Appendix V4-2D

Doris North Gold Mine Project: Air Quality Compliance Report Q1 and Q2, 2011

TMAC RESOURCES

Hope Bay Mining Limited

DORIS NORTH GOLD MINE PROJECT
Air Quality Compliance Report
Q1 and Q2, 2011

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NORTH AMERICA

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November 2011

DORIS NORTH GOLD MINE PROJECT

AIR QUALITY COMPLIANCE REPORT Q1 AND Q2, 2011

November 2011
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Prepared for:

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The Gold Company

Hope Bay Mining Limited

Prepared by:

Rescan™
Engineers and Scientists

Rescan™ Environmental Services Ltd.
Vancouver, British Columbia

Executive Summary

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Executive Summary

The following atmospheric monitoring requirements are outlined in the Doris North Gold Mine Project Certificate (NIRB No. 003, issued September 15, 2006; NIRB 2006):

1. Section 4.0. Item 8. HBML will fund and install a weather station at the mine site to collect atmospheric data, including air temperature and precipitation. The design and location of this station shall be developed in consultation with Environment Canada officials.
2. Section 4.0. Item 30. HBML will install and fund an atmospheric monitoring station. This station and its location shall be developed in consultation with Environment Canada and Health Canada air quality officials and focus on particulates of concern generated at the mine site. The results of air quality monitoring are to be reported every six months to NIRB through the Monitoring Officer, and from there to all of the parties.
3. Commentary: NIRB expects that Canada Wide Standards for Dioxins and Furans and the Canada Wide Standards for Mercury will apply and should be followed including stack testing of incinerators.

This report is intended to meet the requirements outlined in bullet two above for the first six months of 2011. Requirements outlined in bullets 1 and 3 are addressed in separate reports.

In order to comply with Item 30 in Section 4.0 of the Project Certificate, Hope Bay Mining Limited (HBML) along with Rescan Environmental Services (Rescan) conducted the following activities in Q1 and Q2 2011:

- Collected measurements of particulates of concern, including suspended particulate matter (by the use of a Partisol sampler which measured PM_{10}, $PM_{2.5}$ and TSP) and dustfall (four dustfall monitoring stations); and
- Collected measurements of ambient air quality, including sulphur dioxide, nitrogen dioxide, and ozone (SO_2, NO_2 and O_3), by the use of a Passive Air Monitoring System (PASS).

The samples collected for particulate matter (PM_{10}, $PM_{2.5}$ and TSP), dustfall and SO_2, NO_2 and O_3 were analyzed at an accredited laboratory. Where possible, parameters were compared with the Nunavut Environmental Guidelines for Air Quality, Canada Wide Standards and Canadian National Ambient Air Quality Objectives (NAAQOs) established under the Canadian Environmental Protection Act (CEPA). In addition, where possible, comparison was made to predictions presented in the Environmental Impact Statement (EIS) for the Doris North Gold Mine Project (MHBL 2005). Additional comparisons will be made in the 2011 Q3/Q4 report which will include a full year's worth of data.

The PM_{10} and $PM_{2.5}$ concentrations were below the relevant guidelines for the January through June 2011 period and are considered typical of background concentrations for remote undisturbed areas in Canada. Compared to the predicted maximum concentrations reported in the EIS for the Doris North Gold Mine Project, PM_{10} and $PM_{2.5}$ concentrations were well below predictions.

Total suspended particulate matter concentrations (TSP) were deemed invalid due to a long standing issue that was identified as a mechanical failure. The problem has since been rectified and the sampler will be operational in Q4 of 2011.

All dustfall rates were below the relevant standards. Total dustfall was above the rate predicted in the EIS for the Doris North Gold Mine Project (0.36 mg/dm^2/day) at DF1A in February and DF1 in June 2011 and at the predicted rate at DF3 and DF1A in June 2011. Total dustfall at all other stations and all other periods were below the predicted rate.

The passive ambient air quality monitoring program included monthly sampling for SO_2, NO_2 and O_3. Monthly and six-month average concentrations cannot be directly compared to standards. However, monthly concentrations of O_3 were within the range of concentrations estimated by Health Canada for areas relatively unimpacted by anthropogenic pollution.

Table of Contents

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DORIS NORTH GOLD MINE PROJECT
AIR QUALITY COMPLIANCE REPORT Q1 AND Q2, 2011

Table of Contents

List of Figures

List of Tables

List of Plates

List of Appendices

Glossary and Abbreviations

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Glossary and Abbreviations

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

Air Quality Standards	Objectives for maximum concentrations of criteria air contaminants in the atmosphere developed to ensure long-tern protection of public health and the environment.
Ambient Air Quality	The outdoor air quality at a particular site.
ASTM	American Society for Testing and Materials.
BC MoE	British Columbia Ministry of Environment.
CALA	Canadian Association for Laboratory Accreditation
CEPA	Canadian Environmental Protection Act
Criteria Air Contaminants (CAC)	Contaminants for which environmental regulatory agencies have established ambient air concentration limits.
CCME	Canadian Council of Ministers of the Environment
Dustfall	The settleable fraction of total particulate matter in ambient air.
EC	Environment Canada
EIS	Environmental Impact Statement
Fixed Dustfall	The residue remaining after ignition of a total dustfall sample.
Fugitive Dust	Particulate matter, often sand or mineral dust, released to the atmosphere by mechanical disruption of soil or by wind scouring.
Geometric Mean	The geometric mean is a type of mean or average, which indicates the central tendency or typical value of a set of numbers. The numbers in a data set are multiplied together and then the nth root (where n is the count of numbers in the set) of the resulting product is taken. The geometric mean of a data set is less than or equal to the data set's arithmetic mean/average.
GN	Government of Nunavut
HBML	Hope Bay Mining Limited
MHBL	Miramar Hope Bay Limited
NAAQO	National Ambient Air Quality Objective
NAPS	National Air Pollution Surveillance
NIRB	Nunavut Impact Review Board
NWT	North West Territories

Oxides of Nitrogen (NO_x)	NO_x gas primarily consists of nitrogen oxide (NO) and nitrogen dioxide (NO_2). The gases are emitted with exhaust from combustion engines and products from blasting operations. NO_x can be converted to nitric acid in the atmosphere and thus contribute to acid deposition.
Ozone (O_3)	A colourless, odourless reactive gas naturally found in the earth's stratosphere, where it absorbs the ultraviolet component of incoming solar radiation that could be harmful to life on earth. It is also found near earth's surface where pollutants emitted from human activities react in the presence of sunlight to form ozone. How sunny weather and stagnant conditions favour ozone formulation. The principal pollutants involved in these reactions are NO_x, volatile organic carbon (VOC) and carbon monoxide (CO).
PASS	Passive Air monitoring Sampling System
$PM_{2.5}$	Respirable particulate matter. $PM_{2.5}$ particles are a subset of PM_{10} and are defined as particles with a diameter less than 2.5 µm. These particles are small enough to enter deep into the respiratory system. The majority of PM emitted in diesel engine exhaust is $PM_{2.5}$.
PM_{10}	Inhalable particulate matter. PM_{10} particles are airborne particles that have a diameter of 10 µm or less and are thus a subset of total suspended particulate. The majority of PM_{10} particles are from fugitive dust sources. PM_{10} can enter the respiratory system and have been linked to health problems.
Sulphur Dioxide (SO_2)	Fossil fuel contains a small amount of organic compounds. During fuel combustion, the sulphur is oxidized and emitted as SO_2 gas with the engine exhaust. In the atmosphere, SO_2 can further oxidize to sulphate particles, which contribute to acid deposition.
Total Dustfall	The amount of particulate matter material remaining after evaporation and drying of a dustfall sample.
TSP	Total suspended particulates (TSP) are solid matter or liquid droplets from smoke, dust, fuel ash, or condensing vapours that can be suspended in the air.
US EPA	United States Environmental Protection Agency. The USEPA has promulgated a variety of guidelines, objectives, emission factors, air dispersion modelling procedures and statutes for the protection of ambient air quality.

1. Introduction

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1. Introduction

The following atmospheric monitoring requirements are outlined in the Doris North Gold Mine Project Certificate (NIRB No. 003, issued September 15, 2006: NIRB 2006):

1. Section 4.0. Item 8. HBML will fund and install a weather station at the mine site to collect atmospheric data, including air temperature and precipitation. The design and location of this station shall be developed in consultation with Environment Canada (EC) officials.
2. Section 4.0. Item 30. HBML will install and fund an atmospheric monitoring station. This station and its location shall be developed in consultation with EC and Health Canada (HC) air quality officials and focus on particulates of concern generated at the mine site. The results of air-quality monitoring are to be reported every six months to NIRB through the Monitoring Officer, and from there to all of the parties.
3. Commentary: NIRB expects that Canada Wide Standards for Dioxins and Furans and the Canada Wide Standards for Mercury will apply and should be followed including stack testing of incinerators.

This report is intended to meet the requirements outlined in bullet two above for the first six months of 2011. Requirements outlined in bullets 1 and 3 are addressed in separate reports.

In order to comply with Item 30 in Section 4.0 of the Project Certificate, Hope Bay Mining Limited (HBML) along with Rescan Environmental Services (Rescan) conducted the following activities in Q1 and Q2 2011:

- Collected measurements of particulates of concern, including both suspended particulate matter (by the use of Partisol samplers which measured PM_{10}, $PM_{2.5}$ and TSP) and dustfall (four dustfall monitoring stations); and
- Collected measurements of ambient air quality, including sulphur dioxide (SO_2), nitrogen dioxide (NO_2), and ozone (O_3), by the use of a Passive Air Monitoring System (PASS).

As required in the Project Certificate, the locations for the instruments used to measure the above parameters along with the monitoring objectives were reviewed with Mr. Dave Fox (Air Protection Management Analyst North, Environment Canada, Yellowknife).

Chapter 2 of this report provides the results from the particulate matter (both suspended particulate matter and dustfall) measurements, and Chapter 3 of this report provides the results from the passive ambient air quality samplers for SO_2, NO_2 and O_3. Chapter 4 provides a brief discussion of the results.

2. Particulate Matter

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2. Particulate Matter

Particulate matter is a criteria air quality contaminant (CAC) associated with mining and mineral processing operations. It is generated by mobile equipment, crushing, blasting, bulk handling and storage and other associated mineral processing and construction activities. As part of the ambient air quality compliance monitoring program during Q1 and Q2, 2011 particulate matter was monitored on a butte which is approximately 660 m north of Doris camp and dustfall was monitored near Roberts Bay (DF1), at the Doris meteorological station (DF2 and DFA1) and approximately 500 m west of the southern portion of Ogama Lake (DF3). Where possible, measured concentrations were compared to ambient air quality standards given in the 2011 update of the Air Quality Management Plan for the Doris North Gold Mine Project (Rescan 2011) and predictions in the EIS for the Doris North Gold Mine Project (MHBL 2005).

2.1 SUSPENDED PARTICULATE MATTER

Suspended particulate matter in ambient air is generally a complex, multi-phase system of all airborne solid and low vapour pressure liquid particles having aerodynamic particle sizes from 0.01 to 100 µm in diameter. Airborne suspended particulate matter concentrations were monitored using two Partisol samplers located on the butte near the Doris camp. The site selection, methods and results are presented below.

2.1.1 Site Selection

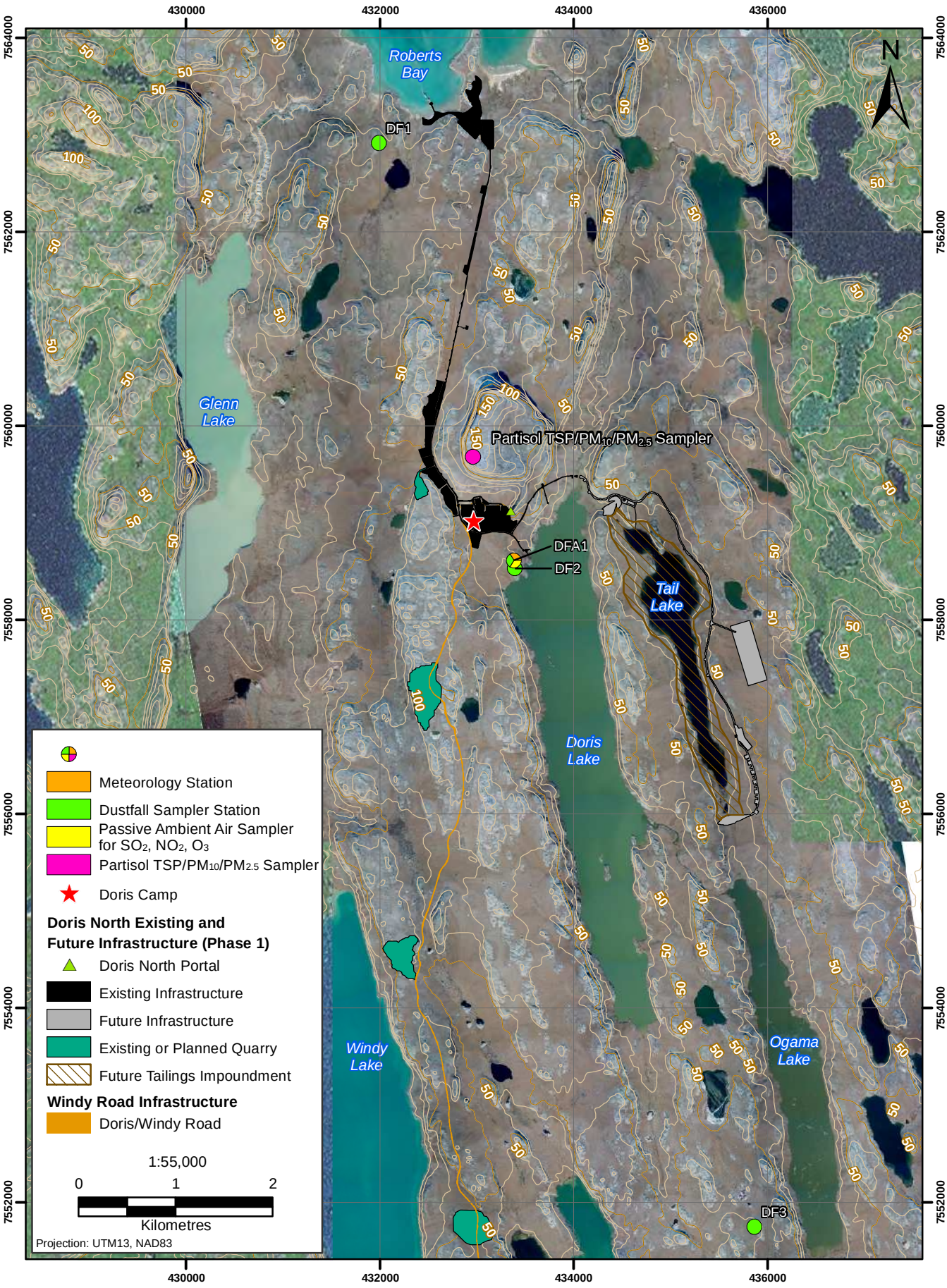
As with any type of ambient air monitoring study, the validity of conclusions depends on representativeness of the sample data. Therefore, the sampling location and the siting of the ambient air samplers are important.

Nunavut does not have established siting requirements for ambient air samplers. Therefore, the siting criteria from the British Columbia Ministry of Environment (BC MoE 2009) and the US EPA (US EPA 2009 and US EPA 1999) were used.

Additional factors, not specified in standard site selection criteria, were also considered. The Partisol air sampler location was free from obstructions and nearby pollutant sources that may cause interference in suspended particulate monitoring (Figure 2-1.1; Plates 2-1.1 and 2.1-2). Due to the very cold climate, the Partisol samplers were installed inside a temperature controlled shelter in an attempt to reduce interruptions to the sample schedule caused by cold weather, wet conditions and excess humidity, air leaks and pump malfunctioning. Despite this effort, the Partisol sampler was not operational for the majority of the measurement period due to sporadic power failures. In addition, the location of the sampler did not allow for easy access or frequent maintenance visits. The sampler will be relocated in Q4 of 2011 in order to rectify this problem and allow for frequent maintenance checks and a more reliable source of continuous power. The new sampler location has been approved by the appropriate representatives from Environment Canada.

2.1.2 Monitoring Method

Suspended particulate matter is being monitored by the Partisol ambient air samplers in three forms; TSP, PM_{10} and $PM_{2.5}$. A Partisol Plus Model 2025 ambient air sampler monitors TSP and a Partisol Sequential Dichotomous Model 2025D ambient air sampler monitors PM_{10} and $PM_{2.5}$ simultaneously (Plate 2.1-3). The Partisol instruments are widely used in Canada for compliance monitoring programs and are recognized as reference equivalent methods by the US EPA (US EPA 2009).



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Doris North Gold Mine Project Ambient Air Quality Monitoring Program Stations

Figure 2.1-1

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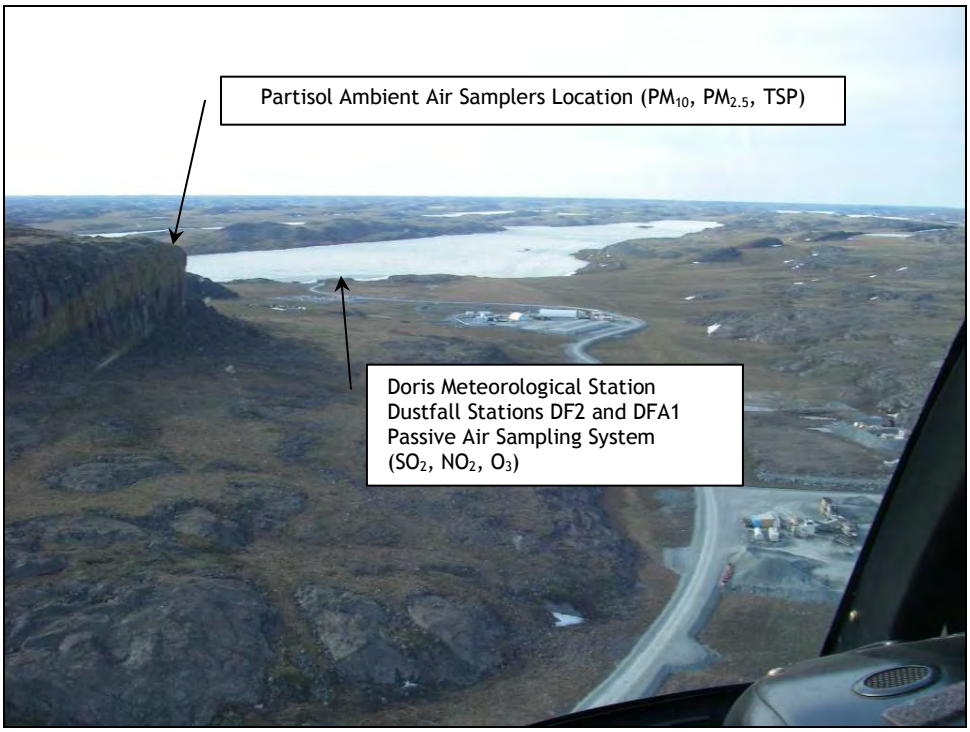


Plate 2.1-1. The Partisol ambient air samplers are located at the top of a butte that is approximately 660 m north of the Doris camp. Doris Lake is shown in the background of this photograph.

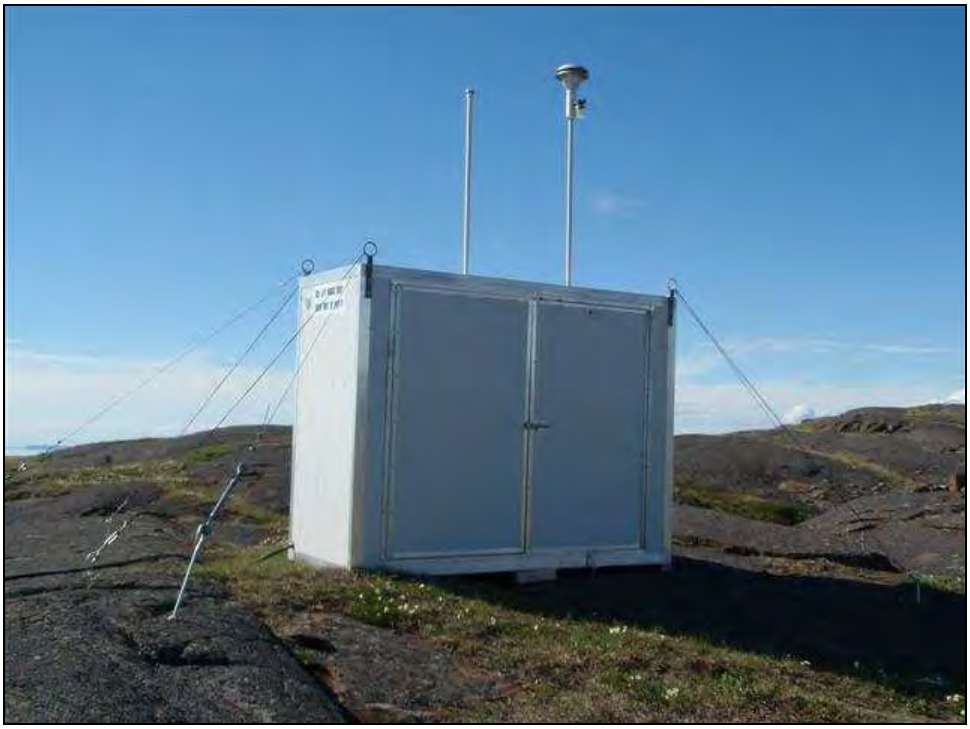


Plate 2.1-2. Temperature controlled shelter housing the Partisol ambient air samplers, early July 2010.

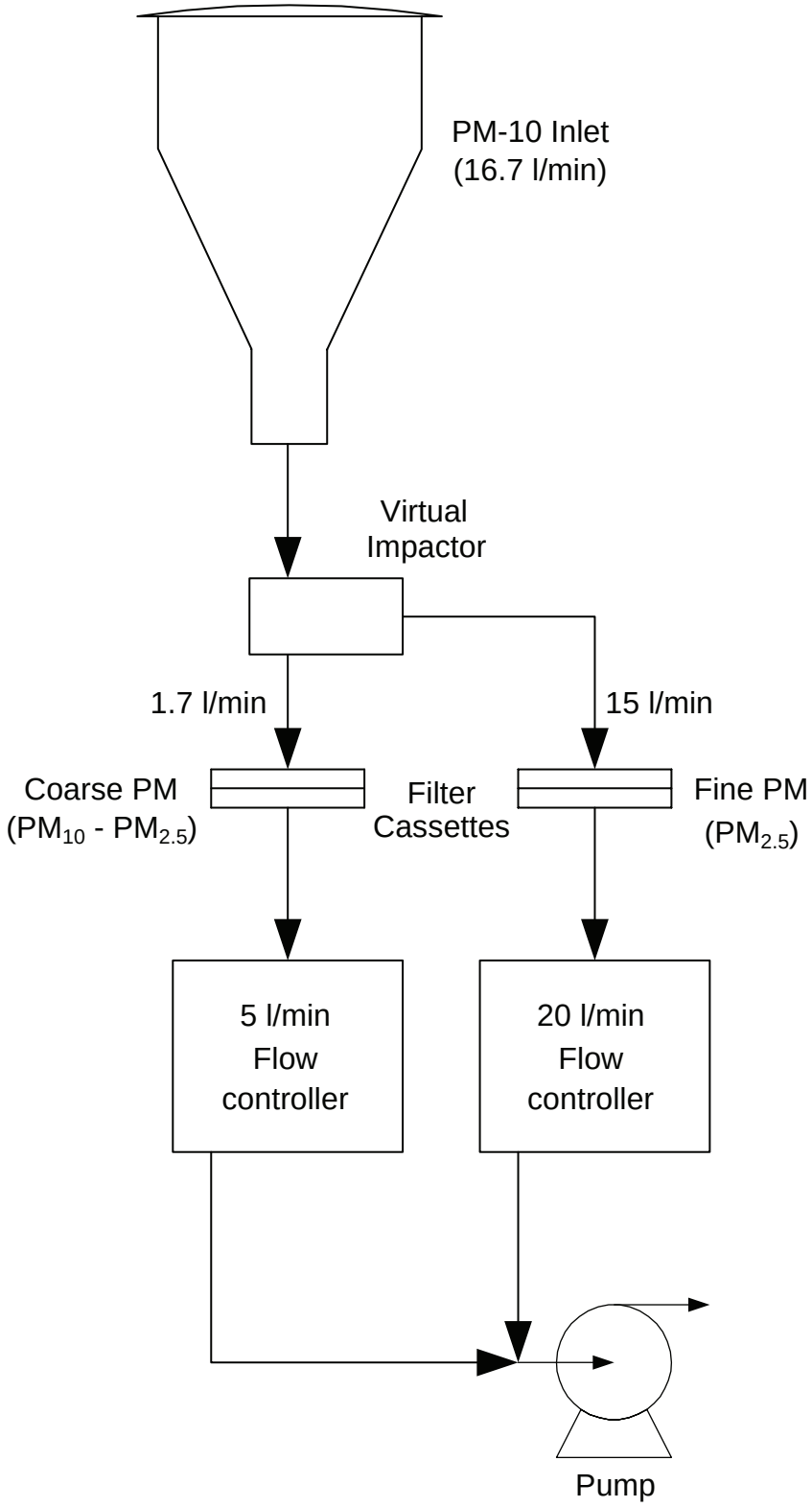
Plate 2.1-3. Inside the temperature controlled shelter the Partisol sampler which monitors TSP is shown on the left and the Partisol sampler which monitors PM_{10} and $PM_{2.5}$ is on the right.

The Partisol ambient air samplers draw a particulate-laden ambient air stream through a size-selective inlet, and then through a 47 mm diameter filter. A built-in pump provides the vacuum required to pull the air flow through the sample filter and a volume flow controller monitors and automatically adjusts the flow rate (Figure 2.1-2). The filters, approved for use with the Partisol ambient air samplers, were the Pallflex TX40H120-WW teflon coated fibre glass type. The Partisol air sampler filters are pre and post weighted at a laboratory that is accredited by the Canadian Association for Laboratory Accreditation (CALA 2011). Maxxam Analytical Laboratory undertook analysis of filters for the first sample (i.e. February 14, 2011), while ALS Laboratory Group was used for the remainder of the 2011 samples.

The filter exchange is performed using pneumatic pressure from the sample pump, and does not involve any special electromechanical components, belts or motors. New filter cassettes from the supply magazine (left, Plate 2.1-4) are pushed up and rightward to the sampling position, while the previous cassette is moved to the storage magazine (right, Plate 2.1-4). The supply and storage magazines are covered to seal off the filter cassettes thereby protecting them from environmental interferences during sampling operations.

The Partisol Plus 2025 $PM_{10}/PM_{2.5}$ sampler (the instrument on the right in Plate 2.1-3) splits the incoming ambient air and all sampling air goes through separate filters for PM_{10} and $PM_{2.5}$. The Partisol Plus 2025 TSP sampler (the instrument on left in Plate 2.1-3) monitors only TSP therefore, the instrument does not split the incoming ambient air and all sampling air goes through one filter.

The Partisol ambient air samplers at the Doris North Gold Mine Project are programmed to follow Environment Canada's National Air Pollution Surveillance (NAPS) schedule (EC 2011). The NAPS program requires 24-hour sampling every six days for particulate matter monitoring.



Source: Thermo Fisher Scientific, 2007

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Simplified Diagram for the Partisol Sequential Dichotomous Model 2025D Ambient Air Sampler

Figure 2.1-2

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Plate 2.1-4. The Partisol air sampler filters are contained in a magazine on the left side of the unit. The filters laden with suspended particulate matter are contained in a magazine on the right side of the unit (PM_{10} at front and $PM_{2.5}$ at rear).

Measured concentrations of TSP concentrations at the Doris North Gold Mine Project site have been lower than PM_{10} and $PM_{2.5}$ concentrations for some sample periods since the equipment was installed in summer 2009. PM_{10} and $PM_{2.5}$ are subsets of TSP; therefore, the TSP concentration should always be equal or higher than PM_{10} and $PM_{2.5}$ concentration. This suggested that there may be a malfunction with the sampling equipment. A leak test and a flow audit were performed during the site visit in fall 2010, but this indicated that the equipment passed the various tests and was performing to manufacturers guidelines. Further investigation into the matter was undertaken during 2011 and the problem has been identified as mechanical failure. The unit has been sent to the manufacturer and will be repaired and calibrated before redeployment in late 2011. The first valid TSP results should be available in the 2011 Q3 and Q4 Air Quality Compliance Report which will be prepared during 2012.

During a site visit in February 2011 the inlet to the Partisol sampler was found to be damaged and partially blocked by ice, therefore there are no Partisol results available prior to February 6, 2011. Shortly after the February 2011 site visit power to the station was interrupted and the samplers remained inactive until the subsequent visit during early May 2011. A similar situation occurred approximately two weeks after the May 2011 visit and the two samples collected during the July 2011 visit were deemed invalid; therefore, no valid data were collected between February 26 and June 30, 2011. Although the power supply was likely only interrupted for a brief period of time during each of these events the sampler requires a manual reset by field personnel when sampling is interrupted. Because field visits typically occur on a quarterly basis, the sampler was left inoperational for approximately three months in each case. As mentioned above, once the samplers return from repair and calibration they will be relocated to a more accessible location which has a more reliable, continuous supply of power. Once this relocation occurs, during Q4 of 2011, the samplers will be visited more frequently greatly reducing the potential for extended periods of downtime.

2.1.3 Results and Comparison

Table 2.1-1 summarizes ambient PM_{10} and $PM_{2.5}$ concentrations measured with the Partisol 2025 Dichotomous sampler. Full laboratory results for the Q1/Q2 2011 period are presented in Appendix 1.

Table 2.1-1. PM_{10} and $PM_{2.5}$ Results Summary, Doris North Gold Mine Project, Q1 and Q2, 2010

	PM_{10} (µg/m^3)	$PM_{2.5}$ (µg/m^3)
Ambient Air Quality Standard	50 [a]	30 [b]
EIS Predictions (MHBL 2005)	61.9 (Maximum 24-hour concentration. 50 µg /m^3 exceeded 2 days per year)	18.4 (24-hour 98th percentile concentration)
Q1 Q2 Average	**9.1** [c]	**4.2** [d]

[a] *British Columbia Ministry of Environment Level B 24-hour Standard for PM_{10} used (BC MoE 2011) as there are no ambient air quality standards for PM_{10} set by Federal or Nunavut Territorial Governments*
[b] *Canada Wide Standard for 24-hour $PM_{2.5}$ (CCME 2000). There are no ambient air quality standards for $PM_{2.5}$ set by the Nunavut Territorial Government.*
[c] *Average concentration is based on Feb. 20, 2011 data.*
[d] *Average concentration is based on Feb. 14, 20, and 26, 2011 data.*

There are no ambient air quality standards in Nunavut for PM_{10} and $PM_{2.5}$ therefore results were compared to the British Columbia Ministry of Environment Level B Standard for PM_{10} (BC MoE 2011) and the Canada-Wide Standards for $PM_{2.5}$ (CCME 2000). In addition, concentrations are compared to the predicted concentrations contained in the Environmental Impact Statement (EIS) for the Doris North Gold Mine Project (MHBL 2005).

The PM_{10} and $PM_{2.5}$ concentrations for the January through July 2011 reporting period were well below the relevant ambient air quality standards (Table 2.1-1). The EIS for the Doris North Gold Mine Project predicted maximum concentrations of 61.5 micrograms per cubic metre (µg/m^3), with the PM_{10} 24-hour standard exceeded 2 days per year (MHBL 2005). This was predicted at 200 m from the proposed ore processing facility. PM_{10} concentrations monitored during the first half of 2011 were below this maximum predicted concentration. $PM_{2.5}$ concentrations for the Project were predicted to be 18.4 µg/m^3 based on 98th percentile of the 24-hour ambient measurement, averaged over 3 years (MHBL 2005). Concentrations of $PM_{2.5}$ monitored during 2011 were below these predicted concentrations. Average annual concentrations of $PM_{2.5}$ and PM_{10} for 2011 will be presented and compared to the annual EIS predictions in the 2011 Q3/Q4 report.

As discussed above, there are no valid TSP results available for January through July 2011. The 2011 Q3/Q4 report will include an average annual TSP concentration, based on available data, along with comparisons to relevant guidelines and the predicted concentrations contained in the EIS for the Doris North Gold Mine Project (MHBL 2005).

Environment Canada undertakes monitoring at various locations across Canada as part of the National Air Pollution Surveillance (NAPS) Network. The nearest NAPS suspended particulate matter monitoring station to the Project is Yellowknife, NWT station, and the PM_{10} and $PM_{2.5}$ annual averages were 6 and 3 µg/m^3 in 2006 (EC 2008), respectively, which was is the latest year of published data. The only suspended particulate matter monitoring station operated by NAPS in Nunavut is located in Iqaluit and this station monitors PM_{10} only. The annual average at Iqualit station for PM_{10} was 14 µg/m^3 in 2006 (EC 2008). Monitoring of TSP concentrations by NAPS ceased in 2003. The latest regional data is from 2002 and an annual geometric mean of 27 µg/m^3 was reported at Yellowknife, NWT station (EC 2003). 2011 annual average TSP, PM_{10} and $PM_{2.5}$ concentrations measured at the Doris North Gold Mine Project site will be compared to monitoring results from the NAPS Yellowknife and Iqualit stations as part of the 2011 Q3/Q4 report.

2.2 DUSTFALL

The purpose of the dustfall monitoring program is to quantify the amount of dust deposition near the Doris North Gold Mine Project site and compare the results to the available standards and the predicted concentrations reported in the EIS for the Doris North Gold Mine Project (MHBL 2005).

Dustfall monitoring was undertaken at four locations during Q1 and Q2 of 2011. One dustfall station, co-located with Doris North meteorological station, uses an Alberta Environment sampling method (Alberta AMD 1989), and the other three stations use the ASTM D1739-98 sampling method (ASTM 2004).

2.2.1 Site Selection

Nunavut does not have established siting requirements for ambient air samplers. Therefore, the siting criteria from the British Columbia Ministry of Environment (BC MoE 2009) and the US EPA (US EPA 2009 and US EPA 1999) were used. The dustfall monitoring station which uses the Alberta Environment method is co-located at the Doris North meteorological station (DFA1). The other three dustfall stations followed the ASTM 2004 site selection recommendations (DF1, DF2 and DF3) (Figure 2.1-1). Dominant wind directions as well as present and potential future project activities were considered during the site selection process. There are no obstructions or local sources of air pollutants near the stations. In addition, the relatively flat topography allows for the collection of representative data (Figure 2.1-1). The dustfall monitoring stations are in open areas that are free of structures higher than 1 m within a 20 m radius of the collection container.

2.2.2 Monitoring Method

The dustfall monitoring stations collect particles small enough to pass through a 1 mm screen and large enough to settle by virtue of their weight. This requires containers of a standard size and shape, which are partially filled with deionised water. The containers are installed on a 2 m pole, surrounded by a windscreen and bird spikes and are exposed to the atmosphere for approximately 30 days. The windscreen around the sample container improves the dustfall collection efficiency and bird spikes are used to minimize contaminants from bird faeces (Plate 2.2-1). Monthly samples are sent to a laboratory for analysis. Dustfall results were prorated by the laboratory to a 30-day average, so that they could be compared with standards.

Plate 2.2-1. Example of a dustfall monitoring station (DF1) located approximately 1 km west of the Roberts Bay laydown area which uses the ASTM monitoring method.

Dustfall was monitored at stations DF1, DF2 and DF3 (Figure 2.1-1) using the ASTM D1739-98 sampling method (ASTM 2004). These stations have two dustfall collectors. One of the containers is analyzed for particulates (total, soluble and insoluble) and anions (sulphate, nitrate, chloride, and ammonia) and the other for total metals and various cations. Algae are an interference for dustfall measurements; therefore, the deionized water in the dustfall containers also contains algaecide. Analysis was undertaken by ALS laboratory Group.

The fourth dustfall station, DFA1, which is co-located with the Doris North meteorological station (Figure 2.1-1), is operated in accordance with the Alberta Environment sampling method (Alberta AMD 1989). The station has one dustfall collector. Samples are analysed for total dustfall and total fixed dustfall. Total dustfall is defined as the amount of material left after evaporation of a sample of dustfall and its subsequent drying. Total fixed dustfall is the residue that is left after ignition of the total dustfall sample (Alberta AMD 1989). Analysis was undertaken by Maxxam Analytical Laboratory.

2.2.3 Results and Comparison

Table 2.2-1 summarizes the dustfall limits in various jurisdictions. The 2011 update of the Air Quality Management Plan for the Doris North Gold Mine Project (Rescan 2011) included the Alberta Environment Ambient Air Quality Standard for Dustfall (Alberta Environment 2010) as a guideline for comparison. However, other standards have been included in previous Doris North Gold Mine Project Air Quality Compliance Reports and are presented here for consistency. The dustfall results are summarized in Tables 2.2-2 for the ASTM method and 2.2-3 for the Alberta Environment method. A time series of dustfall results for the Alberta Environment method are summarized in Figure 2.2-1. From January through June 2011 one batch of dustfall samples was collected per month for the months of May and June 2011 at the stations that followed the ASTM method (DF1, DF2 and DF3), with the exception of DF2 for which data was not available during June 2011. Between January and June 2011 six monthly dustfall samples were collected at the DFA1 station using the Alberta Environment method.

Table 2.2-1. Dustfall Limits in Several Jurisdictions

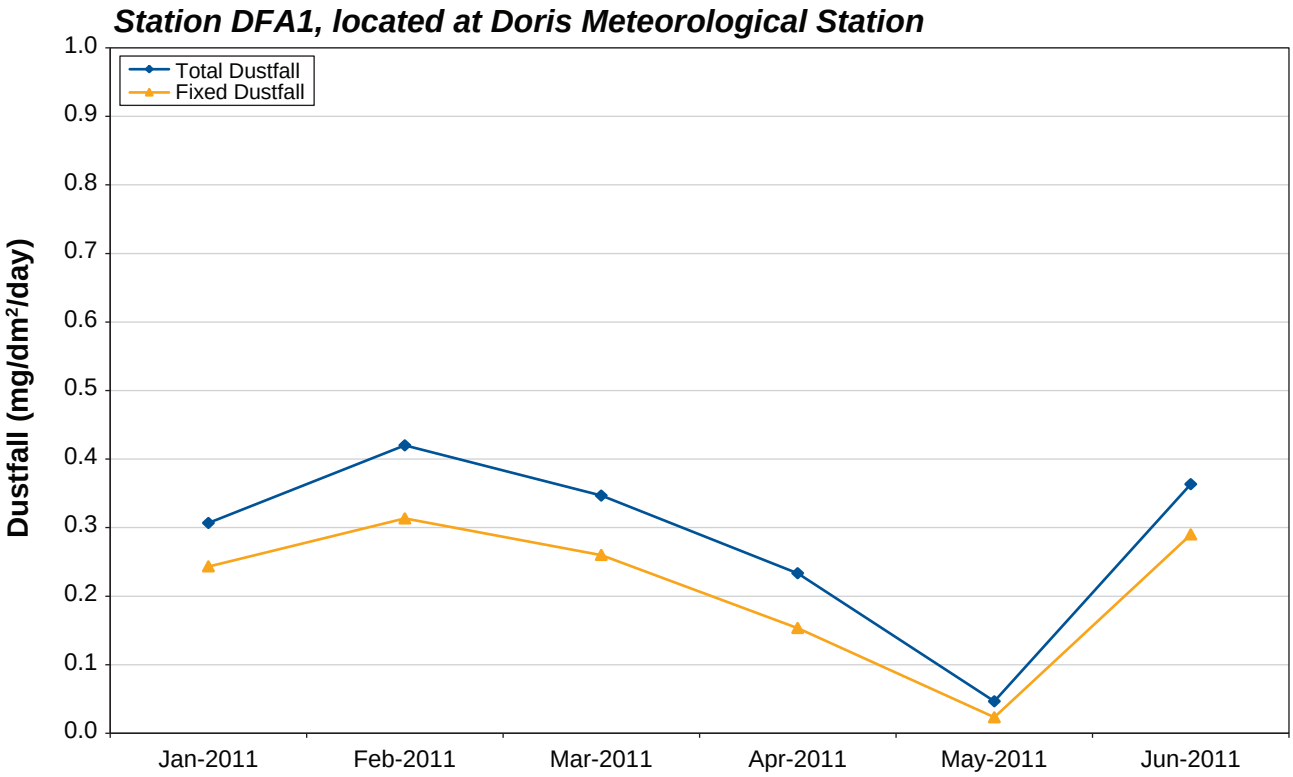
Jurisdiction	Dustfall Criterion ($mg/dm^2/day$)	Comments
Alberta (Alberta Environment 2010)	1.75	Residential and recreational areas
	5.25	Commercial and industrial areas
Ontario (Ontario Ministry of the Environment 2008)	2.3	-
Saskatchewan (Saskatchewan 1996)	6.67	-
British Columbia Pollution Control Objective (BC MOE 1979)	1.7 to 2.9	-

Table 2.2-2. Dustfall Results using the ASTM Method, Doris North Gold Mine Project ($mg/dm^2/day$)

	DF1	DF2	DF3		DF1	DF2	DF3
May-11[a]				**Jun-11**			
Total	0.11	0.31	0.10	Total	1.10	n/a	0.36
Total Insoluble	0.09	0.16	*0.05*	Total Insoluble	*0.05*	n/a	*0.05*
Total Soluble	*0.05*	0.18	0.13	Total Soluble	1.04	n/a	0.34

Limit of Detection is 0.10 $mg/dm^2/day$. Results below detection limit are reported as half of the detection limit (i.e. 0.05 $mg/dm^2/day$) and are shown in italics.

[a] *May-11 results were based on two samples collected at each station. The values presented are the average of the two samples. It was possible to analyze both containers at the station for all parameters because of the amount of sample collected. Normal analysis procedures are described in section 2.2-2. Typically some of the liquid in a sample container evaporates, thus, not allowing enough sample for all parameters to be analysed. In this case, evaporation was likely low or precipitation was high which allowed for both containers to be analysed.*



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Dustfall Results using the Alberta Environment Method, Doris North Gold Mine Project

Figure 2.2-1

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Table 2.2-3. Dustfall Results using the Alberta Environment Method, Doris North Gold Mine Project

	Total Dustfall at DFA1 ($mg/dm^2/day$)	Fixed Dustfall at DFA1 ($mg/dm^2/day$)
Jan-2011	0.31	0.24
Feb-2011	0.42	0.31
Mar-2011	0.35	0.26
Apr-2011	0.23	0.15
May-2011	0.05	0.02
Jun-2011	0.36	0.29
Q1Q2 Average	**0.29**	**0.21**

Dustfall rates below the limits are generally expected and indicate baseline levels for a typical undeveloped area. All dustfall results recorded during the first half of 2011 were below the limits listed in Table 2.2-1. A maximum annual deposition rate of 0.36 $mg/dm^2/day$ was predicted in the EIS for the Doris North Gold Mine Project at 20 m from the proposed mine portal (reported as 10.8 $mg/100\ cm^2/30$ days in the EIS). The monitoring stations are all located at a greater distance from the proposed mine portal. Total dustfall was above this predicted rate at DF1A in February and DF1 in June 2011 and equal to the predicted rate at DF3 and DF1A in June 2011. Total dustfall at all other stations and all other periods were below this predicted rate. The 2011 annual average total dustfall rate for the station using the Alberta Environment method, DFA1, will be compared to the maximum annual deposition rate predicted in EIS for the Doris North Gold Mine Project in the 2011 Q3/Q4 report.

The concentration of total metals in the dustfall samples was also analyzed and the laboratory results are summarized in Appendix 2. Most of the metal concentrations were below the detection limits and for all intents and purposes would be considered negligible. There are no specific criteria for metal concentrations in dustfall. However, there are workplace or occupational air quality standards (e.g., industrial hygiene) for metals that are of concern with respect to human health. The metals that are a concern for human health are cadmium, lead and arsenic and the concentrations of these metals in the collected dustfall samples were close to or below detection limits. There were no predictions of concentration of total metals in the dustfall within the EIS for the Doris North Gold Mine Project.

3. Ambient Air Quality Monitoring by Passive Samplers

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3. Ambient Air Quality Monitoring by Passive Samplers

As part of the ambient air quality compliance monitoring program, monthly average concentrations of criteria air contaminants were monitored at the Project site in Q1 and Q2, 2011. A Passive Air Sampling System (PASS) at the Doris North meteorological station was used to monitor sulphur dioxide (SO_2), nitrogen dioxide (NO_2) and ozone (O_3) (Figure 2.2-1). Measured concentrations will be compared to ambient air quality standards given in the 2011 update of the Air Quality Management Plan for the Doris North Gold Mine Project (Rescan 2011) and predictions in the EIS for the Doris North Gold Mine Project (MHBL 2005) when a full year of data is available, in the 2011 Q3/Q4 report.

3.1 SITE SELECTION

Nunavut does not have established siting requirements for ambient air samplers. Therefore, the siting criteria from the British Columbia Ministry of Environment (BC MoE 2009) and the US EPA (US EPA 2009) were used. The samplers were placed in environmentally safe locations where they would not be affected by weather or damaged by wildlife. They were placed far from obstructions and there were no nearby roadways that could influence measurements.

3.2 MONITORING METHOD

Passive air sampling is a diffusive method which monitors gas or vapour pollutants from the atmosphere at a rate controlled by a physical process, such as diffusion through a static air layer or permeation through a membrane. The passive method does not involve the active movement of the air through the sampler; therefore no electric air moving pump is required. The number of days of contact between the ambient air and the permeation membrane is important. The local meteorological conditions are also used in the calculations. The meteorological parameters that are used in the PASS calculations are air temperature, wind speed and relative humidity.

The PASS provides low detection limits, is very easy to install and does not require power. The passive sampler is kept under a rain shelter (Plate 3.2-1) on the Doris meteorological station. Sampling was undertaken on a monthly basis and PASS samples were sent to Maxxam Analytical Laboratory for analysis following each sampling period.

Plate 3.2-1. Passive air samplers under a rain shelter at Doris meteorological station.

3.3 RESULTS AND COMPARISON

The relevant ambient air quality standards are summarized in Table 3.3-1. Maximum predicted concentrations contained in the EIS for the Doris North Gold Mine Project (MHBL 2005) are presented in Table 3.3-2. PASS results are summarized in Table 3.3-3 and the original laboratory reports are presented in Appendix 2. The time series of concentrations are presented in Figures 3.3-1 to 3.3-3.

Table 3.3-1. Ambient Air Quality Standards for SO_2, NO_2 and O_3

Parameter	Unit	Annual	Daily	1-Hour
SO_2 [a]	µg/m^3	30	150	450
NO_2 [b]	µg/m^3	100	200	400
O_3 [c]	µg/m^3	30	50	160

[a] *National Ambient Air Quality Objective (EC 2011) and Nunavut Territorial Government (GN 2002) maximum desirable concentrations for SO_2.*
[b] *National Ambient Air Quality Objective (EC 2011) maximum acceptable concentrations for NO_2. Achievement of the annual and 1-hour standards is of most concern for Environment Canada.*
[c] *National Ambient Air Quality Objective (EC 2011) maximum acceptable concentration for O_3. Achievement of the 1-hour standard is of most concern for Environment Canada. Canada Wide Standard (CCME 2000) for O_3 has an 8-hour averaging period which cannot be compared with monthly results.*

Table 3.3-2. Maximum Predicted Concentrations of SO_2, NO_2 and O_3 from the EIS for the Doris North Gold Mine Project (MHBL 2005)

Parameter	Unit	Annual	Daily	1-Hour
SO_2	µg/m^3	5.8	49.6	265.9
NO_2	µg/m^3	47.7	126.4	306.7
O_3	µg/m^3	n/a	n/a	n/a

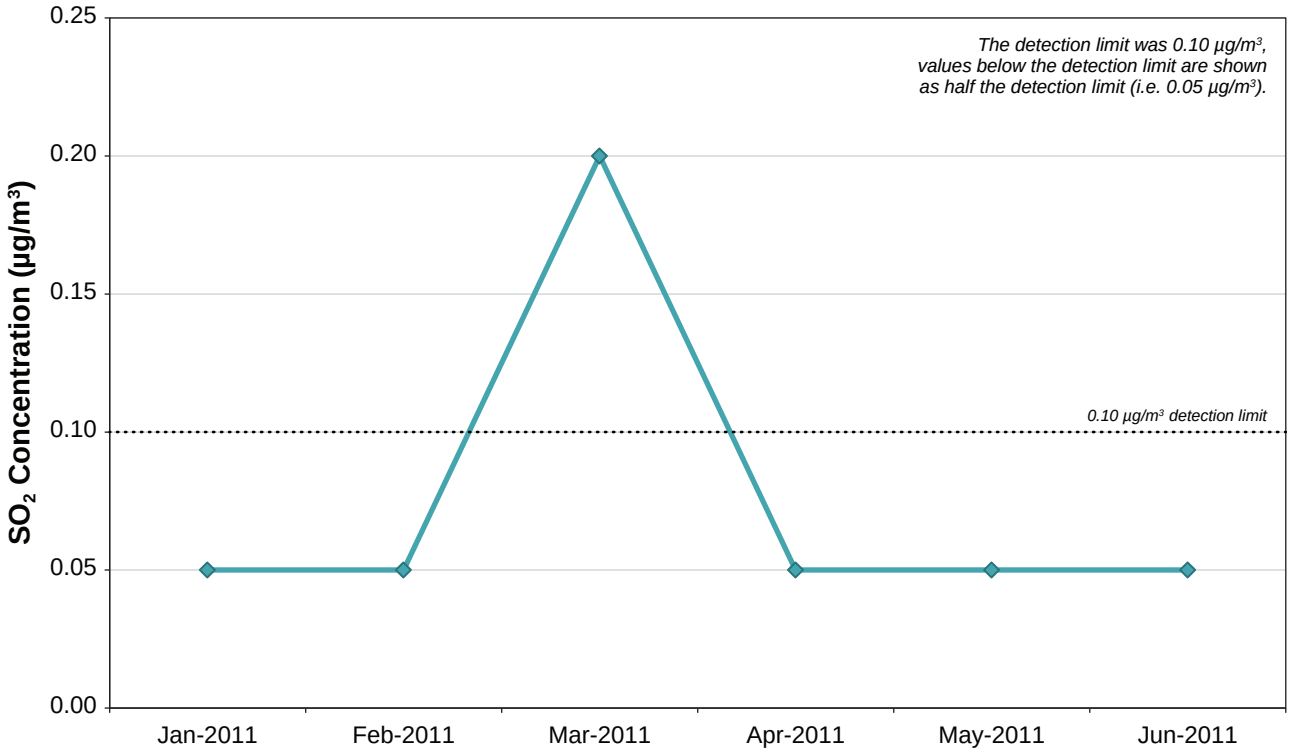
Predictions of Ozone concentrations were not included in the EIS for the Doris North Gold Mine Project.

Table 3.3-3. Passive Ambient Air Quality Monitoring Results, Doris North Gold Mine Project

Parameter	Units	Jan-2011	Feb-2011	Mar-2011	Apr-2011	May-2011	Jun-2011	Q1Q2 Avg.
SO_2	µg/m^3	*0.1*	*0.1*	0.5	*0.1*	*0.1*	*0.1*	0.2
NO_2	µg/m^3	3.9	4.9	3.8	0.2	3.2	0.9	2.8
O_3	µg/m^3	61.0	60.8	62.3	42.9	55.5	47.6	55.0

Laboratory results provided in ppb. Conversion factors for calculating µg/m^3 are 2.61 for SO_2, 1.88 for NO_2 and 1.96 for O_3 assuming conditions of 25°C and 101 kPA.
Limit of Detection is 0.3 µg/m^3 (0.1 ppb) for SO_2, 0.2 µg/m^3 (0.1 ppb) for NO_2 and 0.2 µg/m^3 (0.1 ppb) for O_3. For the purpose of calculating period averages concentration assumed to be the limit of detection. Values recorded below detection are shown in italics.

The PASS results are expressed as monthly average concentrations; however Health Canada's National Ambient Air Quality Objectives (NAAQO), the Nunavut Environmental Guideline for Air Quality, and the EIS for the Doris North Gold Mine Project (MHBL 2005) utilize averaging periods of 1-hour, 24-hour and 1-year. Only the 2011 annual average concentrations can be directly compared to these standards and predictions and thus, such comparisons will be presented in the Q3/Q4 report.



NEWMONT NORTH AMERICA

SO_2 Concentrations from the Passive Air Sampling System, Doris North Gold Mine Project

Figure 3.3-1

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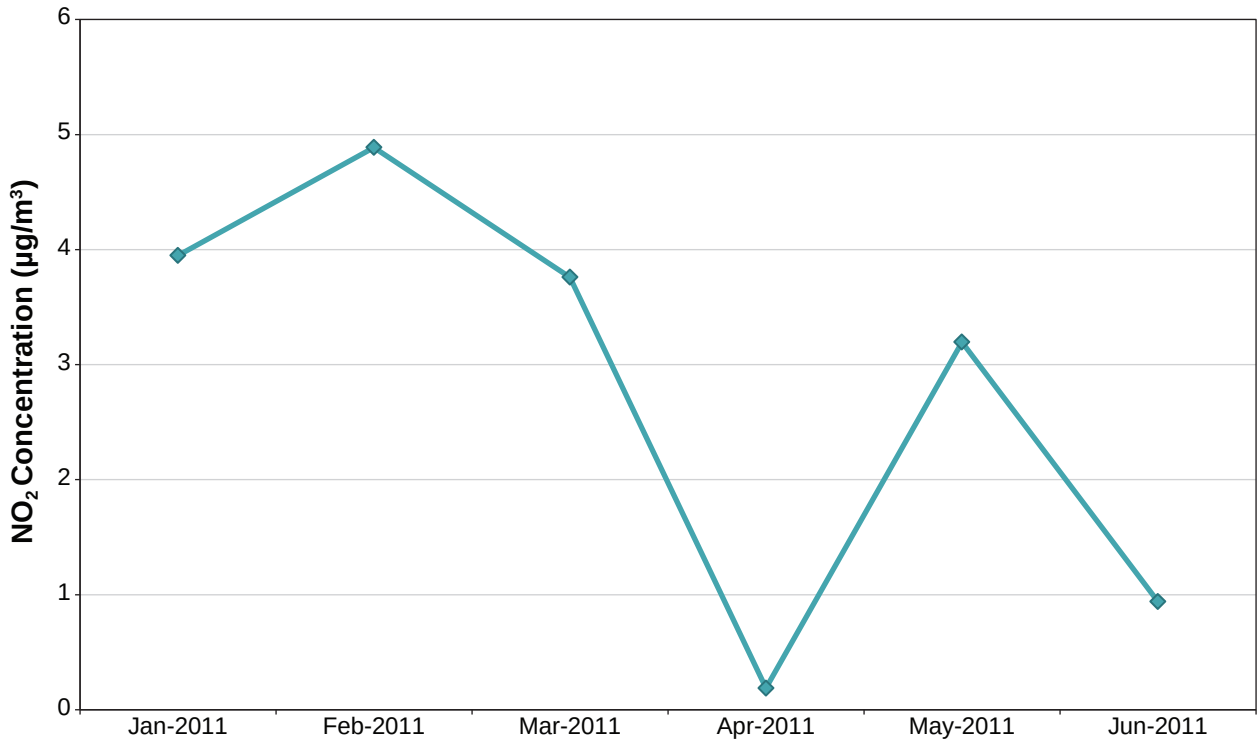
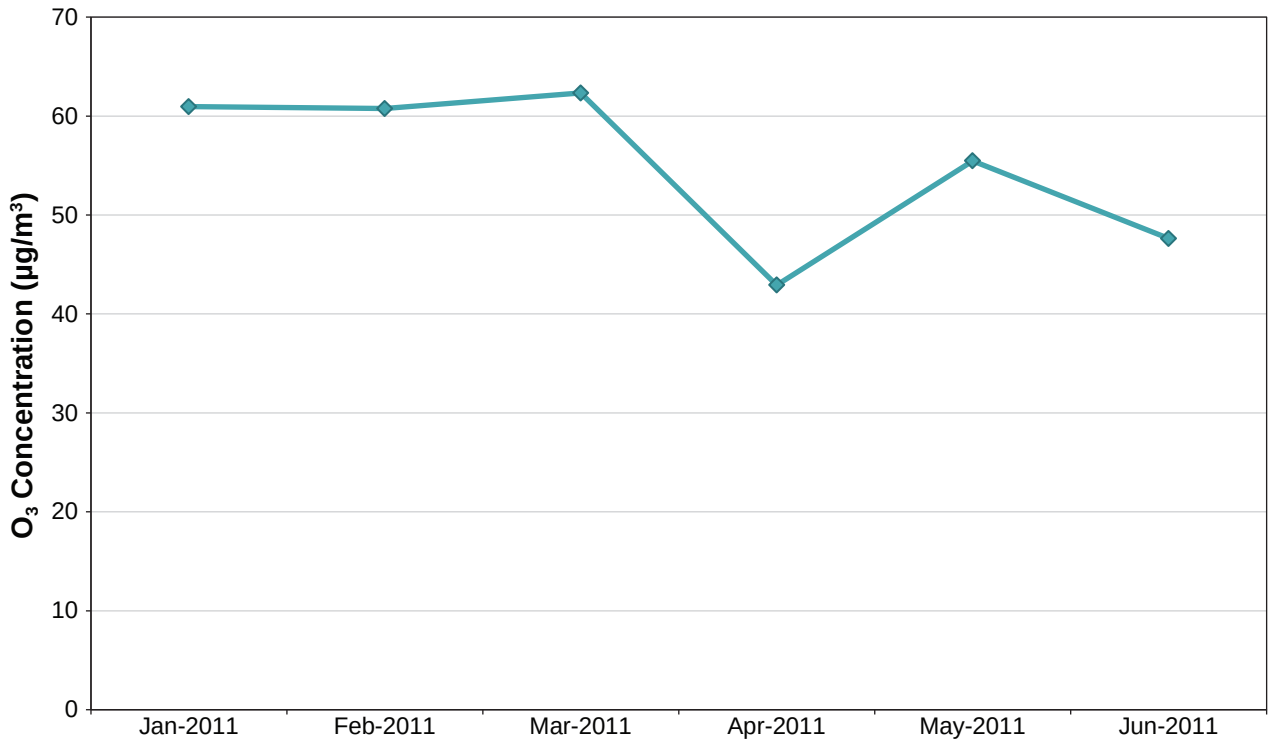


NEWMONT NORTH AMERICA

NO_2 Concentrations from the Passive Air Sampling System, Doris North Gold Mine Project

Figure 3.3-2

Rescan™ Engineers & Scientists



NEWMONT NORTH AMERICA

O_3 Concentrations from the Passive Air Sampling System, Doris North Gold Mine Project

Figure 3.3-3

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Health Canada recognises that the annual standard for ozone may not be achievable in remote locations and provides estimates of ozone concentrations expected in areas that are not influenced by anthropogenic pollution (HC 1999). These guidelines are given for the May to September period, but it is stated that when all months of the year are included, values would be slightly lower. The guidelines are:

- Daily 1 hr. Maximum (May - Sept.) 69 to 94 µg/m^3 (reported as 35 to 48 ppb); and
- Monthly 1 hr. Average (May - Sept.) 49 to 78 µg/m^3 (reported as 25 - 40 ppb).

Remote locations may experience higher concentrations of ground level O_3 than urban locations due to the transport of O_3 from urban areas and the lower NO_2 concentrations, which scavenges O_3 from the air through chemical reactions. Monthly O_3 concentrations were within the range of concentrations estimated by Health Canada and are considered representative of concentrations in an area relatively unimpacted by anthropogenic pollution.

Environment Canada undertakes monitoring at various locations across Canada as part of the National Air Pollution Surveillance (NAPS) Network. The nearest NAPS monitoring station to the Project which measures SO_2, NO_2 and O_3 concentrations is the Yellowknife, NWT station. Annual average concentrations of SO_2, NO_2 and O_3 were 0 µg/m^3 (reported as 0 ppb), 8 µg/m^3 (reported as 4 ppb) and 51 µg/m^3 (reported as 26 ppb), respectively, for 2006 (EC 2008) which is the latest year of published data. 2011 annual average SO_2, NO_2 and O_3 concentrations measured at the Doris North Gold Mine Project site will be compared to monitoring results from the NAPS Yellowknife station in the 2011 Q3/Q4 report.

4. Results and Discussion

4. Results and Discussion

The ambient air quality monitoring program at the Doris North Gold Mine Project site was continued during the first six months of 2011. This included Partisol monitoring of particulate matter, dustfall monitoring and passive ambient air monitoring of concentrations of SO_2, NO_2 and O_3.

The Partisol ambient air quality program follows the Environment Canada – National Air Pollutant Surveillance (NAPS) schedule and allows for collection of a 24-hr sample every six days for each parameter (TSP, PM_{10} and $PM_{2.5}$). The PM_{10} and $PM_{2.5}$ concentrations were below the relevant regulatory guidelines and EIS predictions from February 6 through 26, 2011. Unfortunately there were extended periods during which PM_{10} and $PM_{2.5}$ were not monitored or data were deemed invalid due to icing, power failures or contaminated samples. In addition, the ongoing issue with the TSP sampler was identified as a mechanical failure and the unit has since been repaired and recalibrated. Both particulate matter samplers (i.e. $PM_{2.5}$ / PM_{10} and TSP) will be relocated during Q4 of 2011 to an area which is more accessible and has a more reliable source of continuous power.

There were four dustfall stations that were actively monitoring in the first six months of 2011. Three dustfall stations (DF1, DF2 and DF3) were operated according to the ASTM 1739-98 sampling method (reapproved in 2004). The other dustfall station (DFA1) located at the Doris North meteorological station followed the 1985 Alberta Air Monitoring Directive Method. All of the dustfall rates were below the relevant standards. Total dustfall was above the rate predicted in the EIS for the Doris North Gold Mine Project at DF1A in February and at DF1 in June 2011 and equal to the predicted rate at DF3 and DF1A in June 2011. This is likely due to construction activities taking place around Doris camp and in the Roberts Bay area during 2011. Total dustfall at all other stations and all other periods were below the predicted rate in the EIS for the Doris North Gold Mine Project.

The passive ambient air quality monitoring program included monthly sampling for SO_2, NO_2 and O_3. The monthly and 6-month average concentrations cannot be directly compared to regulatory standards. However, monthly concentrations of O_3 were within the range of concentrations estimated by Health Canada for areas relatively unimpacted by anthropogenic pollution.

The ambient air quality monitoring program for the Doris North Gold Mine Project will continue during the second half of 2011 and include sampling of TSP, PM_{10} and $PM_{2.5}$, monthly dustfall monitoring and passive air sampling for SO_2, NO_2 and O_3.

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Appendix 1

Suspended Particulate Matter Laboratory Results (TSP, PM_{10} and $PM_{2.5}$)

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Engineers and Scientists

Your Project #: 1009-008-02
Site Location: HOPE BAY, NUNAVUT - BASELINE

Attention: TOLGA OLCAY
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2011/10/20
This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B191562
Received: 2011/09/27, 12:13

Sample Matrix: Filter
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Mass Determination(ug/filter)	3	N/A	2011/09/28	EINDSOP-00151	EPA 2.12 Monitoring
Mass Determination (ug/m³) (1)	2	N/A	2011/10/20	EINDSOP-00151	EPA 2.12 Monitoring
Volume	2	N/A	2011/10/20	N/A	see departement

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) As per method, results are blank subtracted.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Customer Service
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B191562
Report Date: 2011/10/20

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 1009-008-02
Site Location: HOPE BAY, NUNAVUT - BASELINE

RESULTS OF CHEMICAL ANALYSES OF FILTER

Maxxam ID		BQ3476	BQ3477	BQ3478		
Sampling Date						
	Units	**RP084092**	**RP058031**	**BLANK**	**RDL**	**QC Batch**
.						
Volume	m3	22.80	25.30		0.01	5286266
PM2.5/10						
Particulate Matter	ug/m3	0.6	1.1		0.1	5286265
Particulate Matter	ug/filter	14	27	11	3	5216463

RDL = Reportable Detection Limit

General Comments

Results relate only to the items tested.

RESCAN ENVIRONMENTAL SERVICES LTD.
Attention: TOLGA OLCAY
Client Project #: 1009-008-02
P.O. #:
Site Location: HOPE BAY, NUNAVUT - BASELINE

Quality Assurance Report

Maxxam Job Number: PB191562

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5216463	SS6	Calibration Check	Particulate Matter	2011/09/28		100	%	N/A

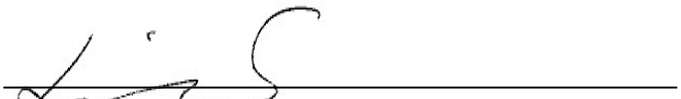
Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 6744 - 50th Street T6B 3M9 Telephone(780) 378-8500 FAX(780) 378-8699

Validation Signature Page

Maxxam Job #: B191562

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Linda Lin, Supervisor, Centre for Passive Sampling Technology

==========

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RESCAN ENVIRONMENTAL SERVICES
ATTN: Tolga Olcay
Sixth Floor
1111 West Hastings Street
Vancouver BC V6E 2J3

Date Received: 02-SEP-11
Report Date: 26-SEP-11 14:29 (MT)
Version: FINAL

Client Phone: 604-689-9460

Certificate of Analysis

Lab Work Order #: L1053843

Project P.O. #: NOT SUBMITTED
Job Reference: HOPE BAY 1009-008-002
C of C Numbers:
Legal Site Desc:

Amber Springer
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1053843-2	L1053843-3	L1053843-4	L1053843-6	L1053843-7
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	20-FEB-11	26-FEB-11	20-FEB-11	20-FEB-11	26-FEB-11
	Sampled Time					
	Client ID	24943	27443	27433	27715	27727
Grouping	**Analyte**					
FILTER						
Particulates	Particulate - PM2.5 (ug)				180	97
	Particulate - PM2.5 (ug/m3)				7.9	4.2
	Particulate - PM10 (ug/m3)			9.1		
	Total Suspended Particulate (ug)	127	150			
	Total Suspended Particulate (ug/m3)	5.0	5.9			

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1053843-2	L1053843-3	L1053843-6	L1053843-7	
	Description	WATER	WATER	WATER	WATER	
	Sampled Date	20-FEB-11	26-FEB-11	20-FEB-11	26-FEB-11	
	Sampled Time					
	Client ID	24943	27443	27715	27727	
Grouping	**Analyte**					
MISC.						
Field Tests	Air Volume, Client Supplied (L)	25400	25300	22800	22800	

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
AIR VOLUME-VA	Misc.	Air volume (L)	HYGIENE METHOD
PART-PM10-VA	Filter	Total Particulate (PM10) by Gravimetric	BCMOE METHOD

Total Particulate Matter (PM10) Method analysis is carried out in accordance with the BCMOE Lab Manual, Section G Air Constituents - Inorganics, "Total Particulate - PM10/PM02 - 47mm - HiVol" method. ALS provides pre-weighed filters (Pallflex TX40 HI20-WW 47mm) and clients typically sample using a "Partisol Model 2000 Air Sampler" as per U.S. EPA Reference Method RFPS-0694-098, fitted with a PM10 inlet. The particulate matter is determined gravimetrically.

PART-PM2.5-VA	Filter	Total Particulate (PM2.5) by Gravimetric	BCMOE METHOD

Total Particulate Matter (PM2.5) Method analysis is carried out in accordance with the BCMOE Lab Manual, Section G Air Constituents - Inorganics, "Total Particulate - PM10/PM02 - 47mm - HiVol" method. ALS provides pre-weighed filters (Pallflex TX40 HI20-WW 47mm) and clients typically sample using a "Partisol Model 2000 Air Sampler" as per U.S. EPA Reference Method RFPS-0694-098, fitted with a PM2.5 inlet. The particulate matter is determined gravimetrically.

PART-TSP-VA	Filter	Total Particulate (TSP) by Gravimetric	BCMOE METHOD

Total Suspended Particulate Matter (TSP) Method of analysis is modified from the BCMOE Lab Manual, Section G Air Constituents - Inorganics, "Total Particulate - PM10/PM02 - 47mm - HiVol" method. ALS provides pre-weighed filters (Pallflex TX40 HI20-WW 47mm) and clients typically sample using a "Partisol Model 2000 Air Sampler" as per U.S. EPA Reference Method RFPS-0694-098, fitted with a TSP inlet. The particulate matter is determined gravimetrically.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

ALS

CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM

CANADA TOLL FREE 1-800-668-9878

www.alsenviro.com

L1053843-COFC

REPORT TO:		REPORT FORMAT / DISTRIBUTION		SERVICE REQUESTED	
COMPANY:	Rescan Environmental Services Ltd.	HARDCOPY:	STANDARD	REGULAR SERVICE (DEFAULT)	X
CONTACT:	Tolga Olcay	ELECTRONIC	PDF and EXCEL	PRIORITY SERVICE (2-3 DAYS)	
ADDRESS:	6th Flr, 1111 West Hastings Street	EMAIL 1:	tolcay@rescan.com	EMERGENCY SERVICE (1-2 DAY / WEEKEND)	
CITY/ PROV	Vancouver, BC V6E 2J3	EMAIL 2:		OTHER (<1 DAY / WEEKEND) - CONTACT ALS	
PHONE: 604-689-9460	604-689-4277			ANALYSIS REQUEST	

INVOICE TO: SAME AS REPORT ? YES / NO		CLIENT / PROJECT INFORMATION:	
COMPANY:	SAME AS ABOVE		
CONTACT:		JOB #:	Hope Bay 1009-008-002
ADDRESS:		PO /AFE:	
CITY/ PROV		Legal Site Description:	
PHONE:	FAX	QUOTE #:	
Lab Work Order # (lab use only)	L1053843	ALS CONTACT	

Please indicate below Filtered, Preserved or both (F, P, F/P)

Sample #	SAMPLE IDENTIFICATION (This description will appear on the report)	DATE (dd-mmm-yy)	TIME (hh:mm)	SAMPLE TYPE	TSP	PM10	PM2.5											NUMBER OF CONTAINERS
	rp 058031	Feb 14, 2011		Water	x					Vol=25.3 m3								
	24943	Feb 20, 2011		Water	x					Voll=25.4m3								
	27443	feb 26, 2011		Water	x					Vol=25.3m3								
	27433	Feb 20, 2011		Water		x				Vol=2.4m3								
	rp 084092	Feb 14, 2011		Water			x			Vol=22.8m3								
	27715	Feb 20, 2011		Water			x			Vol=22.8m4								
	27727	feb 26, 2011		Water			x			Vol=22.8m5								
	rp 090549	Feb14, 2011		Water	DAMAGED PM10 FILTER													
				Water														
				Water														

GUIDELINES / REGULATIONS	SPECIAL INSTRUCTIONS / HAZARDOUS DETAILS
	Use Partisol 2025 D calculation instructions for PM2.5 and PM10 filters

Failure to complete all portions of this form may delay analysis. Please fill in this form *LEGIBLY*. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified below.

RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:	SAMPLE CONDITION (lab use only)	
TOLGA		Mani Sept 2nd 11 13:30		TEMPERATURE	SAMPLES RECEIVED IN GOOD CONDITION ?
RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:		If NO, Explain

2°C

Appendix 2

Dustfall and Passive Ambient Air Quality Laboratory Results

Rescan™
Engineers and Scientists

Maxxam

Your Project #: 1009-002-02
Site: HOPE BAY (BOSTON/DORIS)

Attention: TOLGA OLCAY
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2011/03/04

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B111200
Received: 2011/02/11, 14:08

Sample Matrix: Air
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total & Fixed Dustfall	2	2011/02/18	2011/02/18	EINDSOP-00180	AMD 32020
Determination of Dustfall-mg/cm2/30 days	2	2011/02/18	2011/02/18		see departement
Exposure (Number of days)	2	2011/02/15	2011/02/15		see department
NO2 Passive Analysis (1)	3	2011/02/16	2011/03/04	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	3	2011/02/18	2011/03/04	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	3	2011/02/18	2011/03/04	EINDSOP-00149	Tang Passive SO2 in

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

LEVI MANCHAK,
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B111200
Report Date: 2011/03/04

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 1009-002-02
Site Reference: HOPE BAY (BOSTON/DORIS)
Sampler Initials: JT

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		Z85622	Z85624	Z85626		
Sampling Date		2011/01/10 14:45	2011/01/11 10:35	2011/01/11 10:35		
	Units	**11DORIS-001**	**11BOSTON-001**	**11BOSTOND-001**	**RDL**	**QC Batch**
Industrial						
Exposure	days	20	21		1	4635415
Dustfall Determination						
Total Dustfall	mg	5	5		1	4647172
Total Dustfall (30 day)	mg/cm2/30day	0.092	0.087		0.001	4647173
Total Fixed Dustfall	mg	4	3		1	4647172
Total Fixed Dustfall (30 day)	mg/cm2/30day	0.073	0.052		0.001	4647173
Passive Monitoring						
Calculated NO2	ppb	2.1	2.9	2.8	0.1	4638238
Calculated O3	ppb	31.1	34.4	33.3	0.1	4647026
Calculated SO2	ppb	<0.1	<0.1	<0.1	0.1	4646677

RDL = Reportable Detection Limit

Maxxam

Maxxam Job #: B111200
Report Date: 2011/03/04

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 1009-002-02
Site Reference: HOPE BAY (BOSTON/DORIS)
Sampler Initials: JT

General Comments

Exposure Dates:
11Doris-001: 2011/01/10 - 2011/01/30
11Boston-001: 2011/01/11 - 2011/02/01
11BostonDUP-001: 2011/01/11 - 2011/02/01

No Blanks returned. Lab blanks utilized for all parameters. - DF

All DUSTFALL samples with the Summer solution.-OZ

Results relate only to the items tested.

RESCAN ENVIRONMENTAL SERVICES LTD.
Attention: TOLGA OLCAY
Client Project #: 1009-002-02
P.O. #:
Site Reference: HOPE BAY (BOSTON/DORIS)

Quality Assurance Report

Maxxam Job Number: PB111200

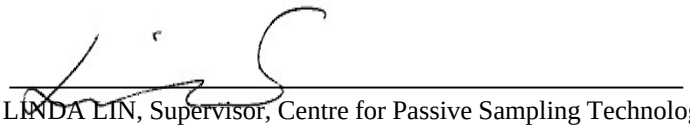
QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
4638238	DF4	Calibration Check	Calculated NO2	2011/02/16		99	%	76 - 118
		Spiked Blank	Calculated NO2	2011/02/16		99	%	N/A
		Method Blank	Calculated NO2	2011/02/16	<0.1		ppb	
4646677	DF4	Calibration Check	Calculated SO2	2011/02/18		101	%	95 - 105
		Spiked Blank	Calculated SO2	2011/02/18		99	%	N/A
		Method Blank	Calculated SO2	2011/02/18	<0.1		ppb	
4647026	OZ	Calibration Check	Calculated O3	2011/02/18		100	%	91 - 107
		Spiked Blank	Calculated O3	2011/02/18		100	%	N/A
		Method Blank	Calculated O3	2011/02/18	<0.1		ppb	
4647172	OZ	Calibration Check	Total Dustfall	2011/02/18		101	%	N/A
		Method Blank	Total Dustfall	2011/02/18	<1		mg	
			Total Fixed Dustfall	2011/02/18	<1		mg	

Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Validation Signature Page

Maxxam Job #: B111200

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



LINDA LIN, Supervisor, Centre for Passive Sampling Technology

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Your Project #: 1009-002-02
Site: HOPE BAY (BOSTON/DORIS)

Attention: TOLGA OLCAY
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2011/03/24

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B120749
Received: 2011/03/16, 14:30

Sample Matrix: Air
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total & Fixed Dustfall	2	2011/03/23	2011/03/23	EINDSOP-00180	AMD 32020
Determination of Dustfall-mg/cm2/30 days	2	2011/03/23	2011/03/23		see departement
Exposure (Number of days)	2	2011/03/23	2011/03/23		see department
NO2 Passive Analysis (1)	3	2011/03/21	2011/03/24	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	3	2011/03/23	2011/03/24	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	3	2011/03/23	2011/03/24	EINDSOP-00149	Tang Passive SO2 in

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

LEVI MANCHAK,
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

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Total cover pages: 1

Maxxam Job #: B120749
Report Date: 2011/03/24

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 1009-002-02
Site Reference: HOPE BAY (BOSTON/DORIS)
Sampler Initials: JT

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		AD6444	AD6445	AD6447		
Sampling Date		2011/01/30 15:30	2011/02/01 14:00	2011/02/01 14:00		
	Units	**11DORIS-002**	**11BOSTON-002**	**11BOSTOND-002**	**RDL**	**QC Batch**
Industrial						
Exposure	days	35	32		1	4726852
Dustfall Determination						
Total Dustfall	mg	12	3		2	4726849
Total Dustfall (30 day)	mg/cm2/30day	0.126	0.038		0.002	4726850
Total Fixed Dustfall	mg	9	<2		2	4726849
Total Fixed Dustfall (30 day)	mg/cm2/30day	0.094	0.013		0.002	4726850
Passive Monitoring						
Calculated NO2	ppb	2.6	3.7	3.7	0.1	4719596
Calculated O3	ppb	31.0	33.4	31.6	0.1	4726832
Calculated SO2	ppb	<0.1	<0.1	<0.1	0.1	4726754

RDL = Reportable Detection Limit

Maxxam Job #: B120749
Report Date: 2011/03/24

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 1009-002-02
Site Reference: HOPE BAY (BOSTON/DORIS)
Sampler Initials: JT

General Comments

All samples with the Propanol solution.
Sample Exposure Times:
Feb. 1, 2011 - Mar. 6, 2011

Results relate only to the items tested.

RESCAN ENVIRONMENTAL SERVICES LTD.
Attention: TOLGA OLCAY
Client Project #: 1009-002-02
P.O. #:
Site Reference: HOPE BAY (BOSTON/DORIS)

Quality Assurance Report

Maxxam Job Number: PB120749

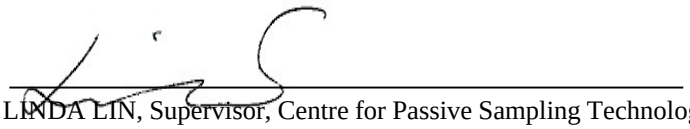
QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
4719596	DF4	Calibration Check	Calculated NO2	2011/03/21		100	%	76 - 118
		Spiked Blank	Calculated NO2	2011/03/21		100	%	N/A
		Method Blank	Calculated NO2	2011/03/21	<0.1		ppb	
4726754	DF4	Calibration Check	Calculated SO2	2011/03/23		100	%	95 - 105
		Spiked Blank	Calculated SO2	2011/03/23		100	%	N/A
		Method Blank	Calculated SO2	2011/03/23	<0.1		ppb	
4726832	OZ	Calibration Check	Calculated O3	2011/03/23		102	%	91 - 107
		Spiked Blank	Calculated O3	2011/03/23		100	%	N/A
		Method Blank	Calculated O3	2011/03/23	<0.1		ppb	
4726849	OZ	Calibration Check	Total Dustfall	2011/03/23		101	%	N/A
		Method Blank	Total Dustfall	2011/03/23	<1		mg	
			Total Fixed Dustfall	2011/03/23	<1		mg	

Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Validation Signature Page

Maxxam Job #: B120749

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



LINDA LIN, Supervisor, Centre for Passive Sampling Technology

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Maxxam

Your Project #: 1009-002-02
Site: HOPE BAY (BOSTON/DORIS)

Attention: TOLGA OLCAY
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2011/04/27

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B130168
Received: 2011/04/15, 14:47

Sample Matrix: Air
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total & Fixed Dustfall	2	2011/04/27	2011/04/27	EINDSOP-00180	AMD 32020
Determination of Dustfall-mg/cm2/30 days	2	2011/04/27	2011/04/27		see departement
Exposure (Number of days)	2	2011/04/27	2011/04/27		see department
NO2 Passive Analysis (1)	3	2011/04/27	2011/04/27	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	3	2011/04/21	2011/04/27	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	3	2011/04/27	2011/04/27	EINDSOP-00149	Tang Passive SO2 in

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

LEVI MANCHAK,
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

==========

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Total cover pages: 1

Maxxam Job #: B130168
Report Date: 2011/04/27

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 1009-002-02
Site Reference: HOPE BAY (BOSTON/DORIS)
Sampler Initials: JK

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		AI6024	AI6025	AI6027		
Sampling Date		2011/03/06 17:00	2011/03/06 12:30	2011/03/06 12:30		
	Units	**11DORIS-003**	**11BOSTON-003**	**11BOSTOND-003**	**RDL**	**QC Batch**
Industrial						
Exposure	days	35	33		1	4813042
Dustfall Determination						
Total Dustfall	mg	10	<2		2	4813039
Total Dustfall (30 day)	mg/cm2/30day	0.104	0.013		0.001	4813040
Total Fixed Dustfall	mg	7	<2		2	4813039
Total Fixed Dustfall (30 day)	mg/cm2/30day	0.078	<0.001		0.001	4813040
Passive Monitoring						
Calculated NO2	ppb	2.0	1.6	1.6	0.1	4812734
Calculated O3	ppb	31.8	35.9	33.2	0.1	4802572
Calculated SO2	ppb	0.2	0.3	0.3	0.1	4812721

RDL = Reportable Detection Limit

Maxxam Job #: B130168
Report Date: 2011/04/27

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 1009-002-02
Site Reference: HOPE BAY (BOSTON/DORIS)
Sampler Initials: JK

General Comments

Used 2-Propanol for dustfall. SS

Results relate only to the items tested.

RESCAN ENVIRONMENTAL SERVICES LTD.
Attention: TOLGA OLCAY
Client Project #: 1009-002-02
P.O. #:
Site Reference: HOPE BAY (BOSTON/DORIS)

Quality Assurance Report

Maxxam Job Number: PB130168

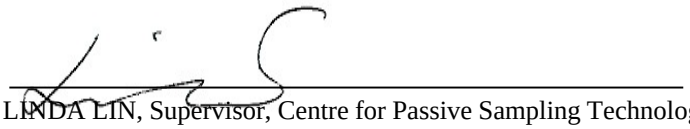
QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
4802572	SS6	Calibration Check	Calculated O3	2011/04/21		100	%	91 - 107
		Spiked Blank	Calculated O3	2011/04/21		100	%	N/A
		Method Blank	Calculated O3	2011/04/21	<0.1		ppb	
4812721	DF4	Calibration Check	Calculated SO2	2011/04/27		99	%	95 - 105
		Spiked Blank	Calculated SO2	2011/04/27		101	%	N/A
		Method Blank	Calculated SO2	2011/04/27	<0.1		ppb	
4812734	DF4	Calibration Check	Calculated NO2	2011/04/27		99	%	76 - 118
		Spiked Blank	Calculated NO2	2011/04/27		102	%	N/A
		Method Blank	Calculated NO2	2011/04/27	<0.1		ppb	
4813039	SS6	Calibration Check	Total Dustfall	2011/04/27		104	%	N/A
		Method Blank	Total Dustfall	2011/04/27	<1		mg	
			Total Fixed Dustfall	2011/04/27	<1		mg	
		RPD [AI6024-01]	Total Dustfall	2011/04/27	NC		%	N/A
			Total Fixed Dustfall	2011/04/27	NC		%	N/A

N/A = Not Applicable
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Validation Signature Page

Maxxam Job #: B130168

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



LINDA LIN, Supervisor, Centre for Passive Sampling Technology

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Your Project #: 1009-002-02
Site: HOPE BAY (BOSTON/DORIS)

Attention: TOLGA OLCAY
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2011/05/27

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B141231
Received: 2011/05/19, 13:28

Sample Matrix: Air
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total & Fixed Dustfall	2	2011/05/27	2011/05/27	EINDSOP-00180	AMD 32020
Determination of Dustfall-mg/cm2/30 days	2	2011/05/27	2011/05/27		see departement
Exposure (Number of days)	2	2011/05/27	2011/05/27		see department
NO2 Passive Analysis (1)	3	2011/05/26	2011/05/27	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	3	2011/05/24	2011/05/27	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	3	2011/05/27	2011/05/27	EINDSOP-00149	Tang Passive SO2 in

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Customer Service
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

==========

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Total cover pages: 1

Maxxam Job #: B141231
Report Date: 2011/05/27

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 1009-002-02
Site Reference: HOPE BAY (BOSTON/DORIS)
Sampler Initials: JK

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		AO3039	AO3040	AO3042		
Sampling Date		2011/04/10 17:25	2011/04/09 08:45	2011/04/09 08:45		
	Units	**11DORIS-004**	**11BOSTON-004**	**11BOSTOND-004**	**RDL**	**QC Batch**
Industrial						
Exposure	days	19	24		1	4885012
Dustfall Determination						
Total Dustfall	mg	4	2		2	4885009
Total Dustfall (30 day)	mg/cm2/30day	0.070	0.037		0.002	4885010
Total Fixed Dustfall	mg	2	<2		2	4885009
Total Fixed Dustfall (30 day)	mg/cm2/30day	0.046	0.018		0.002	4885010
Passive Monitoring						
Calculated NO2	ppb	0.1	0.5	0.2	0.1	4881817
Calculated O3	ppb	21.9	22.4	22.7	0.1	4875172
Calculated SO2	ppb	<0.1	<0.1	0.2	0.1	4884958

RDL = Reportable Detection Limit

Maxxam Job #: B141231
Report Date: 2011/05/27

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 1009-002-02
Site Reference: HOPE BAY (BOSTON/DORIS)
Sampler Initials: JK

General Comments

All DUSTFALL samples with the Propanol solution. - OZ

Results relate only to the items tested.

RESCAN ENVIRONMENTAL SERVICES LTD.
Attention: TOLGA OLCAY
Client Project #: 1009-002-02
P.O. #:
Site Reference: HOPE BAY (BOSTON/DORIS)

Quality Assurance Report

Maxxam Job Number: PB141231

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
4875172	OZ	Calibration Check	Calculated O3	2011/05/24		98	%	91 - 107
		Spiked Blank	Calculated O3	2011/05/24		99	%	N/A
		Method Blank	Calculated O3	2011/05/24	<0.1		ppb	
4881817	DF4	Calibration Check	Calculated NO2	2011/05/26		101	%	76 - 118
		Spiked Blank	Calculated NO2	2011/05/26		96	%	N/A
		Method Blank	Calculated NO2	2011/05/26	<0.1		ppb	
4884958	DF4	Calibration Check	Calculated SO2	2011/05/27		102	%	95 - 105
		Spiked Blank	Calculated SO2	2011/05/27		99	%	N/A
		Method Blank	Calculated SO2	2011/05/27	<0.1		ppb	
4885009	OZ	Calibration Check	Total Dustfall	2011/05/27		103	%	N/A
		Method Blank	Total Dustfall	2011/05/27	<1		mg	
			Total Fixed Dustfall	2011/05/27	<1		mg	
		RPD [AO3039-01]	Total Dustfall	2011/05/27	NC		%	N/A
			Total Fixed Dustfall	2011/05/27	NC		%	N/A

N/A = Not Applicable
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Validation Signature Page

Maxxam Job #: B141231

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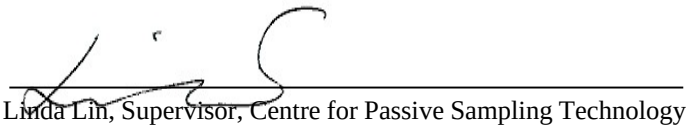

Linda Lin, Supervisor, Centre for Passive Sampling Technology

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Your Project #: 1009-002-02
Site Location: HOPE BAY (BOSTON/DORIS)

Attention: TOLGA OLCAY
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2011/08/29

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B174664
Received: 2011/08/15, 08:08

Sample Matrix: Air
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total & Fixed Dustfall	2	2011/08/26	2011/08/26	EINDSOP-00180	AMD 32020
Determination of Dustfall-mg/cm2/30 days	2	2011/08/26	2011/08/26		see departement
Exposure (Number of days)	2	2011/08/17	2011/08/17		see department
NO2 Passive Analysis (1)	2	2011/08/26	2011/08/26	EINDSOP-00148	Tang Passive NO2 in
NO2 Passive Analysis (1)	1	2011/08/26	2011/08/29	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	2	2011/08/24	2011/08/26	EINDSOP-00197	EPA 300 R2.1
O3 Passive Analysis (1)	1	2011/08/24	2011/08/29	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	2	2011/08/24	2011/08/26	EINDSOP-00149	Tang Passive SO2 in
SO2 Passive Analysis (1)	1	2011/08/24	2011/08/29	EINDSOP-00149	Tang Passive SO2 in

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Customer Service
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B174664
Report Date: 2011/08/29

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 1009-002-02
Site Location: HOPE BAY (BOSTON/DORIS)
Sampler Initials: JK

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		BG2695		BG2696	BG2713		
Sampling Date		2011/06/02 11:20		2011/06/05 10:00	2011/06/05 10:00		
	Units	**11DORIS-006**	**RDL**	**11BOSTON-006**	**11BOSTOND-006**	**RDL**	**QC Batch**
Industrial							
Exposure	days	32	1	27		1	5081527
Dustfall Determination							
Total Dustfall	mg	10	3	8		2	5126138
Total Dustfall (30 day)	mg/cm2/30day	0.109	0.003	0.102		0.002	5126139
Total Fixed Dustfall	mg	8	3	5		2	5126138
Total Fixed Dustfall (30 day)	mg/cm2/30day	0.087	0.003	0.061		0.002	5126139
Passive Monitoring							
Calculated NO2	ppb	0.5	0.1	1.4	1.7	0.1	5125580
Calculated O3	ppb	24.3	0.1	22.9	25.2	0.1	5117139
Calculated SO2	ppb	<0.1	0.1	<0.1	<0.1	0.1	5119081

RDL = Reportable Detection Limit

Maxxam Job #: B174664
Report Date: 2011/08/29

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 1009-002-02
Site Location: HOPE BAY (BOSTON/DORIS)
Sampler Initials: JK

General Comments

Results relate only to the items tested.

RESCAN ENVIRONMENTAL SERVICES LTD.
Attention: TOLGA OLCAY
Client Project #: 1009-002-02
P.O. #:
Site Location: HOPE BAY (BOSTON/DORIS)

Quality Assurance Report

Maxxam Job Number: PB174664

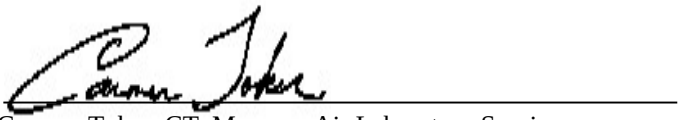
QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5117139	OZ	Calibration Check	Calculated O3	2011/08/24		101	%	91 - 107
		Spiked Blank	Calculated O3	2011/08/24		100	%	N/A
		Method Blank	Calculated O3	2011/08/24	<0.1		ppb	
5119081	DF4	Calibration Check	Calculated SO2	2011/08/24		100	%	95 - 105
		Spiked Blank	Calculated SO2	2011/08/24		101	%	N/A
		Method Blank	Calculated SO2	2011/08/24	<0.1		ppb	
5125580	DF4	Calibration Check	Calculated NO2	2011/08/26		100	%	76 - 118
		Spiked Blank	Calculated NO2	2011/08/26		102	%	N/A
		Method Blank	Calculated NO2	2011/08/26	<0.1		ppb	
5126138	OZ	Calibration Check	Total Dustfall	2011/08/26		101	%	N/A
		Method Blank	Total Dustfall	2011/08/26	<1		mg	
			Total Fixed Dustfall	2011/08/26	<1		mg	
		RPD [BG2695-01]	Total Dustfall	2011/08/26	NC		%	N/A
			Total Fixed Dustfall	2011/08/26	NC		%	N/A

N/A = Not Applicable
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Validation Signature Page

Maxxam Job #: B174664

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Carmen Toker, CT, Manager Air Laboratory Services

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Your Project #: 1009-002-02
Site Location: HOPE BAY (BOSTON/DORIS)

Attention: TOLGA OLCAY
RESCAN ENVIRONMENTAL SERVICES LTD.
SIXTH FLOOR
1111 WEST HASTINGS STREET
VANCOUVER, BC
CANADA V6E 2J3

Report Date: 2011/08/26

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B174668
Received: 2011/08/15, 08:23

Sample Matrix: Air
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total & Fixed Dustfall	2	2011/08/26	2011/08/26	EINDSOP-00180	AMD 32020
Determination of Dustfall-mg/cm2/30 days	2	2011/08/26	2011/08/26		see departement
Exposure (Number of days)	2	2011/08/17	2011/08/17		see department
NO2 Passive Analysis (1)	3	2011/08/26	2011/08/26	EINDSOP-00148	Tang Passive NO2 in
O3 Passive Analysis (1)	3	2011/08/24	2011/08/26	EINDSOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	3	2011/08/24	2011/08/26	EINDSOP-00149	Tang Passive SO2 in

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) The detection limit is based on a 30 day sampling period.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Levi Manchak, Customer Service
Email: LManchak@maxxam.ca
Phone# (780) 378-8500

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Total cover pages: 1

Maxxam Job #: B174668
Report Date: 2011/08/26

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 1009-002-02
Site Location: HOPE BAY (BOSTON/DORIS)
Sampler Initials: JK

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		BG2717	BG2718	BG2720		
Sampling Date		2011/07/05 10:00	2011/07/02 17:40	2011/07/02 17:40		
	Units	**11DORIS-007**	**11BOSTON-007**	**11BOSTOND-007**	**RDL**	**QC Batch**
Industrial						
Exposure	days	30	30		1	5081527
Dustfall Determination						
Total Dustfall	mg	19	13		1	5126145
Total Dustfall (30 day)	mg/cm2/30day	0.228	0.154		0.001	5126146
Total Fixed Dustfall	mg	7	9		1	5126145
Total Fixed Dustfall (30 day)	mg/cm2/30day	0.088	0.110		0.001	5126146
Passive Monitoring						
Calculated NO2	ppb	0.4	0.9	0.9	0.1	5125580
Calculated O3	ppb	24.5	24.2	23.4	0.1	5117139
Calculated SO2	ppb	0.4	<0.1	DAMAGED	0.1	5119081

RDL = Reportable Detection Limit

Maxxam Job #: B174668
Report Date: 2011/08/26

RESCAN ENVIRONMENTAL SERVICES LTD.
Client Project #: 1009-002-02
Site Location: HOPE BAY (BOSTON/DORIS)
Sampler Initials: JK

General Comments

Sample: BG2720 was returned to the lab damaged. - DF

Results relate only to the items tested.

RESCAN ENVIRONMENTAL SERVICES LTD.
Attention: TOLGA OLCAY
Client Project #: 1009-002-02
P.O. #:
Site Location: HOPE BAY (BOSTON/DORIS)

Quality Assurance Report

Maxxam Job Number: PB174668

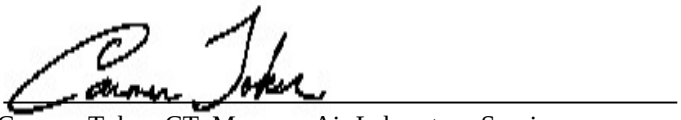
QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
5117139	OZ	Calibration Check	Calculated O3	2011/08/24		101	%	91 - 107
		Spiked Blank	Calculated O3	2011/08/24		100	%	N/A
		Method Blank	Calculated O3	2011/08/24	<0.1		ppb	
5119081	DF4	Calibration Check	Calculated SO2	2011/08/24		100	%	95 - 105
		Spiked Blank	Calculated SO2	2011/08/24		101	%	N/A
		Method Blank	Calculated SO2	2011/08/24	<0.1		ppb	
5125580	DF4	Calibration Check	Calculated NO2	2011/08/26		100	%	76 - 118
		Spiked Blank	Calculated NO2	2011/08/26		102	%	N/A
		Method Blank	Calculated NO2	2011/08/26	<0.1		ppb	
5126145	OZ	Calibration Check	Total Dustfall	2011/08/26		101	%	N/A
		Method Blank	Total Dustfall	2011/08/26	<1		mg	
			Total Fixed Dustfall	2011/08/26	<1		mg	

Calibration Check: A calibration standard analyzed at different times to evaluate on-going calibration accuracy.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Validation Signature Page

Maxxam Job #: B174668

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Carmen Toker, CT, Manager Air Laboratory Services

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RESCAN ENVIRONMENTAL SERVICES
ATTN: Tolga Olcay
Sixth Floor
1111 West Hastings Street
Vancouver BC V6E 2J3

Date Received: 17-JUN-11
Report Date: 28-JUN-11 14:46 (MT)
Version: FINAL

Client Phone: 604-689-9460

Certificate of Analysis

Lab Work Order #: L1019622
Project P.O. #: NOT SUBMITTED
Job Reference: 1009-008-02 HOPE BAY BASELINE & CONSTRUCTION DUSTFALL
Legal Site Desc:
C of C Numbers:

Amber Springer
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1019622-1 DUSTFALL 04-JUN-11 12:00 DF1A	L1019622-2 DUSTFALL 04-JUN-11 12:00 DF1B	L1019622-3 DUSTFALL 06-JUN-11 13:30 DF2A	L1019622-4 DUSTFALL 06-JUN-11 13:30 DF2B	L1019622-5 DUSTFALL 04-JUN-11 12:16 DF3A
Sample ID						
Description						
Sampled Date						
Sampled Time						
Client ID						
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.16	<0.10	<0.10	0.57	<0.10
	Total Insoluble Dustfall (mg/dm2.day)	0.12	<0.10	<0.10	0.26	<0.10
	Total Soluble Dustfall (mg/dm2.day)	<0.10	<0.10	<0.10	0.31	0.10
Anions and Nutrients	Ammonia (as N) (mg/dm2.day)	0.000042	0.000207	0.000419	0.000073	0.000058
	Chloride (Cl) (mg/dm2.day)	0.0023	<0.0054	<0.0047	0.0031	0.0013
	Nitrate (as N) (mg/dm2.day)	0.000500	0.000978	0.000734	0.000505	0.000357
	Sulfate (SO4) (mg/dm2.day)	0.0015	0.0063	0.0056	<0.0022	0.0016
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00115	0.000343	0.00117	0.00169	0.000116
	Antimony (Sb)-Total (mg/dm2.day)	<0.00000026	<0.0000011	0.00000239	<0.00000045	<0.00000024
	Arsenic (As)-Total (mg/dm2.day)	0.0000113	<0.0000011	<0.00000094	0.0000157	0.0000104
	Barium (Ba)-Total (mg/dm2.day)	0.00000753	0.0000172	0.0000112	0.00000968	0.00000230
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000013	<0.0000054	<0.0000047	<0.0000022	<0.0000012
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000013	<0.0000054	<0.0000047	<0.0000022	<0.0000012
	Boron (B)-Total (mg/dm2.day)	<0.000026	<0.00011	<0.000094	<0.000045	0.000024
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000043	0.00000192	<0.00000047	0.00000046	0.00000044
	Calcium (Ca)-Total (mg/dm2.day)	0.00746	0.0233	0.00627	0.0205	0.00071
	Chromium (Cr)-Total (mg/dm2.day)	0.0000086	<0.0000054	0.0000080	0.0000094	0.0000033
	Cobalt (Co)-Total (mg/dm2.day)	0.00000115	0.0000012	0.00000128	0.00000188	<0.00000024
	Copper (Cu)-Total (mg/dm2.day)	0.0000166	0.0000768	0.0000571	0.0000219	0.0000204
	Iron (Fe)-Total (mg/dm2.day)	0.00164	0.00050	0.00179	0.00308	0.000151
	Lead (Pb)-Total (mg/dm2.day)	0.00000020	0.00000459	0.00000149	0.00000169	0.00000052
	Lithium (Li)-Total (mg/dm2.day)	<0.000013	<0.000054	<0.000047	<0.000022	<0.000012
	Magnesium (Mg)-Total (mg/dm2.day)	0.00099	0.0011	0.00126	0.00191	0.00025
	Manganese (Mn)-Total (mg/dm2.day)	0.0000653	0.000154	0.0000685	0.0000807	0.00000663
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000013	<0.0000011	<0.00000047	<0.00000022	<0.00000024
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000013	<0.00000054	<0.00000047	0.00000023	<0.00000012
	Nickel (Ni)-Total (mg/dm2.day)	0.0000040	0.0000069	<0.0000047	0.0000049	0.0000025
	Phosphorus (P)-Total (mg/dm2.day)	<0.00079	<0.0032	<0.0028	<0.0013	<0.00071
	Potassium (K)-Total (mg/dm2.day)	<0.0052	<0.021	<0.019	<0.0089	<0.0047
	Selenium (Se)-Total (mg/dm2.day)	<0.0000026	<0.000011	<0.0000094	<0.0000045	<0.0000024
	Silicon (Si)-Total (mg/dm2.day)	0.00133	0.00073	0.00174	0.00285	0.00026
	Silver (Ag)-Total (mg/dm2.day)	<0.000000026	<0.00000011	<0.000000094	<0.000000045	<0.000000024
	Sodium (Na)-Total (mg/dm2.day)	<0.0052	<0.021	<0.019	<0.0089	<0.0047
	Strontium (Sr)-Total (mg/dm2.day)	0.00000406	0.0000121	0.00000599	0.0000110	0.00000216
	Thallium (Tl)-Total (mg/dm2.day)	<0.00000026	<0.0000011	<0.00000094	<0.00000045	<0.00000024
	Tin (Sn)-Total (mg/dm2.day)	<0.00000026	0.0000047	<0.00000094	<0.00000045	<0.00000024
	Titanium (Ti)-Total (mg/dm2.day)	0.000054	<0.00011	<0.000094	0.000111	<0.000024

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1019622-6	L1019622-7	L1019622-8	L1019622-9	
Description	DUSTFALL	DUSTFALL	DUSTFALL	DUSTFALL	
Sampled Date	04-JUN-11	04-JUN-11	04-JUN-11	04-JUN-11	
Sampled Time	12:16	12:05	12:07	12:09	
Client ID	DF3B	CDF1	CDF2	CDF3	
Grouping / **Analyte**					
DUSTFALL					
Particulates					
Total Dustfall (mg/dm2.day)	0.15	<0.10	0.16	<0.10	
Total Insoluble Dustfall (mg/dm2.day)	<0.10	<0.10	<0.10	<0.10	
Total Soluble Dustfall (mg/dm2.day)	0.16	0.12	<0.10	<0.10	
Anions and Nutrients					
Ammonia (as N) (mg/dm2.day)	0.000072	0.000042	0.000319	0.000150	
Chloride (Cl) (mg/dm2.day)	<0.0026	<0.0026	<0.0062	<0.0046	
Nitrate (as N) (mg/dm2.day)	0.000417	0.000363	0.000758	0.000386	
Sulfate (SO4) (mg/dm2.day)	<0.0026	<0.0026	0.0062	<0.0046	
Metals					
Aluminum (Al)-Total (mg/dm2.day)	0.0000996	0.000169	0.000642	0.00134	
Antimony (Sb)-Total (mg/dm2.day)	<0.00000052	<0.00000052	<0.0000012	<0.00000092	
Arsenic (As)-Total (mg/dm2.day)	0.0000183	0.0000189	<0.0000012	<0.00000092	
Barium (Ba)-Total (mg/dm2.day)	0.00000463	0.00000567	0.0000180	0.00000659	
Beryllium (Be)-Total (mg/dm2.day)	<0.0000026	<0.0000026	<0.0000062	<0.0000046	
Bismuth (Bi)-Total (mg/dm2.day)	<0.0000026	<0.0000026	<0.0000062	<0.0000046	
Boron (B)-Total (mg/dm2.day)	<0.000052	<0.000052	<0.00012	<0.000092	
Cadmium (Cd)-Total (mg/dm2.day)	0.00000091	0.00000086	<0.00000062	<0.00000046	
Calcium (Ca)-Total (mg/dm2.day)	0.00111	0.00157	0.0213	0.00441	
Chromium (Cr)-Total (mg/dm2.day)	<0.0000026	<0.0000026	<0.0000062	0.0000063	
Cobalt (Co)-Total (mg/dm2.day)	<0.00000052	<0.00000052	<0.0000012	0.00000109	
Copper (Cu)-Total (mg/dm2.day)	0.0000358	0.0000187	0.0000216	0.0000671	
Iron (Fe)-Total (mg/dm2.day)	<0.00016	0.00020	0.00090	0.00157	
Lead (Pb)-Total (mg/dm2.day)	0.00000098	0.00000046	<0.00000062	0.00000213	
Lithium (Li)-Total (mg/dm2.day)	<0.000026	<0.000026	<0.000062	<0.000046	
Magnesium (Mg)-Total (mg/dm2.day)	<0.00052	<0.00052	<0.0012	0.00104	
Manganese (Mn)-Total (mg/dm2.day)	0.00000851	0.0000129	0.000145	0.0000569	
Mercury (Hg)-Total (mg/dm2.day)	<0.00000026	<0.00000026	<0.0000012	<0.00000046	
Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000026	<0.00000026	<0.00000062	<0.00000046	
Nickel (Ni)-Total (mg/dm2.day)	0.0000058	<0.0000026	<0.0000062	0.0000047	
Phosphorus (P)-Total (mg/dm2.day)	<0.0016	<0.0016	<0.0037	<0.0028	
Potassium (K)-Total (mg/dm2.day)	<0.010	<0.010	<0.025	<0.018	
Selenium (Se)-Total (mg/dm2.day)	<0.0000052	<0.0000052	<0.000012	<0.0000092	
Silicon (Si)-Total (mg/dm2.day)	<0.00026	0.00042	0.00101	0.00145	
Silver (Ag)-Total (mg/dm2.day)	<0.000000052	<0.000000052	<0.00000012	<0.000000092	
Sodium (Na)-Total (mg/dm2.day)	<0.010	<0.010	<0.025	<0.018	
Strontium (Sr)-Total (mg/dm2.day)	0.00000360	0.00000240	0.0000102	0.00000482	
Thallium (Tl)-Total (mg/dm2.day)	<0.00000052	<0.00000052	<0.0000012	<0.00000092	
Tin (Sn)-Total (mg/dm2.day)	<0.00000052	<0.00000052	<0.0000012	<0.00000092	
Titanium (Ti)-Total (mg/dm2.day)	<0.000052	<0.000052	<0.00012	<0.000092	

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1019622-1	L1019622-2	L1019622-3	L1019622-4	L1019622-5
	Description	DUSTFALL	DUSTFALL	DUSTFALL	DUSTFALL	DUSTFALL
	Sampled Date	04-JUN-11	04-JUN-11	06-JUN-11	06-JUN-11	04-JUN-11
	Sampled Time	12:00	12:00	13:30	13:30	12:16
	Client ID	DF1A	DF1B	DF2A	DF2B	DF3A
Grouping	**Analyte**					
DUSTFALL						
Metals	Uranium (U)-Total (mg/dm2.day)	<0.000000026	<0.00000011	<0.000000094	<0.000000045	<0.000000024
	Vanadium (V)-Total (mg/dm2.day)	0.0000063	<0.000011	<0.0000094	0.0000086	<0.0000024
	Zinc (Zn)-Total (mg/dm2.day)	0.0000181	0.000121	0.000213	0.0000589	0.0000124

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1019622-6	L1019622-7	L1019622-8	L1019622-9	
	Description	DUSTFALL	DUSTFALL	DUSTFALL	DUSTFALL	
	Sampled Date	04-JUN-11	04-JUN-11	04-JUN-11	04-JUN-11	
	Sampled Time	12:16	12:05	12:07	12:09	
	Client ID	DF3B	CDF1	CDF2	CDF3	
Grouping	**Analyte**					
DUSTFALL						
Metals	Uranium (U)-Total (mg/dm2.day)	<0.000000052	<0.000000052	<0.00000012	<0.000000092	
	Vanadium (V)-Total (mg/dm2.day)	<0.0000052	<0.0000052	<0.000012	<0.0000092	
	Zinc (Zn)-Total (mg/dm2.day)	0.0000175	0.0000147	0.000089	0.000144	

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-IC-VA	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

DUSTFALLS-COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE DUSTFALLS

Dustfall analysis is carried out in accordance with procedures published by the B.C. Ministry of Environment Laboratory.

HG-DUST(DM2-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DUST(DM2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH3-F-VA	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifcially carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO3-IC-VA	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

SO4-IC-VA	Dustfall	Dustfall Sulphate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulphate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

L10196 22-COFC

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM COC #

CANADA TOLL FREE 1-800-668-9878

www.alsenviro.com

REPORT TO:		REPORT FORMAT / DISTRIBUTION		SERVICE REQUESTED	
COMPANY:	Rescan Environmental Services Ltd.	HARDCOPY:	STANDARD	REGULAR SERVICE (DEFAULT)	X
CONTACT:	[redacted]	ELECTRONIC	PDF and EXCEL	PRIORITY SERVICE (2-3 DAYS)	
ADDRESS:	6th Flr,1111 West Hastings Street	EMAIL 1:	tolcay@rescan.com	EMERGENCY SERVICE (1-2 DAY / WEEKEND)	
CITY/ PROV	Vancouver, BC V6E 2J3	EMAIL 2:	dgriffin@rescan.com	OTHER (<1 DAY / WEEKEND) - CONTACT ALS	
PHONE:	604-689-9460 Fax 604-689-4277	[redacted]		ANALYSIS REQUEST	
INVOICE TO:	SAME AS REPORT ? YES / NO			Please indicate below Filtered. Preserved or both (F, P, F/P)	
COMPANY:	SAME AS ABOVE	CLIENT / PROJECT INFORMATION:			
CONTACT:	[redacted]	JOB #:	1009-002-02		
ADDRESS:	[redacted]	PO /AFE:	[redacted]		
CITY/ PROV	[redacted]	Legal Site Description:			
PHONE:	[redacted] FAX [redacted]	QUOTE #:	[redacted]		
Lab Work Order #(lab use only)	L10196 22	ALS CONTACT			

Sample #	SAMPLE IDENTIFICATION (This description will appear on the report)	DATE (dd-mmm-yy)	TIME (hh:mm)	SAMPLE TYPE	Total, Soluble, Insoluble Partic	Cl, SO4, NO3, NH3	Total Mg, Ca, K	NUMBER OF CONTAINERS
[redacted]	DF1a	June 4 11	12:00	Water	X	X	X	1
[redacted]	DF1b	June 4 11	12:00	Water	X	X	X	1
[redacted]	DF2a	June 6 11	13:30	Water	X	X	X	1
[redacted]	DF2b	June 6 11	13:30	Water	X	X	X	1
[redacted]	DF3a	June 4 11	12:16	Water	X	X	X	1
[redacted]	DF3b	June 4 11	12:16	Water	X	X	X	1
[redacted]	CDF1	June 4 11	12:05	Water	X	X	X	1
[redacted]	CDF2	June 4 11	12:07	Water	X	X	X	1
[redacted]	CDF3	June 4 11	12:09	Water	X	X	X	1
[redacted]	(month installed dustfall)							

GUIDELINES / REGULATIONS	SPECIAL INSTRUCTIONS / HAZARDOUS DETAILS
	Please split the sample to analyze for different parameters

Failure to complete all portions of this form may delay analysis. Please fill in this form *LEGIBLY*. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified below.

RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:	SAMPLE CONDITION (lab use only)	
		[redacted]	Jun 7/11	TEMPERATURE	SAMPLES RECEIVED IN GOOD CONDITION ?
RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:	17.0	
			10:Bam		If NO, Explain

RESCAN ENVIRONMENTAL SERVICES
ATTN: Tolga Olcay
Sixth Floor
1111 West Hastings Street
Vancouver BC V6E 2J3

Date Received: 15-AUG-11
Report Date: 24-AUG-11 16:30 (MT)
Version: FINAL

Client Phone: 604-689-9460

Certificate of Analysis

Lab Work Order #: L1044754

Project P.O. #: NOT SUBMITTED
Job Reference: 1009-002-02
C of C Numbers:
Legal Site Desc:

Amber Springer
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1044754-1	L1044754-2	L1044754-3	L1044754-4	L1044754-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	05-JUL-11	04-AUG-11	05-JUL-11	05-JUL-11	05-JUL-11
	Sampled Time	16:45	17:00	17:15	17:30	17:30
	Client ID	DF1 (JUN4/11-JUL5/11)	DF3 (JUN4/11-JUL5/11)	CDF1 (JUN4/11-JUL5/11)	CDF2 (JUN4/11-JUL5/11)	CDF3 (JUN4/11-JUL5/11)
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	1.10	0.36	3.95	0.91	0.48
	Total Insoluble Dustfall (mg/dm2.day)	<0.10	<0.10	<0.10	<0.10	<0.10
	Total Soluble Dustfall (mg/dm2.day)	1.04	0.34	3.91	0.86	0.46
Anions and Nutrients	Ammonia (as N) (mg/dm2.day)	0.00165	0.000447	0.00071	0.00147	0.00083
	Chloride (Cl) (mg/dm2.day)	0.086	0.0463	0.406	0.080	0.082
	Nitrate (as N) (mg/dm2.day)	0.00128	0.000621	0.00123	0.00144	0.00099
	Sulfate (SO4) (mg/dm2.day)	<0.018	<0.0088	<0.020	<0.023	<0.017
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000705	0.000110	0.000226	0.00136	0.000309
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000035	<0.0000021	<0.0000040	<0.0000046	<0.0000035
	Arsenic (As)-Total (mg/dm2.day)	<0.0000035	<0.0000021	<0.0000040	<0.0000046	<0.0000035
	Barium (Ba)-Total (mg/dm2.day)	0.0000093	0.0000047	0.0000074	0.0000140	0.0000071
	Beryllium (Be)-Total (mg/dm2.day)	<0.000018	<0.000010	<0.000020	<0.000023	<0.000017
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000018	<0.000010	<0.000020	<0.000023	<0.000017
	Boron (B)-Total (mg/dm2.day)	<0.00035	<0.00021	<0.00040	<0.00046	<0.00035
	Cadmium (Cd)-Total (mg/dm2.day)	<0.0000018	0.0000011	<0.0000020	<0.0000023	<0.0000017
	Calcium (Ca)-Total (mg/dm2.day)	0.0085	<0.0010	0.0047	0.0084	0.0025
	Chromium (Cr)-Total (mg/dm2.day)	<0.000018	<0.000010	<0.000020	<0.000023	<0.000017
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000035	<0.0000021	<0.0000040	<0.0000046	<0.0000035
	Copper (Cu)-Total (mg/dm2.day)	0.000130	0.0000372	0.000286	0.0000872	0.0000643
	Iron (Fe)-Total (mg/dm2.day)	<0.0011	<0.00063	<0.0012	0.0022	<0.0010
	Lead (Pb)-Total (mg/dm2.day)	0.0000025	0.0000011	0.0000036	<0.0000023	<0.0000017
	Lithium (Li)-Total (mg/dm2.day)	<0.00018	<0.00010	<0.00020	<0.00023	<0.00017
	Magnesium (Mg)-Total (mg/dm2.day)	<0.0035	<0.0021	<0.0040	<0.0046	<0.0035
	Manganese (Mn)-Total (mg/dm2.day)	0.0000731	0.0000080	0.0000348	0.0000889	0.0000296
	Mercury (Hg)-Total (mg/dm2.day)	<0.0000035	<0.0000021	<0.0000040	<0.0000046	<0.0000035
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.0000018	<0.0000010	<0.0000020	<0.0000023	<0.0000017
	Nickel (Ni)-Total (mg/dm2.day)	<0.000018	<0.000010	<0.000020	<0.000023	<0.000017
	Phosphorus (P)-Total (mg/dm2.day)	<0.011	<0.0063	<0.012	<0.014	<0.010
	Potassium (K)-Total (mg/dm2.day)	<0.071	<0.042	<0.079	<0.092	<0.070
	Selenium (Se)-Total (mg/dm2.day)	<0.000035	<0.000021	<0.000040	<0.000046	<0.000035
	Silicon (Si)-Total (mg/dm2.day)	<0.0018	<0.0010	<0.0020	<0.0023	<0.0017
	Silver (Ag)-Total (mg/dm2.day)	<0.00000035	<0.00000021	<0.00000040	<0.00000046	<0.00000035
	Sodium (Na)-Total (mg/dm2.day)	<0.071	<0.042	<0.079	<0.092	<0.070
	Strontium (Sr)-Total (mg/dm2.day)	0.0000083	0.0000024	0.0000079	0.0000068	0.0000039
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000035	<0.0000021	<0.0000040	<0.0000046	<0.0000035
	Tin (Sn)-Total (mg/dm2.day)	<0.0000035	<0.0000021	<0.0000040	<0.0000046	<0.0000035
	Titanium (Ti)-Total (mg/dm2.day)	<0.00035	<0.00021	<0.00040	<0.00046	<0.00035

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1044754-1 WATER 05-JUL-11 16:45 DF1 (JUN4/11-JUL5/11)	L1044754-2 WATER 04-AUG-11 17:00 DF3 (JUN4/11-JUL5/11)	L1044754-3 WATER 05-JUL-11 17:15 CDF1 (JUN4/11-JUL5/11)	L1044754-4 WATER 05-JUL-11 17:30 CDF2 (JUN4/11-JUL5/11)	L1044754-5 WATER 05-JUL-11 17:30 CDF3 (JUN4/11-JUL5/11)
Sample ID		L1044754-1	L1044754-2	L1044754-3	L1044754-4	L1044754-5
Description		WATER	WATER	WATER	WATER	WATER
Sampled Date		05-JUL-11	04-AUG-11	05-JUL-11	05-JUL-11	05-JUL-11
Sampled Time		16:45	17:00	17:15	17:30	17:30
Client ID		DF1 (JUN4/11-JUL5/11)	DF3 (JUN4/11-JUL5/11)	CDF1 (JUN4/11-JUL5/11)	CDF2 (JUN4/11-JUL5/11)	CDF3 (JUN4/11-JUL5/11)
DUSTFALL						
Metals	Uranium (U)-Total (mg/dm2.day)	<0.00000035	<0.00000021	<0.00000040	<0.00000046	<0.00000035
	Vanadium (V)-Total (mg/dm2.day)	<0.000035	<0.000021	<0.000040	<0.000046	<0.000035
	Zinc (Zn)-Total (mg/dm2.day)	0.000100	0.000043	0.000105	0.000062	0.000053

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
NR:NR	No Result: Sample Not Received At Laboratory - samples # DF2a and DF2b - not received

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-IC-VA	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

DUSTFALLS-COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE DUSTFALLS

Dustfall analysis is carried out in accordance with procedures published by the B.C. Ministry of Environment Laboratory.

HG-DUST(DM2-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DUST(DM2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH3-F-VA	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifcially carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO3-IC-VA	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

SO4-IC-VA	Dustfall	Dustfall Sulphate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS

The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulphate analysis is specifcially carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

L10447 54-COFC

Environmental Division

(ALS)

CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM COC #

CANADA TOLL FREE 1-800-668-9878

www.alsenviro.com

REPORT TO:		REPORT FORMAT / DISTRIBUTION		SERVICE REQUESTED	
COMPANY:	Rescan Environmental Services Ltd.	HARDCOPY:	STANDARD	REGULAR SERVICE (DEFAULT)	X
CONTACT:	[redacted]	ELECTRONIC	PDF and EXCEL	PRIORITY SERVICE (2-3 DAYS)	
ADDRESS:	6th Flr, 1111 West Hastings Street	EMAIL 1:	tolcay@rescan.com	EMERGENCY SERVICE (1-2 DAY / WEEKEND)	
CITY/ PROV	Vancouver, BC V6E 2J3	EMAIL 2:	dgriffin@rescan.com	OTHER (<1 DAY / WEEKEND) - CONTACT ALS	
PHONE:	604-689-9460 Fax 604-689-4277	[redacted]		ANALYSIS REQUEST	
INVOICE TO:	SAME AS REPORT ? YES / NO			Please indicate below Filtered. Preserved or both (F, P, F/P)	
COMPANY:	SAME AS ABOVE	CLIENT / PROJECT INFORMATION:			
CONTACT:	[redacted]	JOB #:	1009-002-02		
ADDRESS:	[redacted]	PO /AFE:	[redacted]		
CITY/ PROV	[redacted]	Legal Site Description:	[redacted]		
PHONE:	[redacted] FAX [redacted]	QUOTE #:	[redacted]		
Lab Work Order #. (lab use only)	[redacted] L1044754	ALS CONTACT			

Sample #	SAMPLE IDENTIFICATION (This description will appear on the report)	DATE (dd-mmm-yy)	TIME (hh:mm)	SAMPLE TYPE	Total, Soluble, Insoluble Partic	Cl, SO4, NO3, NH3	Total Mg, Ca, K										NUMBER OF CONTAINERS
[redacted]	DF1a	5-Jul-2011	4:45	Water	X	X	X										1
[redacted]	DF1b	5-Jul-2011	4:45	Water	X	X	X										1
[redacted]	DF2a	4-Aug-2011	5:00	Water	X	X	X										1
[redacted]	DF2b	4-Aug-2011	5:00	Water	X	X	X										1
[redacted]	DF3a	5-Jul-2011	5:15	Water	X	X	X										1
[redacted]	DF3b	5-Jul-2011	5:15	Water	X	X	X										1
[redacted]	CDF1	5-Jul-2011	5:30	Water	X	X	X										1
[redacted]	CDF2	5-Jul-2011	5:30	Water	X	X	X										1
[redacted]	CDF3	5-Jul-2011	5:30	Water	X	X	X										1
[redacted]	(installed June 4/11)																

GUIDELINES / REGULATIONS

SPECIAL INSTRUCTIONS / HAZARDOUS DETAILS

Please split the sample to analyze for different parameters

Failure to complete all portions of this form may delay analysis. Please fill in this form *LEGIBLY*. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified below.

RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:
		KyA	Aug 15
RELINQUISHED BY:	DATE & TIME:	RECEIVED BY:	DATE & TIME:

SAMPLE CONDITION (lab use only)

TEMPERATURE	SAMPLES RECEIVED IN GOOD CONDITION ?
21°C	
[redacted]	If NO, Explain [redacted]

9:30