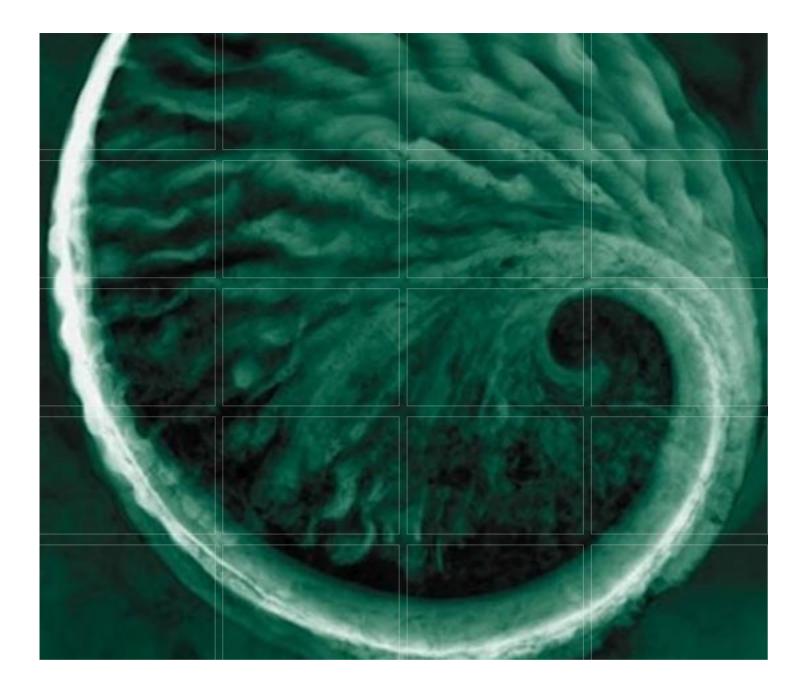
Appendix 9-A

Air Quality Baseline Report

HARPER CREEK PROJECT

Application for an Environmental Assessment Certificate/ Environmental Impact Statement



Prepared for:



HARPER CREEK PROJECT Air Quality Baseline Report

June 2014



Harper Creek Mining Corporation

HARPER CREEK PROJECT Air Quality Baseline Report

June 2014

Project #0230881-0003

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EXECUTIVE SUMMARY

The Harper Creek Project (the Project) is a proposed open pit copper mine located in south-central British Columbia (BC), approximately 150 km northeast by road from Kamloops. The Project has an estimated 28-year mine life based on a process plant throughput of 70,000 tonnes per day. The Proponent, Harper Creek Mining Corporation, is a wholly owned subsidiary of Yellowhead Mining Inc., which is a public BC junior mineral development company trading on the Toronto Stock Exchange.

This report presents the results of the 2011 to 2013 air quality monitoring program. The objective of the baseline program was to collect information on existing ambient conditions prior to project commencement. This data will be used for planning of the Project, describing the environmental setting, and assessing potential environmental effects of the various Project phases.

The baseline monitoring program began in September 2011 and included dustfall measurements collected at six locations, three sites located in Vavenby and three sites located in the Project site. In 2012, an additional site was installed at Birch Island and a site at Vavenby was deactivated.

Dustfall analyses included particulates (total, soluble and insoluble), anions (sulphate, nitrate, chloride and ammonia), total metals and various cations. The monthly dustfall results ranged from less than 0.10 to $1.53 \text{ mg/dm}^2/\text{day}$. Maximum dustfall deposition rates of 0.62, 0.82 and $1.53 \text{ mg/dm}^2/\text{day}$, were measured in 2011, 2012 and 2013 respectively. All the dustfall results measured were below the BC MOE objective of $1.75 \text{ mg/dm}^2/\text{day}$ (BC MOE 1979).

Anions of nitrate and sulphate were analyzed from the dustfall samples in order to calculate acid deposition. The monthly acid deposition results ranged from 79.1 (October 2011) to 242 eq/hq/yr (January 2012). The acid deposition results were all below the guideline value of 250 eq/hq/yr (WHO 2000).

Dustfall samples were also analyzed for metals. The majority of metal deposition levels analyzed were either very low or below detection limits. The reported metal deposition rates are predominantly the result of natural sources in the area.

ACKNOWLEDGEMENTS

This report was prepared for Harper Creek Mining Corporation by ERM Consultants Canada Ltd. (ERM Rescan). Field work was completed by Knight Piésold Ltd. Data analysis was performed by Kiri Heal (B.Sc., M.Sc; ERM Rescan). This report was written by Kiri Heal and reviewed by Derek Shaw (M.A.Sc., P.Eng.; ERM Rescan), Mark Branson (M.Sc.,(Hons.)) and Mellissa Winfield (M.Sc.,(Hons)).

HARPER CREEK PROJECT Air Quality Baseline Report

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Appendix A. 2011-2013 Dustfall Results

GLOSSARY AND ABBREVIATIONS

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

AIR	Application Information Requirements
BC	British Columbia
BC EAA	British Columbia Environmental Assessment Act
BC EAO	British Columbia Environmental Assessment Office
BDL	Below Detection Limit
CEA Agency	Canadian Environmental Assessment Agency
CEAA, 1992	Canadian Environmental Assessment Act, 1992
CEARIS	Canadian Environmental Assessment Registry Internet Site
Critical acid load	Amount of acid deposition a particular region can receive without being adversely affected
EA	Environmental Assessment
EIS	Environmental Impact Statement
eq/ha/yr	Total acidity equivalency per hectare per year
НСМС	Harper Creek Mining Corporation
kg/ha/yr	Kilograms per hectare per year
mg/dm²/day	Milligrams per square decimetre per day
Proponent, the	Harper Creek Mining Corporation
t/d	tonne per day
t/y	tonne per year
TMF	Tailings Management Facility
TSX	Toronto Stock Exchange
μg/m³	Microgram per cubic metre
WHO	World Health Organization
YMI	Yellowhead Mining Inc.

1. INTRODUCTION

1.1 PROJECT DESCRIPTION

Harper Creek Mining Corporation (HCMC) proposes to construct and operate the Harper Creek Project (the Project), an open pit copper mine near Vavenby, British Columbia (BC). The Project has an estimated 28-year mine life based on a process plant throughput of 70,000 tonnes per day (25 million tonnes per year). Ore will be processed on site through a conventional crushing, grinding and flotation process to produce a copper concentrate, with gold and silver by-products, which will be trucked from the Project site along approximately 24 km of existing access roads to a rail load-out facility located at Vavenby. The concentrate will be transported via the existing Canadian National Railway network to the existing Vancouver Wharves storage, handling and loading facilities located at the Port of Vancouver for shipment to overseas smelters.

The Project consists of an open pit mine, on-site processing facility, tailings management facility (TMF) (for tailings solids, subaqueous storage of PAG waste rock, and recycling of water for processing), waste rock stockpiles, low grade and overburden stockpiles, a temporary construction camp, ancillary facilities, mine haul roads, sewage and waste management facilities, a 24 km access road between the Project site and a rail load-out facility located on private land owned by HCMC in Vavenby, and a 12 km power line connecting the Project site to the BC Hydro transmission line corridor in Vavenby. The Project location and infrastructure is shown in Figure 1.1-1.

This report describes the air quality baseline conditions for the purposes of the Application for an Environmental Assessment (EA) Certificate under the British Columbia *Environmental Assessment Act* (BC EAA) in accordance with the Application Information Requirements (AIR) for the Project approved on October 21, 2011. This report also meets the purposes of the Environmental Impact Statement (EIS) in accordance with the 'Background Information for the Initial Federal Public Comment Period on the Comprehensive Study pursuant to the *Canadian Environmental Assessment Act* of the Harper Creek Mine Project near Kamloops British Columbia'.

1.2 PROJECT LOCATION

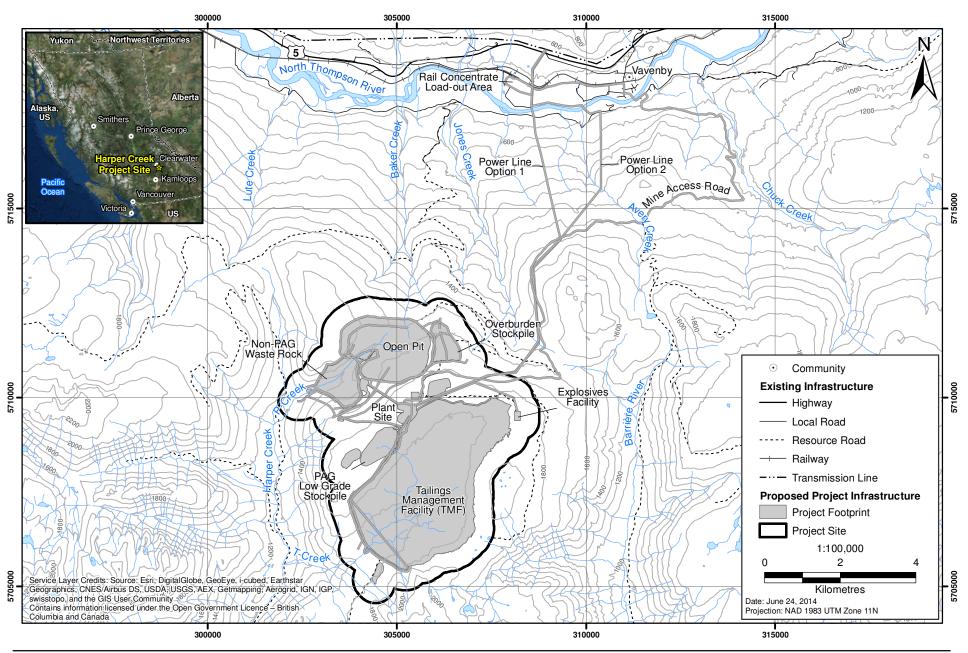
The Project is located in the Thompson-Nicola area of BC, approximately 150 km north-east of Kamloops along Yellowhead Highway #5, approximately 10 km southwest of the unincorporated municipality of Vavenby, British Columbia. The Project is located within National Topographic System (NTS) map sheets 82M/5 and 82M/12, is geographically centred at 51°30'N latitude and 119°48'W longitude, and is situated at approximately 1800 Metres above sea level (masl). The mineral claims comprising the Project cover an area of 42,636.48 hectares. The Project location is shown in Figure 1.2-1.

1.3 PROJECT PROPONENT

The Proponent of the Project is HCMC, a wholly owned subsidiary of Yellowhead Mining Inc. (YMI). YMI was formed in 2005 as a private British Columbia company specifically to acquire, explore and, if feasible, develop the Project. YMI is now a publicly owned BC based mineral development company trading on the Toronto Stock Exchange (TSX) in Canada. HCMC's strategy is to engineer, permit, finance, construct, and operate the Project.

Figure 1.1-1 Project Location and Infrastructure



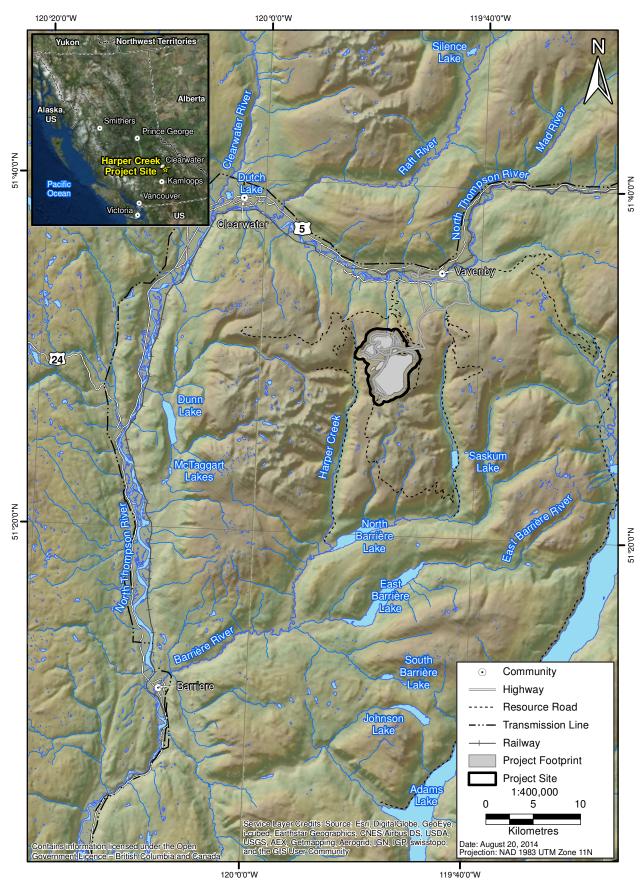


HARPER CREEK MINING CORPORATION

Figure 1.2-1

Project Location





Proj # 0230881-0024 | GIS # HCP-15-009

1.4 PROJECT SETTING

The Project is located in the interior of BC, just west of the Columbia Mountains. Meteorological conditions at the Project are heavily influenced by continental air masses and the local and regional complex terrain. Winds are primarily from the southeast and south-southeast in all seasons. Wind speeds are typically higher during the winter (October to April) than the summer (May to September).

There a number of potential air pollution sources in the surrounding area. The unincorporated municipality of Vavenby is located approximately 10 km to the northwest of the Project. There is also active logging in the area surrounding the Project location, with a network of forestry roads and a sawmill located in Vavenby. The Yellowhead #5 Highway runs along the North Thompson River and, at its closest point, is approximately 7 km to the north of the Project site.

1.5 STUDY OBJECTIVES

The objective of the air quality baseline program was to collect information on the existing ambient air quality conditions prior to Project commencement. This data will be used for planning of the Project, describing the environmental setting, and assessing potential environmental effects of the Project as it moves through the various design phases. This objective was achieved by:

- Installing dustfall stations to collect data on dust deposition; and
- Comparing the amount of dustfall and acid deposition to applicable guidelines.

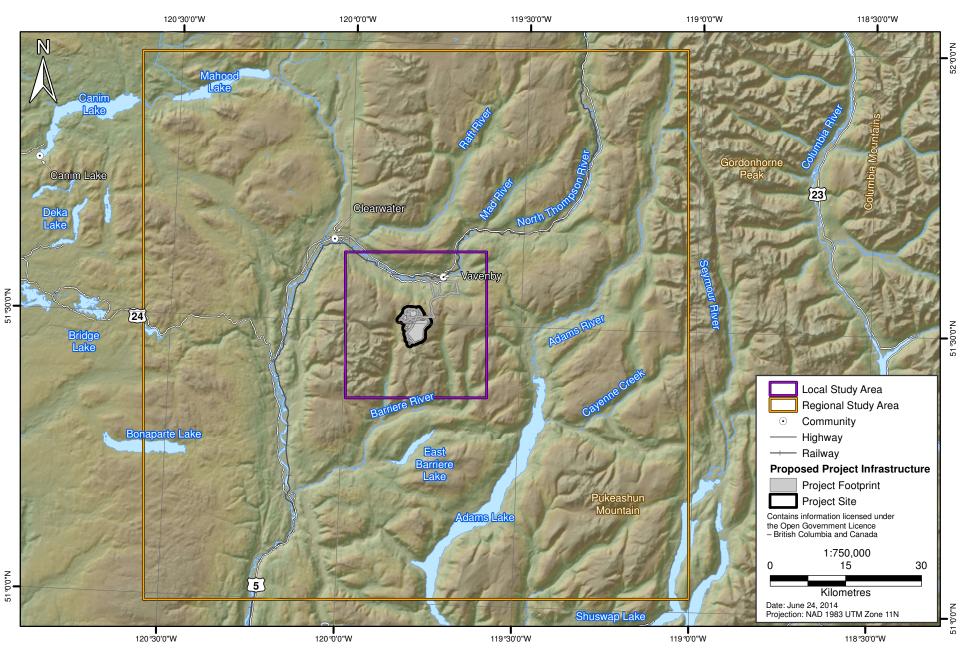
This report details the methodology used in the development of the air quality monitoring program and a comparison of the results to relevant legislation and guidelines. Chapter 2 of this report presents the relevant legislation, Chapter 3 provides details of the methodology, Chapter 4 presents the results and discussion, and Chapter 5 provides a summary. All raw data obtained from the laboratories are included as appendices to this report.

1.6 BASELINE STUDY AREA

The air quality baseline study area is shown in Figure 1.6-1. The local study area encompasses the Project site and a 10 km buffer, and the regional study area extends 50 km from the Project site. The baseline monitoring program focused on the Project site, anticipated to be the location of main site activity and air emissions during the operations phase of the Project, and also the closest receptor locations including the towns of Vavenby and Birch Island.

Figure 1.6-1 Air Quality Study Areas





HARPER CREEK MINING CORPORATION

Proj # 0230881-0003 | GIS # HCP-12-005

2. BACKGROUND REVIEW

2.1 LEGISLATION, REGULATIONS, AND GUIDELINES

The Project is subject to both provincial and federal environmental assessment (EA) requirements under the British Columbia *Environmental Assessment Act* (2002) and *Canadian Environmental Assessment Act 1992* (CEAA; 1992). The EA will undergo a coordinated review by the BC Environmental Assessment Office (EAO) and the Canadian Environmental Assessment Agency (CEA Agency) in accordance with the 2004 Canada-BC Agreement for Environmental Assessment Cooperation. The requirements for the provincial EA are defined in the AIR for the Project, approved by the BC Environmental Assessment Office (EAO) on October 21, 2011. Requirements of the federal EA are outlined in the 'Background Information for the Initial Federal Public Comment Period on the Comprehensive Study pursuant to the *Canadian Environmental Assessment Act* of the Harper Creek Mine Project near Kamloops British Columbia' as issued in April 2011 on the CEA Agency's Registry Internet Site (CEARIS).

The management of air quality across Canada requires collaboration between multiple governmental levels, including federal, provincial, regional and municipal. The federal government has set National Ambient Air Quality Objectives (NAAQOS), Canada Wide Standards (CWS) and Canadian Ambient Air Quality Standards (CAAQS). The CAAQS, which were adopted in 2013 and will be effective from 2015 and 2020, will supersede the CWSs. CAAQSs and CWSs are intended to be achievable targets that will reduce health and environmental risks within a specific timeframe, whereas NAAQOs identify benchmark levels of protection for people and the environment. At a provincial level, BC has also developed air quality objectives for a number of contaminants. There are no NAAQO, CWS, CAAQS or provincial air quality objectives applicable to the parameters monitored at the Project. The following sections therefore include a brief discussion of any other relevant criteria.

2.1.1 Total Dustfall

The Pollution Control Objectives for the Mining, Smelting, and Related Industries of British Columbia (BC MOE 1979) identify the maximum desirable ambient air objective for dustfall as 1.75 mg/dm²/day averaged over 30 days.

The Ministry of Environment's (MOE) *Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators* outlines and defines the baseline study requirements and information considerations necessary to propose a mineral development project in BC. The standard methodology for dustfall collection is outlined in *ASTM D1739-98 Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter)* (ASTM Standard D1739-98 Reapproved 2010).

2.1.2 Acid Deposition

Acid deposition is the end product of the reaction between sulphur oxides (SO_X), nitrogen oxides (NO_X) and water and oxygen in the atmosphere to form sulphuric acid and nitric acid. Acid deposition occurs when these acid-forming pollutants are deposited on the earth's surface. The critical load is a

quantitative estimate of the maximum amount of acid generating pollutants that environmental receptors can withstand without being adversely affected, according to present knowledge.

There are no air quality standards for acid deposition in BC; however critical loads of acid deposition proposed by the World Health Organization (WHO 2000) range from less than 250 eq/ha/year to more than 1,500 eq/ha/year, dependent on soil type. A conservative critical load value of 250 eq/ha/year was chosen for the assessment.

2.1.3 Metal Deposition

There are currently no specific criteria for total metals in dustfall. The atmospheric metal levels are generally low; however, they tend to contribute to the deposition in soils. Metal deposition results can be used in order to model future concentrations of metals in soil or vegetation, which can then be used to assess the potential for effects to wildlife or humans through uptake of metals via the food chain.

2.2 **PREVIOUS ENVIRONMENTAL STUDIES**

No existing air quality studies were identified. The closest airshed management planning study is the Kamloops Airshed Management Plan (City of Kamloops, 2012).

3. METHODOLOGY

The following section describes the methodology associated with the dustfall monitoring.

3.1 SAMPLING METHODS

The baseline monitoring program was conducted by Knight Piesold Ltd. from October 2011 to November 2013 Results from the monitoring program are available for October 2011 to September 2013.

The dustfall monitoring program was developed in accordance with sampling method ASTM D1739-98 (ASTM Standard D1739-98 Reapproved 2010), for all sites except DF-01. The dustfall monitoring stations collect particles small enough to pass through a 1 mm stainless steel sieve and large enough to settle by virtue of weight. Each dustfall station was comprised of two sample containers with separate mounts. The containers used were open-topped cylinders not less than 150 mm in diameter placed at the top of the stands at a height of 2 m above ground. The containers were installed on 2 m poles, surrounded by a windscreen to improve the dustfall collection efficiency.

Sample containers were exposed to the atmosphere for approximately 30 days, after which they were sent to the laboratory for analysis. One container was then analysed for particulates (total, soluble and insoluble) and total metals and various cations. Additional analysis of anions (sulphate, nitrate, chloride and ammonia) was carried out in October 2011 and January 2012. Sulphate was analysed in March 2012.

3.2 SAMPLING LOCATIONS

The baseline program began in September 2011. Dustfall measurements were collected at six locations: three sites located in the town of Vavenby and three sites located around the Project boundary. The dominant wind direction was taken into consideration when selecting the site locations. In 2012 an additional site was installed at Birch Island and the site DF-01 at Vavenby was deactivated. The locations of the dustfall monitoring stations are presented in Table 3.2-1 and shown in Figure 3.2-1.

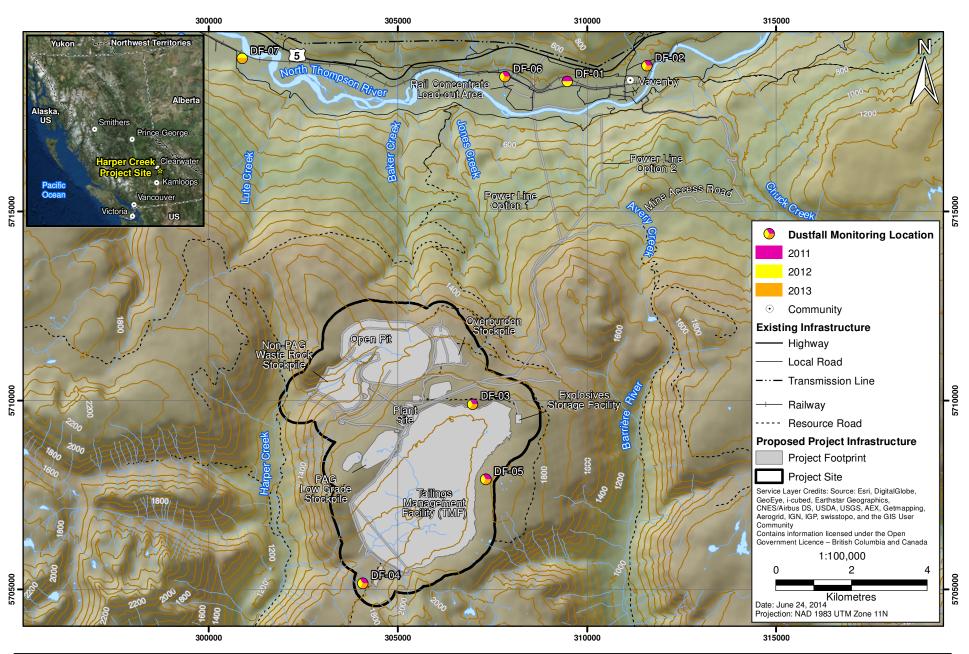
		UTM			Monitoring Period			
Name	Easting (m)	Northing (m)	Location	2011	2012	2013		
DF-01	E 0309480	N5718442	Near Canfor Plant	Sep - Oct	Jan – Jun	-		
DF-02	E0311580	N5718858	Near school	Sep - Oct	Jan - Aug	Sep - Nov		
DF-03	E0306977	N5709899	Near Met Station	Sep - Oct	Aug	Sep		
DF-04	E0304082	N5705158	Near South side of Tailings Pond	Sep - Oct	Aug	Sep		
DF-05	E0307327	N5707910	Near East side of Tailings Pond	Sep - Oct	Aug	Sep		
DF-06	E0307829	N5718569	Near Canfor Plant (East Side)	Sep - Oct	Jan - Aug	Sep - Nov		
DF-07	E0300888	N5719051	Birch Island - Opposite McNeil house	-	Aug	Sep - Nov		

Table 3.2-1. Summary of Air Quality Monitoring Stations (2011-2013)

Note: Geodetic network U11.

Figure 3.2-1 Dustfall Monitoring Locations, 2011 - 2013





3.3 DATA ANALYSIS

The dustfall samples were sent to the ALS Laboratory for analysis following each sampling period. Following receipt of the results from the laboratory, acid deposition rates were calculated based on sulphate and nitrate content measured in each dustfall sample. The unit conversion factors used to calculate charge equivalency were obtained from the 2004 Canadian Acid Deposition Science Assessment (EC 2004). The unit conversion factors are presented in Table 3.3-1

Chemical Species	kg/ha/yr	eq/ha/yr
SO4 ²⁻	1.00	20.8
Ν	1.00	71.4

Table 3.3-1. Conversion Units for Atmospheric Deposition

3.4 LIMITATIONS AND ASSUMPTIONS

The baseline monitoring program ran from 2011 to 2013, with monitoring occurring for two months in 2011, four months in 2012 and three months in 2013; a full year of data is not available. Based on the limited dataset, seasonal or annual change in deposition values could not be assessed.

Site DF-01 was not established in accordance with sampling method ASTM D1739-98, the results are therefore less reliable than those from the other sites, however it is believed that these samples will still provide a representative average daily dustfall levels for the location sampled.

In a number of cases the containers were exposed for longer than the recommended time period. The March and August 2012 samples were exposed for two months, rather than the recommended 30 day period, and the January and June 2012 samples were exposed for approximately three months. It is not anticipated that any appreciable degradation of the sample would have occurred during this short time period, however there is the potential for canisters to fill up with rain water and overflow, or become damaged. The containers were checked when collected and no evidence was found to suggest the containers were not suitable for analysis.

4. **RESULTS AND DISCUSSION**

4.1 TOTAL DUSTFALL

Dustfall results for 2011 to 2013 are summarized in Table 4.1-1 and Figure 4.1-1. The monthly dustfall results ranged from less than 0.10 to $1.53 \text{ mg/dm}^2/\text{day}$. Maximum dustfall deposition rates of 0.62, 0.82 and $1.53 \text{ mg/dm}^2/\text{day}$, were measured in 2011, 2012 and 2013 respectively. All the dustfall results measured were below the objective of $1.75 \text{ mg/dm}^2/\text{day}$.

	DF-01	DF-02	DF-03	DF-04	DF-05	DF-06	DF-07
Sep-11	0.62	0.54	0.35	0.39	0.21	0.39	-
Oct-11	0.40	0.35	0.16	0.12	0.15	0.34	-
Jan-12	0.82	0.12	-	-	-	0.56	-
Mar-12	0.23	<0.10	-	-	-	<0.10	-
Jun-12	0.22	0.22	-	-	-	0.24	-
Aug-12	-	0.19	< 0.10	0.13	0.10	0.64	0.15
Sep-13	-	0.34	0.27	0.33	< 0.11	1.53	<0.10
Oct-13	-	0.16	-	-	-	< 0.10	<0.10
Nov-13	-	0.45	-	-	-	0.59	0.12
Average	0.46	0.27	0.21	0.24	0.13	0.49	0.09

Table 4.1-1. Total Dustfall Results, 2011-2013 (mg/dm²/day)

Note: The values below detection limits were assumed to be half of the detection limit in the calculation of averages.

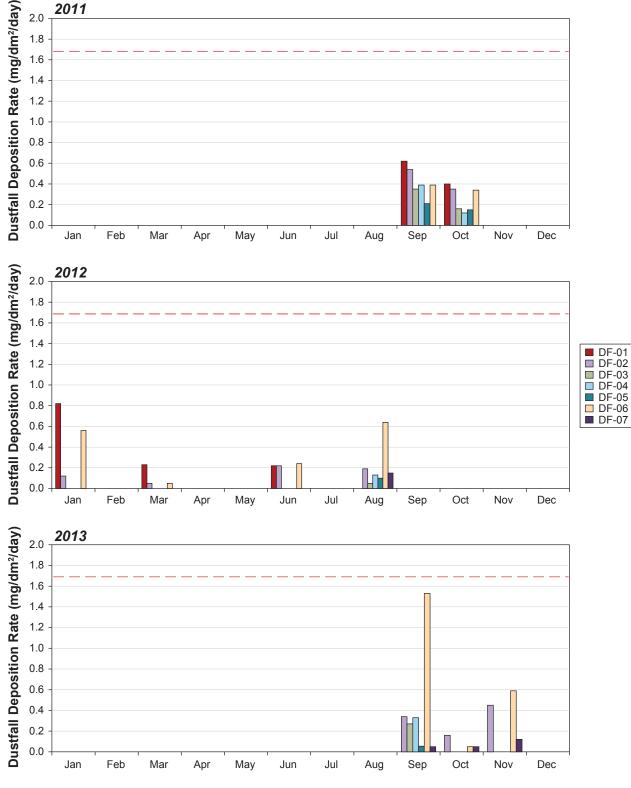
4.2 ACID DEPOSITION

Anions of nitrate and sulphate were analyzed from the dustfall samples and are presented in Table 4.2-1. The acid deposition rates are presented in Table 4.2-2. The monthly acid deposition results ranged from 79.1 (October 2011) to 242 eq/hq/yr (January 2012). The acid deposition results were all below the WHO guideline value of 250 eq/hq/yr.

4.3 METAL DEPOSITION

Table 4.3-1 shows the maximum metal deposition averaged over the 30-day collection period. All analytical results are presented in Appendix 1. The majority of the metal deposition values were either very low or below the detection limits. In 2013, 12 of the 33 metals that were analyzed were always below the detection limits. In 2012, 8 were also always below the detection limit and in 2011, 10 were always below the detection limits. All other metals had at least one reading that was above the detection limits, but generally with very low metal deposition rates.





Note: Red dashed line represents BC Pollution Control Objective - Most Stringent (1.7 mg/dm²/day).



	DF-01	DF-02	DF-03	DF-04	DF-05	DF-06	DF-07
Nitrate							
Sep-11	-	-	-	-	-	-	-
Oct-11	0.002	0.002	0.004	0.005	0.005	0.002	-
Jan-12	0.006	0.003	-	-	-	0.005	-
Mar-12	-	-	-	-	-	-	-
Jun-12	-	-	-	-	-	-	-
Aug-12	-	-	-	-	-	-	-
Sep-13	-	-	-	-	-	-	-
Oct-13	-	-	-	-	-	-	-
Nov-13	-	-	-	-	-	-	-
Sulphate							
Sep-11	-	-	-	-	-	-	-
Oct-11	< 0.012	<0.011	< 0.018	< 0.028	< 0.024	< 0.010	-
Jan-12	< 0.021	< 0.006	-	-	-	< 0.017	-
Mar-12	< 0.004	< 0.003	-	-	-	< 0.003	-
Jun-12	-	-	-	-	-	-	-
Aug-12	-	-	-	-	-	-	-
Sep-13	-	-	-	-	-	-	-
Oct-13	-	-	-	-	-	-	-
Nov-13	-	-	-	-	-	-	-

Table 4.2-1. Nitrate and Sulphate Deposition Analysis Results from Dustfall, 2011-2013 (mg/dm²/day)

Notes:

(-) No sampling undertaken.

The values below detection limits were assumed to be half of the detection limit in the calculation of averages.

Table 4.2-2. Calculated Acid Deposition Rates, 2011-2013 (eq/ha/yr)

	DF-01	DF-02	DF-03	DF-04	DF-05	DF-06	DF-07
Sep-11	-	-	-	-	-	-	-
Oct-11	88.6	84.0	181	232	213	79.1	-
Jan-12	242	101	-	-	-	195	-
Mar-12 ^a	-	-	-	-	-	-	-
Jun-12	-	-	-	-	-	-	-
Aug-12	-	-	-	-	-	-	-
Sep-13	-	-	-	-	-	-	-
Oct-13	-	-	-	-	-	-	-
Nov-13	-	-	-	-	-	-	-

Note:

(-) No sampling undertaken.

^a Nitrate values were not available in March 2012 and therefore acid deposition has not been calculated.

	Maximum Deposition Rate (mg/dm²/day)				Maximum Deposition Rate (mg/dm²/day)			
Metal	2011	2012	2013	Metal	2011	2012	2013	
Aluminum (Al)-Total	4.9E-03	2.7E-03	2.1E-03	Mercury (Hg)-Total	BDL	BDL	BDL	
Antimony (Sb)-Total	8.0E-07	8.6E-07	4.8E-06	Molybdenum (Mo)- Total	2.2E-06	1.9E-06	3.1E-06	
Arsenic (As)-Total	1.8E-06	1.4E-05	2.7E-05	Nickel (Ni)-Total	1.7E-05	1.2E-04	1.6E-05	
Barium (Ba)-Total	8.6E-05	4.9E-05	9.1E-05	Phosphorus (P)-Total	2.0E-03	6.6E-03	4.4E-02	
Beryllium (Be)-Total	BDL	BDL	BDL	Potassium (K)-Total	BDL	1.1E - 02	7.3E-02	
Bismuth (Bi)-Total	BDL	BDL	BDL	Selenium (Se)-Total	BDL	BDL	BDL	
Boron (B)-Total	BDL	BDL	3.2E-04	Silicon (Si)-Total	6.6E-03	4.8E-03	3.6E-03	
Cadmium (Cd)-Total	2.1E-06	7.5E-07	2.6E-05	Silver (Ag)-Total	BDL	2.3E-07	5.3E-07	
Calcium (Ca)-Total	5.7E-02	4.6E-03	6.3E-03	Sodium (Na)-Total	BDL	BDL	BDL	
Chromium (Cr)-Total	1.8E-05	1.2E-05	2.0E-05	Strontium (Sr)-Total	2.9E-04	2.7E-05	3.6E-05	
Cobalt (Co)-Total	3.1E-06	2.0E-06	BDL	Thallium (Tl)-Total	BDL	BDL	BDL	
Copper (Cu)-Total	2.5E-04	2.2E-04	4.5E-04	Tin (Sn)-Total	2.9E-06	5.3E-06	BDL	
Iron (Fe)-Total	7.6E-03	6.1E-03	6.2E-03	Titanium (Ti)-Total	2.6E-04	1.3E-04	BDL	
Lead (Pb)-Total	6.5E-06	4.1E-05	6.7E-06	Uranium (U)-Total	3.3E-07	1.8E-07	BDL	
Lithium (Li)-Total	BDL	BDL	BDL	Vanadium (V)-Total	9.7E-06	5.7E-06	BDL	
Magnesium (Mg)- Total	2.9E-03	2.8E-03	6.0E-03	Zinc (Zn)-Total	2.1E-04	4.7E-04	4.9E-04	
Manganese (Mn)- Total	2.3E-04	1.6E-04	4.6E-04					

 Table 4.3-1.
 Maximum Metal Deposition from all Dustfall Stations, 2011-2013

Note: BDL = *Below Detection Limit*

5. CONCLUSIONS

The air quality baseline monitoring program ran from 2011 to 2013. The program began in September 2011 and included dustfall measurements collected at six locations, three sites located in Vavenby and three sites located around the Project boundary. In 2012, an additional site was installed at Birch Island and a site at Vavenby was deactivated.

Dustfall analyses included particulates (total, soluble and insoluble), anions (sulphate, nitrate, chloride and ammonia), total metals and various cations. The monthly dustfall results ranged from less than 0.10 to $1.53 \text{ mg/dm}^2/\text{day}$. Maximum dustfall deposition rates of 0.62, 0.82 and $1.53 \text{ mg/dm}^2/\text{day}$, were measured in 2011, 2012 and 2013 respectively. All the dustfall results measured were below the dustfall objective of $1.75 \text{ mg/dm}^2/\text{day}$.

Anions of nitrate and sulphate were analyzed from the dustfall samples in order to calculate acid deposition. The monthly acid deposition results ranged from 79.1 (October 2011) to 242 eq/hq/yr (January 2012). The acid deposition results were all below the WHO guideline value of 250 eq/hq/yr.

Dustfall samples were also analyzed for metals. The majority of metal deposition levels analyzed were either very low, or below detection limits. The reported metal deposition rates are predominantly the result of natural sources in the area.

REFERENCES

Definitions of the acronyms and abbreviations used in this reference list can be found in the Glossary and Abbreviations section.

- British Columbia Environmental Assessment Act (2002)
- Canadian Environmental Assessment Act 1992 (1992)
- ASTM Standard D1739-98. Reapproved 2010. *Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter)*. West Conshohocken, PA: ASTM International.
- BC MOE. 1979. Pollution Control Objectives for The Mining, Smelting, and Related Industries of British Columbia. Victoria, BC: BC Ministry of Environment.
- City of Kamloops. 2012. Airshed Management Plan. Available at http://www.city.kamloops.bc.ca/environment/pdfs/13-05-AirshedManagementPlan.pdf (accessed May 2014).
- EC. 2004. 2004 *Canadian acid deposition science assessment*. Downsview, Ontario: Meteorological Service of Canada.
- WHO. 2000. Air Quality Guidelines for Europe, Second edition. WHO Regional Publications, European Series No. 91.

Appendix A

2011-2013 Dustfall Results

HARPER CREEK PROJECT

Air Quality Baseline Report



KNIGHT PIESOLD LTD. ATTN: Oscar Gustafson 1400 - 750 West Pender Street Vancouver BC V6C 2T8 Date Received:23-SEP-11Report Date:06-OCT-11 10:16 (MT)Version:FINAL

Client Phone: 604-685-0543

Certificate of Analysis

Lab Work Order #: L1063019

Project P.O. #: Job Reference: C of C Numbers: Legal Site Desc: NOT SUBMITTED 101-458/5

Comments: ADDITIONAL 05-OCT-11 17:29

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Andre Langlais Account Manager

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L1063019 CONTD.... PAGE 2 of 4 06-OCT-11 10:16 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L1063019-1 DUSTFALL 23-SEP-11 DF-01 (AUG16- SEP23)	L1063019-2 DUSTFALL 23-SEP-11 DF-02 (AUG17- SEP23)	L1063019-3 DUSTFALL 23-SEP-11 DF-03 (AUG17- SEP23)	L1063019-4 DUSTFALL 23-SEP-11 DF-04 (AUG17- SEP23)	L1063019-5 DUSTFALL 23-SEP-11 DF-05 (AUG17- SEP23)
Grouping	Analyte					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.62	0.54	0.35	0.39	0.21
	Total Insoluble Dustfall (mg/dm2.day)	0.35	0.24	<0.10	<0.10	<0.10
	Total Soluble Dustfall (mg/dm2.day)	0.35	0.24	0.28	0.30	0.15
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.29	0.00202	0.20	0.00122	0.000904
	Antimony (Sb)-Total (mg/dm2.day)	0.0000080	0.0000054	<0.00000059	< 0.00000055	<0.000904
	Arsenic (As)-Total (mg/dm2.day)	0.00000139	0.00000034	<0.00000059	0.00000080	0.00000074
	Barium (Ba)-Total (mg/dm2.day)					
	Beryllium (Be)-Total (mg/dm2.day)	0.0000790 <0.0000027	0.0000352	0.0000115	0.0000223 <0.0000028	0.0000172
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000027	<0.0000021	<0.0000030	<0.0000028	<0.0000032
	Boron (B)-Total (mg/dm2.day)	<0.000027	<0.000021	<0.000030	<0.000028	<0.000032
	Cadmium (Cd)-Total (mg/dm2.day)	0.0000035	<0.000042	0.00000105	0.00000140	<0.000004
	Calcium (Ca)-Total (mg/dm2.day)	0.00000035	0.00171	0.00066	0.00201	0.00176
	Chromium (Cr)-Total (mg/dm2.day)	0.0000172	0.000094	<0.000030	0.0000034	< 0.000032
	Cobalt (Co)-Total (mg/dm2.day)	0.00000314	0.00000127	<0.00000059	0.00000094	< 0.0000032
	Copper (Cu)-Total (mg/dm2.day)	0.0000314	0.0000255	0.0000174	0.0000307	0.0000266
	Iron (Fe)-Total (mg/dm2.day)	0.00763	0.00358	0.00040	0.00104	0.000200
	Lead (Pb)-Total (mg/dm2.day)	0.00000558	0.0000300	0.000040	0.00000314	0.00000213
	Lithium (Li)-Total (mg/dm2.day)	<0.000027	<0.000021	<0.000030	< 0.000028	< 0.000032
	Magnesium (Mg)-Total (mg/dm2.day)	0.00231	0.00097	<0.00059	0.00087	0.00076
	Manganese (Mn)-Total (mg/dm2.day)	0.000227	0.0000961	0.0000209	0.0000749	0.0000580
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000227	<0.00000021	< 0.00000030	< 0.00000028	< 0.0000003
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000212	0.00000151	<0.00000030	0.00000020	<0.0000003
	Nickel (Ni)-Total (mg/dm2.day)	0.0000111	0.0000106	0.0000033	0.00000059	0.0000087
	Phosphorus (P)-Total (mg/dm2.day)	<0.0016	<0.0013	<0.0018	0.0018	0.0020
	Potassium (K)-Total (mg/dm2.day)	<0.011	<0.0085	<0.012	<0.011	<0.013
	Selenium (Se)-Total (mg/dm2.day)	<0.000054	<0.000042	<0.000059	<0.000055	<0.000064
	Silicon (Si)-Total (mg/dm2.day)	0.00663	0.00277	0.00066	0.00190	0.00128
	Silver (Ag)-Total (mg/dm2.day)	DLB <0.00000022	<0.00000017	DLB <0.00000024	DLB <0.00000022	<0.0000002
	Sodium (Na)-Total (mg/dm2.day)	<0.011	<0.0085	<0.012	<0.011	<0.013
	Strontium (Sr)-Total (mg/dm2.day)	0.0000299	0.0000187	0.00000469	0.0000149	0.00000988
	Thallium (TI)-Total (mg/dm2.day)	<0.00000054	<0.00000042	< 0.00000059	< 0.00000055	< 0.0000006
	Tin (Sn)-Total (mg/dm2.day)	0.00000114	<0.00000042	<0.00000059	0.00000288	<0.0000006
	Titanium (Ti)-Total (mg/dm2.day)	0.000262	0.000093	<0.000059	< 0.000055	< 0.000064
	Uranium (U)-Total (mg/dm2.day)	0.000000334	0.00000088	<0.00000059	<0.00000055	<0.00000006
	Vanadium (V)-Total (mg/dm2.day)	0.0000097	0.0000045	<0.0000059	<0.0000055	<0.0000064
	Zinc (Zn)-Total (mg/dm2.day)	0.0000756	0.0000415	0.0000412	0.0000611	0.0000550

L1063019 CONTD.... PAGE 3 of 4 06-OCT-11 10:16 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L1063019-6 DUSTFALL 23-SEP-11 DF-06 (AUG17- SEP23)		
Grouping	Analyte			
DUSTFALL				
Particulates	Total Dustfall (mg/dm2.day)	0.39		
	Total Insoluble Dustfall (mg/dm2.day)	0.16		
	Total Soluble Dustfall (mg/dm2.day)	0.23		
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00203		
	Antimony (Sb)-Total (mg/dm2.day)	0.00000047		
	Arsenic (As)-Total (mg/dm2.day)	0.00000175		
	Barium (Ba)-Total (mg/dm2.day)	0.0000368		
	Beryllium (Be)-Total (mg/dm2.day)	<0.000021		
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000021		
	Boron (B)-Total (mg/dm2.day)	<0.000042		
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000027		
	Calcium (Ca)-Total (mg/dm2.day)	0.00284		
	Chromium (Cr)-Total (mg/dm2.day)	0.000093		
	Cobalt (Co)-Total (mg/dm2.day)	0.00000169		
	Copper (Cu)-Total (mg/dm2.day)	0.0000297		
	Iron (Fe)-Total (mg/dm2.day)	0.00347		
	Lead (Pb)-Total (mg/dm2.day)	0.00000277		
	Lithium (Li)-Total (mg/dm2.day)	<0.000021		
	Magnesium (Mg)-Total (mg/dm2.day)	0.00140		
	Manganese (Mn)-Total (mg/dm2.day)	0.000123		
	Mercury (Hg)-Total (mg/dm2.day)	<0.0000021		
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000128		
	Nickel (Ni)-Total (mg/dm2.day)	0.0000167		
	Phosphorus (P)-Total (mg/dm2.day)	0.0016		
	Potassium (K)-Total (mg/dm2.day)	<0.0085		
	Selenium (Se)-Total (mg/dm2.day)	<0.0000042		
	Silicon (Si)-Total (mg/dm2.day)	0.00291		
	Silver (Ag)-Total (mg/dm2.day)	DLB <0.00000017		
	Sodium (Na)-Total (mg/dm2.day)	<0.0085		
	Strontium (Sr)-Total (mg/dm2.day)	0.0000218		
	Thallium (TI)-Total (mg/dm2.day)	<0.00000042		
	Tin (Sn)-Total (mg/dm2.day)	<0.00000042		
	Titanium (Ti)-Total (mg/dm2.day)	0.000091		
	Uranium (U)-Total (mg/dm2.day)	0.000000100		
	Vanadium (V)-Total (mg/dm2.day)	0.0000046		
	Zinc (Zn)-Total (mg/dm2.day)	0.0000630		

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Descriptio	n		
DLB	Detection	limit was rais	sed due to detection of analyte at comparable	level in Method Blank.
Test Method	References	:		
ALS Test Cod	le	Matrix	Test Description	Method Reference**
DUSTFALLS-	COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE DUSTFALLS
Dustfall analy	ysis is carried o	out in accord	ance with procedures published by the B.C. N	linistry of Environment Laboratory.
HG-DUST(DM	12-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7
American Pu	blic Health As	sociation, an	d with procedures adapted from "Test Method	e Examination of Water and Wastewater" published by the Is for Evaluating Solid Waste" SW-846 published by the United pour atomic fluorescence spectrophotometry (EPA Method 245.7)
MET-DUST(D	M2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B
American Pu	blic Health Assonmental Prote	sociation, an	d with procedures adapted from "Test Method	e Examination of Water and Wastewater" published by the Is for Evaluating Solid Waste" SW-846 published by the United Ily coupled plasma - optical emission spectrophotometry (EPA
MET-DUST(D	M2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
American Pu	blic Health As	sociation, an	d with procedures adapted from "Test Method	Examination of Water and Wastewater" published by the Is for Evaluating Solid Waste" SW-846 published by the United Ily coupled plasma - mass spectrometry (EPA Method 6020A).
* ALS test met	hods may inco	rporate mod	ifications from specified reference methods to	improve performance.
The last two le	etters of the ab	ove test cod	e(s) indicate the laboratory that performed an	alytical analysis for that test. Refer to the list below:
Laboratory De	efinition Code	e Labora	tory Location	
VA		ALS EN	IVIRONMENTAL - VANCOUVER, BC, CANA	DA
Chain of Custo	ody Numbers:			
applicable test	compound that ts, surrogates	t is similar in are added to	behaviour to target analyte(s), but that does samples prior to analysis as a check on reco	not occur naturally in environmental samples. For very.

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.

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KNIGHT PIESOLD LTD. ATTN: Oscar Gustafson 1400 - 750 West Pender Street Vancouver BC V6C 2T8 Date Received:20-OCT-11Report Date:28-OCT-11 12:12 (MT)Version:FINAL

Client Phone: 604-685-0543

Certificate of Analysis

Lab Work Order #: L1074764

Project P.O. #: Job Reference: C of C Numbers: Legal Site Desc: NOT SUBMITTED 101-458/5 10-168089

Comments: the Blank sample represents the original solution added to canisters.

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Andre Langlais Account Manager

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L1074764 CONTD.... PAGE 2 of 7 28-OCT-11 12:12 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L1074764-1 DUSTFALL 19-OCT-11 16:00 DF-01 (SEP23 - OCT19/11)	L1074764-2 DUSTFALL 19-OCT-11 16:30 DF-02 (SEP23 - OCT19/11)	L1074764-3 DUSTFALL 19-OCT-11 17:00 DF-03 (SEP23 - OCT19/11)	L1074764-4 DUSTFALL 19-OCT-11 16:00 DF-04 (SEP23 - OCT19/11)	L1074764-5 DUSTFALL 19-OCT-11 14:00 DF-05 (SEP23 - OCT19/11)
Grouping	Analyte					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.40	0.35	0.16	0.12	0.15
	Total Insoluble Dustfall (mg/dm2.day)	0.12	<0.12	<0.12	<0.12	<0.12
	Total Soluble Dustfall (mg/dm2.day)	0.27	0.29	0.14	0.12	0.13
Anions and Nutrients	Ammonia (as N) (mg/dm2.day)	0.00107	0.00072	0.00219	0.00228	0.00249
	Chloride (Cl) (mg/dm2.day)	0.035	0.039	0.050	0.051	0.050
	Nitrate (as N) (mg/dm2.day)	0.00165	0.00162	0.00431	0.00484	0.00467
	Sulfate (SO4) (mg/dm2.day)	<0.012	<0.011	<0.018	<0.028	<0.024
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00222	0.00155	0.000678	0.000951	0.000727
	Antimony (Sb)-Total (mg/dm2.day)	DLB <0.0000048	DLB <0.000034	<0.0000037	<0.0000056	<0.0000047
	Arsenic (As)-Total (mg/dm2.day)	<0.0000024	<0.000023	<0.0000037	<0.0000056	<0.0000047
	Barium (Ba)-Total (mg/dm2.day)	0.0000446	0.0000411	0.0000317	0.0000332	0.0000348
	Beryllium (Be)-Total (mg/dm2.day)	<0.000012	<0.000011	<0.000018	<0.000028	<0.000024
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000012	<0.000011	<0.000018	<0.000028	<0.000024
	Boron (B)-Total (mg/dm2.day)	<0.00024	<0.00023	<0.00037	<0.00056	<0.00047
	Cadmium (Cd)-Total (mg/dm2.day)	<0.0000012	<0.0000011	<0.0000018	<0.000028	<0.0000024
	Calcium (Ca)-Total (mg/dm2.day)	0.0029	0.0029	0.0029	0.0035	0.0031
	Chromium (Cr)-Total (mg/dm2.day)	0.000018	0.000013	<0.000018	<0.000028	<0.000024
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000024	<0.000023	<0.000037	<0.0000056	<0.0000047
	Copper (Cu)-Total (mg/dm2.day)	0.000232	0.000118	0.000249	0.0000867	0.0000873
	Iron (Fe)-Total (mg/dm2.day)	0.00552	0.00405	<0.0011	<0.0017	<0.0014
	Lead (Pb)-Total (mg/dm2.day)	0.0000051	0.0000053	0.0000065	0.0000051	0.0000061
	Lithium (Li)-Total (mg/dm2.day)	<0.00012	<0.00011	<0.00018	<0.00028	<0.00024
	Magnesium (Mg)-Total (mg/dm2.day)	<0.0024	<0.0023	<0.0037	<0.0056	<0.0047
	Manganese (Mn)-Total (mg/dm2.day)	0.000173	0.000125	0.0000939	0.000127	0.0000825
	Mercury (Hg)-Total (mg/dm2.day)	<0.0000012	<0.0000011	<0.0000018	<0.000028	<0.0000024
	Molybdenum (Mo)-Total (mg/dm2.day)	0.0000022	0.0000021	<0.0000018	<0.000028	<0.0000024
	Nickel (Ni)-Total (mg/dm2.day)	<0.000012	<0.000011	<0.000018	<0.000028	<0.000024
	Phosphorus (P)-Total (mg/dm2.day)	<0.0073	<0.0069	<0.011	<0.017	<0.014
	Potassium (K)-Total (mg/dm2.day)	<0.048	<0.046	<0.074	<0.11	<0.094
	Selenium (Se)-Total (mg/dm2.day)	<0.000024	<0.000023	<0.000037	<0.000056	<0.000047
	Silicon (Si)-Total (mg/dm2.day)	0.0036	0.0027	<0.0018	<0.0028	<0.0024
	Silver (Ag)-Total (mg/dm2.day)	DLB <0.00000073	O.00000069	ol.0000015	ol.0000022	DLB <0.0000014
	Sodium (Na)-Total (mg/dm2.day)	<0.048	<0.046	<0.074	<0.11	<0.094
	Strontium (Sr)-Total (mg/dm2.day)	0.0000205	0.0000163	0.0000147	0.0000179	0.0000153
	Thallium (TI)-Total (mg/dm2.day)	<0.0000024	<0.000023	<0.000037	<0.0000056	<0.0000047
	Tin (Sn)-Total (mg/dm2.day)	<0.0000024	<0.000023	<0.000037	<0.0000056	<0.0000047
	Titanium (Ti)-Total (mg/dm2.day)	<0.00024	<0.00023	<0.00037	<0.00056	<0.00047

L1074764 CONTD.... PAGE 3 of 7 28-OCT-11 12:12 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L1074764-6 DUSTFALL 19-OCT-11 15:00 DF-06 (SEP23 - OCT19/11)	L1074764-7 BLANK		
Grouping	Analyte				
DUSTFALL					
Particulates	Total Dustfall (mg/dm2.day)	0.34			
	Total Insoluble Dustfall (mg/dm2.day)	<0.12			
	Total Soluble Dustfall (mg/dm2.day)	0.29			
Anions and Nutrients	Ammonia (as N) (mg/dm2.day)	0.00082	<0.00013		
	Chloride (Cl) (mg/dm2.day)	0.038	0.042		
	Nitrate (as N) (mg/dm2.day)	0.00158	<0.00013		
	Sulfate (SO4) (mg/dm2.day)	<0.010	<0.013		
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000978			
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000021			
	Arsenic (As)-Total (mg/dm2.day)	<0.0000021			
	Barium (Ba)-Total (mg/dm2.day)	0.0000861			
	Beryllium (Be)-Total (mg/dm2.day)	<0.000010			
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000010			
	Boron (B)-Total (mg/dm2.day)	<0.00021			
	Cadmium (Cd)-Total (mg/dm2.day)	0.0000021			
	Calcium (Ca)-Total (mg/dm2.day)	0.0570			
	Chromium (Cr)-Total (mg/dm2.day)	<0.000010			
	Cobalt (Co)-Total (mg/dm2.day)	<0.000021			
	Copper (Cu)-Total (mg/dm2.day)	0.0000797			
	Iron (Fe)-Total (mg/dm2.day)	0.00216			
	Lead (Pb)-Total (mg/dm2.day)	0.0000030			
	Lithium (Li)-Total (mg/dm2.day)	<0.00010			
	Magnesium (Mg)-Total (mg/dm2.day)	0.0029			
	Manganese (Mn)-Total (mg/dm2.day)	0.000130			
	Mercury (Hg)-Total (mg/dm2.day)	<0.0000010			
	Molybdenum (Mo)-Total (mg/dm2.day)	0.0000012			
	Nickel (Ni)-Total (mg/dm2.day)	<0.000010			
	Phosphorus (P)-Total (mg/dm2.day)	<0.0062			
	Potassium (K)-Total (mg/dm2.day)	<0.041			
	Selenium (Se)-Total (mg/dm2.day)	<0.000021			
	Silicon (Si)-Total (mg/dm2.day)	0.0022			
	Silver (Ag)-Total (mg/dm2.day)	DLB <0.00000062			
	Sodium (Na)-Total (mg/dm2.day)	<0.041			
	Strontium (Sr)-Total (mg/dm2.day)	0.000294			
	Thallium (TI)-Total (mg/dm2.day)	<0.0000021			
	Tin (Sn)-Total (mg/dm2.day)	<0.0000021			
	Titanium (Ti)-Total (mg/dm2.day)	<0.00021			

L1074764 CONTD.... PAGE 4 of 7 28-OCT-11 12:12 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L1074764-1 DUSTFALL 19-OCT-11 16:00 DF-01 (SEP23 - OCT19/11)	L1074764-2 DUSTFALL 19-OCT-11 16:30 DF-02 (SEP23 - OCT19/11)	L1074764-3 DUSTFALL 19-OCT-11 17:00 DF-03 (SEP23 - OCT19/11)	L1074764-4 DUSTFALL 19-OCT-11 16:00 DF-04 (SEP23 - OCT19/11)	L1074764-5 DUSTFALL 19-OCT-11 14:00 DF-05 (SEP23 - OCT19/11)
Grouping	Analyte					
DUSTFALL						
Metals	Uranium (U)-Total (mg/dm2.day)	<0.0000024	<0.0000023	<0.0000037	<0.00000056	<0.0000004
	Vanadium (V)-Total (mg/dm2.day)					
	Zinc (Zn)-Total (mg/dm2.day)	<0.000024	<0.000023	<0.000037	<0.000056	<0.000047 0.000069
		0.000086	0.000077	0.000070	0.000075	0.000069

L1074764 CONTD.... PAGE 5 of 7 28-OCT-11 12:12 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L1074764-6 DUSTFALL 19-OCT-11 15:00 DF-06 (SEP23 - OCT19/11)	L1074764-7 BLANK		
Grouping	Analyte				
DUSTFALL					
Metals	Uranium (U)-Total (mg/dm2.day)	<0.0000021			
	Vanadium (V)-Total (mg/dm2.day)	<0.000021			
	Zinc (Zn)-Total (mg/dm2.day)	0.000207			

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Descriptio	n		
DLB	Detection	limit was rai	sed due to detection of analyte at comparable leve	l in Method Blank.
est Method	References	:		
ALS Test Cod	le	Matrix	Test Description	Method Reference**
CL-IC-VA		Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN PART SOLUBLE - ANIONS
Cations by Ic	on Chromatogr	aphy'. The		d 'Particulate - Total' and 'Particulate - Soluble - Anions and ocedures adapted from APHA Method 4110 "Determination ions by Ion Chromatography".
DUSTFALLS-	COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE DUSTFALLS
Dustfall analy	ysis is carried	out in accore	dance with procedures published by the B.C. Minist	try of Environment Laboratory.
HG-DUST(DM	12-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7
American Pu	ublic Health As	sociation, ar	nd with procedures adapted from "Test Methods for	amination of Water and Wastewater" published by the r Evaluating Solid Waste" SW-846 published by the United atomic fluorescence spectrophotometry (EPA Method 245.7)
MET-DUST(D	M2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B
American Pu	ublic Health Assonmental Prote	sociation, ar	nd with procedures adapted from "Test Methods for	amination of Water and Wastewater" published by the r Evaluating Solid Waste" SW-846 published by the United pupled plasma - optical emission spectrophotometry (EPA
MET-DUST(D	M2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
American Pu	blic Health As	sociation, ar	nd with procedures adapted from "Test Methods for	amination of Water and Wastewater" published by the r Evaluating Solid Waste" SW-846 published by the United pupled plasma - mass spectrometry (EPA Method 6020A).
NH3-F-VA		Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN PART SOLUBLE - ANIONS
Cations by Ic	on Chromatogr ociety of Chem	aphy'. The	ammonia analysis is specifcially carried out using p	d 'Particulate - Total' and 'Particulate - Soluble - Anions and procedures modified from J. Environ. Monit., 2005, 7, 37 - 42 ne determination of trace levels of ammonium in seawater",
NO3-IC-VA		Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN PART SOLUBLE - ANIONS
Cations by Ic	on Chromatogr	aphy'. The		d 'Particulate - Total' and 'Particulate - Soluble - Anions and cedures adapted from APHA Method 4110 "Determination of ns by Ion Chromatography".
SO4-IC-VA		Dustfall	Dustfall Sulphate by Ion Chromatography	BC LAB MAN PART SOLUBLE - ANIONS
Cations by Ic	on Chromatogr	aphy'. The		d 'Particulate - Total' and 'Particulate - Soluble - Anions and rocedures adapted from APHA Method 4110 "Determination nions by Ion Chromatography".
* ALS test met	hods may inco	orporate mod	lifications from specified reference methods to imp	rove performance.
The last two le	etters of the ab	ove test cod	le(s) indicate the laboratory that performed analytic	al analysis for that test. Refer to the list below:
Laboratory De	efinition Code	e Labora	atory Location	

VA

ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-168089

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.

10-168089

Page 1 of 1



ALS) Environmental

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KNIGHT PIESOLD LTD. ATTN: Peter Troffe 1400 - 750 WEST PENDER STREET VANCOUVER BC V6C 2T8 Date Received:30-JAN-12Report Date:08-FEB-12 17:28 (MT)Version:FINAL

Client Phone: 604-685-0543

Certificate of Analysis

Lab Work Order #: L1108792

Project P.O. #: Job Reference: C of C Numbers: Legal Site Desc: NOT SUBMITTED 101-458/5 10-196447

V

Andre Langlais Account Manager

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L1108792 CONTD.... PAGE 2 of 4 08-FEB-12 17:28 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L1108792-1 DUSTFALL 26-JAN-12 14:00 DF-02 (DEC19/11 - JAN26/12)	L1108792-2 DUSTFALL 26-JAN-12 14:30 DF-06	L1108792-3 DUSTFALL 26-JAN-12 15:00 DF-01 (OCT19/11 - JAN26/12)	
Grouping	Analyte				
DUSTFALL					
Particulates	Total Dustfall (mg/dm2.day)	0.12	0.56	0.82	
	Total Insoluble Dustfall (mg/dm2.day)	<0.10	0.13	0.32	
	Total Soluble Dustfall (mg/dm2.day)	<0.10	0.44	0.50	
Anions and Nutrients	Ammonia, Total (as N) (mg/dm2.day)	0.000551	0.00153	0.00117	
	Chloride (Cl) (mg/dm2.day)	<0.0060	0.036	0.038	
	Nitrate (as N) (mg/dm2.day)	0.00301	0.00501	0.00624	
	Sulfate (SO4) (mg/dm2.day)	<0.0060	<0.017	<0.021	
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000354	0.000483	0.000658	
	Antimony (Sb)-Total (mg/dm2.day)	<0.00000051	<0.0000014	<0.0000011	
	Arsenic (As)-Total (mg/dm2.day)	0.00000056	<0.0000014	<0.0000011	
	Barium (Ba)-Total (mg/dm2.day)	0.0000122	0.0000272	0.0000232	
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000025	<0.000069	<0.0000056	
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000025	<0.000069	<0.0000056	
	Boron (B)-Total (mg/dm2.day)	<0.000051	<0.00014	<0.00011	
	Cadmium (Cd)-Total (mg/dm2.day)	<0.0000025	<0.0000069	<0.0000056	
	Calcium (Ca)-Total (mg/dm2.day)	0.00098	0.00208	0.00161	
	Chromium (Cr)-Total (mg/dm2.day)	0.0000034	<0.000069	<0.0000056	
	Cobalt (Co)-Total (mg/dm2.day)	<0.00000051	<0.0000014	<0.0000011	
	Copper (Cu)-Total (mg/dm2.day)	0.0000610	0.0000697	0.0000534	
	Iron (Fe)-Total (mg/dm2.day)	0.00123	0.00145	0.00197	
	Lead (Pb)-Total (mg/dm2.day)	0.00000699	0.0000407	0.0000287	
	Lithium (Li)-Total (mg/dm2.day)	<0.000025	<0.000069	<0.000056	
	Magnesium (Mg)-Total (mg/dm2.day)	<0.00051	<0.0014	<0.0011	
	Manganese (Mn)-Total (mg/dm2.day)	0.0000408	0.000107	0.0000925	
	Mercury (Hg)-Total (mg/dm2.day)	<0.0000025	<0.0000069	<0.0000056	
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000046	<0.0000069	0.00000081	
	Nickel (Ni)-Total (mg/dm2.day)	<0.000025	<0.000069	<0.0000056	
	Phosphorus (P)-Total (mg/dm2.day)	<0.0015	<0.0041	<0.0033	
	Potassium (K)-Total (mg/dm2.day)	<0.010	<0.028	<0.022	
	Selenium (Se)-Total (mg/dm2.day)	<0.0000051	<0.000014	<0.000011	
	Silicon (Si)-Total (mg/dm2.day)	0.00073	0.00077	0.00104	
	Silver (Ag)-Total (mg/dm2.day)	<0.00000051	<0.0000014	<0.0000011	
	Sodium (Na)-Total (mg/dm2.day)	<0.010	<0.028	<0.022	
	Strontium (Sr)-Total (mg/dm2.day)	0.00000486	0.0000107	0.0000084	
	Thallium (TI)-Total (mg/dm2.day)	<0.00000051	<0.0000014	<0.0000011	
	Tin (Sn)-Total (mg/dm2.day)	0.00000129	0.0000028	0.0000053	
	Titanium (Ti)-Total (mg/dm2.day)	<0.000051	<0.00014	<0.00011	

L1108792 CONTD.... PAGE 3 of 4 08-FEB-12 17:28 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L1108792-1 DUSTFALL 26-JAN-12 14:00 DF-02 (DEC19/11 - JAN26/12)	L1108792-2 DUSTFALL 26-JAN-12 14:30 DF-06	L1108792-3 DUSTFALL 26-JAN-12 15:00 DF-01 (OCT19/11 - JAN26/12)	
Grouping	Analyte				
DUSTFALL					
Metals	Uranium (U)-Total (mg/dm2.day)	<0.000000051	<0.0000014	<0.0000011	
	Vanadium (V)-Total (mg/dm2.day)	<0.000051	<0.000014	<0.000011	
	Zinc (Zn)-Total (mg/dm2.day)	0.000028	0.000057	0.000054	

L1108792 CONTD PAGE 4 of 4 08-FEB-12 17:28 (MT) Version: FINAL

ALS Test Code	Matrix	Test Description	Method Reference**
CL-IC-VA	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN PART SOLUBLE - ANIONS
Cations by Ion Chromatog	raphy'. The c		Particulate - Total' and 'Particulate - Soluble - Anions and peedures adapted from APHA Method 4110 "Determination ions by Ion Chromatography".
DUSTFALLS-COM-DM2-V	A Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE DUSTFALLS
Dustfall analysis is carried	out in accord	lance with procedures published by the B.C. Minist	ry of Environment Laboratory.
HG-DUST(DM2-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7
American Public Health As	sociation, an	d with procedures adapted from "Test Methods for	mination of Water and Wastewater" published by the Evaluating Solid Waste" SW-846 published by the United atomic fluorescence spectrophotometry (EPA Method 245.7
MET-DUST(DM2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B
American Public Health As	sociation, an	d with procedures adapted from "Test Methods for	mination of Water and Wastewater" published by the Evaluating Solid Waste" SW-846 published by the United upled plasma - optical emission spectrophotometry (EPA
MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
American Public Health As	sociation, an	d with procedures adapted from "Test Methods for	mination of Water and Wastewater" published by the Evaluating Solid Waste" SW-846 published by the United upled plasma - mass spectrometry (EPA Method 6020A).
NH3-F-VA	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN PART SOLUBLE - ANIONS
Cations by Ion Chromatog	raphy'. The a	ammonia analysis is specifcially carried out using p	I 'Particulate - Total' and 'Particulate - Soluble - Anions and rocedures modified from J. Environ. Monit., 2005, 7, 37 - 4: e determination of trace levels of ammonium in seawater",
NO3-IC-VA	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN PART SOLUBLE - ANIONS
Cations by Ion Chromatog	raphy'. The r		I 'Particulate - Total' and 'Particulate - Soluble - Anions and edures adapted from APHA Method 4110 "Determination o ns by Ion Chromatography".
SO4-IC-VA	Dustfall	Dustfall Sulphate by Ion Chromatography	BC LAB MAN PART SOLUBLE - ANIONS
Cations by Ion Chromatog	raphy'. The s		I 'Particulate - Total' and 'Particulate - Soluble - Anions and ocedures adapted from APHA Method 4110 "Determinatior ions by Ion Chromatography".
* ALS test methods may inco	orporate mod	ifications from specified reference methods to impr	rove performance.
The last two letters of the a	bove test coo	de(s) indicate the laboratory that performed analyti	ical analysis for that test. Refer to the list below:
Laboratory Definition Cod	e Labor	atory Location	
VA	ALS E	NVIRONMENTAL - VANCOUVER, BC, CANADA	
hain of Custody Numbers	:		
10-196447			
applicable tests, surrogates	at is similar ii are added to	n behaviour to target analyte(s), but that does not o samples prior to analysis as a check on recovery n 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.

10-196447

Chain of Custody / Analytical Request Form Canada Toll Free: 1 800 668 9878

ALS Environmental

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KNIGHT PIESOLD LTD. ATTN: Peter Troffe 1400 - 750 WEST PENDER STREET VANCOUVER BC V6C 2T8 Date Received:04-APR-12Report Date:18-APR-12 17:00 (MT)Version:FINAL

Client Phone: 604-685-0543

Certificate of Analysis

Lab Work Order #: Project P.O. #: Job Reference: L1131425 NOT SUBMITTED

Job Reference: C of C Numbers: Legal Site Desc:

10-206862

Stefanie Teo Account Manager

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L1131425 CONTD.... PAGE 2 of 3 18-APR-12 17:00 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L1131425-1 DUSTFALL 31-MAR-12 17:15 DF-02 (26-JAN- 12-31-MAR-12)	L1131425-2 DUSTFALL 31-MAR-12 17:15 DF-06 (26-JAN- 12~31-MAR-12)	L1131425-3 DUSTFALL 31-MAR-12 17:15 DF-01 (26-JAN- 12-31-MAR-12)
Grouping	Analyte			
DUSTFALL				
Particulates	Total Dustfall (mg/dm2.day)	<0.10	<0.10	0.23
	Total Insoluble Dustfall (mg/dm2.day)	<0.10	<0.10	0.17
	Total Soluble Dustfall (mg/dm2.day)	<0.10	<0.10	<0.10
Anions and Nutrients	Sulfate (SO4) (mg/dm2.day)	<0.0034	<0.0033	<0.0041
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.000671	0.000268	0.00108
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000068	<0.0000067	<0.0000082
	Arsenic (As)-Total (mg/dm2.day)	<0.0000068	<0.0000067	<0.0000082
	Barium (Ba)-Total (mg/dm2.day)	0.0000336	0.0000204	0.0000372
	Beryllium (Be)-Total (mg/dm2.day)	<0.000034	<0.000033	<0.0000041
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000034	<0.000033	<0.0000041
	Boron (B)-Total (mg/dm2.day)	<0.00068	<0.000067	<0.000082
	Cadmium (Cd)-Total (mg/dm2.day)	<0.0000034	<0.0000033	<0.00000041
	Calcium (Ca)-Total (mg/dm2.day)	0.00252	0.00182	0.00254
	Chromium (Cr)-Total (mg/dm2.day)	0.0000073	0.0000034	0.0000079
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000068	<0.0000067	0.00000199
	Copper (Cu)-Total (mg/dm2.day)	DLB <0.000020	DLB <0.000023	0.0000550
	Iron (Fe)-Total (mg/dm2.day)	0.00324	0.00152	0.00372
	Lead (Pb)-Total (mg/dm2.day)	0.00000223	0.00000178	0.00000291
	Lithium (Li)-Total (mg/dm2.day)	<0.000034	<0.000033	<0.000041
	Magnesium (Mg)-Total (mg/dm2.day)	<0.00068	<0.00067	<0.00082
	Manganese (Mn)-Total (mg/dm2.day)	0.000160	0.0000798	0.000149
	Mercury (Hg)-Total (mg/dm2.day)	<0.0000034	<0.0000033	<0.00000041
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000115	0.00000061	0.00000108
	Nickel (Ni)-Total (mg/dm2.day)	0.0000054	0.0000043	0.0000050
	Phosphorus (P)-Total (mg/dm2.day)	<0.0020	<0.0020	<0.0025
	Potassium (K)-Total (mg/dm2.day)	<0.014	<0.013	<0.016
	Selenium (Se)-Total (mg/dm2.day)	<0.0000068	<0.000067	<0.000082
	Silicon (Si)-Total (mg/dm2.day)	0.00137	0.00048	0.00203
	Silver (Ag)-Total (mg/dm2.day)	<0.00000068	<0.00000067	<0.00000082
	Sodium (Na)-Total (mg/dm2.day)	<0.014	<0.013	<0.016
	Strontium (Sr)-Total (mg/dm2.day)	0.0000129	0.00000852	0.0000132
	Thallium (TI)-Total (mg/dm2.day)	<0.0000068	<0.0000067	<0.0000082
	Tin (Sn)-Total (mg/dm2.day)	<0.0000068	<0.0000067	<0.0000082
	Titanium (Ti)-Total (mg/dm2.day)	<0.00068	<0.000067	<0.000082
	Uranium (U)-Total (mg/dm2.day)	<0.00000068	<0.00000067	<0.00000082
	Vanadium (V)-Total (mg/dm2.day)	<0.000068	<0.000067	<0.000082
	Zinc (Zn)-Total (mg/dm2.day)	0.000043	0.000043	0.000044

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

Qualifiers for Individual Parameters Listed:

Qualifier	Description	n		
DLB	Detection	limit was ra	ised due to detection of analyte at comparable le	evel in Method Blank.
est Method	References:	:		
ALS Test Cod	le	Matrix	Test Description	Method Reference**
DUSTFALLS-	COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE DUSTFALLS
Dustfall analy	ysis is carried o	out in accor	dance with procedures published by the B.C. Mi	inistry of Environment Laboratory.
HG-DUST(DM	12-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7
American Pu	blic Health As	sociation, a	nd with procedures adapted from "Test Methods	Examination of Water and Wastewater" published by the for Evaluating Solid Waste" SW-846 published by the United pur atomic fluorescence spectrophotometry (EPA Method 245.7)
MET-DUST(D	M2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B
American Pu	ublic Health Assonmental Prote	sociation, a	nd with procedures adapted from "Test Methods	Examination of Water and Wastewater" published by the for Evaluating Solid Waste" SW-846 published by the United y coupled plasma - optical emission spectrophotometry (EPA
MET-DUST(D	M2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
American Pu	ublic Health Ass	sociation, a	nd with procedures adapted from "Test Methods	Examination of Water and Wastewater" published by the for Evaluating Solid Waste" SW-846 published by the United y coupled plasma - mass spectrometry (EPA Method 6020A).
SO4-IC-VA		Dustfall	Dustfall Sulphate by Ion Chromatography	BC LAB MAN PART SOLUBLE - ANIONS
Cations by Ic	on Chromatogra	aphy'. The		thod 'Particulate - Total' and 'Particulate - Soluble - Anions and g procedures adapted from APHA Method 4110 "Determination Anions by Ion Chromatography".
* ALS test met	hods may inco	orporate mo	difications from specified reference methods to i	mprove performance.
The last two le	etters of the ab	ove test co	de(s) indicate the laboratory that performed anal	lytical analysis for that test. Refer to the list below:
Laboratory De	efinition Code	e Laboi	atory Location	
VA		ALS E	NVIRONMENTAL - VANCOUVER, BC, CANAD	A
Chain of Custo	ody Numbers:			
10-206862				
Surrogate - A applicable test mg/kg - milligr	ts, surrogates a ams per kilogra	t is similar i are added t am based c	n behaviour to target analyte(s), but that does no o samples prior to analysis as a check on recove on dry weight of sample.	ot occur naturally in environmental samples. For ery.

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.

10-206862

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KNIGHT PIESOLD LTD. ATTN: Jessica Mackie 1400 - 750 West Pender Street Vancouver BC V6C 2T8 Date Received:25-JUN-12Report Date:12-JUL-12 15:40 (MT)Version:FINAL REV. 2

Client Phone: 604-685-0543

Certificate of Analysis

Lab Work Order #: L1167273

Project P.O. #: Job Reference: C of C Numbers: Legal Site Desc: NOT SUBMITTED VA101-458/6 10-251685

Comments: ADDITIONAL 05-JUL-12 17:34

12-JUL-12: Revised report Dustfall articulates analysis has been added.

V

Andre Langlais Account Manager

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L1167273 CONTD.... PAGE 2 of 3 12-JUL-12 15:40 (MT) Version: FINAL REV. 2

	Sample ID Description Sampled Date Sampled Time Client ID	L1167273-1 DUSTFALL 19-JUN-12 17:15 DF-06	L1167273-2 DUSTFALL 20-JUN-12 18:55 DF-01	L1167273-3 DUSTFALL 20-JUN-12 18:00 DF-02	
Grouping	Analyte				
DUSTFALL					
Particulates	Total Dustfall (mg/dm2.day)	0.24	0.22	0.22	
	Total Insoluble Dustfall (mg/dm2.day)	0.17	0.16	0.16	
	Total Soluble Dustfall (mg/dm2.day)	<0.10	<0.10	<0.10	
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00135	0.00274	0.00106	
	Antimony (Sb)-Total (mg/dm2.day)	0.00000064	0.00000086	0.00000067	
	Arsenic (As)-Total (mg/dm2.day)	<0.0000030	OLDM <0.0000024	OLD DLM <0.0000010	
	Barium (Ba)-Total (mg/dm2.day)	0.0000274	0.0000488	0.0000238	
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000025	<0.0000024	<0.000025	
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000025	<0.000024	<0.000025	
	Boron (B)-Total (mg/dm2.day)	<0.000049	<0.000049	<0.000050	
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000075	0.00000031	<0.0000025	
	Calcium (Ca)-Total (mg/dm2.day)	0.00421	0.00457	0.00321	
	Chromium (Cr)-Total (mg/dm2.day)	0.0000078	0.0000118	0.0000060	
	Cobalt (Co)-Total (mg/dm2.day)	0.00000101	0.00000166	0.00000071	
	Copper (Cu)-Total (mg/dm2.day)	DLB <0.000099	0.000221	DLB <0.000075	
	Iron (Fe)-Total (mg/dm2.day)	0.00321	0.00610	0.00271	
	Lead (Pb)-Total (mg/dm2.day)	DLB <0.0000049	DLB <0.0000073	DLB <0.0000030	
	Lithium (Li)-Total (mg/dm2.day)	<0.000025	<0.000024	<0.000025	
	Magnesium (Mg)-Total (mg/dm2.day)	0.00177	0.00283	0.00110	
	Manganese (Mn)-Total (mg/dm2.day)	0.0000992	0.000153	0.0000675	
	Mercury (Hg)-Total (mg/dm2.day)	<0.0000025	<0.0000024	<0.0000025	
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000126	0.00000191	0.00000125	
	Nickel (Ni)-Total (mg/dm2.day)	DLB <0.0000074	0.000122	DLB <0.000012	
	Phosphorus (P)-Total (mg/dm2.day)	0.0036	0.0066	<0.0015	
	Potassium (K)-Total (mg/dm2.day)	<0.0099	0.0113	<0.010	
	Selenium (Se)-Total (mg/dm2.day)	<0.0000049	<0.000049	<0.000050	
	Silicon (Si)-Total (mg/dm2.day)	0.00240	0.00478	0.00194	
	Silver (Ag)-Total (mg/dm2.day)	0.000000102	0.000000226	<0.00000050	
	Sodium (Na)-Total (mg/dm2.day)	<0.0099	<0.0097	<0.010	
	Strontium (Sr)-Total (mg/dm2.day)	0.0000213	0.0000270	0.0000189	
	Thallium (TI)-Total (mg/dm2.day)	<0.00000049	<0.0000049	<0.0000050	
	Tin (Sn)-Total (mg/dm2.day)	<0.00000049	0.00000067	<0.0000050	
	Titanium (Ti)-Total (mg/dm2.day)	0.000056	0.000131	0.000054	
	Uranium (U)-Total (mg/dm2.day)	0.000000118	0.000000182	0.00000067	
	Vanadium (V)-Total (mg/dm2.day)	<0.0000049	0.0000057	<0.0000050	
	Zinc (Zn)-Total (mg/dm2.day)	0.000061	0.000469	0.000044	

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

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.
DLM	Detection Limit Adjusted For Sample Matrix Effects

Toot Mathed Deferences

Dustfall		
Dustian	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE
determined degrees cel	Isius. Total Soluble Dustfall is determined by evap	ined by filtering a sample through a 0.45 um membrane filter
Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7
ssociation, ar	nd with procedures adapted from "Test Methods f	or Evaluating Solid Waste" SW-846 published by the United
Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B
ssociation, ar	nd with procedures adapted from "Test Methods f	or Evaluating Solid Waste" SW-846 published by the United
Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
ssociation, ar	nd with procedures adapted from "Test Methods f	or Evaluating Solid Waste" SW-846 published by the United
orporate mod	difications from specified reference methods to im	prove performance.
oove test coo	de(s) indicate the laboratory that performed analyt	ical analysis for that test. Refer to the list below:
e Labor	atory Location	
ALS E	NVIRONMENTAL - VANCOUVER, BC, CANADA	
	e determined degrees ce f Insoluble D bustfall t using processociation, a section Agen Dustfall t using processociation, a section Agen Dustfall t using processociation, a section Agen orporate mo bove test con	determined gravimetrically. Total Insoluble Dustfall is determ degrees celsius. Total Soluble Dustfall is determined by evap f Insoluble Dustfall and the Soluble Dustfall. Dustfall Total Mercury in Dustfalls by CVAFS tusing procedures adapted from "Standard Methods for the E sociation, and with procedures adapted from "Test Methods f rection Agency (EPA). Instrumental analysis is by cold vapou Dustfall Total Metals in Dustfalls by ICPOES tusing procedures adapted from "Standard Methods for the E sociation, and with procedures adapted from "Test Methods f tusing procedures adapted from "Standard Methods for the E sociation, and with procedures adapted from "Test Methods f tusing procedures adapted from "Standard Methods for the E sociation, and with procedures adapted from "Test Methods f tusing procedures adapted from "Standard Methods for the E sociation, and with procedures adapted from "Test Methods f tusing procedures adapted from "Standard Methods for the E sociation, and with procedures adapted from "Test Methods f tusing procedures adapted from "Standard Methods for the E sociation, and with procedures adapted from "Test Methods f tusing procedures adapted from "Standard Methods for the E sociation, and with procedures adapted from "Test Methods f tusing procedures adapted from standard Methods for the E sociation, and with procedures adapted from "Test Methods f tusing procedures adapted from standard Methods for the E sociation, and with procedures adapted from "Test Methods f tusing procedures adapted from standard Methods for the E sociation, and with procedures adapted from "Test Methods f tusing procedures adapted from standard Methods for the E sociation, and with procedures adapted from "Test Methods f tusing procedures adapted from standard Methods for the E sociation, and with procedures adapted from standard Methods for the E sociation, and with procedures adapte

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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.

10-251685

Page _____ of _____

Chain of Custody / Analytical Request Form Canada Toll Free: 1 800 668 9878

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KNIGHT PIESOLD LTD. ATTN: Lawrence Duong 1400 - 750 West Pender Street Vancouver BC V6C 2T8 Date Received: 27-AUG-12 Report Date: 06-SEP-12 15:57 (MT) Version: FINAL

Client Phone: 604-685-0543

# **Certificate of Analysis**

### Lab Work Order #: L1200300

Project P.O. #: Job Reference: C of C Numbers: Legal Site Desc: NOT SUBMITTED VA101-458/6 10-195732

1

Andre Langlais Account Manager

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L1200300 CONTD.... PAGE 2 of 4 06-SEP-12 15:57 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L1200300-1 Dustfall 23-AUG-12 DF-02	L1200300-2 Dustfall 23-AUG-12 DF-03	L1200300-3 Dustfall 23-AUG-12 DF-04	L1200300-4 Dustfall 23-AUG-12 DF-05	L1200300-5 Dustfall 23-AUG-12 DF-06
Grouping	Analyte					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.19	<0.10	0.13	0.10	0.64
	Total Insoluble Dustfall (mg/dm2.day)	0.19	<0.10	<0.10	<0.10	0.55
	Total Soluble Dustfall (mg/dm2.day)	<0.10	<0.10	<0.10	<0.10	<0.10
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00149	0.000622	0.00142	0.000723	0.00131
	Antimony (Sb)-Total (mg/dm2.day)	<0.00000054	0.00000039	0.00000058	0.00000052	0.00000054
	Arsenic (As)-Total (mg/dm2.day)	0.00000070	0.0000130	0.0000139	0.0000140	0.00000180
	Barium (Ba)-Total (mg/dm2.day)	0.0000284	0.0000156	0.0000221	0.0000173	0.0000150
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000027	< 0.0000012	<0.0000022	<0.0000020	<0.0000027
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000027	<0.0000012	<0.0000022	<0.0000020	<0.0000027
	Boron (B)-Total (mg/dm2.day)	<0.000054	<0.000024	<0.000045	<0.000040	<0.000053
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000027	0.00000015	<0.0000022	0.00000036	<0.00000027
	Calcium (Ca)-Total (mg/dm2.day)	0.00261	0.00176	0.00212	0.00209	0.00423
	Chromium (Cr)-Total (mg/dm2.day)	0.0000066	0.0000016	0.0000033	0.0000095	0.0000048
	Cobalt (Co)-Total (mg/dm2.day)	0.00000140	0.00000050	0.00000077	0.00000064	0.00000170
	Copper (Cu)-Total (mg/dm2.day)	DLB <0.000049	0.0000900	0.000121	0.000178	DLB <0.000051
	Iron (Fe)-Total (mg/dm2.day)	0.00327	0.000726	0.00157	0.00123	0.00251
	Lead (Pb)-Total (mg/dm2.day)	0.00000245	0.00000433	0.00000535	0.00000733	OLB <0.0000021
	Lithium (Li)-Total (mg/dm2.day)	<0.000027	<0.000012	<0.000022	<0.000020	<0.000027
	Magnesium (Mg)-Total (mg/dm2.day)	0.00112	0.00062	0.00091	0.00067	0.00251
	Manganese (Mn)-Total (mg/dm2.day)	0.000144	0.0000433	0.0000596	0.0000593	0.000118
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000027	<0.00000012	<0.00000022	<0.00000020	<0.00000027
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000065	0.00000030	0.00000084	0.00000133	0.00000065
	Nickel (Ni)-Total (mg/dm2.day)	0.0000085	0.0000026	0.0000028	0.0000054	0.0000069
	Phosphorus (P)-Total (mg/dm2.day)	< 0.0016	< 0.00072	<0.0013	<0.0012	0.0035
	Potassium (K)-Total (mg/dm2.day)	<0.011	<0.0048	<0.0090	<0.0080	<0.011
	Selenium (Se)-Total (mg/dm2.day)	<0.0000054	<0.0000024	<0.0000045	<0.0000040	<0.0000053
	Silicon (Si)-Total (mg/dm2.day)	0.00247	0.00132	0.00292	0.00137	0.00233
	Silver (Ag)-Total (mg/dm2.day)	<0.000000054	0.000000060	0.000000079	0.000000101	< 0.00000005
	Sodium (Na)-Total (mg/dm2.day)	<0.011	<0.0048	< 0.0090	<0.0080	<0.011
	Strontium (Sr)-Total (mg/dm2.day)	0.0000158	0.0000111	0.0000146	0.0000125	0.0000178
	Thallium (TI)-Total (mg/dm2.day)	<0.00000054	<0.00000024	<0.0000045	<0.00000123	< 0.00000053
	Tin (Sn)-Total (mg/dm2.day)	<0.00000054	<0.00000024	<0.00000045	<0.00000040	<0.00000053
	Titanium (Ti)-Total (mg/dm2.day)	0.000079	0.000024	0.000049	<0.0000040	0.000064
	Uranium (U)-Total (mg/dm2.day)	0.000000090	0.0000000000000000000000000000000000000	0.000000079	0.00000040	0.0000004
	Vanadium (V)-Total (mg/dm2.day)	<0.00000054	<0.00000040	< 0.00000079	<0.00000048	<0.00000053
	Zinc (Zn)-Total (mg/dm2.day)	<0.0000054	0.0000024	<0.000045	<0.0000040	0.0000053

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

L1200300 CONTD.... PAGE 3 of 4 06-SEP-12 15:57 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L1200300-6 Dustfall 23-AUG-12 DF-07		
Grouping	Analyte			
DUSTFALL				
Particulates	Total Dustfall (mg/dm2.day)	0.15		
	Total Insoluble Dustfall (mg/dm2.day)	<0.10		
	Total Soluble Dustfall (mg/dm2.day)	<0.10		
Metals	Aluminum (Al)-Total (mg/dm2.day)	<0.000016		
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000054		
	Arsenic (As)-Total (mg/dm2.day)	<0.0000054		
	Barium (Ba)-Total (mg/dm2.day)	DLB <0.00000054		
	Beryllium (Be)-Total (mg/dm2.day)	<0.000027		
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000027		
	Boron (B)-Total (mg/dm2.day)	<0.000054		
	Cadmium (Cd)-Total (mg/dm2.day)	<0.0000027		
	Calcium (Ca)-Total (mg/dm2.day)	<0.00027		
	Chromium (Cr)-Total (mg/dm2.day)	<0.000027		
	Cobalt (Co)-Total (mg/dm2.day)	<0.00000054		
	Copper (Cu)-Total (mg/dm2.day)	DLB <0.000014		
	Iron (Fe)-Total (mg/dm2.day)	<0.00016		
	Lead (Pb)-Total (mg/dm2.day)	DLB <0.00000054		
	Lithium (Li)-Total (mg/dm2.day)	<0.000027		
	Magnesium (Mg)-Total (mg/dm2.day)	<0.00054		
	Manganese (Mn)-Total (mg/dm2.day)	0.0000031		
	Mercury (Hg)-Total (mg/dm2.day)	<0.0000027		
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.0000027		
	Nickel (Ni)-Total (mg/dm2.day)	<0.000027		
	Phosphorus (P)-Total (mg/dm2.day)	<0.0016		
	Potassium (K)-Total (mg/dm2.day)	<0.011		
	Selenium (Se)-Total (mg/dm2.day)	<0.0000054		
	Silicon (Si)-Total (mg/dm2.day)	<0.00027		
	Silver (Ag)-Total (mg/dm2.day)	<0.00000054		
	Sodium (Na)-Total (mg/dm2.day)	<0.011		
	Strontium (Sr)-Total (mg/dm2.day)	<0.0000054		
	Thallium (TI)-Total (mg/dm2.day)	<0.0000054		
	Tin (Sn)-Total (mg/dm2.day)	<0.0000054		
	Titanium (Ti)-Total (mg/dm2.day)	<0.000054		
	Uranium (U)-Total (mg/dm2.day)	<0.00000054		
	Vanadium (V)-Total (mg/dm2.day)	<0.0000054		
	Zinc (Zn)-Total (mg/dm2.day)	<0.000016		

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

#### **Qualifiers for Individual Parameters Listed:**

Qualifier	Description		
DLB	Detection limit was	raised due to detection of analyte a	at comparable level in Method Blank.
Test Method F	References:		
ALS Test Code	e Matrix	Test Description	Method Reference**
DUSTFALLS-C	OM-DM2-VA Dustfal	Combined Dustfalls-Total, sol	uble, insol BCMOE PARTICULATE
Particulates of and drying the	r Dustfall are determir e filter at 104 degrees	ed gravimetrically. Total Insoluble	Imbia Environmental Manual "Particulate." Dustfall is determined by filtering a sample through a 0.45 um membrane filter etermined by evaporating the filtrate to dryness at 104 degrees celsius. The
HG-DUST(DM2	-CVAFS-VA Dustfal	I Total Mercury in Dustfalls by (	CVAFS EPA 245.7
American Pub	lic Health Association	, and with procedures adapted from	Methods for the Examination of Water and Wastewater" published by the "Test Methods for Evaluating Solid Waste" SW-846 published by the United is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7)
MET-DUST(DM	12)-ICP-VA Dustfal	I Total Metals in Dustfalls by IC	POES EPA 6010B
American Pub	lic Health Association	, and with procedures adapted from	Methods for the Examination of Water and Wastewater" published by the n "Test Methods for Evaluating Solid Waste" SW-846 published by the United is by inductively coupled plasma - optical emission spectrophotometry (EPA
MET-DUST(DM	12)-MS-VA Dustfal	I Total Metals in Dustfalls by IC	CPMS EPA 6020A
American Pub	lic Health Association	, and with procedures adapted from	Methods for the Examination of Water and Wastewater" published by the "Test Methods for Evaluating Solid Waste" SW-846 published by the United is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).
* ALS test meth	ods may incorporate	modifications from specified referen	ce methods to improve performance.
The last two let	ters of the above test	code(s) indicate the laboratory that	performed analytical analysis for that test. Refer to the list below:
Laboratory Def	finition Code La	poratory Location	
VA	AL	S ENVIRONMENTAL - VANCOUVE	R, BC, CANADA
Chain of Custor	dy Numbers:		
10-195732			

### **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.

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Address: 14	10 - 750	WEST PENDER AVG	Email 1:	tokay	2 knightpieso	ld-com		Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT									
Vi	WOUVER	,	Email 2:	Iduona	<u>e knightpie</u>	sold com		Same Day or Weekend Emergency - Contact ALS to confirm TAT									
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KNIGHT PIESOLD LTD. ATTN: Lawrence Duong 1400 - 750 West Pender Street Vancouver BC V6C 2T8 Date Received:27-SEP-13Report Date:09-OCT-13 14:46 (MT)Version:FINAL

Client Phone: 604-685-0543

# **Certificate of Analysis**

### Lab Work Order #:

Project P.O. #: Job Reference: C of C Numbers: Legal Site Desc: L1370048 NOT SUBMITTED VA101-458/9

V

Andre Langlais Account Manager

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L1370048 CONTD.... PAGE 2 of 3 09-OCT-13 14:46 (MT) Version: FINAL

# ALS ENVIRONMENTAL ANALYTICAL REPORT

					Version	: FINAL
	Sample ID Description Sampled Date Sampled Time Client ID	L1370048-1 DUSTFALL 20-SEP-13 09:10 DF-06 AUG.22- SEPT.20	L1370048-2 DUSTFALL 20-SEP-13 09:32 DF-02 AUG.22- SEPT.20	L1370048-3 DUSTFALL 20-SEP-13 17:00 DF-07 AUG.22- SEPT.20		
Grouping	Analyte					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	1.53	0.34	<0.10		
	Total Insoluble Dustfall (mg/dm2.day)	0.62	0.16	<0.10		
	Total Soluble Dustfall (mg/dm2.day)	0.91	0.18	<0.10		
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00126	0.00125	0.000209		
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000016	<0.0000014	<0.000209		
	Arsenic (As)-Total (mg/dm2.day)	0.0000273	<0.0000014	<0.0000020		
	Barium (Ba)-Total (mg/dm2.day)	0.0000273	0.0000471	0.0000176		
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000430	<0.0000471	<0.0000170		
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000081	<0.0000070	<0.000010		
	Boron (B)-Total (mg/dm2.day)	0.00020	<0.00014	<0.00020		
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00020	<0.0000070	<0.00020		
	Calcium (Ca)-Total (mg/dm2.day)	0.00609	0.00351	0.0014		
	Chromium (Cr)-Total (mg/dm2.day)	0.0000085	<0.0000070			
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000085	<0.0000070	<0.000010 <0.000020		
	Copper (Cu)-Total (mg/dm2.day)					
	Iron (Fe)-Total (mg/dm2.day)	0.000453	0.000361	0.000071		
	Lead (Pb)-Total (mg/dm2.day)	0.00338	0.00343	<0.00060		
	Lithium (Li)-Total (mg/dm2.day)	0.00000329	0.00000268	0.0000013		
	Magnesium (Mg)-Total (mg/dm2.day)	<0.000081	<0.000070	<0.00010		
	Manganese (Mn)-Total (mg/dm2.day)	0.0060	< 0.0014	<0.0020		
	Mercury (Hg)-Total (mg/dm2.day)	0.000303	0.000128	0.0000430		
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.0000081	<0.0000070	<0.0000010		
	Nickel (Ni)-Total (mg/dm2.day)	0.00000192	<0.0000070	<0.0000010		
	Phosphorus (P)-Total (mg/dm2.day)	<0.000081	0.0000105	<0.000010		
	Potassium (K)-Total (mg/dm2.day)	0.0441	<0.0042	<0.0060		
	Selenium (Se)-Total (mg/dm2.day)	0.073	<0.028	<0.040		
	Silicon (Si)-Total (mg/dm2.day)	<0.000016	<0.000014	<0.000020		
	Silver (Ag)-Total (mg/dm2.day)	0.00280	0.00217	<0.0010		
	Sodium (Na)-Total (mg/dm2.day)	0.00000020	<0.0000014	<0.0000020		
	Strontium (Sr)-Total (mg/dm2.day)	<0.033	<0.028	<0.040		
	Thallium (TI)-Total (mg/dm2.day)	0.0000357	0.0000191	0.0000129		
	Tin (Sn)-Total (mg/dm2.day)	<0.000016	<0.000014	<0.000020		
		<0.000016	<0.000014	<0.000020		
	Titanium (Ti)-Total (mg/dm2.day)	<0.00016	<0.00014	<0.00020		
	Uranium (U)-Total (mg/dm2.day)	<0.00000016	<0.0000014	<0.0000020		
	Vanadium (V)-Total (mg/dm2.day)	<0.000016	<0.000014	<0.000020		
	Zinc (Zn)-Total (mg/dm2.day)	0.000278	0.000122	0.000073		

L1370048 CONTD.... PAGE 3 of 3 09-OCT-13 14:46 (MT) Version: FINAL

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DUSTFALLS-COM-DM2	VA Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE
Particulates or Dustfall a and drying the filter at 1	are determined 04 degrees cels		ental Manual "Particulate." nined by filtering a sample through a 0.45 um membrane filter porating the filtrate to dryness at 104 degrees celsius. The
HG-DUST(DM2-CVAFS-	VA Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7
American Public Health	Association, an otection Agenc	d with procedures adapted from "Test Methods y (EPA). Instrumental analysis is by cold vapou	examination of Water and Wastewater" published by the for Evaluating Solid Waste" SW-846 published by the United ar atomic fluorescence spectrophotometry or atomic absorption
MET-DUST(DM2)-ICP-V	A Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B
American Public Health	Association, an	d with procedures adapted from "Test Methods	examination of Water and Wastewater" published by the for Evaluating Solid Waste" SW-846 published by the United coupled plasma - optical emission spectrophotometry (EPA
MET-DUST(DM2)-MS-V	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
American Public Health	Association, an	d with procedures adapted from "Test Methods	Examination of Water and Wastewater" published by the for Evaluating Solid Waste" SW-846 published by the United coupled plasma - mass spectrometry (EPA Method 6020A).
* ALS test methods may i	ncorporate mod	ifications from specified reference methods to in	nprove performance.
, iee toot motiodo may i			

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.



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

COC #

Page	of	1
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Report To	Report Fo	rmat / Distribut	ion		Service	Request	ad (Rush	for routine	analysis subje	ct to availab	oility)	
Company: Knickt Pladela	Standard	Other	DD		🖲 Regula	(Standard Tu	maround Ti	mes - Busine	ss Days)			
Contact: LOUTENCE PLANO,	PDF	Excel	🗋 Digital	Fax	O Priority	(2-4 Business	Days) - 50°	% Surcharge	- Contact ALS to	Confirm TAT		
Address: NO - 750 W. Paralen	Email 1:	LDUONO	50 Knight	pilesold.con	C Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT							
Vancouver BC V6G1K7	Email 2:		~ ~ ~		🗘 Same D	ay or Weeker	nd Ermergenk	y - Contact A	LS to Confirm T	AT		
Phone: 604-685-0543 Fax: 604-685-0147	Email 3:			Analysis Request								
Invoice To Same as Report ? 🗹 Yes 🗌 No		oject Informatio			Please indicate below Filtered, Preserved or both (F, P, F/F							
Hardcopy of Invoice with Report?  Yes Vo	Job #:	VAIQ1-	458/9		RNAUKIS						_	
Company: Yellachead Muning	PO/AFE:											
Contact: Charlene Higgins	LSD:											
Address: CHigginseupliorsteamining.com					BE						lers	
Phone: Fax:	Quote #:				TAAT						fair	
(labuse only)	ALS Contact:	André	Sampler: $\mathbb{R}_{\mathcal{Y}}$	an Papp	4 634						Number of Containers	
Sample Sample Identification (This description will appear on the report)		Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	CARAMIS						Numbe	
DF-6-96		2007-13	09-10	Dustfall	V						2	
DE~ (A)		20009-12	09:32	DustFall	$\overline{}$						2	
		20 59.17	17:00	Dust Fall	1		+				$\frac{1}{2}$	
		20-0 pm	11.00	DHIST PAR		-	+					
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L1370048-COFC												
Special Instructions / Regulations with water or lan	d use (CCM	E-Freshwater A	quatic Life/BC (	CSR - Commerci	al/AB Ti	er 1 - Natu	ral, etc)	/ Hazardo	ous Details			
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SHIPMENT RELEASE (client use)           Released by:         Date (dd-mmm-yy) Time (hh-mm) Received		MENT RECEPTI	ON (lab use only Time:	Temperature:	Verified		Date		Time:	and the second se	vations:	
		Serot 27	1	12.0 °C		29.	Date			Yes /		

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NA-FM-03266 v07 Front/ 19 August 2013



KNIGHT PIESOLD LTD. ATTN: Lawrence Duong 1400 - 750 West Pender Street Vancouver BC V6C 2T8 Date Received:24-OCT-13Report Date:04-NOV-13 16:55 (MT)Version:FINAL

Client Phone: 604-685-0543

# **Certificate of Analysis**

### Lab Work Order #:

Project P.O. #: Job Reference: C of C Numbers: Legal Site Desc: L1382823 NOT SUBMITTED VA101-458/9

V

Andre Langlais Account Manager

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L1382823 CONTD.... PAGE 2 of 3 04-NOV-13 16:55 (MT) Version: FINAL

# ALS ENVIRONMENTAL ANALYTICAL REPORT

					Versio	n: FINA
	Sample ID Description Sampled Date Sampled Time Client ID	L1382823-1 Dustfall 20-OCT-13 11:38 DF-06 (SEP 20- OCT 20)	L1382823-2 Dustfall 20-OCT-13 11:12 DF-02 (SEP 20- OCT 20)	L1382823-3 Dustfall 20-OCT-13 10:28 DF-07 (SEP 20- OCT 20)		
Grouping	Analyte					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.40	0.40	0.40		
T articulates	Total Insoluble Dustfall (mg/dm2.day)	<0.10	0.16	<0.10		
	Total Soluble Dustfall (mg/dm2.day)	<0.10	<0.10	<0.10		
Metals	Aluminum (Al)-Total (mg/dm2.day)	<0.10	<0.10	<0.10		
wetars		0.000424	0.000847	0.000364		
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000012	<0.0000012	<0.000012		
	Arsenic (As)-Total (mg/dm2.day)	0.0000017	0.0000012	0.0000013		
	Barium (Ba)-Total (mg/dm2.day)	0.0000255	0.0000278	0.0000356		
	Beryllium (Be)-Total (mg/dm2.day)	<0.000058	<0.000058	<0.000058		
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000058	<0.000058	<0.000058		
	Boron (B)-Total (mg/dm2.day)	<0.00012	<0.00012	<0.00012		
	Cadmium (Cd)-Total (mg/dm2.day)	<0.0000058	<0.0000058	0.00000112		
	Calcium (Ca)-Total (mg/dm2.day)	0.00233	0.00235	0.00161		
	Chromium (Cr)-Total (mg/dm2.day)	<0.000058	0.0000105	<0.000058		
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000012	<0.000012	<0.000012		
	Copper (Cu)-Total (mg/dm2.day)	0.0000660	0.000108	0.000196		
	Iron (Fe)-Total (mg/dm2.day)	0.00170	0.00458	0.00158		
	Lead (Pb)-Total (mg/dm2.day)	0.00000173	0.00000182	0.00000427		
	Lithium (Li)-Total (mg/dm2.day)	<0.000058	<0.000058	<0.000058		
	Magnesium (Mg)-Total (mg/dm2.day)	<0.0012	<0.0012	<0.0012		
	Manganese (Mn)-Total (mg/dm2.day)	0.0000899	0.000130	0.0000641		
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000058	<0.0000058	<0.0000058		
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000095	0.00000157	<0.0000058		
	Nickel (Ni)-Total (mg/dm2.day)	<0.0000058	<0.000058	<0.000058		
	Phosphorus (P)-Total (mg/dm2.day)	<0.0035	<0.0035	<0.0035		
	Potassium (K)-Total (mg/dm2.day)	<0.023	<0.023	<0.023		
	Selenium (Se)-Total (mg/dm2.day)	<0.000012	<0.000012	<0.000012		
	Silicon (Si)-Total (mg/dm2.day)	0.00099	0.00234	0.00116		
	Silver (Ag)-Total (mg/dm2.day)	<0.00000012	<0.00000012	<0.0000012		
	Sodium (Na)-Total (mg/dm2.day)	<0.0000012	<0.023	<0.0000012		
	Strontium (Sr)-Total (mg/dm2.day)	0.0000100	0.0000112	0.0000112		
	Thallium (TI)-Total (mg/dm2.day)	<0.0000100	<0.0000112	< 0.0000112		
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012	<0.0000012	<0.0000012		
	Titanium (Ti)-Total (mg/dm2.day)					
	Uranium (U)-Total (mg/dm2.day)	<0.00012	<0.00012	<0.00012		
	Vanadium (V)-Total (mg/dm2.day)	< 0.0000012	<0.0000012	<0.0000012		
	Zinc (Zn)-Total (mg/dm2.day)	<0.000012	<0.000012	<0.000012		
		0.000040	0.000053	0.000044		

L1382823 CONTD.... PAGE 3 of 3 04-NOV-13 16:55 (MT) Version: FINAL

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DUSTFALLS-COM-DM2-	VA Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE
Particulates or Dustfall a and drying the filter at 10	re determined of 04 degrees cels	dures modified from British Columbia Environme gravimetrically. Total Insoluble Dustfall is determ sius. Total Soluble Dustfall is determined by evap istfall and the Soluble Dustfall.	ntal Manual "Particulate." ined by filtering a sample through a 0.45 um membrane filter borating the filtrate to dryness at 104 degrees celsius. The
HG-DUST(DM2-CVAFS-\	A Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7
American Public Health	Association, an otection Agenc	d with procedures adapted from "Test Methods f y (EPA). Instrumental analysis is by cold vapou	xamination of Water and Wastewater" published by the or Evaluating Solid Waste" SW-846 published by the United r atomic fluorescence spectrophotometry or atomic absorption
MET-DUST(DM2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B
American Public Health	Association, an	d with procedures adapted from "Test Methods f	xamination of Water and Wastewater" published by the or Evaluating Solid Waste" SW-846 published by the United coupled plasma - optical emission spectrophotometry (EPA
MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
American Public Health	Association, an	d with procedures adapted from "Test Methods f	xamination of Water and Wastewater" published by the or Evaluating Solid Waste" SW-846 published by the United coupled plasma - mass spectrometry (EPA Method 6020A).
* ALS test methods may ir	corporate mod	ifications from specified reference methods to im	prove performance.

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.

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

ALSE	nvironmental

Report To	Report Fo	rmat / Distributi	on		Servic	e Requ	ested (Ru	sh for rou	itine analy	/sis subjec	t to availabi	ility)
Company: Knight Piesold	X Standard	X Other	DD		🖲 Regul	ar (Standai	d Turnaroun	d Times - B	lusiness Day	/\$)		
Contact: Lawrence Duong		Excel	Digital	Fax	O Priorit	y (2-4 Bus	iness Days) -	50% Surch	varge - Conf	tact ALS to G	onfirm TAT	
Address: 1400 - 750 W. Pender St.	Email 1:	_DUONG@I	<u>knightpieso</u>	old.com	🔿 Emerç	ency (1-2	Bus. Days) -	100% Surc	thange - Cor	stact ALS to C	onfirm TAT	
Vancouver, BC V6G 1K7	Email 2:				Same Day or Weekend Emergency - Contact ALS to Confirm TAT							
Phone: 604-685-0543 Fax: 604-685-0147	Email 3:				Analysis Request							
Invoice To Same as Report ? 🕅 Yes 🗌 No	Client / Pr	oject Informatio			Please indicate below Filtered, Preserved or both (F, P, F/P)							<b>&gt;</b> )
Hardcopy of Invoice with Report? 🗋 Yes 🙀 No	Job #:	<u>VA101-458</u>	/9									
Company: Yellowhead Mining Inc.	PO / AFE:	. <u></u>			Analysi				1			
Contact: Charlene Higgins				Pua								
Address: CHiggins@yellowheadmining.com	ļ			<u> </u>	Fall							ers
Phone: Fax:	Quote #:			т Т							tain	
(lab Work Order # CISB282823	ALS Contact:	Andre	Sampler:Rya	in Papp	ard Dust							Number of Container
Sample Identification           Image: Construction of the second state of th		Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Standard							nmbei
DF-06		20-OCT-13	11:38	Dust fall				┽╼┼			-+	
					X		+-	+	<u> </u>	+ +	++-	2
DF-02		20-OCT-13	11:12	Dust fall	X	_	$ \vdash  \vdash $					2
DF-07		<u>20-OCT-13</u>	10:28	Dust fall	X							2
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Special Instructions / Regulations with water or land	l use (CCM	E-Freshwater Ac	uatic Life/BC	CSR - Commerci	al/AB T	ier 1 - N	atural, et	c) / Haz	ardous I	Details		
Please only analyze one container from ea	ach pair.											
Failure to complete all	portions of	f this form may d	lelay analysis.	Please fill in this	form l	EGIBL	Y.					
By the use of this form the user ackno Also provided on another Excel tab are the ALS location	wiedges a	nd agrees with t	he Terms and (	Conditions as pr	ovided	on a se	parate Ex			analues		
SHIPMENT RELEASE (client use)		MENT RECEPTION			vauon		HIPMENT					
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kranby 2300713 09:30 meg	n-	Oct. 24	10-00	11.2 °C							Yes / N If Yes a	lo? add SIF

NA-FM-0326d v07 Front / 19 August 2013



KNIGHT PIESOLD LTD. ATTN: Lawrence Duong 1400 - 750 West Pender Street Vancouver BC V6C 2T8 Date Received:04-DEC-13Report Date:13-DEC-13 17:47 (MT)Version:FINAL

Client Phone: 604-685-0543

# **Certificate of Analysis**

### Lab Work Order #: L1399554

Project P.O. #: Job Reference: C of C Numbers: Legal Site Desc: NOT SUBMITTED VA101-458/9 (OCT20-NOV20)

1

V

Andre Langlais Account Manager

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L1399554 CONTD.... PAGE 2 of 4 13-DEC-13 17:47 (MT) Version: FINAL

# ALS ENVIRONMENTAL ANALYTICAL REPORT

				Version: FINAL			
	Sample ID Description Sampled Date Sampled Time Client ID	L1399554-1 DUST FALL 20-NOV-13 12:30 DF-02	L1399554-2 DUST FALL 20-NOV-13 14:25 DF-06	L1399554-3 DUST FALL 20-NOV-13 15:10 DF-07	L1399554-4 DUST FALL 20-SEP-13 11:20 DF-03	L1399554-5 DUST FALL 20-SEP-13 13:30 DF-05	
Grouping	Analyte						
DUSTFALL							
Particulates	Total Dustfall (mg/dm2.day)	0.45	0.59	0.12	0.27	<0.11	
	Total Insoluble Dustfall (mg/dm2.day)	0.23	0.39	<0.10	0.16	<0.11	
	Total Soluble Dustfall (mg/dm2.day)	0.22	0.20	<0.10	<0.11	<0.11	
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00206	0.00123	0.00111	0.000849	0.00113	
	Antimony (Sb)-Total (mg/dm2.day)	0.0000048	<0.0000026	<0.0000027	<0.0000021	<0.0000031	
	Arsenic (As)-Total (mg/dm2.day)	0.0000029	<0.0000026	0.0000073	<0.0000021	<0.0000031	
	Barium (Ba)-Total (mg/dm2.day)	0.0000910	0.0000536	0.0000582	DLB <0.000019	0.0000211	
	Beryllium (Be)-Total (mg/dm2.day)	< 0.000014	<0.000013	<0.000013	<0.000010	< 0.000015	
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000014	<0.000013	<0.000013	<0.000010	< 0.000015	
	Boron (B)-Total (mg/dm2.day)	<0.00029	0.00032	<0.00027	<0.00021	<0.00031	
	Cadmium (Cd)-Total (mg/dm2.day)	0.0000101	0.0000258	0.0000154	<0.0000010	<0.0000015	
	Calcium (Ca)-Total (mg/dm2.day)	0.0063	0.0056	0.0048	0.0025	0.0022	
	Chromium (Cr)-Total (mg/dm2.day)	0.000020	0.000019	<0.000013	<0.000010	<0.000015	
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000029	<0.0000026	<0.0000027	<0.0000021	<0.0000031	
	Copper (Cu)-Total (mg/dm2.day)	0.000217	0.000123	0.000237	0.000147	0.000016	
	Iron (Fe)-Total (mg/dm2.day)	0.00624	0.00493	0.00242	0.00109	0.00107	
	Lead (Pb)-Total (mg/dm2.day)	0.0000056	0.0000047	0.0000049	0.0000067	0.0000021	
	Lithium (Li)-Total (mg/dm2.day)	<0.00014	<0.00013	<0.00013	<0.00010	<0.00015	
	Magnesium (Mg)-Total (mg/dm2.day)	<0.0029	0.0029	<0.0027	<0.0021	<0.0031	
	Manganese (Mn)-Total (mg/dm2.day)	0.000458	0.000290	0.000243	0.0000804	0.0000572	
	Mercury (Hg)-Total (mg/dm2.day)	<0.0000014	<0.0000013	<0.0000013	<0.0000010	<0.0000015	
	Molybdenum (Mo)-Total (mg/dm2.day)	0.0000019	0.0000031	<0.0000013	<0.0000010	<0.0000015	
	Nickel (Ni)-Total (mg/dm2.day)	< 0.000014	0.000016	<0.000013	<0.000010	<0.000015	
	Phosphorus (P)-Total (mg/dm2.day)	<0.0087	0.0180	<0.0081	<0.0062	<0.0093	
	Potassium (K)-Total (mg/dm2.day)	<0.058	<0.053	<0.054	<0.042	<0.062	
	Selenium (Se)-Total (mg/dm2.day)	<0.000029	<0.00026	<0.00027	<0.00021	<0.0002	
	Silicon (Si)-Total (mg/dm2.day)	0.0036	0.0023	0.0017	0.0021	0.0026	
	Silver (Ag)-Total (mg/dm2.day)	0.00000053	<0.0000026	0.0000030	<0.00000021	<0.0000003	
	Sodium (Na)-Total (mg/dm2.day)	<0.058	<0.053	< 0.054	<0.042	<0.062	
	Strontium (Sr)-Total (mg/dm2.day)	0.0000298	0.0000277	0.0000185	0.0000107	0.0000139	
	Thallium (TI)-Total (mg/dm2.day)	<0.0000298	<0.0000277	< 0.0000185	<0.0000021	< 0.0000031	
	Tin (Sn)-Total (mg/dm2.day)	<0.0000029	<0.0000026	<0.0000027	<0.0000021	<0.0000031	
	Titanium (Ti)-Total (mg/dm2.day)	<0.000029	<0.00020	<0.000027	<0.000021	<0.00031	
	Uranium (U)-Total (mg/dm2.day)	<0.00029	<0.00028	<0.000027	<0.00021	<0.000031	
	Vanadium (V)-Total (mg/dm2.day)	<0.0000029	<0.0000028	<0.0000027	<0.0000021	<0.000003	
	Zinc (Zn)-Total (mg/dm2.day)						
	· · · · · · · · · · · · · · · · · · ·	0.000194	0.000491	0.000256	0.000120	<0.000093	

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

L1399554 CONTD.... PAGE 3 of 4 13-DEC-13 17:47 (MT) Version: FINAL

					Voic	sion:	FINAL
	Sample ID Description Sampled Date Sampled Time Client ID	L1399554-6 DUST FALL 20-SEP-13 14:36 DF-04					
Grouping	Analyte						
DUSTFALL							
Particulates	Total Dustfall (mg/dm2.day)	0.33					
	Total Insoluble Dustfall (mg/dm2.day)	<0.11					
	Total Soluble Dustfall (mg/dm2.day)	0.23					
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00090					
	Antimony (Sb)-Total (mg/dm2.day)	< 0.0000037					
	Arsenic (As)-Total (mg/dm2.day)	<0.0000037					
	Barium (Ba)-Total (mg/dm2.day)	0.0000281					
	Beryllium (Be)-Total (mg/dm2.day)	<0.000019					
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000019					
	Boron (B)-Total (mg/dm2.day)	< 0.00037					
	Cadmium (Cd)-Total (mg/dm2.day)	<0.0000019					
	Calcium (Ca)-Total (mg/dm2.day)	0.0026					
	Chromium (Cr)-Total (mg/dm2.day)	<0.000019					
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000037					
	Copper (Cu)-Total (mg/dm2.day)	0.000295					
	Iron (Fe)-Total (mg/dm2.day)	<0.0011					
	Lead (Pb)-Total (mg/dm2.day)	0.0000021					
	Lithium (Li)-Total (mg/dm2.day)	<0.00019					
	Magnesium (Mg)-Total (mg/dm2.day)	<0.0037					
	Manganese (Mn)-Total (mg/dm2.day)	0.000132					
	Mercury (Hg)-Total (mg/dm2.day)	<0.0000019					
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.0000019					
	Nickel (Ni)-Total (mg/dm2.day)	<0.000019					
	Phosphorus (P)-Total (mg/dm2.day)	<0.011					
	Potassium (K)-Total (mg/dm2.day)	<0.074					
	Selenium (Se)-Total (mg/dm2.day)	<0.000037					
	Silicon (Si)-Total (mg/dm2.day)	0.0025					
	Silver (Ag)-Total (mg/dm2.day)	<0.0000037					
	Sodium (Na)-Total (mg/dm2.day)	<0.074					
	Strontium (Sr)-Total (mg/dm2.day)	0.0000124					
	Thallium (TI)-Total (mg/dm2.day)	<0.0000037					
	Tin (Sn)-Total (mg/dm2.day)	<0.000037					
	Titanium (Ti)-Total (mg/dm2.day)	<0.00037					
	Uranium (U)-Total (mg/dm2.day)	<0.0000037					
	Vanadium (V)-Total (mg/dm2.day)	<0.000037					
	Zinc (Zn)-Total (mg/dm2.day)	0.00013					
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* Please refer to the Reference Information section for an explanation of any qualifiers detected.

#### **Qualifiers for Individual Parameters Listed:**

Qualifier	Descriptio	n		
DLB	Detection	Limit was ra	ised due to detection of analyte at com	parable level in Method Blank.
est Method	References	:		
ALS Test Coc	le	Matrix	Test Description	Method Reference**
DUSTFALLS-	COM-DM2-VA	Dustfall	Combined Dustfalls-Total, soluble, in	sol BCMOE PARTICULATE
Particulates and drying the	or Dustfall are he filter at 104	determined degrees cel		nvironmental Manual "Particulate." is determined by filtering a sample through a 0.45 um membrane filter ed by evaporating the filtrate to dryness at 104 degrees celsius. The
HG-DUST(DM	2-CVAFS-VA	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7
American Pu States Enviro	blic Health As	sociation, an ection Agenc	d with procedures adapted from "Test I y (EPA). Instrumental analysis is by c	for the Examination of Water and Wastewater" published by the Methods for Evaluating Solid Waste" SW-846 published by the United old vapour atomic fluorescence spectrophotometry or atomic absorption
MET-DUST(D	M2)-ICP-VA	Dustfall	Total Metals in Dustfalls by ICPOES	EPA 6010B
American Pu	blic Health As	sociation, an	d with procedures adapted from "Test I	for the Examination of Water and Wastewater" published by the Methods for Evaluating Solid Waste" SW-846 published by the United ductively coupled plasma - optical emission spectrophotometry (EPA
MET-DUST(D	M2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
American Pu	blic Health As	sociation, an	d with procedures adapted from "Test I	for the Examination of Water and Wastewater" published by the Methods for Evaluating Solid Waste" SW-846 published by the United ductively coupled plasma - mass spectrometry (EPA Method 6020A).
	hods may inco	proorate mod	ifications from specified reference mether	oods to improve performance
* ALS test met	nous may mot	siperate mee	incatione norm opcomed reference met	

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

1

### 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.



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

COC #	
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1 of 1	
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