r	n/r	0.0014	n/r	0.012	0.680	0.002	0.0052	n/r	n/r	0.277	n/r	0.0152	0.83
Arithmetic mean	20.5	n/r	n/r	0.0020	n/r	0.014	1.168	0.004	0.0078	n/r	n/r	0.360	n/r	0.0188	1.08
Max. concentration	65.0	n/r	n/r	0.0061	n/r	0.032	5.148	0.033	0.0253	0.0106	n/r	0.861	0.0025	0.0565	2.58
Min. concentration	5.0	n/r	n/r	0.0003	n/r	0.005	0.139	0.001	0.0012	n/r	n/r	0.026	n/r	0.0052	0.08
90th percentile	38.0														
95th percentile	49.0														
Standard*	120	n/a	0.25*	n/a	n/a	50	25	n/a	n/a	0.5	n/a	n/a	2	120	n/a
No. > Sch. 3 value*	0	n/a	0	n/a	n/a	0.000	0	n/a	n/a	0	n/a	n/a	0	0	n/a
Guideline	n/a	0.3	n/a	1.5	0.1	n/a	n/a	0.5	2.5	n/a	10.0	n/a	n/a	n/a	n/a
No. > guideline	n/a	0	n/a	0	0	n/a	n/a	0	0	n/a	0	n/a	n/a	n/a	n/a
No. of valid samples	61	19	19	19	19	19	19	19	19	19	19	19	19	19	19
No. samples < mdl	0	19	19	4	18	0	0	8	0	11	19	0	16	0	0
Detection limit	0.3	0.0006	0.0003	0.0006	0.0006	0.0006	0.0012	0.0012	0.0006	0.0018	0.0006	0.0031	0.0012	0.003	0.0031
Half detection limit	0.15	0.0003	0.0002	0.0003	0.0003	0.0003	0.0006	0.0006	0.0003	0.0009	0.0003	0.0016	0.0006	0.0015	0.0016
% < detection limit	0	100	100	21	95	0	0	42	0	58	100	0	84	0	0
% valid data	100														

Notes:

- All non detectable results were reported as 1/2 the detection limit
- * O. Reg.419/05 schedule 3, 24-hour standard; note that for cadmium and its compounds, 0.25 $\mu\text{g}/\text{m}^3$ is the URT under schedule 6
- n/r: Statistics not reported due to high % of values < detection limit
- Total Fe expressed as Fe_2O_3
- Total S assumed to be all in SO_4 form



Shania Twain Rd Monitoring Results for PM₁₀ and Metals (2011)
 (results expressed in µg/m³)

Date	PM ₁₀	As	Cd	Cr	Co	Cu	Fe(Fe ₂ O ₃)	Pb	Mn	Ni	Se	S	V	Zn	SO ₄
January 3, 2011	18														
January 9, 2011	4	0.0003	0.0002	0.0003	0.0003	0.004	0.080	0.0006	0.0007	0.0009	0.0003	0.200	0.0006	0.0055	0.60
January 15, 2011	6														
January 21, 2011	7	0.0003	0.0002	0.0020	0.0003	0.003	0.189	0.0006	0.0017	0.0009	0.0003	0.253	0.0006	0.0090	0.76
January 27, 2011	7														
February 2, 2011	10	0.0003	0.0002	0.0003	0.0003	0.010	0.360	0.0027	0.0045	0.0009	0.0003	0.320	0.0006	0.0475	0.96
February 8, 2011	7														
February 14, 2011	6														
February 20, 2011	5														
February 26, 2011	8	0.0003	0.0002	0.0003	0.0003	0.005	0.221	0.0022	0.0017	0.0009	0.0003	0.238	0.0006	0.0076	0.72
March 4, 2011	9														
March 10, 2011	4														
March 16, 2011	0.15														
March 22, 2011	0.15	0.0003	0.0002	0.0003	0.0003	0.002	0.037	0.0006	0.0008	0.0009	0.0003	0.002	0.0006	0.0015	0.00
March 28, 2011	0.15														
April 3, 2011	0.15														
April 9, 2011	3														
April 15, 2011	3	0.0003	0.0002	0.0003	0.0003	0.002	0.059	0.0006	0.0003	0.0009	0.0003	0.002	0.0006	0.0015	0.02
April 21, 2011	16														
April 27, 2011	9														
May 3, 2011	12														
May 9, 2011	12	0.0003	0.0002	0.0003	0.0003	0.005	0.704	0.0033	0.0052	0.0009	0.0003	0.311	0.0006	0.0099	0.93
May 15, 2011	10														
May 21, 2011	17														
May 27, 2011	10														
June 2, 2011	15														
June 8, 2011	21	0.0003	0.0002	0.0003	0.0003	0.006	0.395	0.0018	0.0041	0.0009	0.0003	0.687	0.0006	0.0223	2.06
June 14, 2011	23														
June 20, 2011	19														
June 26, 2011	21														
July 2, 2011	24														
July 8, 2011	20	0.0003	0.0002	0.0014	0.0003	0.006	0.460	0.0006	0.00333	0.0009	0.0003	0.204	0.0006	0.0089	0.61
July 14, 2011	21														
July 20, 2011	46														
July 26, 2011	14														
August 1, 2011	18														
August 7, 2011	14														
August 13, 2011	8														
August 19, 2011	26														
August 25, 2011	18	0.0003	0.0002	0.0014	0.0003	0.0042	0.41756	0.0006	0.00269	0.0009	0.0003	0.074	0.0006	0.0066	0.22
August 31, 2011	15														



Shania Twain Rd Monitoring Results for PM₁₀ and Metals (2011)
 (results expressed in µg/m³)

Date	PM ₁₀	As	Cd	Cr	Co	Cu	Fe(Fe ₂ O ₃)	Pb	Mn	Ni	Se	S	V	Zn	SO ₄
September 6, 2011	12	0.0003	0.0002	0.0029	0.0003	0.006	1.030	0.0122	0.00682	0.0019	0.0003	0.090	0.0006	0.0112	0.27
September 12, 2011	8														
September 18, 2011	14														
September 24, 2011	15														
September 30, 2011	8														
October 6, 2011	17	0.0003	0.0002	0.0031	0.0003	0.006	1.193	0.0056	0.00846	0.0028	0.0003	0.272	0.0006	0.0092	0.82
October 12, 2011	26														
October 18, 2011	7														
October 24, 2011	11														
October 30, 2011	10														
November 5, 2011	9	0.0003	0.0002	0.0016	0.0003	0.003	0.363	0.0006	0.00251	0.0023	0.0003	0.233	0.0006	0.0070	0.70
November 11, 2011	0.15														
November 17, 2011	0.15														
November 23, 2011	3														
November 29, 2011	0.15														
December 5, 2011	0.15	0.0003	0.0002	0.0015	0.0003	0.004	0.360	0.0006	0.00441	0.0009	0.0003	0.122	0.0006	0.0050	0.37
December 11, 2011	7														
December 17, 2011	6														
December 23, 2011	6														
December 29, 2011	9														
Geometric mean	6.1	n/r	n/r	0.0008	n/r	0.004	0.285	n/r	0.0024	n/r	n/r	0.106	n/r	0.0075	0.33
Arithmetic mean	11.1	n/r	n/r	0.0011	n/r	0.005	0.419	n/r	0.0034	n/r	n/r	0.215	n/r	0.0109	0.65
Max. concentration	46.0	n/r	n/r	0.0031	n/r	0.010	1.193	0.0122	0.0085	0.0028	n/r	0.687	n/r	0.0475	2.06
Min. concentration	0.2	n/r	n/r	0.0003	n/r	0.002	0.037	n/r	0.0003	n/r	n/r	0.002	n/r	0.0015	0.00
90th percentile	21.0														
95th percentile	24.0														
AAQC	50*	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Number > AAQC	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
No. of valid samples	61	14	14	14	14	14	14	14	14	14	14	14	14	14	14
No. samples < mdl	8	14	14	7	14	0	0	8	1	11	14	2	14	2	1
Detection limit	0.3	0.0006	0.0003	0.0006	0.0006	0.0006	0.0012	0.0012	0.0006	0.0018	0.0006	0.0031	0.0012	0.003	0.0031
Half detection limit	0.15	0.0003	0.0002	0.0003	0.0003	0.0003	0.0006	0.0006	0.0003	0.0009	0.0003	0.0016	0.0006	0.0015	0.0016
% < detection limit	13	100	100	50	100	0	0	57	7	79	100	14	100	14	7
% valid data	100														

Notes:

All non detectable results were reported as 1/2 the detection limit

* O. Reg.419/05 schedule 3, 24-hour standard

n/r: Statistics not reported due to high % of values < detection limit

Total Fe expressed as Fe₂O₃

Total S assumed to be all in SO₄ form

Goldcorp Canada Limited
Baseline Air Quality Monitoring Program
Annual 2011 Report
Timmins, Ontario
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Appendix C-2
Total Dustfall Sampling Results

Extendicare Facility Monitoring Results for Dustfall (2011)
 (results expressed in g/m²/30days)

Month	No. Exposure	Dustfall	Dustfall	Dustfall
	Days	(insoluble)	(soluble)	(total)
January	28	0.02	0.31	0.3
February	28	0.08	0.61	0.7
March	30	0.18	0.42	0.6
April	32	0.82	1.33	2.2
May	30	0.78	0.87	1.7
June	invalid			
July	29	0.67	1.34	2.0
August	33	0.42	3.95	4.4
September	30	0.17	0.47	0.6
October	31	0.37	1.09	1.5
November	no sample			
December	34	0.17	0.32	0.5
Arithmetic mean		0.37	1.07	1.4
Max. value		0.82	3.95	4.4
Min. value		0.02	0.31	0.3
Standard		n/a	n/a	7.0
No. > Sch. 3 value		n/a	n/a	0
No. of valid samples		10	10	10
Detection limit		0.01	0.01	0.02
Half detection limit		0.005	0.005	0.01
% Valid Data		83	83	83

Note:

June sample contaminated

November sample shipped to wrong lab and discarded

MRCA Office Monitoring Results for Dustfall (2011)
 (results expressed in g/m²/30days)

Month	No. Exposure	Dustfall	Dustfall	Dustfall
	Days	(insoluble)	(soluble)	(total)
January	28	0.03	0.26	0.3
February	invalid			
March	30	0.21	0.19	0.4
April	32	0.83	1.12	2.0
May	30	1.17	3.10	4.3
June	30	5.00	2.80	7.8
July	29	0.91	1.52	2.4
August	33	1.01	3.71	4.7
September	30	1.03	1.57	2.6
October	31	0.35	0.63	1.0
November	no sample			
December	34	0.10	0.35	0.5
Arithmetic mean		1.06	1.53	2.6
Max. value		5.00	3.71	7.8
Min. value		0.03	0.19	0.3
Standard		n/a	n/a	7.0
No. > Sch. 3 value		n/a	n/a	1
No. of valid samples		10	10	10
Detection limit		0.01	0.01	0.02
Half detection limit		0.005	0.005	0.01
% Valid Data		83	83	83

Notes:

February sample invalid since sample bag missing due to high winds

November sample shipped to the wrong lab and discarded

Shania Twain Rd Monitoring Results for Dustfall (2011)
 (results expressed in g/m²/30days)

Month	No. Exposure	Dustfall	Dustfall	Dustfall
	Days	(insoluble)	(soluble)	(total)
January	28	0.02	0.21	0.2
February	28	0.04	0.42	0.5
March	30	0.21	0.35	0.6
April	32	0.55	0.76	1.3
May	30	1.88	3.54	5.4
June	30	2.44	2.96	5.4
July	29	1.00	1.50	2.5
August	33	0.93	5.53	6.5
September	30	0.48	0.43	0.9
October	31	0.23	0.59	0.8
November	no sample			
December	34	0.05	0.31	0.4
Arithmetic mean		0.71	1.51	2.2
Max. value		2.44	5.53	6.5
Min. value		0.02	0.21	0.2
Standard		n/a	n/a	7.0
No. > Sch. 3 value		n/a	n/a	0
No. of valid samples		11	11	11
Detection limit		0.01	0.01	0.02
Half detection limit		0.005	0.005	0.01
% Valid Data		92	92	92

Note:

November sample shipped to wrong lab and discarded

Goldcorp Canada Limited
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Appendix C-3

SO₂ and NO₂ Passive Sampling Results

Monitoring Results for Passive SO₂ and NO₂ (2011)
 (results expressed in ppb)

Month	Extendicare Home		MRCA Office		Shania Twain Rd	
	SO ₂	NO ₂	SO ₂	NO ₂	SO ₂	NO ₂
January	0.3	3.6	0.1	5.5	0.2	7.3
February	0.7	0.8	0.9	2.4	1.1	2.2
March	0.2	1.4	0.05	3	0.4	3.1
April	0.1	1.7	0.1	3.4	0.1	3.1
May	0.2	0.9	0.1	2.0	0.1	1.1
June	0.3	1.1	0.4	2.1	0.4	1.6
July	0.1	1.0	0.1	3.8	0.2	1.2
August	0.4	1.4	0.3	1.6	0.4	1.5
September	0.2	1.9	0.2	5.9	0.2	3.0
October	0.6	1.8	0.4	3.1	0.4	2.7
November	0.4	1.4	0.4	2.0	0.4	1.7
December	0.6	1.7	0.5	3.0	0.7	2.5
Arithmetic mean	0.3	1.6	0.3	3.2	0.4	2.6
Max. concentration	0.7	3.6	0.9	5.9	1.1	7.3
Min. concentration	0.1	0.8	0.1	1.6	0.1	1.1
No. of valid samples	12	12	12	12	12	12
Detection limit	0.1	0.1	0.1	0.1	0.1	0.1
Half detection limit	0.05	0.05	0.05	0.05	0.05	0.05
% Valid data	100	100	100	100	100	100