

## ***Appendix 8***

### ***The Ekati Mine Dustfall Sampling Work Instruction***

## EKA WI.2113.18 Dustfall Sampling

<b>Version:</b>	1.1
<b>Replaces:</b>	NA
<b>Creation Date:</b>	2014-01-04
<b>Scheduled Review Date:</b>	2015-04-01
<b>Review Date:</b>	N/A
<b>Document Team Members:</b>	Environment Advisor - Operations Environmental Specialists Team Leaders
<b>Document Owner:</b>	Environment Advisor - Operations
<b>Document Approver:</b>	Superintendent – Environment Operations
<b>Related Documents:</b>	EKA WI.2113.01 Sample Shipping
<b>Key Contacts:</b>	Operations Advisor
<b>Change Requests:</b>	Environment Advisor - Operations
<b>Brief Description:</b>	Procedure for dustfall sampling under Air Quality Monitoring Program.

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## Task Description

This work instruction describes the protocol for completing AQMP-Dust fall deployment and retrieval. Field work is completed by use of truck or by helicopter.

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## HSE Information / Safety Risks:

- Haul traffic, vehicle and equipment interaction
- Helicopter interaction (noise and moving parts)
- Slips, trips and falls
- Traversing over steep embankment's, uneven and boulder field
- Awkward lifting and pinch points
- Dustfall preservative
- Wildlife

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## Additional Resources Required:

- PPE Requirements: hearing protection (heli), reflective vests, kevlar gloves, nitrile gloves and glasses
- No hard hats required during helicopter work
- Dustfall repair kit (zip ties and bird spikes)
- Field gear and communications (as required) GPS, SPOT, SAT phone, wildlife deterrents
- Helicopter orientation
- Review related Work Instructions (ie: Field Crew Check-in (WI.2113.10), Sample Shipping (WI.2113.01), Working in Remote Locations (WI.2113.04).

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## Work Preparation:

1. Review Dust fall work instruction and other relevant work instructions.
2. Print off bottle labels and field sheet and map.
3. Obtain field gear and equipment (bird spikes, dustfall canisters, 1 ziplock bag, coolers and or lids).
4. Complete formal group JHA at the beginning of initial deployment.

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## Work Execution Steps:

1. Complete informal JHA.
2. Initial deployment in June and final retrieval is completed in September.  
June canisters contain alcohol preservative to prevent freezing and subsequent months use algaecide preservative.

## Label Canister



Two 4-Litre canisters are deployed per site. Each label indicates the location and analysis requested (ie: AQ-49-M; AQ-49-P).

1- Metal and,

2- Particulate.

I. Affix near the bottom of canister.

II. Use sharpie when marking label.

III. Deployment and retrieval dates are required for ALS analysis.

**Note:** labels will fade when exposed to sunlight when placed too high on the canister.

## Canister Deployment and/ or Retrieval

I. Ensure when deploying or retrieving the canister, the alcohol/ algaecide within the canister is not spilled. Helicopter

Sites: the helicopter must set down a minimum of 50-70m downwind of stations to prevent cross contamination from helicopter rotor wash.

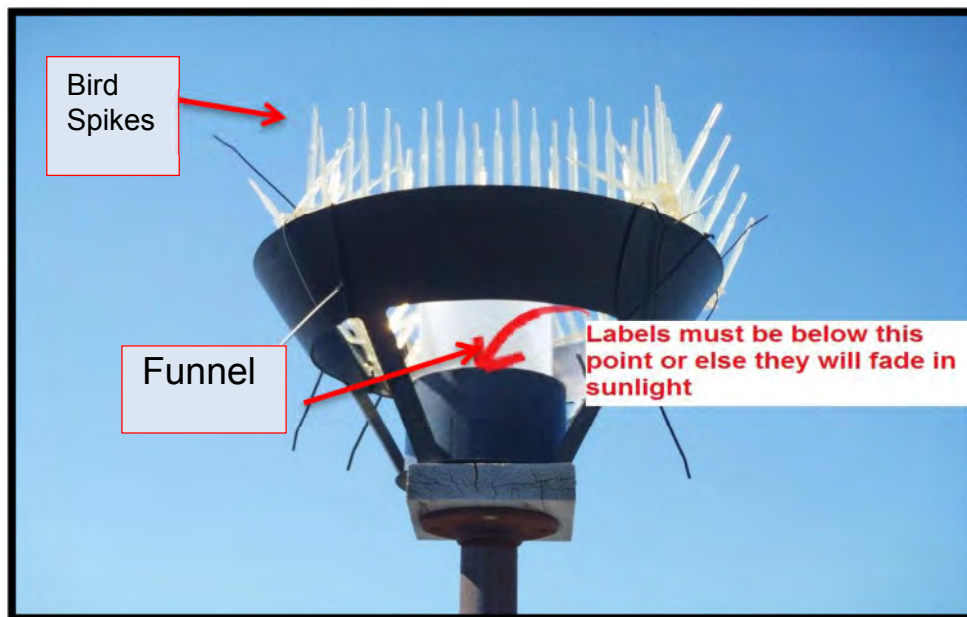
- II. Wear nitrile gloves when handling the canisters and leather or kevlar gloves when handling the metal pole. Do not stand directly under the funnel as water pools within the funnel area and spills.
- III. Record observations under comments ie: weather, canister empty, post fallen or if the canister was spilled.

## Deployment: June

- I. Slowly remove and lower the pole in order to insert a new canister into the funnel.
- II. Remove the lid from the new canister and place into ziplock bag.
- III. Note date/time of deployment of canister.
- IV. Replace pole into the wooden base and secure with rocks.

## Retrieving & Deployment: July, August and September

- I. Label all canisters required to be exchanged prior to the field.
- II. At each location, slowly lower the pole from wooden base.
- III. Retrieve the canister from the funnel and replace the lid. Confirm label is affixed to the canister.
- IV. Insert a new canister into the funnel and slowly replace pole into base and secure with rocks.
- V. Record retrieval date on the first canister and record on the field sheet.
- VI. Record the deployment time/date of the 2<sup>nd</sup> (replaced) canister.



## Database Input

- I. Enter the retrieval date into the database. Both deployment and retrieval is required for ALS analysis.
- I. Copy field sheet as a PDF into folder.
- II. See Work Instruction WI.2113.01 Sample Shipping for creating the COC, package and ship coolers.

## Dustfall Repair

Bird spikes may require repair each season. Wear gloves when attaching bird spikes with zip ties during repairs. Bird spikes are sharp.

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## General Remarks:

- June deployment often requires repair to dustfall bird spikes.
- Reported field observations may include: pole has fallen over, spillage of preservative, weather or retrieved an empty canister.
- Prevent cross contamination using nitrile gloves and ensuring helicopter/truck distance.
- Review COC and field dates prior to shipping.

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## Approval signatures record

REVIEWER ROLE	NAME	SIGNATURE	DATE
Advisor- Operations	Andrew Howton	<i>A Howton</i>	15Apr2014
Superintendent – Environment Operations	Claudine Lee	<i>Claudine Lee</i>	8Aug2014

## ***Appendix 9***

*Dustfall Sampling Lab Analysis Data, 2012 to 2014*

EKATI DIAMOND MINE

**2014 Air Quality Monitoring Program**





BHP BILLITON CANADA INC..  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 12-JUL-12  
Report Date: 23-JUL-12 18:39 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1177569  
**Project P.O. #:** BHP2503  
**Job Reference:** 68846  
**C of C Numbers:** 2, 68846  
**Legal Site Desc:** 6201066626

Can Dang  
Senior Account Manager

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ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1177569-1 DUST 04-JUN-12 15:10 AIR-P162-M	L1177569-2 DUST 04-JUN-12 15:11 AIR-P162-P	L1177569-3 DUST 04-JUN-12 13:27 FOX-D30-M	L1177569-4 DUST 04-JUN-12 13:29 FOX-D30-P	L1177569-5 DUST 04-JUN-12 14:37 FOX-U30-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.27		7.61	
	Total Insoluble Dustfall (mg/dm2.day)		0.24		7.43	
	Total Soluble Dustfall (mg/dm2.day)		<0.10		0.19	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.000119		<0.000048	
	Chloride (Cl) (mg/dm2.day)		<0.0027		<0.0048	
	Nitrate (as N) (mg/dm2.day)		0.000414		0.000989	
	Sulfate (SO4) (mg/dm2.day)		<0.0027		0.0160	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	8.20		130		230
	Antimony (Sb)-Total (mg/dm2.day)	0.00098		0.00106		<0.00084
	Arsenic (As)-Total (mg/dm2.day)	0.0872		0.0710		0.0707
	Barium (Ba)-Total (mg/dm2.day)	0.152		2.40		4.61
	Beryllium (Be)-Total (mg/dm2.day)	<0.0041		<0.0042		<0.0042
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0041		<0.0042		<0.0042
	Boron (B)-Total (mg/dm2.day)	<0.081		<0.084		<0.084
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00041		<0.00042		<0.00042
	Calcium (Ca)-Total (mg/dm2.day)	3.71		43.3		88.5
	Chromium (Cr)-Total (mg/dm2.day)	0.0327		0.456		0.817
	Cobalt (Co)-Total (mg/dm2.day)	0.00683		0.0926		0.168
	Copper (Cu)-Total (mg/dm2.day)	<0.053 <sup>DLB</sup>		<0.17 <sup>DLB</sup>		<0.27 <sup>DLB</sup>
	Lead (Pb)-Total (mg/dm2.day)	<0.0024 <sup>DLB</sup>		0.0158		0.0314
	Lithium (Li)-Total (mg/dm2.day)	<0.041		0.225		0.394
	Magnesium (Mg)-Total (mg/dm2.day)	9.93		138		255
	Manganese (Mn)-Total (mg/dm2.day)	0.135		1.87		3.36
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00100 <sup>DLB</sup>		0.00527		0.0107
	Nickel (Ni)-Total (mg/dm2.day)	<0.081		0.614		1.18
	Potassium (K)-Total (mg/dm2.day)	5.25		81.0		158
	Selenium (Se)-Total (mg/dm2.day)	<0.0081		<0.0084		<0.0084
	Silver (Ag)-Total (mg/dm2.day)	<0.000081		0.000241		0.000373
	Sodium (Na)-Total (mg/dm2.day)	1.59		21.2		44.3
	Strontium (Sr)-Total (mg/dm2.day)	0.0474		0.622		1.20
	Thallium (Tl)-Total (mg/dm2.day)	<0.00081		0.00241		0.00418
	Tin (Sn)-Total (mg/dm2.day)	<0.00081		0.00284		0.00476
	Uranium (U)-Total (mg/dm2.day)	0.000466		0.00495		0.00963
	Vanadium (V)-Total (mg/dm2.day)	0.0221		0.369		0.659
	Zinc (Zn)-Total (mg/dm2.day)	<0.057 <sup>DLB</sup>		0.445		0.774

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1177569-6 DUST 04-JUN-12 14:35 FOX-U30-P	L1177569-7 DUST 04-JUN-12 13:53 LLCF-PA-M	L1177569-8 DUST 02-JUN-12 16:49 MIS-D300-M	L1177569-9 DUST 02-JUN-12 16:31 MIS-D30-M	L1177569-10 DUST 02-JUN-12 16:32 MIS-D30-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	27.6				3.44
	Total Insoluble Dustfall (mg/dm2.day)	27.1				3.38
	Total Soluble Dustfall (mg/dm2.day)	0.52				<0.10
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	<0.000072				<0.000050
	Chloride (Cl) (mg/dm2.day)	0.0114				<0.0050
	Nitrate (as N) (mg/dm2.day)	0.00114				0.00116
	Sulfate (SO4) (mg/dm2.day)	0.0493				0.0060
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		12.4	16.8	108	
	Antimony (Sb)-Total (mg/dm2.day)		<0.00092	<0.0016	<0.00079	
	Arsenic (As)-Total (mg/dm2.day)		0.0879	0.113	0.0852	
	Barium (Ba)-Total (mg/dm2.day)		0.377	0.291	1.96	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0046	<0.0079	<0.0039	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0046	<0.0079	<0.0039	
	Boron (B)-Total (mg/dm2.day)		<0.092	<0.16	<0.079	
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00046	<0.00079	<0.00039	
	Calcium (Ca)-Total (mg/dm2.day)		10.6	4.96	27.7	
	Chromium (Cr)-Total (mg/dm2.day)		0.0815	0.0573	0.374	
	Cobalt (Co)-Total (mg/dm2.day)		0.0194	0.0116	0.0776	
	Copper (Cu)-Total (mg/dm2.day)		<0.18 <sup>DLB</sup>	<0.079 <sup>DLB</sup>	<0.16 <sup>DLB</sup>	
	Lead (Pb)-Total (mg/dm2.day)		<0.0041 <sup>DLB</sup>	<0.0039 <sup>DLB</sup>	0.0163	
	Lithium (Li)-Total (mg/dm2.day)		<0.046	<0.079	0.216	
	Magnesium (Mg)-Total (mg/dm2.day)		37.4	15.6	105	
	Manganese (Mn)-Total (mg/dm2.day)		0.273	0.262	1.71	
	Molybdenum (Mo)-Total (mg/dm2.day)		0.0106 <sup>DLB</sup>	<0.00079 <sup>DLB</sup>	0.00377 <sup>DLB</sup>	
	Nickel (Ni)-Total (mg/dm2.day)		<0.32 <sup>DLB</sup>	<0.094 <sup>DLB</sup>	<0.43 <sup>DLB</sup>	
	Potassium (K)-Total (mg/dm2.day)		8.47	11.0	72.7	
	Selenium (Se)-Total (mg/dm2.day)		<0.0092	<0.016	<0.0079	
	Silver (Ag)-Total (mg/dm2.day)		0.000098	<0.00016	0.000284	
	Sodium (Na)-Total (mg/dm2.day)		21.9	2.47	11.9	
	Strontium (Sr)-Total (mg/dm2.day)		0.207	0.0645	0.358	
	Thallium (Tl)-Total (mg/dm2.day)		<0.00092	<0.0016	0.00228	
	Tin (Sn)-Total (mg/dm2.day)		<0.00092	<0.0016	0.00273	
	Uranium (U)-Total (mg/dm2.day)		0.000755	0.00087	0.00573	
	Vanadium (V)-Total (mg/dm2.day)		0.0318 <sup>DLB</sup>	0.046 <sup>DLB</sup>	0.313	
	Zinc (Zn)-Total (mg/dm2.day)		<0.083 <sup>DLB</sup>	<0.11 <sup>DLB</sup>	0.360	

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1177569-11 DUST 02-JUN-12 16:41 MIS-D90-M	L1177569-12 DUST 02-JUN-12 16:40 MIS-D90-P	L1177569-13 DUST 02-JUN-12 17:07 MIS-U30-M	L1177569-14 DUST 02-JUN-12 13:06 MIS-U30-P	L1177569-15 DUST AQ-49-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		1.80		5.46	
	Total Insoluble Dustfall (mg/dm2.day)		1.76		5.39	
	Total Soluble Dustfall (mg/dm2.day)		<0.10		<0.10	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		<0.000052		0.000245	
	Chloride (Cl) (mg/dm2.day)		<0.0052		<0.0058	
	Nitrate (as N) (mg/dm2.day)		0.000972		0.00140	
	Sulfate (SO4) (mg/dm2.day)		<0.0052		0.0081	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	23.6		123		1.58
	Antimony (Sb)-Total (mg/dm2.day)	<0.0010		<0.0010		<0.0011
	Arsenic (As)-Total (mg/dm2.day)	0.0764		0.105		<0.0011
	Barium (Ba)-Total (mg/dm2.day)	0.439		2.23		0.0301
	Beryllium (Be)-Total (mg/dm2.day)	<0.0052		<0.0052		<0.0054
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0052		<0.0052		<0.0054
	Boron (B)-Total (mg/dm2.day)	<0.10		<0.10		<0.11
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00052		<0.00052		<0.00054
	Calcium (Ca)-Total (mg/dm2.day)	7.52		32.6		1.93
	Chromium (Cr)-Total (mg/dm2.day)	0.0848		0.423		0.0077
	Cobalt (Co)-Total (mg/dm2.day)	0.0177		0.0867		0.0013
	Copper (Cu)-Total (mg/dm2.day)	<0.14 <sup>DLB</sup>		<0.16 <sup>DLB</sup>		<0.065 <sup>DLB</sup>
	Lead (Pb)-Total (mg/dm2.day)	<0.0042 <sup>DLB</sup>		0.0185		0.00133
	Lithium (Li)-Total (mg/dm2.day)	0.053		0.248		<0.054
	Magnesium (Mg)-Total (mg/dm2.day)	22.6		116		1.96
	Manganese (Mn)-Total (mg/dm2.day)	0.422		1.92		0.0332
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00112		0.00375		<0.00054
	Nickel (Ni)-Total (mg/dm2.day)	<0.10 <sup>DLB</sup>		<0.47 <sup>DLB</sup>		<0.038 <sup>DLB</sup>
	Potassium (K)-Total (mg/dm2.day)	18.1		81.5		1.35
	Selenium (Se)-Total (mg/dm2.day)	<0.010		<0.010		<0.011
	Silver (Ag)-Total (mg/dm2.day)	<0.00010		0.00024		<0.00011
	Sodium (Na)-Total (mg/dm2.day)	2.53		13.5		0.76
	Strontium (Sr)-Total (mg/dm2.day)	0.0840		0.414		0.0139
	Thallium (Tl)-Total (mg/dm2.day)	<0.0010		0.0026		<0.0011
	Tin (Sn)-Total (mg/dm2.day)	<0.0010		0.0034		<0.0011
	Uranium (U)-Total (mg/dm2.day)	0.00096		0.00631		0.00023
	Vanadium (V)-Total (mg/dm2.day)	0.073		0.357		<0.011
	Zinc (Zn)-Total (mg/dm2.day)	<0.13 <sup>DLB</sup>		<0.42 <sup>DLB</sup>		<0.065 <sup>DLB</sup>

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1177569-16 DUST  AQ-49-P	L1177569-17 DUST  AQ-54-M	L1177569-18 DUST  AQ-54-P	L1177569-19 DUST  FOX-D1000-M	L1177569-20 DUST  FOX-D1000-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	<0.10		<0.10		0.75
	Total Insoluble Dustfall (mg/dm2.day)	<0.10		<0.10		0.69
	Total Soluble Dustfall (mg/dm2.day)	<0.10		<0.10		<0.10
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.000389		0.000209		<0.000046
	Chloride (Cl) (mg/dm2.day)	<0.0041		<0.0034		<0.0046
	Nitrate (as N) (mg/dm2.day)	0.000369		0.000279		0.000914
	Sulfate (SO4) (mg/dm2.day)	<0.0041		<0.0034		<0.0046
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.624		19.2	
	Antimony (Sb)-Total (mg/dm2.day)		<0.0014		<0.0011	
	Arsenic (As)-Total (mg/dm2.day)		0.0630		0.104	
	Barium (Ba)-Total (mg/dm2.day)		<0.014 <sup>DLB</sup>		0.337	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0068		<0.0054	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0068		<0.0054	
	Boron (B)-Total (mg/dm2.day)		<0.14		<0.11	
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00068		<0.00054	
	Calcium (Ca)-Total (mg/dm2.day)		0.99		6.70	
	Chromium (Cr)-Total (mg/dm2.day)		<0.0068		0.0678	
	Cobalt (Co)-Total (mg/dm2.day)		<0.0014		0.0139	
	Copper (Cu)-Total (mg/dm2.day)		<0.12 <sup>DLB</sup>		<0.098 <sup>DLB</sup>	
	Lead (Pb)-Total (mg/dm2.day)		<0.0027 <sup>DLB</sup>		<0.0038 <sup>DLB</sup>	
	Lithium (Li)-Total (mg/dm2.day)		<0.068		<0.054	
	Magnesium (Mg)-Total (mg/dm2.day)		0.979 <sup>DLB</sup>		19.5	
	Manganese (Mn)-Total (mg/dm2.day)		<0.016 <sup>DLB</sup>		0.275	
	Molybdenum (Mo)-Total (mg/dm2.day)		<0.00068 <sup>DLB</sup>		0.00081	
	Nickel (Ni)-Total (mg/dm2.day)		<0.028 <sup>DLB</sup>		0.103	
	Potassium (K)-Total (mg/dm2.day)		1.69		12.1	
	Selenium (Se)-Total (mg/dm2.day)		<0.014		<0.011	
	Silver (Ag)-Total (mg/dm2.day)		<0.00014		<0.00011	
	Sodium (Na)-Total (mg/dm2.day)		0.83		3.56	
	Strontium (Sr)-Total (mg/dm2.day)		0.0064		0.0889	
	Thallium (Tl)-Total (mg/dm2.day)		<0.0014		<0.0011	
	Tin (Sn)-Total (mg/dm2.day)		<0.0014		<0.0011	
	Uranium (U)-Total (mg/dm2.day)		<0.00014		0.00084	
	Vanadium (V)-Total (mg/dm2.day)		<0.014		0.052	
	Zinc (Zn)-Total (mg/dm2.day)		<0.041		<0.098 <sup>DLB</sup>	

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1177569-21 DUST  AIR-P125-M	L1177569-22 DUST  AIR-P125-P	L1177569-23 DUST  AIR-P280-M	L1177569-24 DUST  AIR-P280-P	L1177569-25 DUST  FOX-D300-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.53		1.95	
	Total Insoluble Dustfall (mg/dm2.day)		0.51		1.89	
	Total Soluble Dustfall (mg/dm2.day)		<0.10		<0.10	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.000134		0.000153	
	Chloride (Cl) (mg/dm2.day)		<0.0035		<0.0046	
	Nitrate (as N) (mg/dm2.day)		0.000303		0.000633	
	Sulfate (SO4) (mg/dm2.day)		<0.0035		0.0062	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	13.9		40.8		73.1
	Antimony (Sb)-Total (mg/dm2.day)	<0.0016		<0.0011		<0.0014
	Arsenic (As)-Total (mg/dm2.day)	0.101		0.112		0.0983
	Barium (Ba)-Total (mg/dm2.day)	0.242		0.769		1.38
	Beryllium (Be)-Total (mg/dm2.day)	<0.0081		<0.0054		<0.0070
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0081		<0.0054		<0.0070
	Boron (B)-Total (mg/dm2.day)	<0.16		<0.11		<0.14
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00081		<0.00054		<0.00070
	Calcium (Ca)-Total (mg/dm2.day)	4.01		12.4		25.8
	Chromium (Cr)-Total (mg/dm2.day)	0.0520		0.161		0.264
	Cobalt (Co)-Total (mg/dm2.day)	0.0102		0.0314		0.0538
	Copper (Cu)-Total (mg/dm2.day)	<0.073 <sup>DLB</sup>		<0.14 <sup>DLB</sup>		<0.11 <sup>DLB</sup>
	Lead (Pb)-Total (mg/dm2.day)	<0.0033 <sup>DLB</sup>		<0.0076 <sup>DLB</sup>		0.0107
	Lithium (Li)-Total (mg/dm2.day)	<0.081		0.081		0.132
	Magnesium (Mg)-Total (mg/dm2.day)	13.3		43.4		77.6
	Manganese (Mn)-Total (mg/dm2.day)	0.205		0.629		1.08
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00081		0.00157		0.00269
	Nickel (Ni)-Total (mg/dm2.day)	<0.081 <sup>DLB</sup>		<0.22 <sup>DLB</sup>		<0.42 <sup>DLB</sup>
	Potassium (K)-Total (mg/dm2.day)	9.29		28.4		45.8
	Selenium (Se)-Total (mg/dm2.day)	<0.016		<0.011		<0.014
	Silver (Ag)-Total (mg/dm2.day)	<0.00016		<0.00011		<0.00014
	Sodium (Na)-Total (mg/dm2.day)	1.95		5.19		11.0
	Strontium (Sr)-Total (mg/dm2.day)	0.0521		0.160		0.347
	Thallium (Tl)-Total (mg/dm2.day)	<0.0016		<0.0011		0.0014
	Tin (Sn)-Total (mg/dm2.day)	<0.0016		0.0012		0.0017
	Uranium (U)-Total (mg/dm2.day)	0.00073		0.00182		0.00269
	Vanadium (V)-Total (mg/dm2.day)	0.042		0.125		0.206
	Zinc (Zn)-Total (mg/dm2.day)	<0.081 <sup>DLB</sup>		<0.16 <sup>DLB</sup>		<0.28 <sup>DLB</sup>

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1177569-26 DUST  FOX-D300-P	L1177569-27 DUST  FOX-D90-M	L1177569-28 DUST  FOX-D90-P	L1177569-29 DUST  LLCF-PA-P	L1177569-30 DUST  LLCF-PB-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	2.73		6.94	0.36	
	Total Insoluble Dustfall (mg/dm2.day)	2.66		6.77	0.30	
	Total Soluble Dustfall (mg/dm2.day)	<0.10		0.17	<0.10	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	<0.000052		<0.000064	0.000039	
	Chloride (Cl) (mg/dm2.day)	<0.0052		<0.0064	<0.0029	
	Nitrate (as N) (mg/dm2.day)	0.000902		0.00100	0.000807	
	Sulfate (SO4) (mg/dm2.day)	0.0072		0.0144	0.0278	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		152			8.49
	Antimony (Sb)-Total (mg/dm2.day)		<0.0011			<0.0014
	Arsenic (As)-Total (mg/dm2.day)		0.0891			<0.0014
	Barium (Ba)-Total (mg/dm2.day)		2.74			0.181
	Beryllium (Be)-Total (mg/dm2.day)		<0.0054			<0.0068
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0054			<0.0068
	Boron (B)-Total (mg/dm2.day)		<0.11			<0.14
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00054			<0.00068
	Calcium (Ca)-Total (mg/dm2.day)		52.7			4.44
	Chromium (Cr)-Total (mg/dm2.day)		0.522			0.0374
	Cobalt (Co)-Total (mg/dm2.day)		0.107			0.0078
	Copper (Cu)-Total (mg/dm2.day)		<0.22 <sup>DLB</sup>			<0.054 <sup>DLB</sup>
	Lead (Pb)-Total (mg/dm2.day)		0.0202			<0.0027 <sup>DLB</sup>
	Lithium (Li)-Total (mg/dm2.day)		0.257			<0.068
	Magnesium (Mg)-Total (mg/dm2.day)		158			12.3
	Manganese (Mn)-Total (mg/dm2.day)		2.15			0.146
	Molybdenum (Mo)-Total (mg/dm2.day)		0.00536			0.00069 <sup>DLB</sup>
	Nickel (Ni)-Total (mg/dm2.day)		0.735			<0.081 <sup>DLB</sup>
	Potassium (K)-Total (mg/dm2.day)		91.7			5.69
	Selenium (Se)-Total (mg/dm2.day)		<0.011			<0.014
	Silver (Ag)-Total (mg/dm2.day)		0.00024			<0.00014
	Sodium (Na)-Total (mg/dm2.day)		23.2			2.22
	Strontium (Sr)-Total (mg/dm2.day)		0.722			0.0620
	Thallium (Tl)-Total (mg/dm2.day)		0.0027			<0.0014
	Tin (Sn)-Total (mg/dm2.day)		0.0032			<0.0014
	Uranium (U)-Total (mg/dm2.day)		0.00573			0.00038
	Vanadium (V)-Total (mg/dm2.day)		0.416			0.025 <sup>DLB</sup>
	Zinc (Zn)-Total (mg/dm2.day)		0.494			<0.081 <sup>DLB</sup>

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1177569-31 DUST  LLCF-PB-P	L1177569-32 DUST  MIS-D1000-P	L1177569-33 DUST  MIS-D300-P	L1177569-34 DUST  MIS-D1000-M	
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	0.18	0.14	0.41		
	Total Insoluble Dustfall (mg/dm2.day)	0.17	0.13	0.40		
	Total Soluble Dustfall (mg/dm2.day)	<0.10	<0.10	<0.10		
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	<0.000050	0.000096	0.000030		
	Chloride (Cl) (mg/dm2.day)	<0.0050	<0.0037	<0.0024		
	Nitrate (as N) (mg/dm2.day)	0.000451	0.000228	0.000359		
	Sulfate (SO4) (mg/dm2.day)	<0.0050	<0.0037	<0.0024		
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)				3.30	
	Antimony (Sb)-Total (mg/dm2.day)				<0.0011	
	Arsenic (As)-Total (mg/dm2.day)				0.0928	
	Barium (Ba)-Total (mg/dm2.day)				0.0585	
	Beryllium (Be)-Total (mg/dm2.day)				<0.0054	
	Bismuth (Bi)-Total (mg/dm2.day)				<0.0054	
	Boron (B)-Total (mg/dm2.day)				<0.11	
	Cadmium (Cd)-Total (mg/dm2.day)				<0.00054	
	Calcium (Ca)-Total (mg/dm2.day)				1.87	
	Chromium (Cr)-Total (mg/dm2.day)				0.0126	
	Cobalt (Co)-Total (mg/dm2.day)				0.0026	
	Copper (Cu)-Total (mg/dm2.day)				<0.043 <sup>DLB</sup>	
	Lead (Pb)-Total (mg/dm2.day)				<0.0016 <sup>DLB</sup>	
	Lithium (Li)-Total (mg/dm2.day)				<0.054	
	Magnesium (Mg)-Total (mg/dm2.day)				3.75	
	Manganese (Mn)-Total (mg/dm2.day)				0.0573	
	Molybdenum (Mo)-Total (mg/dm2.day)				<0.00054	
	Nickel (Ni)-Total (mg/dm2.day)				<0.033 <sup>DLB</sup>	
	Potassium (K)-Total (mg/dm2.day)				2.80	
	Selenium (Se)-Total (mg/dm2.day)				<0.011	
	Silver (Ag)-Total (mg/dm2.day)				<0.00011	
	Sodium (Na)-Total (mg/dm2.day)				1.15	
	Strontium (Sr)-Total (mg/dm2.day)				0.0158	
	Thallium (Tl)-Total (mg/dm2.day)				<0.0011	
	Tin (Sn)-Total (mg/dm2.day)				<0.0011	
	Uranium (U)-Total (mg/dm2.day)				0.00017	
	Vanadium (V)-Total (mg/dm2.day)				<0.011	
	Zinc (Zn)-Total (mg/dm2.day)				<0.043 <sup>DLB</sup>	

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



## Reference Information

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>CL-IC-VA</b>	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>DUSTFALLS-COM-DM2-VA</b>	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE
This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate." Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.			
<b>MET-DUST(DM2)-MS-VA</b>	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
<b>NH3-F-VA</b>	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifically carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
<b>NO3-IC-VA</b>	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>SO4-IC-VA</b>	Dustfall	Dustfall Sulphate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulphate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			

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

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

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

## Chain of Custody Numbers:

2	68846
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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 ww - 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.*

15 -

Chain of Custody	Station ID	Replication	Matrix	Sample ID	Total of Sub Code	Ammonia	Chloride	Dustfall Metals	soluble Particulate	Nitrate	soluble Particulate	Sulphate	Total Particulate
68846	AQ-49-M		Dust	47384	1			1					
68846	AQ-49-P		Dust	47385	7	1	1		1	1	1	1	1
68846	AQ-54-M		Dust	47386	1			1					
68846	AQ-54-P		Dust	47387	7	1	1		1	1	1	1	1
68846	FOX-D1000-M		Dust	47389	1			1					
68846	FOX-D1000-P		Dust	47390	7	1	1		1	1	1	1	1
68846	MIS-D1000-M		Dust	47391	1			1					
68846	Air-P125-M		Dust	47393	1			1					
68846	Air-P125-P		Dust	47394	7	1	1		1	1	1	1	1
68846	Air-P162-M		Dust	47395	1			1					
68846	Air-P162-P		Dust	47396	7	1	1		1	1	1	1	1
68846	Air-P280-M		Dust	47397	1			1					
68846	Air-P280-P		Dust	47398	7	1	1		1	1	1	1	1
68846	Fox-D300-M		Dust	47399	1			1					
68846	Fox-D300-P		Dust	47400	7	1	1		1	1	1	1	1
68846	Fox-D30-M		Dust	47401	1			1					
68846	Fox-D30-P		Dust	47402	7	1	1		1	1	1	1	1
68846	Fox-D90-M		Dust	47403	1			1					
68846	Fox-D90-P		Dust	47404	7	1	1		1	1	1	1	1
68846	Fox-U30-M		Dust	47405	1			1					
68846	Fox-U30-P		Dust	47406	7	1	1		1	1	1	1	1
68846	LLCF-PA-M		Dust	47407	1			1					
68846	LLCF-PA-P		Dust	47408	7	1	1		1	1	1	1	1
68846	LLCF-PB-M		Dust	47409	1			1					
68846	LLCF-PB-P		Dust	47410	7	1	1		1	1	1	1	1
68846	Mis-D300-M		Dust	47411	1			1					
68846	Mis-D30-M		Dust	47413	1			1					
68846	Mis-D30-P		Dust	47414	7	1	1		1	1	1	1	1
68846	Mis-D90-M		Dust	47415	1			1					
68846	Mis-D90-P		Dust	47416	7	1	1		1	1	1	1	1
68846	Mis-U30-M		Dust	47417	1			1					
68846	Mis-U30-P		Dust	47418	7	1	1		1	1	1	1	1
68846	MIS-D1000-P		Dust	47419	7	1	1		1	1	1	1	1
68846	MIS-D300-P		Dust	47420	7	1	1		1	1	1	1	1

MIS D1000M







8081 Louheed Highway • Suite 100 • Burnaby,

Tel: 6

ALS



700

So: 39672

Form 68846



bhpbilliton

BHP Billiton Diamonds Inc.

# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1

Tel: 867-880-2157 Fax: 867-880-4012

BHP Contacts: David Bruce/ Richard EhlerDavid

# CHAIN OF CUSTODY FORM

For Lab Use

L1177569

FOR LAB USE ONLY

Station ID	Matrix	Date	Time	Init	Ammonia	Chloride	Dustfall Metals	Insoluble Particulate	Nitrate	Soluble Particulate	Sulphate	Total Particulate								
Air-P162-M	Dust	04-Jun-2012	03:10 PM	KS			1						BHP2							
Air-P162-P	Dust	04-Jun-2012	03:11 PM	KS	1	1	1	1	1	1	1	1	BHP2							
Fox-D30-M	Dust	04-Jun-2012	01:27 PM	KS			1						BHP2							
Fox-D30-P	Dust	04-Jun-2012	01:29 PM	KS	1	1		1	1	1	1	1	BHP2							
Fox-U30-M	Dust	04-Jun-2012	02:37 PM	KS			1						BHP2							
Fox-U30-P	Dust	04-Jun-2012	02:35 PM	KS	1	1		1	1	1	1	1	BHP2							
LLCF-PA-M	Dust	04-Jun-2012	01:53 PM	KS			1						BHP2							
Mis-D300-M	Dust	02-Jun-2012	04:49 PM	RH			1						BHP2							
Mis-D30-M	Dust	02-Jun-2012	04:31 PM	RH			1						BHP2							
Mis-D30-P	Dust	02-Jun-2012	04:32 PM	RH	1	1		1	1	1	1	1	BHP2							
Mis-D90-M	Dust	02-Jun-2012	04:41 PM	RH			1						BHP2							
Mis-D90-P	Dust	02-Jun-2012	04:40 PM	RH	1	1		1	1	1	1	1	BHP2							
Mis-U30-M	Dust	02-Jun-2012	05:07 PM	RH			1						BHP2							
Mis-U30-P	Dust	02-Jun-2012	01:06 PM	RH	1	1		1	1	1	1	1	BHP2							

Turn around Required: Regular 2-week turnaround. Forward results by 23 July 2012

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2503

Relinquished by:

Date

Time

Received by:

Date

Time

Relinquished by:

Date

Time

Received by:

Date

Time

FOR LAB USE ONLY

Cooler seal intact upon receipt?

☒ Yes ☐ No ☐ N/A

Sample temperature upon receipt:

Frozen? ☐ Yes ☒ No

19.4 c.

Send Analytical Results to:

compliance.team@bhpbilliton.com;

①



BHP BILLITON CANADA INC..  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 20-AUG-12  
Report Date: 31-AUG-12 11:31 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1196982  
**Project P.O. #:** BHP2503  
**Job Reference:** 68904  
**C of C Numbers:** 1, 2  
**Legal Site Desc:** 6201066626

Can Dang  
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1196982-1 DUST 03-JUL-12 10:38 AQ-54-P	L1196982-2 DUST 03-JUL-12 13:33 FOX-D1000-M	L1196982-3 DUST 03-JUL-12 13:32 FOX-D1000-P	L1196982-4 DUST 03-JUL-12 12:53 MIS-D1000-M	L1196982-5 DUST 03-JUL-12 12:54 MIS-D1000-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	0.23		0.81		0.31
	Total Insoluble Dustfall (mg/dm2.day)	<0.10		0.42		<0.10
	Total Soluble Dustfall (mg/dm2.day)	0.21		0.39		0.25
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.00012		<0.000087		<0.000087
	Chloride (Cl) (mg/dm2.day)	0.0258		0.0327		0.0241
	Nitrate (as N) (mg/dm2.day)	0.00150		0.000968		0.000748
	Sulfate (SO4) (mg/dm2.day)	0.0051		0.0072		0.0032
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.00256		0.000841	
	Antimony (Sb)-Total (mg/dm2.day)		<0.00000080		<0.00000080	
	Arsenic (As)-Total (mg/dm2.day)		0.00000090		0.00000088	
	Barium (Ba)-Total (mg/dm2.day)		0.0000537		0.0000218	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000040		<0.0000040	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000040		<0.0000040	
	Boron (B)-Total (mg/dm2.day)		<0.000080		<0.000080	
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00000040		0.00000053	
	Calcium (Ca)-Total (mg/dm2.day)		0.00211		0.00096	
	Chromium (Cr)-Total (mg/dm2.day)		0.0000094		<0.0000040	
	Cobalt (Co)-Total (mg/dm2.day)		0.00000211		<0.00000080	
	Copper (Cu)-Total (mg/dm2.day)		<0.00016 <sup>DLB</sup>		<0.000056 <sup>DLB</sup>	
	Lead (Pb)-Total (mg/dm2.day)		<0.0000032 <sup>DLB</sup>		0.00000425	
	Lithium (Li)-Total (mg/dm2.day)		<0.000040		<0.000040	
	Magnesium (Mg)-Total (mg/dm2.day)		0.00291		0.00121	
	Manganese (Mn)-Total (mg/dm2.day)		0.0000577		0.0000325	
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000040		<0.00000040	
	Molybdenum (Mo)-Total (mg/dm2.day)		<0.00000040		<0.00000040	
	Nickel (Ni)-Total (mg/dm2.day)		0.0000167		0.0000068	
	Potassium (K)-Total (mg/dm2.day)		0.00240		0.00300	
	Selenium (Se)-Total (mg/dm2.day)		<0.0000080		<0.0000080	
	Silver (Ag)-Total (mg/dm2.day)		<0.00000080		<0.00000080	
	Sodium (Na)-Total (mg/dm2.day)		0.00061		0.00097	
	Strontium (Sr)-Total (mg/dm2.day)		0.0000194		0.00000725	
	Thallium (Tl)-Total (mg/dm2.day)		<0.00000080		<0.00000080	
	Tin (Sn)-Total (mg/dm2.day)		<0.00000080		<0.00000080	
	Uranium (U)-Total (mg/dm2.day)		0.000000129		<0.00000080	
	Vanadium (V)-Total (mg/dm2.day)		0.0000083		<0.0000080	
	Zinc (Zn)-Total (mg/dm2.day)		0.000052		0.000058	

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1196982-6 DUST 03-JUL-12 09:49 AIR-P125-M	L1196982-7 DUST 03-JUL-12 09:48 AIR-P125-P	L1196982-8 DUST 03-JUL-12 09:35 AIR-P162-M	L1196982-9 DUST 03-JUL-12 09:33 AIR-P162-P	L1196982-10 DUST 03-JUL-12 09:18 AIR-P280-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.56		0.85	
	Total Insoluble Dustfall (mg/dm2.day)		0.21		0.48	
	Total Soluble Dustfall (mg/dm2.day)		0.35		0.37	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		<0.000096		0.00157	
	Chloride (Cl) (mg/dm2.day)		0.0363		0.0435	
	Nitrate (as N) (mg/dm2.day)		0.00105		0.00104	
	Sulfate (SO4) (mg/dm2.day)		0.0041		0.0046	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.00185		0.00249		0.0137
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000080		<0.0000080		<0.0000080
	Arsenic (As)-Total (mg/dm2.day)	0.0000109		0.0000146		0.0000178
	Barium (Ba)-Total (mg/dm2.day)	0.0000603		0.0000597		0.000271
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000040		<0.0000040		<0.0000040
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000040		<0.0000040		<0.0000040
	Boron (B)-Total (mg/dm2.day)	<0.000080		<0.000080		<0.000080
	Cadmium (Cd)-Total (mg/dm2.day)	<0.0000040		<0.0000040		<0.0000040
	Calcium (Ca)-Total (mg/dm2.day)	0.00284		0.00338		0.00830
	Chromium (Cr)-Total (mg/dm2.day)	0.0000078		0.0000100		0.0000572
	Cobalt (Co)-Total (mg/dm2.day)	0.00000178		0.00000227		0.0000129
	Copper (Cu)-Total (mg/dm2.day)	<0.000064 <sup>DLB</sup>		<0.00012 <sup>DLB</sup>		<0.00012
	Lead (Pb)-Total (mg/dm2.day)	0.00000462		<0.000028 <sup>DLB</sup>		0.00000406
	Lithium (Li)-Total (mg/dm2.day)	<0.000040		<0.000040		<0.000040
	Magnesium (Mg)-Total (mg/dm2.day)	0.00270		0.00510		0.0216
	Manganese (Mn)-Total (mg/dm2.day)	0.0000802		0.000148		0.000293
	Mercury (Hg)-Total (mg/dm2.day)	<0.0000040		<0.0000040		<0.0000040
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.0000040		<0.0000040		0.00000056
	Nickel (Ni)-Total (mg/dm2.day)	0.0000226		0.0000216		0.000109
	Potassium (K)-Total (mg/dm2.day)	0.00431		0.0179		0.0269
	Selenium (Se)-Total (mg/dm2.day)	<0.0000080		<0.0000080		<0.0000080
	Silver (Ag)-Total (mg/dm2.day)	<0.00000080		<0.00000080		<0.00000080
	Sodium (Na)-Total (mg/dm2.day)	0.00071		0.00215		0.00352
	Strontium (Sr)-Total (mg/dm2.day)	0.0000218		0.0000241		0.000101
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000080		<0.0000080		<0.0000080
	Tin (Sn)-Total (mg/dm2.day)	<0.0000080		<0.0000080		<0.0000080
	Uranium (U)-Total (mg/dm2.day)	0.000000093		0.000000132		0.000000539
	Vanadium (V)-Total (mg/dm2.day)	<0.0000080		0.0000081		0.0000427
	Zinc (Zn)-Total (mg/dm2.day)	0.000109		0.000133		0.000144

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1196982-11 DUST 03-JUL-12 09:14 AIR-P280-P	L1196982-12 DUST 03-JUL-12 08:53 LLCF-PA-M	L1196982-13 DUST 03-JUL-12 08:50 LLCF-PA-P	L1196982-14 DUST 03-JUL-12 08:19 LLCF-PB-M	L1196982-15 DUST 03-JUL-12 08:23 LLCF-PB-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	1.32		0.65		3.48
	Total Insoluble Dustfall (mg/dm2.day)	1.03		0.23		1.46
	Total Soluble Dustfall (mg/dm2.day)	0.29		0.42		2.02
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	<0.00019		<0.0010		<0.0080
	Chloride (Cl) (mg/dm2.day)	0.0395		0.0317		0.0419
	Nitrate (as N) (mg/dm2.day)	0.00123		0.000640		0.000078
	Sulfate (SO4) (mg/dm2.day)	0.0051		0.0060		0.0057
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.00300		0.00376	
	Antimony (Sb)-Total (mg/dm2.day)		<0.00000080		<0.00000080	
	Arsenic (As)-Total (mg/dm2.day)		0.00000143		0.00000132	
	Barium (Ba)-Total (mg/dm2.day)		0.0000744		0.0000893	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000040		<0.0000040	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000040		<0.0000040	
	Boron (B)-Total (mg/dm2.day)		<0.000080		<0.000080	
	Cadmium (Cd)-Total (mg/dm2.day)		0.0000159		0.0000108	
	Calcium (Ca)-Total (mg/dm2.day)		0.00503		0.00429	
	Chromium (Cr)-Total (mg/dm2.day)		0.0000151		0.0000174	
	Cobalt (Co)-Total (mg/dm2.day)		0.00000415		0.00000454	
	Copper (Cu)-Total (mg/dm2.day)		0.000160		<0.00016 <sup>DLB</sup>	
	Lead (Pb)-Total (mg/dm2.day)		0.00000437		<0.0000032 <sup>DLB</sup>	
	Lithium (Li)-Total (mg/dm2.day)		<0.000040		<0.000040	
	Magnesium (Mg)-Total (mg/dm2.day)		0.00868		0.00841	
	Manganese (Mn)-Total (mg/dm2.day)		0.000101		0.000123	
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000040		<0.00000040	
	Molybdenum (Mo)-Total (mg/dm2.day)		0.00000256		0.00000121	
	Nickel (Ni)-Total (mg/dm2.day)		0.0000440		0.0000478	
	Potassium (K)-Total (mg/dm2.day)		0.0597		0.0443	
	Selenium (Se)-Total (mg/dm2.day)		<0.0000080		<0.0000080	
	Silver (Ag)-Total (mg/dm2.day)		0.000000115		0.000000085	
	Sodium (Na)-Total (mg/dm2.day)		0.0119		0.00817	
	Strontium (Sr)-Total (mg/dm2.day)		0.0000534		0.0000413	
	Thallium (Tl)-Total (mg/dm2.day)		<0.00000080		<0.00000080	
	Tin (Sn)-Total (mg/dm2.day)		<0.00000080		<0.00000080	
	Uranium (U)-Total (mg/dm2.day)		0.000000169		0.000000193	
	Vanadium (V)-Total (mg/dm2.day)		0.0000092		0.0000108	
	Zinc (Zn)-Total (mg/dm2.day)		0.000566		0.000297	

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



# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1196982-16 DUST 02-JUL-12 15:18 MIS-D300-M	L1196982-17 DUST 02-JUL-12 15:20 MIS-D300-P	L1196982-18 DUST 02-JUL-12 15:02 MIS-D30-M	L1196982-19 DUST 03-JUL-12 13:54 WASTE ROCK- 1000-M	L1196982-20 DUST 03-JUL-12 13:46 WASTE ROCK- 1000-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.42			0.46
	Total Insoluble Dustfall (mg/dm2.day)		0.22			<0.10
	Total Soluble Dustfall (mg/dm2.day)		0.21			0.38
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		<0.000089			<0.00010
	Chloride (Cl) (mg/dm2.day)		0.0271			0.0388
	Nitrate (as N) (mg/dm2.day)		0.000790			0.00132
	Sulfate (SO4) (mg/dm2.day)		0.0026			0.0049
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.00366		0.0880	0.00196	
	Antimony (Sb)-Total (mg/dm2.day)	<0.00000080		<0.00000079	<0.00000079	
	Arsenic (As)-Total (mg/dm2.day)	0.00000113		0.00000507	0.00000117	
	Barium (Ba)-Total (mg/dm2.day)	0.0000853		0.00160	0.0000467	
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000040		<0.0000039	<0.0000039	
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000040		<0.0000039	<0.0000039	
	Boron (B)-Total (mg/dm2.day)	<0.000080		<0.000079	<0.000079	
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000040		<0.00000039	<0.00000039	
	Calcium (Ca)-Total (mg/dm2.day)	0.00181		0.0205	0.00173	
	Chromium (Cr)-Total (mg/dm2.day)	0.0000133		0.000292	0.0000074	
	Cobalt (Co)-Total (mg/dm2.day)	0.00000282		0.0000627	0.00000170	
	Copper (Cu)-Total (mg/dm2.day)	<0.000072 <sup>DLB</sup>		<0.00016 <sup>DLB</sup>	<0.00012 <sup>DLB</sup>	
	Lead (Pb)-Total (mg/dm2.day)	<0.0000028 <sup>DLB</sup>		0.0000117	0.00000370	
	Lithium (Li)-Total (mg/dm2.day)	<0.000040		0.000157	<0.000039	
	Magnesium (Mg)-Total (mg/dm2.day)	0.00351		0.0743	0.00232	
	Manganese (Mn)-Total (mg/dm2.day)	0.0000878		0.00142	0.0000531	
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000040		<0.00000039	<0.00000039	
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000040		0.00000169	<0.00000039	
	Nickel (Ni)-Total (mg/dm2.day)	0.0000163		0.000293	0.0000144	
	Potassium (K)-Total (mg/dm2.day)	0.00386		0.0727	0.00208	
	Selenium (Se)-Total (mg/dm2.day)	<0.0000080		<0.0000079	<0.0000079	
	Silver (Ag)-Total (mg/dm2.day)	<0.000000080		0.000000152	<0.000000079	
	Sodium (Na)-Total (mg/dm2.day)	0.00061		0.00915	0.00061	
	Strontium (Sr)-Total (mg/dm2.day)	0.0000161		0.000253	0.0000157	
	Thallium (Tl)-Total (mg/dm2.day)	<0.00000080		0.00000124	<0.00000079	
	Tin (Sn)-Total (mg/dm2.day)	<0.00000080		0.00000203	<0.00000079	
	Uranium (U)-Total (mg/dm2.day)	0.000000163		0.00000347	0.000000107	
	Vanadium (V)-Total (mg/dm2.day)	0.0000122		0.000267	<0.0000079	
	Zinc (Zn)-Total (mg/dm2.day)	0.000062		0.000392	0.000072	

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



# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1196982-21 DUST 03-JUL-12 15:03 WASTE ROCK- 100-M	L1196982-22 DUST 03-JUL-12 15:02 WASTE ROCK- 100-P	L1196982-23 DUST 03-JUL-12 14:19 WASTE ROCK- 300-M	L1196982-24 DUST 03-JUL-12 14:17 WASTE ROCK- 300-P	L1196982-25 DUST 03-JUL-12 12:07 AQ-49-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.27		0.44	
	Total Insoluble Dustfall (mg/dm2.day)		0.13		0.15	
	Total Soluble Dustfall (mg/dm2.day)		0.13		0.29	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		<0.00019		<0.00012	
	Chloride (Cl) (mg/dm2.day)		0.0194		0.0333	
	Nitrate (as N) (mg/dm2.day)		0.000649		0.00121	
	Sulfate (SO4) (mg/dm2.day)		<0.0038		0.0051	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.00401		0.00240		0.000287
	Antimony (Sb)-Total (mg/dm2.day)	<0.00000079		<0.00000079		<0.00000080
	Arsenic (As)-Total (mg/dm2.day)	0.00000201		0.00000141		0.00000146
	Barium (Ba)-Total (mg/dm2.day)	0.0000805		0.0000679		0.0000109
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000039		<0.0000039		<0.0000040
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000039		<0.0000039		<0.0000040
	Boron (B)-Total (mg/dm2.day)	<0.000079		<0.000079		<0.000080
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000039		<0.00000039		<0.00000040
	Calcium (Ca)-Total (mg/dm2.day)	0.00374		0.00231		0.00079
	Chromium (Cr)-Total (mg/dm2.day)	0.0000139		0.0000088		<0.0000040
	Cobalt (Co)-Total (mg/dm2.day)	0.00000397		0.00000206		<0.00000080
	Copper (Cu)-Total (mg/dm2.day)	<0.00015 <sup>DLB</sup>		<0.000071 <sup>DLB</sup>		<0.000036 <sup>DLB</sup>
	Lead (Pb)-Total (mg/dm2.day)	<0.0000031 <sup>DLB</sup>		<0.0000028 <sup>DLB</sup>		<0.0000020 <sup>DLB</sup>
	Lithium (Li)-Total (mg/dm2.day)	<0.000039		<0.000039		<0.000040
	Magnesium (Mg)-Total (mg/dm2.day)	0.00480		0.00298		0.000450
	Manganese (Mn)-Total (mg/dm2.day)	0.000146		0.0000718		0.0000310
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000039		<0.00000039		<0.00000040
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000039		<0.00000039		<0.00000040
	Nickel (Ni)-Total (mg/dm2.day)	0.0000294		0.0000201		<0.0000040
	Potassium (K)-Total (mg/dm2.day)	0.00470		0.00283		0.00094
	Selenium (Se)-Total (mg/dm2.day)	<0.0000079		<0.0000079		<0.0000080
	Silver (Ag)-Total (mg/dm2.day)	<0.000000079		<0.000000079		<0.000000080
	Sodium (Na)-Total (mg/dm2.day)	0.00145		0.00086		<0.00040
	Strontium (Sr)-Total (mg/dm2.day)	0.0000382		0.0000232		0.00000434
	Thallium (Tl)-Total (mg/dm2.day)	<0.00000079		<0.00000079		<0.00000080
	Tin (Sn)-Total (mg/dm2.day)	<0.00000079		<0.00000079		<0.00000080
	Uranium (U)-Total (mg/dm2.day)	0.000000187		0.000000128		<0.000000080
	Vanadium (V)-Total (mg/dm2.day)	0.0000121		<0.0000079		<0.0000080
	Zinc (Zn)-Total (mg/dm2.day)	0.000078		0.000052		0.000025

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1196982-26 DUST 03-JUL-12 12:05 AQ-49-P	L1196982-27 DUST 03-JUL-12 10:41 AQ-54-M	L1196982-28 DUST 02-JUL-12 16:47 FOX-D300-M	L1196982-29 DUST 02-JUL-12 16:43 FOX-D300-P	L1196982-30 DUST 02-JUL-12 17:04 FOX-D30-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	0.47			1.55	
	Total Insoluble Dustfall (mg/dm2.day)	<0.10			1.32	
	Total Soluble Dustfall (mg/dm2.day)	0.42			0.23	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.00022			0.00014	
	Chloride (Cl) (mg/dm2.day)	0.0408			0.0298	
	Nitrate (as N) (mg/dm2.day)	0.00139			0.000826	
	Sulfate (SO4) (mg/dm2.day)	0.0051			0.0074	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.000170	0.0230		0.224
	Antimony (Sb)-Total (mg/dm2.day)		<0.00000080	<0.00000079		<0.00000079
	Arsenic (As)-Total (mg/dm2.day)		0.00000160	0.00000236		0.0000153
	Barium (Ba)-Total (mg/dm2.day)		0.00000876	0.000408		0.00454
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000040	<0.0000039		<0.0000039
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000040	<0.0000039		<0.0000039
	Boron (B)-Total (mg/dm2.day)		<0.000080	<0.000079		0.000093
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00000040	<0.00000039		0.00000110
	Calcium (Ca)-Total (mg/dm2.day)		0.00100	0.00930		0.0869
	Chromium (Cr)-Total (mg/dm2.day)		<0.0000040	0.0000805		0.000857
	Cobalt (Co)-Total (mg/dm2.day)		<0.00000080	0.0000175		0.000182
	Copper (Cu)-Total (mg/dm2.day)		<0.0000028 <sup>DLB</sup>	<0.000031 <sup>DLB</sup>		0.000281
	Lead (Pb)-Total (mg/dm2.day)		<0.0000024 <sup>DLB</sup>	0.00000424		0.0000328
	Lithium (Li)-Total (mg/dm2.day)		<0.000040	<0.000039		0.000392
	Magnesium (Mg)-Total (mg/dm2.day)		0.000415	0.0247		0.248
	Manganese (Mn)-Total (mg/dm2.day)		0.0000341	0.000358		0.00364
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000040	<0.00000039		<0.00000039
	Molybdenum (Mo)-Total (mg/dm2.day)		<0.00000040	0.00000112		0.0000134
	Nickel (Ni)-Total (mg/dm2.day)		<0.0000040	0.000118		0.00124
	Potassium (K)-Total (mg/dm2.day)		0.00282	0.0199		0.173
	Selenium (Se)-Total (mg/dm2.day)		<0.0000080	<0.0000079		<0.0000079
	Silver (Ag)-Total (mg/dm2.day)		<0.00000080	<0.00000079		0.000000395
	Sodium (Na)-Total (mg/dm2.day)		0.00043	0.00466		0.0394
	Strontium (Sr)-Total (mg/dm2.day)		0.00000395	0.000124		0.00113
	Thallium (Tl)-Total (mg/dm2.day)		<0.00000080	<0.00000079		0.00000358
	Tin (Sn)-Total (mg/dm2.day)		<0.00000080	<0.00000079		0.00000452
	Uranium (U)-Total (mg/dm2.day)		<0.00000080	0.000000822		0.00000990
	Vanadium (V)-Total (mg/dm2.day)		<0.0000080	0.0000638		0.000693
	Zinc (Zn)-Total (mg/dm2.day)		0.000048	0.000140		0.00108

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1196982-31 DUST 02-JUL-12 17:02 FOX-D30-P	L1196982-32 DUST 02-JUL-12 17:15 FOX-U30-M	L1196982-33 DUST 02-JUL-12 17:18 FOX-U30-P	L1196982-34 DUST 02-JUL-12 16:54 FOX-D90-M	L1196982-35 DUST 02-JUL-12 16:57 FOX-D90-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	21.9		23.8		4.40
	Total Insoluble Dustfall (mg/dm2.day)	21.3		23.4		4.13
	Total Soluble Dustfall (mg/dm2.day)	0.56		0.39		0.26
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	<0.00026		<0.00029		<0.00013
	Chloride (Cl) (mg/dm2.day)	0.0503		0.0474		0.0386
	Nitrate (as N) (mg/dm2.day)	0.000538		0.00126		0.00120
	Sulfate (SO4) (mg/dm2.day)	0.0532		0.0465		0.0171
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.174		0.0505	
	Antimony (Sb)-Total (mg/dm2.day)		<0.0000016 <sup>DLA</sup>		<0.0000079	
	Arsenic (As)-Total (mg/dm2.day)		0.0000113		0.00000347	
	Barium (Ba)-Total (mg/dm2.day)		0.00331		0.00103	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000079 <sup>DLA</sup>		<0.0000039	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000079 <sup>DLA</sup>		<0.0000039	
	Boron (B)-Total (mg/dm2.day)		<0.00016 <sup>DLA</sup>		<0.000079	
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00000079		<0.00000039	
	Calcium (Ca)-Total (mg/dm2.day)		0.0653		0.0233	
	Chromium (Cr)-Total (mg/dm2.day)		0.000613		0.000173	
	Cobalt (Co)-Total (mg/dm2.day)		0.000138		0.0000367	
	Copper (Cu)-Total (mg/dm2.day)		0.000215		0.000292	
	Lead (Pb)-Total (mg/dm2.day)		0.0000279		0.00000885	
	Lithium (Li)-Total (mg/dm2.day)		0.000235		0.000064	
	Magnesium (Mg)-Total (mg/dm2.day)		0.188		0.0500	
	Manganese (Mn)-Total (mg/dm2.day)		0.00274		0.000773	
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000039		<0.00000039	
	Molybdenum (Mo)-Total (mg/dm2.day)		0.0000100		0.00000298	
	Nickel (Ni)-Total (mg/dm2.day)		0.000924		0.000252	
	Potassium (K)-Total (mg/dm2.day)		0.115		0.0411	
	Selenium (Se)-Total (mg/dm2.day)		<0.000016 <sup>DLA</sup>		<0.0000079	
	Silver (Ag)-Total (mg/dm2.day)		0.00000031		0.000000122	
	Sodium (Na)-Total (mg/dm2.day)		0.0310		0.0112	
	Strontium (Sr)-Total (mg/dm2.day)		0.000835		0.000328	
	Thallium (Tl)-Total (mg/dm2.day)		0.0000027		<0.00000079	
	Tin (Sn)-Total (mg/dm2.day)		0.0000029		0.00000128	
	Uranium (U)-Total (mg/dm2.day)		0.00000789		0.00000189	
	Vanadium (V)-Total (mg/dm2.day)		0.000500		0.000138	
	Zinc (Zn)-Total (mg/dm2.day)		0.000754		0.000251	

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1196982-36 DUST 02-JUL-12 15:00 MIS-D30-P	L1196982-37 DUST 02-JUL-12 15:06 MIS-D90-M	L1196982-38 DUST 02-JUL-12 15:09 MIS-D90-P	L1196982-39 DUST 02-JUL-12 14:51 MIS-U30-M	L1196982-40 DUST 02-JUL-12 14:39 MIS-U30-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	6.86		1.51		7.82
	Total Insoluble Dustfall (mg/dm2.day)	6.66		1.28		7.58
	Total Soluble Dustfall (mg/dm2.day)	0.21		0.23		0.24
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	<0.00017		<0.00015		<0.00024
	Chloride (Cl) (mg/dm2.day)	0.0336		0.0326		0.0318
	Nitrate (as N) (mg/dm2.day)	0.000999		0.000849		0.00115
	Sulfate (SO4) (mg/dm2.day)	0.0139		0.0046		0.0159
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.0159		0.102	
	Antimony (Sb)-Total (mg/dm2.day)		<0.00000079		<0.00000079	
	Arsenic (As)-Total (mg/dm2.day)		0.00000175		0.00000662	
	Barium (Ba)-Total (mg/dm2.day)		0.000315		0.00184	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000039		<0.0000039	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000039		<0.0000039	
	Boron (B)-Total (mg/dm2.day)		<0.000079		<0.000079	
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00000039		<0.00000039	
	Calcium (Ca)-Total (mg/dm2.day)		0.00488		0.0299	
	Chromium (Cr)-Total (mg/dm2.day)		0.0000524		0.000333	
	Cobalt (Co)-Total (mg/dm2.day)		0.0000116		0.0000725	
	Copper (Cu)-Total (mg/dm2.day)		0.000267		0.000198	
	Lead (Pb)-Total (mg/dm2.day)		0.00000379		0.0000161	
	Lithium (Li)-Total (mg/dm2.day)		<0.000039		0.000157	
	Magnesium (Mg)-Total (mg/dm2.day)		0.0141		0.0869	
	Manganese (Mn)-Total (mg/dm2.day)		0.000285		0.00165	
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000039		<0.00000039	
	Molybdenum (Mo)-Total (mg/dm2.day)		<0.00000039		0.00000311	
	Nickel (Ni)-Total (mg/dm2.day)		0.0000577		0.000346	
	Potassium (K)-Total (mg/dm2.day)		0.0143		0.0762	
	Selenium (Se)-Total (mg/dm2.day)		<0.0000079		<0.0000079	
	Silver (Ag)-Total (mg/dm2.day)		0.000000105		0.000000243	
	Sodium (Na)-Total (mg/dm2.day)		0.00217		0.0110	
	Strontium (Sr)-Total (mg/dm2.day)		0.0000558		0.000351	
	Thallium (Tl)-Total (mg/dm2.day)		<0.00000079		0.00000187	
	Tin (Sn)-Total (mg/dm2.day)		<0.00000079		0.00000218	
	Uranium (U)-Total (mg/dm2.day)		0.000000587		0.00000482	
	Vanadium (V)-Total (mg/dm2.day)		0.0000484		0.000306	
	Zinc (Zn)-Total (mg/dm2.day)		0.000107		0.000366	

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

## Reference Information

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit Adjusted For required dilution
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>CL-IC-VA</b>	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>DUSTFALLS-COM-DM2-VA</b>	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE
This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate." Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.			
<b>HG-DUST(DM2-CVAFS-VA</b>	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
<b>MET-DUST(DM2)-MS-VA</b>	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
<b>NH3-F-VA</b>	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifically carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
<b>NO3-IC-VA</b>	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>SO4-IC-VA</b>	Dustfall	Dustfall Sulphate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulphate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			

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

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

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

## Chain of Custody Numbers:

1

2

## Reference Information

### GLOSSARY OF REPORT TERMS

*Surrogate* - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

*mg/kg* - milligrams per kilogram based on dry weight of sample.

*mg/kg ww* - milligrams per kilogram based on wet weight of sample.

*mg/kg lw* - 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.*









8081 Lougheed Highway • Suite 100 • Burnaby

Tel: 604-253-

ALS Contact



S.O. 39986

Form 68904

BHP Billiton Diamonds Inc.

bhpbilliton

# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1

Tel: 867-880-2157 Fax: 867-880-4012

BHP Contacts: David Bruce/ Richard EhlerDavid

# CHAIN OF CUSTODY FORM

For Lab Use

FOR LAB USE ONLY

Station ID	Matrix	Date	Time	Init	Ammonia	Chloride	Dustfall Metals	Insoluble Particulate	Nitrate	Soluble Particulate	Sulphate	Total Particulate								
Q-49-M	Dust	03-Jul-2012	12:07 PM	GL		1	1	1	1	1	1	1	BHP2							
Q-49-P	Dust	03-Jul-2012	12:05 PM	GL	1	1	1	1	1	1	1	1	BHP2							
Q-54-M	Dust	03-Jul-2012	10:41 AM	GL		1	1	1	1	1	1	1	BHP2							
Fox-D300-M	Dust	02-Jul-2012	04:47 PM	GL		1	1	1	1	1	1	1	BHP2							
Fox-D300-P	Dust	02-Jul-2012	04:43 PM	GL	1	1	1	1	1	1	1	1	BHP2							
Fox-D30-M	Dust	02-Jul-2012	05:04 PM	GL		1	1	1	1	1	1	1	BHP2							
Fox-D30-P	Dust	02-Jul-2012	05:02 PM	GL	1	1	1	1	1	1	1	1	BHP2							
Fox-U30-M	Dust	02-Jul-2012	05:15 PM	GL		1	1	1	1	1	1	1	BHP2							
Fox-U30-P	Dust	02-Jul-2012	05:18 PM	GL	1	1	1	1	1	1	1	1	BHP2							
Fox-D90-M	Dust	02-Jul-2012	04:54 PM	GL		1	1	1	1	1	1	1	BHP2							
Fox-D90-P	Dust	02-Jul-2012	04:57 PM	GL	1	1	1	1	1	1	1	1	BHP2							
Mis-D30-P	Dust	02-Jul-2012	03:00 PM	GL	1	1	1	1	1	1	1	1	BHP2							
Mis-D90-M	Dust	02-Jul-2012	03:06 PM	GL		1	1	1	1	1	1	1	BHP2							
Mis-D90-P	Dust	02-Jul-2012	03:09 PM	GL	1	1	1	1	1	1	1	1	BHP2							
Mis-U30-M	Dust	02-Jul-2012	02:51 PM	GL		1	1	1	1	1	1	1	BHP2							
Mis-U30-P	Dust	02-Jul-2012	02:39 PM	GL	1	1	1	1	1	1	1	1	BHP2							

**Short Holding Time**

*Rush Processing*

Turn around Required: Regular turnaround time

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2503

Relinquished by:	Date	Received by:	Date
	Time		Time
Relinquished by:	Date	Received by:	Date
	Time		Time

FOR LAB USE ONLY

Cooler seal intact upon receipt?

☐ Yes ☐ No ☐ N/A

Sample temperature upon receipt:

Frozen? ☐ Yes ☐ No

Send Analytical Results to:

compliance.team@bhpbilliton.com;





BHP BILLITON CANADA INC..  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 19-SEP-12  
Report Date: 01-OCT-12 15:46 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1211427  
**Project P.O. #:** BHP2503  
**Job Reference:** 68934  
**C of C Numbers:** 68934  
**Legal Site Desc:** 6201066626

**Comments:** ALS received 6 extra samples not listed on the COC, but they were analyzed like other samples in this work order.

Can Dang  
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1211427-1 Dust 14-SEP-12 08:46 AQ-49-M	L1211427-2 Dust 14-SEP-12 08:45 AQ-49-P	L1211427-3 Dust 14-SEP-12 12:01 AIR-P125-P	L1211427-4 Dust 14-SEP-12 14:00 AIR-P162-M	L1211427-5 Dust 14-SEP-12 13:59 AIR-P162-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.23	0.19		0.25
	Total Insoluble Dustfall (mg/dm2.day)		<0.10	0.19		0.25
	Total Soluble Dustfall (mg/dm2.day)		0.20	<0.10		<0.10
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.000899	0.00232		0.00087
	Chloride (Cl) (mg/dm2.day)		0.0567	0.037		0.037
	Nitrate (as N) (mg/dm2.day)		0.00175	0.00150		0.00146
	Sulfate (SO4) (mg/dm2.day)		<0.0081	<0.012		<0.012
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.000159			0.00591	
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000011			<0.0000020	
	Arsenic (As)-Total (mg/dm2.day)	<0.0000011			<0.0000020	
	Barium (Ba)-Total (mg/dm2.day)	0.0000126			0.000143	
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000057			<0.0000099	
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000057			<0.0000099	
	Boron (B)-Total (mg/dm2.day)	<0.00011			<0.00020	
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000057			<0.00000099	
	Calcium (Ca)-Total (mg/dm2.day)	<0.0010 <sup>DLB</sup>			0.00372	
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000057			0.0000244	
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000011			0.0000051	
	Copper (Cu)-Total (mg/dm2.day)	<0.00018 <sup>DLB</sup>			<0.00013 <sup>DLB</sup>	
	Lead (Pb)-Total (mg/dm2.day)	<0.0000091 <sup>DLB</sup>			<0.0000070 <sup>DLB</sup>	
	Lithium (Li)-Total (mg/dm2.day)	<0.000057			<0.000099	
	Magnesium (Mg)-Total (mg/dm2.day)	<0.00034 <sup>DLB</sup>			0.00785	
	Manganese (Mn)-Total (mg/dm2.day)	0.0000226			0.000123	
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000057			<0.00000099	
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000057			<0.00000099	
	Nickel (Ni)-Total (mg/dm2.day)	0.0000105			0.0000532	
	Potassium (K)-Total (mg/dm2.day)	0.00068			0.00445	
	Selenium (Se)-Total (mg/dm2.day)	<0.000011			<0.000020	
	Silver (Ag)-Total (mg/dm2.day)	<0.00000011			<0.00000020	
	Sodium (Na)-Total (mg/dm2.day)	0.00058 <sup>DLB</sup>			0.00147	
	Strontium (Sr)-Total (mg/dm2.day)	<0.0000046			0.0000388	
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011			<0.0000020	
	Tin (Sn)-Total (mg/dm2.day)	<0.0000011			<0.0000020	
	Uranium (U)-Total (mg/dm2.day)	<0.00000011			0.00000032	
	Vanadium (V)-Total (mg/dm2.day)	<0.000011			<0.000020 <sup>DLB</sup>	
	Zinc (Zn)-Total (mg/dm2.day)	<0.000068 <sup>DLB</sup>			<0.00012 <sup>DLB</sup>	

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1211427-6 Dust 14-SEP-12 14:10 AIR-P280-M	L1211427-7 Dust 14-SEP-12 14:09 AIR-P280-P	L1211427-8 Dust 14-SEP-12 15:57 FPX-D300-M	L1211427-9 Dust 14-SEP-12 15:57 FPX-D300-P	L1211427-10 Dust 14-SEP-12 16:09 FOX-D30-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.61		1.45	
	Total Insoluble Dustfall (mg/dm2.day)		0.61		1.45	
	Total Soluble Dustfall (mg/dm2.day)		<0.10		<0.10	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.00194		<0.00011	
	Chloride (Cl) (mg/dm2.day)		0.043		0.048	
	Nitrate (as N) (mg/dm2.day)		0.00162		0.00145	
	Sulfate (SO4) (mg/dm2.day)		<0.011		<0.011	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.0214		0.0404		0.232
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000018		<0.0000019		<0.0000015
	Arsenic (As)-Total (mg/dm2.day)	<0.0000018		0.0000033		0.0000156
	Barium (Ba)-Total (mg/dm2.day)	0.000522		0.000813		0.00466
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000088		<0.0000095		<0.0000075
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000088		<0.0000095		<0.0000075
	Boron (B)-Total (mg/dm2.day)	<0.00018		<0.00019		<0.00015
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000088		<0.00000095		<0.00000075
	Calcium (Ca)-Total (mg/dm2.day)	0.00739		0.0161		0.0946
	Chromium (Cr)-Total (mg/dm2.day)	0.0000843		0.000140		0.000813
	Cobalt (Co)-Total (mg/dm2.day)	0.0000172		0.0000293		0.000174
	Copper (Cu)-Total (mg/dm2.day)	<0.000088 <sup>DLB</sup>		<0.00014 <sup>DLB</sup>		0.000341
	Lead (Pb)-Total (mg/dm2.day)	<0.0000061 <sup>DLB</sup>		<0.0000076 <sup>DLB</sup>		0.0000378
	Lithium (Li)-Total (mg/dm2.day)	<0.000088		<0.000095		0.000397
	Magnesium (Mg)-Total (mg/dm2.day)	0.0236		0.0415		0.244
	Manganese (Mn)-Total (mg/dm2.day)	0.000358		0.000602		0.00342
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000088		<0.00000095		<0.00000075
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000088		0.00000215		0.0000137
	Nickel (Ni)-Total (mg/dm2.day)	0.000123		0.000210		0.00120
	Potassium (K)-Total (mg/dm2.day)	0.0171		0.0277		0.151
	Selenium (Se)-Total (mg/dm2.day)	<0.000018		<0.000019		<0.000015
	Silver (Ag)-Total (mg/dm2.day)	<0.00000018		<0.00000019		0.00000047
	Sodium (Na)-Total (mg/dm2.day)	0.00251		0.00753		0.0402
	Strontium (Sr)-Total (mg/dm2.day)	0.0000880		0.000221		0.00129
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000018		<0.0000019		0.0000030
	Tin (Sn)-Total (mg/dm2.day)	<0.0000018		<0.0000019		0.0000051
	Uranium (U)-Total (mg/dm2.day)	0.00000090		0.00000143		0.00000974
	Vanadium (V)-Total (mg/dm2.day)	0.000072		0.000110		0.000651
	Zinc (Zn)-Total (mg/dm2.day)	<0.00016 <sup>DLB</sup>		<0.00023 <sup>DLB</sup>		0.000811

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L1211427-11 Dust 13-SEP-12 16:10 FOX-D30-P	L1211427-12 Dust 13-SEP-12 16:11 FOX-U30-M	L1211427-13 Dust 13-SEP-12 16:12 FOX-U30-P	L1211427-14 Dust 13-SEP-12 04:04 FOX-D90-M	L1211427-15 Dust 13-SEP-12 04:03 FOX-D90-P
Grouping	Analyte						
<b>DUSTFALL</b>							
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	17.9			16.4		4.00
	Total Insoluble Dustfall (mg/dm2.day)	17.6			16.4		4.00
	Total Soluble Dustfall (mg/dm2.day)	0.27			<0.10		<0.10
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.00238			0.00035		0.00034
	Chloride (Cl) (mg/dm2.day)	0.072			0.064		0.056
	Nitrate (as N) (mg/dm2.day)	0.00235			0.00198		0.00167
	Sulfate (SO4) (mg/dm2.day)	0.052			0.035		0.016
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)			0.225		0.0965	
	Antimony (Sb)-Total (mg/dm2.day)			<0.0000014		<0.0000016	
	Arsenic (As)-Total (mg/dm2.day)			0.0000168		0.0000069	
	Barium (Ba)-Total (mg/dm2.day)			0.00474		0.00211	
	Beryllium (Be)-Total (mg/dm2.day)			<0.0000069		<0.0000082	
	Bismuth (Bi)-Total (mg/dm2.day)			<0.0000069		<0.0000082	
	Boron (B)-Total (mg/dm2.day)			<0.00014		<0.00016	
	Cadmium (Cd)-Total (mg/dm2.day)			<0.00000069		<0.00000082	
	Calcium (Ca)-Total (mg/dm2.day)			0.106		0.0350	
	Chromium (Cr)-Total (mg/dm2.day)			0.000817		0.000343	
	Cobalt (Co)-Total (mg/dm2.day)			0.000174		0.0000727	
	Copper (Cu)-Total (mg/dm2.day)			0.000362		<0.00027 <sup>DLB</sup>	
	Lead (Pb)-Total (mg/dm2.day)			0.0000310		0.0000164	
	Lithium (Li)-Total (mg/dm2.day)			0.000380		0.000157	
	Magnesium (Mg)-Total (mg/dm2.day)			0.248		0.0979	
	Manganese (Mn)-Total (mg/dm2.day)			0.00346		0.00144	
	Mercury (Hg)-Total (mg/dm2.day)			<0.00000069		<0.00000082	
	Molybdenum (Mo)-Total (mg/dm2.day)			0.0000140		0.00000476	
	Nickel (Ni)-Total (mg/dm2.day)			0.00124		0.000494	
	Potassium (K)-Total (mg/dm2.day)			0.163		0.0632	
	Selenium (Se)-Total (mg/dm2.day)			<0.000014		<0.000016	
	Silver (Ag)-Total (mg/dm2.day)			0.00000035		0.00000023	
	Sodium (Na)-Total (mg/dm2.day)			0.0424		0.0153	
	Strontium (Sr)-Total (mg/dm2.day)			0.00145		0.000479	
	Thallium (Tl)-Total (mg/dm2.day)			0.0000030		<0.0000016	
	Tin (Sn)-Total (mg/dm2.day)			0.00000059		0.00000023	
	Uranium (U)-Total (mg/dm2.day)			0.00000946		0.00000381	
	Vanadium (V)-Total (mg/dm2.day)			0.000651		0.000275	
	Zinc (Zn)-Total (mg/dm2.day)			0.000776		0.000357	

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1211427-16 Dust 13-SEP-12 14:42 LLCF-PA-M	L1211427-17 Dust 13-SEP-12 14:41 LLCF-PA-P	L1211427-18 Dust 13-SEP-12 14:51 LLCF-PB-M	L1211427-19 Dust 13-SEP-12 14:50 LLCF-PB-P	L1211427-20 Dust 13-SEP-12 11:28 MIS-D300-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		1.67		0.49	
	Total Insoluble Dustfall (mg/dm2.day)		1.34		0.33	
	Total Soluble Dustfall (mg/dm2.day)		0.34		0.16	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		<0.0050		0.00108	
	Chloride (Cl) (mg/dm2.day)		0.043		0.0527	
	Nitrate (as N) (mg/dm2.day)		0.00124		0.00133	
	Sulfate (SO4) (mg/dm2.day)		0.014		<0.0094	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.00666		0.00950		0.00182
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000014		<0.0000016		<0.0000014
	Arsenic (As)-Total (mg/dm2.day)	0.0000017		0.0000018		<0.0000014
	Barium (Ba)-Total (mg/dm2.day)	0.000406		0.000474		0.0000711
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000069		<0.0000082		<0.0000069
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000069		<0.0000082		<0.0000069
	Boron (B)-Total (mg/dm2.day)	<0.00014		<0.00016		<0.00014
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000069		<0.00000082		<0.00000069
	Calcium (Ca)-Total (mg/dm2.day)	0.0133		0.0118		0.00225
	Chromium (Cr)-Total (mg/dm2.day)	0.0000611		0.0000974		0.0000073
	Cobalt (Co)-Total (mg/dm2.day)	0.0000154		0.0000222		0.0000016
	Copper (Cu)-Total (mg/dm2.day)	<0.00018 <sup>DLB</sup>		<0.00011 <sup>DLB</sup>		0.000329
	Lead (Pb)-Total (mg/dm2.day)	<0.0000049 <sup>DLB</sup>		<0.0000049 <sup>DLB</sup>		<0.0000083 <sup>DLB</sup>
	Lithium (Li)-Total (mg/dm2.day)	<0.000069		<0.000082		<0.000069
	Magnesium (Mg)-Total (mg/dm2.day)	0.0297		0.0414		0.00206
	Manganese (Mn)-Total (mg/dm2.day)	0.000221		0.000298		0.0000775
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000069		<0.00000082		<0.00000069
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000590		0.00000106		<0.00000069
	Nickel (Ni)-Total (mg/dm2.day)	0.000242		0.000353		0.0000100
	Potassium (K)-Total (mg/dm2.day)	0.0155		0.00764		0.00266
	Selenium (Se)-Total (mg/dm2.day)	<0.000014		<0.000016		<0.000014
	Silver (Ag)-Total (mg/dm2.day)	<0.00000014		<0.00000016		<0.00000014
	Sodium (Na)-Total (mg/dm2.day)	0.00452		0.00243		<0.00069 <sup>DLB</sup>
	Strontium (Sr)-Total (mg/dm2.day)	0.000193		0.000178		<0.000011
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000014		<0.0000016		<0.0000014
	Tin (Sn)-Total (mg/dm2.day)	<0.0000014		<0.0000016		<0.0000014
	Uranium (U)-Total (mg/dm2.day)	0.00000064		0.00000068		<0.00000014
	Vanadium (V)-Total (mg/dm2.day)	0.000018		0.000024		<0.000014
	Zinc (Zn)-Total (mg/dm2.day)	<0.00012 <sup>DLB</sup>		<0.00015 <sup>DLB</sup>		<0.000083 <sup>DLB</sup>

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1211427-21 Dust  WASTEROCK 100M	L1211427-22 Dust  WASTEROCK 100P	L1211427-23 Dust  WASTEROCK 300M	L1211427-24 Dust  WASTEROCK 300P	L1211427-25 Dust  WASTEROCK 1000M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.33		0.37	
	Total Insoluble Dustfall (mg/dm2.day)		0.16		0.15	
	Total Soluble Dustfall (mg/dm2.day)		0.17		0.22	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.00117		0.00153	
	Chloride (Cl) (mg/dm2.day)		0.0578		0.064	
	Nitrate (as N) (mg/dm2.day)		0.00149		0.00159	
	Sulfate (SO4) (mg/dm2.day)		<0.0099		<0.012	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.00460		0.00187		0.00125
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000017		<0.0000017		<0.0000016
	Arsenic (As)-Total (mg/dm2.day)	<0.0000017		<0.0000017		<0.0000016
	Barium (Ba)-Total (mg/dm2.day)	0.000132		0.0000764		0.0000495
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000087		<0.0000084		<0.0000079
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000087		<0.0000084		<0.0000079
	Boron (B)-Total (mg/dm2.day)	<0.00017		<0.00017		<0.00016
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000087		<0.00000084		0.00000166
	Calcium (Ca)-Total (mg/dm2.day)	0.00406		0.00281		0.00209
	Chromium (Cr)-Total (mg/dm2.day)	0.0000188		<0.0000084		<0.0000079
	Cobalt (Co)-Total (mg/dm2.day)	0.0000042		0.0000018		<0.0000016
	Copper (Cu)-Total (mg/dm2.day)	<0.00029 <sup>DLB</sup>		<0.00031 <sup>DLB</sup>		0.000301
	Lead (Pb)-Total (mg/dm2.day)	<0.0000095 <sup>DLB</sup>		<0.0000093 <sup>DLB</sup>		<0.0000079 <sup>DLB</sup>
	Lithium (Li)-Total (mg/dm2.day)	<0.000087		<0.000084		<0.000079
	Magnesium (Mg)-Total (mg/dm2.day)	0.00607		0.00251		0.00173
	Manganese (Mn)-Total (mg/dm2.day)	0.0000970		0.0000529		0.0000426
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000087		<0.00000084		<0.00000079
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000087		<0.00000084		<0.00000079
	Nickel (Ni)-Total (mg/dm2.day)	0.0000382		0.0000175		0.0000116
	Potassium (K)-Total (mg/dm2.day)	0.00379		0.00245		0.00206
	Selenium (Se)-Total (mg/dm2.day)	<0.000017		<0.000017		<0.000016
	Silver (Ag)-Total (mg/dm2.day)	<0.00000017		0.00000028		0.00000019
	Sodium (Na)-Total (mg/dm2.day)	0.00133		0.00096		0.00129
	Strontium (Sr)-Total (mg/dm2.day)	0.0000443		0.0000242		0.0000149
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000017		<0.0000017		<0.0000016
	Tin (Sn)-Total (mg/dm2.day)	<0.0000017		<0.0000017		<0.0000016
	Uranium (U)-Total (mg/dm2.day)	0.00000027		0.00000017		<0.00000016
	Vanadium (V)-Total (mg/dm2.day)	<0.000017		<0.000017		<0.000016
	Zinc (Zn)-Total (mg/dm2.day)	<0.00010 <sup>DLB</sup>		<0.00010 <sup>DLB</sup>		<0.000094 <sup>DLB</sup>

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1211427-26 Dust  WASTEROCK 1000P				
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	0.21				
	Total Insoluble Dustfall (mg/dm2.day)	0.13				
	Total Soluble Dustfall (mg/dm2.day)	<0.10				
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.00201				
	Chloride (Cl) (mg/dm2.day)	0.0432				
	Nitrate (as N) (mg/dm2.day)	0.00146				
	Sulfate (SO4) (mg/dm2.day)	<0.0096				
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)					
	Antimony (Sb)-Total (mg/dm2.day)					
	Arsenic (As)-Total (mg/dm2.day)					
	Barium (Ba)-Total (mg/dm2.day)					
	Beryllium (Be)-Total (mg/dm2.day)					
	Bismuth (Bi)-Total (mg/dm2.day)					
	Boron (B)-Total (mg/dm2.day)					
	Cadmium (Cd)-Total (mg/dm2.day)					
	Calcium (Ca)-Total (mg/dm2.day)					
	Chromium (Cr)-Total (mg/dm2.day)					
	Cobalt (Co)-Total (mg/dm2.day)					
	Copper (Cu)-Total (mg/dm2.day)					
	Lead (Pb)-Total (mg/dm2.day)					
	Lithium (Li)-Total (mg/dm2.day)					
	Magnesium (Mg)-Total (mg/dm2.day)					
	Manganese (Mn)-Total (mg/dm2.day)					
	Mercury (Hg)-Total (mg/dm2.day)					
	Molybdenum (Mo)-Total (mg/dm2.day)					
	Nickel (Ni)-Total (mg/dm2.day)					
	Potassium (K)-Total (mg/dm2.day)					
	Selenium (Se)-Total (mg/dm2.day)					
	Silver (Ag)-Total (mg/dm2.day)					
	Sodium (Na)-Total (mg/dm2.day)					
	Strontium (Sr)-Total (mg/dm2.day)					
	Thallium (Tl)-Total (mg/dm2.day)					
	Tin (Sn)-Total (mg/dm2.day)					
	Uranium (U)-Total (mg/dm2.day)					
	Vanadium (V)-Total (mg/dm2.day)					
	Zinc (Zn)-Total (mg/dm2.day)					

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



## Reference Information

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>CL-IC-VA</b>	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>DUSTFALLS-COM-DM2-VA</b>	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE
This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate." Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.			
<b>HG-DUST(DM2-CVAFS-VA</b>	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
<b>MET-DUST(DM2)-MS-VA</b>	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
<b>NH3-F-VA</b>	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifically carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
<b>NO3-IC-VA</b>	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>SO4-IC-VA</b>	Dustfall	Dustfall Sulphate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulphate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			

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

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

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

## Chain of Custody Numbers:

68934

## Reference Information

### GLOSSARY OF REPORT TERMS

*Surrogate* - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

*mg/kg* - milligrams per kilogram based on dry weight of sample.

*mg/kg ww* - milligrams per kilogram based on wet weight of sample.

*mg/kg lw* - 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.*

[illegible]

1211427

FOR LAB USE ONLY

Billing Code: BHP2503

compliance.team@bhpbilliton.com;



BHP BILLITON CANADA INC..  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 19-SEP-12  
Report Date: 01-OCT-12 13:08 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1211429  
**Project P.O. #:** BHP2503  
**Job Reference:** 68934  
**C of C Numbers:** 68934  
**Legal Site Desc:** 6201066626

Can Dang  
Senior Account Manager

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# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1211429-1 Dust 14-SEP-12 08:31 AQ-54-M	L1211429-2 Dust 14-SEP-12 08:30 AQ-54-P	L1211429-3 Dust 14-SEP-12 09:10 FOX-D1000-M	L1211429-4 Dust 14-SEP-12 09:11 FOX-D1000-P	L1211429-5 Dust 14-SEP-12 09:20 MIS-D1000-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.23		0.56	
	Total Insoluble Dustfall (mg/dm2.day)		<0.10		0.39	
	Total Soluble Dustfall (mg/dm2.day)		0.21		0.17	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.000574		0.00141	
	Chloride (Cl) (mg/dm2.day)		0.0509		0.058	
	Nitrate (as N) (mg/dm2.day)		0.000823		0.00150	
	Sulfate (SO4) (mg/dm2.day)		<0.0073		<0.010	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	<sup>DLB</sup> <0.00016		0.00370		0.000564
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000011		<0.0000018		<0.0000014
	Arsenic (As)-Total (mg/dm2.day)	<0.0000011		<0.0000018		<0.0000014
	Barium (Ba)-Total (mg/dm2.day)	0.0000105		0.000137		0.0000261
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000054		<0.0000088		<0.0000068
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000054		<0.0000088		<0.0000068
	Boron (B)-Total (mg/dm2.day)	<0.00011		<0.00018		<0.00014
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000309		<0.0000088		<0.0000068
	Calcium (Ca)-Total (mg/dm2.day)	<sup>DLB</sup> <0.0013		0.00376		<0.0019
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000054		0.0000133		<0.0000068
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000011		0.0000030		<0.0000014
	Copper (Cu)-Total (mg/dm2.day)	0.000289		<0.00022 <sup>DLB</sup>		<0.00016 <sup>DLB</sup>
	Lead (Pb)-Total (mg/dm2.day)	0.0000139		<0.0000062 <sup>DLB</sup>		<0.0000041 <sup>DLB</sup>
	Lithium (Li)-Total (mg/dm2.day)	<0.000054		<0.000088		<0.000068
	Magnesium (Mg)-Total (mg/dm2.day)	<sup>DLB</sup> <0.00032		0.00420		0.000831
	Manganese (Mn)-Total (mg/dm2.day)	0.0000319		0.0000900		0.0000301
	Mercury (Hg)-Total (mg/dm2.day)	<0.0000054		<0.0000088		<0.0000068
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.0000054		<0.0000088		<0.0000068
	Nickel (Ni)-Total (mg/dm2.day)	0.0000182		0.0000526		0.0000125
	Potassium (K)-Total (mg/dm2.day)	0.00088		0.00483		0.00129
	Selenium (Se)-Total (mg/dm2.day)	<0.000011		<0.000018		<0.000014
	Silver (Ag)-Total (mg/dm2.day)	0.00000011		<0.0000018		<0.0000014
	Sodium (Na)-Total (mg/dm2.day)	0.00056		0.00151		0.00075
	Strontium (Sr)-Total (mg/dm2.day)	<sup>DLB</sup> <0.0000049		0.0000350		<0.0000088 <sup>DLB</sup>
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011		<0.0000018		<0.0000014
	Tin (Sn)-Total (mg/dm2.day)	<0.0000011		<0.0000018		<0.0000014
	Uranium (U)-Total (mg/dm2.day)	<0.00000011		<0.00000018		<0.00000014
	Vanadium (V)-Total (mg/dm2.day)	<0.000011		<0.000018		<0.000014
	Zinc (Zn)-Total (mg/dm2.day)	0.000059		0.000120		0.000055

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



# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1211429-6 Dust 14-SEP-12 09:21 MIS-D1000-P	L1211429-7 Dust 14-SEP-12 12:00 AIR-0125-M	L1211429-8 Dust 14-SEP-12 11:27 MIS-D300-P	L1211429-9 Dust 14-SEP-12 11:38 MIS-D30-M	L1211429-10 Dust 14-SEP-12 11:37 MIS-D30-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	0.37		0.19		3.48
	Total Insoluble Dustfall (mg/dm2.day)	<0.10		0.14		3.48
	Total Soluble Dustfall (mg/dm2.day)	0.27		<0.10		<0.10
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.000850		0.00118		0.00086
	Chloride (Cl) (mg/dm2.day)	0.0564		0.0518		0.044
	Nitrate (as N) (mg/dm2.day)	0.00144		0.00181		0.00192
	Sulfate (SO4) (mg/dm2.day)	<0.0071		<0.0094		<0.013
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.00478		0.0423	
	Antimony (Sb)-Total (mg/dm2.day)		<0.0000019		<0.0000013	
	Arsenic (As)-Total (mg/dm2.day)		<0.0000019		0.0000041	
	Barium (Ba)-Total (mg/dm2.day)		0.000101		0.00103	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000096		<0.0000063	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000096		<0.0000063	
	Boron (B)-Total (mg/dm2.day)		<0.00019		<0.00013	
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00000096		<0.00000063	
	Calcium (Ca)-Total (mg/dm2.day)		0.00369		0.0129	
	Chromium (Cr)-Total (mg/dm2.day)		0.0000197		0.000152	
	Cobalt (Co)-Total (mg/dm2.day)		0.0000042		0.0000329	
	Copper (Cu)-Total (mg/dm2.day)		<0.00016 <sup>DLB</sup>		0.000615	
	Lead (Pb)-Total (mg/dm2.day)		<0.0000048 <sup>DLB</sup>		0.00000962	
	Lithium (Li)-Total (mg/dm2.day)		<0.000096		0.000080	
	Magnesium (Mg)-Total (mg/dm2.day)		0.00611		0.0414	
	Manganese (Mn)-Total (mg/dm2.day)		0.000108		0.000792	
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000096		<0.00000063	
	Molybdenum (Mo)-Total (mg/dm2.day)		<0.00000096		0.00000123	
	Nickel (Ni)-Total (mg/dm2.day)		0.0000392		0.000163	
	Potassium (K)-Total (mg/dm2.day)		0.00400		0.0393	
	Selenium (Se)-Total (mg/dm2.day)		<0.000019		<0.000013	
	Silver (Ag)-Total (mg/dm2.day)		<0.00000019		0.00000019	
	Sodium (Na)-Total (mg/dm2.day)		<0.00096		0.00443	
	Strontium (Sr)-Total (mg/dm2.day)		0.0000307		0.000145	
	Thallium (Tl)-Total (mg/dm2.day)		<0.0000019		<0.0000013	
	Tin (Sn)-Total (mg/dm2.day)		<0.0000019		0.0000014	
	Uranium (U)-Total (mg/dm2.day)		0.00000023		0.00000206	
	Vanadium (V)-Total (mg/dm2.day)		<0.000019		0.000139	
	Zinc (Zn)-Total (mg/dm2.day)		0.000078		0.000215	

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



# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1211429-11 Dust 14-SEP-12 11:33 MIS-D90-M	L1211429-12 Dust 14-SEP-12 11:34 MIS-D90-P	L1211429-13 Dust 14-SEP-12 11:42 MIS-U30-M	L1211429-14 Dust 14-SEP-12 11:41 MIS-U30-P	
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.67		7.10	
	Total Insoluble Dustfall (mg/dm2.day)		0.52		7.10	
	Total Soluble Dustfall (mg/dm2.day)		0.15		<0.10	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.00093		0.00057	
	Chloride (Cl) (mg/dm2.day)		0.053		0.039	
	Nitrate (as N) (mg/dm2.day)		0.00157		0.00197	
	Sulfate (SO4) (mg/dm2.day)		<0.010		0.016	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.00854		0.138		
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000016		<0.0000018		
	Arsenic (As)-Total (mg/dm2.day)	<0.0000016		0.0000080		
	Barium (Ba)-Total (mg/dm2.day)	0.000247		0.00321		
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000081		<0.0000088		
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000081		<0.0000088		
	Boron (B)-Total (mg/dm2.day)	<0.00016		<0.00018		
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000081		<0.00000088		
	Calcium (Ca)-Total (mg/dm2.day)	0.00441		0.0337		
	Chromium (Cr)-Total (mg/dm2.day)	0.0000304		0.000508		
	Cobalt (Co)-Total (mg/dm2.day)	0.0000069		0.000108		
	Copper (Cu)-Total (mg/dm2.day)	0.000395		<0.00015 <sup>DLB</sup>		
	Lead (Pb)-Total (mg/dm2.day)	0.00000928		0.0000174		
	Lithium (Li)-Total (mg/dm2.day)	<0.000081		0.000284		
	Magnesium (Mg)-Total (mg/dm2.day)	0.00819		0.130		
	Manganese (Mn)-Total (mg/dm2.day)	0.000177		0.00241		
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000081		<0.00000088		
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000081		0.00000306		
	Nickel (Ni)-Total (mg/dm2.day)	0.0000362		0.000473		
	Potassium (K)-Total (mg/dm2.day)	0.00968		0.114		
	Selenium (Se)-Total (mg/dm2.day)	<0.000016		<0.000018		
	Silver (Ag)-Total (mg/dm2.day)	<0.00000016		0.00000024		
	Sodium (Na)-Total (mg/dm2.day)	0.00114		0.0115		
	Strontium (Sr)-Total (mg/dm2.day)	0.0000366		0.000393		
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000016		<0.0000018		
	Tin (Sn)-Total (mg/dm2.day)	<0.0000016		0.0000038		
	Uranium (U)-Total (mg/dm2.day)	0.00000039		0.00000721		
	Vanadium (V)-Total (mg/dm2.day)	0.000028		0.000466		
	Zinc (Zn)-Total (mg/dm2.day)	0.000091		0.000539		

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

## Reference Information

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>CL-IC-VA</b>	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>DUSTFALLS-COM-DM2-VA</b>	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE
This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate." Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.			
<b>HG-DUST(DM2-CVAFS-VA</b>	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
<b>MET-DUST(DM2)-MS-VA</b>	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
<b>NH3-F-VA</b>	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifically carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
<b>NO3-IC-VA</b>	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>SO4-IC-VA</b>	Dustfall	Dustfall Sulphate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulphate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			

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

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

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

## Chain of Custody Numbers:

68934

## Reference Information

### GLOSSARY OF REPORT TERMS

*Surrogate* - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

*mg/kg* - milligrams per kilogram based on dry weight of sample.

*mg/kg ww* - milligrams per kilogram based on wet weight of sample.

*mg/kg lw* - 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.*



8081 Lougheed Highway • Suite 100 • Burnaby,  
Tel: 604-253-4188 Toll Free: 1-800-665-0243 FAX: 604-253-6700  
ALS Contact: Can Dang

80# 4-2541

Form 68934



bhpbilliton

BHP Billiton Diamonds Inc.  
# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1  
Tel: 867-880-2157 Fax: 867-880-4012  
BHP Contacts: David Bruce/ Richard EhlerDavid

## CHAIN OF CUSTODY FORM

For Lab Use

L1211429

FOR LAB USE ONLY

Station ID	Matrix	Date	Time	Inlt	Ammonia	Chloride	Dustfall Metals	Insoluble Particulate	Nitrate	Soluble Particulate	Sulphate	Total Particulate								
AQ-54-M	Dust	14-Sep-2012	08:31 AM	JP			1	1	1	1	1	1	BHP2							
AQ-54-P	Dust	14-Sep-2012	08:30 AM	JP	1	1		1	1	1	1	1	BHP2							
FOX-D1000-M	Dust	14-Sep-2012	09:10 AM	JP			1						BHP2							
FOX-D1000-P	Dust	14-Sep-2012	09:11 AM	JP	1	1		1	1	1	1	1	BHP2							
MIS-D1000-M	Dust	14-Sep-2012	09:20 AM	JP			1						BHP2							
MIS-D1000-P	Dust	14-Sep-2012	09:21 AM	JP	1	1		1	1	1	1	1	BHP2							
Air-P125-M	Dust	14-Sep-2012	12:00 PM	KJ			1						BHP2							
Mis-D300-P	Dust	14-Sep-2012	11:27 AM	KJ	1	1		1	1	1	1	1	BHP2							
Mis-D30-M	Dust	14-Sep-2012	11:38 AM	KJ			1						BHP2							
Mis-D30-P	Dust	14-Sep-2012	11:37 AM	KJ	1	1		1	1	1	1	1	BHP2							
Mis-D90-M	Dust	14-Sep-2012	11:33 AM	KJ			1						BHP2							
Mis-D90-P	Dust	14-Sep-2012	11:34 AM	KJ	1	1		1	1	1	1	1	BHP2							
Mis-U30-M	Dust	14-Sep-2012	11:42 AM	KJ			1						BHP2							
Mis-U30-P	Dust	14-Sep-2012	11:41 AM	KJ	1	1		1	1	1	1	1	BHP2							



Turn around Required: Reg 2 week TAT

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2503

Relinquished by: <i>[Signature]</i>	Date	Received by: <i>Britt</i>	Date <i>Sept. 19</i>
	Time		Time <i>10:40</i>
Relinquished by:	Date	Received by:	Date
	Time		Time

### FOR LAB USE ONLY

Cooler seal intact upon receipt? ☒ Yes ☐ No ☐ N/A  
Sample temperature upon receipt: *10.7 c.*  
Frozen? ☐ Yes ☒ No

Send Analytical Results to:

compliance.team@bhpbilliton.com;



Dominion Diamond Ekati Corporation (DDEC)  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 22-JUL-13  
Report Date: 04-OCT-13 11:42 (MT)  
Version: FINAL REV. 2

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1336332  
**Project P.O. #:** BHP2503  
**Job Reference:** 69111  
**C of C Numbers:**  
**Legal Site Desc:** 6201104485

### Comments:

04-OCT-13:  
Revision 2: This revision replaces and supersedes previous revisionn of this report. The Date  
Sampled has been corrected for all samples.

Can Dang  
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

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ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company



# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1336332-1 DUST 15-JUN-13 10:45 AIR-P125-M	L1336332-2 DUST 15-JUN-13 10:46 AIR-P125-P	L1336332-3 DUST 15-JUN-13 11:32 FOX-D300-M	L1336332-4 DUST 15-JUN-13 11:32 FOX-D300-P	L1336332-5 DUST 15-JUN-13 13:39 FOX-D30-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		1.40		2.72	
	Total Insoluble Dustfall (mg/dm2.day)		0.69		1.55	
	Total Soluble Dustfall (mg/dm2.day)		0.71		1.17	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.000232		0.000578	
	Chloride (Cl) (mg/dm2.day)		0.0231		0.0312	
	Nitrate (as N) (mg/dm2.day)		0.000952		0.000944	
	Sulfate (SO4) (mg/dm2.day)		0.0037		0.0066	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.00585		0.0188		0.0617
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000012		<0.0000012		<0.0000012
	Arsenic (As)-Total (mg/dm2.day)	0.0000013		0.0000014		0.0000045
	Barium (Ba)-Total (mg/dm2.day)	0.000187		0.000459		0.00141
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000058		<0.0000058		<0.0000058
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000058		<0.0000058		<0.0000058
	Boron (B)-Total (mg/dm2.day)	<0.00012		<0.00012		<0.00012
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000058		<0.00000058		<0.00000058
	Calcium (Ca)-Total (mg/dm2.day)	0.00527		0.0106		0.0504
	Chromium (Cr)-Total (mg/dm2.day)	0.0000255		0.0000808		0.000208
	Cobalt (Co)-Total (mg/dm2.day)	0.0000053		0.0000141		0.0000445
	Copper (Cu)-Total (mg/dm2.day)	0.0000958		0.000169		0.000483
	Lead (Pb)-Total (mg/dm2.day)	0.00000426		0.00000362		0.0000135
	Lithium (Li)-Total (mg/dm2.day)	<0.000058		<0.000058		0.000098
	Magnesium (Mg)-Total (mg/dm2.day)	0.00744		0.0206		0.0723
	Manganese (Mn)-Total (mg/dm2.day)	0.000132		0.000309		0.00109
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000058		<0.00000058		<0.00000058
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000058		0.00000100		0.00000615
	Nickel (Ni)-Total (mg/dm2.day)	0.0000434		0.000102		0.000351
	Potassium (K)-Total (mg/dm2.day)	0.00622		0.0209		0.0856
	Selenium (Se)-Total (mg/dm2.day)	<0.000012		<0.000012		<0.000012
	Silver (Ag)-Total (mg/dm2.day)	0.00000020		<0.00000012		0.00000036
	Sodium (Na)-Total (mg/dm2.day)	0.00117		0.00497		0.0207
	Strontium (Sr)-Total (mg/dm2.day)	0.0000593		0.000122		0.000616
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012		<0.0000012		0.0000012
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012		<0.0000012		0.0000013
	Uranium (U)-Total (mg/dm2.day)	0.00000035		0.00000058		0.00000213
	Vanadium (V)-Total (mg/dm2.day)	0.000016		0.000052		0.000163
	Zinc (Zn)-Total (mg/dm2.day)	0.000061		0.000123		0.000327



# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1336332-6 DUST 15-JUN-13 13:38 FOX-D30-P	L1336332-7 DUST 15-JUN-13 13:49 FOX-D90-P	L1336332-8 DUST 15-JUN-13 14:08 FOX-U30-M	L1336332-9 DUST 15-JUN-13 11:50 LLCFC-PA-M	L1336332-10 DUST 15-JUN-13 11:51 LLCFC-PA-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	23.0	4.26			1.33
	Total Insoluble Dustfall (mg/dm2.day)	22.3	3.84			1.01
	Total Soluble Dustfall (mg/dm2.day)	0.74	0.41			0.32
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	<0.0013	0.000282			0.00135
	Chloride (Cl) (mg/dm2.day)	0.0596	0.0525			0.0298
	Nitrate (as N) (mg/dm2.day)	0.000434	0.00131			0.00129
	Sulfate (SO4) (mg/dm2.day)	0.0322	0.0101			0.0123
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)			0.111	0.00390	
	Antimony (Sb)-Total (mg/dm2.day)			<0.0000012	<0.0000012	
	Arsenic (As)-Total (mg/dm2.day)			0.0000064	<0.0000012	
	Barium (Ba)-Total (mg/dm2.day)			0.00235	0.000145	
	Beryllium (Be)-Total (mg/dm2.day)			<0.0000058	<0.0000058	
	Bismuth (Bi)-Total (mg/dm2.day)			<0.0000058	<0.0000058	
	Boron (B)-Total (mg/dm2.day)			<0.00012	<0.00012	
	Cadmium (Cd)-Total (mg/dm2.day)			<0.00000058	<0.00000058	
	Calcium (Ca)-Total (mg/dm2.day)			0.0646	0.00565	
	Chromium (Cr)-Total (mg/dm2.day)			0.000382	0.0000198	
	Cobalt (Co)-Total (mg/dm2.day)			0.0000800	0.0000045	
	Copper (Cu)-Total (mg/dm2.day)			0.000228	0.0000739	
	Lead (Pb)-Total (mg/dm2.day)			0.0000200	0.00000213	
	Lithium (Li)-Total (mg/dm2.day)			0.000177	<0.000058	
	Magnesium (Mg)-Total (mg/dm2.day)			0.117	0.00772	
	Manganese (Mn)-Total (mg/dm2.day)			0.00162	0.000102	
	Mercury (Hg)-Total (mg/dm2.day)			<0.00000058	<0.00000058	
	Molybdenum (Mo)-Total (mg/dm2.day)			0.00000724	0.00000118	
	Nickel (Ni)-Total (mg/dm2.day)			0.000586	0.0000514	
	Potassium (K)-Total (mg/dm2.day)			0.0896	0.00764	
	Selenium (Se)-Total (mg/dm2.day)			<0.000012	<0.000012	
	Silver (Ag)-Total (mg/dm2.day)			0.00000021	<0.00000012	
	Sodium (Na)-Total (mg/dm2.day)			0.0239	0.00538	
	Strontium (Sr)-Total (mg/dm2.day)			0.000829	0.0000786	
	Thallium (Tl)-Total (mg/dm2.day)			0.0000015	<0.0000012	
	Tin (Sn)-Total (mg/dm2.day)			0.0000024	<0.0000012	
	Uranium (U)-Total (mg/dm2.day)			0.00000404	0.00000017	
	Vanadium (V)-Total (mg/dm2.day)			0.000299	<0.000012	
	Zinc (Zn)-Total (mg/dm2.day)			0.000407	0.000051	

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1336332-11 DUST 15-JUN-13 11:20 LLCFC-PB-M	L1336332-12 DUST 15-JUN-13 11:21 LLCFC-PB-P	L1336332-13 DUST 15-JUN-13 13:16 MIS-D1000-M	L1336332-14 DUST 15-JUN-13 13:16 MIS-D1000-P	L1336332-15 DUST 15-JUN-13 13:30 MIS-D300-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		1.34		0.95	
	Total Insoluble Dustfall (mg/dm2.day)		0.68		0.27	
	Total Soluble Dustfall (mg/dm2.day)		0.66		0.69	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.00126		0.000271	
	Chloride (Cl) (mg/dm2.day)		0.0455		0.0330	
	Nitrate (as N) (mg/dm2.day)		0.00128		0.000813	
	Sulfate (SO4) (mg/dm2.day)		0.0073		0.0032	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.00374		0.000875		0.00521
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000012		<0.0000012		<0.0000012
	Arsenic (As)-Total (mg/dm2.day)	<0.0000012		<0.0000012		<0.0000012
	Barium (Ba)-Total (mg/dm2.day)	0.000139		0.0000485		0.000132
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000058		<0.0000058		<0.0000058
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000058		<0.0000058		<0.0000058
	Boron (B)-Total (mg/dm2.day)	<0.00012		<0.00012		<0.00012
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000058		0.00000083		<0.00000058
	Calcium (Ca)-Total (mg/dm2.day)	0.00598		0.00321		0.00378
	Chromium (Cr)-Total (mg/dm2.day)	0.0000192		<0.0000058		0.00105
	Cobalt (Co)-Total (mg/dm2.day)	0.0000044		<0.0000012		0.0000055
	Copper (Cu)-Total (mg/dm2.day)	0.000293		0.000274		0.000223
	Lead (Pb)-Total (mg/dm2.day)	0.00000532		0.00000933		0.00000556
	Lithium (Li)-Total (mg/dm2.day)	<0.000058		<0.000058		<0.000058
	Magnesium (Mg)-Total (mg/dm2.day)	0.00774		0.00201		0.00631
	Manganese (Mn)-Total (mg/dm2.day)	0.000130		0.000132		0.000236
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000058		<0.00000058		<0.00000058
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000058		<0.00000058		0.00000260
	Nickel (Ni)-Total (mg/dm2.day)	0.0000469		0.0000123		0.0000449
	Potassium (K)-Total (mg/dm2.day)	0.0160		0.00834		0.0126
	Selenium (Se)-Total (mg/dm2.day)	<0.000012		<0.000012		<0.000012
	Silver (Ag)-Total (mg/dm2.day)	0.00000015		0.00000029		<0.00000012
	Sodium (Na)-Total (mg/dm2.day)	0.00268		0.00280		0.00252
	Strontium (Sr)-Total (mg/dm2.day)	0.0000554		0.0000171		0.0000260
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012		<0.0000012		<0.0000012
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012		<0.0000012		<0.0000012
	Uranium (U)-Total (mg/dm2.day)	0.00000023		0.00000013		0.00000028
	Vanadium (V)-Total (mg/dm2.day)	<0.000012		<0.000012		0.000019
	Zinc (Zn)-Total (mg/dm2.day)	0.000112		0.000088		0.000092

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1336332-16 DUST 15-JUN-13 10:05 MIS-D30-M	L1336332-17 DUST 15-JUN-13 10:06 MIS-D30-P	L1336332-18 DUST 15-JUN-13 09:54 MIS-D90-M	L1336332-19 DUST 15-JUN-13 09:55 MIS-D90-P	L1336332-20 DUST 15-JUN-13 09:50 MIS-U30-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		5.90		1.82	
	Total Insoluble Dustfall (mg/dm2.day)		5.58		1.07	
	Total Soluble Dustfall (mg/dm2.day)		0.32		0.75	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.00020		0.000416	
	Chloride (Cl) (mg/dm2.day)		0.0269		0.0334	
	Nitrate (as N) (mg/dm2.day)		0.00161		0.000926	
	Sulfate (SO4) (mg/dm2.day)		0.0110		0.0048	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.0152		0.0157		0.0426
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000012		<0.0000012		<0.0000012
	Arsenic (As)-Total (mg/dm2.day)	0.0000021		0.0000015		0.0000026
	Barium (Ba)-Total (mg/dm2.day)	0.000326		0.000361		0.000899
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000058		<0.0000058		<0.0000058
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000058		<0.0000058		<0.0000058
	Boron (B)-Total (mg/dm2.day)	<0.00012		<0.00012		<0.00012
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000058		<0.00000058		<0.00000058
	Calcium (Ca)-Total (mg/dm2.day)	0.0133		0.00879		0.0148
	Chromium (Cr)-Total (mg/dm2.day)	0.0000458		0.0000549		0.000143
	Cobalt (Co)-Total (mg/dm2.day)	0.0000107		0.0000111		0.0000307
	Copper (Cu)-Total (mg/dm2.day)	0.000436		0.000423		0.000256
	Lead (Pb)-Total (mg/dm2.day)	0.00000470		0.00000748		0.00000689
	Lithium (Li)-Total (mg/dm2.day)	<0.000058		<0.000058		0.000082
	Magnesium (Mg)-Total (mg/dm2.day)	0.0161		0.0153		0.0380
	Manganese (Mn)-Total (mg/dm2.day)	0.000470		0.000288		0.000718
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000058		<0.00000058		<0.00000058
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000228		0.00000065		0.00000145
	Nickel (Ni)-Total (mg/dm2.day)	0.0000703		0.0000643		0.000156
	Potassium (K)-Total (mg/dm2.day)	0.0369		0.0243		0.0426
	Selenium (Se)-Total (mg/dm2.day)	<0.000012		<0.000012		<0.000012
	Silver (Ag)-Total (mg/dm2.day)	0.00000034		0.00000014		0.00000023
	Sodium (Na)-Total (mg/dm2.day)	0.00432		0.00450		0.00687
	Strontium (Sr)-Total (mg/dm2.day)	0.000116		0.0000767		0.000170
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012		<0.0000012		<0.0000012
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012		<0.0000012		<0.0000012
	Uranium (U)-Total (mg/dm2.day)	0.00000088		0.00000070		0.00000178
	Vanadium (V)-Total (mg/dm2.day)	0.000038		0.000045		0.000121
	Zinc (Zn)-Total (mg/dm2.day)	0.000120		0.000139		0.000188

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1336332-21 DUST 15-JUN-13 10:31 AIR-P162-M	L1336332-22 DUST 15-JUN-13 10:32 AIR-P162-P	L1336332-23 DUST 15-JUN-13 14:33 AIR-P280-M	L1336332-24 DUST 15-JUN-13 14:37 AIR-P280-P	L1336332-25 DUST 15-JUN-13 10:57 AQ-49-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		1.30		2.09	
	Total Insoluble Dustfall (mg/dm2.day)		0.83		1.77	
	Total Soluble Dustfall (mg/dm2.day)		0.47		0.32	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.000215		0.000361	
	Chloride (Cl) (mg/dm2.day)		0.0390		0.0336	
	Nitrate (as N) (mg/dm2.day)		0.00100		0.00138	
	Sulfate (SO4) (mg/dm2.day)		0.0042		0.0083	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.00755		0.0203		0.000571
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000012		<0.0000012		<0.0000012
	Arsenic (As)-Total (mg/dm2.day)	0.0000027		0.0000018		<0.0000012
	Barium (Ba)-Total (mg/dm2.day)	0.000246		0.000572		0.0000363
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000058		<0.0000058		<0.0000058
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000058		<0.0000058		<0.0000058
	Boron (B)-Total (mg/dm2.day)	<0.00012		<0.00012		<0.00012
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000062		<0.00000058		<0.00000058
	Calcium (Ca)-Total (mg/dm2.day)	0.00844		0.0122		0.00322
	Chromium (Cr)-Total (mg/dm2.day)	0.0000327		0.0000801		<0.0000058
	Cobalt (Co)-Total (mg/dm2.day)	0.0000072		0.0000167		<0.0000012
	Copper (Cu)-Total (mg/dm2.day)	0.000915		0.000135		0.000129
	Lead (Pb)-Total (mg/dm2.day)	0.0000121		0.00000406		0.00000263
	Lithium (Li)-Total (mg/dm2.day)	<0.000058		<0.000058		<0.000058
	Magnesium (Mg)-Total (mg/dm2.day)	0.0105		0.0244		0.00167
	Manganese (Mn)-Total (mg/dm2.day)	0.000167		0.000367		0.0000985
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000058		<0.00000058		<0.00000058
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000067		0.00000113		<0.00000058
	Nickel (Ni)-Total (mg/dm2.day)	0.0000630		0.000116		0.0000079
	Potassium (K)-Total (mg/dm2.day)	0.0174		0.0277		0.00939
	Selenium (Se)-Total (mg/dm2.day)	<0.000012		<0.000012		<0.000012
	Silver (Ag)-Total (mg/dm2.day)	0.00000027		<0.00000012		<0.00000012
	Sodium (Na)-Total (mg/dm2.day)	0.00406		0.00626		0.00261
	Strontium (Sr)-Total (mg/dm2.day)	0.0000737		0.000137		0.0000122
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012		<0.0000012		<0.0000012
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012		<0.0000012		<0.0000012
	Uranium (U)-Total (mg/dm2.day)	0.00000037		0.00000080		<0.00000012
	Vanadium (V)-Total (mg/dm2.day)	0.000022		0.000058		<0.000012
	Zinc (Zn)-Total (mg/dm2.day)	0.000156		0.000110		0.000065

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1336332-26 DUST 15-JUN-13 10:57 AQ-49-P	L1336332-27 DUST 15-JUN-13 10:35 AQ-54-M	L1336332-28 DUST 15-JUN-13 10:35 AQ-54-P	L1336332-29 DUST 15-JUN-13 11:19 FOX-D1000-M	L1336332-30 DUST 15-JUN-13 11:19 FOX-D1000-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	1.03		0.58		0.85
	Total Insoluble Dustfall (mg/dm2.day)	0.47		0.17		0.54
	Total Soluble Dustfall (mg/dm2.day)	0.56		0.41		0.31
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.000351		0.00123		0.000371
	Chloride (Cl) (mg/dm2.day)	0.0456		0.0351		0.0336
	Nitrate (as N) (mg/dm2.day)	0.00154		0.00204		0.00113
	Sulfate (SO4) (mg/dm2.day)	0.0055		0.0076		0.0051
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.000410		0.00646	
	Antimony (Sb)-Total (mg/dm2.day)		<0.0000012		<0.0000012	
	Arsenic (As)-Total (mg/dm2.day)		<0.0000012		<0.0000012	
	Barium (Ba)-Total (mg/dm2.day)		0.0000247		0.000183	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000058		<0.0000058	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000058		<0.0000058	
	Boron (B)-Total (mg/dm2.day)		<0.00012		<0.00012	
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00000058		<0.00000058	
	Calcium (Ca)-Total (mg/dm2.day)		0.00282		0.00501	
	Chromium (Cr)-Total (mg/dm2.day)		<0.0000058		0.0000248	
	Cobalt (Co)-Total (mg/dm2.day)		0.0000016		0.0000052	
	Copper (Cu)-Total (mg/dm2.day)		0.000271		0.000109	
	Lead (Pb)-Total (mg/dm2.day)		0.00000362		0.00000353	
	Lithium (Li)-Total (mg/dm2.day)		<0.000058		<0.000058	
	Magnesium (Mg)-Total (mg/dm2.day)		0.00144		0.00740	
	Manganese (Mn)-Total (mg/dm2.day)		0.0000711		0.000129	
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000058		<0.00000058	
	Molybdenum (Mo)-Total (mg/dm2.day)		<0.00000058		<0.00000058	
	Nickel (Ni)-Total (mg/dm2.day)		0.0000077		0.0000400	
	Potassium (K)-Total (mg/dm2.day)		0.0107		0.00710	
	Selenium (Se)-Total (mg/dm2.day)		<0.000012		<0.000012	
	Silver (Ag)-Total (mg/dm2.day)		<0.00000012		<0.00000012	
	Sodium (Na)-Total (mg/dm2.day)		0.00146		0.00170	
	Strontium (Sr)-Total (mg/dm2.day)		0.0000123		0.0000456	
	Thallium (Tl)-Total (mg/dm2.day)		<0.0000012		<0.0000012	
	Tin (Sn)-Total (mg/dm2.day)		<0.0000012		<0.0000012	
	Uranium (U)-Total (mg/dm2.day)		<0.00000012		0.00000024	
	Vanadium (V)-Total (mg/dm2.day)		<0.000012		0.000019	
	Zinc (Zn)-Total (mg/dm2.day)		0.000076		0.000062	

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1336332-31 DUST 15-JUN-13 11:42 FOX-D90-M	L1336332-32 DUST 15-JUN-13 13:30 MIS-D300-P	L1336332-33 DUST 15-JUN-13 09:51 MIS-U30-P	L1336332-34 DUST 15-JUN-13 14:16 FOX-U30-P	
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		1.53	4.73	17.2	
	Total Insoluble Dustfall (mg/dm2.day)		0.52	4.49	16.8	
	Total Soluble Dustfall (mg/dm2.day)		1.01	0.23	0.37	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.000521	0.000172	0.000313	
	Chloride (Cl) (mg/dm2.day)		0.0419	0.0187	0.0272	
	Nitrate (as N) (mg/dm2.day)		0.00109	0.000113	0.00103	
	Sulfate (SO4) (mg/dm2.day)		0.0055	0.0107	0.0213	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.0493				
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000012				
	Arsenic (As)-Total (mg/dm2.day)	0.0000031				
	Barium (Ba)-Total (mg/dm2.day)	0.000999				
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000058				
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000058				
	Boron (B)-Total (mg/dm2.day)	<0.00012				
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000058				
	Calcium (Ca)-Total (mg/dm2.day)	0.0238				
	Chromium (Cr)-Total (mg/dm2.day)	0.000172				
	Cobalt (Co)-Total (mg/dm2.day)	0.0000357				
	Copper (Cu)-Total (mg/dm2.day)	0.000163				
	Lead (Pb)-Total (mg/dm2.day)	0.00000715				
	Lithium (Li)-Total (mg/dm2.day)	0.000075				
	Magnesium (Mg)-Total (mg/dm2.day)	0.0504				
	Manganese (Mn)-Total (mg/dm2.day)	0.000727				
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000058				
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000274				
	Nickel (Ni)-Total (mg/dm2.day)	0.000250				
	Potassium (K)-Total (mg/dm2.day)	0.0418				
	Selenium (Se)-Total (mg/dm2.day)	<0.000012				
	Silver (Ag)-Total (mg/dm2.day)	<0.00000012				
	Sodium (Na)-Total (mg/dm2.day)	0.0116				
	Strontium (Sr)-Total (mg/dm2.day)	0.000308				
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012				
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012				
	Uranium (U)-Total (mg/dm2.day)	0.00000172				
	Vanadium (V)-Total (mg/dm2.day)	0.000130				
	Zinc (Zn)-Total (mg/dm2.day)	0.000194				



## Reference Information

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>CL-IC-VA</b>	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>DUSTFALLS-COM-DM2-VA</b>	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE
This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate." Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.			
<b>HG-DUST(DM2-CVAFS-VA</b>	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			
<b>MET-DUST(DM2)-MS-VA</b>	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
<b>NH3-F-VA</b>	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifically carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
<b>NO3-IC-VA</b>	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>SO4-IC-VA</b>	Dustfall	Dustfall Sulfate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulfate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			

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

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

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

## Chain of Custody Numbers:

## GLOSSARY OF REPORT TERMS

*Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.*

*mg/kg - milligrams per kilogram based on dry weight of sample.*

*mg/kg wwt - milligrams per kilogram based on wet weight of sample.*

*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.*

*mg/L - milligrams per litre.*

*< - Less than.*

*D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*



5.0.44810

Form 69111



**bhpbilliton**

8081 Lougheed Highway • Suite 100 • Burnaby,

Tel: 604-253-4188 Toll Free: 1-800-665-0243 FAX: 604-253-6700

ALS Contact: Can Dang

BHP Billiton Diamonds Inc.

# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1

Tel: 867-880-2157 Fax: 867-880-4012

BHP Contacts: David Bruce / Richard Ehlert

# CHAIN OF CUSTODY FORM

L1336332

For Lab Use

FOR LAB USE ONLY

Station ID	Matrix	Date	Time	Init	Ammonia	Chloride	Dustfall Metals	Insoluble Particulate	Nitrate	Soluble Particulate	Sulphate	Total Particulate								
Air-P125-M	Dust	15-Jun-2013	10:45 AM	KJ									BHP2							
Air-P125-P	Dust	15-Jun-2013	10:46 AM	KJ	1	1		1	1	1	1	1	BHP2							
Fox-D300-M	Dust	15-Jun-2013	11:32 AM	DB				1					BHP2							
Fox-D300-P	Dust	15-Jun-2013	11:32 AM	DB	1	1		1	1	1	1	1	BHP2							
Fox-D30-M	Dust	15-Jun-2013	01:39 PM	KJ				1					BHP2							
Fox-D30-P	Dust	15-Jun-2013	01:38 PM	KJ	1	1		1	1	1	1	1	BHP2							
Fox-D90-P	Dust	15-Jun-2013	01:49 PM	KJ	1	1		1	1	1	1	1	BHP2							
Fox-U30-M	Dust	15-Jun-2013	02:08 PM	KJ				1					BHP2							
LLCF-PA-M	Dust	15-Jun-2013	11:50 AM	KJ				1					BHP2							
LLCF-PA-P	Dust	15-Jun-2013	11:51 AM	KJ	1	1		1	1	1	1	1	BHP2							
LLCF-PB-M	Dust	15-Jun-2013	11:20 AM	KJ				1					BHP2							
LLCF-PB-P	Dust	15-Jun-2013	11:21 AM	KJ	1	1		1	1	1	1	1	BHP2							
MIS-D1000-M	Dust	15-Jun-2013	01:16 PM	DB				1					BHP2							
MIS-D1000-P	Dust	15-Jun-2013	01:16 PM	DB	1	1		1	1	1	1	1	BHP2							
MIS-D300-M	Dust	15-Jun-2013	01:30 PM	DB				1					BHP2							
Mis-D30-M	Dust	15-Jun-2013	10:05 AM	DB				1					BHP2							
Mis-D30-P	Dust	15-Jun-2013	10:06 AM	DB	1	1		1	1	1	1	1	BHP2							
Mis-D90-M	Dust	15-Jun-2013	09:54 AM	DB				1					BHP2							
Mis-D90-P	Dust	15-Jun-2013	09:55 AM	DB	1	1		1	1	1	1	1	BHP2							
Mis-U30-M	Dust	15-Jun-2013	09:50 AM	KJ				1					BHP2							



L1336332-COFC

Turn around Required: Regular two-week turn around time.

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2503

Relinquished by:	Date	Received by:	Date
	Time		Time
Relinquished by:	Date	Received by:	Date
	Time		Time

**FOR LAB USE ONLY**

Cooler seal intact upon receipt? ☐ Yes ☐ No ☒ N/A

Sample temperature upon receipt: 16.9 c. 16.6

Frozen? ☐ Yes ☒ No 15.8

Send Analytical Results to:

compliance.team@bhpbilliton.com;

PAGE 1 OF 2



8081 Lougheed Highway • Suite 100 • Burnaby,  
Tel: 604-253-4188 Toll Free: 1-800-665-0243 FAX: 604-253-6700  
**ALS Contact: Can Dang**

**BHP Billiton Diamonds Inc.**  
# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1  
Tel: 867-880-2157 Fax: 867-880-4012  
**BHP Contacts: David Bruce/ Richard Ehler/David**

## CHAIN OF CUSTODY FORM

L1336332

[illegible]

Turn around Required: Regular two-week turn around time.

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2503

Relinquished by:	Date	Received by:	Date
	Time		Time
Relinquished by:	Date	Received by:	Date <i>July 22</i>
	Time	<i>Elise</i>	Time <i>19:10</i>

FOR LAB USE ONLY

Cooler seal intact upon receipt? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample temperature upon receipt: <u>16.9</u> C. Frozen? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <u>158</u>
--	---

**Send Analytical Results to:**

compliance.team@bhpbilliton.com;

16.6  
15.3  
16.6



Dominion Diamond Ekati Corporation (DDEC)  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 21-AUG-13  
Report Date: 30-AUG-13 20:14 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1351109  
**Project P.O. #:** BHP2503  
**Job Reference:** 69149  
**C of C Numbers:** 69149 page 1 of 2, 69149 page 2 of 2  
**Legal Site Desc:** 6201104485

Can Dang  
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

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ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1351109-1 DUSTFALL 15-JUL-13 14:00 AIR-P125-M (DEP JULY 15 - RET AUG 15)	L1351109-2 DUSTFALL 15-JUL-13 14:00 AIR-P125-P (DEP JULY 15 - RET AUG 15)	L1351109-3 DUSTFALL 15-JUL-13 13:50 AIR-P162-M (DEP JULY 15 - RET AUG 15)	L1351109-4 DUSTFALL 15-JUL-13 13:50 AIR-P162-P (DEP JULY 15 - RET AUG 15)	L1351109-5 DUSTFALL 15-JUL-13 13:40 AIR-P280-M (DEP JULY 15 - RET AUG 15)
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.70		1.31	
	Total Insoluble Dustfall (mg/dm2.day)		0.39		0.49	
	Total Soluble Dustfall (mg/dm2.day)		0.31		0.81	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.000266		0.00162	
	Chloride (Cl) (mg/dm2.day)		0.0282		0.0489	
	Nitrate (as N) (mg/dm2.day)		0.00129		0.00122	
	Sulfate (SO4) (mg/dm2.day)		0.0067		0.0089	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.00281		0.00376		0.0116
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000011		<0.0000011		<0.0000011
	Arsenic (As)-Total (mg/dm2.day)	<0.0000011		<0.0000011		0.0000013
	Barium (Ba)-Total (mg/dm2.day)	0.0000942		0.0000991		0.000328
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000056		<0.0000056		<0.0000056
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000056		<0.0000056		<0.0000056
	Boron (B)-Total (mg/dm2.day)	<0.00011		<0.00011		<0.00011
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000056		<0.00000056		<0.00000056
	Calcium (Ca)-Total (mg/dm2.day)	0.00658		0.00704		0.0140
	Chromium (Cr)-Total (mg/dm2.day)	0.0000127		0.0000160		0.0000470
	Cobalt (Co)-Total (mg/dm2.day)	0.0000027		0.0000038		0.0000103
	Copper (Cu)-Total (mg/dm2.day)	0.000219		0.000252		0.000241
	Lead (Pb)-Total (mg/dm2.day)	0.00000947		0.00000548		0.00000492
	Lithium (Li)-Total (mg/dm2.day)	<0.000056		<0.000056		<0.000056
	Magnesium (Mg)-Total (mg/dm2.day)	0.00381		0.00637		0.0152
	Manganese (Mn)-Total (mg/dm2.day)	0.000182		0.000199		0.000306
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000056		<0.00000056		<0.00000056
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000056		0.00000078		0.00000117
	Nickel (Ni)-Total (mg/dm2.day)	0.0000257		0.0000342		0.0000919
	Potassium (K)-Total (mg/dm2.day)	0.00412		0.0190		0.0141
	Selenium (Se)-Total (mg/dm2.day)	<0.000011		<0.000011		<0.000011
	Silver (Ag)-Total (mg/dm2.day)	0.00000014		<0.00000011		<0.00000011
	Sodium (Na)-Total (mg/dm2.day)	0.00088		0.00294		0.00402
	Strontium (Sr)-Total (mg/dm2.day)	0.0000414		0.0000478		0.000127
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011		<0.0000011		<0.0000011
	Tin (Sn)-Total (mg/dm2.day)	<0.0000011		<0.0000011		<0.0000011
	Uranium (U)-Total (mg/dm2.day)	0.00000021		0.00000020		0.00000062
	Vanadium (V)-Total (mg/dm2.day)	<0.000011		0.000011		0.000034
	Zinc (Zn)-Total (mg/dm2.day)	0.000092		0.000103		0.000116

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1351109-6 DUSTFALL 15-JUL-13 13:40 AIR-P280-P (DEP JULY 15 - RET AUG 15)	L1351109-7 DUSTFALL 15-JUL-13 13:39 AQ-49-M (DEP JULY 15 - RET AUG 15)	L1351109-8 DUSTFALL 15-JUL-13 13:39 AQ-49-P (DEP JULY 15 - RET AUG 15)	L1351109-9 DUSTFALL 15-JUL-13 13:21 AQ-54-M (DEP JULY 15 - RET AUG 15)	L1351109-10 DUSTFALL 15-JUL-13 13:21 AQ-54-P (DEP JULY 15 - RET AUG 15)
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	1.60		0.75		0.34
	Total Insoluble Dustfall (mg/dm2.day)	1.21		<0.10		<0.10
	Total Soluble Dustfall (mg/dm2.day)	0.39		0.67		0.31
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.000164		0.00050		0.00212
	Chloride (Cl) (mg/dm2.day)	0.0466		0.0700		0.0385
	Nitrate (as N) (mg/dm2.day)	0.00163		0.00132		0.00127
	Sulfate (SO4) (mg/dm2.day)	0.0084		<0.0051		0.0053
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.000241		0.000358	
	Antimony (Sb)-Total (mg/dm2.day)		<0.0000011		<0.0000011	
	Arsenic (As)-Total (mg/dm2.day)		<0.0000011		<0.0000011	
	Barium (Ba)-Total (mg/dm2.day)		0.0000196		0.0000110	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000056		<0.0000056	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000056		<0.0000056	
	Boron (B)-Total (mg/dm2.day)		<0.00011		<0.00011	
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00000056		<0.00000056	
	Calcium (Ca)-Total (mg/dm2.day)		0.00461		0.00442	
	Chromium (Cr)-Total (mg/dm2.day)		<0.0000056		<0.0000056	
	Cobalt (Co)-Total (mg/dm2.day)		<0.0000011		<0.0000011	
	Copper (Cu)-Total (mg/dm2.day)		0.000290		0.000336	
	Lead (Pb)-Total (mg/dm2.day)		0.00000277		0.00000262	
	Lithium (Li)-Total (mg/dm2.day)		<0.000056		<0.000056	
	Magnesium (Mg)-Total (mg/dm2.day)		0.00111		0.000667	
	Manganese (Mn)-Total (mg/dm2.day)		0.0000490		0.0000520	
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000056		<0.00000056	
	Molybdenum (Mo)-Total (mg/dm2.day)		<0.00000056		0.00000147	
	Nickel (Ni)-Total (mg/dm2.day)		0.0000105		<0.0000056	
	Potassium (K)-Total (mg/dm2.day)		0.00527		0.00265	
	Selenium (Se)-Total (mg/dm2.day)		<0.000011		<0.000011	
	Silver (Ag)-Total (mg/dm2.day)		<0.00000011		0.00000029	
	Sodium (Na)-Total (mg/dm2.day)		0.00247		0.00177	
	Strontium (Sr)-Total (mg/dm2.day)		0.0000167		0.0000142	
	Thallium (Tl)-Total (mg/dm2.day)		<0.0000011		<0.0000011	
	Tin (Sn)-Total (mg/dm2.day)		<0.0000011		<0.0000011	
	Uranium (U)-Total (mg/dm2.day)		<0.00000011		<0.00000011	
	Vanadium (V)-Total (mg/dm2.day)		<0.000011		<0.000011	
	Zinc (Zn)-Total (mg/dm2.day)		0.000082		0.000157	

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



# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1351109-11 DUSTFALL 15-JUL-13 14:01 FOX-D1000-M (DEP JULY 15 - RET AUG 15)	L1351109-12 DUSTFALL 15-JUL-13 14:01 FOX-D1000-P (DEP JULY 15 - RET AUG 15)	L1351109-13 DUSTFALL 15-JUL-13 14:16 FOX-D300-M (DEP JULY 15 - RET AUG 15)	L1351109-14 DUSTFALL 15-JUL-13 14:16 FOX-D300-P (DEP JULY 15 - RET AUG 15)	L1351109-15 DUSTFALL 15-JUL-13 14:39 FOX-D30-M (DEP JULY 15 - RET AUG 15)
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.57		1.13	
	Total Insoluble Dustfall (mg/dm2.day)		0.28		0.85	
	Total Soluble Dustfall (mg/dm2.day)		0.29		0.28	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.000236		0.000136	
	Chloride (Cl) (mg/dm2.day)		0.0401		0.0367	
	Nitrate (as N) (mg/dm2.day)		0.00106		0.00114	
	Sulfate (SO4) (mg/dm2.day)		0.0055		0.0075	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.00493		0.0103		0.0653
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000011		<0.0000011		<0.0000011
	Arsenic (As)-Total (mg/dm2.day)	<0.0000011		<0.0000011		0.0000044
	Barium (Ba)-Total (mg/dm2.day)	0.000148		0.000201		0.00121
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000056		<0.0000056		<0.0000056
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000056		<0.0000056		<0.0000056
	Boron (B)-Total (mg/dm2.day)	<0.00011		<0.00011		<0.00011
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000056		<0.00000056		<0.00000056
	Calcium (Ca)-Total (mg/dm2.day)	0.00789		0.00967		0.0365
	Chromium (Cr)-Total (mg/dm2.day)	0.0000194		0.0000368		0.000230
	Cobalt (Co)-Total (mg/dm2.day)	0.0000042		0.0000075		0.0000482
	Copper (Cu)-Total (mg/dm2.day)	0.000229		0.000178		0.000277
	Lead (Pb)-Total (mg/dm2.day)	0.00000527		0.00000367		0.0000125
	Lithium (Li)-Total (mg/dm2.day)	<0.000056		<0.000056		0.000105
	Magnesium (Mg)-Total (mg/dm2.day)	0.00542		0.0113		0.0692
	Manganese (Mn)-Total (mg/dm2.day)	0.000161		0.000229		0.000968
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000056		<0.00000056		<0.00000056
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000064		0.00000116		0.00000601
	Nickel (Ni)-Total (mg/dm2.day)	0.0000350		0.0000547		0.000349
	Potassium (K)-Total (mg/dm2.day)	0.00490		0.0106		0.0504
	Selenium (Se)-Total (mg/dm2.day)	<0.000011		<0.000011		<0.000011
	Silver (Ag)-Total (mg/dm2.day)	0.00000011		0.00000033		0.00000025
	Sodium (Na)-Total (mg/dm2.day)	0.00218		0.00368		0.0181
	Strontium (Sr)-Total (mg/dm2.day)	0.0000496		0.0000855		0.000481
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011		<0.0000011		<0.0000011
	Tin (Sn)-Total (mg/dm2.day)	0.000105		<0.0000011		0.0000013
	Uranium (U)-Total (mg/dm2.day)	0.00000102		0.00000037		0.00000266
	Vanadium (V)-Total (mg/dm2.day)	0.000015		0.000028		0.000173
	Zinc (Zn)-Total (mg/dm2.day)	0.000089		0.000119		0.000337

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1351109-16 DUSTFALL 15-JUL-13 14:39 FOX-D30-P (DEP JULY 15 - RET AUG 15)	L1351109-17 DUSTFALL 15-JUL-13 14:28 FOX-D90-M (DEP JULY 15 - RET AUG 15)	L1351109-18 DUSTFALL 15-JUL-13 14:28 FOX-D90-P (DEP JULY 15 - RET AUG 15)	L1351109-19 DUSTFALL 15-JUL-13 14:53 FOX-U30-M (DEP JULY 15 - RET AUG 15)	L1351109-20 DUSTFALL 15-JUL-13 17:15 LLCF-PA-M (DEP JULY 15 - RET AUG 15)
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	12.4		2.88		
	Total Insoluble Dustfall (mg/dm2.day)	11.9		2.56		
	Total Soluble Dustfall (mg/dm2.day)	0.50		0.32		
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	<0.0013		0.000131		
	Chloride (Cl) (mg/dm2.day)	0.0468		0.0407		
	Nitrate (as N) (mg/dm2.day)	0.00176		0.00133		
	Sulfate (SO4) (mg/dm2.day)	0.0284		0.0134		
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.0226		0.193	0.00132
	Antimony (Sb)-Total (mg/dm2.day)		<0.0000011		<0.0000011	<0.0000011
	Arsenic (As)-Total (mg/dm2.day)		0.0000015		0.0000131	<0.0000011
	Barium (Ba)-Total (mg/dm2.day)		0.000392		0.00363	0.0000399
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000056		<0.0000056	<0.0000056
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000056		<0.0000056	<0.0000056
	Boron (B)-Total (mg/dm2.day)		<0.00011		<0.00011	<0.00011
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00000056		0.00000106	<0.00000056
	Calcium (Ca)-Total (mg/dm2.day)		0.0168		0.0875	0.00348
	Chromium (Cr)-Total (mg/dm2.day)		0.0000766		0.000660	0.0000075
	Cobalt (Co)-Total (mg/dm2.day)		0.0000160		0.000141	0.0000017
	Copper (Cu)-Total (mg/dm2.day)		0.000234		0.000318	0.0000927
	Lead (Pb)-Total (mg/dm2.day)		0.00000413		0.0000266	0.00000104
	Lithium (Li)-Total (mg/dm2.day)		<0.000056		0.000298	<0.000056
	Magnesium (Mg)-Total (mg/dm2.day)		0.0237		0.198	0.00431
	Manganese (Mn)-Total (mg/dm2.day)		0.000364		0.00273	0.0000562
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000056		<0.00000056	<0.00000056
	Molybdenum (Mo)-Total (mg/dm2.day)		0.00000212		0.0000142	<0.00000056
	Nickel (Ni)-Total (mg/dm2.day)		0.000116		0.000974	0.0000206
	Potassium (K)-Total (mg/dm2.day)		0.0214		0.130	0.0275
	Selenium (Se)-Total (mg/dm2.day)		<0.000011		<0.000011	<0.000011
	Silver (Ag)-Total (mg/dm2.day)		<0.00000011		0.00000050	<0.00000011
	Sodium (Na)-Total (mg/dm2.day)		0.00827		0.0419	0.00782
	Strontium (Sr)-Total (mg/dm2.day)		0.000182		0.00124	0.0000300
	Thallium (Tl)-Total (mg/dm2.day)		<0.0000011		0.0000024	<0.0000011
	Tin (Sn)-Total (mg/dm2.day)		<0.0000011		0.0000041	<0.0000011
	Uranium (U)-Total (mg/dm2.day)		0.00000093		0.00000879	<0.00000011
	Vanadium (V)-Total (mg/dm2.day)		0.000058		0.000511	<0.000011
	Zinc (Zn)-Total (mg/dm2.day)		0.000146		0.000904	0.000057

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1351109-21 DUSTFALL 15-JUL-13 17:15 LLCF-PA-P (DEP JULY 15 - RET AUG 15)	L1351109-22 DUSTFALL 15-JUL-13 16:56 LLCF-PB-M (DEP JULY 15 - RET AUG 15)	L1351109-23 DUSTFALL 15-JUL-13 16:56 LLCF-PB-P (DEP JULY 15 - RET AUG 15)	L1351109-24 DUSTFALL 15-JUL-13 15:20 MIS-D1000-M (DEP JULY 15 - RET AUG 15)	L1351109-25 DUSTFALL 15-JUL-13 15:20 MIS-D1000-P (DEP JULY 15 - RET AUG 15)
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	0.77		0.90		0.53
	Total Insoluble Dustfall (mg/dm2.day)	0.30		0.46		0.18
	Total Soluble Dustfall (mg/dm2.day)	0.48		0.45		0.35
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.00132		0.00236		0.000958
	Chloride (Cl) (mg/dm2.day)	0.0222		0.0165		0.0351
	Nitrate (as N) (mg/dm2.day)	0.000681		0.000618		0.000893
	Sulfate (SO4) (mg/dm2.day)	0.0072		<0.0051		<0.0051
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.00254		0.00158	
	Antimony (Sb)-Total (mg/dm2.day)		<0.0000011		<0.0000011	
	Arsenic (As)-Total (mg/dm2.day)		<0.0000011		<0.0000011	
	Barium (Ba)-Total (mg/dm2.day)		0.0000678		0.0000301	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000056		<0.0000056	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000056		<0.0000056	
	Boron (B)-Total (mg/dm2.day)		<0.00011		<0.00011	
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00000056		<0.00000056	
	Calcium (Ca)-Total (mg/dm2.day)		0.00702		0.00625	
	Chromium (Cr)-Total (mg/dm2.day)		0.0000123		0.0000066	
	Cobalt (Co)-Total (mg/dm2.day)		0.0000029		0.0000014	
	Copper (Cu)-Total (mg/dm2.day)		0.000171		0.000257	
	Lead (Pb)-Total (mg/dm2.day)		0.00000167		0.00000222	
	Lithium (Li)-Total (mg/dm2.day)		<0.000056		<0.000056	
	Magnesium (Mg)-Total (mg/dm2.day)		0.00607		0.00219	
	Manganese (Mn)-Total (mg/dm2.day)		0.0000878		0.0000714	
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000056		<0.00000056	
	Molybdenum (Mo)-Total (mg/dm2.day)		0.00000059		<0.00000056	
	Nickel (Ni)-Total (mg/dm2.day)		0.0000360		0.0000213	
	Potassium (K)-Total (mg/dm2.day)		0.0331		0.00429	
	Selenium (Se)-Total (mg/dm2.day)		<0.000011		<0.000011	
	Silver (Ag)-Total (mg/dm2.day)		<0.00000011		0.00000017	
	Sodium (Na)-Total (mg/dm2.day)		0.00873		0.00256	
	Strontium (Sr)-Total (mg/dm2.day)		0.0000479		0.0000279	
	Thallium (Tl)-Total (mg/dm2.day)		<0.0000011		<0.0000011	
	Tin (Sn)-Total (mg/dm2.day)		<0.0000011		<0.0000011	
	Uranium (U)-Total (mg/dm2.day)		0.00000012		<0.00000011	
	Vanadium (V)-Total (mg/dm2.day)		<0.000011		<0.000011	
	Zinc (Zn)-Total (mg/dm2.day)		0.000058		0.000082	

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1351109-26 DUSTFALL 15-JUL-13 15:54 MIS-D300-M (DEP JULY 15 - RET AUG 15)	L1351109-27 DUSTFALL 15-JUL-13 15:54 MIS-D300-P (DEP JULY 15 - RET AUG 15)	L1351109-28 DUSTFALL 15-JUL-13 15:00 MIS-D30-M (DEP JULY 15 - RET AUG 15)	L1351109-29 DUSTFALL 15-JUL-13 15:00 MIS-D30-P (DEP JULY 15 - RET AUG 15)	L1351109-30 DUSTFALL 15-JUL-13 16:04 MIS-D90-M (DEP JULY 15 - RET AUG 15)
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		1.11		11.2	
	Total Insoluble Dustfall (mg/dm2.day)		0.82		10.8	
	Total Soluble Dustfall (mg/dm2.day)		0.29		0.44	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.000465		0.00026	
	Chloride (Cl) (mg/dm2.day)		0.0372		0.0379	
	Nitrate (as N) (mg/dm2.day)		0.00109		0.00146	
	Sulfate (SO4) (mg/dm2.day)		0.0056		0.0296	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.00878		0.0704		0.0296
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000011		<0.0000011		<0.0000011
	Arsenic (As)-Total (mg/dm2.day)	<0.0000011		0.0000047		0.0000024
	Barium (Ba)-Total (mg/dm2.day)	0.000147		0.00132		0.000482
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000056		<0.0000056		<0.0000056
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000056		<0.0000056		<0.0000056
	Boron (B)-Total (mg/dm2.day)	<0.00011		<0.00011		<0.00011
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000056		<0.00000056		<0.00000056
	Calcium (Ca)-Total (mg/dm2.day)	0.00679		0.0271		0.0143
	Chromium (Cr)-Total (mg/dm2.day)	0.0000303		0.000233		0.0000935
	Cobalt (Co)-Total (mg/dm2.day)	0.0000066		0.0000500		0.0000206
	Copper (Cu)-Total (mg/dm2.day)	0.000176		0.000164		0.000163
	Lead (Pb)-Total (mg/dm2.day)	0.00000300		0.0000140		0.00000512
	Lithium (Li)-Total (mg/dm2.day)	<0.000056		0.000149		0.000061
	Magnesium (Mg)-Total (mg/dm2.day)	0.00798		0.0646		0.0257
	Manganese (Mn)-Total (mg/dm2.day)	0.000179		0.00116		0.000480
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000056		<0.00000056		<0.00000056
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000062		0.00000316		0.00000212
	Nickel (Ni)-Total (mg/dm2.day)	0.0000372		0.000268		0.000112
	Potassium (K)-Total (mg/dm2.day)	0.00728		0.0634		0.0275
	Selenium (Se)-Total (mg/dm2.day)	<0.000011		<0.000011		<0.000011
	Silver (Ag)-Total (mg/dm2.day)	0.00000012		0.00000016		<0.00000011
	Sodium (Na)-Total (mg/dm2.day)	0.00259		0.0139		0.00703
	Strontium (Sr)-Total (mg/dm2.day)	0.0000503		0.000302		0.000136
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011		0.0000014		<0.0000011
	Tin (Sn)-Total (mg/dm2.day)	<0.0000011		0.0000016		<0.0000011
	Uranium (U)-Total (mg/dm2.day)	0.00000042		0.00000391		0.00000182
	Vanadium (V)-Total (mg/dm2.day)	0.000026		0.000212		0.000081
	Zinc (Zn)-Total (mg/dm2.day)	0.000075		0.000336		0.000145

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1351109-31 DUSTFALL 15-JUL-13 16:04 MIS-D90-P (DEP JULY 15 - RET AUG 15)	L1351109-32 DUSTFALL 15-JUL-13 15:00 MIS-U30-M (DEP JULY 15 - RET AUG 15)	L1351109-33 DUSTFALL 15-JUL-13 15:00 MIS-U30-P (DEP JULY 15 - RET AUG 15)	L1351109-34 DUSTFALL 15-JUL-13 14:53 FOX-U30-P (DEP JULY 15 - RET AUG 15)	
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	2.96		35.9	18.3	
	Total Insoluble Dustfall (mg/dm2.day)	2.65		35.4	17.7	
	Total Soluble Dustfall (mg/dm2.day)	0.31		0.53	0.55	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.000207		0.000190	0.000598	
	Chloride (Cl) (mg/dm2.day)	0.0386		0.0324	0.0464	
	Nitrate (as N) (mg/dm2.day)	0.00143		0.00186	0.00155	
	Sulfate (SO4) (mg/dm2.day)	0.0081		0.0430	0.0408	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.358 <sup>DLA</sup>			
	Antimony (Sb)-Total (mg/dm2.day)		<0.0000022			
	Arsenic (As)-Total (mg/dm2.day)		0.0000206			
	Barium (Ba)-Total (mg/dm2.day)		0.00704 <sup>DLA</sup>			
	Beryllium (Be)-Total (mg/dm2.day)		<0.000011 <sup>DLA</sup>			
	Bismuth (Bi)-Total (mg/dm2.day)		<0.000011 <sup>DLA</sup>			
	Boron (B)-Total (mg/dm2.day)		<0.00022 <sup>DLA</sup>			
	Cadmium (Cd)-Total (mg/dm2.day)		<0.0000011 <sup>DLA</sup>			
	Calcium (Ca)-Total (mg/dm2.day)		0.103			
	Chromium (Cr)-Total (mg/dm2.day)		0.00121			
	Cobalt (Co)-Total (mg/dm2.day)		0.000262			
	Copper (Cu)-Total (mg/dm2.day)		0.000437			
	Lead (Pb)-Total (mg/dm2.day)		0.0000480			
	Lithium (Li)-Total (mg/dm2.day)		0.00072			
	Magnesium (Mg)-Total (mg/dm2.day)		0.328			
	Manganese (Mn)-Total (mg/dm2.day)		0.00593			
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000056			
	Molybdenum (Mo)-Total (mg/dm2.day)		0.0000124			
	Nickel (Ni)-Total (mg/dm2.day)		0.00127			
	Potassium (K)-Total (mg/dm2.day)		0.261 <sup>DLA</sup>			
	Selenium (Se)-Total (mg/dm2.day)		<0.000022			
	Silver (Ag)-Total (mg/dm2.day)		0.00000060			
	Sodium (Na)-Total (mg/dm2.day)		0.0395			
	Strontium (Sr)-Total (mg/dm2.day)		0.00121			
	Thallium (Tl)-Total (mg/dm2.day)		0.0000065			
	Tin (Sn)-Total (mg/dm2.day)		0.0000083			
	Uranium (U)-Total (mg/dm2.day)		0.0000191			
	Vanadium (V)-Total (mg/dm2.day)		0.00108			
	Zinc (Zn)-Total (mg/dm2.day)		0.00129			

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

## Reference Information

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit Adjusted For required dilution

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>CL-IC-VA</b>	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>DUSTFALLS-COM-DM2-VA</b>	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE
This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate." Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.			
<b>HG-DUST(DM2-CVAFS-VA</b>	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			
<b>MET-DUST(DM2)-MS-VA</b>	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
<b>NH3-F-VA</b>	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifically carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
<b>NO3-IC-VA</b>	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>SO4-IC-VA</b>	Dustfall	Dustfall Sulfate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulfate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			

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

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

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

## Chain of Custody Numbers:

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## Reference Information

### GLOSSARY OF REPORT TERMS

*Surrogate* - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

*mg/kg* - milligrams per kilogram based on dry weight of sample.

*mg/kg ww* - milligrams per kilogram based on wet weight of sample.

*mg/kg lw* - 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.*



8081 Lougheed Highway • Suite 100 • Burnaby,  
Tel: 604-253-4188 Toll Free: 1-800-665-0243 FAX: 604-253-6700  
ALS Contact: Can Dang

S.O. 44059

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Form 69149

BHP Billiton Diamonds Inc.  
# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1  
Tel: 867-880-2157 Fax: 867-880-4012  
BHP Contacts: David Bruce / Richard Ehler



bhpbilliton

# CHAIN OF CUSTODY FORM

L1351109



L1351109-COFC

For Lab Use

FOR LAB USE ONLY

Station ID	Matrix	Date	Time	Init	Ammonia	Chloride	Dustfall Metals	Insoluble Particulate	Nitrate	Soluble Particulate	Sulphate	Total Particulate
1 Air-P125-M	Dust	15-Jul-2013	02:00 PM	JP			1	1	1	1	1	BHP2
2 Air-P125-P	Dust	15-Jul-2013	02:00 PM	JP	1	1	1	1	1	1	1	BHP2
3 Air-P162-M	Dust	15-Jul-2013	01:50 PM	JP			1	1	1	1	1	BHP2
4 Air-P162-P	Dust	15-Jul-2013	01:50 PM	JP	1	1	1	1	1	1	1	BHP2
5 Air-P280-M	Dust	15-Jul-2013	01:40 PM	JP			1	1	1	1	1	BHP2
6 Air-P280-P	Dust	15-Jul-2013	01:40 PM	JP	1	1	1	1	1	1	1	BHP2
7 AQ-49-M	Dust	15-Jul-2013	01:39 PM	DB			1	1	1	1	1	BHP2
8 AQ-49-P	Dust	15-Jul-2013	01:39 PM	DB	1	1	1	1	1	1	1	BHP2
9 AQ-54-M	Dust	15-Jul-2013	01:21 PM	DB			1	1	1	1	1	BHP2
10 AQ-54-P	Dust	15-Jul-2013	01:21 PM	DB	1	1	1	1	1	1	1	BHP2
11 FOX-D1000-M	Dust	15-Jul-2013	02:01 PM	DB			1	1	1	1	1	BHP2
12 FOX-D1000-P	Dust	15-Jul-2013	02:01 PM	DB	1	1	1	1	1	1	1	BHP2
13 Fox-D300-M	Dust	15-Jul-2013	02:16 PM	DB			1	1	1	1	1	BHP2
14 Fox-D300-P	Dust	15-Jul-2013	02:16 PM	DB	1	1	1	1	1	1	1	BHP2
15 Fox-D30-M	Dust	15-Jul-2013	02:39 PM	DB			1	1	1	1	1	BHP2
16 Fox-D30-P	Dust	15-Jul-2013	02:39 PM	DB	1	1	1	1	1	1	1	BHP2
17 Fox-D90-M	Dust	15-Jul-2013	02:28 PM	DB			1	1	1	1	1	BHP2
18 Fox-D90-P	Dust	15-Jul-2013	02:28 PM	DB	1	1	1	1	1	1	1	BHP2
19 Fox-U30-M	Dust	15-Jul-2013	02:53 PM	DB			1	1	1	1	1	BHP2
20 LLCF-PA-M	Dust	15-Jul-2013	05:15 PM	DB			1					BHP2

Turn around Required: Regular 2-week turn around time.

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2503

Please refer to the sample labels and ignore the writing on the canisters.

Relinquished by:

Date

19.12/15.28  
18.30/18.46

Time

Received by:

YC

Date

Aug 21  
11.28

Time

Relinquished by:

Date

Time

Received by:

Date

Time

FOR LAB USE ONLY

Cooler seal intact upon receipt?

Sample temperature upon receipt:

C.

☐ Yes ☐ No ☐ N/A

Frozen? ☐ Yes ☐ No

Send Analytical Results to:

compliance.team@bhpbilliton.com;





8081 Lougheed Highway • Suite 100 • Burnaby,  
Tel: 604-253-4188 Toll Free: 1-800-665-0243 FAX: 604-253-6700  
ALS Contact: Can Dang

S.O. 44059

PAGE 1 OF 2  
Form 69149  
BHP Billiton Diamonds Inc.  
# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1  
Tel: 867-880-2157 Fax: 867-880-4012  
BHP Contacts: David Bruce/ Richard EhlerDavid

bhpbilliton

## CHAIN OF CUSTODY FORM



L1351109-COFC

For Lab Use

Station ID	Matrix	Date	Time	Init	Ammonia	Chloride	Dustfall Metals	Insoluble Particulate	Nitrate	Soluble Particulate	Sulphate	Total Particulate	
21	LLCF-PA-P	Dust	15-Jul-2013	05:15 PM	OB	1	1	1	1	1	1	1	BHP2
22	LLCF-PB-M	Dust	15-Jul-2013	04:56 PM	OB	1	1	1	1	1	1	1	BHP2
23	LLCF-PB-P	Dust	15-Jul-2013	04:56 PM	OB	1	1	1	1	1	1	1	BHP2
24	MIS-D1000-M	Dust	15-Jul-2013	03:20 PM	OB	1	1	1	1	1	1	1	BHP2
25	MIS-D1000-P	Dust	15-Jul-2013	03:20 PM	OB	1	1	1	1	1	1	1	BHP2
26	Mis-D300-M	Dust	15-Jul-2013	03:54 PM	OB	1	1	1	1	1	1	1	BHP2
27	Mis-D300-P	Dust	15-Jul-2013	03:54 PM	OB	1	1	1	1	1	1	1	BHP2
28	Mis-D30-M	Dust	15-Jul-2013	03:00 PM	JP	1	1	1	1	1	1	1	BHP2
29	Mis-D30-P	Dust	15-Jul-2013	03:00 PM	JP	1	1	1	1	1	1	1	BHP2
30	Mis-D90-M	Dust	15-Jul-2013	04:04 PM	OB	1	1	1	1	1	1	1	BHP2
31	Mis-D90-P	Dust	15-Jul-2013	04:04 PM	OB	1	1	1	1	1	1	1	BHP2
32	Mis-U30-M	Dust	15-Jul-2013	03:00 PM	JP	1	1	1	1	1	1	1	BHP2
33	Mis-U30-P	Dust	15-Jul-2013	03:00 PM	JP	1	1	1	1	1	1	1	BHP2
34	Fox-U30-P	Dust	15-Jul-2013	02:53 PM	OB	1	1	1	1	1	1	1	BHP2

Turn around Required: Regular 2-week turn around time.

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2503

Please refer to the sample labels and ignore the writing on the canisters.

Relinquished by: [Signature]	Date: 19-1/18-2	Received by: YC	Date: Aug 21
Relinquished by:	Date: 18-3/18-4	Received by:	Date: 11-25

FOR LAB USE ONLY			
Cooler seal intact upon receipt?		Sample temperature upon receipt: ____ C.	
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No

Send Analytical Results to:

compliance.team@bhpbilliton.com;



Dominion Diamond Ekati Corporation (DDEC)  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 02-OCT-13  
Report Date: 11-OCT-13 14:51 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1372020  
**Project P.O. #:** BHP2503  
**Job Reference:** 69185  
**C of C Numbers:** 2, 69185  
**Legal Site Desc:** 6201104485

Can Dang  
Senior Account Manager

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# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1372020-1 dust 15-AUG-13 10:00 AQ-54-M	L1372020-2 dust 15-AUG-13 09:59 AQ-54-P	L1372020-3 dust 15-AUG-13 10:33 FOX-D1000-M	L1372020-4 dust 15-AUG-13 14:27 FOX-D90-M	L1372020-5 dust 15-AUG-13 17:29 LLCF-PB-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.29			
	Total Insoluble Dustfall (mg/dm2.day)		<0.10			
	Total Soluble Dustfall (mg/dm2.day)		0.27			
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.00206			
	Chloride (Cl) (mg/dm2.day)		0.041			
	Nitrate (as N) (mg/dm2.day)		0.00082			
	Sulfate (SO4) (mg/dm2.day)		<0.011			
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.000305		0.00183	0.0956	0.00372
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000018		<0.0000017	<0.0000017	<0.0000018
	Arsenic (As)-Total (mg/dm2.day)	<0.0000018		0.0000018	0.0000068	<0.0000018
	Barium (Ba)-Total (mg/dm2.day)	0.0000152		0.000141	0.00193	0.000102
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000089		<0.0000086	<0.0000086	<0.0000089
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000089		<0.0000086	<0.0000086	<0.0000089
	Boron (B)-Total (mg/dm2.day)	<0.00018		<0.00017	<0.00017	<0.00018
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000089		<0.00000086	<0.00000086	0.0000149
	Calcium (Ca)-Total (mg/dm2.day)	0.00171		0.00560	0.0487	0.00752
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000089		<0.0000086	0.000331	0.0000194
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000018		0.0000018	0.0000703	0.0000041
	Copper (Cu)-Total (mg/dm2.day)	0.000439		0.000410	0.000210	0.000192
	Lead (Pb)-Total (mg/dm2.day)	0.00000557		0.00000389	0.0000163	0.0000103
	Lithium (Li)-Total (mg/dm2.day)	<0.000089		<0.000086	0.000145	<0.000089
	Magnesium (Mg)-Total (mg/dm2.day)	0.000392		0.00244	0.102	0.0129
	Manganese (Mn)-Total (mg/dm2.day)	0.0000211		0.0000479	0.00139	0.000117
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000089		<0.00000086	<0.00000086	<0.00000089
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000089		<0.00000086	0.00000595	0.00000129
	Nickel (Ni)-Total (mg/dm2.day)	<0.0000089		0.0000183	0.000531	0.0000417
	Potassium (K)-Total (mg/dm2.day)	<0.00089		0.00454	0.0593	0.0711
	Selenium (Se)-Total (mg/dm2.day)	<0.000018		<0.000017	<0.000017	<0.000018
	Silver (Ag)-Total (mg/dm2.day)	<0.00000018		<0.00000017	0.00000032	0.00000025
	Sodium (Na)-Total (mg/dm2.day)	<0.00089		0.00209	0.0209	0.0144
	Strontium (Sr)-Total (mg/dm2.day)	<0.0000053 <sup>DLB</sup>		0.0000422	0.000694	0.0000731
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000018		<0.0000017	<0.0000017	<0.0000018
	Tin (Sn)-Total (mg/dm2.day)	<0.0000018		<0.0000017	0.0000019	<0.0000018
	Uranium (U)-Total (mg/dm2.day)	<0.00000018		<0.00000017	0.00000365	0.00000022
	Vanadium (V)-Total (mg/dm2.day)	<0.000018		<0.000017	0.000239	<0.000018
	Zinc (Zn)-Total (mg/dm2.day)	0.000076		0.000071	0.000364	0.000402

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1372020-6 dust 15-AUG-13 17:29 LLCF-PB-P	L1372020-7 dust 15-AUG-13 10:59 MIS-D1000-M	L1372020-8 dust 15-AUG-13 10:59 MIS-D1000-P	L1372020-9 dust 15-AUG-13 11:07 MIS-D300-M	L1372020-10 dust 15-AUG-13 11:09 MIS-D300-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	1.21		0.38		0.53
	Total Insoluble Dustfall (mg/dm2.day)	0.66		0.11		0.48
	Total Soluble Dustfall (mg/dm2.day)	0.55		0.26		<0.10
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	<0.0054		0.00102		<0.000099
	Chloride (Cl) (mg/dm2.day)	0.053		0.0419		0.0285
	Nitrate (as N) (mg/dm2.day)	0.00106		0.000923		0.000995
	Sulfate (SO4) (mg/dm2.day)	<0.011		<0.0089		<0.0099
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.00119		0.00289	
	Antimony (Sb)-Total (mg/dm2.day)		<0.0000016		<0.0000016	
	Arsenic (As)-Total (mg/dm2.day)		<0.0000016		<0.0000016	
	Barium (Ba)-Total (mg/dm2.day)		0.0000537		0.000113	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000081		<0.0000081	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000081		<0.0000081	
	Boron (B)-Total (mg/dm2.day)		<0.00016		<0.00016	
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00000081		<0.00000081	
	Calcium (Ca)-Total (mg/dm2.day)		0.00208		0.00406	
	Chromium (Cr)-Total (mg/dm2.day)		<0.0000081		0.0000109	
	Cobalt (Co)-Total (mg/dm2.day)		0.0000017		0.0000023	
	Copper (Cu)-Total (mg/dm2.day)		0.000340		0.000235	
	Lead (Pb)-Total (mg/dm2.day)		0.00000671		0.00000274	
	Lithium (Li)-Total (mg/dm2.day)		<0.000081		<0.000081	
	Magnesium (Mg)-Total (mg/dm2.day)		0.00146		0.00344	
	Manganese (Mn)-Total (mg/dm2.day)		0.000104		0.0000694	
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000081		<0.00000081	
	Molybdenum (Mo)-Total (mg/dm2.day)		<0.00000081		<0.00000081	
	Nickel (Ni)-Total (mg/dm2.day)		0.0000103		0.0000252	
	Potassium (K)-Total (mg/dm2.day)		0.00208		0.00799	
	Selenium (Se)-Total (mg/dm2.day)		<0.000016		<0.000016	
	Silver (Ag)-Total (mg/dm2.day)		<0.00000016		<0.00000016	
	Sodium (Na)-Total (mg/dm2.day)		<0.00081		0.00263	
	Strontium (Sr)-Total (mg/dm2.day)		<0.000015 <sup>DLB</sup>		<0.000027 <sup>DLB</sup>	
	Thallium (Tl)-Total (mg/dm2.day)		<0.0000016		<0.0000016	
	Tin (Sn)-Total (mg/dm2.day)		<0.0000016		<0.0000016	
	Uranium (U)-Total (mg/dm2.day)		<0.00000016		<0.00000016	
	Vanadium (V)-Total (mg/dm2.day)		<0.000016		<0.000016	
	Zinc (Zn)-Total (mg/dm2.day)		0.000095		0.000232	

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



# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1372020-11 dust 15-AUG-13 15:48 MIS-D30-M	L1372020-12 dust 15-AUG-13 15:48 MIS-D30-P	L1372020-13 dust 15-AUG-13 15:41 MIS-D90-M	L1372020-14 dust 15-AUG-13 14:03 FOX-U30-P	L1372020-15 dust 15-AUG-13 16:32 AIR-P125-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		7.49		25.1	
	Total Insoluble Dustfall (mg/dm2.day)		7.40		24.7	
	Total Soluble Dustfall (mg/dm2.day)		<0.10		0.39	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.00150		<0.00010	
	Chloride (Cl) (mg/dm2.day)		0.031		0.052	
	Nitrate (as N) (mg/dm2.day)		0.00148		0.00141	
	Sulfate (SO4) (mg/dm2.day)		0.016		0.039	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.115		0.0308		0.00403
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000018		<0.0000019		<0.0000022
	Arsenic (As)-Total (mg/dm2.day)	0.0000087		0.0000032		<0.0000022
	Barium (Ba)-Total (mg/dm2.day)	0.00211		0.000667		0.000114
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000088		<0.0000095		<0.000011
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000088		<0.0000095		<0.000011
	Boron (B)-Total (mg/dm2.day)	<0.00018		<0.00019		<0.00022
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000088		<0.00000095		<0.0000011
	Calcium (Ca)-Total (mg/dm2.day)	0.0427		0.0111		0.00274
	Chromium (Cr)-Total (mg/dm2.day)	0.000363		0.0000982		0.000016
	Cobalt (Co)-Total (mg/dm2.day)	0.0000778		0.0000204		0.0000033
	Copper (Cu)-Total (mg/dm2.day)	0.000394		0.000234		0.000099
	Lead (Pb)-Total (mg/dm2.day)	0.0000216		0.00000702		0.0000071
	Lithium (Li)-Total (mg/dm2.day)	0.000202		<0.000095		<0.00011
	Magnesium (Mg)-Total (mg/dm2.day)	0.0993		0.0265		0.00471
	Manganese (Mn)-Total (mg/dm2.day)	0.00177		0.000494		0.0000738
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000088		<0.00000095		<0.0000011
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000667		0.00000168		<0.0000011
	Nickel (Ni)-Total (mg/dm2.day)	0.000437		0.000117		0.000027
	Potassium (K)-Total (mg/dm2.day)	0.0753		0.0249		0.0038
	Selenium (Se)-Total (mg/dm2.day)	<0.000018		<0.000019		<0.000022
	Silver (Ag)-Total (mg/dm2.day)	0.00000038		<0.00000019		<0.00000022
	Sodium (Na)-Total (mg/dm2.day)	0.0197		0.00557		<0.0011
	Strontium (Sr)-Total (mg/dm2.day)	0.000563		0.000149		<0.000032 <sup>DLB</sup>
	Thallium (Tl)-Total (mg/dm2.day)	0.0000022		<0.0000019		<0.0000022
	Tin (Sn)-Total (mg/dm2.day)	0.0000032		<0.0000019		<0.0000022
	Uranium (U)-Total (mg/dm2.day)	0.00000618		0.00000141		<0.00000022
	Vanadium (V)-Total (mg/dm2.day)	0.000298		0.000082		<0.000022
	Zinc (Zn)-Total (mg/dm2.day)	0.000491		0.000165		0.000070

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1372020-16 dust 15-AUG-13 16:32 AIR-P125-P	L1372020-17 dust 15-AUG-13 16:45 AIR-P162-M	L1372020-18 dust 15-AUG-13 16:45 AIR-P162-P	L1372020-19 dust 15-AUG-13 16:57 AIR-P280-M	L1372020-20 dust 15-AUG-13 16:57 AIR-P280-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	0.91		0.44		1.23
	Total Insoluble Dustfall (mg/dm2.day)	0.57		0.35		0.91
	Total Soluble Dustfall (mg/dm2.day)	0.34		<0.10		0.33
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.00058		0.00442		<0.00010
	Chloride (Cl) (mg/dm2.day)	0.059		0.026		0.057
	Nitrate (as N) (mg/dm2.day)	0.00101		0.00125		0.00106
	Sulfate (SO4) (mg/dm2.day)	<0.011		<0.015		<0.010
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.00364		0.00260	
	Antimony (Sb)-Total (mg/dm2.day)		<0.0000021		<0.0000017	
	Arsenic (As)-Total (mg/dm2.day)		0.0000052		<0.0000017	
	Barium (Ba)-Total (mg/dm2.day)		0.000103		0.000204	
	Beryllium (Be)-Total (mg/dm2.day)		<0.000011		<0.0000086	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.000011		<0.0000086	
	Boron (B)-Total (mg/dm2.day)		<0.00021		<0.00017	
	Cadmium (Cd)-Total (mg/dm2.day)		<0.0000011		<0.00000086	
	Calcium (Ca)-Total (mg/dm2.day)		0.00376		0.00556	
	Chromium (Cr)-Total (mg/dm2.day)		0.000016		0.0000112	
	Cobalt (Co)-Total (mg/dm2.day)		0.0000030		0.0000030	
	Copper (Cu)-Total (mg/dm2.day)		0.000149		0.0000724	
	Lead (Pb)-Total (mg/dm2.day)		0.0000035		0.00000159	
	Lithium (Li)-Total (mg/dm2.day)		<0.00011		<0.000086	
	Magnesium (Mg)-Total (mg/dm2.day)		0.00584		0.00407	
	Manganese (Mn)-Total (mg/dm2.day)		0.0000868		0.0000942	
	Mercury (Hg)-Total (mg/dm2.day)		<0.0000011		<0.00000086	
	Molybdenum (Mo)-Total (mg/dm2.day)		<0.0000011		<0.00000086	
	Nickel (Ni)-Total (mg/dm2.day)		0.000027		0.0000296	
	Potassium (K)-Total (mg/dm2.day)		0.0162		0.00602	
	Selenium (Se)-Total (mg/dm2.day)		<0.000021		<0.000017	
	Silver (Ag)-Total (mg/dm2.day)		<0.00000021		<0.00000017	
	Sodium (Na)-Total (mg/dm2.day)		0.0036		0.00170	
	Strontium (Sr)-Total (mg/dm2.day)		<0.000038 <sup>DLB</sup>		0.0000685	
	Thallium (Tl)-Total (mg/dm2.day)		<0.0000021		<0.0000017	
	Tin (Sn)-Total (mg/dm2.day)		<0.0000021		<0.0000017	
	Uranium (U)-Total (mg/dm2.day)		0.00000022		<0.00000017	
	Vanadium (V)-Total (mg/dm2.day)		<0.000021		<0.000017	
	Zinc (Zn)-Total (mg/dm2.day)		0.000168		0.000067	

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1372020-21 dust 15-AUG-13 10:16 AQ-49-M	L1372020-22 dust 15-AUG-13 10:15 AQ-49-P	L1372020-23 dust 15-AUG-13 10:34 FOX-D1000-P	L1372020-24 dust 15-AUG-13 10:46 FOX-D300-M	L1372020-25 dust 15-AUG-13 10:48 FOX-D300-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.49	0.44		3.42
	Total Insoluble Dustfall (mg/dm2.day)		0.20	0.43		3.35
	Total Soluble Dustfall (mg/dm2.day)		0.29	<0.10		<0.10
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.00238	<0.00012		0.000472
	Chloride (Cl) (mg/dm2.day)		0.0415	0.029		0.0350
	Nitrate (as N) (mg/dm2.day)		0.00107	<0.00012		0.00130
	Sulfate (SO4) (mg/dm2.day)		<0.0095	<0.012		0.0100
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.000355			0.0370	
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000016			<0.0000014	
	Arsenic (As)-Total (mg/dm2.day)	<0.0000016			0.0000028	
	Barium (Ba)-Total (mg/dm2.day)	0.0000148			0.000878	
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000079			<0.0000069	
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000079			<0.0000069	
	Boron (B)-Total (mg/dm2.day)	<0.00016			<0.00014	
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000079			<0.00000069	
	Calcium (Ca)-Total (mg/dm2.day)	0.00122			0.0197	
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000079			0.000129	
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000016			0.0000272	
	Copper (Cu)-Total (mg/dm2.day)	0.000203			0.000328	
	Lead (Pb)-Total (mg/dm2.day)	0.00000222			0.00000660	
	Lithium (Li)-Total (mg/dm2.day)	<0.000079			<0.000069	
	Magnesium (Mg)-Total (mg/dm2.day)	0.000854			0.0393	
	Manganese (Mn)-Total (mg/dm2.day)	0.0000226			0.000555	
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000079			<0.00000069	
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000084			0.00000238	
	Nickel (Ni)-Total (mg/dm2.day)	<0.0000079			0.000209	
	Potassium (K)-Total (mg/dm2.day)	0.00321			0.0284	
	Selenium (Se)-Total (mg/dm2.day)	<0.000016			<0.000014	
	Silver (Ag)-Total (mg/dm2.day)	<0.00000016			0.00000021	
	Sodium (Na)-Total (mg/dm2.day)	0.00079			0.00856	
	Strontium (Sr)-Total (mg/dm2.day)	<0.0000079 <sup>DLB</sup>			0.000281	
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000016			<0.0000014	
	Tin (Sn)-Total (mg/dm2.day)	<0.0000016			0.0000025	
	Uranium (U)-Total (mg/dm2.day)	<0.00000016			0.00000126	
	Vanadium (V)-Total (mg/dm2.day)	<0.000016			0.000096	
	Zinc (Zn)-Total (mg/dm2.day)	0.000060			0.000162	

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1372020-26 dust 15-AUG-13 14:21 FOX-D30-M	L1372020-27 dust 15-AUG-13 14:21 FOX-D30-P	L1372020-28 dust 15-AUG-13 14:27 FOX-D90-P	L1372020-29 dust 15-AUG-13 14:02 FOX-U30-M	L1372020-30 dust 15-AUG-13 17:15 LLCF-PA-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		35.7	6.00		
	Total Insoluble Dustfall (mg/dm2.day)		35.3	5.86		
	Total Soluble Dustfall (mg/dm2.day)		0.39	0.13		
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		<0.00015	0.00019		
	Chloride (Cl) (mg/dm2.day)		0.046	0.046		
	Nitrate (as N) (mg/dm2.day)		<0.00015	0.00089		
	Sulfate (SO4) (mg/dm2.day)		0.050	0.013		
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.301			0.180	0.00357
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000020			<0.0000016	<0.0000021
	Arsenic (As)-Total (mg/dm2.day)	0.0000206			0.0000116	<0.0000021
	Barium (Ba)-Total (mg/dm2.day)	0.00597			0.00352	0.000110
	Beryllium (Be)-Total (mg/dm2.day)	<0.000010			<0.0000081	<0.000010
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000010			<0.0000081	<0.000010
	Boron (B)-Total (mg/dm2.day)	<0.00020			<0.00016	<0.00021
	Cadmium (Cd)-Total (mg/dm2.day)	<0.0000010			<0.00000081	0.0000064
	Calcium (Ca)-Total (mg/dm2.day)	0.146			0.0967	0.00655
	Chromium (Cr)-Total (mg/dm2.day)	0.00106			0.000596	0.000018
	Cobalt (Co)-Total (mg/dm2.day)	0.000226			0.000128	0.0000045
	Copper (Cu)-Total (mg/dm2.day)	0.000287			0.000334	0.000247
	Lead (Pb)-Total (mg/dm2.day)	0.0000447			0.0000271	0.0000029
	Lithium (Li)-Total (mg/dm2.day)	0.00047			0.000270	<0.00010
	Magnesium (Mg)-Total (mg/dm2.day)	0.327			0.184	0.0107
	Manganese (Mn)-Total (mg/dm2.day)	0.00442			0.00254	0.000109
	Mercury (Hg)-Total (mg/dm2.day)	<0.0000010			<0.00000081	<0.0000010
	Molybdenum (Mo)-Total (mg/dm2.day)	0.0000205			0.0000132	0.0000015
	Nickel (Ni)-Total (mg/dm2.day)	0.00165			0.000935	0.000055
	Potassium (K)-Total (mg/dm2.day)	0.186			0.114	0.0412
	Selenium (Se)-Total (mg/dm2.day)	<0.000020			<0.000016	<0.000021
	Silver (Ag)-Total (mg/dm2.day)	0.00000046			0.00000039	0.00000021
	Sodium (Na)-Total (mg/dm2.day)	0.0606			0.0432	0.0101
	Strontium (Sr)-Total (mg/dm2.day)	0.00201			0.00143	0.0000796
	Thallium (Tl)-Total (mg/dm2.day)	0.0000040			0.0000023	<0.0000021
	Tin (Sn)-Total (mg/dm2.day)	0.0000059			0.0000036	<0.0000021
	Uranium (U)-Total (mg/dm2.day)	0.0000148			0.00000730	<0.00000021
	Vanadium (V)-Total (mg/dm2.day)	0.000790			0.000448	<0.000021
	Zinc (Zn)-Total (mg/dm2.day)	0.00108			0.000646	0.000311

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1372020-31 dust 15-AUG-13 17:15 LLCF-PA-P	L1372020-32 dust 15-AUG-13 15:41 MIS-D90-P	L1372020-33 dust 15-AUG-13 16:00 MIS-U30-M	L1372020-34 dust 15-AUG-13 16:00 MIS-U30-P	
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	2.29	2.00		14.9	
	Total Insoluble Dustfall (mg/dm2.day)	1.49	1.89		14.7	
	Total Soluble Dustfall (mg/dm2.day)	0.80	0.10		0.19	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	<0.0058	0.00328		0.00111	
	Chloride (Cl) (mg/dm2.day)	0.051	0.037		0.042	
	Nitrate (as N) (mg/dm2.day)	0.00138	0.00108		0.00175	
	Sulfate (SO4) (mg/dm2.day)	<0.012	<0.010		0.028	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)			0.204		
	Antimony (Sb)-Total (mg/dm2.day)			<0.0000018		
	Arsenic (As)-Total (mg/dm2.day)			0.0000151		
	Barium (Ba)-Total (mg/dm2.day)			0.00362		
	Beryllium (Be)-Total (mg/dm2.day)			<0.0000091		
	Bismuth (Bi)-Total (mg/dm2.day)			<0.0000091		
	Boron (B)-Total (mg/dm2.day)			<0.00018		
	Cadmium (Cd)-Total (mg/dm2.day)			<0.00000091		
	Calcium (Ca)-Total (mg/dm2.day)			0.0772		
	Chromium (Cr)-Total (mg/dm2.day)			0.000637		
	Cobalt (Co)-Total (mg/dm2.day)			0.000134		
	Copper (Cu)-Total (mg/dm2.day)			0.000211		
	Lead (Pb)-Total (mg/dm2.day)			0.0000325		
	Lithium (Li)-Total (mg/dm2.day)			0.000361		
	Magnesium (Mg)-Total (mg/dm2.day)			0.175		
	Manganese (Mn)-Total (mg/dm2.day)			0.00307		
	Mercury (Hg)-Total (mg/dm2.day)			<0.00000091		
	Molybdenum (Mo)-Total (mg/dm2.day)			0.00000976		
	Nickel (Ni)-Total (mg/dm2.day)			0.000757		
	Potassium (K)-Total (mg/dm2.day)			0.132		
	Selenium (Se)-Total (mg/dm2.day)			<0.000018		
	Silver (Ag)-Total (mg/dm2.day)			0.00000043		
	Sodium (Na)-Total (mg/dm2.day)			0.0342		
	Strontium (Sr)-Total (mg/dm2.day)			0.00104		
	Thallium (Tl)-Total (mg/dm2.day)			0.0000031		
	Tin (Sn)-Total (mg/dm2.day)			0.0000048		
	Uranium (U)-Total (mg/dm2.day)			0.0000112		
	Vanadium (V)-Total (mg/dm2.day)			0.000528		
	Zinc (Zn)-Total (mg/dm2.day)			0.000685		

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

## Reference Information

### Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>CL-IC-VA</b>	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>DUSTFALLS-COM-DM2-VA</b>	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE
This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate." Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.			
<b>HG-DUST(DM2-CVAFS-VA</b>	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			
<b>MET-DUST(DM2)-MS-VA</b>	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
<b>NH3-F-VA</b>	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifically carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
<b>NO3-IC-VA</b>	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>SO4-IC-VA</b>	Dustfall	Dustfall Sulfate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulfate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			

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

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

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

### Chain of Custody Numbers:

2	69185
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## Reference Information

### GLOSSARY OF REPORT TERMS

*Surrogate* - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

*mg/kg* - milligrams per kilogram based on dry weight of sample.

*mg/kg ww* - milligrams per kilogram based on wet weight of sample.

*mg/kg lw* - milligrams per kilogram based on lipid-adjusted weight of sample.

*mg/L* - milligrams per litre.

*<* - Less than.

*D.L.* - The reported Detection Limit, also known as the Limit of Reporting (LOR).

*N/A* - Result not available. Refer to qualifier code and definition for explanation.

*Test results reported relate only to the samples as received by the laboratory.*

**UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.**

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*

**ALS Contact:** Can Dang

So # 44765

## CHAIN OF CUSTODY FORM



bhpbilliton


**BHP Contacts:** David Bruce/ Richard Ehler/David

Station ID	Matrix	Date	Time	Init	Al	de	Metals	articulate	le	articulate	ate	aculate								
LAQ-54-M	Dust	15-Sep-2013	10:29 AM	KP		1						BHP2								
LAQ-54-P	Dust	15-Sep-2013	10:28 AM	KP	1	1		1	1	1	1	BHP2								
FOX-D1000-M	Dust	15-Sep-2013	09:59 AM	KP			1					BHP2								
FOX-D90-M	Dust	17-Sep-2013	04:30 PM	KP			1					BHP2								
LLCF-PB-M	Dust	15-Sep-2013	03:20 PM	KJ			1					BHP2								
LLCF-PB-P	Dust	15-Sep-2013	03:21 PM	KJ	1	1		1	1	1	1	BHP2								
MIS-D1000-M	Dust	15-Sep-2013	09:49 AM	KP			1					BHP2								
MIS-D1000-P	Dust	15-Sep-2013	09:48 AM	KP	1	1		1	1	1	1	BHP2								
Mis-D300-M	Dust	25-Sep-2013	11:08 AM	JH			1					BHP2								
Mis-D300-P	Dust	25-Sep-2013	11:09 AM	JH	1	1		1	1	1	1	BHP2								
Mis-D30-M	Dust	17-Sep-2013	01:30 PM	KP			1					BHP2								
Mis-D30-P	Dust	17-Sep-2013	01:30 PM	KP	1	1		1	1	1	1	BHP2								
Mis-D90-M	Dust	17-Sep-2013	01:30 PM	KP			1					BHP2								
FOX-U30-P	Dust	17-Sep-2013	05:00 PM	KP	1	1		1	1	1	1	BHP2								

FOR LAB USE ONLY

For Lab Use

Short Holding Time  
Rush Processing


  
L1372020-COFC

Date on COC = retrieval date; please see individual canisters for installation dates and times

compliance.team@ekati.ddcorp.ca;

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8081 Lougheed Highway • Suite 100 • Burnaby,  
Tel: 604-253-4188 Toll Free: 1-800-665-0243 FAX: 604-253-6700  
ALS Contact: Can Dang

2/2

Form 69185

BHP Billiton Diamonds Inc.  
# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1  
Tel: 867-880-2157 Fax: 867-880-4012  
BHP Contacts: David Bruce / Richard Ehler



## CHAIN OF CUSTODY FORM

For Lab Use

FOR LAB USE ONLY

Station ID	Matrix	Date	Time	Init	Ammonia	Chloride	Dustfall Metals	Insoluble Particulate	Nitrate	Soluble Particulate	Sulphate	Total Particulate								
✓ Air-P125-M	Dust	16-Sep-2013	03:00 PM	KP			1						BHP2							
✓ Air-P125-P	Dust	16-Sep-2013	03:00 PM	KP	1	1		1	1	1	1	1	BHP2							
✓ Air-P162-M	Dust	16-Sep-2013	03:00 PM	KP			1						BHP2							
✓ Air-P162-P	Dust	16-Sep-2013	03:00 PM	KP	1	1		1	1	1	1	1	BHP2							
✓ Air-P280-M	Dust	16-Sep-2013	03:10 PM	KP			1						BHP2							
✓ Air-P280-P	Dust	16-Sep-2013	03:10 PM	KP	1	1		1	1	1	1	1	BHP2							
✓ AQ-49-M	Dust	15-Sep-2013	10:11 AM	KP			1						BHP2							
✓ AQ-49-P	Dust	15-Sep-2013	10:12 AM	KP	1	1		1	1	1	1	1	BHP2							
✓ FOX-D1000-P	Dust	15-Sep-2013	10:00 AM	KP	1	1		1	1	1	1	1	BHP2							
✓ Fox-D300-M	Dust	25-Sep-2013	10:25 AM	JH			1						BHP2							
✓ Fox-D300-P	Dust	25-Sep-2013	10:26 AM	JH	1	1		1	1	1	1	1	BHP2							
✓ Fox-D30-M	Dust	17-Sep-2013	04:30 PM	KP			1						BHP2							
✓ Fox-D30-P	Dust	17-Sep-2013	04:30 PM	KP	1	1		1	1	1	1	1	BHP2							
✓ Fox-D90-P	Dust	17-Sep-2013	04:30 PM	KP	1	1		1	1	1	1	1	BHP2							
✓ Fox-U30-M	Dust	17-Sep-2013	05:00 PM	KP			1						BHP2							
✓ LCF-PA-M	Dust	17-Sep-2013	03:35 PM	KP			1						BHP2							
✓ LCF-PA-P	Dust	17-Sep-2013	03:36 PM	KP	1	1		1	1	1	1	1	BHP2							
✓ Mls-D90-P	Dust	17-Sep-2013	01:30 PM	KP	1	1		1	1	1	1	1	BHP2							
✓ Mls-U30-M	Dust	17-Sep-2013	01:30 PM	KP			1						BHP2							
✓ Mls-U30-P	Dust	17-Sep-2013	01:30 PM	KP	1	1		1	1	1	1	1	BHP2							



L1372020-COFC

Turn around Required: Regular 2 week TAT

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2503

Keep cool but do not freeze. Please forward SRC and results to andrew.howton@ekati.ddcorp.ca

Relinquished by:	Date	Received by:	Date
	Time		Time
Relinquished by:	Date	Received by:	Date
	Time		Time

### FOR LAB USE ONLY

Cooler seal intact upon receipt?

☒ Yes ☐ No ☐ N/A

Sample temperature upon receipt: C.

Frozen? ☒ Yes ☐ No

Send Analytical Results to:

compliance.team@ekati.ddcorp.ca;

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Dominion Diamond Ekati Corporation (DDEC)  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 18-JUL-14  
Report Date: 29-JUL-14 17:38 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1489214  
**Project P.O. #:** BHP2503  
**Job Reference:** 69322  
**C of C Numbers:** 1, 2  
**Legal Site Desc:** 6201104485

Can Dang  
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1489214-1 Dust 15-JUL-14 16:00 MIS-U30-P	L1489214-2 Dust 15-JUL-14 16:00 MIS-U30-M	L1489214-3 Dust 15-JUL-14 14:59 LLCF-PB-P	L1489214-4 Dust 15-JUL-14 14:59 LLCF-PB-M	L1489214-5 Dust 15-JUL-14 14:44 LLCF-PA-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	27.7		5.25		0.75
	Total Insoluble Dustfall (mg/dm2.day)	27.2		2.40		0.50
	Total Soluble Dustfall (mg/dm2.day)	0.54		2.85		0.25
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.0217		0.0120		0.000256
	Chloride (Cl) (mg/dm2.day)	<0.0073		0.0075		<0.0052
	Nitrate (as N) (mg/dm2.day)	0.00193		0.000827		0.00148
	Sulfate (SO4) (mg/dm2.day)	0.0367		0.0413		0.0689
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.398		0.0116	
	Antimony (Sb)-Total (mg/dm2.day)		<0.0000023 <sup>DLM</sup>		<0.0000012 <sup>DLM</sup>	
	Arsenic (As)-Total (mg/dm2.day)		<0.00015		<0.000092	
	Barium (Ba)-Total (mg/dm2.day)		0.00780		0.000262	
	Beryllium (Be)-Total (mg/dm2.day)		<0.000012		<0.0000058	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.000012		<0.0000058	
	Boron (B)-Total (mg/dm2.day)		<0.00023		<0.00012	
	Cadmium (Cd)-Total (mg/dm2.day)		<0.0000012		0.00000071	
	Calcium (Ca)-Total (mg/dm2.day)		0.118		0.00912	
	Chromium (Cr)-Total (mg/dm2.day)		0.00135		0.0000502	
	Cobalt (Co)-Total (mg/dm2.day)		0.000288		0.0000116	
	Copper (Cu)-Total (mg/dm2.day)		0.000330		0.0000595	
	Lead (Pb)-Total (mg/dm2.day)		0.0000544		0.00000281	
	Lithium (Li)-Total (mg/dm2.day)		0.00070		<0.000058	
	Magnesium (Mg)-Total (mg/dm2.day)		0.368		0.0221	
	Manganese (Mn)-Total (mg/dm2.day)		0.00615		0.000398	
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000058		<0.00000058	
	Molybdenum (Mo)-Total (mg/dm2.day)		0.0000126		0.00000156	
	Nickel (Ni)-Total (mg/dm2.day)		0.00144		0.000115	
	Potassium (K)-Total (mg/dm2.day)		0.269 <sup>DLM</sup>		0.0523	
	Selenium (Se)-Total (mg/dm2.day)		<0.000023		<0.000012	
	Silver (Ag)-Total (mg/dm2.day)		0.00000070		0.00000013	
	Sodium (Na)-Total (mg/dm2.day)		0.0470		0.00514	
	Strontium (Sr)-Total (mg/dm2.day)		0.00148		0.000106	
	Thallium (Tl)-Total (mg/dm2.day)		0.0000079		<0.0000012	
	Tin (Sn)-Total (mg/dm2.day)		0.0000085		<0.0000012	
	Uranium (U)-Total (mg/dm2.day)		0.0000184		0.00000069	
	Vanadium (V)-Total (mg/dm2.day)		0.00114		0.000031	
	Zinc (Zn)-Total (mg/dm2.day)		0.00161		0.000431	

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1489214-6 Dust 15-JUL-14 14:44 LLCF-PA-M	L1489214-7 Dust 15-JUL-14 14:15 FOX-U30-P	L1489214-8 Dust 15-JUL-14 14:15 FOX-U30-M	L1489214-9 Dust 15-JUL-14 11:19 FOX-D90-P	L1489214-10 Dust 15-JUL-14 13:57 FOX-D30-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		19.5		5.46	32.3
	Total Insoluble Dustfall (mg/dm2.day)		19.1		5.23	31.7
	Total Soluble Dustfall (mg/dm2.day)		0.41		0.23	0.54
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.000119		0.000548	0.000143
	Chloride (Cl) (mg/dm2.day)		0.0064		<0.0052	0.0155
	Nitrate (as N) (mg/dm2.day)		0.00125		0.00140	0.00171
	Sulfate (SO4) (mg/dm2.day)		0.0194		0.0105	0.0399
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.0113		0.310		
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000012		<0.0000012		
	Arsenic (As)-Total (mg/dm2.day)	<0.00013 <sup>DLM</sup>		<0.00014 <sup>DLM</sup>		
	Barium (Ba)-Total (mg/dm2.day)	0.000367		0.00554		
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000058		<0.0000058		
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000058		<0.0000058		
	Boron (B)-Total (mg/dm2.day)	<0.00012		<0.00012		
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000058		<0.00000058		
	Calcium (Ca)-Total (mg/dm2.day)	0.0119		0.109		
	Chromium (Cr)-Total (mg/dm2.day)	0.0000658		0.00104		
	Cobalt (Co)-Total (mg/dm2.day)	0.0000159		0.000215		
	Copper (Cu)-Total (mg/dm2.day)	0.0000291		0.000304		
	Lead (Pb)-Total (mg/dm2.day)	0.00000346		0.0000385		
	Lithium (Li)-Total (mg/dm2.day)	<0.000058		0.000455		
	Magnesium (Mg)-Total (mg/dm2.day)	0.0288		0.296		
	Manganese (Mn)-Total (mg/dm2.day)	0.000330		0.00427		
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000058		<0.00000058		
	Molybdenum (Mo)-Total (mg/dm2.day)	0.0000128		0.0000174		
	Nickel (Ni)-Total (mg/dm2.day)	0.000211		0.00131		
	Potassium (K)-Total (mg/dm2.day)	0.00856		0.185		
	Selenium (Se)-Total (mg/dm2.day)	<0.000012		<0.000012		
	Silver (Ag)-Total (mg/dm2.day)	<0.00000012		0.00000049		
	Sodium (Na)-Total (mg/dm2.day)	0.0349		0.0537		
	Strontium (Sr)-Total (mg/dm2.day)	0.000263		0.00156		
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012		0.0000053		
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012		0.0000070		
	Uranium (U)-Total (mg/dm2.day)	0.00000074		0.0000109		
	Vanadium (V)-Total (mg/dm2.day)	0.000030		0.000829		
	Zinc (Zn)-Total (mg/dm2.day)	0.000124		0.00105		

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



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1489214-11 Dust 15-JUL-14 13:57 FOX-D30-M	L1489214-12 Dust 15-JUL-14 11:07 FOX-D300-P	L1489214-13 Dust 15-JUL-14 11:07 FOX-D300-M	L1489214-14 Dust 15-JUL-14 10:57 FOX-D1000-P	L1489214-15 Dust 15-JUL-14 10:57 FOX-D1000-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		2.17		0.81	
	Total Insoluble Dustfall (mg/dm2.day)		2.02		0.56	
	Total Soluble Dustfall (mg/dm2.day)		0.14		0.25	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.000342		0.000209	
	Chloride (Cl) (mg/dm2.day)		<0.0052		<0.0052	
	Nitrate (as N) (mg/dm2.day)		0.00122		0.000829	
	Sulfate (SO4) (mg/dm2.day)		0.0090		0.0055	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.338 <sup>DLA</sup>		0.0348		0.0141
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000023 <sup>DLA</sup>		<0.0000012 <sup>DLM</sup>		<0.0000012 <sup>DLM</sup>
	Arsenic (As)-Total (mg/dm2.day)	<0.00014 <sup>DLA</sup>		<0.00012 <sup>DLM</sup>		<0.00012 <sup>DLM</sup>
	Barium (Ba)-Total (mg/dm2.day)	0.00567 <sup>DLA</sup>		0.000608		0.000268
	Beryllium (Be)-Total (mg/dm2.day)	<0.000012 <sup>DLA</sup>		<0.0000058		<0.0000058
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000012 <sup>DLA</sup>		<0.0000058		<0.0000058
	Boron (B)-Total (mg/dm2.day)	<0.00023 <sup>DLA</sup>		<0.00012		<0.00012
	Cadmium (Cd)-Total (mg/dm2.day)	<0.0000012 <sup>DLA</sup>		<0.00000058		<0.00000058
	Calcium (Ca)-Total (mg/dm2.day)	0.115		0.0165		0.00900
	Chromium (Cr)-Total (mg/dm2.day)	0.00108		0.000114		0.0000482
	Cobalt (Co)-Total (mg/dm2.day)	0.000227		0.0000245		0.0000103
	Copper (Cu)-Total (mg/dm2.day)	0.000267		0.000246		0.0000463
	Lead (Pb)-Total (mg/dm2.day)	0.0000394		0.00000587		0.00000293
	Lithium (Li)-Total (mg/dm2.day)	0.00049		<0.000058		<0.000058
	Magnesium (Mg)-Total (mg/dm2.day)	0.321		0.0338		0.0146
	Manganese (Mn)-Total (mg/dm2.day)	0.00454		0.000596		0.000335
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000058		<0.00000058		<0.00000058
	Molybdenum (Mo)-Total (mg/dm2.day)	0.0000194		0.00000235		0.00000105
	Nickel (Ni)-Total (mg/dm2.day)	0.00139		0.000156		0.0000702
	Potassium (K)-Total (mg/dm2.day)	0.192 <sup>DLA</sup>		0.0249		0.00992
	Selenium (Se)-Total (mg/dm2.day)	<0.000023 <sup>DLA</sup>		<0.000012		<0.000012
	Silver (Ag)-Total (mg/dm2.day)	<0.00000023		<0.00000012		<0.00000012
	Sodium (Na)-Total (mg/dm2.day)	0.0982		0.00913		0.00320
	Strontium (Sr)-Total (mg/dm2.day)	0.00158		0.000200		0.0000915
	Thallium (Tl)-Total (mg/dm2.day)	0.0000054		<0.0000012		<0.0000012
	Tin (Sn)-Total (mg/dm2.day)	0.0000072		<0.0000012		<0.0000012
	Uranium (U)-Total (mg/dm2.day)	0.0000129		0.00000132		0.00000064
	Vanadium (V)-Total (mg/dm2.day)	0.000875		0.000090		0.000038
	Zinc (Zn)-Total (mg/dm2.day)	0.00114		0.000272		0.000141

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1489214-16 Dust 15-JUL-14 10:21 AQ-54-P	L1489214-17 Dust 15-JUL-14 10:21 AQ-54-M	L1489214-18 Dust 15-JUL-14 10:39 AQ-49-P	L1489214-19 Dust 15-JUL-14 16:22 AIR-P280-P	L1489214-20 Dust 15-JUL-14 16:22 AIR-P280-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	0.28		0.29	4.06	
	Total Insoluble Dustfall (mg/dm2.day)	0.13		0.16	3.91	
	Total Soluble Dustfall (mg/dm2.day)	0.16		0.13	0.14	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.000149		0.000283	0.000276	
	Chloride (Cl) (mg/dm2.day)	<0.0052		<0.0052	<0.0052	
	Nitrate (as N) (mg/dm2.day)	0.000603		0.000375	0.00118	
	Sulfate (SO4) (mg/dm2.day)	<0.0052		<0.0052	0.0075	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.000656			0.0826
	Antimony (Sb)-Total (mg/dm2.day)		<0.0000012			<0.0000012
	Arsenic (As)-Total (mg/dm2.day)		<sup>DLM</sup> <0.000069			<sup>DLM</sup> <0.000081
	Barium (Ba)-Total (mg/dm2.day)		0.0000310			0.00150
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000058			<0.0000058
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000058			<0.0000058
	Boron (B)-Total (mg/dm2.day)		<0.00012			<0.00012
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00000058			<0.00000058
	Calcium (Ca)-Total (mg/dm2.day)		0.00280			0.0267
	Chromium (Cr)-Total (mg/dm2.day)		<0.0000058			0.000310
	Cobalt (Co)-Total (mg/dm2.day)		<0.0000012			0.0000619
	Copper (Cu)-Total (mg/dm2.day)		0.000120			0.000338
	Lead (Pb)-Total (mg/dm2.day)		0.00000146			0.0000136
	Lithium (Li)-Total (mg/dm2.day)		<0.000058			0.000135
	Magnesium (Mg)-Total (mg/dm2.day)		0.00116			0.0787
	Manganese (Mn)-Total (mg/dm2.day)		0.000117			0.00131
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000058			<0.00000058
	Molybdenum (Mo)-Total (mg/dm2.day)		<0.00000058			0.00000295
	Nickel (Ni)-Total (mg/dm2.day)		0.0000099			0.000339
	Potassium (K)-Total (mg/dm2.day)		0.00269			0.0534
	Selenium (Se)-Total (mg/dm2.day)		<0.000012			<0.000012
	Silver (Ag)-Total (mg/dm2.day)		<0.00000012			0.00000018
	Sodium (Na)-Total (mg/dm2.day)		0.00090			0.0109
	Strontium (Sr)-Total (mg/dm2.day)		0.0000123			0.000337
	Thallium (Tl)-Total (mg/dm2.day)		<0.0000012			0.0000017
	Tin (Sn)-Total (mg/dm2.day)		<0.0000012			0.0000022
	Uranium (U)-Total (mg/dm2.day)		<0.00000012			0.00000348
	Vanadium (V)-Total (mg/dm2.day)		<0.000012			0.000247
	Zinc (Zn)-Total (mg/dm2.day)		0.000100			0.000356

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1489214-21 Dust 15-JUL-14 11:58 MIS-D90-P	L1489214-22 Dust 15-JUL-14 11:58 MIS-D90-M	L1489214-23 Dust 15-JUL-14 15:52 MIS-D30-P	L1489214-24 Dust 15-JUL-14 15:52 MIS-D30-M	L1489214-25 Dust 15-JUL-14 11:49 MIS-D300-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	5.47		40.1		2.43
	Total Insoluble Dustfall (mg/dm2.day)	5.29		39.6		2.32
	Total Soluble Dustfall (mg/dm2.day)	0.18		0.41		0.11
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.00522		<0.000071		0.000118
	Chloride (Cl) (mg/dm2.day)	<0.0081		<0.0071		<0.0068
	Nitrate (as N) (mg/dm2.day)	0.000939		0.00195		0.00114
	Sulfate (SO4) (mg/dm2.day)	0.0096		0.0316		<0.0068
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.193 <sup>DLB</sup>		0.425 <sup>DLA</sup>	
	Antimony (Sb)-Total (mg/dm2.day)		<0.0000023 <sup>DLM</sup>		<0.0000023 <sup>DLM</sup>	
	Arsenic (As)-Total (mg/dm2.day)		<0.00015		<0.000035	
	Barium (Ba)-Total (mg/dm2.day)		0.00370		0.00829 <sup>DLA</sup>	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000058		<0.000012 <sup>DLA</sup>	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000058		<0.000012 <sup>DLA</sup>	
	Boron (B)-Total (mg/dm2.day)		<0.00012		<0.00023 <sup>DLA</sup>	
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00000058		<0.0000012 <sup>DLA</sup>	
	Calcium (Ca)-Total (mg/dm2.day)		0.0651		0.127	
	Chromium (Cr)-Total (mg/dm2.day)		0.000632		0.00143	
	Cobalt (Co)-Total (mg/dm2.day)		0.000134		0.000302	
	Copper (Cu)-Total (mg/dm2.day)		0.000479		0.000466	
	Lead (Pb)-Total (mg/dm2.day)		0.0000287		0.0000584	
	Lithium (Li)-Total (mg/dm2.day)		0.000324		0.00074	
	Magnesium (Mg)-Total (mg/dm2.day)		0.169		0.384	
	Manganese (Mn)-Total (mg/dm2.day)		0.00296		0.00651	
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000058		<0.00000058	
	Molybdenum (Mo)-Total (mg/dm2.day)		0.00000596		0.0000131	
	Nickel (Ni)-Total (mg/dm2.day)		0.000685		0.00151	
	Potassium (K)-Total (mg/dm2.day)		0.121		0.296 <sup>DLA</sup>	
	Selenium (Se)-Total (mg/dm2.day)		<0.000012		<0.000023	
	Silver (Ag)-Total (mg/dm2.day)		0.00000048		0.00000077	
	Sodium (Na)-Total (mg/dm2.day)		0.0282		0.0537	
	Strontium (Sr)-Total (mg/dm2.day)		0.000876		0.00162	
	Thallium (Tl)-Total (mg/dm2.day)		0.0000037		0.0000085	
	Tin (Sn)-Total (mg/dm2.day)		0.0000045		0.0000096	
	Uranium (U)-Total (mg/dm2.day)		0.00000860		0.0000191	
	Vanadium (V)-Total (mg/dm2.day)		0.000533		0.00122	
	Zinc (Zn)-Total (mg/dm2.day)		0.000705		0.00153	

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1489214-26 Dust 15-JUL-14 11:49 MIS-D300-M	L1489214-27 Dust 15-JUL-14 11:35 MIS-D1000-P	L1489214-28 Dust 15-JUL-14 11:35 MIS-D1000-M	L1489214-29 Dust 15-JUL-14 11:19 FOX-D90-M	L1489214-30 Dust 15-JUL-14 10:39 AQ-49-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.56			
	Total Insoluble Dustfall (mg/dm2.day)		0.42			
	Total Soluble Dustfall (mg/dm2.day)		0.13			
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.00279			
	Chloride (Cl) (mg/dm2.day)		<0.0076			
	Nitrate (as N) (mg/dm2.day)		0.000922			
	Sulfate (SO4) (mg/dm2.day)		<0.0076			
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.0356		0.00985	0.0877	0.00123
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000012		<0.0000012	<0.0000012	<0.0000012
	Arsenic (As)-Total (mg/dm2.day)	<0.00012 <sup>DLM</sup>		<0.00014 <sup>DLM</sup>	<0.00013 <sup>DLM</sup>	<0.000069 <sup>DLM</sup>
	Barium (Ba)-Total (mg/dm2.day)	0.000662		0.000170	0.00153	0.0000374
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000058		<0.0000058	<0.0000058	<0.0000058
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000058		<0.0000058	<0.0000058	<0.0000058
	Boron (B)-Total (mg/dm2.day)	<0.00012		<0.00012	<0.00012	<0.00012
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000058		<0.00000058	<0.00000058	<0.00000058
	Calcium (Ca)-Total (mg/dm2.day)	0.0142		0.00628	0.0331	0.00387
	Chromium (Cr)-Total (mg/dm2.day)	0.000117		0.0000306	0.000299	<0.0000058
	Cobalt (Co)-Total (mg/dm2.day)	0.0000248		0.0000068	0.0000624	0.0000013
	Copper (Cu)-Total (mg/dm2.day)	0.0000542		0.000313	0.000149	0.000198
	Lead (Pb)-Total (mg/dm2.day)	0.00000655		0.00000781	0.0000131	0.00000165
	Lithium (Li)-Total (mg/dm2.day)	0.000061		<0.000058	0.000131	<0.000058
	Magnesium (Mg)-Total (mg/dm2.day)	0.0317		0.00884	0.0838	0.00213
	Manganese (Mn)-Total (mg/dm2.day)	0.000584		0.000254	0.00132	0.000167
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000058		<0.00000058	<0.00000058	<0.00000058
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000131		0.00000154	0.00000535	<0.00000058
	Nickel (Ni)-Total (mg/dm2.day)	0.000140		0.0000401	0.000384	0.0000107
	Potassium (K)-Total (mg/dm2.day)	0.0253		0.0106	0.0534	0.00237
	Selenium (Se)-Total (mg/dm2.day)	<0.000012		<0.000012	<0.000012	<0.000012
	Silver (Ag)-Total (mg/dm2.day)	0.00000013		0.00000026	0.00000027	<0.00000012
	Sodium (Na)-Total (mg/dm2.day)	0.00617		0.00331	0.0173	0.00093
	Strontium (Sr)-Total (mg/dm2.day)	0.000176		0.0000552	0.000464	0.0000206
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012		<0.0000012	0.0000015	<0.0000012
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012		0.0000021	0.0000020	<0.0000012
	Uranium (U)-Total (mg/dm2.day)	0.00000167		0.00000067	0.00000369	0.00000013
	Vanadium (V)-Total (mg/dm2.day)	0.000096		0.000025	0.000234	<0.000012
	Zinc (Zn)-Total (mg/dm2.day)	0.000214		0.000170	0.000411	0.000065

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1489214-31 Dust 15-JUL-14 16:55 AIR-P162-P	L1489214-32 Dust 15-JUL-14 16:55 AIR-P162-M	L1489214-33 Dust 15-JUL-14 16:40 AIR-P125-P	L1489214-34 Dust 15-JUL-14 16:40 AIR-P125-M	
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	0.77		0.77		
	Total Insoluble Dustfall (mg/dm2.day)	0.70		0.65		
	Total Soluble Dustfall (mg/dm2.day)	<0.10		0.12		
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.000129		0.000110		
	Chloride (Cl) (mg/dm2.day)	<0.0052		<0.0052		
	Nitrate (as N) (mg/dm2.day)	0.000670		0.000795		
	Sulfate (SO4) (mg/dm2.day)	<0.0052		<0.0052		
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.0133		0.00897	
	Antimony (Sb)-Total (mg/dm2.day)		<0.0000012		<0.0000012	
	Arsenic (As)-Total (mg/dm2.day)		<0.00013 <sup>DLM</sup>		<0.00013 <sup>DLM</sup>	
	Barium (Ba)-Total (mg/dm2.day)		0.000297		0.000182	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000058		<0.0000058	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000058		<0.0000058	
	Boron (B)-Total (mg/dm2.day)		<0.00012		<0.00012	
	Cadmium (Cd)-Total (mg/dm2.day)		0.00000115		<0.00000058	
	Calcium (Ca)-Total (mg/dm2.day)		0.0112		0.00741	
	Chromium (Cr)-Total (mg/dm2.day)		0.0000482		0.0000350	
	Cobalt (Co)-Total (mg/dm2.day)		0.0000103		0.0000071	
	Copper (Cu)-Total (mg/dm2.day)		0.000347		0.0000296	
	Lead (Pb)-Total (mg/dm2.day)		0.00000698		0.00000235	
	Lithium (Li)-Total (mg/dm2.day)		<0.000058		<0.000058	
	Magnesium (Mg)-Total (mg/dm2.day)		0.0181		0.0105	
	Manganese (Mn)-Total (mg/dm2.day)		0.000397		0.000258	
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000058		<0.00000058	
	Molybdenum (Mo)-Total (mg/dm2.day)		0.00000115		0.00000061	
	Nickel (Ni)-Total (mg/dm2.day)		0.0000734		0.0000548	
	Potassium (K)-Total (mg/dm2.day)		0.0480		0.00623	
	Selenium (Se)-Total (mg/dm2.day)		<0.000012		<0.000012	
	Silver (Ag)-Total (mg/dm2.day)		0.00000040		<0.00000012	
	Sodium (Na)-Total (mg/dm2.day)		0.0134		0.00167	
	Strontium (Sr)-Total (mg/dm2.day)		0.0000924		0.0000589	
	Thallium (Tl)-Total (mg/dm2.day)		<0.0000012		<0.0000012	
	Tin (Sn)-Total (mg/dm2.day)		<0.0000012		<0.0000012	
	Uranium (U)-Total (mg/dm2.day)		0.00000075		0.00000054	
	Vanadium (V)-Total (mg/dm2.day)		0.000036		0.000025	
	Zinc (Zn)-Total (mg/dm2.day)		0.000525		0.000103	

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

## Reference Information

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLB	Detection Limit was raised due to detection of analyte at comparable level in Method Blank.
DLM	Detection Limit Adjusted due to sample matrix effects.

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>CL-IC-VA</b>	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>DUSTFALLS-COM-DM2-VA</b>	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE
This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate." Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.			
<b>HG-DUST(DM2-CVAFS-VA</b>	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			
<b>MET-DUST(DM2)-MS-VA</b>	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
<b>NH3-F-VA</b>	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifically carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
<b>NO3-IC-VA</b>	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>SO4-IC-VA</b>	Dustfall	Dustfall Sulfate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulfate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			

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

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

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

## Chain of Custody Numbers:

1	2
---	---



## Reference Information

### GLOSSARY OF REPORT TERMS

*Surrogate* - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

*mg/kg* - milligrams per kilogram based on dry weight of sample.

*mg/kg ww* - milligrams per kilogram based on wet weight of sample.

*mg/kg lw* - 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.*



L1489214-COFC

S.O. 45555

# CHAIN OF CUSTODY FORM

Form 69322



BHP Billiton Diamonds Inc.

bhpbilliton

# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1

Tel: 867-880-2157 Fax: 867-880-4012

BHP Contacts: David Bruce / Richard Ehler

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For Lab Use

Station ID	Matrix	Date	Time	Init	Ammonia	Chloride	Dustfall Metals	Insoluble Particulate	Nitrate	Soluble Particulate	Sulphate	Total Particulate								
Mis-U30-P	Dust	15-Jul-2014	04:00 PM	DB	1	1	1	1	1	1	1	1	BHP2							
Mis-U30-M	Dust	15-Jul-2014	04:00 PM	DB			1						BHP2							
LLCF-PB-P	Dust	15-Jul-2014	02:59 PM	DB	1	1	1	1	1	1	1	1	BHP2							
LLCF-PB-M	Dust	15-Jul-2014	02:59 PM	DB			1						BHP2							
LLCF-PA-P	Dust	15-Jul-2014	02:44 PM	DB	1	1	1	1	1	1	1	1	BHP2							
LLCF-PA-M	Dust	15-Jul-2014	02:44 PM	DB			1						BHP2							
Fox-U30-P	Dust	15-Jul-2014	02:15 PM	DB	1	1	1	1	1	1	1	1	BHP2							
Fox-U30-M	Dust	15-Jul-2014	02:15 PM	DB			1						BHP2							
Fox-D90-P	Dust	15-Jul-2014	11:19 AM	DB	1	1	1	1	1	1	1	1	BHP2							
Fox-D30-P	Dust	15-Jul-2014	01:57 PM	DB	1	1	1	1	1	1	1	1	BHP2							
Fox-D30-M	Dust	15-Jul-2014	01:57 PM	DB			1						BHP2							
Fox-D300-P	Dust	15-Jul-2014	11:07 AM	DB	1	1	1	1	1	1	1	1	BHP2							
Fox-D300-M	Dust	15-Jul-2014	11:07 AM	DB			1						BHP2							
FOX-D1000-P	Dust	15-Jul-2014	10:57 AM	DB	1	1	1	1	1	1	1	1	BHP2							
FOX-D1000-M	Dust	15-Jul-2014	10:57 AM	DB			1						BHP2							
AQ-54-P	Dust	15-Jul-2014	10:21 AM	DB	1	1	1	1	1	1	1	1	BHP2							
AQ-54-M	Dust	15-Jul-2014	10:21 AM	DB			1						BHP2							
AQ-49-P	Dust	15-Jul-2014	10:39 AM	DB	1	1	1	1	1	1	1	1	BHP2							
Air-P280-P	Dust	15-Jul-2014	04:22 PM	DB	1	1	1	1	1	1	1	1	BHP2							
Air-P280-M	Dust	15-Jul-2014	04:22 PM	DB			1						BHP2							

Turn around Required: Regular 1 Week TAT

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2503

Relinquished by:

Date

Time

Received by:

Date

Time

Relinquished by:

Date

Time

Received by:

Date

Time

FOR LAB USE ONLY

Cooler seal intact upon receipt?

☐ Yes ☐ No ☐ N/A

Sample temperature upon receipt: C.

Frozen? ☐ Yes ☐ No

Send Analytical Results to:

compliance.team@ekati.ddcorp.ca;

18.8/20/19  
19.7





L1489214-COFC

S.O. 45555

# CHAIN OF CUSTODY FORM

Form 69322



bhpbilliton

BHP Billiton Diamonds Inc.

# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1

Tel: 867-880-2157 Fax: 867-880-4012

BHP Contacts: David Bruce/ Richard EhlerDavid

Page 2/2

For Lab Use

FOR LAB USE ONLY

Station ID	Matrix	Date	Time	Init	Ammonia	Chloride	Dustfall Metals	Insoluble Particulate	Nitrate	Soluble Particulate	Sulphate	Total Particulate								
Mis-D90-P	Dust	15-Jul-2014	11:58 AM	DB	1	1	1	1	1	1	1	1	BHP2							
Mis-D90-M	Dust	15-Jul-2014	11:58 AM	DB			1						BHP2							
Mis-D30-P	Dust	15-Jul-2014	03:52 PM	DB	1	1	1	1	1	1	1	1	BHP2							
Mis-D30-M	Dust	15-Jul-2014	03:52 PM	DB			1						BHP2							
Mis-D300-P	Dust	15-Jul-2014	11:49 AM	DB	1	1	1	1	1	1	1	1	BHP2							
Mis-D300-M	Dust	15-Jul-2014	11:49 AM	DB			1						BHP2							
MIS-D1000-P	Dust	15-Jul-2014	11:35 AM	DB	1	1	1	1	1	1	1	1	BHP2							
MIS-D1000-M	Dust	15-Jul-2014	11:35 AM	DB			1						BHP2							
Fox-D90-M	Dust	15-Jul-2014	11:19 AM	DB			1						BHP2							
AQ-49-M	Dust	15-Jul-2014	10:39 AM	DB			1						BHP2							
Air-P162-P	Dust	15-Jul-2014	04:55 PM	DB	1	1	1	1	1	1	1	1	BHP2							
Air-P162-M	Dust	15-Jul-2014	04:55 PM	DB			1						BHP2							
Air-P125-P	Dust	15-Jul-2014	04:40 PM	DB	1	1	1	1	1	1	1	1	BHP2							
Air-P125-M	Dust	15-Jul-2014	04:40 PM	DB			1						BHP2							

Turn around Required: Regular 1 Week TAT

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2503

Relinquished by:	Date	Received by:	Date
	Time	JN	July 18
			Time 11:55
Relinquished by:	Date	Received by:	Date
	Time		Time

FOR LAB USE ONLY

Cooler seal intact upon receipt?

☐ Yes ☐ No ☐ N/A

Sample temperature upon receipt:

Frozen? ☐ Yes ☐ No

Send Analytical Results to:

compliance.team@ekati.ddcorp.ca;

18.8/20.1/  
19/19.7



Dominion Diamond Ekati Corporation (DDEC)  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 21-AUG-14  
Report Date: 03-SEP-14 11:44 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #: L1506803**

Project P.O. #: BHP2503

Job Reference: 69367

C of C Numbers: 69367

Legal Site Desc:

Can Dang  
Senior Account Manager

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ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1506803-1 Dust 15-AUG-14 14:35 AIR-P125-M	L1506803-2 Dust 15-AUG-14 14:35 AIR-P125-P	L1506803-3 Dust 15-AUG-14 15:07 FOX-U30-P	L1506803-4 Dust 15-AUG-14 14:59 FOX-D30-M	L1506803-5 Dust 15-AUG-14 14:59 FOX-D30-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		1.28	11.5		7.36
	Total Insoluble Dustfall (mg/dm2.day)		0.58	10.6		6.53
	Total Soluble Dustfall (mg/dm2.day)		0.70	0.93		0.83
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		<0.0018	<0.0011		<0.0026
	Chloride (Cl) (mg/dm2.day)		0.0447	0.0539		0.0561
	Nitrate (as N) (mg/dm2.day)		0.00553	0.00790		0.00665
	Sulfate (SO4) (mg/dm2.day)		0.0276	0.0354		0.0310
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.0144			0.106	
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000011			<0.0000011	
	Arsenic (As)-Total (mg/dm2.day)	0.0000080			0.0000106	
	Barium (Ba)-Total (mg/dm2.day)	0.000420			0.00190	
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000056			<0.0000056	
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000056			<0.0000056	
	Boron (B)-Total (mg/dm2.day)	<0.00011			<0.00011	
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000110			0.00000123	
	Calcium (Ca)-Total (mg/dm2.day)	0.0280			0.0540	
	Chromium (Cr)-Total (mg/dm2.day)	0.0000587			0.000330	
	Cobalt (Co)-Total (mg/dm2.day)	0.0000124			0.0000704	
	Copper (Cu)-Total (mg/dm2.day)	0.000461			0.000131	
	Lead (Pb)-Total (mg/dm2.day)	<0.000022 <sup>DLB</sup>			<0.000033 <sup>DLB</sup>	
	Lithium (Li)-Total (mg/dm2.day)	<0.000056			0.000152	
	Magnesium (Mg)-Total (mg/dm2.day)	0.0186			0.0983	
	Manganese (Mn)-Total (mg/dm2.day)	0.000764			0.00184	
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000056			<0.00000056	
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000194			0.00000558	
	Nickel (Ni)-Total (mg/dm2.day)	0.0000961			0.000444	
	Potassium (K)-Total (mg/dm2.day)	0.0112			0.0727	
	Selenium (Se)-Total (mg/dm2.day)	<0.000011			<0.000011	
	Silver (Ag)-Total (mg/dm2.day)	0.00000065			0.00000030	
	Sodium (Na)-Total (mg/dm2.day)	0.00227			0.0218	
	Strontium (Sr)-Total (mg/dm2.day)	0.000162			0.000649	
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011			0.0000011	
	Tin (Sn)-Total (mg/dm2.day)	<0.0000011			0.0000021	
	Uranium (U)-Total (mg/dm2.day)	0.00000145			0.00000443	
	Vanadium (V)-Total (mg/dm2.day)	0.000038			0.000258	
	Zinc (Zn)-Total (mg/dm2.day)	0.000727			0.000521	

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1506803-6 Dust 15-AUG-14 14:56 FOX-D90-P	L1506803-7 Dust 15-AUG-14 11:49 FOX-D300-M	L1506803-8 Dust 15-AUG-14 11:48 FOX-D300-P	L1506803-9 Dust 15-AUG-14 11:37 FOX-D1000-M	L1506803-10 Dust 15-AUG-14 11:39 FOX-D1000-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	2.32		1.47		0.89
	Total Insoluble Dustfall (mg/dm2.day)	1.62		0.76		0.31
	Total Soluble Dustfall (mg/dm2.day)	0.70		0.71		0.57
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	<0.0013		<0.0010		<0.0012
	Chloride (Cl) (mg/dm2.day)	0.0454		0.0424		0.0388
	Nitrate (as N) (mg/dm2.day)	0.00683		0.00662		0.00649
	Sulfate (SO4) (mg/dm2.day)	0.0261		0.0167		0.0159
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.0104		0.00323	
	Antimony (Sb)-Total (mg/dm2.day)		0.0000016		<0.0000011	
	Arsenic (As)-Total (mg/dm2.day)		0.0000067		0.0000046	
	Barium (Ba)-Total (mg/dm2.day)		0.000319		0.000163	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000056		<0.0000056	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000056		<0.0000056	
	Boron (B)-Total (mg/dm2.day)		<0.00011		<0.00011	
	Cadmium (Cd)-Total (mg/dm2.day)		0.00000077		0.00000100	
	Calcium (Ca)-Total (mg/dm2.day)		0.0211		0.0140	
	Chromium (Cr)-Total (mg/dm2.day)		0.0000381		0.0000115	
	Cobalt (Co)-Total (mg/dm2.day)		0.0000077		0.0000028	
	Copper (Cu)-Total (mg/dm2.day)		0.000268		0.000217	
	Lead (Pb)-Total (mg/dm2.day)		<0.000022 <sup>DLB</sup>		<0.000011 <sup>DLB</sup>	
	Lithium (Li)-Total (mg/dm2.day)		<0.000056		<0.000056	
	Magnesium (Mg)-Total (mg/dm2.day)		0.0117		0.00478	
	Manganese (Mn)-Total (mg/dm2.day)		0.000692		0.000464	
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000056		<0.00000056	
	Molybdenum (Mo)-Total (mg/dm2.day)		0.00000137		<0.00000056	
	Nickel (Ni)-Total (mg/dm2.day)		0.0000530		0.0000232	
	Potassium (K)-Total (mg/dm2.day)		0.0110		0.00825	
	Selenium (Se)-Total (mg/dm2.day)		<0.000011		<0.000011	
	Silver (Ag)-Total (mg/dm2.day)		0.00000032		0.00000017	
	Sodium (Na)-Total (mg/dm2.day)		0.00275		0.00165	
	Strontium (Sr)-Total (mg/dm2.day)		0.000141		0.0000719	
	Thallium (Tl)-Total (mg/dm2.day)		<0.0000011		<0.0000011	
	Tin (Sn)-Total (mg/dm2.day)		<0.0000011		<0.0000011	
	Uranium (U)-Total (mg/dm2.day)		0.00000048		0.00000021	
	Vanadium (V)-Total (mg/dm2.day)		0.000026		<0.000011	
	Zinc (Zn)-Total (mg/dm2.day)		0.000274		0.000235	

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



# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1506803-11 Dust 15-AUG-14 15:37 LLCF-PA-M	L1506803-12 Dust 15-AUG-14 15:37 LLCF-PA-P	L1506803-13 Dust 15-AUG-14 15:26 LLCF-PB-M	L1506803-14 Dust 15-AUG-14 15:26 LLCF-PB-P	L1506803-15 Dust 15-AUG-14 14:15 MIS-U30-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		6.95		1.80	
	Total Insoluble Dustfall (mg/dm2.day)		4.92		0.64	
	Total Soluble Dustfall (mg/dm2.day)		2.03		1.16	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		<0.0043		<0.0019	
	Chloride (Cl) (mg/dm2.day)		0.0805		0.0500	
	Nitrate (as N) (mg/dm2.day)		0.000144		0.00641	
	Sulfate (SO4) (mg/dm2.day)		0.207		0.0453	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.0329		0.0129		0.417 <sup>DLA</sup>
	Antimony (Sb)-Total (mg/dm2.day)	0.0000035		<0.0000011		<0.0000022
	Arsenic (As)-Total (mg/dm2.day)	0.0000131		0.0000072		0.0000331
	Barium (Ba)-Total (mg/dm2.day)	0.00176		0.000585		0.00911 <sup>DLA</sup>
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000056		<0.0000056		<0.000011 <sup>DLA</sup>
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000056		<0.0000056		<0.000011 <sup>DLA</sup>
	Boron (B)-Total (mg/dm2.day)	0.00017		<0.00011		<0.00022 <sup>DLA</sup>
	Cadmium (Cd)-Total (mg/dm2.day)	0.0000452		0.00000789		<0.0000011 <sup>DLA</sup>
	Calcium (Ca)-Total (mg/dm2.day)	0.0675		0.0257		0.134
	Chromium (Cr)-Total (mg/dm2.day)	0.000258		0.0000806		0.00152
	Cobalt (Co)-Total (mg/dm2.day)	0.0000712		0.0000221		0.000326
	Copper (Cu)-Total (mg/dm2.day)	0.000741		0.000465		0.000479
	Lead (Pb)-Total (mg/dm2.day)	<0.000033 <sup>DLB</sup>		<0.000011 <sup>DLB</sup>		<0.000067 <sup>DLB</sup>
	Lithium (Li)-Total (mg/dm2.day)	<0.000056		<0.000056		0.00079
	Magnesium (Mg)-Total (mg/dm2.day)	0.162		0.0460		0.414
	Manganese (Mn)-Total (mg/dm2.day)	0.00120		0.000571		0.00743
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000056		<0.00000056		<0.00000056
	Molybdenum (Mo)-Total (mg/dm2.day)	0.0000335		0.00000707		0.0000112
	Nickel (Ni)-Total (mg/dm2.day)	0.00115		0.000317		0.00168
	Potassium (K)-Total (mg/dm2.day)	0.177		0.0467		0.309 <sup>DLB</sup>
	Selenium (Se)-Total (mg/dm2.day)	0.000013		<0.000011		<0.000022
	Silver (Ag)-Total (mg/dm2.day)	0.00000108		0.00000042		0.00000089
	Sodium (Na)-Total (mg/dm2.day)	0.0931		0.0196		0.0367
	Strontium (Sr)-Total (mg/dm2.day)	0.00140		0.000395		0.00136
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011		<0.0000011		0.0000046
	Tin (Sn)-Total (mg/dm2.day)	<0.0000011		<0.0000011		0.0000087
	Uranium (U)-Total (mg/dm2.day)	0.00000280		0.00000080		0.0000203
	Vanadium (V)-Total (mg/dm2.day)	0.000065		0.000030		0.00128
	Zinc (Zn)-Total (mg/dm2.day)	0.00153		0.000318		0.00150

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1506803-16 Dust 15-AUG-14 14:15 MIS-U30-P	L1506803-17 Dust 15-AUG-14 14:07 MIS-D30-M	L1506803-18 Dust 15-AUG-14 14:07 MIS-D30-P	L1506803-19 Dust 15-AUG-14 14:01 MIS-D90-M	L1506803-20 Dust 15-AUG-14 14:01 MIS-D90-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	25.0		13.8		3.05
	Total Insoluble Dustfall (mg/dm2.day)	24.4		13.3		2.44
	Total Soluble Dustfall (mg/dm2.day)	0.62		0.57		0.61
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.0198		<0.0011		<0.00082
	Chloride (Cl) (mg/dm2.day)	0.0479		0.0467		0.0416
	Nitrate (as N) (mg/dm2.day)	0.00594		0.00627		0.00518
	Sulfate (SO4) (mg/dm2.day)	0.0309		0.0285		0.0163
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.183		0.0433	
	Antimony (Sb)-Total (mg/dm2.day)		0.0000013		<0.0000011	
	Arsenic (As)-Total (mg/dm2.day)		0.0000162		0.0000071	
	Barium (Ba)-Total (mg/dm2.day)		0.00358		0.000999	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000056		<0.0000056	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000056		<0.0000056	
	Boron (B)-Total (mg/dm2.day)		<0.00011		<0.00011	
	Cadmium (Cd)-Total (mg/dm2.day)		0.00000091		0.00000073	
	Calcium (Ca)-Total (mg/dm2.day)		0.0730		0.0310	
	Chromium (Cr)-Total (mg/dm2.day)		0.000603		0.000145	
	Cobalt (Co)-Total (mg/dm2.day)		0.000127		0.0000310	
	Copper (Cu)-Total (mg/dm2.day)		0.000498		0.000293	
	Lead (Pb)-Total (mg/dm2.day)		<0.000033 <sup>DLB</sup>		<0.000022 <sup>DLB</sup>	
	Lithium (Li)-Total (mg/dm2.day)		0.000323		0.000075	
	Magnesium (Mg)-Total (mg/dm2.day)		0.163		0.0396	
	Manganese (Mn)-Total (mg/dm2.day)		0.00334		0.00123	
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000056		<0.00000056	
	Molybdenum (Mo)-Total (mg/dm2.day)		0.00000546		0.00000165	
	Nickel (Ni)-Total (mg/dm2.day)		0.000665		0.000163	
	Potassium (K)-Total (mg/dm2.day)		0.129		0.0354	
	Selenium (Se)-Total (mg/dm2.day)		<0.000011		<0.000011	
	Silver (Ag)-Total (mg/dm2.day)		0.00000055		0.00000026	
	Sodium (Na)-Total (mg/dm2.day)		0.0226		0.00648	
	Strontium (Sr)-Total (mg/dm2.day)		0.000797		0.000264	
	Thallium (Tl)-Total (mg/dm2.day)		0.0000022		<0.0000011	
	Tin (Sn)-Total (mg/dm2.day)		0.0000040		0.0000014	
	Uranium (U)-Total (mg/dm2.day)		0.00000751		0.00000170	
	Vanadium (V)-Total (mg/dm2.day)		0.000507		0.000118	
	Zinc (Zn)-Total (mg/dm2.day)		0.000950		0.000363	

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1506803-21 Dust 15-AUG-14 14:20 AIR-P162-M	L1506803-22 Dust 15-AUG-14 14:20 AIR-P162-P	L1506803-23 Dust 15-AUG-14 08:25 AIR-P280-M	L1506803-24 Dust 15-AUG-14 08:25 AIR-P280-P	L1506803-25 Dust 15-AUG-14 11:23 AQ-49-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		1.74		1.94	
	Total Insoluble Dustfall (mg/dm2.day)		0.98		1.48	
	Total Soluble Dustfall (mg/dm2.day)		0.76		0.45	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		<0.0017		<0.0011	
	Chloride (Cl) (mg/dm2.day)		0.0463		0.0313	
	Nitrate (as N) (mg/dm2.day)		0.00548		0.00638	
	Sulfate (SO4) (mg/dm2.day)		0.0183		0.0191	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.0187		0.0295		0.000741
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000011		<0.0000011		<0.0000021
	Arsenic (As)-Total (mg/dm2.day)	0.0000060		0.0000070		0.0000060
	Barium (Ba)-Total (mg/dm2.day)	0.000459		0.000705		0.000107
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000056		<0.0000056		<0.000011
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000056		<0.0000056		<0.000011
	Boron (B)-Total (mg/dm2.day)	<0.00011		<0.00011		<0.00021
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000129		0.00000059		<0.0000011
	Calcium (Ca)-Total (mg/dm2.day)	0.0207		0.0247		0.0121
	Chromium (Cr)-Total (mg/dm2.day)	0.0000702		0.000117		<0.000011
	Cobalt (Co)-Total (mg/dm2.day)	0.0000154		0.0000246		<0.0000021
	Copper (Cu)-Total (mg/dm2.day)	0.000525		0.0000953		0.000214
	Lead (Pb)-Total (mg/dm2.day)	<0.000011 <sup>DLB</sup>		<0.000011 <sup>DLB</sup>		<0.000011 <sup>DLB</sup>
	Lithium (Li)-Total (mg/dm2.day)	<0.000056		<0.000056		<0.00011
	Magnesium (Mg)-Total (mg/dm2.day)	0.0238		0.0371		0.00218
	Manganese (Mn)-Total (mg/dm2.day)	0.000727		0.000856		0.000420
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000056		<0.00000056		<0.0000011
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000136		0.00000203		<0.0000011
	Nickel (Ni)-Total (mg/dm2.day)	0.000107		0.000192		<0.000011
	Potassium (K)-Total (mg/dm2.day)	0.0395		0.0239		0.0066
	Selenium (Se)-Total (mg/dm2.day)	<0.000011		<0.000011		<0.000021
	Silver (Ag)-Total (mg/dm2.day)	0.00000037		0.00000028		<0.00000021
	Sodium (Na)-Total (mg/dm2.day)	0.00827		0.00509		<0.0011
	Strontium (Sr)-Total (mg/dm2.day)	0.000157		0.000227		0.0000489
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011		<0.0000011		<0.0000021
	Tin (Sn)-Total (mg/dm2.day)	<0.0000011		<0.0000011		<0.0000021
	Uranium (U)-Total (mg/dm2.day)	0.00000107		0.00000148		<0.00000021
	Vanadium (V)-Total (mg/dm2.day)	0.000049		0.000081		<0.000021
	Zinc (Zn)-Total (mg/dm2.day)	0.000342		0.000218		0.000278

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1506803-26 Dust 15-AUG-14 11:21 AQ-49-P	L1506803-27 Dust 15-AUG-14 11:10 AQ-54-M	L1506803-28 Dust 15-AUG-14 11:11 AQ-54-P	L1506803-29 Dust 15-AUG-14 15:07 FOX-U30-M	L1506803-30 Dust 15-AUG-14 14:56 FOX-D90-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	0.76		0.55		
	Total Insoluble Dustfall (mg/dm2.day)	0.25		<0.10		
	Total Soluble Dustfall (mg/dm2.day)	0.51		0.52		
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	<0.0021		<0.0012		
	Chloride (Cl) (mg/dm2.day)	0.0395		0.0430		
	Nitrate (as N) (mg/dm2.day)	0.00671		0.00340		
	Sulfate (SO4) (mg/dm2.day)	0.0198		0.0143		
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.000915		0.213	0.0335
	Antimony (Sb)-Total (mg/dm2.day)		<0.000011		<0.000011	<0.000011
	Arsenic (As)-Total (mg/dm2.day)		0.0000037		0.0000187	0.0000071
	Barium (Ba)-Total (mg/dm2.day)		0.000140		0.00401	0.000685
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000056		<0.0000056	<0.0000056
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000056		<0.0000056	<0.0000056
	Boron (B)-Total (mg/dm2.day)		<0.00011		<0.00011	<0.00011
	Cadmium (Cd)-Total (mg/dm2.day)		0.00000137		0.00000102	0.00000108
	Calcium (Ca)-Total (mg/dm2.day)		0.0156		0.0971	0.0268
	Chromium (Cr)-Total (mg/dm2.day)		<0.0000056		0.000730	0.000112
	Cobalt (Co)-Total (mg/dm2.day)		0.0000029		0.000154	0.0000249
	Copper (Cu)-Total (mg/dm2.day)		0.000392		0.000435	0.000111
	Lead (Pb)-Total (mg/dm2.day)		<0.000011 <sup>DLB</sup>		<0.000033 <sup>DLB</sup>	<0.000011 <sup>DLB</sup>
	Lithium (Li)-Total (mg/dm2.day)		<0.000056		0.000332	<0.000056
	Magnesium (Mg)-Total (mg/dm2.day)		0.00518		0.213	0.0365
	Manganese (Mn)-Total (mg/dm2.day)		0.000665		0.00349	0.000926
	Mercury (Hg)-Total (mg/dm2.day)		<0.00000056		<0.00000056	<0.00000056
	Molybdenum (Mo)-Total (mg/dm2.day)		0.00000142		0.0000120	0.00000435
	Nickel (Ni)-Total (mg/dm2.day)		0.0000056		0.000965	0.000162
	Potassium (K)-Total (mg/dm2.day)		0.0260		0.140	0.0517
	Selenium (Se)-Total (mg/dm2.day)		<0.000011		<0.000011	<0.000011
	Silver (Ag)-Total (mg/dm2.day)		0.00000044		0.00000052	0.00000027
	Sodium (Na)-Total (mg/dm2.day)		0.00626		0.0369	0.00775
	Strontium (Sr)-Total (mg/dm2.day)		0.0000672		0.00120	0.000246
	Thallium (Tl)-Total (mg/dm2.day)		<0.0000011		0.0000026	<0.0000011
	Tin (Sn)-Total (mg/dm2.day)		<0.0000011		0.0000047	<0.0000011
	Uranium (U)-Total (mg/dm2.day)		0.00000021		0.00000942	0.00000148
	Vanadium (V)-Total (mg/dm2.day)		<0.000011		0.000573	0.000087
	Zinc (Zn)-Total (mg/dm2.day)		0.000314		0.000809	0.000312

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1506803-31 Dust 15-AUG-14 12:26 MIS-D300-M	L1506803-32 Dust 15-AUG-14 12:27 MIS-D300-P	L1506803-33 Dust 15-AUG-14 12:16 MIS-D1000-M	L1506803-34 Dust 15-AUG-14 12:17 MIS-D1000-P	
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		1.15		0.62	
	Total Insoluble Dustfall (mg/dm2.day)		0.62		<0.10	
	Total Soluble Dustfall (mg/dm2.day)		0.53		0.53	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.00813		<0.00070	
	Chloride (Cl) (mg/dm2.day)		0.0387		0.0404	
	Nitrate (as N) (mg/dm2.day)		0.00563		0.00484	
	Sulfate (SO4) (mg/dm2.day)		0.0139		0.0193	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.0120		0.00236		
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000011		<0.0000011		
	Arsenic (As)-Total (mg/dm2.day)	0.0000055		0.0000043		
	Barium (Ba)-Total (mg/dm2.day)	0.000345		0.000178		
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000056		<0.0000056		
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000056		<0.0000056		
	Boron (B)-Total (mg/dm2.day)	<0.00011		<0.00011		
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000056		0.00000085		
	Calcium (Ca)-Total (mg/dm2.day)	0.0183		0.0154		
	Chromium (Cr)-Total (mg/dm2.day)	0.0000395		0.0000085		
	Cobalt (Co)-Total (mg/dm2.day)	0.0000093		0.0000024		
	Copper (Cu)-Total (mg/dm2.day)	0.000198		0.0000664		
	Lead (Pb)-Total (mg/dm2.day)	<0.0000056 <sup>DLB</sup>		<0.0000056 <sup>DLB</sup>		
	Lithium (Li)-Total (mg/dm2.day)	<0.000056		<0.000056		
	Magnesium (Mg)-Total (mg/dm2.day)	0.0128		0.00465		
	Manganese (Mn)-Total (mg/dm2.day)	0.000659		0.000508		
	Mercury (Hg)-Total (mg/dm2.day)	<0.00000056		<0.00000056		
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000056		<0.00000056		
	Nickel (Ni)-Total (mg/dm2.day)	0.0000473		0.0000167		
	Potassium (K)-Total (mg/dm2.day)	0.0216		0.0116		
	Selenium (Se)-Total (mg/dm2.day)	<0.000011		<0.000011		
	Silver (Ag)-Total (mg/dm2.day)	0.00000022		<0.00000011		
	Sodium (Na)-Total (mg/dm2.day)	0.00394		0.00220		
	Strontium (Sr)-Total (mg/dm2.day)	0.000116		0.0000700		
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011		<0.0000011		
	Tin (Sn)-Total (mg/dm2.day)	<0.0000011		<0.0000011		
	Uranium (U)-Total (mg/dm2.day)	0.00000058		0.00000015		
	Vanadium (V)-Total (mg/dm2.day)	0.000033		<0.000011		
	Zinc (Zn)-Total (mg/dm2.day)	0.000196		0.000335		

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

## Reference Information

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLB	Detection Limit was raised due to detection of analyte at comparable level in Method Blank.

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>CL-IC-VA</b>	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>DUSTFALLS-COM-DM2-VA</b>	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE
This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate." Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.			
<b>HG-DUST(DM2-CVAFS-VA</b>	Dustfall	Total Mercury in Dustfalls by CVAFS	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			
<b>MET-DUST(DM2)-MS-VA</b>	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
<b>NH3-F-VA</b>	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifically carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
<b>NO3-IC-VA</b>	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>SO4-IC-VA</b>	Dustfall	Dustfall Sulfate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulfate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			

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

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

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

## Chain of Custody Numbers:

69367



## Reference Information

### GLOSSARY OF REPORT TERMS

*Surrogate* - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

*mg/kg* - milligrams per kilogram based on dry weight of sample.

*mg/kg ww* - milligrams per kilogram based on wet weight of sample.

*mg/kg lw* - milligrams per kilogram based on lipid-adjusted weight of sample.

*mg/L* - milligrams per litre.

*<* - Less than.

*D.L.* - The reported Detection Limit, also known as the Limit of Reporting (LOR).

*N/A* - Result not available. Refer to qualifier code and definition for explanation.

*Test results reported relate only to the samples as received by the laboratory.*

**UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.**

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*

**ALS Contact: Can Dang**



**DOMINION  
DIAMOND**

**DDC Contacts:**David Bruce / Richard Ehlert

## CHAIN OF CUSTODY FORM

[illegible]

Billing Code: **BHP2503**

Date
Time

Frozen? ☐ Yes ☐ No

PAGE 1 OF 2



**ALS Contact: Can Dang**

S.O. 45580



DOMINION  
DIAMOND

**DDC Contacts: David Bruce/ Richard EhlerDavid**

## CHAIN OF CUSTODY FORM

Station ID	Matrix	Date	Time	Init	Ammonia	Chloride	Dustfall Metals	Insoluble Particulate	Nitrate	Soluble Particulate	Sulphate	Total Particulate								
Alr-P162-M	Dust	15-Aug-2014	04:20 PM	TJ			1						BHP2							
Alr-P162-P	Dust	15-Aug-2014	04:20 PM	TJ	1	1		1	1	1	1	1	BHP2							
Alr-P280-M	Dust	15-Aug-2014	08:25 AM	TJ			1						BHP2							
Alr-P280-P	Dust	15-Aug-2014	08:25 AM	TJ	1	1		1	1	1	1	1	BHP2							
AQ-49-M	Dust	15-Aug-2014	11:23 AM	TJ			1						BHP2							
AQ-49-P	Dust	15-Aug-2014	11:21 AM	TJ	1	1		1	1	1	1	1	BHP2							
AQ-54-M	Dust	15-Aug-2014	11:10 AM	TJ			1						BHP2							
AQ-54-P	Dust	15-Aug-2014	11:11 AM	TJ	1	1		1	1	1	1	1	BHP2							
Fox-U30-M	Dust	15-Aug-2014	03:07 PM	TJ			1						BHP2							
Fox-D90-M	Dust	15-Aug-2014	02:56 PM	TJ			1						BHP2							
Mis-D300-M	Dust	15-Aug-2014	12:26 PM	TJ			1						BHP2							
Mis-D300-P	Dust	15-Aug-2014	12:27 PM	TJ	1	1		1	1	1	1	1	BHP2							
MIS-D1000-M	Dust	15-Aug-2014	12:16 PM	TJ			1						BHP2							
MIS-D1000-P	Dust	15-Aug-2014	12:17 PM	TJ	1	1		1	1	1	1	1	BHP2							

Turn around Required: Regular 1 Week TAT

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2503

Relinquished by: <u>DB</u>	Received by: <u>[Signature]</u>
Date <u>19 AUG 2014</u> Time <u>16:00</u>	Date <u>Aug 21</u> Time <u>19:20</u>
Relinquished by: _____ Date _____ Time _____	Received by: _____ Date _____ Time _____

FOR LAB USE ONLY

Cooler seal intact upon receipt? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample temperature upon receipt: <u>20</u> c. Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No
---	---

**Send Analytical Results to:**

compliance.team@ekati.ddcorp.ca;



Dominion Diamond Ekati Corporation (DDEC)  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 24-SEP-14  
Report Date: 06-OCT-14 13:43 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #: L1523186**

Project P.O. #: BHP2503

Job Reference: 69398

C of C Numbers: 69398

Legal Site Desc:

Can Dang  
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1523186-1 Dust 16-SEP-14 15:40 MISNEW-D300-M	L1523186-2 Dust 16-SEP-14 15:40 MISNEW-D300-P	L1523186-3 Dust 15-SEP-14 15:55 MISNEW-D90-M	L1523186-4 Dust 15-SEP-14 15:55 MISNEW-D90-P	L1523186-5 Dust 15-SEP-14 15:30 AIR-P125-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		1.23		6.30	
	Total Insoluble Dustfall (mg/dm2.day)		1.08		6.13	
	Total Soluble Dustfall (mg/dm2.day)		0.15		0.17	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.00394		0.00269	
	Chloride (Cl) (mg/dm2.day)		0.0335		<0.0055	
	Nitrate (as N) (mg/dm2.day)		0.00997		0.00375	
	Sulfate (SO4) (mg/dm2.day)		<0.0056		0.0091	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.0183		0.0940		0.0378
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000011		<0.0000011		<0.0000011
	Arsenic (As)-Total (mg/dm2.day)	0.0000018		0.000166		0.0000095
	Barium (Ba)-Total (mg/dm2.day)	0.000436		0.00181		0.000747
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000054		<0.0000056		<0.0000056
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000054		<0.0000056		<0.0000056
	Boron (B)-Total (mg/dm2.day)	<0.00011		<0.00011		<0.00011
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000054		<0.00000056		<0.00000056
	Calcium (Ca)-Total (mg/dm2.day)	0.00939		0.0336		0.0249
	Chromium (Cr)-Total (mg/dm2.day)	0.0000679		0.000327		0.000170
	Cobalt (Co)-Total (mg/dm2.day)	0.0000138		0.0000669		0.0000350
	Copper (Cu)-Total (mg/dm2.day)	0.000243		0.000281		0.0000576
	Lead (Pb)-Total (mg/dm2.day)	0.00000383		0.0000186		0.0000116
	Lithium (Li)-Total (mg/dm2.day)	<0.000054		0.000171		0.000094
	Magnesium (Mg)-Total (mg/dm2.day)	0.0183		0.0932		0.0513
	Manganese (Mn)-Total (mg/dm2.day)	0.000372		0.00139		0.000782
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000098		0.00000370		0.00000275
	Nickel (Ni)-Total (mg/dm2.day)	0.0000837		0.000421		0.000295
	Potassium (K)-Total (mg/dm2.day)	0.0164		0.0614		0.0282
	Selenium (Se)-Total (mg/dm2.day)	<0.000011		<0.000011		<0.000011
	Silver (Ag)-Total (mg/dm2.day)	<0.00000011		0.00000025		0.00000015
	Sodium (Na)-Total (mg/dm2.day)	0.00311		0.0131		0.00445
	Strontium (Sr)-Total (mg/dm2.day)	0.0000962		0.000448		0.000250
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011		0.0000019		<0.0000011
	Tin (Sn)-Total (mg/dm2.day)	0.0000026		0.0000027		0.0000015
	Uranium (U)-Total (mg/dm2.day)	0.00000081		0.00000485		0.00000372
	Vanadium (V)-Total (mg/dm2.day)	0.000052		0.000261		0.000105
	Zinc (Zn)-Total (mg/dm2.day)	0.000153		0.000382		0.000172

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1523186-6 Dust 15-SEP-14 15:30 AIR-P125-P	L1523186-7 Dust 15-SEP-14 15:11 AIR-P280-M	L1523186-8 Dust 15-SEP-14 15:11 AIR-P280-P	L1523186-9 Dust 16-SEP-14 14:55 AQ-49-P	L1523186-10 Dust 16-SEP-14 14:46 AQ-54-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	2.26		1.85	0.24	
	Total Insoluble Dustfall (mg/dm2.day)	2.18		1.85	0.11	
	Total Soluble Dustfall (mg/dm2.day)	<0.10		<0.10	0.12	
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.00404		0.00517	0.0100	
	Chloride (Cl) (mg/dm2.day)	0.0382		0.0412	0.0346	
	Nitrate (as N) (mg/dm2.day)	0.00253		0.00200	0.00166	
	Sulfate (SO4) (mg/dm2.day)	0.0068		0.0089	<0.0056	
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.0309			0.000854
	Antimony (Sb)-Total (mg/dm2.day)		<0.0000011			<0.0000011
	Arsenic (As)-Total (mg/dm2.day)		0.0000034			0.0000015
	Barium (Ba)-Total (mg/dm2.day)		0.000722			0.0000428
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000056			<0.0000054
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000056			<0.0000054
	Boron (B)-Total (mg/dm2.day)		<0.00011			<0.00011
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00000056			<0.00000054
	Calcium (Ca)-Total (mg/dm2.day)		0.0150			0.00531
	Chromium (Cr)-Total (mg/dm2.day)		0.000121			<0.0000054
	Cobalt (Co)-Total (mg/dm2.day)		0.0000255			0.0000015
	Copper (Cu)-Total (mg/dm2.day)		0.000284			0.0000221
	Lead (Pb)-Total (mg/dm2.day)		0.00000675			0.00000159
	Lithium (Li)-Total (mg/dm2.day)		<0.000056			<0.000054
	Magnesium (Mg)-Total (mg/dm2.day)		0.0356			0.00158
	Manganese (Mn)-Total (mg/dm2.day)		0.000558			0.000156
	Molybdenum (Mo)-Total (mg/dm2.day)		0.00000165			0.00000083
	Nickel (Ni)-Total (mg/dm2.day)		0.000180			0.0000065
	Potassium (K)-Total (mg/dm2.day)		0.0235			0.00150
	Selenium (Se)-Total (mg/dm2.day)		<0.000011			<0.000011
	Silver (Ag)-Total (mg/dm2.day)		0.00000015			0.00000013
	Sodium (Na)-Total (mg/dm2.day)		0.00447			<0.00054
	Strontium (Sr)-Total (mg/dm2.day)		0.000183			0.0000181
	Thallium (Tl)-Total (mg/dm2.day)		<0.0000011			<0.0000011
	Tin (Sn)-Total (mg/dm2.day)		0.0000013			<0.0000011
	Uranium (U)-Total (mg/dm2.day)		0.00000155			0.00000016
	Vanadium (V)-Total (mg/dm2.day)		0.000088			<0.000011
	Zinc (Zn)-Total (mg/dm2.day)		0.000148			0.000081

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



# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1523186-11 Dust 16-SEP-14 14:46 AQ-54-P	L1523186-12 Dust 15-SEP-14 16:47 FOX-U30-M	L1523186-13 Dust 15-SEP-14 16:47 FOX-U30-P	L1523186-14 Dust 15-SEP-14 16:06 MIS-D30-M	L1523186-15 Dust 15-SEP-14 16:06 MIS-D30-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	0.18		9.01		18.1
	Total Insoluble Dustfall (mg/dm2.day)	0.11		8.90		18.0
	Total Soluble Dustfall (mg/dm2.day)	<0.10		0.11		<0.10
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.00499		0.00625		0.00443
	Chloride (Cl) (mg/dm2.day)	0.0423		0.0431		0.0423
	Nitrate (as N) (mg/dm2.day)	0.00190		0.00195		0.00200
	Sulfate (SO4) (mg/dm2.day)	<0.0071		0.0172		0.0150
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.149		0.190	
	Antimony (Sb)-Total (mg/dm2.day)		<0.0000011		<0.0000011	
	Arsenic (As)-Total (mg/dm2.day)		0.0000109		0.0000180	
	Barium (Ba)-Total (mg/dm2.day)		0.00299		0.00435	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000056		<0.0000056	
	Bismuth (Bi)-Total (mg/dm2.day)		0.0000103		<0.0000056	
	Boron (B)-Total (mg/dm2.day)		<0.00011		<0.00011	
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00000056		<0.00000056	
	Calcium (Ca)-Total (mg/dm2.day)		0.0675		0.0714	
	Chromium (Cr)-Total (mg/dm2.day)		0.000513		0.000632	
	Cobalt (Co)-Total (mg/dm2.day)		0.000111		0.000142	
	Copper (Cu)-Total (mg/dm2.day)		0.000137		0.000247	
	Lead (Pb)-Total (mg/dm2.day)		0.0000206		0.0000284	
	Lithium (Li)-Total (mg/dm2.day)		0.000237		0.000374	
	Magnesium (Mg)-Total (mg/dm2.day)		0.157		0.176	
	Manganese (Mn)-Total (mg/dm2.day)		0.00222		0.00321	
	Molybdenum (Mo)-Total (mg/dm2.day)		0.00000781		0.00000463	
	Nickel (Ni)-Total (mg/dm2.day)		0.000771		0.000732	
	Potassium (K)-Total (mg/dm2.day)		0.0973		0.147	
	Selenium (Se)-Total (mg/dm2.day)		<0.000011		<0.000011	
	Silver (Ag)-Total (mg/dm2.day)		0.00000031		0.00000043	
	Sodium (Na)-Total (mg/dm2.day)		0.0275		0.0211	
	Strontium (Sr)-Total (mg/dm2.day)		0.000933		0.000739	
	Thallium (Tl)-Total (mg/dm2.day)		0.0000013		0.0000017	
	Tin (Sn)-Total (mg/dm2.day)		0.0000041		0.0000045	
	Uranium (U)-Total (mg/dm2.day)		0.00000629		0.0000141	
	Vanadium (V)-Total (mg/dm2.day)		0.000404		0.000566	
	Zinc (Zn)-Total (mg/dm2.day)		0.000460		0.000655	

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1523186-16 Dust 15-SEP-14 16:43 FOX-D30-M	L1523186-17 Dust 15-SEP-14 16:43 FOX-D30-P	L1523186-18 Dust 15-SEP-14 16:41 FOX-D90-P	L1523186-19 Dust 16-SEP-14 15:13 FOX-D300-M	L1523186-20 Dust 16-SEP-14 15:13 FOX-D300-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		3.40	1.22		0.42
	Total Insoluble Dustfall (mg/dm2.day)		3.39	1.01		0.42
	Total Soluble Dustfall (mg/dm2.day)		<0.10	0.21		<0.10
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.00331	0.00487		0.00636
	Chloride (Cl) (mg/dm2.day)		0.0369	0.0380		0.0369
	Nitrate (as N) (mg/dm2.day)		0.00243	0.00111		0.00110
	Sulfate (SO4) (mg/dm2.day)		0.0123	0.0055		<0.0064
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.0719			0.00635	
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000011			<0.0000011	
	Arsenic (As)-Total (mg/dm2.day)	0.0000053			0.0000012	
	Barium (Ba)-Total (mg/dm2.day)	0.00142			0.000138	
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000056			<0.0000054	
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000056			<0.0000054	
	Boron (B)-Total (mg/dm2.day)	<0.00011			<0.00011	
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000056			<0.00000054	
	Calcium (Ca)-Total (mg/dm2.day)	0.0310			0.00484	
	Chromium (Cr)-Total (mg/dm2.day)	0.000235			0.0000227	
	Cobalt (Co)-Total (mg/dm2.day)	0.0000517			0.0000050	
	Copper (Cu)-Total (mg/dm2.day)	0.0000636			0.000194	
	Lead (Pb)-Total (mg/dm2.day)	0.00000985			0.00000294	
	Lithium (Li)-Total (mg/dm2.day)	0.000106			<0.000054	
	Magnesium (Mg)-Total (mg/dm2.day)	0.0705			0.00682	
	Manganese (Mn)-Total (mg/dm2.day)	0.00107			0.000171	
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000319			<0.00000054	
	Nickel (Ni)-Total (mg/dm2.day)	0.000335			0.0000331	
	Potassium (K)-Total (mg/dm2.day)	0.0475			0.00534	
	Selenium (Se)-Total (mg/dm2.day)	<0.000011			<0.000011	
	Silver (Ag)-Total (mg/dm2.day)	0.00000011			<0.00000011	
	Sodium (Na)-Total (mg/dm2.day)	0.0141			0.00157	
	Strontium (Sr)-Total (mg/dm2.day)	0.000419			0.0000458	
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011			<0.0000011	
	Tin (Sn)-Total (mg/dm2.day)	0.0000017			<0.0000011	
	Uranium (U)-Total (mg/dm2.day)	0.00000298			0.00000027	
	Vanadium (V)-Total (mg/dm2.day)	0.000188			0.000017	
	Zinc (Zn)-Total (mg/dm2.day)	0.000233			0.000073	

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1523186-21 Dust 16-SEP-14 15:45 MISNEW-D1000-M	L1523186-22 Dust 16-SEP-14 15:45 MISNEW-D1000-P	L1523186-23 Dust 15-SEP-14 15:00 AIR-P162-M	L1523186-24 Dust 16-SEP-14 14:55 AQ-49-M	L1523186-25 Dust 16-SEP-14 16:41 FOX-D90-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.28			
	Total Insoluble Dustfall (mg/dm2.day)		0.20			
	Total Soluble Dustfall (mg/dm2.day)		<0.10			
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.00345			
	Chloride (Cl) (mg/dm2.day)		0.0366			
	Nitrate (as N) (mg/dm2.day)		0.000952			
	Sulfate (SO4) (mg/dm2.day)		<0.0065			
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.00543		0.0571	0.00106	0.0136
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000011		<0.0000011	<0.0000011	<0.0000011
	Arsenic (As)-Total (mg/dm2.day)	0.0000015		0.0000058	0.0000012	0.0000029
	Barium (Ba)-Total (mg/dm2.day)	0.000114		0.00127	0.0000336	0.000306
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000054		<0.0000056	<0.0000054	<0.0000056
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000054		<0.0000056	<0.0000054	<0.0000056
	Boron (B)-Total (mg/dm2.day)	<0.00011		<0.00011	<0.00011	<0.00011
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000054		<0.00000056	<0.00000054	<0.00000056
	Calcium (Ca)-Total (mg/dm2.day)	0.00452		0.0218	0.00314	0.00741
	Chromium (Cr)-Total (mg/dm2.day)	0.0000196		0.000226	<0.0000054	0.0000519
	Cobalt (Co)-Total (mg/dm2.day)	0.0000043		0.0000485	<0.0000011	0.0000116
	Copper (Cu)-Total (mg/dm2.day)	0.000541		0.000145	0.000140	0.000251
	Lead (Pb)-Total (mg/dm2.day)	0.00000519		0.0000116	0.00000154	0.00000660
	Lithium (Li)-Total (mg/dm2.day)	<0.000054		0.000105	<0.000054	<0.000056
	Magnesium (Mg)-Total (mg/dm2.day)	0.00560		0.0662	0.00154	0.0134
	Manganese (Mn)-Total (mg/dm2.day)	0.000204		0.00105	0.000110	0.000268
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000054		0.00000203	<0.00000054	0.00000092
	Nickel (Ni)-Total (mg/dm2.day)	0.0000297		0.000312	0.0000091	0.0000684
	Potassium (K)-Total (mg/dm2.day)	0.00590		0.0464	0.00144	0.00987
	Selenium (Se)-Total (mg/dm2.day)	<0.000011		<0.000011	<0.000011	<0.000011
	Silver (Ag)-Total (mg/dm2.day)	0.00000055		0.00000016	<0.00000011	0.00000015
	Sodium (Na)-Total (mg/dm2.day)	0.00165		0.00662	<0.00054	0.00298
	Strontium (Sr)-Total (mg/dm2.day)	0.0000351		0.000254	0.0000129	0.0000801
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011		<0.0000011	<0.0000011	<0.0000011
	Tin (Sn)-Total (mg/dm2.day)	<0.0000011		0.0000024	<0.0000011	0.0000015
	Uranium (U)-Total (mg/dm2.day)	0.00000031		0.00000340	<0.00000011	0.00000062
	Vanadium (V)-Total (mg/dm2.day)	0.000015		0.000173	<0.000011	0.000035
	Zinc (Zn)-Total (mg/dm2.day)	0.000155		0.000229	0.000078	0.000208

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1523186-26 Dust 16-SEP-14 15:09 FOX-D1000-M	L1523186-27 Dust 16-SEP-14 15:26 MIS-D1000-P	L1523186-28 Dust 16-SEP-14 15:09 FOX-D1000-P	L1523186-29 Dust 16-SEP-14 15:26 MIS-D1000-M	L1523186-30 Dust 15-SEP-14 17:04 LLCF-PA-M
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		0.56	0.21		
	Total Insoluble Dustfall (mg/dm2.day)		0.25	0.11		
	Total Soluble Dustfall (mg/dm2.day)		0.30	<0.10		
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.00396	0.00409		
	Chloride (Cl) (mg/dm2.day)		0.0510	0.0422		
	Nitrate (as N) (mg/dm2.day)		0.000767	0.000797		
	Sulfate (SO4) (mg/dm2.day)		<0.0050	<0.0066		
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.00287			0.00283	0.00395
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000011			<0.0000011	<0.0000011
	Arsenic (As)-Total (mg/dm2.day)	<0.0000011			<0.0000011	0.0000015
	Barium (Ba)-Total (mg/dm2.day)	0.0000657			0.0000867	0.000146
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000054			<0.0000054	<0.0000056
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000054			<0.0000054	<0.0000056
	Boron (B)-Total (mg/dm2.day)	<0.00011			<0.00011	<0.00011
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000054			<0.00000054	0.00000236
	Calcium (Ca)-Total (mg/dm2.day)	0.00338			0.00277	0.00733
	Chromium (Cr)-Total (mg/dm2.day)	0.0000123			0.0000116	0.0000239
	Cobalt (Co)-Total (mg/dm2.day)	0.0000026			0.0000027	0.0000062
	Copper (Cu)-Total (mg/dm2.day)	0.000123			0.000170	0.000370
	Lead (Pb)-Total (mg/dm2.day)	0.00000130			0.00000219	0.00000205
	Lithium (Li)-Total (mg/dm2.day)	<0.000054			<0.000054	<0.000056
	Magnesium (Mg)-Total (mg/dm2.day)	0.00344			0.00302	0.0126
	Manganese (Mn)-Total (mg/dm2.day)	0.000109			0.000106	0.000141
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000054			<0.00000054	0.00000324
	Nickel (Ni)-Total (mg/dm2.day)	0.0000182			0.0000169	0.0000832
	Potassium (K)-Total (mg/dm2.day)	0.00246			0.00339	0.0197
	Selenium (Se)-Total (mg/dm2.day)	<0.000011			<0.000011	<0.000011
	Silver (Ag)-Total (mg/dm2.day)	0.00000022			<0.00000011	<0.00000011
	Sodium (Na)-Total (mg/dm2.day)	0.00077			0.00070	0.0175
	Strontium (Sr)-Total (mg/dm2.day)	0.0000234			0.0000185	0.000116
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011			<0.0000011	<0.0000011
	Tin (Sn)-Total (mg/dm2.day)	<0.0000011			<0.0000011	<0.0000011
	Uranium (U)-Total (mg/dm2.day)	0.00000028			0.00000021	0.00000025
	Vanadium (V)-Total (mg/dm2.day)	<0.000011			<0.000011	<0.000011
	Zinc (Zn)-Total (mg/dm2.day)	0.000075			0.000091	0.000110

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1523186-31 Dust 15-SEP-14 17:04 LLCF-PA-P	L1523186-32 Dust 15-SEP-14 17:10 LLCF-PB-M	L1523186-33 Dust 15-SEP-14 17:10 LLCF-PB-P	L1523186-34 Dust 15-SEP-14 16:08 MIS-U30-M	L1523186-35 Dust 15-SEP-14 16:08 MIS-U30-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)	0.62		0.37		20.1
	Total Insoluble Dustfall (mg/dm2.day)	0.36		0.25		19.9
	Total Soluble Dustfall (mg/dm2.day)	0.26		0.11		0.11
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)	0.0108		0.00648		0.00377
	Chloride (Cl) (mg/dm2.day)	0.0418		0.0342		0.0513
	Nitrate (as N) (mg/dm2.day)	0.00126		0.00126		0.00120
	Sulfate (SO4) (mg/dm2.day)	0.0447		0.0105		0.0242
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)		0.00498		0.221	
	Antimony (Sb)-Total (mg/dm2.day)		<0.0000011		<0.0000011	
	Arsenic (As)-Total (mg/dm2.day)		0.0000014		0.0000155	
	Barium (Ba)-Total (mg/dm2.day)		0.000181		0.00457	
	Beryllium (Be)-Total (mg/dm2.day)		<0.0000056		<0.0000056	
	Bismuth (Bi)-Total (mg/dm2.day)		<0.0000056		<0.0000056	
	Boron (B)-Total (mg/dm2.day)		<0.00011		<0.00011	
	Cadmium (Cd)-Total (mg/dm2.day)		<0.00000056		<0.00000056	
	Calcium (Ca)-Total (mg/dm2.day)		0.00579		0.0756	
	Chromium (Cr)-Total (mg/dm2.day)		0.0000232		0.000699	
	Cobalt (Co)-Total (mg/dm2.day)		0.0000055		0.000154	
	Copper (Cu)-Total (mg/dm2.day)		0.0000179		0.000182	
	Lead (Pb)-Total (mg/dm2.day)		0.00000119		0.0000305	
	Lithium (Li)-Total (mg/dm2.day)		<0.000056		0.000404	
	Magnesium (Mg)-Total (mg/dm2.day)		0.00838		0.197	
	Manganese (Mn)-Total (mg/dm2.day)		0.000154		0.00347	
	Molybdenum (Mo)-Total (mg/dm2.day)		0.00000080		0.00000582	
	Nickel (Ni)-Total (mg/dm2.day)		0.0000504		0.000786	
	Potassium (K)-Total (mg/dm2.day)		0.00746		0.158	
	Selenium (Se)-Total (mg/dm2.day)		<0.000011		<0.000011	
	Silver (Ag)-Total (mg/dm2.day)		<0.00000011		0.00000038	
	Sodium (Na)-Total (mg/dm2.day)		0.00357		0.0291	
	Strontium (Sr)-Total (mg/dm2.day)		0.0000655		0.000933	
	Thallium (Tl)-Total (mg/dm2.day)		<0.0000011		0.0000025	
	Tin (Sn)-Total (mg/dm2.day)		<0.0000011		0.0000047	
	Uranium (U)-Total (mg/dm2.day)		0.00000023		0.0000118	
	Vanadium (V)-Total (mg/dm2.day)		0.000015		0.000622	
	Zinc (Zn)-Total (mg/dm2.day)		0.000064		0.000674	

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



# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1523186-36 Dust 15-SEP-14 16:00 MIS-D90-M	L1523186-37 Dust 15-SEP-14 16:00 MIS-D90-P	L1523186-38 Dust 16-SEP-14 15:34 MIS-D300-M	L1523186-39 Dust 16-SEP-14 15:34 MIS-D300-P	L1523186-40 Dust 15-SEP-14 15:00 AIR-P162-P
Grouping	Analyte					
<b>DUSTFALL</b>						
<b>Particulates</b>	Total Dustfall (mg/dm2.day)		4.06		1.19	2.59
	Total Insoluble Dustfall (mg/dm2.day)		3.88		0.94	2.36
	Total Soluble Dustfall (mg/dm2.day)		0.18		0.24	0.23
<b>Anions and Nutrients</b>	Ammonia, Total (as N) (mg/dm2.day)		0.00416		0.00511	0.00640
	Chloride (Cl) (mg/dm2.day)		0.0559		0.0441	0.0579
	Nitrate (as N) (mg/dm2.day)		0.000976		0.000776	0.00125
	Sulfate (SO4) (mg/dm2.day)		0.0122		<0.0049	0.0075
<b>Metals</b>	Aluminum (Al)-Total (mg/dm2.day)	0.0590		0.0180		
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000011		<0.0000011		
	Arsenic (As)-Total (mg/dm2.day)	0.0000044		0.0000038		
	Barium (Ba)-Total (mg/dm2.day)	0.00116		0.000364		
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000056		<0.0000054		
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000056		<0.0000054		
	Boron (B)-Total (mg/dm2.day)	<0.00011		<0.00011		
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000056		<0.00000054		
	Calcium (Ca)-Total (mg/dm2.day)	0.0191		0.00778		
	Chromium (Cr)-Total (mg/dm2.day)	0.000188		0.0000597		
	Cobalt (Co)-Total (mg/dm2.day)	0.0000416		0.0000132		
	Copper (Cu)-Total (mg/dm2.day)	0.000247		0.000169		
	Lead (Pb)-Total (mg/dm2.day)	0.0000106		0.00000580		
	Lithium (Li)-Total (mg/dm2.day)	0.000101		<0.000054		
	Magnesium (Mg)-Total (mg/dm2.day)	0.0508		0.0164		
	Manganese (Mn)-Total (mg/dm2.day)	0.000947		0.000387		
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000162		0.00000069		
	Nickel (Ni)-Total (mg/dm2.day)	0.000215		0.0000702		
	Potassium (K)-Total (mg/dm2.day)	0.0414		0.0137		
	Selenium (Se)-Total (mg/dm2.day)	<0.000011		<0.000011		
	Silver (Ag)-Total (mg/dm2.day)	0.00000020		0.00000021		
	Sodium (Na)-Total (mg/dm2.day)	0.00822		0.00305		
	Strontium (Sr)-Total (mg/dm2.day)	0.000238		0.0000836		
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011		<0.0000011		
	Tin (Sn)-Total (mg/dm2.day)	0.0000037		0.0000031		
	Uranium (U)-Total (mg/dm2.day)	0.00000256		0.00000083		
	Vanadium (V)-Total (mg/dm2.day)	0.000162		0.000049		
	Zinc (Zn)-Total (mg/dm2.day)	0.000258		0.000109		

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

## Reference Information

## QC Samples with Qualifiers &amp; Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Chloride (Cl)	A	L1523186-11, -13, -15, -17, -18, -2, -20, -22, -27, -28, -31, -33, -35, -37, -39, -4, -40, -6, -8, -9
Method Blank	Nitrate (as N)	A	L1523186-11, -13, -15, -17, -18, -2, -20, -22, -27, -28, -31, -33, -35, -37, -39, -4, -40, -6, -8, -9
Method Blank	Ammonia, Total (as N)	B	L1523186-11, -13, -15, -17, -18, -2, -20, -22, -27, -28, -31, -33, -35, -37, -39, -4, -40, -6, -8, -9
<b>Comments:</b> NH3 results were confirmed by repeat analysis			
Method Blank	Manganese (Mn)-Total	MB-LOR	L1523186-1, -10, -12, -14, -16, -19, -21, -23, -24, -25, -26, -29, -3, -30, -32, -34, -36, -38, -5, -7

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
A	Method Blank exceeds ALS DQO. Refer to narrative comments for further information.
B	Method Blank exceeds ALS DQO. All associated sample results are at least 5 times greater than blank levels and are considered reliable.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>CL-IC-VA</b>	Dustfall	Dustfall Chloride by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The chloride analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>DUSTFALLS-COM-DM2-VA</b>	Dustfall	Combined Dustfalls-Total, soluble, insol	BCMOE PARTICULATE
This analysis is carried out using procedures modified from British Columbia Environmental Manual "Particulate." Particulates or Dustfall are determined gravimetrically. Total Insoluble Dustfall is determined by filtering a sample through a 0.45 um membrane filter and drying the filter at 104 degrees celsius. Total Soluble Dustfall is determined by evaporating the filtrate to dryness at 104 degrees celsius. The Total Dustfall is the sum of Insoluble Dustfall and the Soluble Dustfall.			
<b>MET-DUST(DM2)-MS-VA</b>	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
<b>NH3-F-VA</b>	Dustfall	Dustfall Ammonia by Fluorescence	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The ammonia analysis is specifically carried out using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
<b>NO3-IC-VA</b>	Dustfall	Dustfall Nitrate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The nitrate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>SO4-IC-VA</b>	Dustfall	Dustfall Sulfate by Ion Chromatography	BC LAB MAN. - PART. - SOLUBLE - ANIONS
The Dustfall analysis is carried out in accordance with the B.C. Laboratory Manual method 'Particulate - Total' and 'Particulate - Soluble - Anions and Cations by Ion Chromatography'. The sulfate analysis is specifically carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			

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

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

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

## Chain of Custody Numbers:

69398

## Reference Information

### GLOSSARY OF REPORT TERMS

*Surrogate* - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

*mg/kg* - milligrams per kilogram based on dry weight of sample.

*mg/kg ww* - milligrams per kilogram based on wet weight of sample.

*mg/kg lw* - milligrams per kilogram based on lipid-adjusted weight of sample.

*mg/L* - milligrams per litre.

*<* - Less than.

*D.L.* - The reported Detection Limit, also known as the Limit of Reporting (LOR).

*N/A* - Result not available. Refer to qualifier code and definition for explanation.

*Test results reported relate only to the samples as received by the laboratory.*

*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*

# ALS Environmental

excellence in analytical testing



1988 Triumph Street, Vancouver, BC V5L 1K5  
Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700  
ALS Contact: Can Dang

S.O. 45930

Form 69398

BHP Billiton Diamonds Inc.  
# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1  
Tel: 867-880-2157 Fax: 867-880-4012  
BHP Contacts: David Bruce/ Richard EhlerDavid

bhpbilliton

## CHAIN OF CUSTODY FORM

Ammonia	Chloride	Dustfall Metals	Insoluble Particulate	Nitrate	Soluble Particulate	Sulphate	Total Particulate
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L1523186-COFC

For Lab Use

Station ID	Matrix	Date	Time	Init	Ammonia	Chloride	Dustfall Metals	Insoluble Particulate	Nitrate	Soluble Particulate	Sulphate	Total Particulate
MISNEW-D300-M	Dust	16-Sep-2014	03:40 PM	TJ	1	1	1	1	1	1	1	BHP2
MISNEW-D300-P	Dust	16-Sep-2014	03:40 PM	TJ	1	1	1	1	1	1	1	BHP2
MISNEW-D90-M	Dust	15-Sep-2014	03:55 PM	TJ	1	1	1	1	1	1	1	BHP2
MISNEW-D90-P	Dust	15-Sep-2014	03:55 PM	TJ	1	1	1	1	1	1	1	BHP2
Air-P125-M	Dust	15-Sep-2014	03:30 PM	TJ	1	1	1	1	1	1	1	BHP2
Air-P125-P	Dust	15-Sep-2014	03:30 PM	TJ	1	1	1	1	1	1	1	BHP2
Air-P280-M	Dust	15-Sep-2014	03:11 PM	TJ	1	1	1	1	1	1	1	BHP2
Air-P280-P	Dust	15-Sep-2014	03:11 PM	TJ	1	1	1	1	1	1	1	BHP2
AQ-49-P	Dust	16-Sep-2014	02:46 PM	TJ	1	1	1	1	1	1	1	BHP2
AQ-54-M	Dust	16-Sep-2014	02:46 PM	TJ	1	1	1	1	1	1	1	BHP2
AQ-54-P	Dust	16-Sep-2014	02:46 PM	TJ	1	1	1	1	1	1	1	BHP2
Fox-U30-M	Dust	15-Sep-2014	04:47 PM	TJ	1	1	1	1	1	1	1	BHP2
Fox-U30-P	Dust	15-Sep-2014	04:47 PM	TJ	1	1	1	1	1	1	1	BHP2
Mis-D30-M	Dust	15-Sep-2014	04:06 PM	TJ	1	1	1	1	1	1	1	BHP2
Mis-D30-P	Dust	15-Sep-2014	04:06 PM	TJ	1	1	1	1	1	1	1	BHP2
Fox-D30-M	Dust	15-Sep-2014	04:43 PM	TJ	1	1	1	1	1	1	1	BHP2
Fox-D30-P	Dust	15-Sep-2014	04:43 PM	TJ	1	1	1	1	1	1	1	BHP2
Fox-D90-P	Dust	15-Sep-2014	04:41 PM	TJ	1	1	1	1	1	1	1	BHP2
Fox-D300-M	Dust	16-Sep-2014	03:13 PM	TJ	1	1	1	1	1	1	1	BHP2
Fox-D300-P	Dust	16-Sep-2014	03:13 PM	TJ	1	1	1	1	1	1	1	BHP2

Turn around Required: Routine TAT

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2503

Please also forward results to Andrew Howton, andrew.howton@ekati.ddcorp.ca

Relinquished by: KP

Date: 22 SEP 2014

Time: 16:30

Received by: PAUL

Date: SEP 24

Time: 20:18

Relinquished by:

Date:

Time:

Received by:

Date:

Time:

FOR LAB USE ONLY

Cooler seal intact upon receipt?

☐ Yes ☐ No ☐ N/A

Sample temperature upon receipt: 17.8, 17.1

Frozen? ☐ Yes ☐ No 16.8 C

Send Analytical Results to:

compliance.team@ekati.ddcorp.ca;





**ALS Contact:** Can Dang

**BHP Contacts:**David Bruce / Richard Ehler

bhpbilliton

S.O. 45930

## CHAIN OF CUSTODY FORM

[illegible]

For Lab Use

FOR LAB USE ONLY

Please also forward results to Andrew Howton, [andrew.howton@ekati.ddcorp.ca](mailto:andrew.howton@ekati.ddcorp.ca)

Date	
Time	

**FOR LAB USE ONLY**

198.13.1

16-8  
16-6

compliance.team@ekati.ddcorp.ca;



## ***Appendix 10***

### *The Ekati Mine Snow Core Sampling Work Instruction*

## EKA WI 2113.12 Snow Core Sampling

<b>Version:</b>	1.0
<b>Replaces:</b>	N/A
<b>Creation Date:</b>	2014-11-10
<b>Scheduled Review Date:</b>	2015-11-10
<b>Review Date:</b>	N/A
<b>Document Team Members:</b>	Environment Advisor – Operations
<b>Document Owner:</b>	Environment Advisor - Operations
<b>Document Approver:</b>	Environment Superintendent - Operations
<b>Related Documents:</b>	EKA WI.2109.03 Snowmobile Operation EKA WI.2105.04 Working in Remote Areas EKA PRO.1854 Working in Cold Weather EKA PRO.2111 Helicopter Operations EKA WI.2015.10 Field Check-Ins EKA WI.2113.01 Sample Shipping
<b>Key Contacts:</b>	Environment Advisor – Operations, Team Leader - Environment
<b>Change Requests:</b>	Environment Advisor - Operations
<b>Brief Description:</b>	Collection of snow core samples for the Air Quality Monitoring Program

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## 1.0 Objective

This document informs Dominion Diamond Ekati Corporation (DDEC) Environment personnel of the respective procedures that must be followed when collecting snow samples that can be analyzed for selected parameters.

---

## 2.0 Scope

This procedure applies to all DDEC Environment personnel and consultants, who conduct snow core sampling for the Air Quality Monitoring Program.

---

## 3.0 Introduction

This document has been developed to provide personnel with standard procedures to follow when conducting snow sampling to ensure consistency with snow sampling procedures between sampling years (every 3 years as required by the Air Quality Management and Monitoring Plan).

---

## 4.0 Definitions

Snow Corer	Clear plastic or metal tube with markings to indicate snow depth (cm). A metal bit with teeth is attached to the bottom end of the tube while the top end has a metal collar and handles.
GPS	Global Positioning System. An electronic device with a built in antenna that provides navigation information using satellites and a system of co-ordinates. This device enables the user to mark waypoints allowing them to find the exact location at another time.
SWE	Snow Water Equivalent. Measured using the snow corer weigh scale. This is the calculated weight of the sample in liquid phase.
Dry Weight	Weight of the empty snow corer.
Snow Core Weigh Scale	Used to determine SWE. Comes in two pieces, a spring scale and a cradle, which hooks to the spring scale. The cradle serves to hold the snow corer while weighing it. The Prairie and Federal samplers each have their own scale, they are not interchangeable.

---

## 5.0 Health & Safety

### Hazards

- Cold temperatures and rapidly changing weather can pose a hazard to personnel in the field. Wear appropriate winter clothing and bring survival gear.
- Watch for rocks when snowmobiling to sampling locations.
- Ensure sampling is completed when ice on lakes is at a safe thickness (beware of narrows and areas likely to have currents and thin ice).
- Slips, trips, and falls.
- Heavy and awkward lifting
- Sharp tools (e.g. corer teeth)
- Vehicle interaction
- Hazards associated with working in a remote location, e.g. poor/absent radio reception,
- Refer to related WIs listed on the cover page.

---

## 6.0 Preparation

### Tools

- Prairie snow sampler (1.2m short wide sampler)
- Federal snow sampler (5m long narrow sampler)
- Weigh scale and cradle for snow corer (one for each type of sampler, use the correct one)
- Snow depth probe (3m)
- GPS and extra batteries
- Camera
- Shovels (2)
- Sturdy plastic bags or equivalent plastic containers (37.5L Ziplocs)
- Clean 5 Gallon buckets with lids (one for each sample location plus one more)
- Sharpie markers (2 or 3)
- Compass (15 degrees East declination in March 2014)
- Radios
- SPOT GPS messenger
- SAT phone
- Map of the area being sampled and route to it
- List of sample sites and their GPS coordinates
- 100m tape measure
- Survival Kit
- Rite-in-the-Rain field notebook and field sheets
- Several pencils/pens
- Wildlife deterrents

### Training Requirements

- Helicopter Orientation (if used)
- Snowmobile competency (if used)
- Knowledge of using a GPS
- Knowledge of these procedures and related WIs as listed on the cover page
- At least one person has winter survival training



## 7.0 Tasks

7.1 Prepare Equipment	<ul style="list-style-type: none"> <li>• Check the tool list to ensure that you have all the required tools.</li> <li>• Enter the coordinates of snow sampling sites into GPS. Double check to ensure accuracy of coordinates entered.</li> <li>• Label the plastic bags with the following information: Sampling site, date, sampler initials (eg. AQ-21, April 13, 2011, JLM)</li> </ul>
7.2 Obtaining the Dry Weight of the Snow Corer	<p>The snow corer must be weighed prior to sampling to obtain a dry weight. This should be done prior to the field trip:</p> <ul style="list-style-type: none"> <li>• Check the snow corer tube to make sure that it is clean and free of snow.</li> <li>• Lay the empty snow corer on the scale cradle.</li> <li>• Record the weight of the empty snow corer indicated by the number on the spring scale.</li> <li>• Record the dry weight in the field notebook and datasheets.</li> </ul>
7.3 Locate Sampling Site	<p>To maintain consistency in snow sampling between sites and years, the following steps must be taken to locate the site to be sampled:</p> <ul style="list-style-type: none"> <li>• Use GPS to determine the exact sampling location.</li> <li>• If snowmobiles are left running ensure that they are parked downwind from the sampling location, helicopter must be landed far enough away that it does not disturb the snow sampling site.</li> <li>• Using a compass and the bearing from the 2011 sampling event shot line along which the sample transect runs, from top to toe (refer to previous 2011 sampling notes for bearing of the last transect). Use the 100m tape (or laser range finder) to measure the distance from top to toe. Divide this distance by two to determine the location of the middle slope sample point (i.e. The slope measures 200m long from top to toe, the middle sample point will be located at 100m down slope along the transect).</li> </ul>
7.4 Collecting the Snow Sample	<p>A composite sample must be taken from the top, middle and toe of the slope. These must be taken approximately an equal distance from each other.</p> <p>This procedure must be followed at the top, middle and toe of the slope at each site:</p> <ul style="list-style-type: none"> <li>• Take a photo looking down the transect from the top, a photo looking both up and down from the middle and a photo looking up from the toe.</li> <li>• Use new nitrile gloves (with polypro liners underneath for warmth, if necessary) at each site.</li> <li>• Snow core samples from a single site (top, middle, and toe) should be deposited in the same bag.</li> <li>• Use the snow depth probe to measure and record the depth of snow at the top, middle, and toe of the slope.</li> <li>• QAQC: Take 3 blank snow cores at the sampling location in order to clean the corer and prevent cross contamination from site to site. Blank snow cores can be disposed of on site. Also perform similar action with the snow shovel before it is used at a sample site.</li> <li>• Insert the snow corer vertically to the base of the snow column. If snow is quite hard, try turning the corer clockwise while using some downward pressure.</li> </ul>

	<ul style="list-style-type: none"> <li>• If need be, shovel the perimeter of the corer clear to facilitate removal.</li> <li>• In dry conditions when the snow core will fall out of the tube, insert a shovel below the tool to retain the sample. This is not necessary when the snow is wet and the core will stay in the tube.</li> <li>• Discard the bottom section of approximately 5cm only when it has leaves or dirt, which may contaminate the sample.</li> </ul>
7.5 Record the Snow Depth & SWE	<ul style="list-style-type: none"> <li>• Record the depth of the snow indicated on the core sampler.</li> <li>• For very deep snow pack use Federal snow sampler.</li> <li>• Weigh the snow corer with the snow inside to determine the SWE.</li> <li>• Deposit snow core sample into the labeled Ziploc bag , seated inside of a 5 gallon bucket, and seal closed. Collect approximately one third of a buckets worth of snow at each of the top, middle, and toe locations per site. The bucket should be close to full when done. Seal the lid on the bucket when finished at a site.</li> </ul>
7.6 Sampling in Shallow Snow	<p>Where the snow depth is insufficient to permit a core sample, for example on a windblown lake or hill crest, follow this procedure:</p> <ul style="list-style-type: none"> <li>• Unhook cradle from spring scale and hook empty bucket to the scale to determine the dry weight.</li> <li>• Record the dry weight.</li> <li>• Obtain scoop samples, with a clean shovel, of the undisturbed snow and deposit into the clean plastic bucket.</li> <li>• QAQC – ensure that the bucket is completely free of snow between sample sites to avoid cross contamination.</li> <li>• Enough snow needs to be collected to loosely fill a 5 gallon bucket.</li> <li>• The bucket will need to be weighed to determine SWE.</li> <li>• Hook the bucket handle to the spring scale.</li> <li>• Record the weight indicated by the number on the spring scale.</li> <li>• Sample is deposited in labeled plastic bag and secured closed with a tie wrap. Double bag samples to prevent leakage.</li> <li>• Record that a grab sample had been collected vs a core sample.</li> </ul>
7.7 Information to be Recorded	<p>Record the following information in your field notebook at each snow sampling site:</p> <ul style="list-style-type: none"> <li>• Sample site location (GPS Survey);</li> <li>• Sample date;</li> <li>• Sampler initials;</li> <li>• Name and identification number of snow sampler (if more than one is used)</li> <li>• Snow depth;</li> <li>• Dry weight of snow sampler;</li> <li>• SWE;</li> <li>• General description of snow conditions such as loose, granular, or hard slab;</li> <li>• Indicate whether the slope was leeward (facing downwind) or windward (facing upwind) at the time of sampling;</li> <li>• Indicate whether the slope is facing the mine site;</li> <li>• Visual evidence, if any, of fugitive dust, animal signs, or other disturbances.</li> <li>• Site photos, one looking from toe to top, and one looking from top to toe.</li> </ul>

<p>7.8 Laboratory Sample Preparation</p>	<ul style="list-style-type: none"> <li>• Bring the bags/buckets of snow samples to the Environment Field Office and allow to melt completely.</li> <li>• QA/QC: fill one sample bag from each numbered lot of sample bags used with 5 liters of deionized water and let it sit out overnight with the samples. Decant into sample bottles as equipment blank when transferring samples into bottles. There shall be one equipment blank for each numbered lot of sample bags.</li> <li>• Prior to transferring the water into sample bottles, mix the water thoroughly to ensure a representative sample.</li> <li>• Once snow is entirely melted, cut a small opening in the corner of the sample bag and pour the water into the appropriate sample bottles. If possible try to avoid large twigs and vegetation from entering the sample bottle.</li> <li>• Fill bottles and add preservative where required.</li> <li>• Record the date/time that each melted sample was decanted into bottle. This will be used on the CoC.</li> <li>• Store bottles in a refrigerator until samples can be shipped.</li> <li>• Note – in order to meet holding times, samples need to be shipped on the next available flight. Plan the tasks in Section 6.10 (this section) to accommodate same day or next day sample shipment.</li> </ul>
<p>7.9 Shipping Procedure</p>	<ul style="list-style-type: none"> <li>• Refer to the sample shipping procedures and WIs.</li> </ul>

## 8.0 Documents and Records

Field notebook

Sampling Log



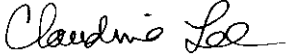
DDEC Air Quality Management and Monitoring Plan.

Chain of Custody form

DDEC shipping form

## Appendix

### Approval signatures record

REVIEWER ROLE	NAME	SIGNATURE	DATE
Environment Advisor – Operations	Andrew Howton		March 25, 2014
Team Leader – Environment	David Bruce		25-Mar-2014
Superintendent – Environment Operations	Claudine Lee		10-Nov-2014

## ***Appendix 11***

*Snow Core Sampling Field Notes, 2014*

EKATI DIAMOND MINE

**2014 Air Quality Monitoring Program**



# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ-019 Collection Date: 12 Apr 2014 2014

Actual GPS Coordinates (top of transect): 515111 1 7172443

Slope Length 105 M Slope Bearing (top to bottom): 330

Sample Time Started: 13:26 Sample Time Finished: 13:46

Field Samplers Initials: JM/KP/JD

Equipment used: Bucket/Shovel/Snow Corer

Weather Conditions: (clear, cloudy, windy etc) drifting snow

Air Temperature (°C): -19

Wind Speed (kph): 32

Wind Direction (degrees): 328

wind: slope side

Slope Facing Mine

<p style="text-align: center;"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>7</u> (Bucket)</p> <p>Snow Depth: <u>20 cm (very granular)</u></p> <p>Snow Weight(SWE): <u>82</u></p> <p>Sampler equipment: <u>Bucket Shovel</u></p> <p>Number of cores to 1/3 fill bucket: <u>2</u></p>	<p><b>Comments:</b> <u>In <sup>rock</sup> gravel field</u> <u>2 cm crust / rest granular</u></p> <p><b>Photos(yes/no):</b></p>
<p style="text-align: center;"><b>Mid Sample</b></p> <p>Distance from top: <u>52.5 m</u></p> <p>Sampler dry weight(SWE): <u>90</u></p> <p>Snow Depth: <u>29 cm</u></p> <p>Snow weight(SWE): <u>95</u></p> <p>Sampler equipment: <u>Snow Corer / Shovel</u></p> <p>Number of cores to 1/3 fill bucket: <u>8</u></p>	<p><b>Comments:</b> <u>Granular snow @ bottom of snow pack</u></p> <p><b>Photos(yes/no):</b></p>
<p style="text-align: center;"><b>Toe Sample</b></p> <p>Distance from top: <u>105 m</u></p> <p>Sampler dry weight(SWE): <u>90</u></p> <p>Snow Depth: <u>55</u></p> <p>Snow Weight(SWE): <u>103</u></p> <p>Sampler equipment: <u>Snow Corer / Shovel</u></p> <p>Number of cores to 1/3 fill bucket: <u>7</u></p>	<p><b>Comments:</b> <u>Snow 1/2 compact / 1/2 granular</u></p> <p><b>Photos(yes/no):</b></p>

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ-109 Collection Date: 10 APR 2014 2014

Actual GPS Coordinates (top of transect): 504841 1 7171650

Slope Length 69 M Slope Bearing (top to bottom): 98

Sample Time Started: 12:33 Sample Time Finished: 12:51

Field Samplers Initials: KP/JH

Equipment used: \_\_\_\_\_

Weather Conditions: (clear, cloudy, windy etc) clear

Air Temperature (°C): \_\_\_\_\_

Wind Speed (kph): \_\_\_\_\_

Wind Direction (degrees): \_\_\_\_\_

*Facing the mine /  
toward side of slope*

<p><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>7</u></p> <p>Snow Depth: <u>12</u></p> <p>Snow Weight(SWE): <u>62</u></p> <p>Sampler equipment: <u>bucket &amp; shovel</u></p> <p>Number of cores to 1/3 fill bucket: <u>N/A</u></p>	<p><b>Comments:</b></p> <p><i>very granular top 2cm = crusty layer</i></p> <p><b>Photos(yes/no):</b></p>
<p><b>Mid Sample</b></p> <p>Distance from top: <u>32</u></p> <p>Sampler dry weight(SWE): <u>89</u></p> <p>Snow Depth: <u>28</u> <u>29</u></p> <p>Snow weight(SWE): <u>94</u></p> <p>Sampler equipment: <u>Snow Corer (provided)</u></p> <p>Number of cores to 1/3 fill bucket: <u>13</u></p>	<p><b>Comments:</b></p> <p><b>Photos(yes/no):</b></p>
<p><b>Toe Sample</b></p> <p>Distance from top: <u>64</u></p> <p>Sampler dry weight(SWE): <u>91</u></p> <p>Snow Depth: <u>80</u></p> <p>Snow Weight(SWE): <u>107</u></p> <p>Sampler equipment: <u>Snow corer (provided)</u></p> <p>Number of cores to 1/3 fill bucket: <u>4</u></p>	<p><b>Comments:</b></p> <p><b>Photos(yes/no):</b></p>

# 2014 AQMP Snow Core Sampling Field Sheet

Leeward / windward

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ 107 Collection Date: 10 APR 2014

Actual GPS Coordinates (top of transect): 558604 / 71536331

Slope Length 11.8 M Slope Bearing (top to bottom): 283

Sample Time Started: 9:59 Sample Time Finished: 10:22

Field Samplers Initials: KP/JY

Equipment used: Pravie / Bucket shovel

Weather Conditions: (clear, cloudy, windy etc) clear

Air Temperature (°C): \_\_\_\_\_

Wind Speed (kph): \_\_\_\_\_

Wind Direction (degrees): \_\_\_\_\_

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>7 (Empty bucket)</u></p> <p>Snow Depth: <u>12 cm</u></p> <p>Snow Weight(SWE): <u>79</u></p> <p>Sampler equipment: <u>Bucket / shovel</u></p> <p>Number of cores to 1/3 fill bucket: <u>0</u></p>	<p><b>Comments:</b></p> <p>Compact top layer / Granular under wetter</p> <p>Windward side</p> <p><b>Photos(yes/no):</b> <u>yes</u></p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>84</u></p> <p>Sampler dry weight(SWE): <u>91</u></p> <p>Snow Depth: <u>26</u></p> <p>Snow weight(SWE): <u>95</u></p> <p>Sampler equipment: <u>Pravie</u></p> <p>Number of cores to 1/3 fill bucket: <u>11 (7)</u></p>	<p><b>Comments:</b></p> <p>compact top layer / granular at bottom</p> <p><b>Photos(yes/no):</b> <u>yes</u></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>168</u></p> <p>Sampler dry weight(SWE): <u>91</u></p> <p>Snow Depth: <u>70</u></p> <p>Snow Weight(SWE): <u>100</u></p> <p>Sampler equipment: <u>Pravie</u></p> <p>Number of cores to 1/3 fill bucket: <u>11 (3)</u></p>	<p><b>Comments:</b></p> <p>compact 40cm top then granular bottom</p> <p>1st core took out some of tundra</p> <p>2nd core lost some of granular bottom</p> <p><b>Photos(yes/no):</b> <u>yes</u></p>

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ-105 Collection Date: 10 APR 2014

Actual GPS Coordinates (top of transect): 539 020 1 7179210

Slope Length 83 M Slope Bearing (top to bottom): 258

Sample Time Started: 11:38 Sample Time Finished: 11:57

Field Samplers Initials: KP/Sq

Equipment used: Bucket / Shovel / Prairie Scale Leeward Side

Weather Conditions: (clear, cloudy, windy etc) \_\_\_\_\_

Air Temperature ('c): \_\_\_\_\_

Wind Speed (kph): \_\_\_\_\_

Wind Direction (degrees): \_\_\_\_\_

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>7 (Bucket)</u></p> <p>Snow Depth: <u>3cm</u></p> <p>Snow Weight(SWE): <u>48</u></p> <p>Sampler equipment: _____</p> <p>Number of cores to 1/3 fill bucket: <u>0 (used shovel)</u></p>	<p><b>Comments:</b> <u>shoveled sample into bucket</u></p> <p><b>Photos(yes/no):</b> <u>yes</u></p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>41.5</u></p> <p>Sampler dry weight(SWE): <u>7</u></p> <p>Snow Depth: <u>10</u></p> <p>Snow weight(SWE): <u>76</u></p> <p>Sampler equipment: _____</p> <p>Number of cores to 1/3 fill bucket: <u>0 (used - shovel / bucket)</u></p>	<p><b>Comments:</b> <u>Shoveled snow into bucket</u></p> <p><b>Photos(yes/no):</b> <u>yes</u></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>83.6</u></p> <p>Sampler dry weight(SWE): <u>7</u></p> <p>Snow Depth: <u>9cm</u></p> <p>Snow Weight(SWE): <u>81</u></p> <p>Sampler equipment: <u>bucket + shovel</u></p> <p>Number of cores to 1/3 fill bucket: <u>0 (used shovel / bucket)</u></p>	<p><b>Comments:</b> <u>Shoveled snow into bucket</u></p> <p><b>Photos(yes/no):</b> <u>yes</u></p>



# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ-004 Collection Date: April 9 2014

Actual GPS Coordinates (top of transect): 0512937 , 7171370

Slope Length 44 <sup>(stake to stake)</sup> M Slope Bearing (top to bottom): 154°

Sample Time Started: 12:35 Sample Time Finished: 13:05

Field Samplers Initials: AWH/KS

Equipment used: 1.2m

Weather Conditions: (clear, cloudy, windy etc) windy Sunny

Air Temperature (°C): -20

Wind Speed (kph): 45 kph

Wind Direction (degrees):

<p><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>90/91/91</u></p> <p>Snow Depth: <u>0.41</u></p> <p>Snow Weight(SWE): <u>100/99/100</u></p> <p>Sampler equipment: <u>1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u>5</u></p>	<p>Comments: <u>For arne</u></p> <p>Photos(yes/no): <u></u></p>
<p><b>Mid Sample</b></p> <p>Distance from top: <u>22m</u></p> <p>Sampler dry weight(SWE): <u>90/91/90</u></p> <p>Snow Depth: <u>1.09</u></p> <p>Snow weight(SWE): <u>125/125/125</u></p> <p>Sampler equipment: <u>1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u>3</u></p>	<p>Comments: <u></u></p> <p>Photos(yes/no): <u></u></p>
<p><b>Toe Sample</b></p> <p>Distance from top: <u>44m</u></p> <p>Sampler dry weight(SWE): <u>90/90/91</u></p> <p>Snow Depth: <u>0.22</u></p> <p>Snow Weight(SWE): <u>94/94/95</u></p> <p>Sampler equipment: <u>1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u>24</u></p>	<p>Comments: <u>For skat</u></p> <p>Photos(yes/no): <u></u></p>

Decanted @ 14:50 hrs 10 APRIL 2014  
IN BOTTLE ROOM

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: A0055 Collection Date: Apr 18 2014

Actual GPS Coordinates (top of transect): 471981 / 7193964

Slope Length 77 M Slope Bearing (top to bottom): 168

Sample Time Started: 1040 Sample Time Finished: 11:20

Field Samplers Initials: RE/KS

Equipment used: bucket / 5m

Weather Conditions: (clear, cloudy, windy etc) \_\_\_\_\_

Air Temperature (°C): \_\_\_\_\_

Wind Speed (kph): \_\_\_\_\_

Wind Direction (degrees): \_\_\_\_\_

<p><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>7/7/7</u></p> <p>Snow Depth: <u>11/8/21</u></p> <p>Snow Weight(SWE): <u>67/68/68</u></p> <p>Sampler equipment: <u>bucket</u></p> <p>Number of cores to 1/3 fill bucket: _____</p>	<p><b>Comments:</b></p> <p><u>used prairie scale</u></p> <p><b>Photos(yes/no):</b></p>
<p><b>Mid Sample</b></p> <p>Distance from top: <u>38m</u></p> <p>Sampler dry weight(SWE): <u>6/8/16</u></p> <p>Snow Depth: <u>53/51/44/38/51/51/50/43/54/49/49/48/52/</u></p> <p>Snow weight(SWE): <u>15/16/16/18</u> <u>lost 2cm</u> <u>lost 1cm</u> <u>lost 4cm</u> <u>lost 4cm</u></p> <p>Sampler equipment: <u>5m</u></p> <p>Number of cores to 1/3 fill bucket: <u>13</u></p>	<p><b>Comments:</b></p> <p><u>v. spongy ground</u></p> <p><b>Photos(yes/no):</b></p>
<p><b>Toe Sample</b></p> <p>Distance from top: <u>77</u></p> <p>Sampler dry weight(SWE): <u>6/7/7</u></p> <p>Snow Depth: <u>10/8/10</u></p> <p>Snow Weight(SWE): <u>83/82/82</u></p> <p>Sampler equipment: <u>bucket</u></p> <p>Number of cores to 1/3 fill bucket: _____</p>	<p><b>Comments:</b></p> <p><u>used prairie scale</u></p> <p><b>Photos(yes/no):</b></p>

★ DECARDED @ 1657 9 APRIL 2014 IN BOTTLE ROOM  
RE/KS.



# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ 054 Collection Date: April 8 2014

Actual GPS Coordinates (top of transect): 483263 / 7186671

Slope Length 1538 M Slope Bearing (top to bottom): 118

Sample Time Started: 12:00 Sample Time Finished: 12:42

Field Samplers Initials: RE/KS

Equipment used: bucket 1.2m

Weather Conditions: (clear, cloudy, windy etc) \_\_\_\_\_

Air Temperature (°C): \_\_\_\_\_

Wind Speed (kph): \_\_\_\_\_

Wind Direction (degrees): \_\_\_\_\_

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>10617</u></p> <p>Snow Depth: <u>20/17/21</u></p> <p>Snow Weight(SWE): <u>98/98/97</u></p> <p>Sampler equipment: <u>bucket</u></p> <p>Number of cores to 1/3 fill bucket: <u>2/30 bed</u></p>	<p>Comments:</p> <p>Photos(<u>yes</u>/no):</p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>18m</u></p> <p>Sampler dry weight(SWE): <u>8/86/87</u></p> <p>Snow Depth: <u>95 + (64)</u> <u>159</u></p> <p>Snow weight(SWE): <u>7(125/125/125) + (110/110/111)</u></p> <p>Sampler equipment: <u>1.2m</u></p> <p>Number of cores to 1/3 fill bucket: _____</p>	<p>Comments:</p> <p><u>firm all the way to bottom</u></p> <p>Photos(<u>yes</u>/no):</p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>36</u></p> <p>Sampler dry weight(SWE): <u>88/89/88</u></p> <p>Snow Depth: <u>25/32/15/32/33/29</u></p> <p>Snow Weight(SWE): <u>9/91/92/92/25</u></p> <p>Sampler equipment: <u>1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u>6</u></p>	<p>Comments:</p> <p><u>~15 cm - 20cm firm</u> <u>the rest is granular</u> <u>void space on glass</u></p> <p>Photos(<u>yes</u>/no):</p>

\*Decanted @ 16:50 19 APRIL 2014 IN BOTTLE ROOM  
RE/KS

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AD110 Collection Date: April 8 2014

Actual GPS Coordinates (top of transect): 485846 / 7175003

Slope Length 21 M Slope Bearing (top to bottom): 84

Sample Time Started: 13:18 Sample Time Finished: 13:40

Field Samplers Initials: RE VB

Equipment used: 5m 1 bucket

Weather Conditions: (clear, cloudy, windy etc) \_\_\_\_\_

Air Temperature (°C): \_\_\_\_\_

Wind Speed (kph): \_\_\_\_\_

Wind Direction (degrees): \_\_\_\_\_

<p><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>doesn't pull scale down</u></p> <p>Snow Depth: <u>scraped off rock, 10/13</u></p> <p>Snow Weight(SWE): <u>254/254/256</u></p> <p>Sampler equipment: <u>bucket</u></p> <p>Number of cores to 1/3 fill bucket: _____</p>	<p><b>Comments:</b></p> <p><u>on rocky outcrop</u></p> <p><b>Photos</b>(yes/no): <u>(yes)</u></p>
<p><b>Mid Sample</b></p> <p>Distance from top: <u>10.5</u></p> <p>Sampler dry weight(SWE): <u>122/124/124</u></p> <p>Snow Depth: <u>1.90m (two tubes), 1.93</u></p> <p>Snow weight(SWE): <u>210/211/214</u></p> <p>Sampler equipment: <u>5m</u></p> <p>Number of cores to 1/3 fill bucket: <u>2</u></p>	<p><b>Comments:</b></p> <p><b>Photos</b>(yes/no): <u>(yes)</u></p>
<p><b>Toe Sample</b></p> <p>Distance from top: <u>21</u></p> <p>Sampler dry weight(SWE): <u>doesn't move scale</u></p> <p>Snow Depth: <u>12</u></p> <p>Snow Weight(SWE): <u>172/172/171</u></p> <p>Sampler equipment: <u>bucket</u></p> <p>Number of cores to 1/3 fill bucket: <u>—</u></p>	<p><b>Comments:</b></p> <p><b>Photos</b>(yes/no): <u>(yes)</u></p>

\*DECANTED @ 16:53 9 APRIL 2014 IN BOTTLE ROOM  
RE/KS

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: 102 106 Collection Date: 4/8 2014

Actual GPS Coordinates (top of transect): 493021 1 71.60898

Slope Length 41 M Slope Bearing (top to bottom): 913

Sample Time Started: 14:40 Sample Time Finished: 15:17

Field Samplers Initials: RE/KS

Equipment used: 5m bucket

Weather Conditions: (clear, cloudy, windy etc) \_\_\_\_\_

Air Temperature (°C): \_\_\_\_\_

Wind Speed (kph): \_\_\_\_\_

Wind Direction (degrees): \_\_\_\_\_

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>does not move scale</u></p> <p>Snow Depth: <u>24/24/25</u></p> <p>Snow Weight(SWE): <u>170/170/172</u></p> <p>Sampler equipment: <u>bucket</u></p> <p>Number of cores to 1/3 fill bucket: _____</p>	<p><b>Comments:</b></p> <p><u>on rocky face</u></p> <p><u>(small drift most of area is hard)</u></p> <p><b>Photos(yes/no):</b></p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>20.5</u></p> <p>Sampler dry weight(SWE): <u>3 extensions = 64</u></p> <p>Snow Depth: <u>2.67m</u></p> <p>Snow weight(SWE): <u>244/240/242</u></p> <p>Sampler equipment: <u>5m</u></p> <p>Number of cores to 1/3 fill bucket: <u>1</u></p>	<p><b>Comments:</b></p> <p><u>extremely windy! may affect weights?</u></p> <p><u>stop face.</u></p> <p><b>Photos(yes/no):</b></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>41</u></p> <p>Sampler dry weight(SWE): <u>extensions = 6/4/6</u></p> <p>Snow Depth: <u>65/65/63/62/61/65/59/66</u></p> <p>Snow Weight(SWE): <u>22/24/24/18/18/18/16/16/18</u></p> <p>Sampler equipment: _____</p> <p>Number of cores to 1/3 fill bucket: _____</p>	<p><b>Comments:</b></p> <p><u>@ LIP OF LAKE</u></p> <p><u>5096.</u></p> <p><b>Photos(yes/no):</b></p>

\* DECANTED @ 16:45 9 APRIL 2014 IN BOTTLE ROOM  
RE/KS



# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: A0049 Collection Date: 4/8 2014

Actual GPS Coordinates (top of transect): 1

Slope Length 41 M Slope Bearing (top to bottom): 47 (followed existing stakes)

Sample Time Started: 1350 Sample Time Finished: 14:25

Field Samplers Initials: RE/KS

Equipment used: 5m bucket 1/2 m probe scale

- plot is on far side  
w 3 pieces rebar  
@ up down hill

Weather Conditions: (clear, cloudy, windy etc)

Air Temperature (°C):

Wind Speed (kph):

Wind Direction (degrees):

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>doesn't have scale</u></p> <p>Snow Depth: <u>8/7/13</u></p> <p>Snow Weight(SWE): <u>211/216/216</u></p> <p>Sampler equipment: <u>bucket</u></p> <p>Number of cores to 1/3 fill bucket: <u>—</u></p>	<p><b>Comments:</b></p> <p>- arctic hare poop &amp; po right beside plot v. windy.</p> <p><b>Photos(yes/no):</b></p> <p><u>yes</u></p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>16</u></p> <p>Sampler dry weight(SWE): <u>doesn't have scale</u></p> <p>Snow Depth: <u>5/6/7</u></p> <p>Snow weight(SWE): <u>170/172/172</u></p> <p>Sampler equipment: <u>bucket</u></p> <p>Number of cores to 1/3 fill bucket: <u>—</u></p>	<p><b>Comments:</b></p> <p>mostly bare rock. Layered clsker v. granular, like ice crust.</p> <p><b>Photos(yes/no):</b></p> <p><u>yes</u></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>41</u></p> <p>Sampler dry weight(SWE): <u>too light under 1</u></p> <p>Snow Depth: <u>30/23/35</u></p> <p>Snow Weight(SWE): <u>142/142/141</u></p> <p>Sampler equipment: <u>bucket</u></p> <p>Number of cores to 1/3 fill bucket: <u>—</u></p>	<p><b>Comments:</b></p> <p>used bucket; too light to weigh.</p> <p><b>Photos(yes/no):</b></p> <p><u>yes</u></p>

\* DECANTED @ 16:37 9 APRIL 2014 IN BOTTLE ROOM RE/KS

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ-C4 Collection Date: April 7 2014

Actual GPS Coordinates (top of transect): 534862 / 7198812

Slope Length 100 M Slope Bearing (top to bottom): 212

Sample Time Started: 1510 Sample Time Finished: 1340

Field Samplers Initials: RE/108

Equipment used: bucket / 1.2m plaine

Weather Conditions: (clear, cloudy, windy etc) \_\_\_\_\_

Air Temperature (°c): \_\_\_\_\_

Wind Speed (kph): \_\_\_\_\_

Wind Direction (degrees): \_\_\_\_\_

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>90/91/90</u></p> <p>Snow Depth: <u>10/14/12/13/10/14/10/10/9/10/13/9/10/10/9/10/9/10/14/10/13/10/14</u></p> <p>Snow Weight(SWE): <u>93/93/92</u></p> <p>Sampler equipment: <u>1.2m plaine</u></p> <p>Number of cores to 1/3 fill bucket: <u>23</u></p>	<p><b>Comments:</b></p> <p><u>v. granular w/ 3cm</u></p> <p><u>firm on top</u></p> <p><u>10/10/9/10/9/10/14/10/13/10/14</u></p> <p><b>Photos(yes/no):</b></p> <p><u>yes</u></p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>50 (although it was kind of uphill)</u></p> <p>Sampler dry weight(SWE): <u>90/90/90</u></p> <p>Snow Depth: <u>31/32/23/26/33/29/33/30/26/23</u></p> <p>Snow weight(SWE): <u>93/93/98</u></p> <p>Sampler equipment: <u>1.7m plaine</u></p> <p>Number of cores to 1/3 fill bucket: _____</p>	<p><b>Comments:</b></p> <p><u>plot is set up to side of hill.</u></p> <p><u>v. firm except for last 5cm</u></p> <p><b>Photos(yes/no):</b></p> <p><u>yes</u></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>100 m</u></p> <p>Sampler dry weight(SWE): <u>71/71/7</u></p> <p>Snow Depth: <u>51/51/5</u></p> <p>Snow Weight(SWE): <u>97/96/96</u></p> <p>Sampler equipment: <u>bucket / shovel</u></p> <p>Number of cores to 1/3 fill bucket: _____</p>	<p><b>Comments:</b></p> <p>_____</p> <p><b>Photos(yes/no):</b></p> <p>_____</p>



# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ101 Collection Date: April 7 2014

Actual GPS Coordinates (top of transect): 543139 / 7209320

Slope Length 124 M Slope Bearing (top to bottom): 240

Sample Time Started: 1400 Sample Time Finished: 14:36

Field Samplers Initials: RE/KC.

Equipment used: 1.2m / bucket & shovel

Weather Conditions: (clear, cloudy, windy etc) \_\_\_\_\_

Air Temperature (°C): \_\_\_\_\_

Wind Speed (kph): \_\_\_\_\_

Wind Direction (degrees): \_\_\_\_\_

<p style="text-align: center;"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>7/7/7</u></p> <p>Snow Depth: <u>13/14/6</u></p> <p>Snow Weight(SWE): <u>90/90/91</u></p> <p>Sampler equipment: <u>SHOVEL BUCKET</u></p> <p>Number of cores to 1/3 fill bucket: <u>SHOVEL / BUCKET</u></p>	<p><b>Comments:</b> <u>landed w/ heel</u> <u>doesn't seem like a</u> <u>strong slope</u></p> <p><b>Photos(yes/no):</b> <u>yes</u></p>
<p style="text-align: center;"><b>Mid Sample</b></p> <p>Distance from top: <u>62m</u></p> <p>Sampler dry weight(SWE): <u>7/7/7</u></p> <p>Snow Depth: <u>5/4/8</u></p> <p>Snow weight(SWE): <u>73/73/73</u></p> <p>Sampler equipment: <u>bucket / shovel</u></p> <p>Number of cores to 1/3 fill bucket: _____</p>	<p><b>Comments:</b> <u>v. granular</u></p> <p><b>Photos(yes/no):</b> <u>yes</u></p>
<p style="text-align: center;"><b>Toe Sample</b></p> <p>Distance from top: <u>124</u></p> <p>Sampler dry weight(SWE): <u>90/90/91</u></p> <p>Snow Depth: <u>20/22/18/20/20/20/25/23</u></p> <p>Snow Weight(SWE): <u>93/94/92</u></p> <p>Sampler equipment: <u>1.2m plane</u></p> <p>Number of cores to 1/3 fill bucket: <u>8</u></p>	<p><b>Comments:</b> <u>looks very much like</u> <u>all other snow</u> <u>15cm firm crust</u></p> <p><b>Photos(yes/no):</b> <u>yes</u></p>

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ C5 Collection Date: April 6 2014

Actual GPS Coordinates (top of transect): /

Slope Length 110 M Slope Bearing (top to bottom): 299

Sample Time Started: 15:30 Sample Time Finished: 1600

Field Samplers Initials: RE/108

Equipment used: buckets 1.2 m planks

Weather Conditions: (clear, cloudy, windy etc) \_\_\_\_\_

Air Temperature (°C): \_\_\_\_\_

Wind Speed (kph): \_\_\_\_\_

Wind Direction (degrees): \_\_\_\_\_

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>90/90/89</u></p> <p>Snow Depth: <u>34/35/32/33</u> <small>lost 1cm</small> <u>25/23/37/22/37/23</u></p> <p>Snow Weight(SWE): <u>101/101/102</u> <small>1bst 2cm</small></p> <p>Sampler equipment: <u>1.2m planks</u></p> <p>Number of cores to 1/3 fill bucket: <u>10</u></p>	<p><b>Comments:</b> <u>v. hard snow, (25 cm) below is granular</u></p> <p><b>Photos(yes/no):</b></p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>35</u></p> <p>Sampler dry weight(SWE): <u>90/91/91</u></p> <p>Snow Depth: <u>65/75/68/65</u></p> <p>Snow weight(SWE): <u>108/109/109</u></p> <p>Sampler equipment: <u>1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u>4</u></p>	<p><b>Comments:</b></p> <p><b>Photos(yes/no):</b></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>110</u></p> <p>Sampler dry weight(SWE): <u>90/88/90</u></p> <p>Snow Depth: <u>12/35/22/17/17/21/14/17/</u></p> <p>Snow Weight(SWE): <u>93/95/94</u></p> <p>Sampler equipment: _____</p> <p>Number of cores to 1/3 fill bucket: _____</p>	<p><b>Comments:</b></p> <p><b>Photos(yes/no):</b></p>

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: A9 C2 Collection Date: April 6 2014

Actual GPS Coordinates (top of transect): 529142 / 772000 (+3m)

Slope Length 69 M Slope Bearing (top to bottom): 330

Sample Time Started: 11:10 Sample Time Finished: \_\_\_\_\_

Field Samplers Initials: KS / RE

Equipment used: bucket / prairie

Weather Conditions: (clear, cloudy, windy etc) \_\_\_\_\_

Air Temperature (°C): \_\_\_\_\_

Wind Speed (kph): \_\_\_\_\_

Wind Direction (degrees): \_\_\_\_\_

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>7/7/7</u></p> <p>Snow Depth: <u>11</u></p> <p>Snow Weight(SWE): <u>76/75/75</u></p> <p>Sampler equipment: <u>SHOVEL / BUCKET</u></p> <p>Number of cores to 1/3 fill bucket: <u>N/A</u></p>	<p><b>Comments:</b></p> <p><u>CRUST ON TOP, THEN VERY GRANULAR.</u></p> <p><b>Photos(yes/no):</b></p> <p align="center"><u>yes</u></p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>34.5</u></p> <p>Sampler dry weight(SWE): <u>90/90/90</u></p> <p>Snow Depth: <u>30</u> <u>27</u> <u>31</u> <u>23</u> <u>32</u> <u>25</u> <u>26</u> <u>26</u> <u>5/22</u></p> <p>Snow weight(SWE): <u>95/94/95</u></p> <p>Sampler equipment: <u>PRAIRIE (1-2)</u></p> <p>Number of cores to 1/3 fill bucket: _____</p>	<p><b>Comments:</b></p> <p><u>FIRM FOR 15-20cm THEN GRANULAR</u></p> <p><b>Photos(yes/no):</b></p> <p align="center"><u>yes</u></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>69</u></p> <p>Sampler dry weight(SWE): <u>7/7/7</u></p> <p>Snow Depth: <u>10</u></p> <p>Snow Weight(SWE): <u>75/74/75</u></p> <p>Sampler equipment: <u>SHOVEL + BUCKET</u></p> <p>Number of cores to 1/3 fill bucket: _____</p>	<p><b>Comments:</b></p> <p><u>VERY ROCKY (BOULDERS) SPOT</u> <u>* SNOW WAGONS MAY BE OFF</u> <u>AS BUCKET (BAG) WAS FILLED</u> <u>WITH PARTIAL SNOW</u></p> <p><b>Photos(yes/no):</b></p> <p align="center"><u>yes</u></p>



# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ1041 Collection Date: April 6/14 2014

Actual GPS Coordinates (top of transect): 533302 1 7179033

Slope Length 68 M Slope Bearing (top to bottom): 230

Sample Time Started: 2:00 pm Sample Time Finished: 14:25

Field Samplers Initials: KB / RE

Equipment used: 1.2 + SHOVEL

Weather Conditions: (clear, cloudy, windy etc) \_\_\_\_\_

Air Temperature (°C): \_\_\_\_\_

Wind Speed (kph): \_\_\_\_\_

Wind Direction (degrees): \_\_\_\_\_

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>7/7/77</u></p> <p>Snow Depth: <u>16</u></p> <p>Snow Weight(SWE): <u>92/90/92</u></p> <p>Sampler equipment: <u>bucket / shovel</u></p> <p>Number of cores to 1/3 fill bucket: _____</p>	<p><b>Comments:</b></p> <p>VERY LOW SLOPE ON HILL ABOVE LAKE. ~ 8 CM FIRM CAP AND THEN GRANULAR</p> <p><b>Photos(yes/no):</b></p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>34</u></p> <p>Sampler dry weight(SWE): <u>90/90/90</u></p> <p>Snow Depth: <u>29</u> <u>43</u> <u>37</u> <u>38</u> <u>38</u> <u>30</u> <u>28</u></p> <p>Snow weight(SWE): <u>97/98/97</u> <u>lost 2cm</u> <u>lost 1cm</u></p> <p>Sampler equipment: <u>PRATT (1.2m)</u></p> <p>Number of cores to 1/3 fill bucket: <u>7</u></p>	<p><b>Comments:</b></p> <p>1/2 PROFILE FIRM, THEN GRANULAR</p> <p><b>Photos(yes/no):</b></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: _____</p> <p>Sampler dry weight(SWE): <u>90/90/90</u></p> <p>Snow Depth: <u>20</u> <u>18</u> <u>21</u> <u>23</u> <u>23</u></p> <p>Snow Weight(SWE): <u>96/96/96</u></p> <p>Sampler equipment: <u>PRATT (1.2m)</u></p> <p>Number of cores to 1/3 fill bucket: <u>5</u></p>	<p><b>Comments:</b></p> <p>FAIRLY FIRM TO LAST 5cm THEN GRANULAR.</p> <p><b>Photos(yes/no):</b></p>

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AG002 Collection Date: April 5/14 2014

Actual GPS Coordinates (top of transect): 522355 1 7176481

Slope Length 124.5 M Slope Bearing (top to bottom): 179

Sample Time Started: 16:09 Sample Time Finished: 1629

Field Samplers Initials: RE/KG

Equipment used: shovel bucket 1.2m prairie

Weather Conditions: (clear, cloudy, windy etc) \_\_\_\_\_

Air Temperature (°C): \_\_\_\_\_

Wind Speed (kph): \_\_\_\_\_

Wind Direction (degrees): \_\_\_\_\_

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>6/7/7</u></p> <p>Snow Depth: <u>17 cm</u></p> <p>Snow Weight(SWE): <u>87/87/88</u></p> <p>Sampler equipment: <u>shovel / bucket</u></p> <p>Number of cores to 1/3 fill bucket: <u>bucket/shovel</u></p>	<p>Comments:</p> <p>Photos(<u>yes</u>/no):</p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>62</u></p> <p>Sampler dry weight(SWE): <u>89/89/81/23</u></p> <p>Snow Depth: <u>12/15/18/12/13/23/16/14/19/18/14/16/1</u></p> <p>Snow weight(SWE): <u>96/97/96</u></p> <p>Sampler equipment: <u>1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u>12</u></p>	<p>Comments:</p> <p><u>- stake initially put further out, used more closer to top.</u></p> <p>Photos(<u>yes</u>/no):</p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>124.0</u></p> <p>Sampler dry weight(SWE): <u>89/89/89</u></p> <p>Snow Depth: <u>22/20/38/23/22/25/29/27/23</u></p> <p>Snow Weight(SWE): <u>993/931/93</u></p> <p>Sampler equipment: <u>1.2 m prairie</u></p> <p>Number of cores to 1/3 fill bucket: <u>9</u></p>	<p>Comments:</p> <p><u>10 cm firm underneath is very granular</u></p> <p>Photos(<u>yes</u>/no):</p>



# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ 103 Collection Date: April 5/14 2014

Actual GPS Coordinates (top of transect): 526028 / 7179266 /

Slope Length 180 M Slope Bearing (top to bottom): 264

Sample Time Started: 13:31 Sample Time Finished: \_\_\_\_\_

Field Samplers Initials: KS/RE

Equipment used: Shovel bucket / Prairie 1.2m

Weather Conditions: (clear, cloudy, windy etc) cold, clear, winds @ ~20 kph

Air Temperature ('c): \_\_\_\_\_

Wind Speed (kph): \_\_\_\_\_

Wind Direction (degrees): \_\_\_\_\_

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>71/717</u></p> <p>Snow Depth: <u>71/61/61</u></p> <p>Snow Weight(SWE): <u>79/78/78</u></p> <p>Sampler equipment: <u>shovel bucket</u></p> <p>Number of cores to 1/3 fill bucket: <u>1 shovel</u></p>	<p><b>Comments:</b> <u>exceptionally granular</u></p> <p><b>Photos(yes/no):</b></p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>90m</u></p> <p>Sampler dry weight(SWE): <u>89/89/90</u></p> <p>Snow Depth: <u>41/33/39/38/34/34/36/34/35</u></p> <p>Snow weight(SWE): <u>96/96/98</u> <u>lost 2cm</u></p> <p>Sampler equipment: <u>Prairie 1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u>10</u></p>	<p><b>Comments:</b> <u>1st 20 cm firm, granular layer underneath</u></p> <p><b>Photos(yes/no):</b></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>180 m</u></p> <p>Sampler dry weight(SWE): <u>90/90/91</u></p> <p>Snow Depth: <u>13/13/18/14/14/11/23/20/23/14/17/20/18/23/20/23</u></p> <p>Snow Weight(SWE): <u>93/92/92</u> <u>lost 2cm</u> <u>lost 3cm</u></p> <p>Sampler equipment: <u>Prairie 1.2 m</u></p> <p>Number of cores to 1/3 fill bucket: <u>16</u></p>	<p><b>Comments:</b> <u>very granular</u></p> <p><b>Photos(yes/no):</b></p>

# 2014 AQMP Snow Core Sampling Field Sheet

2390

yes

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ-049 Collection Date: 04-APR - 2014

Actual GPS Coordinates (top of transect): 0497034 1 7181893

Slope Length 55 M Slope Bearing (top to bottom): 118

Sample Time Started: 11:31 Sample Time Finished: 11:59

Field Samplers Initials: KPIRE 0497034 / 7181893

Equipment used: Federal (5m)

Weather Conditions: (clear, cloudy, windy etc) overcast, windy / cloudy

Air Temperature (°C): -20

Wind Speed (kph): 18

ENE Wind Direction (degrees): 56

<p><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>0 (BUCKET DID NOT REGISTER ON SCALE)</u></p> <p>Snow Depth: <u>5cm</u></p> <p>Snow Weight(SWE): <u>[170/168/170]</u></p> <p>Sampler equipment: <u>BUCKET / SHOVEL</u></p> <p>Number of cores to 1/3 fill bucket: <u>USED BUCKET</u></p>	<p><b>Comments:</b></p> <p>granular bottom top layer hard slab</p> <p><b>Photos(yes/no):</b> <u>yes</u></p>
<p><b>Mid Sample</b></p> <p>Distance from top: <u>22 1/2 m</u></p> <p>Sampler dry weight(SWE): <u>130/132/131</u></p> <p>Snow Depth: <u>202/207</u></p> <p>Snow weight(SWE): <u>206/202/206</u></p> <p>Sampler equipment: <u>FEDERAL 5m (3 sections used)</u></p> <p>Number of cores to 1/3 fill bucket: <u>2</u></p>	<p><b>Comments:</b></p> <p>hard slab snow</p> <p><b>Photos(yes/no):</b> <u>yes</u></p>
<p><b>Toe Sample</b></p> <p>Distance from top: <u>55m</u></p> <p>Sampler dry weight(SWE): <u>4/4/5</u></p> <p>Snow Depth: <u>13/16/19/19/26/29/25/30/25/38/39/33/42</u></p> <p>Snow Weight(SWE): <u>10/12/11</u></p> <p>Sampler equipment: <u>Federal (used one section)</u></p> <p>Number of cores to 1/3 fill bucket: <u>13</u></p>	<p><b>Comments:</b></p> <p>-hitting bucket on bottom lost 2cm on 3rd core + 6th core lost 4cm on 5th core + 10th core lost 3cm on <del>12th</del> 12th core</p> <p><b>Photos(yes/no):</b> <u>yes</u></p>

slope = windward

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ115 Collection Date: 4 APR 2014 2014

Actual GPS Coordinates (top of transect): 0490664 / 7184725

Slope Length 72 M Slope Bearing (top to bottom): 130

Sample Time Started: 13:37 Sample Time Finished: \_\_\_\_\_

Field Samplers Initials: KP/RE

*Slope: windward*

Equipment used: \_\_\_\_\_

Weather Conditions: (clear, cloudy, windy etc) overcast windy, Drifting Snow

Air Temperature (°C): -17

Wind Speed (kph): 32

Wind Direction (degrees): 79

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>0 (Bucket)</u></p> <p>Snow Depth: <u>5</u></p> <p>Snow Weight(SWE): <u>213/212/212</u></p> <p>Sampler equipment: <u>Snow2 / bucket</u></p> <p>Number of cores to 1/3 fill bucket: <u>1</u></p>	<p><b>Comments:</b> granular snow with 1/3 top layer for all 3 (top, mid + toe)</p> <p><b>Photos(yes/no):</b></p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>36m</u></p> <p>Sampler dry weight(SWE): <u>0 / 6 / 2</u></p> <p>Snow Depth: <u>67/68/65/66/65/65/67</u></p> <p>Snow weight(SWE): <u>29/29/29</u></p> <p>Sampler equipment: <u>Federal gm (used 1 x/m section)</u></p> <p>Number of cores to 1/3 fill bucket: <u>7</u></p>	<p><b>Comments:</b> 2nd core - lost 3cm lost 2cm - 3rd core</p> <p><b>Photos(yes/no):</b></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>72m</u></p> <p>Sampler dry weight(SWE): <u>6 / 7 / 7</u></p> <p>Snow Depth: <u>23/18/23/19/17/17/13/22/23/24/23/22/22/5/24</u></p> <p>Snow Weight(SWE): <u>12/11/12</u></p> <p>Sampler equipment: <u>Federal gm (used 1 section)</u></p> <p>Number of cores to 1/3 fill bucket: <u>22</u></p>	<p><b>Comments:</b> Lost 4cm - 1st core, 2nd, 4th, 5th Lost 1cm - 3rd core, 17th, 20th Lost 3cm - 20th + 22nd Hard pack for very crystalline snow on bottom used 3rd core for SWE</p> <p><b>Photos(yes/no):</b></p>



# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ111 Collection Date: 4 APR 2014 2014

Actual GPS Coordinates (top of transect): 493032 , 7174988

Slope Length 21 M Slope Bearing (top to bottom): 94

Sample Time Started: 15:00 Sample Time Finished: 15:22

Field Samplers Initials: RE KP

Equipment used: Federal 5m Sampler

Weather Conditions: (clear, cloudy, windy etc) light snow

Air Temperature (°C): -17

Wind Speed (kph): 34

Wind Direction (degrees): 56

<b>TOP Sample</b> Sampler dry weight(SWE): <u>0 BUCKET</u> Snow Depth: <u>142 <del>142</del> 5 cm</u> Snow Weight(SWE): <u>192 / 192 / 19</u> Sampler equipment: <u>Gilbert</u> Number of cores to 1/3 fill bucket: _____	<b>Comments:</b>  <b>Photos(yes/no):</b>
<b>Mid Sample</b> Distance from top: <u>10.5</u> Sampler dry weight(SWE): <u>18.69/68</u> Snow Depth: <u>101 / 103 lost 1cm / 102 lost 4cm / 99 lost 3cm / 101 lost 3cm</u> Snow weight(SWE): <u>(102/101/102)</u> Sampler equipment: <u>Federal 5m (2 sections)</u> Number of cores to 1/3 fill bucket: <u>5</u>	<b>Comments:</b>  <b>Photos(yes/no):</b>
<b>Toe Sample</b> Distance from top: <u>21</u> Sampler dry weight(SWE): <u>6/6/16/16/18/18/17/18</u> Snow Depth: <u>18 lost 2cm / 18 lost 2cm / 18 lost 2cm / 18 lost 2cm / 18 lost 2cm / 18 lost 2cm / 18 lost 2cm / 18 lost 2cm</u> Snow Weight(SWE): <u>10/11/11</u> Sampler equipment: <u>Federal</u> Number of cores to 1/3 fill bucket: <u>21</u>	<b>Comments:</b> <u>GRANULAR SNOW AT BOTTOM</u> <u>5/18/17/17/20/18/17/17/18/20</u> <b>Photos(yes/no):</b>

18/19/4/18

17/18/20

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ-043 Collection Date: 03 APR 2014 2014

Actual GPS Coordinates (top of transect): 527987 17194535

Slope Length 100 M Slope Bearing (top to bottom): \_\_\_\_\_

Sample Time Started: 11:04 Sample Time Finished: 11:32

Field Samplers Initials: KR/RE

Equipment used: 1.2m corer prairie + bucket + shovel

Weather Conditions: (clear, cloudy, windy etc) clear, windy

Air Temperature (°C): -23.5

Wind Speed (kph): 13

Wind Direction (degrees): 250

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>98/90/90</u></p> <p>Snow Depth: <u>40/40/41/44/41/41/39/39/44/42</u></p> <p>Snow Weight(SWE): <u>97/93/97</u></p> <p>Sampler equipment: <u>1.2m corer prairie</u></p> <p>Number of cores to 1/3 fill bucket: <u>10</u></p>	<p><b>Comments:</b></p> <p>removed 5cm of debris / 5cm of snow came out on own 5th core not much fallout 7th = full + 9th + 10th</p> <p><b>Photos(yes/no):</b> <u>yes</u></p> <p>All snow compact except for granular bottom 5cm</p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>50m</u></p> <p>Sampler dry weight(SWE): <u>107/106/107 90/91/90</u></p> <p>Snow Depth: <u>50/49/59</u></p> <p>Snow weight(SWE): <u>107/106/107</u></p> <p>Sampler equipment: <u>1.2m corer prairie</u></p> <p>Number of cores to 1/3 fill bucket: <u>11</u></p>	<p><b>Comments:</b></p> <p>Compact snow except for granular 5cm at bottom.</p> <p>1st - granular snow fell out at bottom</p> <p>2nd - full</p> <p>3rd core - removed 3cm of debris</p> <p><b>Photos(yes/no):</b> <u>yes</u></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>100</u></p> <p>Sampler dry weight(SWE): <u>90/90/91 7/7/7</u></p> <p>Snow Depth: <u>5cm</u></p> <p>Snow Weight(SWE): <u>67/67/67</u></p> <p>Sampler equipment: <u>bucket + shovel</u></p> <p>Number of cores to 1/3 fill bucket: <u>1</u></p>	<p><b>Comments:</b></p> <p>on ice</p> <p><b>Photos(yes/no):</b> <u>yes</u></p>



# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ 32 Collection Date: 3 APR 2014 2014

Actual GPS Coordinates (top of transect): 0522185 17195057 (3M ERROR)

Slope Length 48 M Slope Bearing (top to bottom): 210

Sample Time Started: 12:50 Sample Time Finished: 13:06

Field Samplers Initials: RE/KP

Equipment used: Plastic Sampler

Weather Conditions: (clear, cloudy, windy etc) clear

Air Temperature (°C): -22.4

Wind Speed (kph): 15

Wind Direction (degrees): 240

<p><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>90/91/90</u></p> <p>Snow Depth: <u>69</u> <u>64</u> <u>64</u> <u>60</u> <u>61</u></p> <p>Snow Weight(SWE): <u>102/106/112</u> <u>104</u> <u>104</u> <u>104</u> <u>104</u></p> <p>Sampler equipment: <u>NO DUBBIS</u> <u>NO DUBBIS</u> <u>NO DUBBIS</u> <u>NO DUBBIS</u> <u>NO DUBBIS</u></p> <p>Number of cores to 1/3 fill bucket: <u>5</u></p>	<p><b>Comments:</b></p> <p>• HIT ROCKS ON BOTTOM</p> <p>• SNOW IS WELL FUSED DOWN TO LAST 5 CM</p> <p><b>Photos(✓/no):</b></p>
<p><b>Mid Sample</b></p> <p>Distance from top: <u>24M</u></p> <p>Sampler dry weight(SWE): <u>89/90/89</u></p> <p>Snow Depth: <u>52</u> <u>52</u> <u>54</u> <u>60</u></p> <p>Snow weight(SWE): <u>104/103/104</u> <u>104</u> <u>104</u> <u>104</u></p> <p>Sampler equipment: <u>NO DUBBIS</u> <u>NO DUBBIS</u> <u>NO DUBBIS</u> <u>NO DUBBIS</u></p> <p>Number of cores to 1/3 fill bucket: <u>4</u></p>	<p><b>Comments:</b></p> <p><b>Photos(✓/no):</b></p>
<p><b>Toe Sample</b></p> <p>Distance from top: <u>48M</u></p> <p>Sampler dry weight(SWE): <u>90/90/90</u></p> <p>Snow Depth: <u>28</u> <u>31</u> <u>35</u> <u>39</u> <u>41</u> <u>35</u></p> <p>Snow Weight(SWE): <u>99/98/99</u> <u>104</u> <u>104</u> <u>104</u> <u>104</u> <u>104</u></p> <p>Sampler equipment: <u>NO DUBBIS</u> <u>NO DUBBIS</u> <u>NO DUBBIS</u> <u>NO DUBBIS</u> <u>NO DUBBIS</u> <u>NO DUBBIS</u></p> <p>Number of cores to 1/3 fill bucket: <u>6</u></p>	<p><b>Comments:</b></p> <p>• HIT ROCKS ON BOTTOM</p> <p><b>Photos(✓/no):</b></p>

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ-035 Collection Date: 03-APR 2014

Actual GPS Coordinates (top of transect): 0522874 17189423 3m ERROR

Slope Length 60 M Slope Bearing (top to bottom): 210

Sample Time Started: 14:09 Sample Time Finished: 14:25

Field Samplers Initials: KR/RE

Equipment used: Prairie sampler

Weather Conditions: (clear, cloudy, windy etc) clear, windy

Air Temperature (°C): -20.1

Wind Speed (kph): 15

Wind Direction (degrees): 230

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>90/91/90</u></p> <p>Snow Depth: <u>44/46/49/51/52</u></p> <p>Snow Weight(SWE): <u>103/103/103</u></p> <p>Sampler equipment: <u>Prairie Sampler</u></p> <p>Number of cores to 1/3 fill bucket: <u>     5</u></p>	<p><b>Comments:</b> <u>granular snow</u></p> <p><u>5th core lost 7cm of granular snow</u></p> <p><b>Photos(yes/no):</b> <u>+</u></p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>30m</u></p> <p>Sampler dry weight(SWE): <u>90/90/90</u></p> <p>Snow Depth: <u>42/39/38/39</u></p> <p>Snow weight(SWE): <u>97/97/98</u></p> <p>Sampler equipment: <u>Prairie Sampler</u></p> <p>Number of cores to 1/3 fill bucket: <u>     4</u></p>	<p><b>Comments:</b> <u>1st core - lost ~9cm granular snow</u> <u>4th core - lost ~6cm snow</u></p> <p><b>Photos(yes/no):</b> <u>+</u></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>60m</u></p> <p>Sampler dry weight(SWE): <u>91/90/91</u></p> <p>Snow Depth: <u>25/27/25/31/32/29/32/32/27</u></p> <p>Snow Weight(SWE): <u>95/96/96</u></p> <p>Sampler equipment: <u>Prairie Sampler</u></p> <p>Number of cores to 1/3 fill bucket: <u>     9</u></p>	<p><b>Comments:</b> <u>1st core - lost ~4cm</u> <u>2nd core - 5cm gap = vegetation</u> <u>4th core - lost ~1cm</u> <u>6th - lost ~1cm</u> <u>9th - lost ~5cm</u></p> <p><b>Photos(yes/no):</b> <u>+</u></p>

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

131° Sampling Location: AQ-114 Collection Date: 28 March 2014

Actual GPS Coordinates (top of transect): 502750 1 7178475

Slope Length 42 M Slope Bearing (top to bottom): 188°

Sample Time Started: 1455 1505 Sample Time Finished: 1525

Field Samplers Initials: JP / DB

Equipment used: corer 1.2m

Weather Conditions: (clear, cloudy, windy etc) Blowing snow

Air Temperature (°C): -22.7 (-37 w/chill)

Wind Speed (kph): 33

Wind Direction (degrees): 10

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>90 corer, Bucket 10</u></p> <p>Snow Depth: <u>18</u></p> <p>Snow Weight(SWE): <u>93.51 corer, 110 shovel</u></p> <p>Sampler equipment: <u>Corer 1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u>2</u></p>	<p>Comments:</p> <p>Photos <u>Yes</u> (yes/no):</p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>21</u></p> <p>Sampler dry weight(SWE): <u>90</u></p> <p>Snow Depth: <u>34</u></p> <p>Snow weight(SWE): <u>105, 106</u></p> <p>Sampler equipment: <u>Corer 1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u>2</u></p>	<p>Comments:</p> <p>Photos <u>Y</u> (yes/no):</p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>42</u></p> <p>Sampler dry weight(SWE): <u>90</u></p> <p>Snow Depth: <u>19</u></p> <p>Snow Weight(SWE): <u>98, 97, 92</u></p> <p>Sampler equipment: <u>Corer 1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u>3</u></p>	<p>Comments:</p> <p>Photos <u>Y</u> (yes/no):</p>

Bottled @ 1437 29-mar-14 JP

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ-113 Collection Date: 28-March 2014

Actual GPS Coordinates (top of transect): 051111 / 7174956

Slope Length 25 M Slope Bearing (top to bottom): 270

Sample Time Started: 11:45 Sample Time Finished: 1215

Field Samplers Initials: JP/OB

Equipment used: 1.2m core, Bucket

Weather Conditions: (clear, cloudy, windy etc) Blowing snow

Air Temperature (°C): -20.4 (-34 w/chill)

Wind Speed (kph): 33

Wind Direction (degrees): 360

<b>TOP Sample</b> Sampler dry weight(SWE): <u>90cm 15cm Bucket</u> Snow Depth: <u>19cm</u> Snow Weight(SWE): <u>54cm</u> Sampler equipment: <u>core</u> Number of cores to 1/3 fill bucket: <u>8</u>	<b>Comments:</b> <u>Re Routed Site location</u>  <b>Photos(yes/no):</b> <u>Yes</u>
<b>Mid Sample</b> Distance from top: <u>13.5</u> Sampler dry weight(SWE): <u>90cm</u> Snow Depth: <u>26cm</u> Snow weight(SWE): <u>91, 92, 92, 95, 94, 93</u> Sampler equipment: <u>1.2m core</u> Number of cores to 1/3 fill bucket: <u>16</u>	<b>Comments:</b>  <b>Photos(yes/no):</b> <u>Yes</u>
<b>Toe Sample</b> Distance from top: <u>25</u> Sampler dry weight(SWE): <u>90cm</u> Snow Depth: <u>44</u> Snow Weight(SWE): <u>99, 98, 100, 97</u> Sampler equipment: <u>1.2m core</u> Number of cores to 1/3 fill bucket: <u>4</u>	<b>Comments:</b>  <b>Photos(yes/no):</b> <u>Yes</u>

Bottled @ 1405 29-Mar-14 JP



# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

155° Sampling Location: AG-044 Collection Date: 28-March 2014

Actual GPS Coordinates (top of transect): 0506991 1 7175693

Slope Length 46 M Slope Bearing (top to bottom): 338°

Sample Time Started: 1250 Sample Time Finished: 1310

Field Samplers Initials: JP/DB

Equipment used: Shovel-Top, corer 1.2m mid, toe

Weather Conditions: (clear, cloudy, windy etc) Blowing snow

Air Temperature (°C): -20.7 (-34 w/chill)

Wind Speed (kph): 35

Wind Direction (degrees): 360

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>Rocket + 1.2m 5cm</u></p> <p>Snow Depth: <u>10cm</u></p> <p>Snow Weight(SWE): <u>51</u></p> <p>Sampler equipment: <u>Shovel</u></p> <p>Number of cores to 1/3 fill bucket: <u>6 shovels</u></p>	<p><b>Comments:</b> <u>changed Bearing to face slope.</u></p> <p><b>Photos(yes/no):</b> <u>Y</u></p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>23</u></p> <p>Sampler dry weight(SWE): <u>90</u></p> <p>Snow Depth: <u>24</u></p> <p>Snow weight(SWE): <u></u></p> <p>Sampler equipment: <u>corer 1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u>95, 96, 95, 96, 97</u> <u>5</u></p>	<p><b>Comments:</b></p> <p><b>Photos(yes/no):</b> <u>Yes</u></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>46</u></p> <p>Sampler dry weight(SWE): <u>90</u></p> <p>Snow Depth: <u>78</u></p> <p>Snow Weight(SWE): <u>112, 116</u></p> <p>Sampler equipment: <u>corer 1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u></u></p>	<p><b>Comments:</b></p> <p><b>Photos(yes/no):</b> <u>Yes</u></p>

Bottled @ 1425 29-mar-14 JP



BHP2501

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

108° Sampling Location: AQ-112 Collection Date: 28 March 2014

Actual GPS Coordinates (top of transect): 0502963 17174758

Slope Length 1405.45 M Slope Bearing (top to bottom): 60°

Sample Time Started: 1405 Sample Time Finished: 1430

Field Samplers Initials: JP/DB

Equipment used: corer 1.2m

Weather Conditions: (clear, cloudy, windy etc) Blowing snow

Air Temperature (°C): 26.1 (-36 with 11)

Wind Speed (kph): 37

Wind Direction (degrees): 10

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>90 corer, Bucket 10 cm</u></p> <p>Snow Depth: <u>34</u></p> <p>Snow Weight(SWE): <u>97 95, 93 96</u></p> <p>Sampler equipment: <u>corer 1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u>4</u></p>	<p><b>Comments:</b></p> <p align="center"><u>Yes</u></p> <p><b>Photos(yes/no):</b></p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>22.5</u></p> <p>Sampler dry weight(SWE): <u>90</u></p> <p>Snow Depth: <u>34</u></p> <p>Snow weight(SWE): <u>95, 93, 93 92, 95, 93</u></p> <p>Sampler equipment: <u>1.2m corer</u></p> <p>Number of cores to 1/3 fill bucket: <u>6</u></p>	<p><b>Comments:</b></p> <p align="center"><u>Yes</u></p> <p><b>Photos(yes/no):</b></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>45</u></p> <p>Sampler dry weight(SWE): <u>90</u></p> <p>Snow Depth: <u>88</u></p> <p>Snow Weight(SWE): <u>112, 108, 105</u></p> <p>Sampler equipment: <u>1.2m corer</u></p> <p>Number of cores to 1/3 fill bucket: <u>3</u></p>	<p><b>Comments:</b></p> <p align="center"><u>Yes</u></p> <p><b>Photos(yes/no):</b></p>

Bottled @ 1415 29-march-14 JP

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ-006 Collection Date: 27-march 2014 2014

Actual GPS Coordinates (top of transect): 0515683 1 7.80688

Slope Length 100 M Slope Bearing (top to bottom): 290° <sup>change</sup> Not towards camp

Sample Time Started: 1400 Sample Time Finished: 1435

Field Samplers Initials: JP / KJ

Equipment used: Shovel, 1.2m core

Weather Conditions: (clear, cloudy, windy etc) Cloudy

Air Temperature (°C): -18.9 (-31 w/chill)

Wind Speed (kph): 30

Wind Direction (degrees): 330

area was odd w bearing - upslope. Changed to 290° / 100m length.

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>15</u> Bucket core 90cm</p> <p>Snow Depth: <u>8</u> cm</p> <p>Snow Weight(SWE): <u>56</u></p> <p>Sampler equipment: <u>Bucket, shovel 1.2m core</u></p> <p>Number of cores to 1/3 fill bucket: <u>6</u></p>	<p><b>Comments:</b> Orv. 2nd Dump bucket 8cm</p> <p>6.</p> <p><b>Photos(yes/no):</b> <u>Yes</u></p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>50</u></p> <p>Sampler dry weight(SWE): <u>90</u></p> <p>Snow Depth: <u>31</u></p> <p>Snow weight(SWE): <u></u></p> <p>Sampler equipment: <u>1st core 96cm, 2nd core 96cm, 3rd-93, 4-100cm</u></p> <p>Number of cores to 1/3 fill bucket: <u>6</u></p> <p><u>5-96cm, 6-97cm</u></p>	<p><b>Comments:</b></p> <p>granular</p> <p>Bottom 2cm loose</p> <p><b>Photos(yes/no):</b> <u>Yes</u></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>100m</u></p> <p>Sampler dry weight(SWE): <u>90</u></p> <p>Snow Depth: <u>45</u></p> <p>Snow Weight(SWE): <u>1-102, 2-102, 3-100cm, 4-104, 5-101</u></p> <p>Sampler equipment: <u>Core 1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u>5</u></p>	<p><b>Comments:</b></p> <p>Compact top</p> <p>loose, granular bottom</p> <p>4cm</p> <p><b>Photos(yes/no):</b> <u>Yes</u></p>

Recorded 28-Mar - 14 KJ@1349

BHP2501

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ-102 Collection Date: 28-Mar-14 2014

Actual GPS Coordinates (top of transect): 0519628 17185037

Slope Length 100 M Slope Bearing (top to bottom): 198

Sample Time Started: 1500 Sample Time Finished: 1535

Field Samplers Initials: JP/KJ

Equipment used: Core 1.2m

Weather Conditions: (clear, cloudy, windy etc) cloudy, blowing snow stronger than 22 kph

Air Temperature (°C): -18.9

Wind Speed (kph): 22 (-30 w/chill)

Wind Direction (degrees): 330

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>90cm</u></p> <p>Snow Depth: <u>36cm</u></p> <p>Snow Weight(SWE): <u>97</u></p> <p>Sampler equipment: <u>Core 1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u>8</u></p>	<p><b>Comments:</b> compact top to granular base</p> <p><b>Photos(✓/no):</b></p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>50m</u></p> <p>Sampler dry weight(SWE): <u>89cm</u></p> <p>Snow Depth: <u>44cm</u></p> <p>Snow weight(SWE): <u>101, 103, 103, 98</u></p> <p>Sampler equipment: <u>Core 1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u>4</u></p>	<p><b>Comments:</b> compact top to granular base</p> <p><b>Photos(✓/no):</b></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>100m</u></p> <p>Sampler dry weight(SWE): <u>90cm</u></p> <p>Snow Depth: <u>26</u></p> <p>Snow Weight(SWE): <u>92, 90, 96, 96, 95</u></p> <p>Sampler equipment: <u>Core 1.2m</u></p> <p>Number of cores to 1/3 fill bucket: <u>5</u></p>	<p><b>Comments:</b> compact - granular base • organics noted in sample</p> <p><b>Photos(✓/no):</b></p>

Decanted 28-Mar-14 1500 1415

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ-031 Collection Date: 27 March 2014

Actual GPS Coordinates (top of transect): 0515765 / 7178215

Slope Length 100 M Slope Bearing (top to bottom): 167°

Sample Time Started: 11:00 Sample Time Finished: 11:15

Field Samplers Initials: JP/KS

Equipment used: Shovel + bucket

Weather Conditions: (clear, cloudy, windy etc) mainly clear

Air Temperature (°C): -20 (-32 w/chill)

Wind Speed (kph): 20

Wind Direction (degrees): 320

<p align="center"><b>TOP Sample</b></p> <p>Sampler dry weight(SWE): <u>11cm</u></p> <p>Snow Depth: <u>10cm</u></p> <p>Snow Weight(SWE): <u>56cm</u></p> <p>Sampler equipment: <u>Shovel/Bucket</u></p> <p>Number of cores to 1/3 fill bucket: <u>4 Shovels</u></p>	<p><b>Comments:</b> Not much snow Granular snow</p> <p><b>Photos(yes/no):</b> <u>Yes</u></p>
<p align="center"><b>Mid Sample</b></p> <p>Distance from top: <u>22 50m</u></p> <p>Sampler dry weight(SWE): <u>56cm</u></p> <p>Snow Depth: <u>22cm</u></p> <p>Snow weight(SWE): <u>75cm</u></p> <p>Sampler equipment: <u>Shovel</u></p> <p>Number of cores to 1/3 fill bucket: <u>2 Shovels</u></p>	<p><b>Comments:</b> <u>0515765 / 7178168</u> compact snow slight granular bottom</p> <p><b>Photos(yes/no):</b> <u>y</u></p>
<p align="center"><b>Toe Sample</b></p> <p>Distance from top: <u>100m</u></p> <p>Sampler dry weight(SWE): <u>75</u></p> <p>Snow Depth: <u>27</u></p> <p>Snow Weight(SWE): <u>125 + mixed out</u></p> <p>Sampler equipment: <u>Shovel</u></p> <p>Number of cores to 1/3 fill bucket: <u>1</u></p>	<p><b>Comments:</b> <u>0515767 / 7178165</u></p> <p><b>Photos(yes/no):</b> <u>y</u></p>

Decanted 28-Mar-14 - KJS 11:50  
Stored in fridge.



# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ-029 Collection Date: 26 MAR. 2014

Actual GPS Coordinates (top of transect): 0519243 E / 7175875 N

Slope Length 100 M Slope Bearing (top to bottom): 280°

Sample Time Started: 2:45 PM Sample Time Finished: 3:26 PM

Field Samplers Initials: DIS/JP

Equipment used: 1.2 m CORER

Weather Conditions: (clear, cloudy, windy etc) mostly cloudy

Air Temperature (°C): 21.8 (-34 w/chill)

Wind Speed (kph): 24

Wind Direction (degrees): 320

TOP Sample		Comments:
Sampler dry weight(SWE):	<u>90 cm</u>   <u>10 cm</u>	1st on rock 2nd
Snow Depth:	<u>32 cm</u>	
Snow Weight(SWE):	<u>11 + 3 + 5 + 6 + 4 + 2 + 2</u> cm	
Sampler equipment:	<u>1.2 m CORER</u>	
Number of cores to 1/3 fill bucket: <u>7</u>		Photos(yes/no): <u>Y</u>
Mid Sample		Comments:
Distance from top:	<u>50 m</u>	<u>0519196, 7175894</u>
Sampler dry weight(SWE):		
Snow Depth:	<u>32 cm</u>	
Snow weight(SWE):	<u>5 + 3 + 3 + 7 + 4 + 10 + 5 + 4</u> cm	
Sampler equipment:	<u>1.2 m CORER</u>	Photos(yes/no): <u>Y</u>
Number of cores to 1/3 fill bucket: <u>8</u>		
Toe Sample		Comments:
Distance from top:	<u>100 m</u>	<u>0519153, 7175915</u>
Sampler dry weight(SWE):		
Snow Depth:	<u>79 cm</u>	
Snow Weight(SWE):	<u>7 + 6 + 11 + 11 + 10 + 10</u> cm	
Sampler equipment:	<u>1.2 m CORER</u>	Photos(yes/no): <u>Y</u>
Number of cores to 1/3 fill bucket: <u>6</u>		

DECANTED INTO BOTTLES @ 1 PM

27 MAR. 2014 DB



# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*Slope should be facing mine site, note if it is not\*\***

**\*\*Take photographs from Top looking Downwards, middle looking both up and down, and toe looking up\*\***

Sampling Location: AQ-106 Collection Date: 26-MAR 2014

Actual GPS Coordinates (top of transect): 0546993E, 7161156N

Slope Length 67 M Slope Bearing (top to bottom): 316°

Sample Time Started: 11:43 Sample Time Finished: 1222

Field Samplers Initials: DB/JP

Equipment used: Shovel, 1.2m core

Weather Conditions: (clear, cloudy, windy etc) partly cloudy

Air Temperature (°C): -22.3 (-35 with chill)

Wind Speed (kph): 26

Wind Direction (degrees): 340

<p><b>TOP Sample</b> <sup>tube bucket</sup></p> <p>Sampler dry weight(SWE): <u>90 cm</u> // <u>11 cm</u></p> <p>Snow Depth: <u>17 cm</u></p> <p>Snow Weight(SWE): <u>55 cm</u></p> <p>Sampler equipment: <u>SHOVEL</u></p> <p>Number of cores to 1/3 fill bucket: <u>2 SHOVELS</u></p>	<p>Comments: <u>GRAB W/ SHOVEL</u></p> <p>Photos(yes/no): <u>Y</u></p>
<p><b>Mid Sample</b></p> <p>Distance from top: <u>33.5 m</u></p> <p>Sampler dry weight(SWE): <u>90 cm</u></p> <p>Snow Depth: <u>35 cm</u></p> <p>Snow weight(SWE): <u>17 + 4 + 17 + 12 cm</u></p> <p>Sampler equipment: <u>1.2 m TUBE</u></p> <p>Number of cores to 1/3 fill bucket: <u>4</u></p>	<p>Comments: <u>2nd CORE ON ROCK</u> <u>0546980, 7161189</u> <u>0546990E</u> <u>7161151 N</u></p> <p>Photos(yes/no): <u>Y</u></p>
<p><b>Toe Sample</b></p> <p>Distance from top: <u>67 m</u></p> <p>Sampler dry weight(SWE): <u>90 cm</u></p> <p>Snow Depth: <u>62 cm</u></p> <p>Snow Weight(SWE): <u>18 + 27 + 29 cm</u></p> <p>Sampler equipment: <u>1.2 m TUBE</u></p> <p>Number of cores to 1/3 fill bucket: <u>3</u></p>	<p>Comments: <u>0546969, 7161223</u> <u>0546990E</u> <u>7161</u></p> <p>Photos(yes/no):</p>

DECANTED INTO BOTTLES @ 1:30 PM  
27-MAR-2014 DB

BWP2501

# 2014 AQMP Snow Core Sampling Field Sheet

**\*\*NOTE - Ensure that slope is facing mine site and that snow is collected on Windward side of slope\*\***

**\*\*Take photograph from Top looking Downwards**

Sampling Location: AQ-005 Collection Date: March 25 2014

Actual GPS Coordinates (top of transect): 0514909 , 7175937

Slope Length 181 M Slope Bearing (degree): 59°

Sample Time: 14:15 Field Samplers Initial: AWH / JP

Equipment used: Shovel & bucket

Empty Dry weight of snow core sampler: 15 (~~15~~ 1.2 m sample)

Weather Conditions: (clear, cloudy, windy etc) Partly cloudy

Air Temperature (°C): -23 (-35 w/chill)

Wind Speed (kph): 32 kph

Wind Direction (degrees): 300

<b>TOP Sample</b> Snow Depth <u>33cm</u> Snow Weight <u>98+105+97+101+</u> Sampler equipment: <u>shovel</u>	<b>Top Replicate (mark X if not collected)</b> Snow Depth Snow Weight Sampler equipment: <u>X</u>
<b>Mid Sample</b> Snow Depth: <u>46cm</u> Snow weight <u>98</u> Sampler equipment: <u>1.2m core (90SWE)</u> <u>100m</u> <u>0514997 7175983</u>	<b>Mid Replicate (mark X if not collected)</b> Snow Depth Snow Weight Sampler equipment:
<b>Toe Sample</b> Snow Depth: <u>58cm 68cm</u> Snow Weight: <u>107 111 cores</u> Sampler equipment: <u>1.2m core (90SWE)</u> <u>81m</u> <u>14:45 end time</u>	<b>Toe Replicate (mark X if not collected)</b> Snow Depth Snow Weight Sampler equipment: <u>dust in snow at toe</u>

Photo taken (Yes/NO)

Additional Comments(fugitive dust, wildlife, exposed groundsurface)

DECANTED INTO BOTTLES @ 12:30 PM  
27-MAR-2014 DB

## ***Appendix 12***

*Snow Core Sampling Lab Analysis Data, 2014*

EKATI DIAMOND MINE

**2014 Air Quality Monitoring Program**



Dominion Diamond Ekati Corporation (DDEC)  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 28-MAR-14  
Report Date: 11-APR-14 15:32 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1437656  
**Project P.O. #:** BHP2501  
**Job Reference:** 69238  
**C of C Numbers:** 1  
**Legal Site Desc:** 6201104485

**Comments:** Due to elevated turbidity reading the samples were acid digested prior to total metals analysis. This procedure is to ensure that all metals are in solution for total metals analysis. Therefore, the reporting detection limits for total metals would be raised accordingly.

Can Dang  
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	Description			
		Sampled Date	Sampled Time	Client ID		
		L1437656-1	Snow	L1437656-2	Snow	
		26-MAR-14	12:00	26-MAR-14	15:00	
		AQ-106		AQ-29		
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Conductivity (uS/cm)	3.4	10.5			
	Hardness (as CaCO3) (mg/L)	1.21	24.3			
	pH (pH)	5.52	6.91			
	Total Suspended Solids (mg/L)	11.7	107			
	Total Dissolved Solids (mg/L)	2.7	20.3			
	Turbidity (NTU)	3.10	25.5			
<b>Anions and Nutrients</b>	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0	2.4			
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	2.4			
	Ammonia, Total (as N) (mg/L)	0.0256 <sup>RRV</sup>	0.0656			
	Chloride (Cl) (mg/L)	<0.50	<0.50			
	Fluoride (F) (mg/L)	<0.020	<0.020			
	Nitrate (as N) (mg/L)	0.0939	0.113			
	Nitrite (as N) (mg/L)	<0.0010	<0.0010			
	Total Kjeldahl Nitrogen (mg/L)	0.062	0.095			
	Orthophosphate-Dissolved (as P) (mg/L)	0.0018	0.0064			
	Phosphorus (P)-Total (mg/L)	0.0102	0.164			
	Sulfate (SO4) (mg/L)	<0.50	<0.50			
	Anion Sum (meq/L)	<0.10	<0.10			
	Cation Sum (meq/L)	<0.10	1.08			
	Cation - Anion Balance (%)	85.3	90.3			
	Total Organic Carbon (mg/L)	1.11 <sup>RRV</sup>	2.78			
<b>Organic / Inorganic Carbon</b>						
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)	0.285	3.02			
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010			
	Arsenic (As)-Total (mg/L)	0.00013	0.00037			
	Barium (Ba)-Total (mg/L)	0.00337	0.0604			
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010			
	Boron (B)-Total (mg/L)	<0.010	<0.010			
	Cadmium (Cd)-Total (mg/L)	<0.000010	0.000026			
	Calcium (Ca)-Total (mg/L)	0.154	2.00			
	Chromium (Cr)-Total (mg/L)	0.00126	0.0122			
	Cobalt (Co)-Total (mg/L)	0.00016	0.00274			
	Copper (Cu)-Total (mg/L)	0.00251	0.00724			
	Iron (Fe)-Total (mg/L)	0.259	3.46			
	Lead (Pb)-Total (mg/L)	0.000495	0.00103			

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



# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	Description	Sampled Date	Sampled Time	Client ID
		L1437656-1	Snow	26-MAR-14	12:00	AQ-106
		L1437656-2	Snow	26-MAR-14	15:00	AQ-29
Grouping	Analyte					
<b>WATER</b>						
Total Metals	Magnesium (Mg)-Total (mg/L)	0.20	4.68			
	Manganese (Mn)-Total (mg/L)	0.00516	0.0438			
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010			
	Molybdenum (Mo)-Total (mg/L)	0.000528	0.000996			
	Nickel (Ni)-Total (mg/L)	0.00144	0.0267			
	Potassium (K)-Total (mg/L)	0.11	1.66			
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010			
	Silicon (Si)-Total (mg/L)	0.561	8.34			
	Silver (Ag)-Total (mg/L)	<0.000010	0.000010			
	Sodium (Na)-Total (mg/L)	0.154	0.641			
	Strontium (Sr)-Total (mg/L)	0.00142	0.0246			
	Uranium (U)-Total (mg/L)	0.000073	0.000207			
	Vanadium (V)-Total (mg/L)	<0.0010	0.0069			
	Zinc (Zn)-Total (mg/L)	0.0041	0.0125			

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

## Reference Information

## QC Samples with Qualifiers &amp; Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Nitrite (as N)	DLM	L1437656-1, -2
Duplicate	Nitrate (as N)	DLM	L1437656-1, -2
Matrix Spike	Manganese (Mn)-Total	MS-B	L1437656-1, -2
Matrix Spike	Sodium (Na)-Total	MS-B	L1437656-1, -2
Matrix Spike	Strontium (Sr)-Total	MS-B	L1437656-1, -2

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>ALK-SCR-VA</b>	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
<b>ANIONS-CL-IC-VA</b>	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-F-IC-VA</b>	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-NO2-IC-VA</b>	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
<b>ANIONS-NO3-IC-VA</b>	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
<b>ANIONS-SO4-IC-VA</b>	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>AS-T-CCMS-VA</b>	Water	Total Arsenic in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
<b>CARBONS-TOC-VA</b>	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
<b>EC-PCT-VA</b>	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
<b>HARDNESS-CALC-VA</b>	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
<b>HG-TOT-LOW-CVAFS-VA</b>	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			
<b>IONBALANCE-VA</b>	Water	Ion Balance Calculation	APHA 1030E

## Reference Information

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

$$\text{Ion Balance (\%)} = [\text{Cation Sum} - \text{Anion Sum}] / [\text{Cation Sum} + \text{Anion Sum}]$$

**MET-T-CCMS-VA**      Water      Total Metals in Water by CRC ICPMS      APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

**MET-TOT-ICP-VA**      Water      Total Metals in Water by ICPOES      EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

**MET-TOT-LOW-ICP-VA**      Water      Total Metals in Water by ICPOES      EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

**N-T-COL-VA**      Water      Total Nitrogen in water by Colour      USGS - 03 - 4174 / NEMI 5735

This analysis is carried out using procedures adapted from the US Geological Survey (USGS) Method 03-4174 "Evaluation of Alkaline persulfate digestion as an alternative to kjeldahl digestion for determination of total and dissolved nitrogen and phosphorus in water." and National Environmental Methods Index Nemi method 5735. Nitrate via manual vanadium (III) reduction.

**NH3-F-VA**      Water      Ammonia in Water by Fluorescence      J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

**P-T-COL-VA**      Water      Total P in Water by Colour      APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.

**PH-PCT-VA**      Water      pH by Meter (Automated)      APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

**PH-PCT-VA**      Water      pH by Meter (Automated)      APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

**PO4-DO-COL-VA**      Water      Diss. Orthophosphate in Water by Colour      APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

**TDS-CALC-VA**      Water      TDS (Calculated)      APHA 1030E (20TH EDITION)

This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".

**TKN-CALC-VA**      Water      TKN in Water (Calculation)      BC MOE LABORATORY MANUAL (2005)

Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

**TSS-VA**      Water      Total Suspended Solids by Gravimetric      APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

**TURBIDITY-VA**      Water      Turbidity by Meter      APHA 2130 "Turbidity"

## Reference Information

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**TURBIDITY-VA**      Water      Turbidity by Meter      APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

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

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

---

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

---

### Chain of Custody Numbers:

---

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 ww - milligrams per kilogram based on wet weight of sample.*

*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.*

*mg/L - milligrams per litre.*

*< - Less than.*

*D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*



**ALS Contact:** Can Dang

S.O. 44799




bhpbilliton

**BHP Contacts:** David Bruce/ Richard Ehler/David

## CHAIN OF CUSTODY FORM

Station ID	Matrix	Date	Time	Init	Nutrients/Organics	AEMP-Physical/Parameters	AEMP-Total Metals	Metals Dissolved ICP-MS Low	Fluoride	Oil and Grease	SNP-0013 BTEX TPH	SNP-0013 Major Ions	SNP-0013 Nutrients	SNP-0013 Physical Parameters	SNP-0013 Total Metals	TDS	TPH	TSS
AQ-106	Snow	26-Mar-2014	12:00 PM	DB	1	1	1	1										BHP2
AQ-29	Snow	26-Mar-2014	03:00 PM	DB	1	1	1	1										BHP2



L1437656-COFC

FOR LAB USE ONLY

Billing Code: BHP2501

Relinquished by: <b>DB</b>	Date: <b>27 MAR 2014</b>	Received by:	Date
	Time: <b>13:38</b>		Time
Relinquished by:	Date:	Received by:	Date: <b>Mar 28</b>
	Time:	<b>Euse</b>	Time: <b>18:00</b>

Cooler seal intact upon receipt? ☐ Yes ☐ No ☒ N/A Sample temperature upon receipt: 5.6 °C  
Frozen? ☐ Yes ☒ No

**Send Analytical Results to:**

compliance.team@ekati.ddcorp.ca;





Dominion Diamond Ekati Corporation (DDEC)  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 28-MAR-14  
Report Date: 14-APR-14 17:05 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1437657  
**Project P.O. #:** BHP2501  
**Job Reference:** 69239  
**C of C Numbers:** 69239  
**Legal Site Desc:** 6201104485

Can Dang  
Senior Account Manager

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# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Conductivity (uS/cm)	<2.0				
	Hardness (as CaCO3) (mg/L)	<0.50				
	pH (pH)	5.70				
	Total Suspended Solids (mg/L)	<3.0				
	Total Dissolved Solids (mg/L)	<1.0				
	Turbidity (NTU)	0.55				
<b>Anions and Nutrients</b>	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0				
	Ammonia, Total (as N) (mg/L)	<0.0050				
	Chloride (Cl) (mg/L)	<0.50				
	Fluoride (F) (mg/L)	<0.020				
	Nitrate (as N) (mg/L)	<0.0050				
	Nitrite (as N) (mg/L)	<0.0010				
	Total Kjeldahl Nitrogen (mg/L)	<0.050				
	Total Nitrogen (mg/L)	<0.050				
	Orthophosphate-Dissolved (as P) (mg/L)	<0.0010				
	Phosphorus (P)-Total (mg/L)	<0.0020				
	Sulfate (SO4) (mg/L)	<0.50				
	Anion Sum (meq/L)	<0.10				
	Cation Sum (meq/L)	<0.10				
	Cation - Anion Balance (%)	0.0				
<b>Organic / Inorganic Carbon</b>	Total Organic Carbon (mg/L)	<0.50				
<b>Total Metals</b>	Arsenic (As)-Total (mg/L)	<0.00010				
	Mercury (Hg)-Total (mg/L)	<0.000010				
	Silicon (Si)-Total (mg/L)	<0.050 <sup>RRV</sup>				
<b>Total Metals (Undigested)</b>	Aluminum (Al)-Total (mg/L)	0.0020				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	<0.000020				
	Barium (Ba)-Total (mg/L)	<0.000050				
	Beryllium (Be)-Total (mg/L)	<0.000010				
	Boron (B)-Total (mg/L)	<0.0050				
	Cadmium (Cd)-Total (mg/L)	<0.000010				
	Calcium (Ca)-Total (mg/L)	0.021 <sup>RRV</sup>				
	Chromium (Cr)-Total (mg/L)	<0.00010				

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1437657-1 Water 27-MAR-14 11:45 AQ-BLANK				
Grouping	Analyte					
<b>WATER</b>						
<b>Total Metals (Undigested)</b>	Cobalt (Co)-Total (mg/L)	<0.00010				
	Copper (Cu)-Total (mg/L)	<0.00010				
	Iron (Fe)-Total (mg/L)	<0.010				
	Lead (Pb)-Total (mg/L)	<sup>RRV</sup> 0.000011				
	Magnesium (Mg)-Total (mg/L)	<0.0050				
	Manganese (Mn)-Total (mg/L)	<0.000050				
	Molybdenum (Mo)-Total (mg/L)	<0.000050				
	Nickel (Ni)-Total (mg/L)	<0.000050				
	Potassium (K)-Total (mg/L)	<0.050				
	Selenium (Se)-Total (mg/L)	<0.000040				
	Silicon (Si)-Total (mg/L)	<0.050				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	<0.010				
	Strontium (Sr)-Total (mg/L)	<0.00010				
	Uranium (U)-Total (mg/L)	<0.000010				
	Vanadium (V)-Total (mg/L)	<0.000050				
	Zinc (Zn)-Total (mg/L)	<sup>RRV</sup> 0.0012				

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

## Reference Information

## QC Samples with Qualifiers &amp; Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Total Nitrogen	DLA	L1437657-1
Duplicate	Nitrite (as N)	DLM	L1437657-1
Duplicate	Nitrate (as N)	DLM	L1437657-1
Matrix Spike	Total Nitrogen	MS-B	L1437657-1
Matrix Spike	Total Nitrogen	MS-B	L1437657-1

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>ALK-SCR-VA</b>	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
OR			
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
<b>ANIONS-CL-IC-VA</b>	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-F-IC-VA</b>	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-NO2-IC-VA</b>	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
<b>ANIONS-NO3-IC-VA</b>	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
<b>ANIONS-SO4-IC-VA</b>	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>AS-T-CCMS-VA</b>	Water	Total Arsenic in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
<b>CARBONS-TOC-VA</b>	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
<b>EC-PCT-VA</b>	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
<b>HARDNESS-CALC-VA</b>	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
<b>HG-TOT-LOW-CVAFS-VA</b>	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			

# Reference Information

## IONBALANCE-VA Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

$$\text{Ion Balance (\%)} = [\text{Cation Sum} - \text{Anion Sum}] / [\text{Cation Sum} + \text{Anion Sum}]$$

## MET-T-NP-U-CCMS-VA Water Total Metals by CRC ICPMS (Undigested) EPA SW-846 6020A

Ultra trace metals in water are analyzed by CRC ICPMS, based on US EPA Method 6020A (Jan 1998). The detection limits provided can only be met for undigested samples. This procedure is intended for colorless, non-turbid, acid-preserved water samples (i.e. pristine water samples), having turbidity < 1 NTU and no odor. Where turbidity exceeds 1 NTU, and/or the sample is colored and has an odor, results may be biased low compared to true Total Metals concentrations. ALS recommends that turbidity analysis be requested on samples submitted for this test to aid with interpretation of results.

## MET-T-NP-U-ICP-VA Water Total Metals by ICPOES (Undigested) EPA SW-846 6010B

Ultra trace metals in water are analyzed by ICPOES, based on US EPA Method 6010B. The detection limits provided can only be met for undigested samples. This procedure is intended for colorless, non-turbid, acid-preserved water samples (i.e. pristine water samples), having turbidity < 1 NTU and no odor. Where turbidity exceeds 1 NTU, and/or the sample is colored and has an odor, results may be biased low compared to true Total Metals concentrations. ALS recommends that turbidity analysis be requested on samples submitted for this test to aid with interpretation of results.

## MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

## N-T-COL-VA Water Total Nitrogen in water by Colour USGS - 03 - 4174 / NEMI 5735

This analysis is carried out using procedures adapted from the US Geological Survey (USGS) Method □ 03-4174 "Evaluation of Alkaline persulfate digestion as an alternative to kjeldahl digestion for determination of total and dissolved nitrogen and phosphorus in water." and National Environmental Methods Index □ Nemi method 5735. Nitrate via manual vanadium (III) reduction.

## NH3-F-VA Water Ammonia in Water by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

## P-T-COL-VA Water Total P in Water by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.

## PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

## PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

## PO4-DO-COL-VA Water Diss. Orthophosphate in Water by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

## TDS-CALC-VA Water TDS (Calculated) APHA 1030E (20TH EDITION)

This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".

## TKN-CALC-VA Water TKN in Water (Calculation) BC MOE LABORATORY MANUAL (2005)

Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

## TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

## TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"



## Reference Information

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**TURBIDITY-VA**      Water      Turbidity by Meter      APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

---

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

---

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

---

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

---

### Chain of Custody Numbers:

---

69239

### 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 ww - milligrams per kilogram based on wet weight of sample.*

*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.*

*mg/L - milligrams per litre.*

*< - Less than.*

*D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*



ALS Contact: Can Dang


S.O. 44799



bhpbilliton

## CHAIN OF CUSTODY FORM

Station ID	Matrix	Date	Time	Init	AEMP-Nutrients/Organics	AEMP-Physical/Ion Parameters	AEMP-Total Metals	Fluoride											
AQ-Blank	Water	27-Mar-2014	11:45 AM	KJ	1	1	1	1	BHP2										



L1437657-COFC

FOR LAB USE ONLY

Relinquished by: <i>DB</i>	Date <i>27 Mar 2014</i> Time <i>13:38</i>	Received by:	Date Time
Relinquished by:	Date Time	Received by: <i>Elise</i>	Date <i>Mar 28</i> Time <i>18:00</i>

Frozen? ☐ Yes ☒ No

compliance.team@ekati.ddcorp.ca;



Dominion Diamond Ekati Corporation (DDEC)  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 28-MAR-14  
Report Date: 15-APR-14 12:49 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1437658  
**Project P.O. #:** BHP2501  
**Job Reference:** 69237  
**C of C Numbers:** 1  
**Legal Site Desc:** 620114485

Can Dang  
Senior Account Manager

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ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
		L1437658-1				
		Snow				
		25-MAR-14				
		14:15				
		AQ-05				
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Conductivity (uS/cm)	24.3				
	Hardness (as CaCO3) (mg/L)	79.1				
	pH (pH)	7.20				
	Total Suspended Solids (mg/L)	103				
	Total Dissolved Solids (mg/L)	44.5				
	Turbidity (NTU)	44.0				
<b>Anions and Nutrients</b>	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	7.9				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Total (as CaCO3) (mg/L)	7.9				
	Ammonia, Total (as N) (mg/L)	0.0523				
	Chloride (Cl) (mg/L)	0.93				
	Fluoride (F) (mg/L)	<0.020				
	Nitrate (as N) (mg/L)	0.128				
	Nitrite (as N) (mg/L)	0.0010				
	Total Kjeldahl Nitrogen (mg/L)	0.101				
	Total Nitrogen (mg/L)	0.230				
	Orthophosphate-Dissolved (as P) (mg/L)	0.0132				
	Phosphorus (P)-Total (mg/L)	0.0970				
	Sulfate (SO4) (mg/L)	1.31				
	Anion Sum (meq/L)	0.22				
	Cation Sum (meq/L)	2.43				
	Cation - Anion Balance (%)	83.3				
<b>Organic / Inorganic Carbon</b>	Total Organic Carbon (mg/L)	3.03				
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)	3.74				
	Antimony (Sb)-Total (mg/L)	0.00014				
	Arsenic (As)-Total (mg/L)	0.00092				
	Barium (Ba)-Total (mg/L)	0.148				
	Beryllium (Be)-Total (mg/L)	0.00012				
	Boron (B)-Total (mg/L)	<0.010				
	Cadmium (Cd)-Total (mg/L)	0.000072				
	Calcium (Ca)-Total (mg/L)	3.81				
	Chromium (Cr)-Total (mg/L)	0.0361				
	Cobalt (Co)-Total (mg/L)	0.00768				
	Copper (Cu)-Total (mg/L)	0.00533				
	Iron (Fe)-Total (mg/L)	5.56				

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID  
 Description  
 Sampled Date  
 Sampled Time  
 Client ID

L1437658-1  
 Snow  
 25-MAR-14  
 14:15  
 AQ-05

Grouping Analyte

WATER

Total Metals	Lead (Pb)-Total (mg/L)	0.00190
	Magnesium (Mg)-Total (mg/L)	16.9
	Manganese (Mn)-Total (mg/L)	0.0838
	Mercury (Hg)-Total (mg/L)	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.00378
	Nickel (Ni)-Total (mg/L)	0.125
	Potassium (K)-Total (mg/L)	1.93
	Selenium (Se)-Total (mg/L)	0.00010
	Silicon (Si)-Total (mg/L)	21.6
	Silver (Ag)-Total (mg/L)	0.000020
	Sodium (Na)-Total (mg/L)	1.81
	Strontium (Sr)-Total (mg/L)	0.0706
	Uranium (U)-Total (mg/L)	0.000351
	Vanadium (V)-Total (mg/L)	0.0087
	Zinc (Zn)-Total (mg/L)	0.0167

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



## Reference Information

## QC Samples with Qualifiers &amp; Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Total Nitrogen	DLA	L1437658-1
Duplicate	Nitrite (as N)	DLM	L1437658-1
Duplicate	Nitrate (as N)	DLM	L1437658-1
Matrix Spike	Total Nitrogen	MS-B	L1437658-1
Matrix Spike	Total Nitrogen	MS-B	L1437658-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L1437658-1
Matrix Spike	Sodium (Na)-Total	MS-B	L1437658-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L1437658-1

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>ALK-SCR-VA</b>	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
<b>ANIONS-CL-IC-VA</b>	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-F-IC-VA</b>	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-NO2-IC-VA</b>	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
<b>ANIONS-NO3-IC-VA</b>	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
<b>ANIONS-SO4-IC-VA</b>	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>AS-T-CCMS-VA</b>	Water	Total Arsenic in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
<b>CARBONS-TOC-VA</b>	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
<b>EC-PCT-VA</b>	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
<b>HARDNESS-CALC-VA</b>	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
<b>HG-TOT-LOW-CVAFS-VA</b>	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to			

# Reference Information

reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

**IONBALANCE-VA** Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

$$\text{Ion Balance (\%)} = [\text{Cation Sum} - \text{Anion Sum}] / [\text{Cation Sum} + \text{Anion Sum}]$$

**MET-T-CCMS-VA** Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

**MET-TOT-LOW-ICP-VA** Water Total Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

**N-T-COL-VA** Water Total Nitrogen in water by Colour USGS - 03 - 4174 / NEMI 5735

This analysis is carried out using procedures adapted from the US Geological Survey (USGS) Method 03-4174 "Evaluation of Alkaline persulfate digestion as an alternative to kjeldahl digestion for determination of total and dissolved nitrogen and phosphorus in water." and National Environmental Methods Index Nemi method 5735. Nitrate via manual vanadium (III) reduction.

**NH3-F-VA** Water Ammonia in Water by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

**P-T-COL-VA** Water Total P in Water by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.

**PH-PCT-VA** Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

**PH-PCT-VA** Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

**PO4-DO-COL-VA** Water Diss. Orthophosphate in Water by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

**SE-T-CCMS-VA** Water Total Selenium in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

**TDS-CALC-VA** Water TDS (Calculated) APHA 1030E (20TH EDITION)

This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".

**TKN-CALC-VA** Water TKN in Water (Calculation) BC MOE LABORATORY MANUAL (2005)

Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

**TSS-VA** Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

## Reference Information

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

**TURBIDITY-VA**                      Water                      Turbidity by Meter                      APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**TURBIDITY-VA**                      Water                      Turbidity by Meter                      APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

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

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

---

Laboratory Definition Code	Laboratory Location
----------------------------	---------------------

VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA
----	---

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**Chain of Custody Numbers:**

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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 ww - milligrams per kilogram based on wet weight of sample.*

*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.*

*mg/L - milligrams per litre.*

*< - Less than.*

*D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

**UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.**

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*

**ALS Environmental**  
excellence in analytical testing



1988 Triumph Street, Vancouver, BC V5L 1K5

Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700

ALS Contact: Can Dang

50 # 44799

Form 69237



**bhpbilliton**

BHP Billiton Diamonds Inc.

# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1

Tel: 867-880-2157 Fax: 867-880-4012

BHP Contacts: David Bruce/ Richard EhlerDavid

## CHAIN OF CUSTODY FORM

For Lab Use

FOR LAB USE ONLY

Station ID	Matrix	Date	Time	Init	Nutrients/Organics AEMP- Parameters	AEMP-Physical/Ion Parameters	AEMP-Total Metals	Fluoride	Metals Dissolved ICP- MS Low	Oil and Grease	SNP-0013 BTEX TPH	SNP-0013 Major Ions	SNP-0013 Nutrients	SNP-0013 Physical Parameters	SNP-0013 Total Metals	TDS	TPH	TSS						
AQ-05	Snow	25-Mar-2014	02:15 PM	AH	1	1	1	1												BHP2				
 L1437658-COFC																								

Turn around Required: Reg 2 week TAT.

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2501

Relinquished by: <i>DB</i>	Date: <i>27 Mar 14</i> Time: <i>13:38</i>	Received by:	Date: <i>Mar 28</i> Time: <i>18:00</i>
Relinquished by:	Date: Time: 	Received by: <i>Elise</i>	Date: Time: 

FOR LAB USE ONLY

Cooler seal intact upon receipt? ☐ Yes ☐ No ☒ N/A Sample temperature upon receipt: *5.6 c.*

Frozen? ☐ Yes ☒ No

Send Analytical Results to:

compliance.team@ekati.ddcorp.ca;



Dominion Diamond Ekati Corporation (DDEC)  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 01-APR-14  
Report Date: 21-APR-14 14:59 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1438631  
**Project P.O. #:** BHP2501  
**Job Reference:** 69240  
**C of C Numbers:** 1  
**Legal Site Desc:** 6201104485

**Comments:** Please note for ALS identified samples L1438631-1 to 7, acid digestion was implemented for metal analysis due to turbidity being >1 NTU. The detection limit was raised accordingly.

Can Dang  
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company



# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1438631-1 Snow 28-MAR-14 15:25 AQ-114	L1438631-2 Snow 28-MAR-14 13:10 AQ-44	L1438631-3 Snow 28-MAR-14 14:30 AQ-112	L1438631-4 Snow 07-MAR-14 15:15 AQ-102	L1438631-5 Snow 27-MAR-14 14:00 AQ-06
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Conductivity (uS/cm)	3.3	4.6	2.8	3.1	2.7
	Hardness (as CaCO3) (mg/L)	<0.50	<0.50	<0.50	<0.50	2.22
	pH (pH)	5.18	5.02	5.19	5.17	5.53
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	16.1
	Total Dissolved Solids (mg/L)	1.6	2.9	1.4	1.7	6.8
	Turbidity (NTU)	1.37	2.16	1.75	1.70	5.93
<b>Anions and Nutrients</b>	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Ammonia, Total (as N) (mg/L)	0.0084	0.0217	0.0093	0.0092	<0.0050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Nitrate (as N) (mg/L)	0.0682	0.0886	0.0641	0.0583	0.0463
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	<0.050	0.088	<0.050	<0.050	0.509
	Total Nitrogen (mg/L)	0.087	0.177	0.087	0.099	0.556
	Orthophosphate-Dissolved (as P) (mg/L)	<0.0010	0.0017	<0.0010	<0.0010	0.0147
	Phosphorus (P)-Total (mg/L)	0.0048	0.0030	<0.0020	0.0033	0.0376
	Sulfate (SO4) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Anion Sum (meq/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cation Sum (meq/L)	<0.10	<0.10	<0.10	<0.10	0.16
	Cation - Anion Balance (%)	65.7	67.2	60.5	67.3	96.0
<b>Organic / Inorganic Carbon</b>	Total Organic Carbon (mg/L)	1.07 <sup>RRV</sup>	2.18	0.88 <sup>RRV</sup>	1.17 <sup>RRV</sup>	4.21 <sup>RRV</sup>
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)	0.0594	0.0663	0.0271	0.0425	0.441
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Barium (Ba)-Total (mg/L)	0.00321	0.00193	0.000837	0.00116	0.00915
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	0.000010
	Calcium (Ca)-Total (mg/L)	0.072	0.110	0.072	0.060	0.411
	Chromium (Cr)-Total (mg/L)	0.00026	0.00040	0.00021	0.00031	0.00319
	Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	0.00041
	Copper (Cu)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.00101
	Iron (Fe)-Total (mg/L)	0.032	0.062	0.024	0.040	0.455

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
		L1438631-6		L1438631-7		
		Snow		Snow		
		27-MAR-14		28-MAR-14		
		11:10		12:15		
		AQ-31		AQ-113		
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Conductivity (uS/cm)	4.6		3.9		
	Hardness (as CaCO3) (mg/L)	7.01		0.96		
	pH (pH)	6.09		5.32		
	Total Suspended Solids (mg/L)	30.9		8.5		
	Total Dissolved Solids (mg/L)	8.8		2.6		
	Turbidity (NTU)	5.91		3.12		
<b>Anions and Nutrients</b>	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0		<2.0		
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0		<2.0		
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0		<2.0		
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0		<2.0		
	Ammonia, Total (as N) (mg/L)	0.0422 <sup>SRU</sup>		0.0157 <sup>SRU</sup>		
	Chloride (Cl) (mg/L)	<0.50		<0.50		
	Fluoride (F) (mg/L)	<0.020		<0.020		
	Nitrate (as N) (mg/L)	0.0911		0.0915		
	Nitrite (as N) (mg/L)	<0.0010		<0.0010		
	Total Kjeldahl Nitrogen (mg/L)	0.212		<0.050		
	Total Nitrogen (mg/L)	0.303		0.141		
	Orthophosphate-Dissolved (as P) (mg/L)	0.0075		0.0034		
	Phosphorus (P)-Total (mg/L)	0.0401		0.0110		
	Sulfate (SO4) (mg/L)	<0.50		<0.50		
	Anion Sum (meq/L)	<0.10		<0.10		
	Cation Sum (meq/L)	0.36		<0.10		
	Cation - Anion Balance (%)	96.5		82.9		
		3.04 <sup>RRV</sup>		1.24 <sup>RRV</sup>		
<b>Organic / Inorganic Carbon</b>						
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)	0.733		0.184		
	Antimony (Sb)-Total (mg/L)	<0.00010		<0.00010		
	Arsenic (As)-Total (mg/L)	0.00012		<0.00010		
	Barium (Ba)-Total (mg/L)	0.0256		0.00376		
	Beryllium (Be)-Total (mg/L)	<0.00010		<0.00010		
	Boron (B)-Total (mg/L)	<0.010		<0.010		
	Cadmium (Cd)-Total (mg/L)	0.000014		<0.000010		
	Calcium (Ca)-Total (mg/L)	1.11		0.145		
	Chromium (Cr)-Total (mg/L)	0.00386		0.00086		
	Cobalt (Co)-Total (mg/L)	0.00094		0.00015		
	Copper (Cu)-Total (mg/L)	0.00108		<0.00050		
	Iron (Fe)-Total (mg/L)	0.865		0.185		

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1438631-1 Snow 28-MAR-14 15:25 AQ-114	L1438631-2 Snow 28-MAR-14 13:10 AQ-44	L1438631-3 Snow 28-MAR-14 14:30 AQ-112	L1438631-4 Snow 07-MAR-14 15:15 AQ-102	L1438631-5 Snow 27-MAR-14 14:00 AQ-06
Grouping	Analyte					
<b>WATER</b>						
Total Metals	Lead (Pb)-Total (mg/L)	0.000072	0.000131	0.000089	0.000095	0.000267
	Magnesium (Mg)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	0.59
	Manganese (Mn)-Total (mg/L)	0.00132	0.00173	0.00125	0.00147	0.0171
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.000156	0.000564	0.000324	0.000239	0.000622
	Nickel (Ni)-Total (mg/L)	<0.00050	0.00073	<0.00050	<0.00050	0.00408
	Potassium (K)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	0.32
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Total (mg/L)	0.081	0.177	0.077	0.091	1.16
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	0.100	0.112	0.082	0.089	0.154
	Strontium (Sr)-Total (mg/L)	0.00057	0.00088	0.00052	0.00048	0.00342
	Uranium (U)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	0.000032
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030	<0.0030	0.0047	0.0055

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
<b>WATER</b>						
<b>Total Metals</b>	Lead (Pb)-Total (mg/L)	0.000303	0.000145			
	Magnesium (Mg)-Total (mg/L)	1.85	0.25			
	Manganese (Mn)-Total (mg/L)	0.0232	0.00344			
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010			
	Molybdenum (Mo)-Total (mg/L)	0.000074	0.00140			
	Nickel (Ni)-Total (mg/L)	0.0130	0.00168			
	Potassium (K)-Total (mg/L)	0.52	<0.10			
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010			
	Silicon (Si)-Total (mg/L)	2.80	0.479			
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010			
	Sodium (Na)-Total (mg/L)	0.230	0.127			
	Strontium (Sr)-Total (mg/L)	0.0101	0.00173			
	Uranium (U)-Total (mg/L)	0.000052	0.000013			
	Vanadium (V)-Total (mg/L)	0.0015	<0.0010			
	Zinc (Zn)-Total (mg/L)	0.0052	0.0039			

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

## Reference Information

## QC Samples with Qualifiers &amp; Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Fluoride (F)	DLM	L1438631-1, -2, -3, -4, -5, -6, -7
Duplicate	Nitrite (as N)	DLM	L1438631-1, -2, -3, -4, -5, -6, -7
Duplicate	Nitrite (as N)	DLM	L1438631-1, -2, -3, -4, -5, -6, -7
Duplicate	Nitrate (as N)	DLM	L1438631-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Phosphorus (P)-Total	MS-B	L1438631-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Ammonia, Total (as N)	MS-B	L1438631-1, -2, -3, -5, -6, -7
Matrix Spike	Aluminum (Al)-Total	MS-B	L1438631-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Barium (Ba)-Total	MS-B	L1438631-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Sodium (Na)-Total	MS-B	L1438631-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Strontium (Sr)-Total	MS-B	L1438631-1, -2, -3, -4, -5, -6, -7

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis
SRU	Sample Received Unpreserved. Results may be biased low for indicated parameter(s)

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>ALK-SCR-VA</b>	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
OR			
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
<b>ANIONS-CL-IC-VA</b>	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-F-IC-VA</b>	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-NO2-IC-VA</b>	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
<b>ANIONS-NO3-IC-VA</b>	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
<b>ANIONS-SO4-IC-VA</b>	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>CARBONS-TOC-VA</b>	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
<b>EC-PCT-VA</b>	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
<b>HARDNESS-CALC-VA</b>	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO <sub>3</sub> equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
<b>HG-TOT-LOW-CVAFS-VA</b>	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			



# Reference Information

## IONBALANCE-VA Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

$$\text{Ion Balance (\%)} = [\text{Cation Sum} - \text{Anion Sum}] / [\text{Cation Sum} + \text{Anion Sum}]$$

## MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

## MET-TOT-LOW-ICP-VA Water Total Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

## N-T-COL-VA Water Total Nitrogen in water by Colour USGS - 03 - 4174 / NEMI 5735

This analysis is carried out using procedures adapted from the US Geological Survey (USGS) Method 03-4174 "Evaluation of Alkaline persulfate digestion as an alternative to kjeldahl digestion for determination of total and dissolved nitrogen and phosphorus in water." and National Environmental Methods Index Nemi method 5735. Nitrate via manual vanadium (III) reduction.

## NH3-F-VA Water Ammonia in Water by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Weston et al.

## P-T-COL-VA Water Total P in Water by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulfate digestion of the sample.

## PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

## PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

## PO4-DO-COL-VA Water Diss. Orthophosphate in Water by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

## TDS-CALC-VA Water TDS (Calculated) APHA 1030E (20TH EDITION)

This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".

## TKN-CALC-VA Water TKN in Water (Calculation) BC MOE LABORATORY MANUAL (2005)

Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

## TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

## TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

## TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

## Reference Information

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

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

Laboratory Definition Code	Laboratory Location
----------------------------	---------------------

VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA
----	---

**Chain of Custody Numbers:**

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 ww - milligrams per kilogram based on wet weight of sample.*

*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.*

*mg/L - milligrams per litre.*

*< - Less than.*

*D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*

**ALS Environmental**

excellence in analytical testing

1988 Triumph Street, Vancouver, BC V5L 1K5

Tel: 604-253-4188 Toll Free: 1-800-665-0243 Fax: 604-253-6700

ALS Contact: Can Dan



L1438631-COFC

S.O. 44800

Form 69240

BHP Billiton Diamonds Inc.

# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1

Tel: 867-880-2157 Fax: 867-880-4012

BHP Contacts: David Bruce/ Richard EhlerDavid

**CHAIN OF CUSTODY FORM**

Station ID	Matrix	Date	Time	Init	Nutrients/Organics AEMP- Parameters	AEMP-Physical/Ion Parameters	AEMP-Total Metals	Fluoride												
AQ-114	Snow	28-Mar-2014	03:25 PM	NA	1	1	1	1	BHP2											
AQ-44	Snow	28-Mar-2014	01:10 PM	NA	1	1	1	1	BHP2											
AQ-112	Snow	28-Mar-2014	02:30 PM	NA	1	1	1	1	BHP2											
AQ-102	Snow	27-Mar-2014	03:15 PM	KJ	1	1	1	1	BHP2											
AQ-06	Snow	27-Mar-2014	02:00 PM	KJ	1	1	1	1	BHP2											
AQ-31	Snow	27-Mar-2014	11:10 AM	KJ	1	1	1	1	BHP2											
AQ-113	Snow	28-Mar-2014	12:15 PM	DB	1	1	1	1	BHP2											

**Short Holding Time**  
*Rush Processing*

Turn around Required: Regular 2 week turn around time

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2501

Relinquished by: DB

Date

30 MAR 2014

Time

18:45

Received by: Paige

Date

Apr 1

Time

19:00

Relinquished by:

Date

Time

Received by:

Date

Time

**FOR LAB USE ONLY**

Cooler seal intact upon receipt?

☐ Yes☐ No☐ N/A

Sample temperature upon receipt: 3,4 c.

Frozen?

☐ Yes☐ No

Send Analytical Results to:

compliance.team@ekati.ddcorp.ca



Dominion Diamond Ekati Corporation (DDEC)  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 08-APR-14  
Report Date: 25-APR-14 16:55 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1441131  
**Project P.O. #:** BHP2501  
**Job Reference:** 69247  
**C of C Numbers:** 1  
**Legal Site Desc:** 6201104485

**Comments:** Due to turbidity being greater than 1 NTU, all samples underwent acid digestion prior to total metal analysis

Can Dang  
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1441131-1 Snow 04-APR-14 11:59 AQ-49	L1441131-2 Snow 04-APR-14 13:31 AQ-115	L1441131-3 Snow 04-APR-14 15:22 AQ-111	L1441131-4 Snow 03-APR-14 13:06 AQ-32	L1441131-5 Snow 03-APR-14 11:32 AQ-43
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Conductivity (uS/cm)	10.8	4.8	5.3	3.7	9.2
	Hardness (as CaCO3) (mg/L)	1.05	<0.50	<0.50	<0.50	2.06
	pH (pH)	4.90	5.02	4.98	5.06	5.11
	Total Suspended Solids (mg/L)	9.2	<3.0	<3.0	<3.0	<3.0
	Total Dissolved Solids (mg/L)	13.1	2.8	2.2	1.2	6.0
	Turbidity (NTU)	1.75	1.37	1.29	1.22	3.03
<b>Anions and Nutrients</b>	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Ammonia, Total (as N) (mg/L)	0.0165	0.0123	0.0115	0.0074	0.0136
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.087	<0.020	<0.020	<0.020	<0.020
	Nitrate (as N) (mg/L)	0.0878	0.0719	0.105	0.0749	0.0760
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050	<0.050	<0.050	0.054
	Total Nitrogen (mg/L)	0.134	0.082	0.097	0.093	0.130
	Orthophosphate-Dissolved (as P) (mg/L)	0.0356	0.0014	0.0090	<0.0010	0.0018
	Phosphorus (P)-Total (mg/L)	0.0404	0.0045	0.0101	0.0039	0.0063
	Sulfate (SO4) (mg/L)	<0.50	<0.50	<0.50	<0.50	2.02
	Anion Sum (meq/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cation Sum (meq/L)	0.21	<0.10	<0.10	<0.10	<0.10
	Cation - Anion Balance (%)	90.4	66.4	63.1	55.3	18.4
<b>Organic / Inorganic Carbon</b>	Total Organic Carbon (mg/L)	10.3	2.18	1.38	0.73	2.66
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)	1.46	0.0483	0.112	0.0408	0.0429
	Antimony (Sb)-Total (mg/L)	0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	0.00014
	Barium (Ba)-Total (mg/L)	0.00343	0.00162	0.00183	0.000722	0.00319
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000017	<0.000010	<0.000010	<0.000010	0.000015
	Calcium (Ca)-Total (mg/L)	0.226	0.062	0.065	<0.050	0.355
	Chromium (Cr)-Total (mg/L)	0.00403	0.00043	0.00058	0.00028	0.00029
	Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Copper (Cu)-Total (mg/L)	0.0174	0.00117	0.00255	<0.00050	0.00070
	Iron (Fe)-Total (mg/L)	0.087	0.037	0.047	0.029	0.047

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



# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
		L1441131-6				
		Snow				
		03-APR-14				
		14:25				
		AQ-35				
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Conductivity (uS/cm)	3.6				
	Hardness (as CaCO3) (mg/L)	<0.50				
	pH (pH)	5.19				
	Total Suspended Solids (mg/L)	<3.0				
	Total Dissolved Solids (mg/L)	4.0				
	Turbidity (NTU)	2.26				
<b>Anions and Nutrients</b>	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0				
	Ammonia, Total (as N) (mg/L)	0.0075				
	Chloride (Cl) (mg/L)	<0.50				
	Fluoride (F) (mg/L)	<0.020				
	Nitrate (as N) (mg/L)	0.0584				
	Nitrite (as N) (mg/L)	<0.0010				
	Total Kjeldahl Nitrogen (mg/L)	0.072				
	Total Nitrogen (mg/L)	0.131				
	Orthophosphate-Dissolved (as P) (mg/L)	0.0041				
	Phosphorus (P)-Total (mg/L)	0.0128				
	Sulfate (SO4) (mg/L)	<0.50				
	Anion Sum (meq/L)	<0.10				
	Cation Sum (meq/L)	<0.10				
	Cation - Anion Balance (%)	69.0				
<b>Organic / Inorganic Carbon</b>	Total Organic Carbon (mg/L)	3.51				
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)	0.0596				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	<0.00010				
	Barium (Ba)-Total (mg/L)	0.00111				
	Beryllium (Be)-Total (mg/L)	<0.00010				
	Boron (B)-Total (mg/L)	<0.010				
	Cadmium (Cd)-Total (mg/L)	<0.000010				
	Calcium (Ca)-Total (mg/L)	0.055				
	Chromium (Cr)-Total (mg/L)	0.00061				
	Cobalt (Co)-Total (mg/L)	<0.00010				
	Copper (Cu)-Total (mg/L)	<0.00050				
	Iron (Fe)-Total (mg/L)	0.057				

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1441131-1	L1441131-2	L1441131-3	L1441131-4	L1441131-5
		Description	Snow	Snow	Snow	Snow	Snow
		Sampled Date	04-APR-14	04-APR-14	04-APR-14	03-APR-14	03-APR-14
		Sampled Time	11:59	13:31	15:22	13:06	11:32
		Client ID	AQ-49	AQ-115	AQ-111	AQ-32	AQ-43
Grouping	Analyte						
<b>WATER</b>							
Total Metals	Lead (Pb)-Total (mg/L)		0.00572	0.000740	0.000974	0.000094	0.000157
	Magnesium (Mg)-Total (mg/L)		0.12	<0.10	<0.10	<0.10	0.28
	Manganese (Mn)-Total (mg/L)		0.00374	0.00201	0.00172	0.00126	0.00319
	Mercury (Hg)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)		0.000271	<0.000050	<0.000050	0.000127	0.000275
	Nickel (Ni)-Total (mg/L)		0.00152	<0.00050	0.00059	<0.00050	<0.00050
	Potassium (K)-Total (mg/L)		0.25	<0.10	<0.10	<0.10	<0.10
	Selenium (Se)-Total (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Total (mg/L)		0.115	0.077	0.113	0.069	0.150
	Silver (Ag)-Total (mg/L)		0.000026	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)		0.133	0.100	0.085	0.071	0.264
	Strontium (Sr)-Total (mg/L)		0.00106	0.00049	0.00056	0.00031	0.00268
	Uranium (U)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	0.000016
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)		0.0080	<0.0030	<0.0030	<0.0030	<0.0030

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
<b>WATER</b>						
Total Metals	Lead (Pb)-Total (mg/L)	0.000119				
	Magnesium (Mg)-Total (mg/L)	<0.10				
	Manganese (Mn)-Total (mg/L)	0.00200				
	Mercury (Hg)-Total (mg/L)	<0.000010				
	Molybdenum (Mo)-Total (mg/L)	0.000202				
	Nickel (Ni)-Total (mg/L)	0.00061				
	Potassium (K)-Total (mg/L)	<0.10				
	Selenium (Se)-Total (mg/L)	<0.00010				
	Silicon (Si)-Total (mg/L)	0.104				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	0.073				
	Strontium (Sr)-Total (mg/L)	0.00048				
	Uranium (U)-Total (mg/L)	<0.000010				
	Vanadium (V)-Total (mg/L)	<0.0010				
	Zinc (Zn)-Total (mg/L)	<0.0030				

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

## Reference Information

## QC Samples with Qualifiers &amp; Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Fluoride (F)	DLM	L1441131-1, -2, -3, -4, -5, -6
Matrix Spike	Phosphorus (P)-Total	MS-B	L1441131-1, -2, -3, -4, -5, -6
Matrix Spike	Total Nitrogen	MS-B	L1441131-1, -2, -3, -4, -5, -6
Matrix Spike	Total Nitrogen	MS-B	L1441131-1, -2, -3, -4, -5, -6
Matrix Spike	Total Organic Carbon	MS-B	L1441131-2, -3, -4, -6

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>ALK-SCR-VA</b>	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
<b>ANIONS-CL-IC-VA</b>	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-F-IC-VA</b>	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-NO2-IC-VA</b>	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
<b>ANIONS-NO3-IC-VA</b>	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
<b>ANIONS-SO4-IC-VA</b>	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>CARBONS-TOC-VA</b>	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
<b>EC-PCT-VA</b>	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
<b>HARDNESS-CALC-VA</b>	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
<b>HG-TOT-LOW-CVAFS-VA</b>	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			
<b>IONBALANCE-VA</b>	Water	Ion Balance Calculation	APHA 1030E
Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.			
Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:			
Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]			

## Reference Information

<b>MET-T-CCMS-VA</b>	Water	Total Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
<b>MET-TOT-LOW-ICP-VA</b>	Water	Total Metals in Water by ICPOES	EPA 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
<b>N-T-COL-VA</b>	Water	Total Nitrogen in water by Colour	USGS - 03 - 4174 / NEMI 5735
This analysis is carried out using procedures adapted from the US Geological Survey (USGS) Method □03-4174 "Evaluation of Alkaline persulfate digestion as an alternative to kjeldahl digestion for determination of total and dissolved nitrogen and phosphorus in water." and National Environmental Methods Index □Nemi method 5735. Nitrate via manual vanadium (III) reduction.			
<b>NH3-F-VA</b>	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
<b>P-T-COL-VA</b>	Water	Total P in Water by Colour	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.			
<b>PH-PCT-VA</b>	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
It is recommended that this analysis be conducted in the field.			
<b>PH-PCT-VA</b>	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
It is recommended that this analysis be conducted in the field.			
<b>PO4-DO-COL-VA</b>	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.			
<b>TDS-CALC-VA</b>	Water	TDS (Calculated)	APHA 1030E (20TH EDITION)
This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".			
<b>TKN-CALC-VA</b>	Water	TKN in Water (Calculation)	BC MOE LABORATORY MANUAL (2005)
Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].			
<b>TSS-VA</b>	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.			
<b>TURBIDITY-VA</b>	Water	Turbidity by Meter	APHA 2130 "Turbidity"
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			
<b>TURBIDITY-VA</b>	Water	Turbidity by Meter	APHA 2130 Turbidity
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			

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

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

Laboratory Definition Code	Laboratory Location
----------------------------	---------------------

VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA
----	---

**Chain of Custody Numbers:**



## Reference Information

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 ww* - 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.*



8081 Lougheed Highway • Suite 100 • Burnaby,  
Tel: 604-253-4188 Toll Free: 1-800-665-0243 FAX: 604-253-6700

ALS Contact: Can f



L1441131-COFC

S.O. 45480

Form 69247

BHP Billiton Diamonds Inc.  
# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1  
Tel: 867-880-2157 Fax: 867-880-4012  
BHP Contacts: David Bruce/ Richard EhlerDavid



## CHAIN OF CUSTODY FORM

For Lab Use

FOR LAB USE ONLY

Station ID	Matrix	Date	Time	Init	Nutrients/Organics AEMP- Parameters	AEMP-Physical/Ion Parameters	AEMP-Total Metals	Fluoride												
AQ-49	Snow	04-Apr-2014	11:59 AM	NA	1	1	1	1	BHP2											
AQ-115	Snow	04-Apr-2014	01:31 PM	NA	1	1	1	1	BHP2											
AQ-111	Snow	04-Apr-2014	03:22 PM	NA	1	1	1	1	BHP2											
AQ-32	Snow	03-Apr-2014	01:06 PM	NA	1	1	1	1	BHP2											
AQ-43	Snow	03-Apr-2014	11:32 AM	NA	1	1	1	1	BHP2											
AQ-35	Snow	03-Apr-2014	02:25 PM	NA	1	1	1	1	BHP2											

**Short Holding Time**

*Rush Processing*

Turn around Required: Regular 2 week turn around time

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2501

Relinquished by: <i>KP</i>	Date: <i>06 APR 2014</i> Time: <i>12:00</i>	Received by: <i>Paige</i>	Date: <i>Apr 8</i> Time: <i>17:30</i>
Relinquished by:	Date: Time:	Received by:	Date: Time:

### FOR LAB USE ONLY

Cooler seal intact upon receipt?

☐ Yes ☐ No ☐ N/A

Sample temperature upon receipt: \_\_\_\_\_ C.

Frozen? ☐ Yes ☐ No

Send Analytical Results to:

compliance.team@ekati.ddcorp.ca;

*7, 6, 6.5, 7.5 °C*



Dominion Diamond Ekati Corporation (DDEC)  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 10-APR-14  
Report Date: 22-APR-14 17:23 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1442147  
**Project P.O. #:** BHP2501  
**Job Reference:** 69248  
**C of C Numbers:** 1  
**Legal Site Desc:** 6201104485

Can Dang  
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1442147-1 Snow 06-APR-14 14:25 AQ-104	L1442147-2 Snow 06-APR-14 11:10 AQ-C2	L1442147-3 Snow 06-APR-14 16:00 AQ-C5	L1442147-4 Snow 05-APR-14 16:29 AQ-02	L1442147-5 Snow 05-APR-14 14:31 AQ-103
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Conductivity (uS/cm)	4.2	4.9	4.8	4.8	12.3
	Hardness (as CaCO3) (mg/L)	<0.50	2.24	0.81	6.15	1.39
	pH (pH)	5.60	5.24	5.07	5.47	4.57
	Total Suspended Solids (mg/L)	7.7	17.7	10.2	25.6	4.7
	Total Dissolved Solids (mg/L)	2.6	5.5	5.3	8.3	14.6
	Turbidity (NTU)	2.27	3.78	2.62	5.43	2.51
<b>Anions and Nutrients</b>	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Ammonia, Total (as N) (mg/L)	0.0155	0.0195	0.0105	0.0312	0.0162
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	<0.020	<0.020	0.022	<0.020	0.076
	Nitrate (as N) (mg/L)	0.0622	0.0961	0.0736	0.0950	0.0686
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	0.0011	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.068	0.324	0.070	0.109	0.073
	Total Nitrogen (mg/L)	0.131	0.420	0.144	0.205	0.142
	Orthophosphate-Dissolved (as P) (mg/L)	0.0036	0.0083	0.0045	0.0062	0.0077
	Phosphorus (P)-Total (mg/L)	0.0107	0.0232	0.0089	0.0377	0.0115
	Sulfate (SO4) (mg/L)	<0.50	<0.50	<0.50	0.64	<0.50
	Anion Sum (meq/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cation Sum (meq/L)	<0.10	0.14	<0.10	0.26	<0.10
	Cation - Anion Balance (%)	65.6	90.4	80.5	85.5	89.0
<b>Organic / Inorganic Carbon</b>	Total Organic Carbon (mg/L)	2.00	3.07	4.40	3.52 <sup>RRV</sup>	13.3
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)	0.0610	0.404	0.120	0.663	0.120
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	<0.00010	0.00021	<0.00010	0.00029	0.00016
	Barium (Ba)-Total (mg/L)	0.00248	0.00942	0.00198	0.0145	0.00330
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000015	0.000015	<0.000010	0.000015	<0.000010
	Calcium (Ca)-Total (mg/L)	0.093	0.259	0.121	0.718	0.289
	Chromium (Cr)-Total (mg/L)	0.00115	0.00160	0.00110	0.00307	0.00043
	Cobalt (Co)-Total (mg/L)	<0.00010	0.00035	<0.00010	0.00057	<0.00010
	Copper (Cu)-Total (mg/L)	<0.00050	0.00088	<0.00050	0.00113	0.00052
	Iron (Fe)-Total (mg/L)	0.047	0.463	0.120	0.666	0.094

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1442147-1 Snow 06-APR-14 14:25 AQ-104	L1442147-2 Snow 06-APR-14 11:10 AQ-C2	L1442147-3 Snow 06-APR-14 16:00 AQ-C5	L1442147-4 Snow 05-APR-14 16:29 AQ-02	L1442147-5 Snow 05-APR-14 14:31 AQ-103
Grouping	Analyte					
<b>WATER</b>						
Total Metals	Lead (Pb)-Total (mg/L)	0.000139	0.000322	0.000128	0.000431	0.000212
	Magnesium (Mg)-Total (mg/L)	<0.10	0.39	0.12	1.06	0.16
	Manganese (Mn)-Total (mg/L)	0.00188	0.0150	0.00260	0.0151	0.00349
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.000444	0.000126	0.000376	0.000207	0.00109
	Nickel (Ni)-Total (mg/L)	0.00089	0.00241	0.00123	0.00660	0.00067
	Potassium (K)-Total (mg/L)	<0.10	0.27	<0.10	0.32	0.19
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Total (mg/L)	0.101	0.833	0.244	1.83	0.244
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	0.086	0.148	0.079	0.258	0.130
	Strontium (Sr)-Total (mg/L)	0.00068	0.00217	0.00088	0.00599	0.00168
	Uranium (U)-Total (mg/L)	<0.000010	0.000052	0.000015	0.000051	<0.000010
	Vanadium (V)-Total (mg/L)	<0.0010	0.0011	<0.0010	0.0015	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0030	0.0037	<0.0030	0.0067	0.0032

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



## Reference Information

## QC Samples with Qualifiers &amp; Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Fluoride (F)	DLM	L1442147-1
Duplicate	Fluoride (F)	DLM	L1442147-1
Matrix Spike	Orthophosphate-Dissolved (as P)	MS-B	L1442147-1, -2, -3, -4, -5
Matrix Spike	Total Nitrogen	MS-B	L1442147-1, -2, -3, -4, -5
Matrix Spike	Total Organic Carbon	MS-B	L1442147-1, -2, -3
Matrix Spike	Total Organic Carbon	MS-B	L1442147-4
Matrix Spike	Barium (Ba)-Total	MS-B	L1442147-1, -2, -3, -4, -5
Matrix Spike	Selenium (Se)-Total	MS-B	L1442147-1, -2, -3, -4, -5
Matrix Spike	Sodium (Na)-Total	MS-B	L1442147-1, -2, -3, -4, -5
Matrix Spike	Strontium (Sr)-Total	MS-B	L1442147-1, -2, -3, -4, -5

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>ALK-SCR-VA</b>	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
OR			
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
<b>ANIONS-CL-IC-VA</b>	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-F-IC-VA</b>	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-NO2-IC-VA</b>	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
<b>ANIONS-NO3-IC-VA</b>	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
<b>ANIONS-SO4-IC-VA</b>	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>CARBONS-TOC-VA</b>	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
<b>EC-PCT-VA</b>	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
<b>HARDNESS-CALC-VA</b>	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
<b>HG-TOT-LOW-CVAFS-VA</b>	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			
<b>IONBALANCE-VA</b>	Water	Ion Balance Calculation	APHA 1030E

## Reference Information

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

$$\text{Ion Balance (\%)} = [\text{Cation Sum} - \text{Anion Sum}] / [\text{Cation Sum} + \text{Anion Sum}]$$

**MET-T-CCMS-VA**      Water      Total Metals in Water by CRC ICPMS      APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

**MET-TOT-LOW-ICP-VA**      Water      Total Metals in Water by ICPOES      EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

**N-T-COL-VA**      Water      Total Nitrogen in water by Colour      USGS - 03 - 4174 / NEMI 5735

This analysis is carried out using procedures adapted from the US Geological Survey (USGS) Method □ 03-4174 " Evaluation of Alkaline persulfate digestion as an alternative to kjeldahl digestion for determination of total and dissolved nitrogen and phosphorus in water." and National Environmental Methods Index □ Nemi method 5735. Nitrate via manual vanadium (III) reduction.

**NH3-F-VA**      Water      Ammonia in Water by Fluorescence      J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

**P-T-COL-VA**      Water      Total P in Water by Colour      APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.

**PH-PCT-VA**      Water      pH by Meter (Automated)      APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

**PH-PCT-VA**      Water      pH by Meter (Automated)      APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

**PO4-DO-COL-VA**      Water      Diss. Orthophosphate in Water by Colour      APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

**TDS-CALC-VA**      Water      TDS (Calculated)      APHA 1030E (20TH EDITION)

This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".

**TKN-CALC-VA**      Water      TKN in Water (Calculation)      BC MOE LABORATORY MANUAL (2005)

Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

**TSS-VA**      Water      Total Suspended Solids by Gravimetric      APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

**TURBIDITY-VA**      Water      Turbidity by Meter      APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**TURBIDITY-VA**      Water      Turbidity by Meter      APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

## Reference Information

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

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

### Chain of Custody Numbers:

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 ww* - 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.



L1442147-COFC

S.O. 45491

Form 69248

BHP Billiton Diamonds Inc.

# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1

Tel: 867-880-2157 Fax: 867-880-4012

BHP Contacts: David Bruce/ Richard EhlerDavid



# CHAIN OF CUSTODY FORM

For Lab Use

Station ID	Matrix	Date	Time	Init	Nutrients/Organics	AEMP-Parameters	AEMP-Physical/Ton	AEMP-Total Metals	Fluoride											
AQ-104	Snow	06-Apr-2014	02:25 PM	KS	1	1	1	1	BHP2											
AQ-C2	Snow	06-Apr-2014	11:10 AM	KS	1	1	1	1	BHP2											
AQ-C5	Snow	06-Apr-2014	04:00 PM	KS	1	1	1	1	BHP2											
AQ-02	Snow	05-Apr-2014	04:29 PM	RE	1	1	1	1	BHP2											
AQ-103	Snow	05-Apr-2014	02:31 PM	RE	1	1	1	1	BHP2											

**Short Holding Time**

*Rush Processing*

Turn around Required:

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2501

Regular 2 week turn around time

Relinquished by: KP	Date: 07 APR-2014 Time: 13:00	Received by: YC	Date: Apr 10 Time: 10:35
Relinquished by:	Date: Time:	Received by:	Date: Time:

FOR LAB USE ONLY			
Cooler seal intact upon receipt?		Sample temperature upon receipt: 9.8 C.	
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No

Send Analytical Results to:

compliance.team@ekati.ddcorp.ca;



Dominion Diamond Ekati Corporation (DDEC)  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 10-APR-14  
Report Date: 23-APR-14 10:57 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1442297  
**Project P.O. #:** BHP2501  
**Job Reference:** 69251  
**C of C Numbers:** 1  
**Legal Site Desc:** 6201104485

**Comments:** Please note that for ALS identified sample L1442297-1, acid digestion for total metal analysis was required due to turbidity being greater than 1 NTU.

Can Dang  
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company



# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1442297-1 SNOW 07-APR-14 14:36 AQ-101	L1442297-2 SNOW 07-APR-14 15:40 AQ-C4			
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Conductivity (uS/cm)	4.7	5.7			
	Hardness (as CaCO3) (mg/L)	<0.50	<0.50			
	pH (pH)	5.46	5.05			
	Total Suspended Solids (mg/L)	6.1	<3.0			
	Total Dissolved Solids (mg/L)	5.5	2.6			
	Turbidity (NTU)	1.79	0.96			
<b>Anions and Nutrients</b>	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	<2.0			
	Ammonia, Total (as N) (mg/L)	0.0143	0.0150			
	Chloride (Cl) (mg/L)	<0.50	<0.50			
	Fluoride (F) (mg/L)	<0.020	<0.020			
	Nitrate (as N) (mg/L)	0.0677	0.0966			
	Nitrite (as N) (mg/L)	<0.0010	<0.0010			
	Total Kjeldahl Nitrogen (mg/L)	0.138	<0.050			
	Orthophosphate-Dissolved (as P) (mg/L)	0.0031	0.0027			
	Phosphorus (P)-Total (mg/L)	0.0126	0.0077			
	Sulfate (SO4) (mg/L)	<0.50	<0.50			
	Anion Sum (meq/L)	<0.10	<0.10			
	Cation Sum (meq/L)	<0.10	<0.10			
	Cation - Anion Balance (%)	71.8	59.6			
<b>Organic / Inorganic Carbon</b>	Total Organic Carbon (mg/L)	4.75 <sup>RRV</sup>	1.77			
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)	0.0714				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	0.00015				
	Barium (Ba)-Total (mg/L)	0.00315				
	Beryllium (Be)-Total (mg/L)	<0.00010				
	Boron (B)-Total (mg/L)	<0.010				
	Cadmium (Cd)-Total (mg/L)	0.000014				
	Calcium (Ca)-Total (mg/L)	0.149				
	Chromium (Cr)-Total (mg/L)	0.00041				
	Cobalt (Co)-Total (mg/L)	<0.00010				
	Copper (Cu)-Total (mg/L)	0.0135				
	Iron (Fe)-Total (mg/L)	0.075				
	Lead (Pb)-Total (mg/L)	0.000168				

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	Description	Sampled Date	Sampled Time	Client ID
		L1442297-1	SNOW	07-APR-14	14:36	AQ-101
		L1442297-2	SNOW	07-APR-14	15:40	AQ-C4
Grouping	Analyte					
<b>WATER</b>						
<b>Total Metals</b>	Magnesium (Mg)-Total (mg/L)	<0.10				
	Manganese (Mn)-Total (mg/L)	0.00714				
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010			
	Molybdenum (Mo)-Total (mg/L)	<0.000050				
	Nickel (Ni)-Total (mg/L)	0.00123				
	Potassium (K)-Total (mg/L)	<0.10				
	Selenium (Se)-Total (mg/L)	<0.00010				
	Silicon (Si)-Total (mg/L)	0.130				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	0.109				
	Strontium (Sr)-Total (mg/L)	0.00071				
	Uranium (U)-Total (mg/L)	0.000020				
	Vanadium (V)-Total (mg/L)	<0.0010				
	Zinc (Zn)-Total (mg/L)	0.0053				
<b>Total Metals (Undigested)</b>	Aluminum (Al)-Total (mg/L)		0.0221			
	Antimony (Sb)-Total (mg/L)		<0.00010			
	Arsenic (As)-Total (mg/L)		0.000044			
	Barium (Ba)-Total (mg/L)		0.00253			
	Beryllium (Be)-Total (mg/L)		<0.000010			
	Boron (B)-Total (mg/L)		<0.0050			
	Cadmium (Cd)-Total (mg/L)		<0.000010			
	Calcium (Ca)-Total (mg/L)		0.083			
	Chromium (Cr)-Total (mg/L)		<0.00010			
	Cobalt (Co)-Total (mg/L)		<0.00010			
	Copper (Cu)-Total (mg/L)		0.00014			
	Iron (Fe)-Total (mg/L)		0.019			
	Lead (Pb)-Total (mg/L)		0.000130			
	Magnesium (Mg)-Total (mg/L)		0.0434			
	Manganese (Mn)-Total (mg/L)		0.00369			
	Molybdenum (Mo)-Total (mg/L)		<0.000050			
	Nickel (Ni)-Total (mg/L)		0.000138			
	Potassium (K)-Total (mg/L)		0.080			
	Selenium (Se)-Total (mg/L)		<0.000040			
	Silicon (Si)-Total (mg/L)		<0.050			
	Silver (Ag)-Total (mg/L)		<0.000010			
	Sodium (Na)-Total (mg/L)		0.091			
	Strontium (Sr)-Total (mg/L)		0.00051			

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

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

## Reference Information

## QC Samples with Qualifiers &amp; Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Fluoride (F)	DLM	L1442297-1, -2
Duplicate	Nitrite (as N)	DLM	L1442297-1, -2
Matrix Spike	Orthophosphate-Dissolved (as P)	MS-B	L1442297-1, -2
Matrix Spike	Barium (Ba)-Total	MS-B	L1442297-2
Matrix Spike	Calcium (Ca)-Total	MS-B	L1442297-2
Matrix Spike	Magnesium (Mg)-Total	MS-B	L1442297-2
Matrix Spike	Strontium (Sr)-Total	MS-B	L1442297-2
Matrix Spike	Total Organic Carbon	MS-B	L1442297-1, -2
Matrix Spike	Barium (Ba)-Total	MS-B	L1442297-1
Matrix Spike	Selenium (Se)-Total	MS-B	L1442297-1
Matrix Spike	Sodium (Na)-Total	MS-B	L1442297-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L1442297-1

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>ALK-SCR-VA</b>	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
OR			
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
<b>ANIONS-CL-IC-VA</b>	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-F-IC-VA</b>	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-NO2-IC-VA</b>	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
<b>ANIONS-NO3-IC-VA</b>	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
<b>ANIONS-SO4-IC-VA</b>	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>CARBONS-TOC-VA</b>	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
<b>EC-PCT-VA</b>	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
<b>HARDNESS-CALC-VA</b>	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
<b>HG-TOT-LOW-CVAFS-VA</b>	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption			

# Reference Information

spectrophotometry (EPA Method 245.7).

## IONBALANCE-VA Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

$$\text{Ion Balance (\%)} = [\text{Cation Sum} - \text{Anion Sum}] / [\text{Cation Sum} + \text{Anion Sum}]$$

## MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

## MET-T-NP-U-CCMS-VA Water Total Metals by CRC ICPMS (Undigested) EPA SW-846 6020A

Ultra trace metals in water are analyzed by CRC ICPMS, based on US EPA Method 6020A (Jan 1998). The detection limits provided can only be met for undigested samples. This procedure is intended for colorless, non-turbid, acid-preserved water samples (i.e. pristine water samples), having turbidity < 1 NTU and no odor. Where turbidity exceeds 1 NTU, and/or the sample is colored and has an odor, results may be biased low compared to true Total Metals concentrations. ALS recommends that turbidity analysis be requested on samples submitted for this test to aid with interpretation of results.

## MET-T-NP-U-ICP-VA Water Total Metals by ICPOES (Undigested) EPA SW-846 6010B

Ultra trace metals in water are analyzed by ICPOES, based on US EPA Method 6010B. The detection limits provided can only be met for undigested samples. This procedure is intended for colorless, non-turbid, acid-preserved water samples (i.e. pristine water samples), having turbidity < 1 NTU and no odor. Where turbidity exceeds 1 NTU, and/or the sample is colored and has an odor, results may be biased low compared to true Total Metals concentrations. ALS recommends that turbidity analysis be requested on samples submitted for this test to aid with interpretation of results.

## MET-TOT-LOW-ICP-VA Water Total Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

## N-T-COL-VA Water Total Nitrogen in water by Colour USGS - 03 - 4174 / NEMI 5735

This analysis is carried out using procedures adapted from the US Geological Survey (USGS) Method □ 03-4174 "Evaluation of Alkaline persulfate digestion as an alternative to kjeldahl digestion for determination of total and dissolved nitrogen and phosphorus in water." and National Environmental Methods Index □ Nemi method 5735. Nitrate via manual vanadium (III) reduction.

## NH3-F-VA Water Ammonia in Water by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

## P-T-COL-VA Water Total P in Water by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.

## PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

## PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

## PO4-DO-COL-VA Water Diss. Orthophosphate in Water by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

## TDS-CALC-VA Water TDS (Calculated) APHA 1030E (20TH EDITION)

This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".



## Reference Information

**TKN-CALC-VA**      Water      TKN in Water (Calculation)      BC MOE LABORATORY MANUAL (2005)

Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

**TSS-VA**      Water      Total Suspended Solids by Gravimetric      APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

**TURBIDITY-VA**      Water      Turbidity by Meter      APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**TURBIDITY-VA**      Water      Turbidity by Meter      APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

---

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

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

---

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

---

### Chain of Custody Numbers:

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 ww - 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.*



8081 Lougheed Highway • Suite 100 • Burnaby,

Tel: 604-253-4188 Toll Free: 1-800-665-0243 FAX: 604-253-6700

ALS Contact: Can D:



L1442297-COFC

Form 69251

BHP Billiton Diamonds Inc.

# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1

Tel: 867-880-2157 Fax: 867-880-4012

BHP Contacts: David Bruce/ Richard EhlertDavid



SO: 45482

# CHAIN OF CUSTODY FORM

For Lab Use

FOR LAB USE ONLY

Station ID	Matrix	Date	Time	Init	Nutrients/Organics AEMP- Parameters	AEMP-Physical/Ton Parameters	AEMP-Total Metals	Fluoride												
AQ-101	Snow	07-Apr-2014	02:36 PM	RE	1	1	1	1	BHP2											
AQ-C4	Snow	07-Apr-2014	03:40 PM	RE	1	1	1	1	BHP2											

## Short Holding Time

Rush Processing

Turn around Required: Regular 2 week turn around time

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2501

Relinquished by:

Date

Time

Received by:

Date

Time

Relinquished by:

Date

Time

Received by:

Date

Time

## FOR LAB USE ONLY

Cooler seal intact upon receipt?

☐ Yes

☐ No

☐ N/A

Sample temperature upon receipt: \_\_\_\_\_ C.

Frozen?

☐ Yes

☐ No

Send Analytical Results to:

compliance.team@ekati.ddcorp.ca;



Dominion Diamond Ekati Corporation (DDEC)  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 14-APR-14  
Report Date: 25-APR-14 17:55 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1443108  
**Project P.O. #:** BHP2501  
**Job Reference:** 69254  
**C of C Numbers:** 1  
**Legal Site Desc:** 6201104485

Can Dang  
Senior Account Manager

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ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
		L1443108-1				
		Snow				
		09-APR-14				
		13:05				
		AQ-04				
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Conductivity (uS/cm)	3.9				
	Hardness (as CaCO3) (mg/L)	6.48				
	pH (pH)	6.10				
	Total Suspended Solids (mg/L)	11.9				
	Total Dissolved Solids (mg/L)	7.8				
	Turbidity (NTU)	6.88				
<b>Anions and Nutrients</b>	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0				
	Ammonia, Total (as N) (mg/L)	0.0169				
	Chloride (Cl) (mg/L)	0.52 <sup>RRV</sup>				
	Fluoride (F) (mg/L)	<0.020				
	Nitrate (as N) (mg/L)	0.0784 <sup>RRV</sup>				
	Nitrite (as N) (mg/L)	<0.0010				
	Total Kjeldahl Nitrogen (mg/L)	0.140				
	Orthophosphate-Dissolved (as P) (mg/L)	0.0097				
	Phosphorus (P)-Total (mg/L)	0.0185				
	Sulfate (SO4) (mg/L)	<0.50				
	Anion Sum (meq/L)	<0.10				
	Cation Sum (meq/L)	0.25				
	Cation - Anion Balance (%)	84.8				
		3.14 <sup>RRV</sup>				
<b>Organic / Inorganic Carbon</b>	Total Organic Carbon (mg/L)					
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)	0.542				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	<0.00010				
	Barium (Ba)-Total (mg/L)	0.0178				
	Beryllium (Be)-Total (mg/L)	<0.00010				
	Boron (B)-Total (mg/L)	<0.010				
	Cadmium (Cd)-Total (mg/L)	0.000011				
	Calcium (Ca)-Total (mg/L)	0.820				
	Chromium (Cr)-Total (mg/L)	0.00232				
	Cobalt (Co)-Total (mg/L)	0.00054				
	Copper (Cu)-Total (mg/L)	0.00078				
	Iron (Fe)-Total (mg/L)	0.620				
	Lead (Pb)-Total (mg/L)	0.000249				

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
<b>WATER</b>						
<b>Total Metals</b>	Magnesium (Mg)-Total (mg/L)	1.08				
	Manganese (Mn)-Total (mg/L)	0.0574				
	Mercury (Hg)-Total (mg/L)	<0.000010				
	Molybdenum (Mo)-Total (mg/L)	0.000722				
	Nickel (Ni)-Total (mg/L)	0.00636				
	Potassium (K)-Total (mg/L)	0.48				
	Selenium (Se)-Total (mg/L)	<0.00010				
	Silicon (Si)-Total (mg/L)	1.59				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	0.189				
	Strontium (Sr)-Total (mg/L)	0.00589				
	Uranium (U)-Total (mg/L)	0.000030				
	Vanadium (V)-Total (mg/L)	0.0013				
	Zinc (Zn)-Total (mg/L)	0.0049				

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



## Reference Information

## QC Samples with Qualifiers &amp; Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Nitrite (as N)	DLM	L1443108-1
Duplicate	Cadmium (Cd)-Total	DLM	L1443108-1
Matrix Spike	Phosphorus (P)-Total	MS-B	L1443108-1
Matrix Spike	Orthophosphate-Dissolved (as P)	MS-B	L1443108-1
Matrix Spike	Sulfate (SO4)	MS-B	L1443108-1

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>ALK-SCR-VA</b>	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
<b>ANIONS-CL-IC-VA</b>	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-F-IC-VA</b>	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-NO2-IC-VA</b>	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
<b>ANIONS-NO3-IC-VA</b>	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
<b>ANIONS-SO4-IC-VA</b>	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>CARBONS-TOC-VA</b>	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
<b>EC-PCT-VA</b>	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
<b>HARDNESS-CALC-VA</b>	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
<b>HG-TOT-LOW-CVAFS-VA</b>	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			
<b>IONBALANCE-VA</b>	Water	Ion Balance Calculation	APHA 1030E
Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.			

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

# Reference Information

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

**MET-T-CCMS-VA** Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

**MET-TOT-ICP-VA** Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

**MET-TOT-LOW-ICP-VA** Water Total Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

**N-T-COL-VA** Water Total Nitrogen in water by Colour USGS - 03 - 4174 / NEMI 5735

This analysis is carried out using procedures adapted from the US Geological Survey (USGS) Method □ 03-4174 "Evaluation of Alkaline persulfate digestion as an alternative to kjeldahl digestion for determination of total and dissolved nitrogen and phosphorus in water." and National Environmental Methods Index □ Nemi method 5735. Nitrate via manual vanadium (III) reduction.

**NH3-F-VA** Water Ammonia in Water by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

**P-T-COL-VA** Water Total P in Water by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.

**PH-PCT-VA** Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

**PH-PCT-VA** Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

**PO4-DO-COL-VA** Water Diss. Orthophosphate in Water by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

**TDS-CALC-VA** Water TDS (Calculated) APHA 1030E (20TH EDITION)

This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".

**TKN-CALC-VA** Water TKN in Water (Calculation) BC MOE LABORATORY MANUAL (2005)

Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

**TSS-VA** Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

**TURBIDITY-VA** Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**TURBIDITY-VA** Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

## Reference Information

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

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

Laboratory Definition Code	Laboratory Location
----------------------------	---------------------

VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA
----	---

**Chain of Custody Numbers:**

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 ww - 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.*



L1443108-COFC

**Form 69254**



**bhpbilliton**

BHP Billiton Diamonds Inc.

# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1

Tel: 867-880-2157 Fax: 867-880-4012

BHP Contacts: David Bruce/ Richard EhlerDavid

8081 Lougheed Highway • Suite 100 • Burnaby,

Tel: 604-253-4188 Toll Free: 1-800-665-0243 FAX: 604-253-6700

ALS Contact: Can Dang

## CHAIN OF CUSTODY FORM

For Lab Use	Station ID	Matrix	Date	Time	Init	Nutrients/Organics AEMP	AEMP-Physical/Ion Parameters	AEMP-Total Metals	Fluoride											
	AQ-04	Snow	09-Apr-2014	01:05 PM	AH	1	1	1	1	BHP2										

FOR LAB USE ONLY

Turn around Required: regular 2 week TAT please

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2501

In addition to sending results to the EKATI compliance Team Inbox, please also send resits to Andrew.Howton@Ekati.DDCORP.CA and Daniel.Casanova@erm.com

Relinquished by: <i>Richard Ehler</i>	Date: 10 APRIL 14	Received by:	Date:
	Time: 14:51		Time:
Relinquished by:	Date:	Received by: <i>Elmer</i>	Date: Apr 14
	Time:		Time: 18:00

FOR LAB USE ONLY	
Cooler seal intact upon receipt?	Sample temperature upon receipt: 4.3 c.
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Frozen? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Send Analytical Results to:

compliance.team@ekati.ddcorp.ca;



Dominion Diamond Ekati Corporation (DDEC)  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 14-APR-14  
Report Date: 30-APR-14 10:01 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1443110  
**Project P.O. #:** BHP2501  
**Job Reference:** 69252  
**C of C Numbers:** 1  
**Legal Site Desc:** 6201104485

**Comments:** Please note that for ALS identified sample L1443110-5, acid digestion was required prior to total metal analysis due to turbidity being greater than 1 NTU.

Can Dang  
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company



# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1443110-1 Snow 08-APR-14 12:42 AQ-54	L1443110-2 Snow 08-APR-14 11:21 AQ-55	L1443110-3 Snow 08-APR-14 13:40 AQ-110	L1443110-4 Snow 08-APR-14 15:17 AQ-108	L1443110-5 Snow 08-APR-14 14:25 AQ-48
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Conductivity (uS/cm)	4.1	5.2	4.7	4.9	4.8
	Hardness (as CaCO3) (mg/L)	<0.50	<0.50	<0.50	<0.50	0.60
	pH (pH)	5.02	4.97	4.99	4.94	5.09
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	4.4
	Total Dissolved Solids (mg/L)	1.6	1.7	1.3	1.4	2.2
	Turbidity (NTU)	0.76	0.52	0.46	0.50	1.07
<b>Anions and Nutrients</b>	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Ammonia, Total (as N) (mg/L)	0.0116	0.0138	0.0174	0.0095	0.0241
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Nitrate (as N) (mg/L)	0.0573	0.0924	0.0783	0.105	0.0598
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Orthophosphate-Dissolved (as P) (mg/L)	<0.0010	0.0023	<0.0010	0.0011	0.0026
	Phosphorus (P)-Total (mg/L)	0.0024	0.0034	<0.0020	0.0031	0.0060
	Sulfate (SO4) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Anion Sum (meq/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cation Sum (meq/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cation - Anion Balance (%)	65.0	56.8	62.0	54.0	77.4
	<b>Organic / Inorganic Carbon</b>	1.21 <sup>RRV</sup>	1.06	0.70 <sup>RRV</sup>	0.74 <sup>RRV</sup>	1.47 <sup>RRV</sup>
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)					0.0684
	Antimony (Sb)-Total (mg/L)					<0.00010
	Arsenic (As)-Total (mg/L)					0.00012
	Barium (Ba)-Total (mg/L)					0.00305
	Beryllium (Be)-Total (mg/L)					<0.00010
	Boron (B)-Total (mg/L)					<0.010
	Cadmium (Cd)-Total (mg/L)					0.000017
	Calcium (Ca)-Total (mg/L)					0.096
	Chromium (Cr)-Total (mg/L)					0.00039
	Cobalt (Co)-Total (mg/L)					<0.00010
	Copper (Cu)-Total (mg/L)					<0.00050
	Iron (Fe)-Total (mg/L)					0.074
	Lead (Pb)-Total (mg/L)					0.000283

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1443110-6 Snow 08-APR-14 13:00 AQ-FB	L1443110-7 Snow 08-APR-14 10:00 AQ-EB			
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Conductivity (uS/cm)	<2.0	<2.0			
	Hardness (as CaCO3) (mg/L)	<0.50	<0.50			
	pH (pH)	5.49	5.54			
	Total Suspended Solids (mg/L)	<3.0	<3.0			
	Total Dissolved Solids (mg/L)	<1.0	<1.0			
	Turbidity (NTU)	0.21	0.15			
<b>Anions and Nutrients</b>	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	<2.0			
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050			
	Chloride (Cl) (mg/L)	<0.50	<0.50			
	Fluoride (F) (mg/L)	<0.020	<0.020			
	Nitrate (as N) (mg/L)	<0.0050	<0.0050			
	Nitrite (as N) (mg/L)	<0.0010	<0.0010			
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050			
	Orthophosphate-Dissolved (as P) (mg/L)	<0.0010	<0.0010			
	Phosphorus (P)-Total (mg/L)	<0.0020	<0.0020			
	Sulfate (SO4) (mg/L)	<0.50	<0.50			
	Anion Sum (meq/L)	<0.10	<0.10			
	Cation Sum (meq/L)	<0.10	<0.10			
	Cation - Anion Balance (%)	0.0	0.0			
<b>Organic / Inorganic Carbon</b>	Total Organic Carbon (mg/L)	<0.50	<0.50			
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)					
	Antimony (Sb)-Total (mg/L)					
	Arsenic (As)-Total (mg/L)					
	Barium (Ba)-Total (mg/L)					
	Beryllium (Be)-Total (mg/L)					
	Boron (B)-Total (mg/L)					
	Cadmium (Cd)-Total (mg/L)					
	Calcium (Ca)-Total (mg/L)					
	Chromium (Cr)-Total (mg/L)					
	Cobalt (Co)-Total (mg/L)					
	Copper (Cu)-Total (mg/L)					
	Iron (Fe)-Total (mg/L)					
	Lead (Pb)-Total (mg/L)					

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1443110-1 Snow 08-APR-14 12:42 AQ-54	L1443110-2 Snow 08-APR-14 11:21 AQ-55	L1443110-3 Snow 08-APR-14 13:40 AQ-110	L1443110-4 Snow 08-APR-14 15:17 AQ-108	L1443110-5 Snow 08-APR-14 14:25 AQ-48
Grouping	Analyte					
<b>WATER</b>						
<b>Total Metals</b>	Magnesium (Mg)-Total (mg/L)					0.14
	Manganese (Mn)-Total (mg/L)					0.00208
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)					<0.000050
	Nickel (Ni)-Total (mg/L)					0.00083
	Potassium (K)-Total (mg/L)					<0.10
	Selenium (Se)-Total (mg/L)					<0.00010
	Silicon (Si)-Total (mg/L)					0.174
	Silver (Ag)-Total (mg/L)					<0.000010
	Sodium (Na)-Total (mg/L)					0.161
	Strontium (Sr)-Total (mg/L)					0.00087
	Uranium (U)-Total (mg/L)					<0.000010
	Vanadium (V)-Total (mg/L)					<0.0010
	Zinc (Zn)-Total (mg/L)					<0.0030
<b>Total Metals (Undigested)</b>	Aluminum (Al)-Total (mg/L)	0.0090	0.0129	0.0143	0.0225	
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Arsenic (As)-Total (mg/L)	0.000034	0.000029	0.000044	0.000031	
	Barium (Ba)-Total (mg/L)	0.00148	0.00115	0.00118	0.00146	
	Beryllium (Be)-Total (mg/L)	<0.000010	<0.000010	<0.000010	0.000013	
	Boron (B)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	
	Cadmium (Cd)-Total (mg/L)	<0.000010	0.000013	0.000013	<0.000010	
	Calcium (Ca)-Total (mg/L)	0.041	0.045	0.063	0.068	
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010	0.00025	<0.00010	
	Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Copper (Cu)-Total (mg/L)	0.00013	0.00040	0.00088	0.00083	
	Iron (Fe)-Total (mg/L)	<0.010	0.013	<0.010	0.011	
	Lead (Pb)-Total (mg/L)	0.000110	0.000372	0.000857	0.00106	
	Magnesium (Mg)-Total (mg/L)	0.0279	0.0351	0.0374	0.0335	
	Manganese (Mn)-Total (mg/L)	0.000828	0.000924	0.000559	0.000735	
	Molybdenum (Mo)-Total (mg/L)	0.000062	<0.000050	<0.000050	<0.000050	
	Nickel (Ni)-Total (mg/L)	0.000051	0.000070	0.000237	0.000108	
	Potassium (K)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	
	Selenium (Se)-Total (mg/L)	<0.000040	<0.000040	<0.000040	0.000147	
	Silicon (Si)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Sodium (Na)-Total (mg/L)	0.082	0.113	0.102	0.082	
	Strontium (Sr)-Total (mg/L)	0.00028	0.00030	0.00036	0.00036	

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	Description			
		Sampled Date	Sampled Time			
		Client ID				
Grouping	Analyte					
<b>WATER</b>						
<b>Total Metals</b>	Magnesium (Mg)-Total (mg/L)					
	Manganese (Mn)-Total (mg/L)					
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010			
	Molybdenum (Mo)-Total (mg/L)					
	Nickel (Ni)-Total (mg/L)					
	Potassium (K)-Total (mg/L)					
	Selenium (Se)-Total (mg/L)					
	Silicon (Si)-Total (mg/L)					
	Silver (Ag)-Total (mg/L)					
	Sodium (Na)-Total (mg/L)					
	Strontium (Sr)-Total (mg/L)					
	Uranium (U)-Total (mg/L)					
	Vanadium (V)-Total (mg/L)					
	Zinc (Zn)-Total (mg/L)					
<b>Total Metals (Undigested)</b>	Aluminum (Al)-Total (mg/L)	<0.0010	<0.0010			
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010			
	Arsenic (As)-Total (mg/L)	<0.000020	<0.000020			
	Barium (Ba)-Total (mg/L)	<0.000050	<0.000050			
	Beryllium (Be)-Total (mg/L)	<0.000010	<0.000010			
	Boron (B)-Total (mg/L)	<0.0050	<0.0050			
	Cadmium (Cd)-Total (mg/L)	<0.000010	<0.000010			
	Calcium (Ca)-Total (mg/L)	<0.020	<0.020			
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00010			
	Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010			
	Copper (Cu)-Total (mg/L)	<0.00010	<0.00010			
	Iron (Fe)-Total (mg/L)	<0.010	<0.010			
	Lead (Pb)-Total (mg/L)	<0.000010	<0.000010			
	Magnesium (Mg)-Total (mg/L)	<0.0050	<0.0050			
	Manganese (Mn)-Total (mg/L)	<0.000050	<0.000050			
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050			
	Nickel (Ni)-Total (mg/L)	<0.000050	<0.000050			
	Potassium (K)-Total (mg/L)	<0.050	<0.050			
	Selenium (Se)-Total (mg/L)	<0.000040	<0.000040			
	Silicon (Si)-Total (mg/L)	<0.050	<0.050			
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010			
	Sodium (Na)-Total (mg/L)	<0.010	<0.010			
	Strontium (Sr)-Total (mg/L)	<0.00010	<0.00010			

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1443110-1	L1443110-2	L1443110-3	L1443110-4	L1443110-5
		Description	Snow	Snow	Snow	Snow	Snow
		Sampled Date	08-APR-14	08-APR-14	08-APR-14	08-APR-14	08-APR-14
		Sampled Time	12:42	11:21	13:40	15:17	14:25
		Client ID	AQ-54	AQ-55	AQ-110	AQ-108	AQ-48
Grouping	Analyte						
<b>WATER</b>							
<b>Total Metals (Undigested)</b>	Uranium (U)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
	Vanadium (V)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
	Zinc (Zn)-Total (mg/L)	<0.0010	0.0011	0.0043	0.0019		

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



# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
<b>WATER</b>						
<b>Total Metals (Undigested)</b>	Uranium (U)-Total (mg/L)	<0.000010	<0.000010			
	Vanadium (V)-Total (mg/L)	<0.000050	<0.000050			
	Zinc (Zn)-Total (mg/L)	<0.0010	<0.0010			

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

## Reference Information

## QC Samples with Qualifiers &amp; Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Nitrite (as N)	DLM	L1443110-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Phosphorus (P)-Total	MS-B	L1443110-1, -2, -3, -4, -6, -7
Matrix Spike	Orthophosphate-Dissolved (as P)	MS-B	L1443110-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Phosphorus (P)-Total	MS-B	L1443110-5
Matrix Spike	Sulfate (SO4)	MS-B	L1443110-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Total Organic Carbon	MS-B	L1443110-2, -6, -7
Matrix Spike	Barium (Ba)-Total	MS-B	L1443110-5
Matrix Spike	Sodium (Na)-Total	MS-B	L1443110-5
Matrix Spike	Strontium (Sr)-Total	MS-B	L1443110-5

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>ALK-SCR-VA</b>	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
<b>ANIONS-CL-IC-VA</b>	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-F-IC-VA</b>	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-NO2-IC-VA</b>	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
<b>ANIONS-NO3-IC-VA</b>	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
<b>ANIONS-SO4-IC-VA</b>	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>CARBONS-TOC-VA</b>	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
<b>EC-PCT-VA</b>	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
<b>HARDNESS-CALC-VA</b>	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
<b>HG-TOT-LOW-CVAFS-VA</b>	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			
<b>IONBALANCE-VA</b>	Water	Ion Balance Calculation	APHA 1030E

## Reference Information

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

$$\text{Ion Balance (\%)} = [\text{Cation Sum} - \text{Anion Sum}] / [\text{Cation Sum} + \text{Anion Sum}]$$

**MET-T-CCMS-VA**      Water      Total Metals in Water by CRC ICPMS      APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

**MET-T-NP-U-CCMS-VA**      Water      Total Metals by CRC ICPMS (Undigested)      EPA SW-846 6020A

Ultra trace metals in water are analyzed by CRC ICPMS, based on US EPA Method 6020A (Jan 1998). The detection limits provided can only be met for undigested samples. This procedure is intended for colorless, non-turbid, acid-preserved water samples (i.e. pristine water samples), having turbidity < 1 NTU and no odor. Where turbidity exceeds 1 NTU, and/or the sample is colored and has an odor, results may be biased low compared to true Total Metals concentrations. ALS recommends that turbidity analysis be requested on samples submitted for this test to aid with interpretation of results.

**MET-T-NP-U-ICP-VA**      Water      Total Metals by ICPOES (Undigested)      EPA SW-846 6010B

Ultra trace metals in water are analyzed by ICPOES, based on US EPA Method 6010B. The detection limits provided can only be met for undigested samples. This procedure is intended for colorless, non-turbid, acid-preserved water samples (i.e. pristine water samples), having turbidity < 1 NTU and no odor. Where turbidity exceeds 1 NTU, and/or the sample is colored and has an odor, results may be biased low compared to true Total Metals concentrations. ALS recommends that turbidity analysis be requested on samples submitted for this test to aid with interpretation of results.

**MET-TOT-LOW-ICP-VA**      Water      Total Metals in Water by ICPOES      EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

**N-T-COL-VA**      Water      Total Nitrogen in water by Colour      USGS - 03 - 4174 / NEMI 5735

This analysis is carried out using procedures adapted from the US Geological Survey (USGS) Method □ 03-4174 "Evaluation of Alkaline persulfate digestion as an alternative to kjeldahl digestion for determination of total and dissolved nitrogen and phosphorus in water." and National Environmental Methods Index □ Nemi method 5735. Nitrate via manual vanadium (III) reduction.

**NH3-F-VA**      Water      Ammonia in Water by Fluorescence      J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Weston et al.

**P-T-COL-VA**      Water      Total P in Water by Colour      APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.

**PH-PCT-VA**      Water      pH by Meter (Automated)      APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

**PH-PCT-VA**      Water      pH by Meter (Automated)      APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

**PO4-DO-COL-VA**      Water      Diss. Orthophosphate in Water by Colour      APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

**TDS-CALC-VA**      Water      TDS (Calculated)      APHA 1030E (20TH EDITION)

This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".

**TKN-CALC-VA**      Water      TKN in Water (Calculation)      BC MOE LABORATORY MANUAL (2005)

Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

## Reference Information

**TSS-VA**                      Water              Total Suspended Solids by Gravimetric                      APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

**TURBIDITY-VA**                      Water              Turbidity by Meter                      APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**TURBIDITY-VA**                      Water              Turbidity by Meter                      APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

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

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

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Laboratory Definition Code	Laboratory Location
----------------------------	---------------------

VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA
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**Chain of Custody Numbers:**

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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.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*



Form 69252



bhpbilliton

# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1

Tel: 867-880-2157 Fax: 867-880-4012

**BHP Contacts:** David Bruce/ Richard EhlerDavid

8081 Lougheed Highway • Suite 100 • Burnaby

Tel: 604-253-4188 Toll Free: 1-800-665-0243 FAX: 604-253-6700

**ALS Contact:** Can Dang

## CHAIN OF CUSTODY FORM

[illegible]

Turn around Required: Regular 2 week TAT

Special Instructions (Billing details, QC reporting, etc):

Billing Code: **BHP2501**

In Addition to the Compliance Team Inbox, please also send results to: [Daniel.Casanova@ern.com](mailto:Daniel.Casanova@ern.com) and [Andrew.Howton@Ekati.DDCORP.CA](mailto:Andrew.Howton@Ekati.DDCORP.CA)

Relinquished by: <i>Rick Ames</i>	Date <i>9 APR 2014</i> Time <i>17:17</i>	Received by:	Date
Relinquished by:	Date	Received by:	Date <i>Apr 14</i> Time <i>18:00</i>
	Time		

**FOR LAB USE ONLY**

Cooler seal intact upon receipt? ☒ Yes ☐ No ☐ N/A Sample temperature upon receipt: 8.8 C.  
Frozen? ☐ Yes ☒ No 2

**Send Analytical Results to:**

compliance.team@ekati.ddcorp.ca;





Dominion Diamond Ekati Corporation (DDEC)  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 15-APR-14  
Report Date: 25-APR-14 16:11 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1443646  
**Project P.O. #:** BHP2501  
**Job Reference:** 69256  
**C of C Numbers:** 1  
**Legal Site Desc:** 6201104485

Can Dang  
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1443646-1 Snow 10-APR-14 12:51 AQ-109	L1443646-2 Snow 10-APR-14 10:22 AQ-107	L1443646-3 Snow 10-APR-14 11:57 AQ-105	L1443646-4 Snow 12-APR-14 13:46 AQ-19	
Grouping	Analyte					
<b>WATER</b>						
<b>Physical Tests</b>	Conductivity (uS/cm)	4.3	4.3	5.6	3.4	
	Hardness (as CaCO3) (mg/L)	1.27	<0.50	1.29	7.01	
	pH (pH)	5.58	5.28	5.08	5.62	
	Total Suspended Solids (mg/L)	6.5	6.7	6.7	25.5	
	Total Dissolved Solids (mg/L)	4.4	2.8	4.5	8.2	
	Turbidity (NTU)	1.30	2.05	1.95	16.0	
<b>Anions and Nutrients</b>	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	
	Ammonia, Total (as N) (mg/L)	0.0146	0.0146	0.0158	0.0235	
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	
	Fluoride (F) (mg/L)	<0.020	<0.020	<0.020	<0.020	
	Nitrate (as N) (mg/L)	0.0595	0.0854	0.0842	0.0838	
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Total Kjeldahl Nitrogen (mg/L)	0.191	0.052	0.053	0.077	
	Orthophosphate-Dissolved (as P) (mg/L)	0.0030	0.0153	0.0040	0.0059	
	Phosphorus (P)-Total (mg/L)	0.0043	0.0257	0.0115	0.0226	
	Sulfate (SO4) (mg/L)	<0.50	<0.50	<0.50	<0.50	
	Anion Sum (meq/L)	<0.10	<0.10	<0.10	<0.10	
	Cation Sum (meq/L)	<0.10	<0.10	<0.10	0.34	
	Cation - Anion Balance (%)	85.4	65.4	82.9	96.5	
<b>Organic / Inorganic Carbon</b>	Total Organic Carbon (mg/L)	3.39 <sup>RRV</sup>	1.98 <sup>RRV</sup>	3.15	3.00 <sup>RRV</sup>	
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)	0.120	0.0705	0.109	0.976	
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Arsenic (As)-Total (mg/L)	<0.00010	0.00012	0.00014	0.00016	
	Barium (Ba)-Total (mg/L)	0.00728	0.00161	0.00680	0.0193	
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	
	Cadmium (Cd)-Total (mg/L)	<0.000010	0.000011	0.000011	0.000012	
	Calcium (Ca)-Total (mg/L)	0.175	0.097	0.282	0.521	
	Chromium (Cr)-Total (mg/L)	0.00061	0.00035	0.00038	0.00376	
	Cobalt (Co)-Total (mg/L)	0.00011	<0.00010	<0.00010	0.00081	
	Copper (Cu)-Total (mg/L)	<0.00050	<0.00050	0.00060	0.00126	
	Iron (Fe)-Total (mg/L)	0.132	0.060	0.115	1.05	
	Lead (Pb)-Total (mg/L)	0.000160	0.000131	0.000231	0.000303	

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1443646-1	L1443646-2	L1443646-3	L1443646-4	
		Description	Snow	Snow	Snow	Snow	
		Sampled Date	10-APR-14	10-APR-14	10-APR-14	12-APR-14	
		Sampled Time	12:51	10:22	11:57	13:46	
		Client ID	AQ-109	AQ-107	AQ-105	AQ-19	
Grouping	Analyte						
<b>WATER</b>							
Total Metals	Magnesium (Mg)-Total (mg/L)		0.20	<0.10	0.14	1.39	
	Manganese (Mn)-Total (mg/L)		0.00544	0.00435	0.0169	0.0141	
	Mercury (Hg)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	
	Molybdenum (Mo)-Total (mg/L)		0.000414	0.000284	<0.000050	0.000264	
	Nickel (Ni)-Total (mg/L)		0.00107	<0.00050	<0.00050	0.00856	
	Potassium (K)-Total (mg/L)		<0.10	0.12	0.13	0.52	
	Selenium (Se)-Total (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	
	Silicon (Si)-Total (mg/L)		0.304	0.137	0.183	2.44	
	Silver (Ag)-Total (mg/L)		<0.000010	0.000066	0.000020	0.000039	
	Sodium (Na)-Total (mg/L)		0.102	0.086	0.154	0.282	
	Strontium (Sr)-Total (mg/L)		0.00132	0.00058	0.00110	0.00677	
	Uranium (U)-Total (mg/L)		0.000011	0.000017	0.000017	0.000052	
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010	0.0023	
	Zinc (Zn)-Total (mg/L)		<0.0030	<0.0030	<0.0030	0.0045	

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

## Reference Information

## QC Samples with Qualifiers &amp; Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Orthophosphate-Dissolved (as P)	MS-B	L1443646-1, -2, -3, -4
Matrix Spike	Sulfate (SO4)	MS-B	L1443646-1, -2, -3, -4
Matrix Spike	Phosphorus (P)-Total	MS-B	L1443646-2, -3, -4
Matrix Spike	Phosphorus (P)-Total	MS-B	L1443646-2, -3, -4
Matrix Spike	Total Organic Carbon	MS-B	L1443646-1, -2, -4

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>ALK-SCR-VA</b>	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
<b>ANIONS-CL-IC-VA</b>	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-F-IC-VA</b>	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-NO2-IC-VA</b>	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
<b>ANIONS-NO3-IC-VA</b>	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
<b>ANIONS-SO4-IC-VA</b>	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>CARBONS-TOC-VA</b>	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
<b>EC-PCT-VA</b>	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
<b>HARDNESS-CALC-VA</b>	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
<b>HG-TOT-LOW-CVAFS-VA</b>	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			
<b>IONBALANCE-VA</b>	Water	Ion Balance Calculation	APHA 1030E
Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.			
Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:			
Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]			

## Reference Information

<b>MET-T-CCMS-VA</b>	Water	Total Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
<b>MET-TOT-LOW-ICP-VA</b>	Water	Total Metals in Water by ICPOES	EPA 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
<b>N-T-COL-VA</b>	Water	Total Nitrogen in water by Colour	USGS - 03 - 4174 / NEMI 5735
This analysis is carried out using procedures adapted from the US Geological Survey (USGS) Method □03-4174 "Evaluation of Alkaline persulfate digestion as an alternative to kjeldahl digestion for determination of total and dissolved nitrogen and phosphorus in water." and National Environmental Methods Index □Nemi method 5735. Nitrate via manual vanadium (III) reduction.			
<b>NH3-F-VA</b>	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
<b>P-T-COL-VA</b>	Water	Total P in Water by Colour	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.			
<b>PH-PCT-VA</b>	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
It is recommended that this analysis be conducted in the field.			
<b>PH-PCT-VA</b>	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
It is recommended that this analysis be conducted in the field.			
<b>PO4-DO-COL-VA</b>	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.			
<b>TDS-CALC-VA</b>	Water	TDS (Calculated)	APHA 1030E (20TH EDITION)
This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".			
<b>TKN-CALC-VA</b>	Water	TKN in Water (Calculation)	BC MOE LABORATORY MANUAL (2005)
Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].			
<b>TSS-VA</b>	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.			
<b>TURBIDITY-VA</b>	Water	Turbidity by Meter	APHA 2130 "Turbidity"
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			
<b>TURBIDITY-VA</b>	Water	Turbidity by Meter	APHA 2130 Turbidity
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			

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

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

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

Chain of Custody Numbers:



## Reference Information

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 ww* - milligrams per kilogram based on wet weight of sample.

*mg/kg lwt* - milligrams per kilogram based on lipid-adjusted weight of sample.

*mg/L* - milligrams per litre.

*<* - Less than.

*D.L.* - The reported Detection Limit, also known as the Limit of Reporting (LOR).

*N/A* - Result not available. Refer to qualifier code and definition for explanation.

*Test results reported relate only to the samples as received by the laboratory.*

**UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.**

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*

ALS Contact: Can D:



L1443646-COFC

bhpbilliton

**BHP Contacts: David Bruce/ Richard EhlertDavid**

50: 45487

## CHAIN OF CUSTODY FORM

[illegible]

In addition to sending results to the EKATI Compliance Team Inbox, please also send results to Andrew.Howton@Ekati.DDCORP.CA and Daniel.Casanova@erm.com

Relinquished by:	Date	Received by:	Date
	Time	<i>Page</i>	<i>Apr 15</i>
			Time <i>18:05</i>
Relinquished by:	Date	Received by:	Date
	Time		Time

FOR LAB USE ONLY			
Cooler seal intact upon receipt?		Sample temperature upon receipt: 5, 4, 5, 6	
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No

**Send Analytical Results to:**

compliance.team@ekati.ddcorp.ca;