Appendix 6-A

Air Quality Baseline Report

DILLON CONSULTING

NWP COAL CANADA LTD

Air Quality Baseline Report

Crown Mountain Coking Coal Project

May 2020 | 12-6231

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Acronyms and Abbreviations

– A –

AIR (Application Information Requirements): Identifies the information to be provided by a proponent in an Application for an Environmental Assessment Certificate.

ASTM: American Society for Testing and Materials

– B –

BC AAQO (British Columbia Ambient Air Quality Objectives – 2020): Air quality objectives that are non-statutory limits (i.e. not legally binding)

BC AQDMG: British Columbia Air Quality Dispersion Modelling Guidelines

BC MOE: Ministry of Environment – Government of B.C

– C –

CS (Climate Station): A facility, either on land or sea, with instruments and equipment for measuring atmospheric conditions to provide information for weather forecasts and to study the weather and climate.

– E –

EA (Environmental Assessment): Is a planning tool used to ensure that projects are considered in a careful and precautionary manner in order to avoid or mitigate possible environmental effects and to encourage decision makers to take actions that promote sustainable development. [1]

EIS (Environmental Impact Statement): A document prepared to describe the effects for proposed activities on the environment.

EPA (Environmental Protection Agency): Is an independent agency of the United States federal government for environmental protection.

[1] Government of Canada, (2015). *Draft Guidelines for the preparation of an environmental impact statement*

– G –

GHG: Greenhouse Gas

– M –

m asl(Meters above sea level): represented as a unit of measure.

Mt CO_2e (metric tonnes of CO_2 equivalents): Carbon dioxide equivalents of greenhouse gases derived by multiplying a gasses global warming potential by the tonnes of gas emitted. This unit is used for the purpose of greenhouse gas quantification.

– P –

PM: Particulate Matter

$PM_{2.5}$ (Fine Particulate Matter): Refers to tiny particles or droplets in the air that are =< 2.5 µm in width/diameter.

PM_{10} (Particulate Matter): Refers to tiny particles or droplets in the air that are =< 10 µm in width/diameter.

Executive Summary

An air quality baseline assessment was completed by Dillon Consulting Limited (Dillon) to support the provincial and federal requirements outlined in the Application Information Requirements (AIR)[2] and the Environmental Impact Statement (EIS)[3] Guidelines for the Crown Mountain Coking Coal Project (the Project).

Data presented for the baseline program will be used in conjunction with estimated Project emissions to quantify potential incremental impacts in air quality anticipated over the course of the Project. The AIR details the receptor and intermediate components that relate to air quality. In particular, air quality is an intermediate component on the pathway to potential effects for several Project receptor Valued Components (VCs).

To quantify potential incremental impacts, four (4) main scopes of work were completed in the baseline air quality report: Evaluation of the Baseline Data (Common Air Contaminants), Evaluation of the Baseline Data (Climate), Evaluation of the Baseline Data (Net Carbon Emissions) and Dustfall Monitoring.

The Evaluation of the Baseline Data (Common Air Contaminants) indicated that ambient air concentrations for the selected contaminants of concern all fall below their corresponding air quality objective as defined in the *BC Ambient Air Quality Objectives – 2020 (BC AAQO)* [4] for each of their respective averaging periods. Specific details on the methodology used to select representative stations along with a detailed comparison of each contaminant's ambient concentrations to their corresponding *BC AAQO* are presented in **Section 2.0**. An analysis of Baseline Climate conditions was completed to provide an understanding of meteorological conditions in the Project and surrounding area. Following this analysis, the predominate wind direction was observed to be southerly. A more detailed analysis including temperature and precipitation data is presented in **Section 3.0**.

Baseline Net Carbon Emissions were evaluated by establishing baseline greenhouse gas (GHG) emissions for the local and regional context surrounding the Project site. The Environment Canada and Climate Change (ECCC) National Inventory Report (NIR)[5] was utilized to provide a breakdown of sector specific GHG emissions. This detail is provided in **Section 4.0.**

As per the AIR, a Dustfall Monitoring program was developed and executed to evaluate baseline dustfall conditions surrounding the Project area. A total of nine (9) dustfall stations were deployed and data was

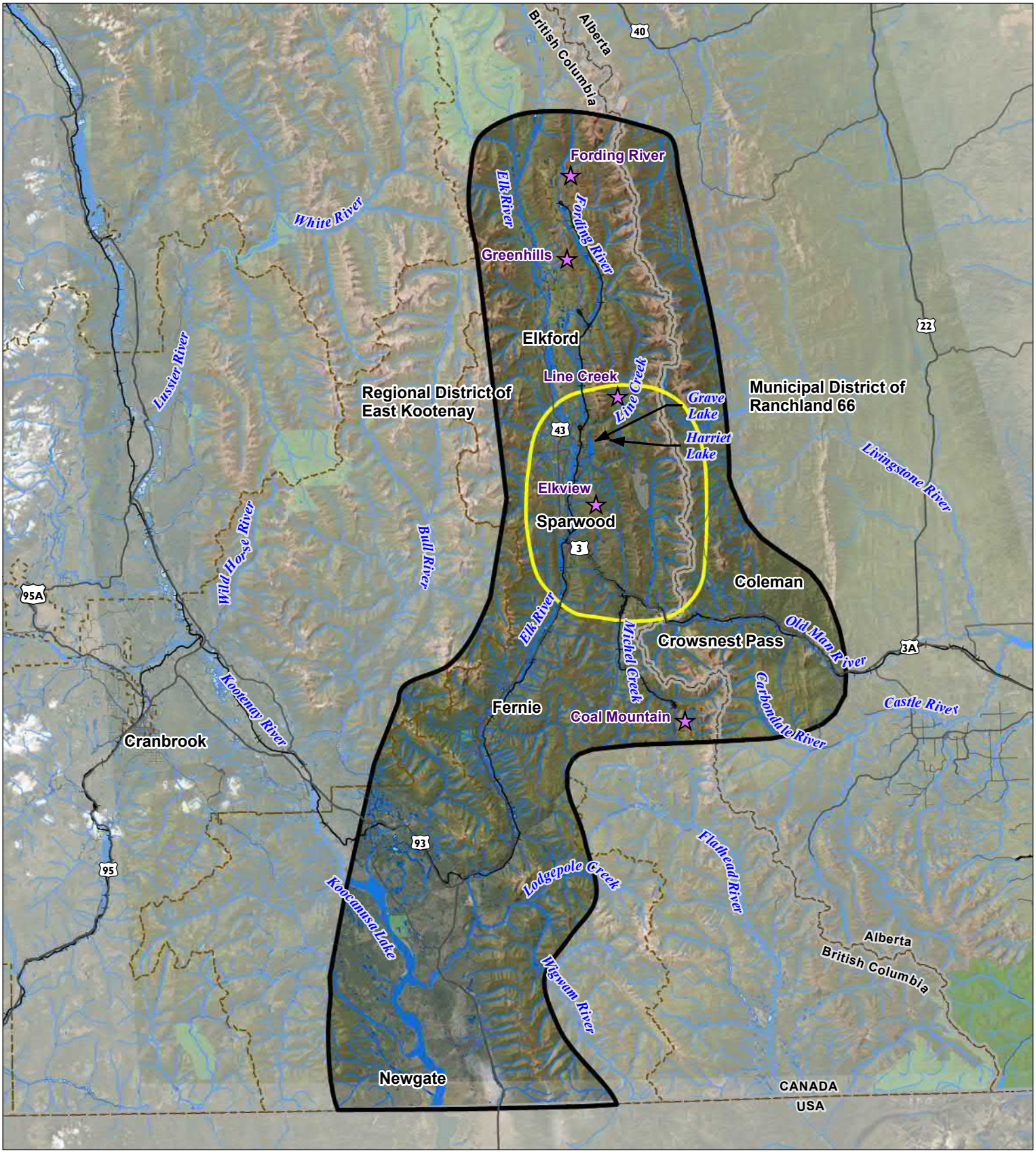
[2] Environmental Assessment Office. (2018). Application Information Requirements: Crown Mountain Coking Coal Project.
[3]Government of Canada. (2020). Guidelines for Preparation of an Environmental Impact Statement. Crown Mountain Coking Coal Project - NWP Coal Canada Ltd. Canadian Environmental Assessment Act. 2012. Retrieved from https://iaac-aeic.gc.ca/050/evaluations/document/101253?culture=en-CA
[4] British Columbia Ministry of Environment. (2020). Ambient Air Quality Objectives. Retrieved from https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/prov_aqo_fact_sheet.pdf
[5] Environment and Climate Change Canada. (2019). National Inventory Report (1990-2017) Greenhouse Gas Sources and Sinks in Canada. Retrieved from http://www.publications.gc.ca/site/eng/9.506002/publication.html

collected for a period of six (6) months. Samples were analysed for total dustfall and total metals. Details on dustfall monitor deployment and laboratory results are provided in **Section 5.0**.

1.0 Introduction

This air quality baseline report details the methodological process and findings from the air quality baseline program that was implemented to meet provincial and federal requirements outlined in the Application Information Requirements (AIR) and the Environmental Impact Statement (EIS) Guidelines for the Crown Mountain Coking Coal Project (the Project). Both the AIR and the EIS Guidelines outline information that is required in the Environmental Assessment (EA) application as it relates to air quality. The AIR details the receptor and intermediate components that relate to air quality. Data obtained through the baseline program will be used in conjunction with estimated emissions from the Project to quantify potential incremental impacts anticipated over the course of the Project related to changes in air quality. The results within this baseline report have been provided in a manner that supports the EA. Baseline results were obtained following specific guidelines and compared to their relevant standards. These guidelines and standards are documented in the methodology sections of each task comprising the scope of work.

The Project site is located 8 km east of the Elk Valley highway in the District of Sparwood, British Columbia (BC). The Elk Valley highway runs north to south with terrain elevation ranging from approximately 1,100 to 1,300 meters above sea level (m asl). There are two communities along this highway, Sparwood and Elkford. The terrain elevation at the project site is approximately 1,500 m asl and the terrain elevation on the north and south sides of the Project site gradually increase to higher than 2,300 m asl. The Project location is presented in **Figure 1.**



Crown Mountain
Coking Coal Project

Air Quality Baseline Report
Regional and Local Study Areas
Figure 1

LEGEND

- Regional Study Area
- Local Study Area
- Project Footprint
- Regional District/Municipal Boundary
- National Park
- Provincial Park
- Waterbody
- Wetland
- Watercourse
- Highways
- Arterial Roads
- Local/Resource Roads
- Railway (Canadian Pacific)
- BC/Alberta Border
- Existing Operating Mines

0 5 10 20 km

SCALE 1:750,000

MAP DRAWING INFORMATION:
Dillon Created, ESRI Base Layers, Province of British Columbia, GeoBC and Open Data BC. BC Water Resource Atlas, CanVec

MAP CREATED BY: RBB
MAP CHECKED BY: DG
MAP PROJECTION: NAD 1983 UTM Zone 11N

DILLON CONSULTING

PROJECT: 12-6231
STATUS: FINAL
DATE: 2021-08-16

FILE LOCATION: \\42dillon\CAD\GIS\2012 and Prior\126231 Crown Mountain\Air\MXD\126231 Baseline Air - Air Quality Regional and Local Study Areas.mxd

1.1 Scope of Work

Four (4) individual scopes of work were completed to support the development of the air quality baseline report. These scopes of work include:

- Evaluation of the Baseline Data, Common Air Contaminants;
- Evaluation of the Baseline Data, Climate;
- Evaluation of the Baseline Data (GHG emissions); and
- Dustfall Monitoring.

The methodology and results for each of these scopes of work are presented in the following sections.

2.0 Common Air Contaminant Baseline Evaluation

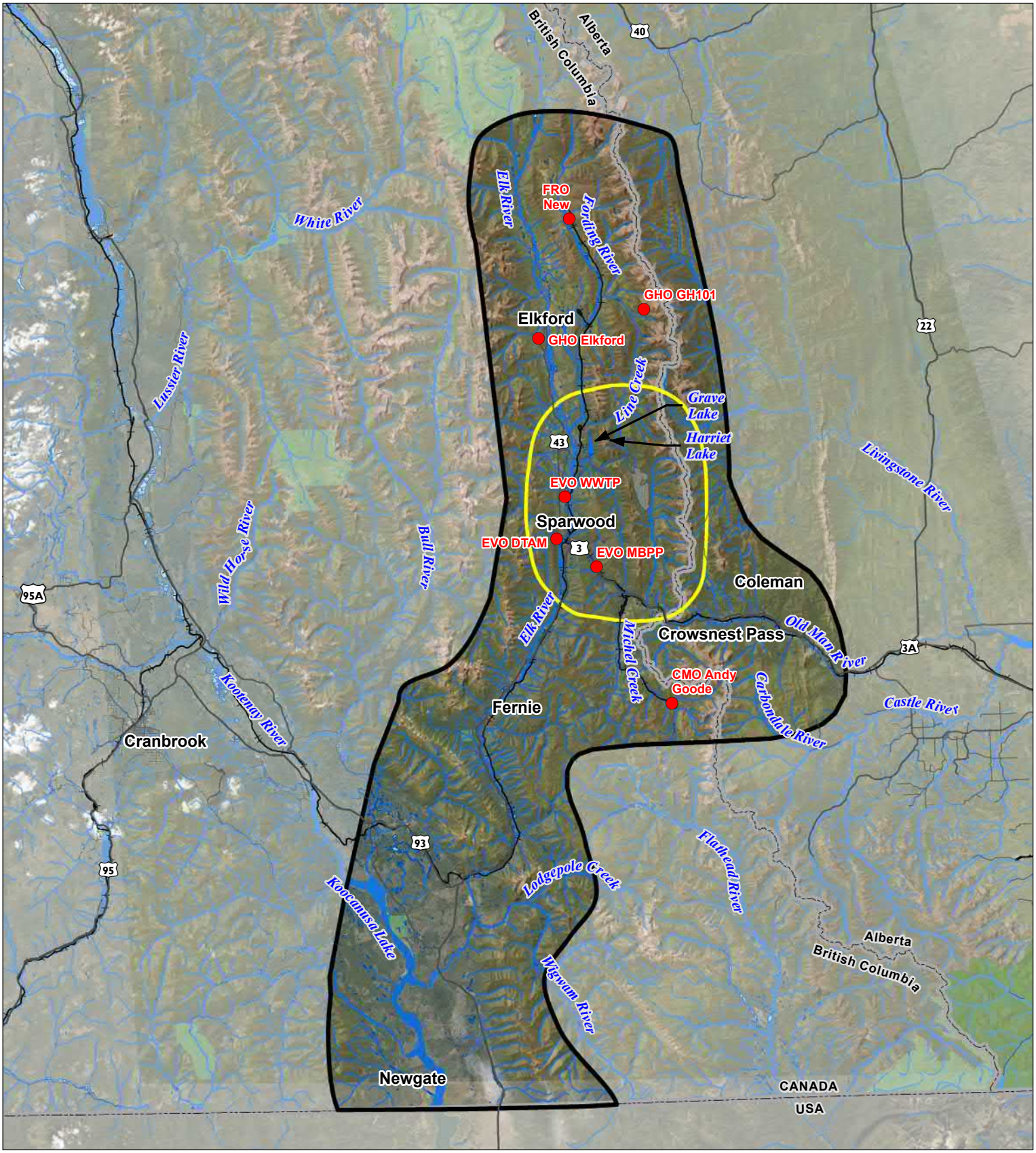
The evaluation of baseline data pertaining to common air contaminants includes an analysis of background levels of the following common air contaminants:

- Nitrogen Dioxide (NO_2);
- Particulate Matter with aerodynamic diameter less than 10µm (PM_{10});
- Particulate Matter with aerodynamic diameter less than 2.5µm ($PM_{2.5}$); and
- Sulphur Dioxide (SO_2).

The selection of these contaminants were based on requirements of the AIR along with data availability from local air monitoring stations. Volatile Organic Compound (VOC) data were not included in this baseline assessment due to the lack of available data.

2.1 Methodology

Baseline air quality was established by quantifying various contaminants of concern using existing monitoring data from the extensive air quality monitoring network in the Elk Valley. Dillon Consulting Limited (Dillon) obtained five years of monitoring data from BC's Ministry of Environment and Climate Change Strategy (ENV) from eight Teck Coal Limited monitoring stations presented in **Table 1**. These stations collect data for nearby municipalities (Fernie, Sparwood, Elkford), and existing mining operations. **Figure 2** displays each station location.



Crown Mountain
Coking Coal Project

Air Quality Baseline Report
Air Monitoring Station Locations
Figure 2

LEGEND

- Regional Study Area
- Local Study Area
- Project Footprint
- National Park
- Provincial Park
- Waterbody
- Wetland
- Watercourse
- Highways
- Arterial Roads
- Local/Resource Roads
- Railway (Canadian Pacific)
- BC/Alberta Border
- Air Monitoring Station

0 5 10 20 km

SCALE 1:750,000

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FILE LOCATION: \\42dillon\CAD\GIS\2012 and Prior\126231 Crown Mountain\Air\MXD\126231 Baseline Air - Air Monitoring Station Locations.mxd

Table 1: Air Quality Environmental Monitoring Stations

Station Name	Study Area	Closest Proximity
CMO Andy Goode	Regional	Coal Mountain Operations – Teck Coal Limited
EVO DTAM	Local	Elkview Operations – Teck Coal Limited
EVO MBPP	Local	Elkview Operations – Teck Coal Limited
EVO WWTP	Local	Elkview Operations – Teck Coal Limited
FRO New	Regional	Fording River Operations – Teck Coal Limited
GHO GH101	Regional	Greenhills Operations – Teck Coal Limited
GHO Elkford	Regional	Municipality of Elkford Greenhills Operations – Teck Coal Limited

ENV has stated that it will not endorse the quality of the data and that it will be the proponent's obligation to do so. As such, Dillon reviewed the data based on, but not limited to, the following:

- Review that the station locations adhere to ENV's siting criteria as detailed in the BC Ministry of Environment *Air Monitoring Site Selection and Exposure Criteria*[6];
- Verify station compliance with guidance documents provided by ENV;
- Review the data for completeness; and
- Perform qualitative and quantitative evaluations of the data to identify any gaps or outliers within the dataset.

After a review of the available data from the stations listed in **Table 1**, Dillon performed an analysis to identify if additional data was required to provide a complete historic record of baseline conditions surrounding the proposed site. A data gap analysis was completed for each station to identify the percent completeness of the data set. The *British Columbia Air Quality Dispersion Modelling Guidelines (BC AQDMG)*[7] recommends that at least one year of data is acceptable, and a data record that is 75% complete in each quarter is used. The monitoring station data sets utilized for this project consisted of a three (3) year data set. An analysis was performed to verify that there was a 75% data set completeness for each quarter. Overall, most quarterly data sets had well over a 90% completeness; however, select quarters did not meet the 75% recommendation. Due to the fact the data set for each station spanned over a three (3) year period compared to the recommended one (1) year period, the data sets were deemed to be sufficient for the purposes of the air contaminant baseline evaluation.

2.1.1 Station Selection

Following an initial data gap screening of each station, an analysis was conducted to determine which of the stations were most appropriate to use for the assessment of ambient air quality in the local air study area. The following considerations were made during site selection:

- Contaminant data availability:

[6] B.C. Ministry of Environment. (2013). Air Monitoring Site Selection and Exposure Criteria (draft, version 6). Guidance Document.
[7] British Columbia Ministry of Environment. (2015). British Columbia Air Quality Dispersion Modelling Guideline. Retrieved from https://www.bcogc.ca/node/13339/download

  - was considered to ensure that data was present to compare to BC AAQO;
- Data quality:
  - The quality of this data was examined to identify if there was any erroneous data present. Erroneous data could be the results of equipment sensors coming on and offline, calibrations, and local influence such as wildfires;
- Geographic location:
  - Station locations were assessed to ensure that sufficient geographic coverage and data capture was present to represent the ambient air quality of the study area; and
- Local influence of station results:
  - Station locations were evaluated to identify if local industry (mines) would have an influence on the data set. The presence of local industries can cause elevations in background contaminant levels not reflective of Project area baseline air quality. In these events, stations were excluded as the intent of the baseline air quality analysis was to evaluate baseline conditions for the Project area.

Based on the criteria listed above, the two following stations were selected to represent the local baseline ambient air quality:

1. EVO Downtown Sparwood Centennial Square (EVO DTAM)
2. Whispering Winds Trailer Park (WWTP)

Table 2 provides justification on why select stations were excluded and not considered for the establishment of baseline air quality criteria.

Table 2: Monitoring Station Removal Justification

Station Name	Reason for Exclusion
CMO Andy Goode	• Located approximately 2 km north of a mine and approximately 30 km south of Project site. • Results would be influenced from mine south of monitor location and not reflective of baseline conditions in Project area.
EVO MBPP	• Monitor is adjacent to Highway 3 less than 2 km southwest of mine. • Results would be influenced from both the mine and highway traffic. -Results would not be reflective of baseline conditions in Project area.
FRO New	• -Located on mine site. • Results would be heavily influenced from mine and not reflective of baseline conditions in Project area.
GHO GH101	• Only TSP data available and located in between two mines.
GHO Elkford	• Located approximately 8 km south of mine and approximately 20 km north of Project site. • Results would be influenced from mine north of site and not reflective of baseline conditions in Project area.

2.1.2 Data Comparison to Ambient Air Quality Objectives

The *BC AQDMG* states that level 3 assessments are recommended in situations where there is a need to evaluate air quality consequences under a permitting or Environmental Assessment process for large industrial developments that have considerable social, economic and environmental consequences. Given the nature of the Crown Mountain Coking Coal Project within the Elk Valley region, a level 3 assessment was considered the most appropriate methodological process for the administration of an air quality assessment.

Additionally, the guideline states that baseline levels for 1-hour cumulative prediction values should be determined as follows:

- The 99th percentile of daily maximum 1-hour values should be used for SO_2;
- The 98th percentile of daily maximum 1-hour values should be used for NO_2 and NO_x;
- The 98th percentile from screened hourly datasets for all other pollutants; and
- The 98th percentile of the 24-hour (daily) values from the screened data as the baseline level for a 24-hour cumulative prediction.

Taking into account the guidelines suggested above for a level 3 dispersion modelling assessment, an analysis of the baseline data was completed that included a statistical analysis of the common air contaminants in the study area. Air assessment results were compared to the *BC AAQO* and Pollution Control Objectives provided in **Table 3**.

Table 3: BC AAQO

Contaminant	Averaging Period	BC Air Quality Objective [µg/m^3]	Criteria
NO_2	1 hr	188	Interim Provincial AQO[1]
	1 hr	113	2020 CAAQS[2]
	Annual	60	Interim Provincial AQO[1]
	Annual	32	2020 CAAQS[2]
$PM_{2,5}$	24 hr	25	Provincial AQO[3]
	24 hr	27	2020 CAAQS[2]
	Annual	8	Provincial AQO
	Annual	8.8	2020 CAAQS[2]
PM_{10}	24 hr	50	Provincial AQO[3]
SO_2	1 hr	196	Interim Provincial AQO[1]
	1 hr	183	2020 CAAQS[2]
	Annual	13	2020 CAAQS[2]
Total Suspended Particulate (TSP)	24 hr	120	NAAQO[4]
	Annual	60	NAAQO[4]
CO	1 hr	14300	PCO[5]
	8 hr	5500	PCO[5]

Table Notes:

Bold – represents most stringent values and those that will be used in assessment

[1] Interim Provincial Air Quality Objectives - NO_2 are currently under review

[2] Canadian Council of Ministers of the Environment: 2020 Canadian Ambient Air Quality Standards

[3] Provincial Air Quality Objectives

[4] Canadian Council of Ministers of the Environment: Canadian National Ambient Air Quality Objectives

[5] Pollution Control Objectives for food-processing, agriculturally orientated, and other misc. industries

2.2 Results

As discussed in **Section 2.1,** an analysis was conducted to determine which of the eight (8) ENV stations were most appropriate to use for the assessment of ambient air quality in the local air study area. Following this analysis, two stations were selected; the EVO Downtown Sparwood Centennial Square (EVO DTAM) and the Whispering Winds Trailer Park (WWTP). **Table 4** below provides a summary of the data set available at each station.

Table 4: Air Monitoring Station Available Data

	EVO DTAM		WWTP
	Particulate	Gasses	Particulate
Contaminant	PM_{10}, $PM_{2.5}$	NO_2, CO, SO_2	PM_{10}, $PM_{2.5}$
Data Range	Jan 2014 – Dec 2016	Jan 2014 – Dec 2016	Jan 2014 – Dec 2016

Following the selection of these two stations, contaminant data was analyzed as per the *BC AQDMG.* **Table 5** provides a summary of each station's data.

Table 5: Air Monitoring Station Data Summary

Contaminant	Station	Averaging Period	Ambient Air Concentration (µg/m³)
NO_2	EVO DTAM	1 hr	29.4[1]
		Annual	7.4[6]
SO_2	EVO DTAM	1 hr	2.4[2]
		Annual	0.8[6]
CO	EVO DTAM	1 hr	647.6[3]
		8 hr	786.9[4]
PM_{10}	EVO DTAM	24 hr	29.8[5]
	WWTP	24 hr	27.6[5]
$PM_{2.5}$	EVO DTAM	24 hr	22.4[5]
		Annual	5.6[6]
	WWTP	24 hr	17.0[5]
		Annual	4.8[6]

Table Notes:

[1] NO_2 value is based on 98th percentile of daily maximum 1-hour value

[2] SO_2 value is based on 99th percentile of daily maximum 1-hour value

[3] CO 1-hr value is based on 98th percentile of 1-hour values
[4] CO 8-hr value is based on 98th percentile of rolling 8-hr average
[5] $PM_{2.5}$ and PM_{10} are based on the 98th percentile of 24-hour averages
[6] Annual averages use the annual mean of 1 hour values over the entire data set

The *BC AQDMG* specifies that when multiple monitoring sites are being used to represent local ambient air quality, the arithmetic average of these stations is calculated to represent what the baseline air quality value should be for each contaminant. **Table 6** provides a summary of this data along with each contaminant's percent contribution to *BC AAQO*.

Table 6: Percent Contribution to BC AAQO

Contaminant	Averaging Period	Ambient Air Concentration (µg/m3)	BC Air Quality Objective (µg/m3)	Criteria	Percent Contribution to Objective
NO_2	1 hr	29.4[1]	113	2020 CAAQS	26.0%
	Annual	7.4[6]	32	2020 CAAQS	23.0%
SO_2	1 hr	2.4[2]	183	2020 CAAQS	1.3%
	Annual	0.8[6]	13	2020 CAAQS	6.1%
CO	1 hr	647.6[3]	14,300	PCO*	4.5%
	8 hr	786.9[4]	5,500	PCO*	14.3%
PM_{10}	24 hr	28.7[5]	50	Provencal AQO	57.3%
$PM_{2.5}$	24 hr	19.7[5]	25	Provincial AQO	78.8%
	Annual	5.2[6]	8	Provincial AQO	64.8%

Table Notes:
[1] NO_2 value is based on 98th percentile of daily maximum 1-hour value
[2] SO_2 value is based on 99th percentile of daily maximum 1-hour value
[3] CO 1-hr value is based on 98th percentile of 1-hour values
[4] CO 8-hr value is based on 98th percentile of rolling 8-hr average
[5] $PM_{2.5}$ and PM_{10} are based on the 98th percentile of 24-hour averages
[6] Annual averages use the annual mean of 1 hour values over the entire data set

3.0 Climate Baseline Evaluation

Defining baseline climate conditions provides an understanding of meteorological conditions at the Project site and surrounding area. This information can be used for future modelling of Project conditions. The following sections discuss the methodology and findings of the analysis of existing climate data.

3.1 Methodology

To develop an understating of baseline climate, established climate normals from the Government of Canada's Climate Normals Online Database[8] were reviewed.

Data was also collected from local air monitoring stations as identified in **Table 2**, as well as Environment and Climate Change Canada (ECCC) meteorological stations, to provide a more detailed understanding of climatic conditions at both regional and site-specific levels.

3.1.1 Climate Stations and Variables

Sparwood is located in the southeast mountainous region of BC. Variables such as temperature, precipitation, wind and humidex vary based on location and elevation in the region. Multiple surface stations with both hourly and daily data were included in the preliminary assessment of local climate. The wind, temperature and precipitation recorded in the following surface stations were processed and analyzed:

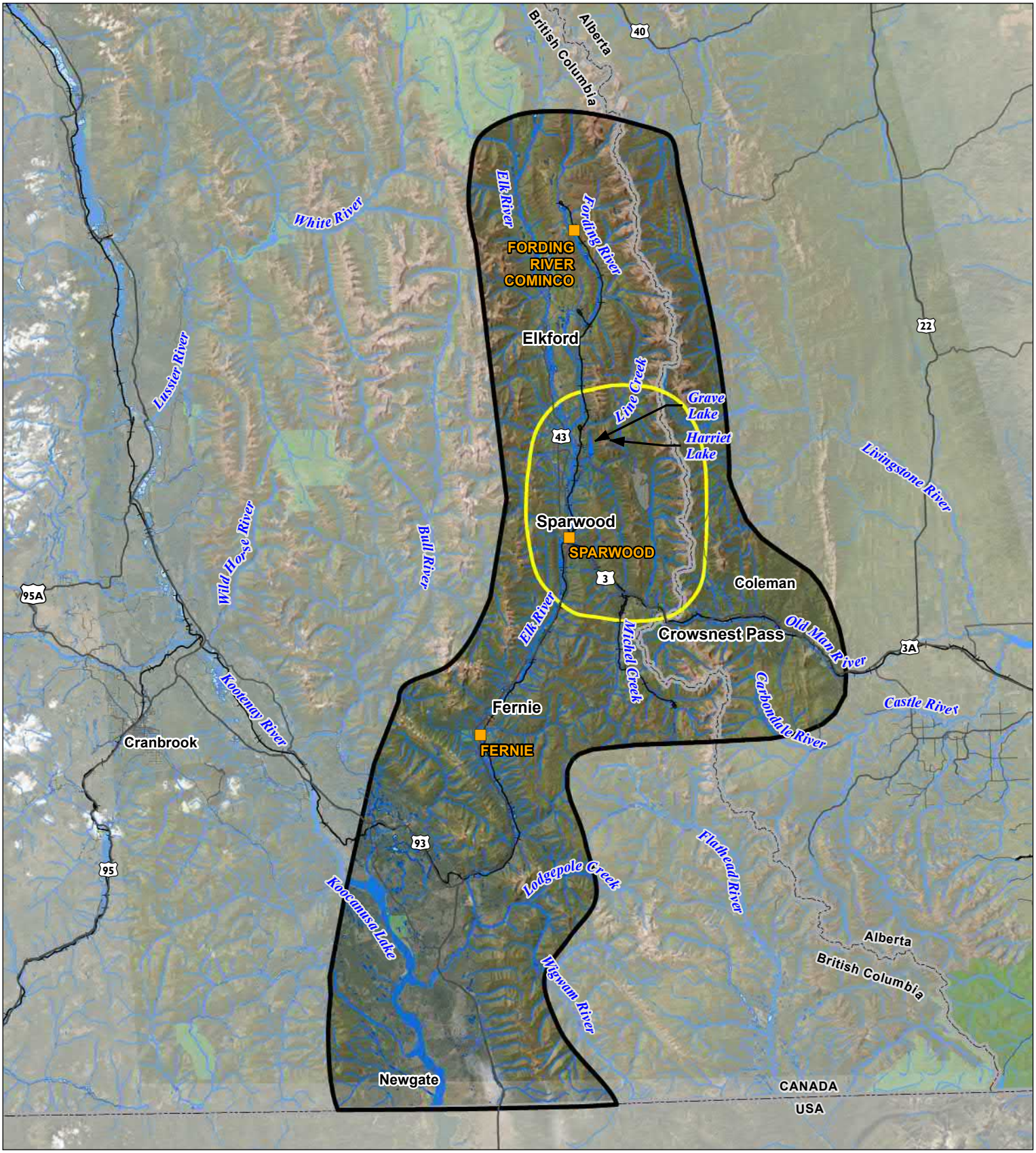
1. Sparwood CS (hourly, daily)
2. Cranbrook Airport (hourly)
3. Crowsnest (hourly)
4. Fording River Cominco (daily)
5. Fernie (daily)

Following the preliminary assessment of hourly wind data, it was concluded that any stations that could potentially represent the regional climatic conditions around the Project should be located within the Elk Valley due to the strong influence of the local topography to the local climatic conditions. Thus, 30-year averages of climatological variables (climate normals) from the following climate stations within Elk Valley were evaluated to represent the regional baseline climatic conditions:

1. Fording River Cominco
2. Sparwood
3. Fernie

[8] Government of Canada. (2019). Canadian Climate Normals: 1981-2010 Climate Normals and Averages. Retrieved from https://climate.weather.gc.ca/climate_normals/

For the purposes of establishing baseline climatic conditions, the Sparwood station was selected based on it being not only centrally located when compared to the other two stations but also due to it being the closest to the Project site. The geographic location of the three (3) climate stations selected and their proximity to the Project site is illustrated in **Figure 3**.



Crown Mountain
Coking Coal Project

Air Quality Baseline Report
Climate Station Locations
Figure 3

LEGEND

- Regional Study Area
- Local Study Area
- Project Footprint
- National Park
- Provincial Park
- Waterbody
- Wetland
- Watercourse
- Highways
- Arterial Roads
- Local/Resource Roads
- Railway (Canadian Pacific)
- BC/Alberta Border
- Climate Station Location

0 5 10 20 km

SCALE 1:750,000

MAP DRAWING INFORMATION:
Dillon Created, ESRI Base Layers, Province of British Columbia, GeoBC and Open Data BC, BC Water Resource Atlas, CANVEC, Environment and Climate Change Canada Meteorological Stations

MAP CREATED BY: RBB
MAP CHECKED BY: DG
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FILE LOCATION: \\42dillon\CAD\GIS\2012 and Prior\126231 Crown Mountain\Air\MXD\126231 Baseline Air - Climate Station Locations.mxd

3.2 Results

Data was collected from local air monitoring stations identified in **Section 3.1.1**, as well as climate normals from the Government of Canada's Climate Normals Online Database to establish baseline climatic conditions both at a regional and site-specific level. The following subsections describe the acquired data.

3.2.1 Hourly Surface Station within the Elk Valley

Sparwood Airport and Sparwood CS stations are the closest hourly surface stations to the Project site. They are located along the Elk Valley highway with approximately 8 km distance between them. Sparwood CS station records wind data continuously every hour, while wind data measured at Sparwood Airport is available only during daytime periods. Therefore, windroses were generated from 5-year period (2014 – 2018) wind data measured at Sparwood CS station.

Figure 4 illustrates the prevailing winds measured at Sparwood CS station. The predominant wind directions measured at this station were the northerly and southerly directions. The most frequent winds were from the south.

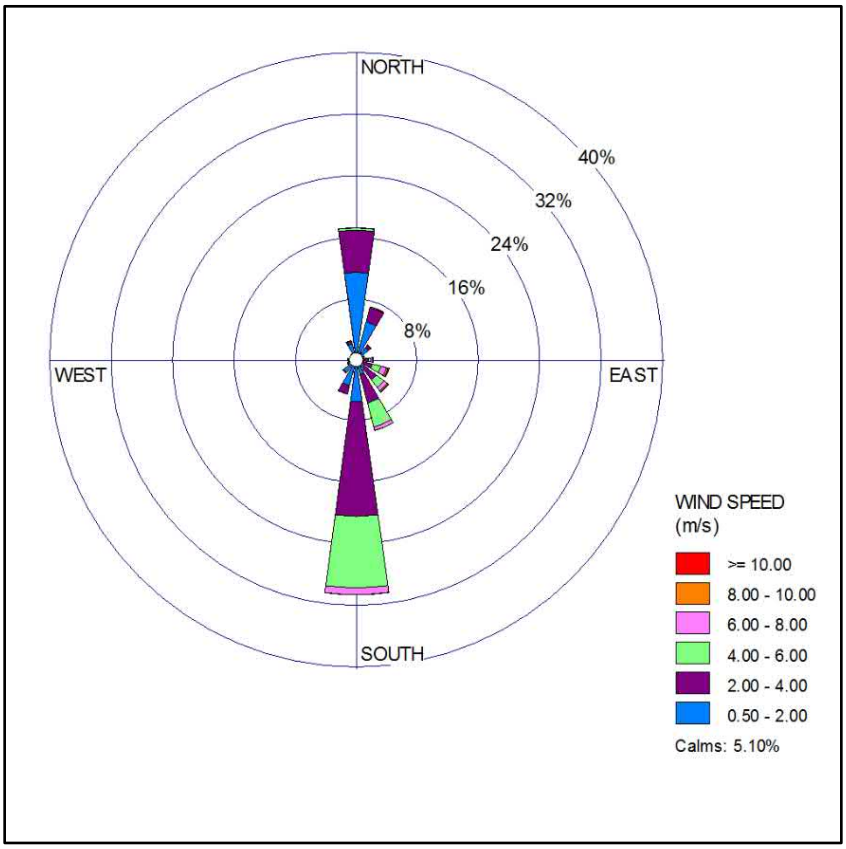


Figure 4: Windrose at Sparwood CS (2014-2018; Blowing From)

3.2.2 Climate Normals

Climate normals data was obtained from the Government of Canada's Climate Normals Online Database for the Sparwood station (Climate ID: 1157630). Data represents climate normals from 1981 to 2010. Key climate parameters including temperature and precipitation are summarized in **Table 7**. It is seen that Sparwood has a yearly average temperature of 4.4 degrees Celsius (˚C) and has a daily average temperature below 0 ˚C from November to February. Daily average temperatures are the highest between July and August. Total precipitation averages to 613.3 mm in a year with November having the highest monthly precipitation average of 72.1 mm.

Table 7: Climate Normals

1981 to 2010 Canadian Climate Normals Station Data – Sparwood Climate ID: 1157630

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Temperature													
Daily Average (°C)	-6.5	-4.5	0.2	4.8	9.1	12.7	15.8	15.5	10.5	4.8	-2	-7.3	4.4
Daily Maximum (°C)	-2.2	0.5	5.4	10.9	15.9	19.6	23.8	24.2	18.2	10.7	1.7	-3.4	10.4
Daily Minimum (°C)	-10.7	-9.6	-5.1	-1.3	2.3	5.8	7.7	6.7	2.9	-1.1	-5.6	-11.3	-1.6
Extreme Maximum (°C)	11.9	13.8	20.6	25.6	31.3	32.5	34.9	36.5	34.2	27.2	16.9	10.5	-
Precipitation													
Rainfall (mm)	17.3	12.4	17.0	27.9	52.0	67.7	46.8	34.8	43.4	39.6	39.1	13.2	411.0
Snowfall (cm)	50.4	37.0	31.7	17.4	8.6	1.8	0.0	0.1	4.2	11.3	47.3	54.2	264.0
Precipitation (mm)	53.9	40.9	44.2	41.4	60.4	69.3	46.8	34.9	47.4	48.8	72.1	53.4	613.3

4.0 Greenhouse Gas Emissions

4.1 Methodology

Dillon compiled data to establish baseline greenhouse gas (GHG) emissions for local and regional context surrounding the Project site. The evaluation of baseline emissions included sources of emissions, sinks, or reservoirs that may be impacted as a result of the Project. The baseline data will be used to assess the existing GHG sources and sinks in the Project area to establish existing conditions. GHG production calculations followed provincial and federal guidelines, including:

- **Federal:** Environment and Climate Change Canada (2017) National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada; and
- **Provincial:** best industry practices such as those prescribed under the *Greenhouse Gas Industrial Reporting and Control Act.*

4.2 Results

To evaluate baseline GHG emissions for the Project area, total GHG emissions from BC and sector specific emissions, particularly emissions from the mining sector, were considered. The best available estimate of BC's reported GHG emissions is provided in the ECCC NIR. GHG emissions from all of Canada are also documented below for context. Results are documented in metric tonnes of CO_2 equivalents (Mt CO_2e).

A review of the 2015-2017 GHG emission summaries from the ECCC NIR show that:

- GHG emissions from all of Canada equate to an annual average of 715.33 Mt CO_2e;
- GHG emissions from the mining sector across Canada had an annual average of 4.29 Mt CO_2e;
- GHG emissions from BC had an annual average of 60.96 mega-tonnes (Mt) CO_2e;
- GHG emissions from the mining sector in BC had an annual average of 0.46 Mt CO_2e.
- GHG fugitive emissions from coal mines had an annual average of 0.9 Mt CO_2e.

Through the course of the project, it is expected that both GHG sources and sinks within the Project area will change. These changes will have an effect on the net GHG emissions in the Project area and will be addressed in the EA application.

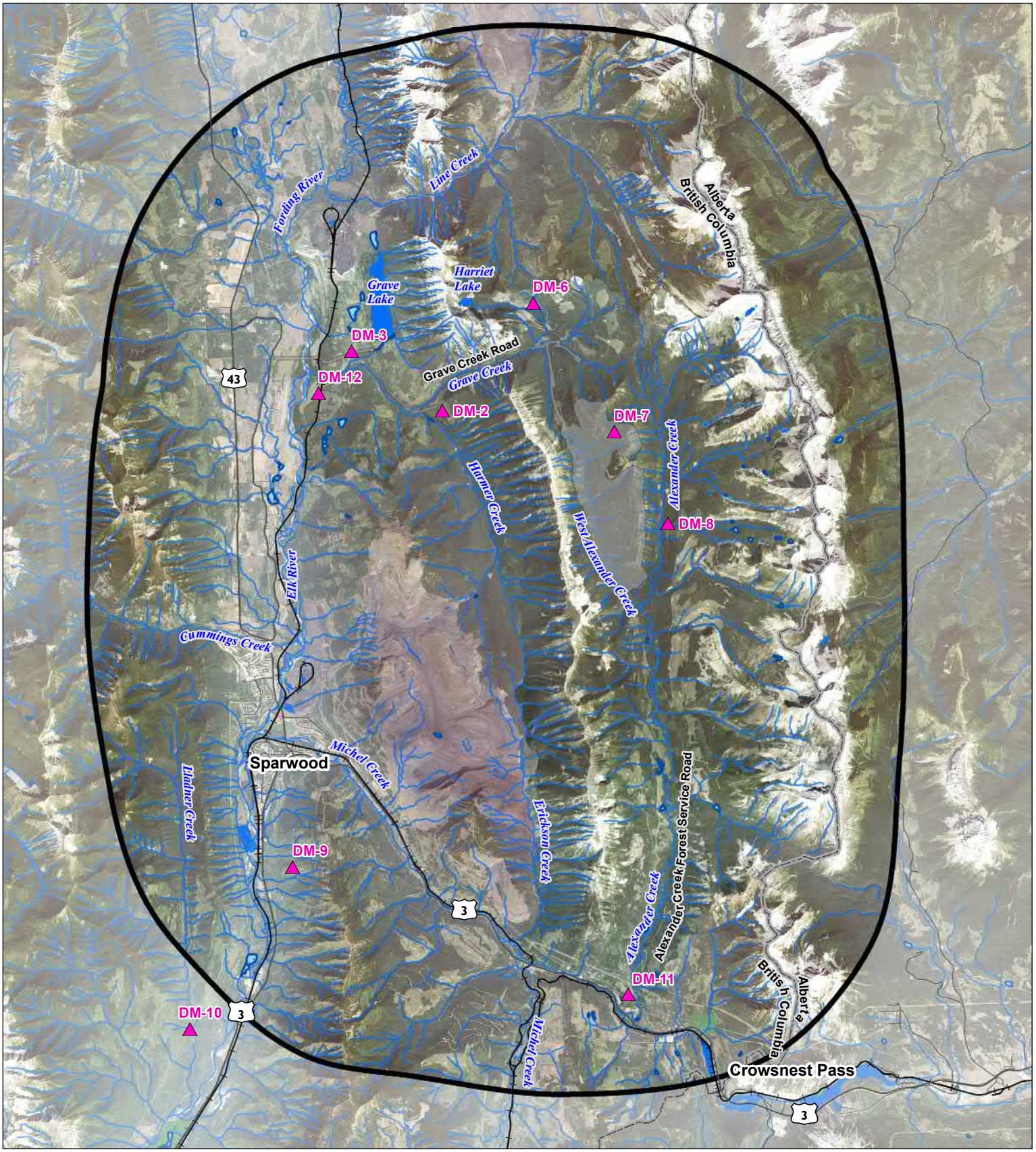
5.0 Dustfall Monitoring

5.1 Methodology

As per the AIR (EAO, 2018), the baseline program included an evaluation of dustfall within and surrounding the Project area. Dillon performed a field sampling program surrounding the proposed Project area, as well as in the nearby community and recreational areas, to satisfy this requirement. Dillon coordinated the sampling of monthly dustfall measurements for six months. Collection of field samples and redeployment of sample canisters was performed by Nupqu Development Corporation. Sampling was conducted as per ASTM Method D1739-98[9]. Sampling canisters were collected and analyzed for total dustfall and metals by an accredited laboratory, ALS Environmental (ALS) located in Burnaby, BC. Polycyclic Aromatic Hydrocarbons (PAHs) concentrations were not analysed, as discussion with the laboratory indicated that analysis for PAHs in dustfall cannot be completed. Long term sampling of PAHs in dustfall would not be a representative method of PAHs due to their volatility.

A total of nine (9) dust monitoring stations were constructed and deployed across the Project site and surrounding area. The locations of these dustfall monitoring stations are illustrated in **Figure 5** and **Table 8** lists each station and respective location. A photo-log of the deployed dustfall monitoring stations is provided in **Appendix A**.

[9] ASTM International. (2017). Designation: D1739-98 Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter)



Crown Mountain
Coking Coal Project

Air Quality Baseline Report
Dustfall Monitoring Locations

Figure 5

LEGEND

- Local Study Area
- Project Footprint
- Provincial Park
- Waterbody
- Wetland
- Watercourse
- Highways
- Arterial Roads
- Local/Resource Roads
- Railway (Canadian Pacific)
- BC/Alberta Border
- Dustfall Monitoring Location

0 0.5 1 2 3 4 5 km

SCALE 1:165,000

MAP DRAWING INFORMATION:
Dillon Created, ESRI Base Layers, Province of British Columbia GeoBC and Open Data BC. BC Water Resource Atlas, CanVec

MAP CREATED BY: RBB
MAP CHECKED BY: DG
MAP PROJECTION: NAD 1983 UTM Zone 11N

DILLON CONSULTING

PROJECT: 12-6231
STATUS: FINAL
DATE: 2021-08-16

FILE LOCATION: \\42dillon\CAD\GIS\2012 and Prior\126231 Crown Mountain\Air\MXD\126231 Baseline Air - Dustfall Monitoring Locations.mxd

Table 8: Dustfall Monitor Locations

Station ID	Latitude, Longitude
DM-2	49.831829, -114.807721
DM-3	49.84982, -114.847662
DM-6	49.862287, -114.765415
DM-7	49.824232, -114.730718
DM-8	49.797292, -114.707909
DM-9	49.700797, -114.880664
DM-10	49. 654555, -114.928772
DM-11	49.660853, -114.732091
DM-12	49.837965, -114.863112

Table 9 provides a summary of the time period for each sampling event. Each sampling event spanned a period of 30 +/- 2 days as specified in ASTM Method D1739-98. No canisters were deployed from January 2019 to May 2019 due to weather conditions and issues with site access.

Table 9: Dustfall Sampling Event Summary

Sample Event #	Month of Canister Deployment	Month of Canister Collection
1	October 2018	November 2018
2	November 2018	December 2018[1]
3	May 2019	June 2019
4	June 2019	July 2019
5	July 2019	August 2019
6	August 2019	September 2019
7	September 2019	October 2019

Table Notes:
[1] December 2018 samples were not analysed by laboratory due to laboratory administrative errors

5.2 Results

A total of 7 sampling events were conducted from 2018 to 2019; however, only 6 were used in the data analysis due to laboratory errors with samples from the discarded sampling event. Total Dustfall results are presented on a monthly basis in **Table 10** below. **Figure 6** displays these results graphically.
When analysing the results from the 6 month sampling event the following observations were made:

- DM-2 experienced the highest average 6 month dustfall accumulation when compared to the other stations (1.26 mg/dm^2.day);
- DM-2 experienced the single highest dustfall accumulation in one particular month, that being during the October 2019 sampling event (1.82 mg/dm^2.day);
- DM-9 experienced the lowest average 6 month dustfall accumulation when compared to the other stations (0.34 mg/dm^2.day);

- The highest average dustfall accumulation across all stations occurred in November 2018 (0.86 mg/dm^2.day), with the second highest being in October 2019 (0.85 mg/dm^2.day); and
- The lowest average dustfall accumulation across all stations occurred in the month of August 2019 (0.28 mg/dm^2.day), with the second lowest being in July 2019 (0.61 mg/dm^2.day).

Table 10: Total Dustfall Results

Station ID	Units	November 2018	June 2019	July 2019	August 2019	September 2019	October 2019
DM-2	mg/dm2.day	1.66	0.91	0.8	NA	1.13	1.82
DM-3	mg/dm2.day	1.64	0.78	0.76	0.36	0.79	1.12
DM-6	mg/dm2.day	0.63	0.55	0.61	0.11	0.52	0.72
DM-7	mg/dm2.day	0.66	0.84	0.7	0.77	0.94	0.52
DM-8	mg/dm2.day	0.4	0.86	0.91	0.2	0.92	0.73
DM-9	mg/dm2.day	0.39	0.51	0.32	0.1	0.39	0.34
DM-10	mg/dm2.day	NA	1.12	0.1	0.1	0.41	0.51
DM-11	mg/dm2.day	0.41	0.38	0.45	0.33	0.16	0.96
DM-12	mg/dm2.day	1.11	NA	0.83	0.28	0.62	0.93

Table Notes:
NA - No sample available for analysis

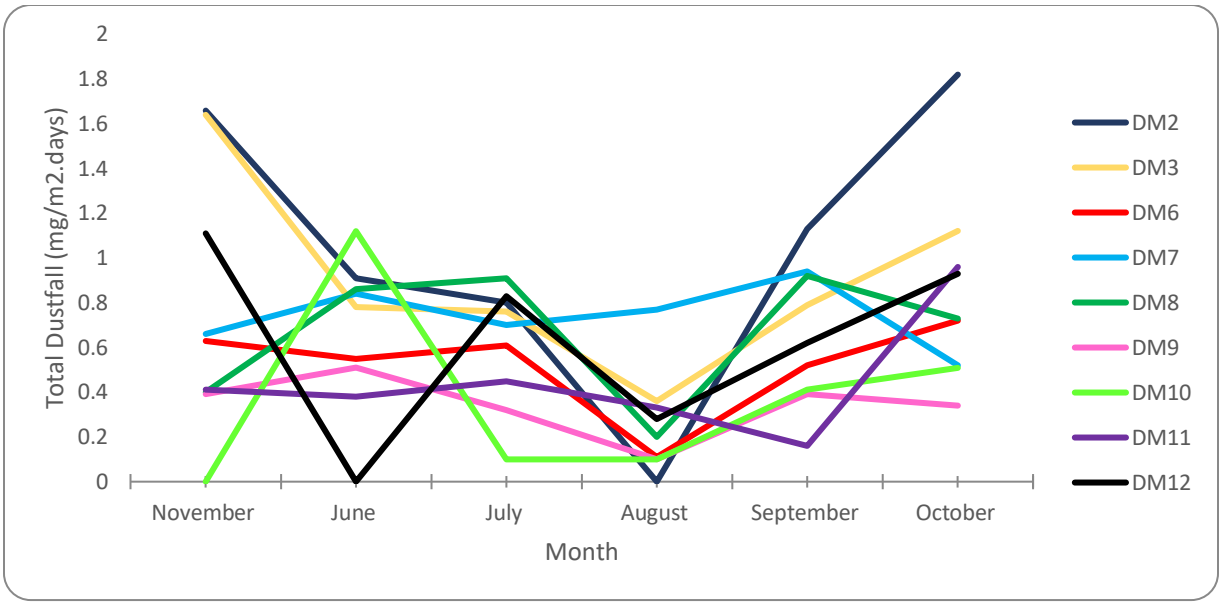


Figure 6: Total Dustfall Results

Average and maximum values of Total Dustfall at each station are presented in **Table 11** below.

Table 11: Dustfall Results

Station ID	Average [mg/dm2.day]	Maximum [mg/dm2.day]
DM-2	1.26	1.82
DM-3	0.91	1.64
DM-6	0.52	0.72
DM-7	0.74	0.94
DM-8	0.67	0.92
DM-9	0.34	0.51
DM-10	0.45	1.12
DM-11	0.45	0.96
DM-12	0.75	1.11

Field notes and photos are appended to this report in **Appendix A.** Metal results are presented in **Table 12**, which provides average and maximum values for each station through the duration of the 6 month dustfall monitoring program. Laboratory Certificates of Analysis (COAs) for each monitoring event are found in **Appendix B**.

Table 12: Dustfall Metal Results

Metal	Monitoring Stations Metal Results (mg/dm^2.day)																	
	DM 2		DM 3		DM 6		DM 7		DM8		DM9		DM10		DM11		DM12	
	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max
Aluminum (Al)	5.41E-03	1.05E-02	2.25E-03	3.06E-03	2.02E-03	3.51E-03	3.48E-03	5.66E-03	2.81E-03	4.48E-03	1.49E-03	2.18E-03	1.87E-03	4.08E-03	2.37E-03	4.00E-03	2.25E-03	2.78E-03
Antimony (Sb)	2.88E-06	4.80E-06	2.17E-06	3.90E-06	3.50E-06	8.40E-06	3.05E-06	6.60E-06	3.18E-06	7.20E-06	1.57E-06	3.20E-06	2.42E-06	5.00E-06	1.98E-06	5.40E-06	4.78E-06	6.80E-06
Arsenic (As)	2.10E-05	7.70E-05	1.63E-05	7.30E-05	1.57E-05	7.80E-05	1.78E-05	8.00E-05	1.69E-05	7.60E-05	8.47E-06	3.90E-05	1.79E-05	7.30E-05	1.48E-05	7.20E-05	3.88E-06	5.00E-06
Barium (Ba)	5.25E-04	8.00E-04	2.13E-04	3.01E-04	1.89E-04	3.12E-04	3.21E-04	4.03E-04	1.06E-03	2.31E-03	1.06E-04	1.67E-04	1.41E-04	4.16E-04	1.30E-04	2.61E-04	2.20E-04	3.28E-04
Beryllium (Be)	9.90E-06	2.20E-05	8.40E-06	1.90E-05	1.15E-05	2.70E-05	1.46E-05	3.30E-05	1.52E-05	3.60E-05	7.82E-06	1.60E-05	1.22E-05	2.50E-05	9.85E-06	2.70E-05	1.11E-05	2.40E-05
Bismuth (Bi)	1.26E-05	2.20E-05	2.09E-05	5.84E-05	1.59E-05	3.30E-05	1.46E-05	3.30E-05	1.66E-05	3.60E-05	1.13E-05	1.60E-05	1.70E-05	3.70E-05	1.08E-05	3.00E-05	1.69E-05	2.54E-05
Boron (B)	1.96E-04	4.30E-04	1.75E-04	3.90E-04	2.30E-04	5.40E-04	2.88E-04	6.60E-04	3.05E-04	7.20E-04	1.57E-04	3.20E-04	2.42E-04	5.00E-04	1.98E-04	5.40E-04	2.22E-04	4.70E-04
Cadmium (Cd)	2.18E-06	3.22E-06	3.53E-06	1.30E-05	1.20E-06	2.70E-06	1.61E-06	3.30E-06	2.31E-06	6.30E-06	1.04E-06	1.60E-06	2.88E-06	4.83E-06	1.35E-06	4.10E-06	5.05E-06	1.52E-05
Calcium (Ca)	2.74E-02	4.30E-02	2.56E-02	3.03E-02	1.04E-02	1.82E-02	1.38E-02	2.44E-02	1.52E-02	2.18E-02	9.09E-03	1.51E-02	1.27E-02	2.05E-02	1.18E-02	2.36E-02	1.35E-02	1.84E-02
Chromium (Cr)	1.45E-05	2.20E-05	8.85E-06	1.90E-05	1.28E-05	3.50E-05	1.49E-05	3.30E-05	1.56E-05	3.60E-05	7.82E-06	1.60E-05	1.70E-05	3.70E-05	1.16E-05	2.70E-05	1.27E-05	2.40E-05
Cobalt (Co)	8.10E-06	1.22E-05	4.10E-06	6.90E-06	3.42E-06	5.40E-06	5.40E-06	6.60E-06	5.18E-06	7.20E-06	2.05E-06	3.20E-06	3.50E-06	7.10E-06	2.82E-06	5.40E-06	3.66E-06	4.70E-06
Copper (Cu)	2.74E-04	6.41E-04	3.90E-04	7.59E-04	1.82E-04	3.40E-04	3.43E-04	9.69E-04	2.86E-04	9.16E-04	4.00E-04	1.11E-03	3.14E-04	9.02E-04	2.38E-04	8.71E-04	4.05E-04	1.19E-03
Iron (Fe)	7.46E-03	1.00E-02	4.17E-03	5.40E-03	2.88E-03	5.34E-03	6.02E-03	9.70E-03	3.91E-03	6.32E-03	2.19E-03	2.92E-03	2.91E-03	6.86E-03	3.24E-03	6.10E-03	4.47E-03	5.96E-03
Lead (Pb)	1.54E-05	2.38E-05	1.16E-05	1.79E-05	2.66E-04	1.55E-03	1.25E-05	1.92E-05	1.12E-05	1.75E-05	7.38E-06	1.00E-05	9.78E-06	1.86E-05	8.54E-06	1.30E-05	1.23E-05	1.78E-05
Lithium (Li)	9.90E-05	2.20E-04	8.40E-05	1.90E-04	1.15E-04	2.70E-04	1.46E-04	3.30E-04	1.52E-04	3.60E-04	7.82E-05	1.60E-04	1.22E-04	2.50E-04	9.85E-05	2.70E-04	1.11E-04	2.40E-04
Magnesium (Mg)	7.44E-03	8.84E-03	7.96E-03	9.99E-03	2.53E-03	3.44E-03	3.60E-03	4.91E-03	3.95E-03	5.67E-03	2.26E-03	2.75E-03	4.03E-03	6.76E-03	2.65E-03	4.45E-03	4.22E-03	6.13E-03
Manganese (Mn)	2.89E-04	4.40E-04	2.19E-04	2.69E-04	1.13E-04	1.78E-04	2.10E-04	3.27E-04	1.75E-04	2.29E-04	1.08E-04	1.56E-04	1.48E-04	2.49E-04	1.50E-04	3.53E-04	1.35E-04	1.60E-04
Molybdenum (Mo)	3.48E-06	6.50E-06	2.54E-06	5.80E-06	1.31E-06	2.70E-06	2.67E-06	6.60E-06	2.09E-06	3.60E-06	1.04E-06	1.60E-06	2.22E-06	4.50E-06	2.04E-06	5.40E-06	3.15E-06	4.70E-06
Nickel (Ni)	3.59E-05	5.40E-05	1.98E-05	3.10E-05	1.67E-05	3.20E-05	2.31E-05	3.30E-05	2.53E-05	3.60E-05	9.98E-06	1.60E-05	1.75E-05	3.50E-05	1.30E-05	2.70E-05	1.63E-05	2.40E-05
Phosphorus (P)	3.26E-03	5.55E-03	1.54E-02	3.47E-02	2.34E-03	5.11E-03	4.72E-03	1.54E-02	4.41E-03	1.54E-02	3.70E-03	6.56E-03	7.32E-03	1.57E-02	4.01E-03	9.11E-03	9.63E-03	1.54E-02

Metal	Monitoring Stations Metal Results (mg/dm^2.day)																	
	DM 2		DM 3		DM 6		DM 7		DM8		DM9		DM10		DM11		DM12	
	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max
Potassium (K)	8.38E-03	1.41E-02	2.24E-02	4.84E-02	4.77E-03	9.00E-03	8.83E-03	2.63E-02	8.22E-03	2.26E-02	7.65E-03	1.01E-02	1.68E-02	3.20E-02	7.23E-03	1.23E-02	1.55E-02	2.94E-02
Selenium (Se)	1.96E-05	4.30E-05	1.72E-05	3.90E-05	2.30E-05	5.40E-05	2.88E-05	6.60E-05	3.05E-05	7.20E-05	1.57E-05	3.20E-05	2.42E-05	5.00E-05	1.98E-05	5.40E-05	2.22E-05	4.70E-05
Silicon (Si)	8.14E-03	1.73E-02	3.42E-03	5.33E-03	2.91E-03	4.40E-03	5.09E-03	9.20E-03	3.78E-03	5.26E-03	2.30E-03	3.67E-03	2.93E-03	6.00E-03	4.01E-03	8.31E-03	3.13E-03	4.23E-03
Silver (Ag)	5.20E-07	8.10E-07	5.18E-07	1.74E-06	2.55E-07	5.40E-07	3.40E-07	6.60E-07	3.80E-07	7.20E-07	2.27E-07	3.20E-07	3.42E-07	5.80E-07	2.17E-07	5.40E-07	3.82E-07	6.00E-07
Sodium (Na)	2.32E-03	5.90E-03	4.45E-03	1.18E-02	2.00E-03	5.80E-03	3.10E-03	6.12E-03	2.85E-03	6.30E-03	2.36E-03	3.30E-03	3.86E-03	6.70E-03	2.32E-03	9.00E-03	3.79E-03	6.08E-03
Strontium (Sr)	9.72E-05	2.65E-04	5.17E-05	8.93E-05	3.81E-05	1.15E-04	6.19E-05	1.75E-04	6.25E-05	1.42E-04	3.15E-05	9.40E-05	4.28E-05	1.17E-04	3.79E-05	1.18E-04	6.02E-05	1.07E-04
Thallium (Tl)	1.96E-06	4.30E-06	1.72E-06	3.90E-06	2.30E-06	5.40E-06	2.88E-06	6.60E-06	3.05E-06	7.20E-06	1.57E-06	3.20E-06	2.42E-06	5.00E-06	1.98E-06	5.40E-06	2.22E-06	4.70E-06
Tin (Sn)	1.96E-06	4.30E-06	2.12E-06	6.20E-06	2.30E-06	5.40E-06	2.88E-06	6.60E-06	3.05E-06	7.20E-06	1.62E-06	3.20E-06	2.42E-06	5.00E-06	1.98E-06	5.40E-06	3.96E-06	1.34E-05
Titanium (Ti)	1.96E-04	4.30E-04	1.72E-04	3.90E-04	2.30E-04	5.40E-04	2.88E-04	6.60E-04	3.05E-04	7.20E-04	1.57E-04	3.20E-04	2.42E-04	5.00E-04	1.98E-04	5.40E-04	2.22E-04	4.70E-04
Uranium (U)	8.54E-07	1.16E-06	5.58E-07	9.10E-07	3.67E-07	6.20E-07	6.52E-07	1.11E-06	5.67E-07	7.50E-07	2.43E-07	3.20E-07	4.10E-07	9.80E-07	3.32E-07	7.10E-07	4.30E-07	6.80E-07
Vanadium (V)	3.30E-05	6.50E-05	1.95E-05	3.90E-05	2.30E-05	5.40E-05	2.98E-05	6.60E-05	3.13E-05	7.20E-05	1.57E-05	3.20E-05	2.42E-05	5.00E-05	2.15E-05	5.40E-05	2.30E-05	4.70E-05
Zinc (Zn)	1.75E-03	7.28E-03	6.15E-04	1.34E-03	8.57E-04	2.60E-03	9.76E-04	2.87E-03	9.32E-04	2.81E-03	6.05E-04	1.74E-03	7.98E-04	2.15E-03	5.83E-04	1.78E-03	8.89E-04	2.04E-03

6.0 References

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Appendix A

Dustfall Monitoring

DILLON CONSULTING

Dustfall Monitoring Station Pictures

Dust Monitoring Station ID	Coordinates	Status	Image
DM-2	Latitude: 49.831829 Longitude: -114.807721	Deployed	
DM-3	Latitude: 49.84982 Longitude: -114.847662	Deployed	
DM-6	Latitude: 49.862287 Longitude:-114.765415	Deployed	

Dust Monitoring Station ID	Coordinates	Status	Image
DM-7	Latitude: 49.824232 Longitude: -114.730718	Deployed	
DM-8	Latitude: 49.797292 Longitude: -114.707909	Deployed	
DM-9	Latitude: 49.700797 Longitude: -114.880664	Deployed	

Dust Monitoring Station ID	Coordinates	Status	Image
DM-10	Latitude: 49. 654555 Longitude: -114.928772	Deployed	
DM-11	Latitude: 49.660853 Longitude: -114.732091	Deployed	
DM-12	Latitude: 49.837965 Longitude: -114.863112	Deployed	

Dustfall Monitor Replacement Field Sheet – November 2018

Canister ID	Date/Time of Canister Replacement	Weather During Replacement (Wind, Temp, Precipitation)	Approximate Depth of Liquid/Snow in Canister (cm) **DO NOT PLACE TAPE MEASURE IN CANISTER**	Condition of Stand and Other Comments (Good, Damaged, Altered…)
DM-2	11:30	wind; S/2 km; partly cloudy; 1°C	~ DEPTH= 2.25 cm	Stand is in good condition, no apparent damage. Sample does not show signs of tampering. Photos: W,N,E,S,ID
DM-3	11:00	wind; S/2 km; partly cloudy; 1°C	~ DEPTH= 2.5 cm	Stand is in good condition, no apparent damage. Sample does not show signs of tampering. Photos: W,N,E,S,ID
DM-6	12:15	wind; S/ 2km; partly cloudy; -4°C	~ DEPTH= 2.5 cm	Stand is in good condition, no apparent damage. Sample does not show signs of tampering. Photos: W,N,E,S,ID
DM-7	13:30	wind; S/ 2km; partly cloudy; - 4°C	~ DEPTH= 8 cm	Stand is in good condition, no apparent damage. Sample does not show signs of tampering. Contents of jar completely frozen, ~4 cm of contents snow. Photos: W,N,E,S,ID
DM-8	16:30	wind; 0 km; partly cloudy; 3°C	~ DEPTH= 5 cm	Stand is in good condition, no apparent damage. Sample does not show signs of tampering. Contents of jar completely frozen, ~4 cm of contents snow… Photos: W,N,E,S,ID
DM-9	09:30	wind; 0 km; partly cloudy; 1°C	~ DEPTH= 2.5 cm	Stand is in good condition, no apparent damage. Sample does not show signs of tampering. Photos: W, N, E, S, ID.
DM-10	7:30	wind; 0 km; partly cloudy; -3°C	0 cm	Stand has been knocked over and broken into several pieces. Jar is empty. Relocation and installation will take place afternoon of Nov. 3, 2018. Reestablished at 49.66082, -114.92907. Station was redeployed at 19:15 on November 3, 2018.
DM-11	17:15	wind; 0 km; partly cloudy; 3°C	~ DEPTH= 2 cm	Stand is in good condition, no apparent damage. Sample does not show signs of tampering. Contents of jar completely frozen, ~4 cm of contents snow. Photos: W, N, E, S, D
DM-12	10:40	wind; S/2 km; partly cloudy; 1°C	~ DEPTH= 5 cm	Stand is in good condition, no apparent damage. Sample does not show signs of tampering. Photos: W, ID, N, E, S

Notes:

- Canisters should be replaced +/- 2 days from initial date of deployment, with a maximum deployment time of 32 days - Canisters should have the following information recorded on them prior to shipping to laboratory:
- Date and Time of Removal
- Station ID (DM-#)
- Dillon Consulting Limited
- Project # 126231

Dustfall Monitor Replacement Field Sheet - December 2018

Canister ID	Date/Time of Canister Replacement	Weather During Replacement (Wind, Temp, Precipitation)	Approximate Depth of Liquid/Snow in Canister (cm) **DO NOT PLACE TAPE MEASURE IN CANISTER**	Condition of Stand and Other Comments (Good, Damaged, Altered…)
DM-2	9:19	Cloudy -17°C	~ depth =7 cm	Contents completely frozen. No signs of tampering. Stand is in good condition. No damage noted. Photos: E, N, W, S, label, inside jar.
DM-3	9:51	Cloudy -19°C	~ depth =7 cm	Contents completely frozen. No signs of tampering. Stand is in good condition. No damage noted. Photos: N, W, S, E, label, inside jar..
DM-6	8:35	Cloudy -17°C	~ depth =11 cm	Contents completely frozen. No signs of tampering. Stand is in good condition. No damage noted. Photos: W, N, E, S, label, inside jar.
DM-7	9:55	Cloudy -20°C		Stand and jar knocked over, appears stand was knocked over by snowmobiles. Sample lost.
DM-8	11:12	Cloudy -7°C	~ depth =13 cm	Contents completely frozen. No signs of tampering. Stand is in good condition. No damage noted. Photos: E, N, W, S, label, Inside jar.
DM-9	12:37	Sunny -8°C	~depth = 6 cm	Contents completely frozen. No signs of tampering. Stand is in good condition. No damage noted. Photos: W, N, E, S, label, inside jar
DM-10	14:00	Partly Cloudy, -7°C	~ depth =5 cm	Contents completely frozen. No signs of tampering. Stand is in good condition. No damage noted. Photos: inside jar, S, label, E, N, W.
DM-11	11:50	Cloudy -7°C	~ depth =5 cm	Contents completely frozen. No signs of tampering. Stand is in good condition. No damage noted. Photos: Inside jar, N, label, W, S, E
DM-12	7:40	Cloudy -17°C	~ depth =6 cm	Contents completely frozen. No signs of tampering. Stand is in good condition. No damage noted. Photos: S, W, N, E, label, inside Jar

Notes:

- Canisters should be replaced +/- 2 days from initial date of deployment, with a maximum deployment time of 32 days
- Canisters should have the following information recorded on them prior to shipping to laboratory:
- Date and Time of Removal
- Station ID (DM-#)
- Dillon Consulting Limited
- Project # 126231

Dustfall Monitor Replacement Field Sheet - May 2019

Canister ID	Date/Time of Canister Replacement	Weather During Replacement (Wind, Temp, Precipitation)	Approximate Depth of Liquid/Snow in Canister (cm) **DO NOT PLACE TAPE MEASURE IN CANISTER**	Condition of Stand and Other Comments (Good, Damaged, Altered…)
DM-2	16:40	wind; 0 km; partly cloudy;	N/A	Stand made it through the winter in good condition. No repairs needed. Photos taken. Sample jar deployed.
DM-3	18:30	12°C	N/A	Stand made it through the winter in good condition. No repairs needed. Photos taken. Sample jar deployed.
DM-6	18:50	wind; 0 km; partly cloudy;	N/A	Stand made it through the winter in good condition. No repairs needed. Photos taken. Sample jar deployed.
DM-7	15:18	14°C	N/A	Stand broken over the winter. Re- assembled. New stand not needed, minor repairs only.
DM-8	11:22	wind; 0 km; partly cloudy;	N/A	Stand made it through the winter in good condition. No repairs needed. Photos taken.
DM-9	9:40	14°C	N/A	Stand broken over the winter. Re- assembled. New stand not needed, minor repairs only.
DM-10	8:45	wind; 0 km; Sunny;	N/A	Stand made it through the winter in good condition. Minor vandalism to wind screen. No repairs needed. Photos taken.
DM-11	17:35	17°C	N/A	Stand made it through the winter in good condition. No repairs needed. Photos taken.
DM-12	18:05	wind; 0 km; partly cloudy;	N/A	Stand made it through the winter. Some minor vandalism. Stand still structurally sound. No repairs needed. Photos taken.

Notes:

- Canisters should be replaced +/- 2 days from initial date of deployment, with a maximum deployment time of 32 days
- Canisters should have the following information recorded on them prior to shipping to laboratory:
- Date and Time of Removal
- Station ID (DM-#)
- Dillon Consulting Limited
- Project # 126231

Dustfall Monitor Replacement Field Sheet - June 2019

Canister ID	Date/Time of Canister Replacement	Weather During Replacement (Wind, Temp, Precipitation)	Approximate Depth of Liquid/Snow in Canister (cm) **DO NOT PLACE TAPE MEASURE IN CANISTER**	Condition of Stand and Other Comments (Good, Damaged, Altered…)
DM-2	10:45	wind; 2 km/ S; Sunny; 18°C	0	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Contents of jar have evaporated completely. Photos: W, S, E, N, jar.
DM-3	12:40	wind; 3 km/ N; partly cloudy; 20°C	0	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Contents of jar have evaporated completely. Photos: W, S, E, N, jar.
DM-6	11:10	wind; 4 km /S; partly cloudy; 16°C	0.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-7	11:45	wind; 5 km/ S; Sunny; 15°C	1	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-8	15:00	wind; 4 km/ S; partly cloudy; 17°C	1.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, N, E, S, jar.
DM-9	9:05	wind; 0 km; Sunny; 13°C	0.1	Stand remains in good condition, no signs of new vandalism. Site information label missing, will replace at next collection date. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-10	8:20	wind; 0 km; Cloudy; 9°C	0.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar
DM-11	15:40	wind;7 km/ W; partly cloudy, light rain; 20°C	0.1	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-12	10:22	wind; 0 km; Sunny; 18°C	0.1	Stand remains in good condition, no signs of new vandalism. Sample has been tampered with. Cigar put out in jar. Sample will be discarded. Photos: jar, W, S, E, N.

Notes:

- Canisters should be replaced +/- 2 days from initial date of deployment, with a maximum deployment time of 32 days
- Canisters should have the following information recorded on them prior to shipping to laboratory:
- Date and Time of Removal
- Station ID (DM-#)
- Dillon Consulting Limited
- Project # 126231

Dustfall Monitor Replacement Field Sheet - July 2019

Canister ID	Date/Time of Canister Replacement	Weather During Replacement (Wind, Temp, Precipitation)	Approximate Depth of Liquid/Snow in Canister (cm) **DO NOT PLACE TAPE MEASURE IN CANISTER**	Condition of Stand and Other Comments (Good, Damaged, Altered…)
DM-2	10:15	wind; 2 km/ S; Sunny; 17°C	3.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-3	12:40	wind; 4 km/ W; partly cloudy; 19°C	4	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-6	10:43	wind; 4 km /W; partly cloudy; 15°C	7.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-7	11:30	wind; 5 km/ S; Sunny; 14°C	9	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-8	14:45	wind; 4 km/ S; partly cloudy; 18°C	8	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, N, E, S, jar.
DM-9	9:10	wind; 3 km/S; Sunny; 16°C	3	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-10	8:15	wind; 1 km/ S; Sunny; 13°C	4.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-11	15:40	wind;3 km/ W; partly cloudy, light rain; 23°C	2.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-12	13:30	wind; 5 km/W; Sunny; 20°C	5	Stand remains in good condition, no signs of new vandalism. Samples do not appear to have been tampered with. Photos: jar, W, S, E, N.

Notes:

- Canisters should be replaced +/- 2 days from initial date of deployment, with a maximum deployment time of 32 days
- Canisters should have the following information recorded on them prior to shipping to laboratory:
- Date and Time of Removal
- Station ID (DM-#)
- Dillon Consulting Limited
- Project # 126231

Dustfall Monitor Replacement Field Sheet - August 2019

Canister ID	Date/Time of Canister Replacement	Weather During Replacement (Wind, Temp, Precipitation)	Approximate Depth of Liquid/Snow in Canister (cm) **DO NOT PLACE TAPE MEASURE IN CANISTER**	Condition of Stand and Other Comments (Good, Damaged, Altered…)
DM-2	12:00	wind; 2 km/N; Cloudy; 14°C	2	Stand remains in good condition, some vandalism. Sample shot with a shotgun, jar punctured. Sample will not be sent; W, S, E, N, jar.
DM-3	12:25	wind; 2 km/ N; Cloudy; 17°C	0.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-6	10:20	wind; 6 km /W; Cloudy; 14°C	7.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-7	11:12	wind; 0 km/ N; partly cloudy; 14°C	4	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, N, E, S, jar.
DM-8	13:55	wind; 0 km/ partly cloudy; 16°C	8	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, N, E, S, jar.
DM-9	8:40	wind; 4 km/N; Cloudy; 10°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-10	7:45	wind; 0 km/ S; Cloudy, light rain; 10°C	7	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-11	14:45	wind;3 km/ E; partly cloudy; 20°C	2.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-12	9:30	wind; 0 km; Cloudy; 11°C	6	Stand remains in good condition, no signs of new vandalism. Samples do not appear to have been tampered with. Photos: jar, W, S, E, N.

Notes:

- Canisters should be replaced +/- 2 days from initial date of deployment, with a maximum deployment time of 32 days
- Canisters should have the following information recorded on them prior to shipping to laboratory:
- Date and Time of Removal
- Station ID (DM-#)
- Dillon Consulting Limited
- Project # 126231

Dustfall Monitor Replacement Field Sheet - September 2019

Canister ID	Date/Time of Canister Replacement	Weather During Replacement (Wind, Temp, Precipitation)	Approximate Depth of Liquid/Snow in Canister (cm) **DO NOT PLACE TAPE MEASURE IN CANISTER**	Condition of Stand and Other Comments (Good, Damaged, Altered…)
DM-2	11:45	wind; 3 km/ S; Sunny; 7°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with.
DM-3	12:15	wind; 3 km/ N; partly cloudy; 7°C	3	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with.
DM-6	10:00	wind; 2 km /N; partly cloudy; 7°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with.
DM-7	10:45	wind; 0 km; Sunny; 7°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with.
DM-8	9:45	wind; 2 km/ N; partly cloudy; 8°C	1.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with.
DM-9	8:30	wind; 0 km; Sunny; 5°C	3	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with.
DM-10	7:30	wind; 0 km; Cloudy; 5°C	3	Possible vandalism, stand remains in good condition, sample intact.
DM-11	14:30	wind;2 km/ W; partly cloudy; 18°C	3	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with.
DM-12	0:30	wind; 2 km; Sunny; 9°C	4	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with.

Notes:

- Canisters should be replaced +/- 2 days from initial date of deployment, with a maximum deployment time of 32 days
- Canisters should have the following information recorded on them prior to shipping to laboratory:
- Date and Time of Removal
- Station ID (DM-#)
- Dillon Consulting Limited
- Project # 126231

Dustfall Monitor Replacement Field Sheet - October 2019

Canister ID	Date/Time of Canister Replacement	Weather During Replacement (Wind, Temp, Precipitation)	Approximate Depth of Liquid/Snow in Canister (cm) **DO NOT PLACE TAPE MEASURE IN CANISTER**	Condition of Stand and Other Comments (Good, Damaged, Altered…)
DM-2	11:45	wind; 1 km/ S; Sunny; -1°C	6	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.
DM-3	12:15	wind; 3 km/ N; Sunny; -1°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.
DM-6	10:00	wind; 0 km; Sunny; -1°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.
DM-7	10:45	wind; 0 km; Sunny; -1°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.
DM-8	9:45	wind; 0 km; Sunny; -1°C	4	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.
DM-9	8:30	wind; 0 km; Sunny; -4°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.
DM-10	7:30	wind; 0 km; Sunny; -5°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.
DM-11	14:30	wind;3 km/ E ;Sunny; 1°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.
DM-12	0:30	wind; 4 km N; Sunny; 2°C	4	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.

Notes:

- Canisters should be replaced +/- 2 days from initial date of deployment, with a maximum deployment time of 32 days
- Canisters should have the following information recorded on them prior to shipping to laboratory:
- Date and Time of Removal
- Station ID (DM-#)
- Dillon Consulting Limited
- Project # 126231

Appendix B

Laboratory Certificates of Analysis

DILLON CONSULTING

DILLON CONSULTING LIMITED
ATTN: Richard Pope
510 - 3820 Cessna Drive
Richmond BC V7B 0A2

Date Received: 16-NOV-18
Report Date: 27-NOV-18 18:18 (MT)
Version: FINAL

Client Phone: 604-278-7847

Certificate of Analysis

Lab Work Order #: L2197752

Project P.O. #: NOT SUBMITTED
Job Reference: 126231
C of C Numbers:
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L2197752-1	L2197752-2	L2197752-3	L2197752-4	L2197752-5
	Description					
	Sampled Date	03-NOV-18	03-NOV-18	03-NOV-18	03-NOV-18	03-NOV-18
	Sampled Time	11:30	11:00	12:15	13:30	16:30
	Client ID	DM2	DM3	DM6	DM7	DM8
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	1.66	1.64	0.63	0.66	0.40
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.0105	0.00283	0.00178	0.00487	0.00341
	Antimony (Sb)-Total (mg/dm2.day)	0.0000030	0.0000023	<0.0000017	<0.0000031	<0.0000032
	Arsenic (As)-Total (mg/dm2.day)	<0.0000087 DLM	<0.000012 DLM	<0.0000034 DLM	<0.0000063 DLM	<0.0000065 DLM
	Barium (Ba)-Total (mg/dm2.day)	0.000800	0.000301	0.000126	0.000305	0.000230
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000062	<0.0000060	<0.0000086	<0.000016	<0.000016
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000062	<0.0000060	<0.0000086	<0.000016	<0.000016
	Boron (B)-Total (mg/dm2.day)	<0.00012	0.00014	<0.00017	<0.00031	<0.00032
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000322	0.0000130	<0.00000086	<0.0000016	<0.0000016
	Calcium (Ca)-Total (mg/dm2.day)	0.0295	0.0216	0.00432	0.00951	0.00846
	Chromium (Cr)-Total (mg/dm2.day)	0.0000219	0.0000075	<0.0000086	<0.000016	<0.000016
	Cobalt (Co)-Total (mg/dm2.day)	0.0000097	0.0000069	<0.0000017	0.0000041	0.0000033
	Copper (Cu)-Total (mg/dm2.day)	<0.000062 DLB	<0.000095 DLB	<0.000017 DLB	<0.000063 DLB	<0.000029 DLB
	Iron (Fe)-Total (mg/dm2.day)	0.00993	0.00540	0.00132	0.00442	0.00251
	Lead (Pb)-Total (mg/dm2.day)	0.0000168	0.0000130	0.00000444	0.0000098	0.0000078
	Lithium (Li)-Total (mg/dm2.day)	<0.000062	<0.000060	<0.000086	<0.00016	<0.00016
	Magnesium (Mg)-Total (mg/dm2.day)	0.00884	0.00999	<0.0012 DLB	<0.0025 DLB	<0.0023 DLB
	Manganese (Mn)-Total (mg/dm2.day)	0.000275	0.000205	0.0000549	0.000149	0.000107
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000405	0.00000320	<0.00000086	0.0000021	<0.0000016
	Nickel (Ni)-Total (mg/dm2.day)	0.0000462	0.0000283	<0.0000086	0.000018	0.000021
	Phosphorus (P)-Total (mg/dm2.day)	0.00225	0.0347	<0.00086	<0.0016	<0.0016
	Potassium (K)-Total (mg/dm2.day)	0.00725	0.0484	0.00153	0.0029	0.0029
	Selenium (Se)-Total (mg/dm2.day)	<0.000012	<0.000012	<0.000017	<0.000031	<0.000032
	Silicon (Si)-Total (mg/dm2.day)	0.0173	0.00403	0.00239	0.0072	0.0047
	Silver (Ag)-Total (mg/dm2.day)	0.00000055	0.00000174	<0.00000017	<0.00000031	<0.00000032
	Sodium (Na)-Total (mg/dm2.day)	0.00072	0.0118	<0.00086	<0.0016	<0.0016
	Strontium (Sr)-Total (mg/dm2.day)	0.0000806	0.0000525	0.0000142	0.0000333	0.0000256
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012	<0.0000012	<0.0000017	<0.0000031	<0.0000032
	Tin (Sn)-Total (mg/dm2.day)	0.0000012	0.0000013	<0.0000017	<0.0000031	<0.0000032
	Titanium (Ti)-Total (mg/dm2.day)	0.00012	<0.00012	<0.00017	<0.00031	<0.00032
	Uranium (U)-Total (mg/dm2.day)	0.00000116	0.00000053	0.00000017	0.00000045	<0.00000032
	Vanadium (V)-Total (mg/dm2.day)	0.000065	0.000026	<0.000017	<0.000031	<0.000032
	Zinc (Zn)-Total (mg/dm2.day)	<0.00037 DLB	<0.00071 DLB	<0.0010 DLB	<0.00094 DLB	<0.00097 DLB

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L2197752-6	L2197752-7	L2197752-8		
	Description					
	Sampled Date	03-NOV-18	03-NOV-18	03-NOV-18		
	Sampled Time	09:30	17:15	10:40		
	Client ID	DM9	DM11	DM12		
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.39	0.41	1.11		
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00155	0.00400	0.00230		
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000011 DLM	<0.0000015 DLM	0.0000068 DLM		
	Arsenic (As)-Total (mg/dm2.day)	<0.0000023	<0.0000044	<0.0000044		
	Barium (Ba)-Total (mg/dm2.day)	0.000116	0.000261	0.000247		
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000057	<0.0000074	<0.0000074		
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000057	<0.0000074	<0.0000074		
	Boron (B)-Total (mg/dm2.day)	<0.00011	<0.00015	<0.00015		
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000131	0.00000098	0.00000411		
	Calcium (Ca)-Total (mg/dm2.day)	0.00856	0.0103	0.0158		
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000057	0.0000097	0.0000123		
	Cobalt (Co)-Total (mg/dm2.day)	0.0000016	0.0000039	0.0000037		
	Copper (Cu)-Total (mg/dm2.day)	<0.000034 DLB	<0.000030 DLB	<0.000059 DLB		
	Iron (Fe)-Total (mg/dm2.day)	0.00206	0.00377	0.00596		
	Lead (Pb)-Total (mg/dm2.day)	0.00000622	0.00000981	0.00000970		
	Lithium (Li)-Total (mg/dm2.day)	<0.000057	<0.000074	<0.000074		
	Magnesium (Mg)-Total (mg/dm2.day)	0.00200	0.00213	0.00613		
	Manganese (Mn)-Total (mg/dm2.day)	0.0000670	0.000116	0.000140		
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000096	0.00000142	0.00000284		
	Nickel (Ni)-Total (mg/dm2.day)	0.0000089	0.0000171	0.0000178		
	Phosphorus (P)-Total (mg/dm2.day)	0.00656	<0.00074	0.0154		
	Potassium (K)-Total (mg/dm2.day)	0.00970	0.00214	0.0294		
	Selenium (Se)-Total (mg/dm2.day)	<0.000011	<0.000015	<0.000015		
	Silicon (Si)-Total (mg/dm2.day)	0.00258	0.00831	0.00353		
	Silver (Ag)-Total (mg/dm2.day)	0.00000029	0.00000022	0.00000060		
	Sodium (Na)-Total (mg/dm2.day)	0.00321	0.00078	0.00608		
	Strontium (Sr)-Total (mg/dm2.day)	0.0000197	0.0000336	0.0000746		
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011	<0.0000015	<0.0000015		
	Tin (Sn)-Total (mg/dm2.day)	<0.0000011	<0.0000015	0.0000015		
	Titanium (Ti)-Total (mg/dm2.day)	<0.00011	<0.00015	<0.00015		
	Uranium (U)-Total (mg/dm2.day)	0.00000020	0.00000043	0.00000038		
	Vanadium (V)-Total (mg/dm2.day)	<0.000011	0.000025	0.000019		
	Zinc (Zn)-Total (mg/dm2.day)	<0.00034 DLB	<0.00044 DLB	<0.00044 DLB		

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Aluminum (Al)-Total	B	L2197752-1, -2, -3, -4, -5, -6, -7, -8
Method Blank	Barium (Ba)-Total	B	L2197752-1, -2, -3, -4, -5, -6, -7, -8
Method Blank	Calcium (Ca)-Total	B	L2197752-1, -2, -3, -4, -5, -6, -7, -8
Method Blank	Manganese (Mn)-Total	B	L2197752-1, -2, -3, -4, -5, -6, -7, -8
Method Blank	Copper (Cu)-Total	MB-LOR	L2197752-1, -2, -3, -4, -5, -6, -7, -8
Method Blank	Magnesium (Mg)-Total	MB-LOR	L2197752-1, -2, -3, -4, -5, -6, -7, -8
Method Blank	Zinc (Zn)-Total	MB-LOR	L2197752-1, -2, -3, -4, -5, -6, -7, -8

Qualifiers for Individual Parameters Listed:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DUSTFALLS-T.DM2-VA	Dustfall	Dustfalls Total+Fixed & Vol (mg/dm2.day)	BCMOE DUSTFALLS

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

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).

** 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, BRITISH COLUMBIA, 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 Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # 1

Page 1 of 1

Report To				Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)
Company:	Dillon Consulting			☑ Standard	☐ Other			◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Richard Pope			☑ PDF	☑ Excel	☑ Digital	☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	3820 Cessna Drive Suite 510			Email 1:	rpope@dillon.ca			○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Richmond, BC, V7B 0A2			Email 2:	ldilley@dillon.ca			○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	(604) 295-7070	Fax:		Email 3:	dgay@dillon.ca			
Invoice To	Same as Report ?	☑ Yes	☐ No	Client / Project Information				Analysis Request
Hardcopy of Invoice with Report?		☑ Yes	☐ No	Job #:	126231			Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:				PO / AFE:				
Contact:				LSD:				
Address:								
Phone:		Fax:		Quote #:				
Lab Work Order # (lab use only):				ALS Contact:	Brent Mack	Sampler:	T. Phillips	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
	DM2	03-Nov-18	11:30	Air	1
	DM3	03-Nov-18	11:00	Air	1
	DM6	03-Nov-18	12:15	Air	1
	DM7	03-Nov-18	13:30	Air	1
	DM8	03-Nov-18	16:30	Air	1
	DM9	03-Nov-18	9:30	Air	1
	DM11	03-Nov-18	17:15	Air	1
	DM12	03-Nov-18	10:40	Air	1

L2197752-COFC

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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 provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Tyler Phillips	3-Nov-18		JC	NOV 16 2018	10:15 am	13+13 °C				

DILLON CONSULTING LIMITED
ATTN: Richard Pope
510 - 3820 Cessna Drive
Richmond BC V7B 0A2

Date Received: 19-JUN-19
Report Date: 27-JUN-19 13:45 (MT)
Version: FINAL

Client Phone: 604-278-7847

Certificate of Analysis

Lab Work Order #: L2295045

Project P.O. #: NOT SUBMITTED
Job Reference: 126231
C of C Numbers:
Legal Site Desc:

<Original signed by>

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L2295045-1	L2295045-2	L2295045-3	L2295045-4	L2295045-5
	Description	Air	Air	Air	Air	Air
	Sampled Date	14-JUN-19	14-JUN-19	14-JUN-19	14-JUN-19	14-JUN-19
	Sampled Time	09:19	09:51	08:35	09:55	11:12
	Client ID	DM2	DM3	DM6	DM10	DM8
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.91	0.78	0.55	1.12	0.86
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00474	0.00306	0.00258	0.00184	0.00305
	Antimony (Sb)-Total (mg/dm2.day)	0.0000025	0.0000017	<0.0000015	<0.0000012	0.0000019
	Arsenic (As)-Total (mg/dm2.day)	<0.000077 DLM	<0.000073 DLM	<0.000078 DLM	<0.000073 DLM	0.000076 DLM
	Barium (Ba)-Total (mg/dm2.day)	0.000278	0.000175	0.000202	0.0000814	0.000643
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000064	<0.0000058	<0.0000074	<0.0000060	<0.0000055
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000064	<0.0000058	<0.0000074	<0.0000060	<0.0000055
	Boron (B)-Total (mg/dm2.day)	<0.00013	<0.00012	<0.00015	<0.00012	<0.00011
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000167	0.00000093	0.00000082	0.00000483	0.00000152
	Calcium (Ca)-Total (mg/dm2.day)	0.0246	0.0242	0.0156	0.0147	0.0172
	Chromium (Cr)-Total (mg/dm2.day)	0.0000090	0.0000063	<0.0000074	<0.0000060	0.0000067
	Cobalt (Co)-Total (mg/dm2.day)	0.0000049	0.0000037	0.0000036	0.0000020	0.0000050
	Copper (Cu)-Total (mg/dm2.day)	0.0000395	0.0000198	0.0000137	0.0000449	0.0000186
	Iron (Fe)-Total (mg/dm2.day)	0.00583	0.00443	0.00356	0.00261	0.00496
	Lead (Pb)-Total (mg/dm2.day)	0.0000100	0.00000653	0.00000633	0.00000523	0.00000787
	Lithium (Li)-Total (mg/dm2.day)	<0.000064	<0.000058	<0.000074	<0.000060	<0.000055
	Magnesium (Mg)-Total (mg/dm2.day)	0.00637	0.00523	0.00344	0.00585	0.00398
	Manganese (Mn)-Total (mg/dm2.day)	0.000282	0.000227	0.000178	0.000173	0.000185
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000200	0.00000174	0.00000128	0.00000239	0.00000212
	Nickel (Ni)-Total (mg/dm2.day)	0.0000212 DLB	0.0000159 DLB	0.0000166 DLB	0.0000104	0.0000237 DLB
	Phosphorus (P)-Total (mg/dm2.day)	<0.0019	<0.0023	<0.0015	0.0114	<0.0017
	Potassium (K)-Total (mg/dm2.day)	0.00432	0.00504	0.00316	0.0320	0.00368
	Selenium (Se)-Total (mg/dm2.day)	<0.000013	<0.000012	<0.000015	<0.000012	<0.000011
	Silicon (Si)-Total (mg/dm2.day)	0.00776	0.00533	0.00437	0.00345	0.00526
	Silver (Ag)-Total (mg/dm2.day)	0.00000022	0.00000016	0.00000021	0.00000029	0.00000030
	Sodium (Na)-Total (mg/dm2.day)	0.00103	0.00082	<0.00074	0.00460	0.00068
	Strontium (Sr)-Total (mg/dm2.day)	0.0000549	0.0000474	0.0000378	0.0000280	0.0000517
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000013	<0.0000012	<0.0000015	<0.0000012	<0.0000011
	Tin (Sn)-Total (mg/dm2.day)	<0.0000013	<0.0000012	<0.0000015	<0.0000012	<0.0000011
	Titanium (Ti)-Total (mg/dm2.day)	<0.00013	<0.00012	<0.00015	<0.00012	<0.00011
	Uranium (U)-Total (mg/dm2.day)	0.00000060	0.00000039	0.00000036	0.00000023	0.00000053
	Vanadium (V)-Total (mg/dm2.day)	0.000018 DLB	0.000012 DLB	<0.000015 DLB	<0.000012 DLB	0.000016 DLB
	Zinc (Zn)-Total (mg/dm2.day)	<0.00027	<0.00024	<0.00022	<0.00025	<0.00020

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L2295045-6	L2295045-7	L2295045-9		
	Description	Air	Air	Air		
	Sampled Date	12-JUN-19	14-JUN-19	14-JUN-19		
	Sampled Time	12:37	14:00	11:45		
	Client ID	DM9	DM11	DM7		
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.51	0.38	0.84		
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00218	0.00220	0.00345		
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000012 DLM	<0.0000011 DLM	0.0000020 DLM		
	Arsenic (As)-Total (mg/dm2.day)	<0.000039	<0.000072	<0.000080		
	Barium (Ba)-Total (mg/dm2.day)	0.000129	0.000104	0.000332		
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000058	<0.0000055	<0.0000051		
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000058	<0.0000055	<0.0000051		
	Boron (B)-Total (mg/dm2.day)	<0.00012	<0.00011	<0.00010		
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000067	0.00000057	0.00000130		
	Calcium (Ca)-Total (mg/dm2.day)	0.0103	0.0135	0.0176		
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000058	<0.0000055	0.0000073		
	Cobalt (Co)-Total (mg/dm2.day)	0.0000026	0.0000020	0.0000061		
	Copper (Cu)-Total (mg/dm2.day)	0.0000151	0.0000115	0.0000223		
	Iron (Fe)-Total (mg/dm2.day)	0.00292	0.00268	0.00591		
	Lead (Pb)-Total (mg/dm2.day)	0.00000463	0.00000419	0.00000943		
	Lithium (Li)-Total (mg/dm2.day)	<0.000058	<0.000055	<0.000051		
	Magnesium (Mg)-Total (mg/dm2.day)	0.00256	0.00266	0.00405		
	Manganese (Mn)-Total (mg/dm2.day)	0.000156	0.000127	0.000207		
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000105	0.00000095	0.00000195		
	Nickel (Ni)-Total (mg/dm2.day)	0.0000130	0.0000083	0.0000258		
	Phosphorus (P)-Total (mg/dm2.day)	<0.0017 DLB	<0.0011 DLB	<0.0015 DLB		
	Potassium (K)-Total (mg/dm2.day)	0.00641	0.00370	0.00365		
	Selenium (Se)-Total (mg/dm2.day)	<0.000012	<0.000011	<0.000010		
	Silicon (Si)-Total (mg/dm2.day)	0.00367	0.00408	0.00548		
	Silver (Ag)-Total (mg/dm2.day)	0.00000014	<0.00000011	0.00000028		
	Sodium (Na)-Total (mg/dm2.day)	0.00199	0.00063	0.00073		
	Strontium (Sr)-Total (mg/dm2.day)	0.0000247	0.0000297	0.0000530		
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012	<0.0000011	<0.0000010		
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012	<0.0000011	<0.0000010		
	Titanium (Ti)-Total (mg/dm2.day)	<0.00012	<0.00011	<0.00010		
	Uranium (U)-Total (mg/dm2.day)	0.00000022	0.00000019	0.00000057		
	Vanadium (V)-Total (mg/dm2.day)	<0.000012	<0.000011	0.000016		
	Zinc (Zn)-Total (mg/dm2.day)	<0.00017 DLB	<0.00017 DLB	0.000569		

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Aluminum (Al)-Total	B	L2295045-1, -2, -3, -4, -5, -6, -7, -9
Method Blank	Barium (Ba)-Total	B	L2295045-1, -2, -3, -4, -5, -6, -7, -9
Method Blank	Calcium (Ca)-Total	B	L2295045-1, -2, -3, -4, -5, -6, -7, -9
Duplicate	Copper (Cu)-Total	DUP-H	L2295045-1, -2, -3, -4, -5, -6, -7, -9
Method Blank	Phosphorus (P)-Total	MB-LOR	L2295045-1, -2, -3, -4, -5, -6, -7, -9
Method Blank	Zinc (Zn)-Total	MB-LOR	L2295045-1, -2, -3, -4, -5, -6, -7, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DUSTFALLS-T.DM2-VA	Dustfall	Dustfalls Total+Fixed & Vol (mg/dm2.day)	BCMOE DUSTFALLS

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

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).

** 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, BRITISH COLUMBIA, 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 Environmental

Ch

L2295045-COFC

COC # 1

Page 1 of 1

Report To		Report	Service Requested (Rush for routine analysis subject to availability)
Company:	Dillon Consulting	☑ Standard	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Richard Pope	☑ PDF ☑ Excel ☑ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	3820 Cessna Drive Suite 510	Email 1: rpope@dillon.ca	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Richmond, BC, V7B 0A2	Email 2: ldilley@dillon.ca	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	(604) 295-7070 Fax:	Email 3: dgay@dillon.ca	**Analysis Request**
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information	Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 126231	
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #:	
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: T. Phillips

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
	DM2	14-Jun-19	9:19	Air	1
	DM3	14-Jun-19	9:51	Air	1
	DM6	14-Jun-19	8:35	Air	1
	DM10	14-Jun-19	9:55	Air	1
	DM8	14-Jun-19	11:12	Air	1
	DM9	14-Jun-19	12:37	Air	1
	DM11	14-Jun-19	14:00	Air	1
	DM12	14-Jun-19	7:40	Air	1
	DM7	14-Jun-19	11:45	Air	

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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 provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Tyler Phillips	14-Jun-19		HM	6/15	12:50p	7.1 °C				

DILLON CONSULTING LIMITED
ATTN: Richard Pope
510 - 3820 Cessna Drive
Richmond BC V7B 0A2

Date Received: 19-JUL-19
Report Date: 31-JUL-19 09:23 (MT)
Version: FINAL

Client Phone: 604-278-7847

Certificate of Analysis

Lab Work Order #: L2313408

Project P.O. #: NOT SUBMITTED
Job Reference: 126231
C of C Numbers:
Legal Site Desc:

<Original signed by>

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L2313408-1 Air 16-JUL-19 10:15 DM2	L2313408-2 Air 16-JUL-19 12:40 DM3	L2313408-3 Air 16-JUL-19 10:43 DM6	L2313408-4 Air 16-JUL-19 08:15 DM10	L2313408-5 Air 16-JUL-19 14:45 DM8
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.80	0.76	0.61	<0.10	0.91
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00277	0.00187	0.00351	0.00102	0.00448
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000018	<0.0000013	<0.0000026	<0.0000015	<0.0000030
	Arsenic (As)-Total (mg/dm2.day)	0.0000054	0.0000038	0.0000047	0.0000020	0.0000056
	Barium (Ba)-Total (mg/dm2.day)	0.000385	0.000240	0.000312	0.0000492	0.00109
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000091	<0.0000064	<0.000013	<0.0000076	<0.000015
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000091	0.0000584	0.000033	<0.0000076	<0.000015
	Boron (B)-Total (mg/dm2.day)	<0.00018	<0.00013	<0.00026	<0.00015	<0.00030
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000135	0.00000192	<0.0000013	<0.00000076	0.0000019
	Calcium (Ca)-Total (mg/dm2.day)	0.0194	0.0277	0.0108	0.00596	0.0156
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000091	<0.0000064	<0.000013	<0.0000076	<0.000015
	Cobalt (Co)-Total (mg/dm2.day)	0.0000052	0.0000034	0.0000052	<0.0000015	0.0000069
	Copper (Cu)-Total (mg/dm2.day)	<0.000081 DLB	0.000677	<0.00034 DLB	<0.00026 DLB	<0.000089 DLB
	Iron (Fe)-Total (mg/dm2.day)	0.00460	0.00382	0.00534	0.00142	0.00632
	Lead (Pb)-Total (mg/dm2.day)	0.00000728	0.0000127	0.0000144	0.00000597	0.0000106
	Lithium (Li)-Total (mg/dm2.day)	<0.000091	<0.000064	<0.00013	<0.000076	<0.00015
	Magnesium (Mg)-Total (mg/dm2.day)	0.00638	0.00773	0.00306	0.00190	0.00408
	Manganese (Mn)-Total (mg/dm2.day)	0.000219	0.000268	0.000161	0.000103	0.000190
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000170	0.00000127	0.0000016	<0.00000076	0.0000021
	Nickel (Ni)-Total (mg/dm2.day)	0.0000225	0.0000151	0.000022	<0.0000076	0.000030
	Phosphorus (P)-Total (mg/dm2.day)	0.00188	0.0135	0.0023	0.00321	0.0018
	Potassium (K)-Total (mg/dm2.day)	0.00371	0.0189	0.0049	0.00870	0.0056
	Selenium (Se)-Total (mg/dm2.day)	<0.000018	<0.000013	<0.000026	<0.000015	<0.000030
	Silicon (Si)-Total (mg/dm2.day)	0.00428	0.00281	0.0044	0.00161	0.0050
	Silver (Ag)-Total (mg/dm2.day)	0.00000024	0.00000021	0.00000031	<0.00000015	0.00000040
	Sodium (Na)-Total (mg/dm2.day)	0.00187	0.00194	<0.0013	0.00091	<0.0015
	Strontium (Sr)-Total (mg/dm2.day)	0.0000362	0.0000346	0.0000318	0.0000112	0.0000489
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000018	<0.0000013	<0.0000026	<0.0000015	<0.0000030
	Tin (Sn)-Total (mg/dm2.day)	<0.0000018	<0.0000013	<0.0000026	<0.0000015	<0.0000030
	Titanium (Ti)-Total (mg/dm2.day)	<0.00018	<0.00013	<0.00026	<0.00015	<0.00030
	Uranium (U)-Total (mg/dm2.day)	0.00000051	0.00000076	0.00000062	<0.00000015	0.00000075
	Vanadium (V)-Total (mg/dm2.day)	<0.000018	<0.000013	<0.000026	<0.000015	<0.000030
	Zinc (Zn)-Total (mg/dm2.day)	<0.00033 DLB	<0.00050 DLB	<0.00047 DLB	<0.00027 DLB	<0.00053 DLB

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L2313408-6	L2313408-7	L2313408-8	L2313408-9	
Description	Air	Air	Air	Air	
Sampled Date	16-JUL-19	16-JUL-19	16-JUL-19	16-JUL-19	
Sampled Time	09:10	15:40	11:30	13:30	
Client ID	DM9	DM11	DM7	DM12	
Grouping / **Analyte**					
DUSTFALL					
Particulates Total Dustfall (mg/dm2.day)	0.32	0.45	0.70	0.83	
Metals Aluminum (Al)-Total (mg/dm2.day)	0.00122	0.00170	0.00566	0.00164	
Antimony (Sb)-Total (mg/dm2.day)	<0.0000011	0.0000011	<0.0000034	0.0000042	
Arsenic (As)-Total (mg/dm2.day)	0.0000020	0.0000035	0.0000068	0.0000050	
Barium (Ba)-Total (mg/dm2.day)	0.0000863	0.000115	0.000380	0.000328	
Beryllium (Be)-Total (mg/dm2.day)	<0.0000057	<0.0000055	<0.000017	<0.0000098	
Bismuth (Bi)-Total (mg/dm2.day)	0.0000146	0.0000074	<0.000017	<0.0000098	
Boron (B)-Total (mg/dm2.day)	<0.00011	<0.00011	<0.00034	<0.00020	
Cadmium (Cd)-Total (mg/dm2.day)	0.00000080	0.00000109	<0.0000017	0.0000152	
Calcium (Ca)-Total (mg/dm2.day)	0.00705	0.00827	0.0115	0.0109	
Chromium (Cr)-Total (mg/dm2.day)	<0.0000057	0.0000134	<0.000017	<0.0000098	
Cobalt (Co)-Total (mg/dm2.day)	0.0000015	0.0000022	0.0000060	0.0000033	
Copper (Cu)-Total (mg/dm2.day)	0.00034 DLB	<0.00015 DLB	<0.00034 DLB	<0.000078 DLB	
Iron (Fe)-Total (mg/dm2.day)	0.00177	0.00337	0.0097	0.00386	
Lead (Pb)-Total (mg/dm2.day)	0.00000769	0.00000806	0.0000151	0.00000968	
Lithium (Li)-Total (mg/dm2.day)	<0.000057	<0.000055	<0.00017	<0.000098	
Magnesium (Mg)-Total (mg/dm2.day)	0.00205	0.00238	0.00369	0.00372	
Manganese (Mn)-Total (mg/dm2.day)	0.000114	0.000124	0.000202	0.000148	
Molybdenum (Mo)-Total (mg/dm2.day)	0.00000074	0.00000130	0.0000019	0.00000199	
Nickel (Ni)-Total (mg/dm2.day)	0.0000063	0.0000106	0.000024	0.0000114	
Phosphorus (P)-Total (mg/dm2.day)	0.00348	0.00317	<0.0017	0.00968	
Potassium (K)-Total (mg/dm2.day)	0.00738	0.00908	0.0042	0.0168	
Selenium (Se)-Total (mg/dm2.day)	<0.000011	<0.000011	<0.000034	<0.000020	
Silicon (Si)-Total (mg/dm2.day)	0.00184	0.00223	0.0092	0.00276	
Silver (Ag)-Total (mg/dm2.day)	0.00000018	0.00000013	<0.00000034	0.00000024	
Sodium (Na)-Total (mg/dm2.day)	0.00159	0.00129	<0.0017	0.00410	
Strontium (Sr)-Total (mg/dm2.day)	0.0000166	0.0000168	0.0000502	0.0000369	
Thallium (Tl)-Total (mg/dm2.day)	<0.0000011	<0.0000011	<0.0000034	<0.0000020	
Tin (Sn)-Total (mg/dm2.day)	0.0000014	<0.0000011	<0.0000034	<0.0000020	
Titanium (Ti)-Total (mg/dm2.day)	<0.00011	<0.00011	<0.00034	<0.00020	
Uranium (U)-Total (mg/dm2.day)	0.00000020	0.00000029	0.00000111	<0.00000020	
Vanadium (V)-Total (mg/dm2.day)	<0.000011	<0.000011	<0.000034	<0.000020	
Zinc (Zn)-Total (mg/dm2.day)	<0.00031 DLB	<0.00033 DLB	<0.00051 DLB	<0.00059 DLB	

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Barium (Ba)-Total	MB-LOR	L2313408-1, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Copper (Cu)-Total	MB-LOR	L2313408-1, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Lead (Pb)-Total	MB-LOR	L2313408-1, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Manganese (Mn)-Total	MB-LOR	L2313408-1, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Zinc (Zn)-Total	MB-LOR	L2313408-1, -2, -3, -4, -5, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DUSTFALLS-T.DM2-VA	Dustfall	Dustfalls Total+Fixed & Vol (mg/dm2.day)	BCMOE DUSTFALLS

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

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).

** 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, BRITISH COLUMBIA, 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 Environmental

L2313408-COFC

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # 1

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Report To		Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)
Company:	Dillon Consulting	☑ Standard	☐ Other			◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Richard Pope	☑ PDF	☑ Excel	☑ Digital	☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	3820 Cessna Drive Suite 510	Email 1: rpope@dillon.ca				○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Richmond, BC, V7B 0A2	Email 2: ldilley@dillon.ca				○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	(604) 295-7070 Fax:	Email 3: dgay@dillon.ca				
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information				Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 126231				Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:				
Contact:		LSD:				
Address:						
Phone:	Fax:	Quote #:				
Lab Work Order # (lab use only)		ALS Contact: Brent Mack		Sampler: T. Phillips		

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total dust fall	Total metals	Number of Containers
	DM2	16-Jul-19	10:15	Air	X	X	1
	DM3	16-Jul-19	12:40	Air	X	X	1
	DM6	16-Jul-19	10:43	Air	X	X	1
	DM10	16-Jul-19	8:15	Air	X	X	1
	DM8	16-Jul-19	14:45	Air	X	X	1
	DM9	16-Jul-19	9:10	Air	X	X	1
	DM11	16-Jul-19	15:40	Air	X	X	1
	DM7	16-Jul-19	11:30	Air	X	X	1
	DM12	16-Jul-19	13:30	Air	X	X	

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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 provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Tyler Phillips	16-Jul-19		JC	JUL 19 2019	10:50Am	18/17 °C				

DILLON CONSULTING LIMITED
ATTN: Richard Pope
510 - 3820 Cessna Drive
Richmond BC V7B 0A2

Date Received: 22-AUG-19
Report Date: 05-SEP-19 12:23 (MT)
Version: FINAL

Client Phone: 604-278-7847

Certificate of Analysis

Lab Work Order #: L2333896

Project P.O. #: NOT SUBMITTED
Job Reference: 126231
C of C Numbers:
Legal Site Desc:

<Original signed by>

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L2333896-1 Air 16-AUG-19 09:30 DM12	L2333896-2 Air 16-AUG-19 12:25 DM3	L2333896-3 Air 16-AUG-19 10:20 DM6	L2333896-4 Air 16-AUG-19 07:45 DM10	L2333896-5 Air 16-AUG-19 13:05 DM8
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.28	0.36	0.11	<0.10	0.20
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00278	0.00162	0.00145	0.000648	0.00165
	Antimony (Sb)-Total (mg/dm2.day)	0.0000043	<0.0000014	<0.0000014	<0.0000019	<0.0000020
	Arsenic (As)-Total (mg/dm2.day)	0.0000027	0.0000022	0.0000016	<0.0000019	0.0000025
	Barium (Ba)-Total (mg/dm2.day)	0.000153	0.000149	0.000201	0.0000426	0.00168
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000059	<0.0000069	<0.0000069	<0.0000093	<0.0000098
	Bismuth (Bi)-Total (mg/dm2.day)	0.0000177	0.0000241	<0.0000069	<0.0000093	0.0000141
	Boron (B)-Total (mg/dm2.day)	<0.00012	<0.00014	<0.00014	<0.00019	<0.00020
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000217	0.00000138	0.00000091	<0.00000093	0.00000122
	Calcium (Ca)-Total (mg/dm2.day)	0.0107	0.0303	0.00690	0.00490	0.0130
	Chromium (Cr)-Total (mg/dm2.day)	0.0000089	<0.0000069	<0.0000069	<0.0000093	<0.0000098
	Cobalt (Co)-Total (mg/dm2.day)	0.0000031	0.0000029	0.0000034	<0.0000019	0.0000041
	Copper (Cu)-Total (mg/dm2.day)	0.000580	0.000759	0.000231	0.000290	0.000916
	Iron (Fe)-Total (mg/dm2.day)	0.00422	0.00307	0.00247	0.00085	0.00274
	Lead (Pb)-Total (mg/dm2.day)	0.0000108	0.00000868	0.00000631	0.00000630	0.00000960
	Lithium (Li)-Total (mg/dm2.day)	<0.000059	<0.000069	<0.000069	<0.000093	<0.000098
	Magnesium (Mg)-Total (mg/dm2.day)	0.00359	0.00900	0.00275	0.00129	0.00357
	Manganese (Mn)-Total (mg/dm2.day)	0.000160	0.000269	0.000113	0.0000777	0.000188
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000430	0.00000097	0.00000083	<0.00000093	<0.00000098
	Nickel (Ni)-Total (mg/dm2.day)	0.0000120	0.0000115	0.0000147	<0.0000093	0.0000168
	Phosphorus (P)-Total (mg/dm2.day)	0.0112	0.00865	0.00511	0.00119	0.00163
	Potassium (K)-Total (mg/dm2.day)	0.0105	0.0124	0.00731	0.00255	0.00342
	Selenium (Se)-Total (mg/dm2.day)	<0.000012	<0.000014	<0.000014	<0.000019	<0.000020
	Silicon (Si)-Total (mg/dm2.day)	0.00423	0.00261	0.00270	0.00107	0.00200
	Silver (Ag)-Total (mg/dm2.day)	0.00000033	0.00000031	0.00000018	<0.00000019	<0.00000020
	Sodium (Na)-Total (mg/dm2.day)	0.00204	0.00184	0.00181	0.00110	0.00134
	Strontium (Sr)-Total (mg/dm2.day)	0.0000455	0.0000440	0.0000189	0.0000109	0.0000484
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012	<0.0000014	<0.0000014	<0.0000019	<0.0000020
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012	<0.0000014	<0.0000014	<0.0000019	<0.0000020
	Titanium (Ti)-Total (mg/dm2.day)	<0.00012	<0.00014	<0.00014	<0.00019	<0.00020
	Uranium (U)-Total (mg/dm2.day)	0.00000068	0.00000037	0.00000035	<0.00000019	0.00000055
	Vanadium (V)-Total (mg/dm2.day)	<0.000012	<0.000014	<0.000014	<0.000019	<0.000020
	Zinc (Zn)-Total (mg/dm2.day)	<0.00071 DLB	<0.00041 DLB	<0.00041 DLB	<0.00056 DLB	<0.00059 DLB

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L2333896-6 Air 16-AUG-19 08:40 DM9	L2333896-7 Air 16-AUG-19 14:45 DM11	L2333896-8 Air 16-AUG-19 11:12 DM7		
Sample ID		L2333896-6	L2333896-7	L2333896-8		
Description		Air	Air	Air		
Sampled Date		16-AUG-19	16-AUG-19	16-AUG-19		
Sampled Time		08:40	14:45	11:12		
Client ID		DM9	DM11	DM7		
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.10	0.33	0.77		
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00148	0.00154	0.00256		
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000016	<0.0000016	<0.0000015		
	Arsenic (As)-Total (mg/dm2.day)	0.0000017	0.0000019	0.0000046		
	Barium (Ba)-Total (mg/dm2.day)	0.0000625	0.0000624	0.000290		
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000079	<0.0000079	<0.0000076		
	Bismuth (Bi)-Total (mg/dm2.day)	0.0000150	<0.0000079	<0.0000076		
	Boron (B)-Total (mg/dm2.day)	<0.00016	<0.00016	<0.00015		
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000079	<0.00000079	0.00000091		
	Calcium (Ca)-Total (mg/dm2.day)	0.00586	0.00602	0.0100		
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000079	0.0000081	<0.0000076		
	Cobalt (Co)-Total (mg/dm2.day)	0.0000018	<0.0000016	0.0000058		
	Copper (Cu)-Total (mg/dm2.day)	0.000712	0.000124	0.000462		
	Iron (Fe)-Total (mg/dm2.day)	0.00196	0.00213	0.00732		
	Lead (Pb)-Total (mg/dm2.day)	0.00000841	0.00000457	0.0000102		
	Lithium (Li)-Total (mg/dm2.day)	<0.000079	<0.000079	<0.000076		
	Magnesium (Mg)-Total (mg/dm2.day)	0.00174	0.00261	0.00491		
	Manganese (Mn)-Total (mg/dm2.day)	0.0000964	0.0000975	0.000243		
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000079	0.00000228	0.00000138		
	Nickel (Ni)-Total (mg/dm2.day)	<0.0000079	<0.0000079	0.0000217		
	Phosphorus (P)-Total (mg/dm2.day)	0.00304	0.00911	0.0154		
	Potassium (K)-Total (mg/dm2.day)	0.00483	0.0123	0.0263		
	Selenium (Se)-Total (mg/dm2.day)	<0.000016	<0.000016	<0.000015		
	Silicon (Si)-Total (mg/dm2.day)	0.00208	0.00228	0.00294		
	Silver (Ag)-Total (mg/dm2.day)	<0.00000016	<0.00000016	0.00000021		
	Sodium (Na)-Total (mg/dm2.day)	0.00150	0.00114	0.00612		
	Strontium (Sr)-Total (mg/dm2.day)	0.0000166	0.0000142	0.0000317		
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000016	<0.0000016	<0.0000015		
	Tin (Sn)-Total (mg/dm2.day)	<0.0000016	<0.0000016	<0.0000015		
	Titanium (Ti)-Total (mg/dm2.day)	<0.00016	<0.00016	<0.00015		
	Uranium (U)-Total (mg/dm2.day)	0.00000026	0.00000018	0.00000057		
	Vanadium (V)-Total (mg/dm2.day)	<0.000016	<0.000016	<0.000015		
	Zinc (Zn)-Total (mg/dm2.day)	<0.00047 DLB	<0.00047 DLB	0.000396		

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Aluminum (Al)-Total	B	L2333896-1, -2, -3, -4, -5, -6, -7, -8
Method Blank	Zinc (Zn)-Total	MB-LOR	L2333896-1, -2, -3, -4, -5, -6, -7, -8

Qualifiers for Individual Parameters Listed:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DUSTFALLS-T.DM2-VA	Dustfall	Dustfalls Total+Fixed & Vol (mg/dm2.day)	BCMOE DUSTFALLS

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

ALS Test Code	Matrix	Test Description	Method Reference**
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).

** 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, BRITISH COLUMBIA, 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 Environmental

L2333896-COFC

ody / Analytical Request Form
Toll Free: 1 800 668 9878
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COC # 1

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Report To		Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)
Company:	Dillon Consulting	☑ Standard	☐ Other			◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Richard Pope	☑ PDF	☑ Excel	☑ Digital	☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	3820 Cessna Drive Suite 510	Email 1:	rpope@dillon.ca			○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Richmond, BC, V7B 0A2	Email 2:	ldilley@dillon.ca			○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	(604) 295-7070 Fax:	Email 3:	dgay@dillon.ca			
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information				Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #:	126231			Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:				
Contact:		LSD:				
Address:						
Phone:	Fax:	Quote #:				
Lab Work Order # (lab use only)		ALS Contact:	Brent Mack	Sampler:	T. Phillips	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
	DM12	16-Aug-19	9:30	Air	1
	DM3	16-Aug-19	12:25	Air	1
	DM6	16-Aug-19	10:20	Air	1
	DM10	16-Aug-19	7:45	Air	1
	DM8	16-Aug-19	13:55	Air	1
	DM9	16-Aug-19	8:40	Air	1
	DM11	16-Aug-19	14:45	Air	1
	DM7	16-Aug-19	11:12	Air	1

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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 provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Tyler Phillips	20-Aug-19		JH	22 Aug 19	10:00AM	2.0 °C				

DILLON CONSULTING LIMITED
ATTN: Richard Pope
510 - 3820 Cessna Drive
Richmond BC V7B 0A2

Date Received: 19-SEP-19
Report Date: 30-SEP-19 16:12 (MT)
Version: FINAL

Client Phone: 604-278-7847

Certificate of Analysis

Lab Work Order #: L2350731

Project P.O. #: NOT SUBMITTED
Job Reference: 126231
C of C Numbers:
Legal Site Desc:

<Original signed by>

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L2350731-1 Air 16-SEP-19 12:30 DM12	L2350731-2 Air 16-SEP-19 12:15 DM3	L2350731-3 Air 16-SEP-19 10:00 DM6	L2350731-4 Air 16-SEP-19 07:30 DM10	L2350731-5 Air 17-SEP-19 09:45 DM8
Sample ID						
Description						
Sampled Date						
Sampled Time						
Client ID						
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.62	0.79	0.52	0.41	0.92
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00217	0.00189	0.000729	0.00408	0.00180
	Antimony (Sb)-Total (mg/dm2.day)	0.0000039	0.0000024	0.0000084	<0.0000025	<0.0000018
	Arsenic (As)-Total (mg/dm2.day)	0.0000026	0.0000028	0.0000012	0.0000075	0.0000035
	Barium (Ba)-Total (mg/dm2.day)	0.000212	0.000195	0.0000270	0.000416	0.00231
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000086	<0.0000063	<0.0000058	<0.000013	<0.0000091
	Bismuth (Bi)-Total (mg/dm2.day)	0.0000254	0.0000121	0.0000123	0.000037	0.0000130
	Boron (B)-Total (mg/dm2.day)	<0.00017	<0.00013	<0.00012	<0.00025	<0.00018
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000138	0.00000127	0.00000062	0.0000046	0.00000132
	Calcium (Ca)-Total (mg/dm2.day)	0.0118	0.0226	0.00668	0.0174	0.0151
	Chromium (Cr)-Total (mg/dm2.day)	0.0000087	0.0000070	<0.0000058	0.000037	0.0000103
	Cobalt (Co)-Total (mg/dm2.day)	0.0000035	0.0000038	<0.0000012	0.0000071	0.0000046
	Copper (Cu)-Total (mg/dm2.day)	0.00119	0.000714	0.000333	0.000902	0.000484
	Iron (Fe)-Total (mg/dm2.day)	0.00391	0.00379	0.00106	0.00686	0.00303
	Lead (Pb)-Total (mg/dm2.day)	0.0000137	0.0000105	0.00155	0.0000186	0.0000141
	Lithium (Li)-Total (mg/dm2.day)	<0.000086	<0.000063	<0.000058	<0.00013	<0.000091
	Magnesium (Mg)-Total (mg/dm2.day)	0.00344	0.00679	0.00180	0.00676	0.00567
	Manganese (Mn)-Total (mg/dm2.day)	0.000125	0.000167	0.0000622	0.000249	0.000153
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000194	0.00000227	<0.00000058	0.0000045	0.00000216
	Nickel (Ni)-Total (mg/dm2.day)	0.0000163	0.0000169	0.0000063	0.000035	0.0000240
	Phosphorus (P)-Total (mg/dm2.day)	0.00436	0.0120	0.00086	0.0157	0.0154
	Potassium (K)-Total (mg/dm2.day)	0.00833	0.0201	0.00270	0.0292	0.0226
	Selenium (Se)-Total (mg/dm2.day)	<0.000017	<0.000013	<0.000012	<0.000025	<0.000018
	Silicon (Si)-Total (mg/dm2.day)	0.00274	0.00353	0.00089	0.0060	0.00212
	Silver (Ag)-Total (mg/dm2.day)	0.00000027	0.00000030	<0.00000012	0.00000058	0.00000034
	Sodium (Na)-Total (mg/dm2.day)	0.00213	0.00280	0.00149	0.0067	0.00566
	Strontium (Sr)-Total (mg/dm2.day)	0.0000369	0.0000421	0.0000109	0.0000467	0.0000581
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000017	<0.0000013	<0.0000012	<0.0000025	<0.0000018
	Tin (Sn)-Total (mg/dm2.day)	<0.0000017	<0.0000013	<0.0000012	<0.0000025	<0.0000018
	Titanium (Ti)-Total (mg/dm2.day)	<0.00017	<0.00013	<0.00012	<0.00025	<0.00018
	Uranium (U)-Total (mg/dm2.day)	0.00000042	0.00000091	0.00000016	0.00000098	0.00000053
	Vanadium (V)-Total (mg/dm2.day)	<0.000017	<0.000013	<0.000012	<0.000025	<0.000018
	Zinc (Zn)-Total (mg/dm2.day)	0.000667	<0.00049 DLB	0.000443	<0.00076 DLB	<0.00049 DLB

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L2350731-6 Air 16-SEP-19 08:30 DM9	L2350731-7 Air 16-SEP-19 14:30 DM11	L2350731-8 Air 16-SEP-19 10:45 DM7	L2350731-9 Air 16-SEP-19 11:45 DM2	
Sample ID **Description** **Sampled Date** **Sampled Time** **Client ID**						
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.39	0.16	0.94	1.13	
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00122	0.000865	0.00172	0.00326	
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000012	<0.0000012	<0.0000017	0.0000023	
	Arsenic (As)-Total (mg/dm2.day)	0.0000015	0.0000014	0.0000027	0.0000058	
	Barium (Ba)-Total (mg/dm2.day)	0.0000765	0.0000650	0.000213	0.000426	
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000058	<0.0000058	<0.0000086	<0.0000058	
	Bismuth (Bi)-Total (mg/dm2.day)	0.0000107	0.0000063	0.0000090	0.0000193	
	Boron (B)-Total (mg/dm2.day)	<0.00012	<0.00012	<0.00017	<0.00012	
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000109	<0.00000058	<0.00000086	0.00000195	
	Calcium (Ca)-Total (mg/dm2.day)	0.00764	0.00898	0.00961	0.0207	
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000058	<0.0000058	<0.0000086	0.0000107	
	Cobalt (Co)-Total (mg/dm2.day)	0.0000016	0.0000018	0.0000038	0.0000085	
	Copper (Cu)-Total (mg/dm2.day)	0.00111	0.000871	0.000969	0.000641	
	Iron (Fe)-Total (mg/dm2.day)	0.00191	0.00140	0.00394	0.00696	
	Lead (Pb)-Total (mg/dm2.day)	0.0000100	0.0000116	0.0000192	0.0000193	
	Lithium (Li)-Total (mg/dm2.day)	<0.000058	<0.000058	<0.000086	<0.000058	
	Magnesium (Mg)-Total (mg/dm2.day)	0.00246	0.00167	0.00253	0.00744	
	Manganese (Mn)-Total (mg/dm2.day)	0.0000852	0.0000842	0.000129	0.000231	
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000110	0.00000089	0.00000210	0.00000315	
	Nickel (Ni)-Total (mg/dm2.day)	0.0000078	0.0000073	0.0000159	0.0000355	
	Phosphorus (P)-Total (mg/dm2.day)	0.00524	0.00203	0.00479	0.00555	
	Potassium (K)-Total (mg/dm2.day)	0.0101	0.00408	0.00883	0.0125	
	Selenium (Se)-Total (mg/dm2.day)	<0.000012	<0.000012	<0.000017	<0.000012	
	Silicon (Si)-Total (mg/dm2.day)	0.00200	0.00147	0.00241	0.00495	
	Silver (Ag)-Total (mg/dm2.day)	0.00000027	0.00000014	0.00000024	0.00000081	
	Sodium (Na)-Total (mg/dm2.day)	0.00256	0.00106	0.00256	0.00210	
	Strontium (Sr)-Total (mg/dm2.day)	0.0000173	0.0000150	0.0000284	0.0000494	
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012	<0.0000012	<0.0000017	<0.0000012	
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012	<0.0000012	<0.0000017	<0.0000012	
	Titanium (Ti)-Total (mg/dm2.day)	<0.00012	<0.00012	<0.00017	<0.00012	
	Uranium (U)-Total (mg/dm2.day)	0.00000026	0.00000019	0.00000055	0.00000091	
	Vanadium (V)-Total (mg/dm2.day)	<0.000012	<0.000012	<0.000017	0.000021	
	Zinc (Zn)-Total (mg/dm2.day)	0.000598	<0.00031 DLB	<0.00057 DLB	0.000488	

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Calcium (Ca)-Total	MB-LOR	L2350731-1, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Zinc (Zn)-Total	MB-LOR	L2350731-1, -2, -3, -4, -5, -6, -7, -8, -9
Laboratory Control Sample	Thallium (Tl)-Total	MES	L2350731-1, -2, -3, -4, -5, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DUSTFALLS-T.DM2-VA	Dustfall	Dustfalls Total+Fixed & Vol (mg/dm2.day)	BCMOE DUSTFALLS

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

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).

** 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, BRITISH COLUMBIA, 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 Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L2350731-COFC

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Dillon Consulting	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Richard Pope	☑ PDF ☑ Excel ☑ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	3820 Cessna Drive Suite 510	Email 1: rpope@dillon.ca	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Richmond, BC, V7B 0A2	Email 2: ldilley@dillon.ca	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	(604) 295-7070 Fax:	Email 3: dgay@dillon.ca	
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 126231	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #:	
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: T. Phillips

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
	DM12	16-Sep-19	12:30	Air	1
	DM3	16-Sep-19	12:15	Air	1
	DM6	16-Sep-19	10:00	Air	1
	DM10	16-Sep-19	7:30	Air	1
	DM8	17-Sep-19	9:45	Air	1
	DM9	16-Sep-19	8:30	Air	1
	DM11	16-Sep-19	14:30	Air	1
	DM7	16-Sep-19	10:45	Air	1
	DM2	16-Sep-19	11:45	Air	1

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Tyler Phillips	18-Sep-19		JG	19 Sep 19	12:15 PM	19, 20 °C				

DILLON CONSULTING LIMITED
ATTN: Richard Pope
510 - 3820 Cessna Drive
Richmond BC V7B 0A2

Date Received: 30-OCT-19
Report Date: 07-NOV-19 13:30 (MT)
Version: FINAL

Client Phone: 604-278-7847

Certificate of Analysis

Lab Work Order #: L2374201

Project P.O. #: NOT SUBMITTED
Job Reference: 126231
C of C Numbers:
Legal Site Desc:

<Original signed by>

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L2374201-1 Air 15-OCT-19 14:15 DM12	L2374201-2 Air 15-OCT-19 14:00 DM3	L2374201-3 Air 15-OCT-19 12:00 DM6	L2374201-4 Air 15-OCT-19 09:25 DM10	L2374201-5 Air 15-OCT-19 15:45 DM8
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.93	1.12	0.72	0.51	0.73
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00236	0.00222	0.00205	0.00174	0.00248
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000047	<0.0000039	<0.0000054	<0.0000050	<0.0000072
	Arsenic (As)-Total (mg/dm2.day)	<0.0000047	<0.0000039	<0.0000054	<0.0000050	<0.0000072
	Barium (Ba)-Total (mg/dm2.day)	0.000161	0.000216	0.000268	0.000115	0.000427
	Beryllium (Be)-Total (mg/dm2.day)	<0.000024	<0.000019	<0.000027	<0.000025	<0.000036
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000024	<0.000019	<0.000027	<0.000025	<0.000036
	Boron (B)-Total (mg/dm2.day)	<0.00047	<0.00039	<0.00054	<0.00050	<0.00072
	Cadmium (Cd)-Total (mg/dm2.day)	<0.0000024	0.0000027	<0.0000027	0.0000033	0.0000063
	Calcium (Ca)-Total (mg/dm2.day)	0.0184	0.0274	0.0182	0.0205	0.0218
	Chromium (Cr)-Total (mg/dm2.day)	<0.000024	<0.000019	0.000035	<0.000025	<0.000036
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000047	<0.0000039	<0.0000054	<0.0000050	<0.0000072
	Copper (Cu)-Total (mg/dm2.day)	<0.00012 DLB	<0.000077 DLB	<0.00016 DLB	<0.000074 DLB	<0.00018 DLB
	Iron (Fe)-Total (mg/dm2.day)	0.0044	0.0045	0.0035	0.0028	0.0039
	Lead (Pb)-Total (mg/dm2.day)	0.0000178	0.0000179	0.0000118	0.0000128	0.0000175
	Lithium (Li)-Total (mg/dm2.day)	<0.00024	<0.00019	<0.00027	<0.00025	<0.00036
	Magnesium (Mg)-Total (mg/dm2.day)	0.00422	0.00904	0.00294	0.00436	0.00411
	Manganese (Mn)-Total (mg/dm2.day)	0.000104	0.000179	0.000109	0.000135	0.000229
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.0000047 DLB	<0.0000058 DLB	<0.0000027	<0.0000025	<0.0000036
	Nickel (Ni)-Total (mg/dm2.day)	<0.000024	0.000031	0.000032	<0.000025	<0.000036
	Phosphorus (P)-Total (mg/dm2.day)	0.0075	0.0211	0.0034	0.0051	0.0043
	Potassium (K)-Total (mg/dm2.day)	0.0123	0.0294	0.0090	0.0115	0.0111
	Selenium (Se)-Total (mg/dm2.day)	<0.000047	<0.000039	<0.000054	<0.000050	<0.000072
	Silicon (Si)-Total (mg/dm2.day)	<0.0024	0.0022	<0.0027	<0.0025	<0.0036
	Silver (Ag)-Total (mg/dm2.day)	<0.00000047	<0.00000039	<0.00000054	<0.00000050	<0.00000072
	Sodium (Na)-Total (mg/dm2.day)	0.0046	0.0075	0.0058	0.0060	0.0063
	Strontium (Sr)-Total (mg/dm2.day)	0.000107	0.0000893	0.000115	0.000117	0.000142
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000047	<0.0000039	<0.0000054	<0.0000050	<0.0000072
	Tin (Sn)-Total (mg/dm2.day)	0.0000134	0.0000062	<0.0000054	<0.0000050	<0.0000072
	Titanium (Ti)-Total (mg/dm2.day)	<0.00047	<0.00039	<0.00054	<0.00050	<0.00072
	Uranium (U)-Total (mg/dm2.day)	<0.00000047	<0.00000039	<0.00000054	<0.00000050	<0.00000072
	Vanadium (V)-Total (mg/dm2.day)	<0.000047	<0.000039	<0.000054	<0.000050	<0.000072
	Zinc (Zn)-Total (mg/dm2.day)	0.00204	0.00134	0.00260	0.00215	0.00281

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L2374201-6 Air 15-OCT-19 10:24 DM9	L2374201-7 Air 15-OCT-19 14:15 DM11	L2374201-8 Air 15-OCT-19 12:45 DM7	L2374201-9 Air 15-OCT-19 01:37 DM2	
Sample ID **Description** **Sampled Date** **Sampled Time** **Client ID**						
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.34	0.96	0.52	1.82	
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00126	0.00392	0.00263	0.00578	
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000032	<0.0000054	<0.0000066	0.0000048	
	Arsenic (As)-Total (mg/dm2.day)	0.0000043	<0.0000054	<0.0000066	0.0000079	
	Barium (Ba)-Total (mg/dm2.day)	0.000167	0.000172	0.000403	0.000734	
	Beryllium (Be)-Total (mg/dm2.day)	<0.000016	<0.000027	<0.000033	<0.000022	
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000016	0.000030	<0.000033	<0.000022	
	Boron (B)-Total (mg/dm2.day)	<0.00032	<0.00054	<0.00066	<0.00043	
	Cadmium (Cd)-Total (mg/dm2.day)	0.0000016	0.0000041	<0.0000033	0.0000027	
	Calcium (Ca)-Total (mg/dm2.day)	0.0151	0.0236	0.0244	0.0430	
	Chromium (Cr)-Total (mg/dm2.day)	<0.000016	<0.000027	<0.000033	<0.000022	
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000032	<0.0000054	<0.0000066	0.0000122	
	Copper (Cu)-Total (mg/dm2.day)	<0.00019 DLB	<0.00024 DLB	<0.00020 DLB	0.000547	
	Iron (Fe)-Total (mg/dm2.day)	0.00252	0.0061	0.0048	0.0100	
	Lead (Pb)-Total (mg/dm2.day)	0.0000073	0.0000130	0.0000114	0.0000238	
	Lithium (Li)-Total (mg/dm2.day)	<0.00016	<0.00027	<0.00033	<0.00022	
	Magnesium (Mg)-Total (mg/dm2.day)	0.00275	0.00445	0.00390	0.00818	
	Manganese (Mn)-Total (mg/dm2.day)	0.000129	0.000353	0.000327	0.000440	
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.0000016	<0.0000054 DLB	<0.0000066 DLB	<0.0000065 DLB	
	Nickel (Ni)-Total (mg/dm2.day)	<0.000016	<0.000027	<0.000033	0.000054	
	Phosphorus (P)-Total (mg/dm2.day)	0.0022	0.0079	<0.0033	0.0047	
	Potassium (K)-Total (mg/dm2.day)	0.0075	0.0121	0.0071	0.0141	
	Selenium (Se)-Total (mg/dm2.day)	<0.000032	<0.000054	<0.000066	<0.000043	
	Silicon (Si)-Total (mg/dm2.day)	<0.0016	0.0057	<0.0033	0.0064	
	Silver (Ag)-Total (mg/dm2.day)	<0.00000032	<0.00000054	<0.00000066	0.00000078	
	Sodium (Na)-Total (mg/dm2.day)	0.0033	0.0090	0.0059	0.0059	
	Strontium (Sr)-Total (mg/dm2.day)	0.0000940	0.000118	0.000175	0.000265	
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000032	<0.0000054	<0.0000066	<0.0000043	
	Tin (Sn)-Total (mg/dm2.day)	<0.0000032	<0.0000054	<0.0000066	<0.0000043	
	Titanium (Ti)-Total (mg/dm2.day)	<0.00032	<0.00054	<0.00066	<0.00043	
	Uranium (U)-Total (mg/dm2.day)	<0.00000032	0.00000071	<0.00000066	0.00000109	
	Vanadium (V)-Total (mg/dm2.day)	<0.000032	<0.000054	<0.000066	<0.000043	
	Zinc (Zn)-Total (mg/dm2.day)	0.00174	0.00178	0.00287	0.00728	

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Zinc (Zn)-Total	B	L2374201-1, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Copper (Cu)-Total	MB-LOR	L2374201-1, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Molybdenum (Mo)-Total	MB-LOR	L2374201-1, -2, -3, -4, -5, -6, -7, -8, -9
Laboratory Control Sample	Silver (Ag)-Total	MES	L2374201-1, -2, -3, -4, -5, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DUSTFALLS-T.DM2-VA	Dustfall	Dustfalls Total+Fixed & Vol (mg/dm2.day)	BCMOE DUSTFALLS

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

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).

** 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, BRITISH COLUMBIA, 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 Environmental

Chain of Custody
Canada Toll
www.

L2374201-COFC

COC # 1

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Report To				Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)
Company:	Dillon Consulting			☑ Standard	☐ Other			◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Richard Pope			☑ PDF	☑ Excel	☑ Digital	☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	3820 Cessna Drive Suite 510			Email 1:	rpope@dillon.ca			○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Richmond, BC, V7B 0A2			Email 2:	ldilley@dillon.ca			○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	(604) 295-7070	Fax:		Email 3:	dgay@dillon.ca			
Invoice To	Same as Report ?	☑ Yes	☐ No	Client / Project Information				Analysis Request
Hardcopy of Invoice with Report?		☑ Yes	☐ No	Job #:	126231			Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:				PO / AFE:				
Contact:				LSD:				
Address:								
Phone:		Fax:		Quote #:				
Lab Work Order # (lab use only)				ALS Contact:	Brent Mack	Sampler:	T. Phillips	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
	DM12	15-Oct-19	14:15	Air	1
	DM3	15-Oct-19	14:00	Air	1
	DM6	15-Oct-19	12:00	Air	1
	DM10	15-Oct-19	9:25	Air	1
	DM8	15-Oct-19	15:45	Air	1
	DM9	15-Oct-19	10:24	Air	1
	DM11	15-Oct-19	14:15	Air	1
	DM7	15-Oct-19	12:45	Air	1
	DM2	15-Oct-19	1:37	Air	1

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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 provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Tyler Phillips	17-Oct-19		JG	Oct 30 19	10:00AM	13 °C				