

Hope Bay 2011 Groundwater Quality Report

Report Prepared for

Hope Bay Mining Ltd.



Prepared by



SRK Consulting (Canada) Inc.
1CH008.060
April 2014

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Executive Summary

Hope Bay Mining Ltd. (HBML), a wholly owned subsidiary of Newmont Mining (Newmont), is advancing engineering and permitting studies for the proposed development of gold deposits within the Hope Bay Belt in Nunavut. SRK Consulting (Canada) Inc. (SRK) has been tasked with characterizing the groundwater in terms of groundwater flow and quality. This report presents results of the 2011 groundwater quality monitoring program.

Water quality samples have been obtained from three specialized multi-level piezometers (Westbay) that were installed on the property. Designated zones in all of the Westbays were developed, and groundwater samples were collected periodically over a period of at least one year. The groundwater samples have been subject to both chemical analysis through ALS Laboratories and isotope analysis through the Saskatchewan Isotope Laboratory.

The groundwater across the Hope Bay Belt has high total dissolved salts (TDS) concentrations, but is not quite as saline as seawater. The following outlines characteristics of each of the Westbays.

Doris North:

- Targets deep sub-permafrost groundwater:
 - Samples from Zone 1 (vertically 575 - 578 meters below ground surface (mbgs)).
- Chemistry and isotope results suggest the zone below the permafrost may still contain drilling fluid:
 - High concentration of calcium, chloride, and ammonia;
 - Low sodium and zinc; and
 - Isotope data was different from Doris Lake water by a small margin, giving an inconclusive result as to whether or not drill fluid is present.

Doris Central:

- Situated in talik of Doris Lake with zones samples at multiple depths:
 - Zone 1 targets groundwater below diabase (vertically 485 - 495 mbgs);
 - Zone 6 targets area of proposed Doris Central stopes and is at a depth that may be influenced by a fault (vertically 221 - 246 mbgs); and
 - Zone 10 targets shallow talik water near the upper part of proposed Doris Central stopes (vertically 57 - 97 mbgs).
- Sodium and chloride are the dominant ions.
- Zones 6 and 10 have similar chemistry with selenium and arsenic below detection limits, ammonia exceeds 3 mg/L on multiple samples, and iron and zinc fluctuate over the course of sampling events.

- Zone 1 had stable parameter concentrations with higher concentration of calcium than that of the upper zones and lower concentrations of magnesium and sulphate. Iron, lead and ammonia are also comparably low to that of the upper zones.

Boston

- Extends through the permafrost into the talik of Spyder Lake:
 - Zone 6 (vertically 272 - 282 mbgs) sampled.
- Cadmium, chromium and selenium are all below detection.
- Stable concentration of magnesium and sodium, although both parameters are lower here than in the upper Doris Central zones.
- Higher concentration of calcium than Doris Central which may be indicative of small amounts of drilling brine still being present in the zone.
- Isotope values are different than those of Spyder Lake which may support that drilling brine has been removed from the zone, but this contradicts the general chemistry results.

SRK recommends that each well be maintained for winter by either adding propylene glycol or lowering the internal water level, or a combination of both activities. All temperature sensitive equipment need to be stored in a warm, dry environment .

Table of Contents

1	Introduction and Scope of Report.....	1
2	Westbay System	1
2.1	Description	1
2.1.1	Location and Purpose	2
2.2	Development of Westbays.....	4
2.3	Sampling Method.....	5
2.3.1	Lab Analysis Methods.....	5
2.3.2	QA/QC 6	
2.3.3	Duplicates	6
2.3.4	Ion Balance	6
2.3.5	Blanks 6	
2.3.6	Frequency	7
3	Results	7
3.1	Lab Analysis.....	7
3.2	Piper Plots.....	7
3.3	Rinsate and Field Blanks	8
3.4	Isotope Data.....	8
4	Discussion.....	13
4.1	Doris North.....	13
4.2	Doris Central	13
4.3	Boston.....	14
4.4	Isotopes Analysis	14
5	Conclusions	18
6	References.....	20

List of Figures

Figure 1: Cross section along the strike of the Doris deposit, showing the location of Westbay Wells 10WBW001 and 10WBW002 and sampled zones (blue arrows) in relation to the proposed mining areas	3
Figure 2: Location of Westbay 10WBW004 with respect to the proposed mining areas (as of January 2011) at Boston.....	3
Figure 3: Piper Plot of Hope Bay Groundwater Samples Compared to Seawater	10
Figure 4: Plot of δD versus Time for the Samples from Doris Central.....	16
Figure 5: Plot of δD Versus Time for the Samples from Doris North and Boston.....	16
Figure 6: Plot of $\delta^{18}O$ Versus Time for the Samples from Doris Central	17
Figure 7: Plot of $\delta^{18}O$ Versus Time from Doris North and Boston	17

List of Tables

Table 1: Zones Targeted for Water Quality Sampling	2
Table 2: Development Volumes for Each Westbay Zone	4
Table 3: 75th Percentile of Selected Parameters for Hope Bay Westbays	9
Table 4: Summary of the δD and $\delta^{18}O$ Measurements Compared to Development Volume	11
Table 5: Summary of the δD and $\delta^{18}O$ Measurements Compared to Development Volume (continued)..	12

Appendices

Appendix A – Groundwater Chemistry

Appendix B - 2011 Lab Reports

Appendix C - Groundwater Parameter Graphs

1 Introduction and Scope of Report

SRK Consulting (Canada) Inc. was retained by Hope Bay Mining Ltd. (HBML), a wholly owned subsidiary of Newmont Mining Company, to investigate groundwater quality at the Hope Bay Gold project site in Nunavut. This report outlines the current understanding of groundwater quality on the property as determined through field sampling and laboratory analysis, and provides an update on the groundwater monitoring program to HBML.

The project as proposed includes development at various deposits, including Boston, Madrid, and Doris. Parts of the proposed mine workings are to be located in permafrost, but large areas will be within talik zones, and the groundwater is anticipated to flow into the mine. As there are three separate deposits, and groundwater quality data at various depths, the groundwater is examined by deposit and depth as well as comparing the groundwater chemistry across the site.

2 Westbay System

2.1 Description

The Westbay wells can be thought of as multi-level piezometers (MP). That is, each installation has multiple, hydraulically isolated “monitoring zones” at various depths allowing sampling or water level measurement at each zone. The zones are designed during drilling and allow virtually complete flexibility over length and position. Each zone is separated from others by hydraulic packers that are inflated following strict quality assurance/quality control (QA/QC) guidelines.

The basis of the MP System is the fluid inside the PVC pipe is isolated from zone fluids outside the pipe by valved couplings that are always in a closed (hydraulically sealed) position unless specifically opened temporarily by a probe. The MP well is operated with internal fluid pressures lower than the external zone pressures, so that any fluid movement during valve operation is into the pipe, and not into the monitoring zone (thus avoiding contamination).

After installation, all of the zones are accessed through a single PVC standpipe via a single wireline tool operated from the surface. This tool is used to collect pressure data and fluid samples from inside and outside of the normally sealed pipe. A benefit of this system, which is of particular importance in the Canadian North, is that the inside of the PVC is hydraulically isolated from all of the sampling zones, allowing the internal volume to be protected from freezing using a mix of propylene glycol and water; unlike a conventional piezometer, water does not rise up inside the PVC to the static water level. Water pressure can be measured at all monitoring zones and provides a vertical pressure profile.

During sampling and monitoring, a proprietary tool called a ‘Mosdax’ sampler/pressure probe is operated on a wireline from surface and activated by a hand held electronic controller (called a ‘MAGI’) to land the probe at the desired valved coupling within the Westbay well. The probe has the ability to read pressure, temperature (of the probe), or to open and close an internal valve, allowing water to flow through the probe into pre-attached sample bottles that hang below it in the well.

2.1.1 Location and Purpose

Each of the three Westbay wells installed at Hope Bay was designed to include short sampling zones either in talik or below permafrost at locations that would be representative of groundwater inflows to the future mine areas. Table 1 summarizes the zones targeted for sampling in each well and their respective vertical depths. Since the Doris Central Westbay is situated completely within talik, it permits groundwater monitoring at multiple depths and there is no danger of the Westbay freezing. The Doris North Westbay is designed to sample groundwater below the permafrost and the Boston Westbay extends through the permafrost into the talik beneath Spyder Lake.

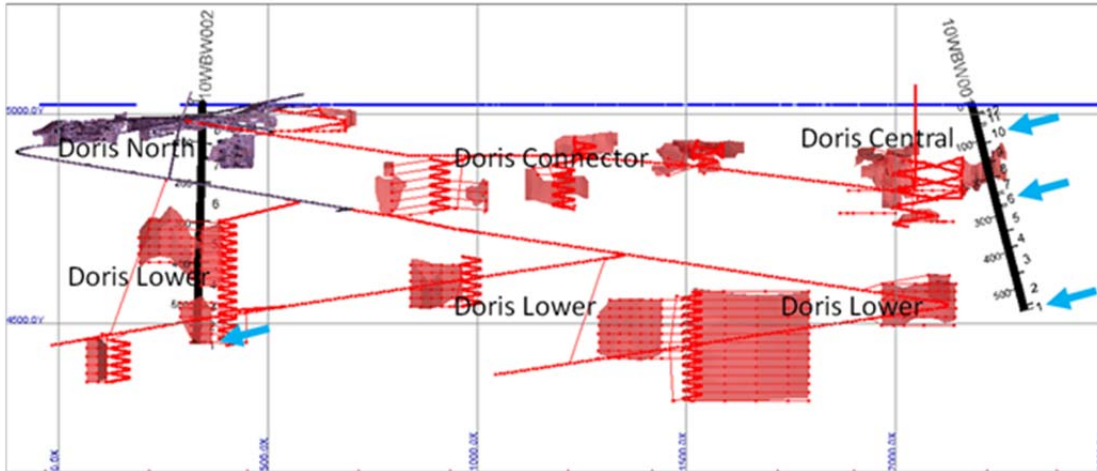
Figure 1 is a cross-section depicting the depths of the Doris sampling zones in relation to the proposed mine workings for the Westbays 10WBW001 and 10WBW002 with the blue arrows highlighting the zones that are part of the sample program. Figure 2 shows the location and orientation of the Boston Westbay, 10WBW004 which has a single zone within the lake talik as part of the standard sampling program. A planned Westbay for the Patch 14 deposit was postponed after drilling determined the planned hole was not suitable for groundwater sampling due to low hydraulic conductivity (K) of the rock mass.

Each of the well designs and installation procedures are outlined in detail in the “*Hope Bay 2010 Westbay Program Data and Installation Report*” (SRK 2011).

Table 1: Zones Targeted for Water Quality Sampling

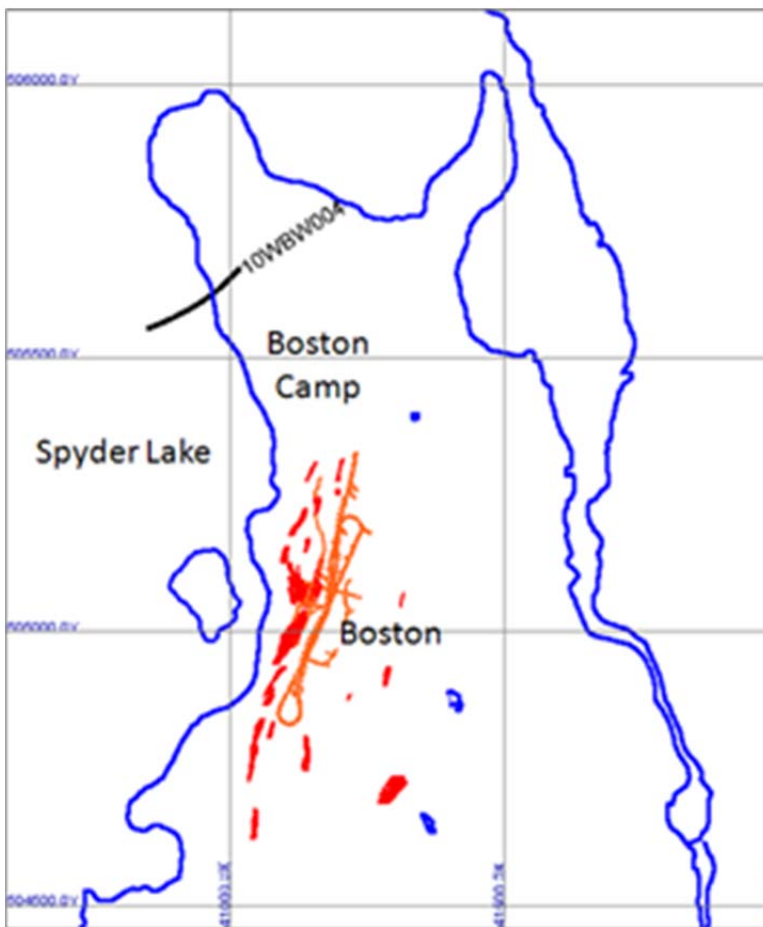
Well	Zone	Vertical Depth Below Ground (m)	Deposit	Groundwater Conditions each Zone Represents
10WBW001	10	57-97 m	Doris Central	Shallow talik water, near the upper parts of the proposed Doris Central stopes.
	6	221-246 m		Medium depth talik water, around the area of the proposed Doris Central stopes, possibly influenced by a nearby fault.
	1	485-495 m	Doris Central Lower	Deep talik water, below the diabase.
10WBW002	1	575-578 m	Doris North Lower	Deep sub permafrost groundwater at Doris North Lower
10WBW004	6	272-282 m	Boston	Talik beneath Spyder Lake

Source:\01_SITES\Hope.Bay\1CH008.013_2010_Westbay_Installation\080_Reporting\20110125 Westbay Data Report\Tables\Table 2 Zones targeted for sampling.xlsx



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Figure 1: Cross section along the strike of the Doris deposit, showing the location of Westbay Wells 10WBW001 and 10WBW002 and sampled zones (blue arrows) in relation to the proposed mining areas



Source: \\01_SITES\Hope.Bay\1CH008.013_2010_Westbay_Installation\020_Project_Data\SRK\12_GEMS screenshots and figures\ 2011-01-21 Figures used in report.pptx

Figure 2: Location of Westbay 10WBW004 with respect to the proposed mining areas (as of January 2011) at Boston

2.2 Development of Westbays

SRK field staff developed the drilling water from each of the target zones, monitoring field parameters and taking laboratory samples to measure the water quality changes as the drill water in the zone was replaced with formation water. The speed of the development process, the development and sampling method, and the number of samples taken varied by location, depended on the presence or absence of permafrost in the hole and the hydraulic conductivity of the rock within the zone. Table 2 below shows the volumes developed and the methods used at each of the targeted sampling zones.

The following developing methods were used:

- The airlift pumping method: This procedure involved opening the pumping port in a target zone and then injecting compressed air into the internal Westbay PVC pipe at a depth above that of the pumping port, to eject water and lower the water level inside the pipe. This caused water to flow from the monitoring zone into the Westbay internal pipe to replace the water removed. Initially the discharged water from the airlift system was the glycol water that was sitting inside the Westbay pipe, but over time the recharging groundwater provided a continuous flow of water up through the Westbay.
- The sample bottle method: This procedure involved using the Mosdax sampler probe with attached sampling water bottles to land at the measurement ports and take 1 L samples. The bottle was then returned to the surface, emptied, re-attached and sent down the hole again to grab another 1 L from the formation. This process continued repetitively for days or weeks in some cases, to develop water from the zones. While slow, the benefit of this method is that the glycol water mix inside the Westbay is not displaced by the formation water (as is the case with the airlift pumping method), therefore the Westbay wells located in permafrost do not freeze solid.

Table 2: Development Volumes for Each Westbay Zone

Deposit	Well	Zone	Volume of Zone (L)	Volume Removed (L)	# of Zone Volumes Removed*	Significant Permafrost in Hole?	Development Method
Doris Central	10WBW001	10	264	3026	11.5	No	Airlift
		6	168	Initially 8,096 L; after bulk sample 13,604 L	Initially 48.2; after bulk sample 81.0		Airlift
		1	96	3195	33.3		Airlift
Doris North	10WBW002	1	37.2	66.1	1.8	Yes	Westbay Sampler
Boston	10WBW004	6	73.2	136	1.9	Yes	Westbay Sampler

Source: U:\1CH008.060_2012 Westbay Program\1080_Deliverables\Groundwater Quality 2011\020_Tables

Note:

* Note that for zones developed using the airlift method, the volume of glycol water developed from inside the Westbay was subtracted from the calculation of # of zone volumes removed.

2.3 Sampling Method

There were two development and sampling methods used at Doris Central: the airlift pumping method and the Westbay sampler “discrete” method. The Doris North and Boston Westbay wells only used the discrete method. When reviewing the water quality sample results, the method used to obtain the sample should be considered, as it has an effect on certain parameters:

- Airlift Samples: grab samples of the airlift discharge taken at the surface have undergone considerable aeration before sampling. The addition of air to the water changes the concentration of the parameters (e.g., alkalinity, redox, isotopes, and other parameters) for chemical analysis. The water samples that were collected during airlifting may not be representative of the formation water. However, as the inflowing mine water would likely be aerated through pumping in the mine, they do provide an interesting comparison with the discrete samples.
- Discrete Samples: samples collected directly from the zones down hole using a specialised tool do not come into contact with the atmosphere until they are poured into sample bottles at the surface. When the sample is depressurized to be collected in sample bottles, it experiences some aeration. For most parameters, they are considered to be more representative of actual formation water than the airlifted samples.

Throughout the development, the SRK crew monitored the field parameters to track the development process and is presented in the “*Hope Bay 2010 Westbay Program Data and Installation Report*” (SRK 2011). As the program progressed to sampling, development was no longer required. The airlift method was only used for bulk samples and to aid with significant development. Field parameters were collected with each sample and can be found in Appendix A with the lab results.

2.3.1 Lab Analysis Methods

Samples were analysed for routine parameters, total metals, dissolved metals, nutrients, and stable isotopes of deuterium (δD), and the ratio of oxygen 18 to oxygen 16 ($\delta^{18}O$).

Initial samples, taken during the development process, were analyzed using the traditional methods of ion chromatography, Inductively Coupled Plasma Mass Spectrometry (ICP-MS), and Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES). These samples had high detection limits and some spurious results, and therefore have not been included in the groundwater quality assessment; they have only been used to evaluate the development process. To achieve better detection limits, the analysis method was changed after the initial sampling rounds. All subsequent groundwater samples collected were analyzed using High Resolution Inductively Coupled Plasma Mass Spectrometry (HR-ICPMS). These are labelled ‘seawater’ analysis in the water quality results table presented in Appendix A.

Groundwater samples were also submitted to the Saskatchewan Isotope Laboratory at the University of Saskatchewan and analyzed for δD and $\delta^{18}O$ by Gas Isotope Ratio Mass Spectrometry (GIRMS). Samples were analyzed using a Thermo Finnigan TC/EA coupled to a ConFlo III and a Delta Plus XL mass spectrometer. The precision of δD and $\delta^{18}O$ analyses were ± 2 and $\pm 0.5\%$, respectively.

2.3.2 QA/QC

The QA/QC checking procedures for this data collection program consisted of the following:

- Collecting and analysing duplicate samples;
- Calculating cation and anion balances;
- Collecting and analyzing a field blank;
- Collecting and analysing rinsate samples; and
- At the Boston Westbay well, collecting and analysing samples from two ports within one zone.

2.3.3 Duplicates

Duplicate samples were collected during each sampling event, with more duplicates collected during the original development process. Duplicate samples were reviewed for relative percent differences (RPD) to monitor the natural variability of the groundwater.

2.3.4 Ion Balance

An ion balance was used to check completeness of analytical results. Total anions must be in balance with total cations; therefore, the sum of the concentrations of anions should equal the sum of the concentration of cations and the ratio of total anions to total cations should be one.

The concentrations in this case must be in terms of ion equivalents. Analyses which yield an ion balance of less than 10% are generally considered to be acceptable.

2.3.5 Blanks

Rinsate Blanks

Between samples, Westbay sample bottles were tripled rinsed. When available, DI water provided by ALS was used for all rinsing. At times when the available quantity of ALS DI water was limited on site, the reverse osmosis (RO) water from the camp water supply system was used for the first and second bottle rinses, followed by DI water as a final rinse. After the third rinse, a rinsate blank sample was collected to analyse if cross contamination was being introduced to the sample via the equipment.

Field Blanks

Each sampling event also included a field blank. This blank is comprised of DI that is carried into the field, opened on site and then poured into the sample bottles. It was handled the same as the regular sample including filtering and preservation, but was not put through the equipment. This field blank allows for the analysis to detect impact that the sampling environment may have on the sample.

2.3.6 Frequency

The sample plan for Hope Bay involved three sampling events every year that coincide with seasonal variation. The first sampling event was pre-freshet in April, one event occurred after freshet in June and the final event was in September when low flow conditions were experienced. Groundwater sampling should occur on a similar seasonal basis until enough data has been collected to show whether there are seasonality effects on groundwater quality.

3 Results

3.1 Lab Analysis

The results of the lab analyses are summarized in Appendix A and include all of the data collected since the beginning of the program until sampling ended in September 2011. Appendix B contains the original lab reports from the 2011 groundwater sampling year. Appendix C contains graphs of parameter trends through the length of the program, but it does not include Doris North as chemistry results from this location still reflect drilling brine and thus does not show similar trends as the two other Westbays (see discussion Section 4.1). It should be noted that there is no data available for the zone in Doris Central (10WBW001) for June 2011 as this sampling event coincided with a bird nesting season, and access to the island was not possible without causing a disruption to the wildlife.

Table 3 gives the 75th percentile of a selection of major parameters across the Hope Bay belt. Some of the initial groundwater samples were analyzed using methods for freshwater instead of seawater at the beginning of the program (SRK, 2011). As such, the detection limits changed, and the more recent lab analyses now have a lower detection limit. To ensure the earlier detection limits did not bias the statistics, the trace element data from these earlier analyses were removed from the data set. Data was reviewed internally by SRK's Geochemistry Group to determine if any other values should be omitted due to suspect data.

3.2 Piper Plots

The chemistry results from 2010 and 2011 were used to generate piper plots for the groundwater results in Figure 3. The samples selected for Boston and Doris North included one sample of each of the 2011 sampling events and the 75th percentile as presented in Table 3. The selected Doris Central samples included a representative sample from each zone for the last three sampling events and the 75th percentile value. From this diagram it can be seen that the dominant anion is chloride in all waters, while the dominant cation varies. The zones in Doris Central and seawater are dominated by sodium+potassium (principally sodium) while Boston and Doris North are dominated by calcium. There were essentially no differences between samples collected from the

same zones. Doris Central Zones 6 and 10 (the upper zones) are almost identical, while Zone 1 (the lower zone) is intermediate in character between these and the Boston samples. From the four sampling zones, three distinct types of water exist.

3.3 Rinsate and Field Blanks

The lab analysis from the rinsate blanks and field blanks showed that there was some equipment contamination occurring early on in the development process. From Appendix A, the early rinsate samples have some parameters above detection limit and show that the equipment needed to be rinsed more thoroughly. Once this procedure was implemented, the rinsate samples showed lower or no detection of the analyzed parameters. Field blanks consistently remained below detection limits or showed trace amounts of detected parameters.

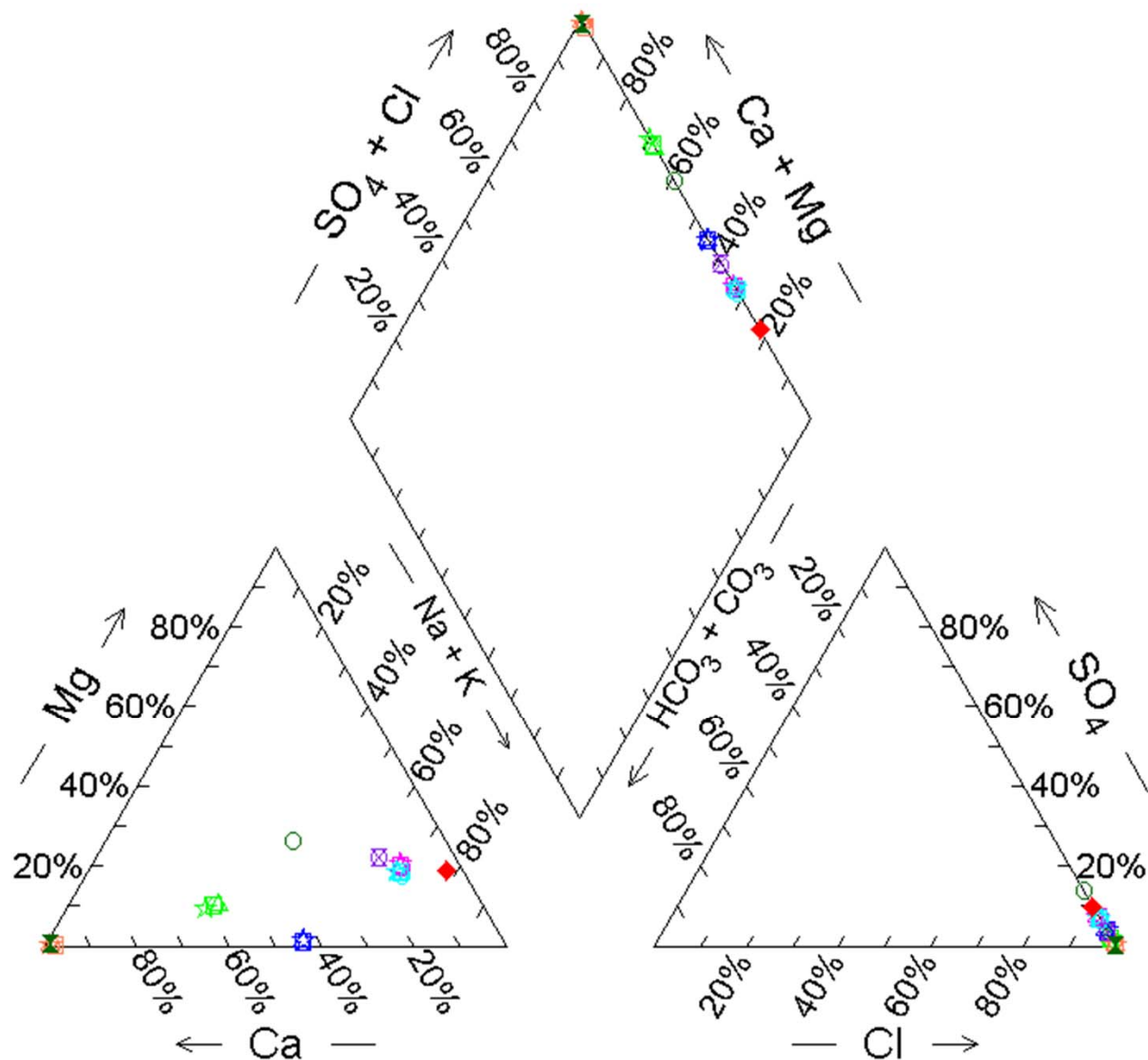
3.4 Isotope Data

The deuterium (δD) and oxygen-18 ($\delta^{18}O$) results for the Westbay systems are presented in Table 4 by zone and location. The summary includes the volume of groundwater removed from the zone, providing the ability to monitor the development process.

Table 3: 75th Percentile of Selected Parameters for Hope Bay Westbays

Parameters	Units	Doris Central			Doris North	Boston
		10WBW001 Zone 1 (548m)	10WBW001 Zone 6 (246m)	10WBW001 Zone 10 (63m)	10WBW002 Zone 1	10WBW004 Zone 6
pH		7.67	7.65	7.57	8.11	7.00
TDS	mg/L	44900	37550	38550	223000	33500
Alkalinity	mg/L	2.18	71.6	115	59.5	41.4
Bicarbonate	mg/L	9.98	56.5	115	109	41.4
Ammonia	mg/L	0.0625	3.44	4.05	7.02	2.41
Chloride	mg/L	19000	19050	19350	133000	13730
Sulphate	mg/L	976	2025	1853	100	352
Calcium	mg/L	4920	1540	1730	78530	4700
Sodium	mg/L	7200	9093	9100	48.9	2653
Potassium	mg/L	39	232	258	200	51
Magnesium	mg/L	69.5	1480	1310	115	440
<i>Dissolved Metals</i>						
Aluminum	mg/L	0.005	0.005	0.005	0.005	0.005
Arsenic	mg/L	0.002	0.0043	0.002	0.087	0.002
Cadmium	mg/L	0.00012	0.00007	0.00011	0.0005	0.0001
Chromium	mg/L	0.0005	0.0005	0.005	0.007	0.0005
Cobalt	mg/L	0.000059	0.00027	0.00015	0.0005	0.0056
Copper	mg/L	0.00083	0.0005	0.0005	0.016	0.0005
Iron	mg/L	0.056	4.5	6.3	0.12	8.6
Lead	mg/L	0.0003	0.0003	0.0003	0.003	0.0003
Manganese	mg/L	0.73	2.1	1.9	0.019	0.91
Mercury	mg/L	0.00005	0.00005	0.00005	0.00005	0.00005
Molybdenum	mg/L	0.011	0.034	0.013	0.20	0.10
Nickel	mg/L	0.0016	0.0010	0.00067	0.011	0.021
Selenium	mg/L	0.002	0.002	0.002	0.02	0.002
Zinc	mg/L	0.137	0.228	0.0659	0.22	0.16

Source: U:\1CH008.060_2012 Westbay Program\080_Deliverables\Groundwater Quality 2011\020_Tables



- Boston April 2011
- Boston June 2011
- △ Boston Sept 2011
- ☆ Boston 75th Percentile
- Doris Central - Z1 - Nov 2011
- Doris Central - Z1 - April 2011
- △ Doris Central - Z1 - Sept 2011
- ☆ Doris Central - Z1 - 75th Percentile
- Doris Central - Z6 - Nov 2010
- Doris Central - Z6 - April 2011
- △ Doris Central - Z6 - Sept 2011
- ☆ Doris Central - Z6 - 75th Percentile
- Doris Central - Z10 - Oct 2010
- Doris Central - Z10 - April 2011
- △ Doris Central - Z10 - Sept 2011
- ☆ Doris Central - Z10 - 75th Percentile
- Doris N - Z1 - April 2011
- Doris N - Z1 - June 2011
- △ Doris N - Z1 - Sept 2011
- ☆ Doris N - Z1 - 75th Percentile
- ◆ Hem (1985) Seawater
- ⊗ Fresh Drill Water
- Doris Lake
- Spyder Lake
- ⊗ Drill Brine (Boston)

Table 4: Summary of the δD and $\delta^{18}O$ Measurements Compared to Development Volume

Site	Zone/Source	Port	δD ‰	$\delta^{18}O$ ‰	Cumulative Volume Removed (L)
Doris Central	Zone 1	Upper Port	-130.59	-17.82	0
			-134.14	-18.09	1189
			-138.00	-18.83	3186
			-135.4	-18.63	3192
			-136.70	-18.61	3192
			-138.1	-18.8	3195
	Zone 6	Upper Port	-69.03	-8.98	0
			-117.72	-15.00	8096
			-96.7	-12.08	13592
			-82.20	-10.57	13592
			-76.80	-9.60	13598
			-75.60	-9.60	13601
		Lower Port	-62.30	-8.52	13595
			-58.2	-7.5	13604
	Zone 10	Upper Port	-110.12	-14.00	0
			-109.57	-13.96	2
			-106.52	-13.49	3008
			-78.0	-10.33	3014
			-79.20	-10.06	3017
			-79.50	-10.50	3023
		Lower Port	-73.40	-9.20	3020
			-69.1	-9.1	3026
	Drilling Water (Doris Central)		-157.78	-19.16	na
			-159.7	-19.25	na
	Doris Lake		-146.79	-18.50	na
			-156.3	-19.44	na
Doris North	Zone 1	Upper Port	-147.68	-20.52	0
			-149.12	-20.83	0.1
			-142.4	-20.32	27
			-147.4	-21.00	52
			-150.0	-21.2	59
			-150.4	-20.7	63
			-144.4	-19.7	66

Table 5: Summary of the δD and $\delta^{18}O$ Measurements Compared to Development Volume (continued)

Site	Zone/Source	Port	δD ‰	$\delta^{18}O$ ‰	Cumulative Volume Removed (L)
Boston	Zone 6	Upper Port	-141.6-140.6	-18.18-18.02	1.138
			-140.6-139.7	-18.02-17.96	3838
			-139.7-135.4	-17.96-17.65	3852
			-135.4-136.0	-17.65-17.67	5284
			-136.0-139.4	-17.67-17.60	8491
			-139.4-138.6	-17.60-17.44	9191
		Lower Port Lower Port	-138.6-140.4	-17.44-18.00	91130
			-140.4-135.8	-18.00-17.10	130136
			-135.8-134.4	-17.10-17.66	13644
			-134.4-135.5	-17.66-17.62	4459
			-135.5-134.8	-17.62-17.77	5972
			-134.8-137.6	-17.77-17.59	72110
			-137.6-135.5	-17.59-17.20	110128
			-135.5-136.7	-17.20-17.40	128128
			-136.7-132	-17.40-16.5	128134
			-132-151.63	-16.5-19.03	134na
	Drilling Water (Boston)		-151.63-154.50	-19.03-19.46	nana
	Drilling Water (Boston)		-154.50-149.48	-19.46-18.93	nana
	Spyder Lake		-149.48	-18.93	na
	Spyder Lake				

Source: U:\1CH008.060_2012 Westbay Program\080_Deliverables\Groundwater Quality 2011\020_Tables

Note:

*values in blue are from samples collected in 2011

4 Discussion

4.1 Doris North

This Westbay was designed and constructed to sample below permafrost. The zone of interest, Zone 1, is at a vertical depth of 575 mbgs. This location is limited by development methods to the Westbay sampler which removes fluid in small increments, and the low hydraulic conductivity of the zone, which also limits the rate at which fluid can be removed.

The groundwater chemistry data collected thus far showed extremely high conductivity and total dissolved solids concentrations. Calcium and chloride were also abnormally high compared to other groundwater samples on the property. The predominance of these parameters is consistent with the presence of drilling brines. Ammonia was found to be the highest on the property at this location, exceeding 8 mg/L while both iron and lead varied a lot between samples with no trend present. Zinc was low in all but one sample which may have been erroneous; half of the zinc samples were below detection limits and the rest were below 0.2 mg/L. Based on the abnormally high calcium and chloride concentrations, it has been concluded that drill fluids could still be present in the zone. Further development of this zone may not be possible due to limitations on the rate of development, and representative samples may not be possible at this site.

4.2 Doris Central

This location is situated completely in talik. This allows each of the zones to be developed using airlift methods, which permit large volumes of water to be removed in only a few days.

This location was also able to use fresh lake water instead of drilling brine as there was no risk with the drill hole freezing. Trends in Zones 6 and 10 are inconclusive with respect to some dissolved metals as iron and zinc have fluctuated between samples, with peak values of iron exceeding 8 mg/L. Some parameters such as arsenic and selenium have remained below detection limit in nearly every sampling event. Ammonia was high in 2011 and exceeds 3 mg/L in both zones. Lead has been quite low in all samples over the past year. Despite these examples of variability the groundwater chemistry is stabilizing, and the most recent samples are considered to represent formation water; thus sufficient development has occurred.

Certain parameters display stratification in the water column within an individual monitoring zone. Parameters such as chlorine, magnesium, potassium, and sodium have higher concentrations when measured at ports located at the bottom of the zone compared to samples taken from the top.

Below the diabase dyke in Zone 1, groundwater chemistry has shown little variation over time. Most parameters remain stable and generally have lower concentration of many constituents in Zones 6 and 10. The one exception to this is that the groundwater appears to have higher concentrations of calcium and lower concentrations of magnesium and sulphate compared to that of the upper zones. Iron, lead and ammonia are all quite low in this zone while zinc is higher than Zones 6 and 10 with the last three samples exceeding 0.11 mg/L.

4.3 Boston

Sampling of the Westbay at Boston has focussed on the one zone that lies within the talik, at a vertical depth of 270 mbgs. This zone has also been sufficiently developed via the Westbay sampler probe with samples collected from the upper and lower ports.

The chemistry in this zone shows initial spikes of data from the development stage. Cadmium, chromium and selenium have all been below detection limits throughout the sampling process. Iron and zinc, as in the upper zones of Doris Central, have fluctuated with no clear trend. Magnesium has remained constant throughout the sample history, with less magnesium than the upper Doris Central zones, but more than that of the Doris Central Zone 1. Sodium also remains constant, but this parameter is the lowest at Boston compared to the rest of the site with a concentration peak at 3,170 mg/L in the most recent sample. Like the deep groundwater of Doris Central's Zone 1, the Boston groundwater has higher concentrations of calcium. This water also has significantly lower concentrations of sodium compared to all the Doris Central zones. The low sodium and high calcium concentrations may be indicative of a mixture of drilling brine and formation water, assuming the high sodium type water is characteristic of site groundwater as suggested by Doris Central analysis.

4.4 Isotopes Analysis

The main objective of the isotope work was to establish whether drilling fluids introduced during the drilling process had been adequately removed from the sampling zones.

Different types of drilling fluids were used at each of the monitoring sites. CaCl_2 brine, produced by adding calcium chloride to water from Doris or Spyder Lake was used to avoid freezing in areas where drilling was expected to encounter permafrost (Doris North and Boston), while lake water was used for the Doris Central site, which was located in talik. During drilling at Doris Central and Boston, drill fluid samples were collected and analyzed for δD and $\delta^{18}\text{O}$. These isotopes monitor the major components of the water; they are not affected by fluid rock exchange processes and are routinely utilized to identify different water sources. The drilling fluids and the Doris and Spyder Lake water have consistent and distinct isotope compositions with δD approximately equal to 153.74‰ and $\delta^{18}\text{O}$ 19.11‰ (Figure 4 and Figure 5). Isotope compositions for the various groundwaters encountered during drilling are distinctly different (Figure 4 and Figure 5). The lake water and drilling fluid values were considered to be the initial reference point samples from which to gauge well development progress.

To interpret these data, deuterium and oxygen isotope compositions were plotted relative to date of sample collection to assess changes over time (Figure 4 to 7). As shown in Figure 4, and 6 isotope values for Doris Central Zones 6 and 10 were distinctly different from isotope values in corresponding drill fluid samples from Doris Lake. Isotope values in Doris Central Zone 1, Doris North and Boston samples also differed from that of their corresponding drill fluid, but to a much lesser extent than in the Doris Central Zone 6 and 10 samples. Never the less, the differences are significantly greater than measurement uncertainties.

The three zones sampled in Doris Central were monitored through the development process with results plotted in Figure 4 and Figure 6. In general, the results for Doris Central Zones 6 and 10 samples collected during purging were still very variable, even two years after drilling was completed. The trends and variations evident in Figures 4, and 6 suggest variable mixing of two water sources, even after two years. One of these components is probably surface water with an equivalent isotope composition to the drilling fluids. As a result, it is not possible to assess whether drilling fluid has been completely removed. However, the elevated δD and $\delta^{18}O$ in Zone 6 shortly after drilling, very similar to values obtained two years later, suggests that most of the drilling fluid was rapidly removed from the system. In the case of Zone 10, the isotope variations suggest that more drilling fluid remained in the system for longer than in Zone 6.

The results from Zone 1 show much less variability and essentially no change over time. In this case, it is also possible that the lack of change could indicate that any drilling fluid present in this zone was removed very early in the purging process. However, it is also possible that the differences between drilling fluid and formation waters are not sufficient to distinguish changes over time. If this later scenario applies, then the difference in isotope composition between Zone 1 and Zones 6 and 10 requires that there be at least two separate groundwater sources.

The δD and $\delta^{18}O$ values from Doris North and Boston also exhibit little variation and no trends over time, as evident in Figure 5 and Figure 7. It is not yet clear whether there are multiple formation waters in the area or whether there is one formation water with isotopic composition equivalent to that seen in Doris Central Zones 6 and 10. If the latter applies, then the isotope composition at Doris Central Zone 1 and Boston could reflect significant contributions of drilling fluid which have not yet been purged from the system. If multiple formation water are accepted then most sites seem to suggest that almost all the drilling fluid has been purged. Chemistry data for both the Doris North and Boston samples indicate that drilling fluids are likely still present.

Differences between Upper and Lower Sample Ports

Some of the sampling zones have two sampling ports (upper and lower ports), typically within a few metres of each other. The isotopic values for Zone 6 and Zone 10 during the 2011 sampling campaign showed greater variation between results from the upper and lower ports than results collected from within the same port. The results from the lower port tended to give higher δD and $\delta^{18}O$ than results from the higher ports. As discussed previously, the chemistry results also showed that there were some geochemical differences between the different sampling ports.

It is not clear why there are differences in the isotopic and chemical composition of the two ports. However, the results may be indicative of flow from different fractures within the sampling zone.

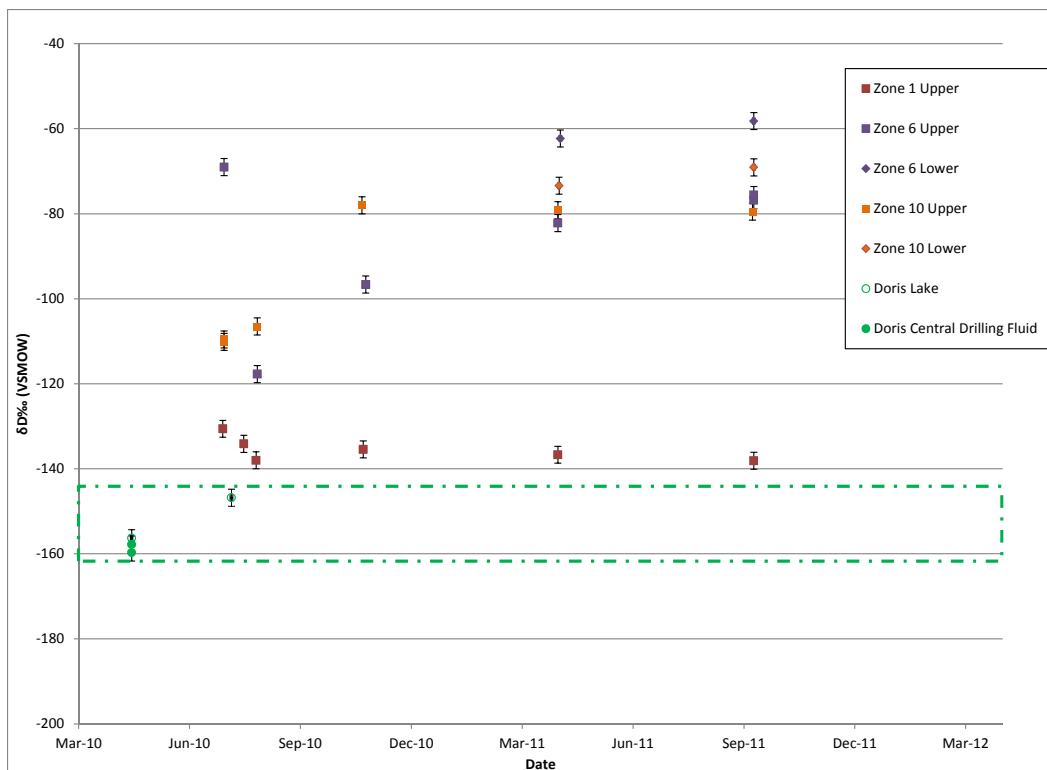


Figure 4: Plot of δD versus Time for the Samples from Doris Central

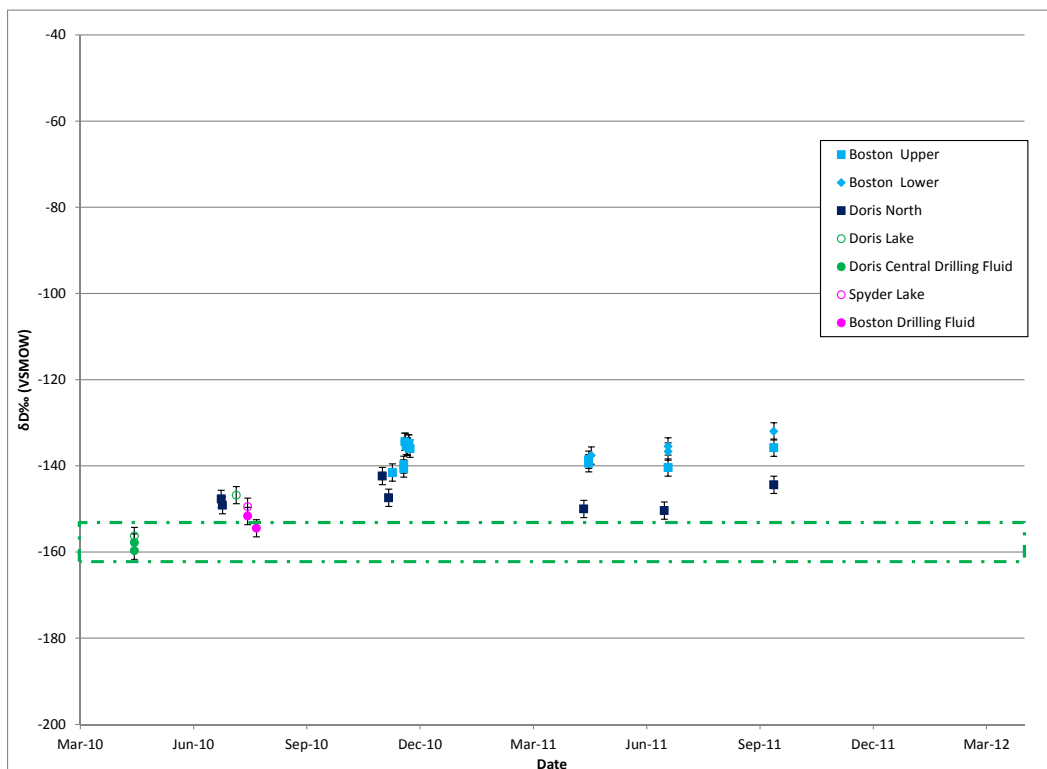


Figure 5: Plot of δD Versus Time for the Samples from Doris North and Boston

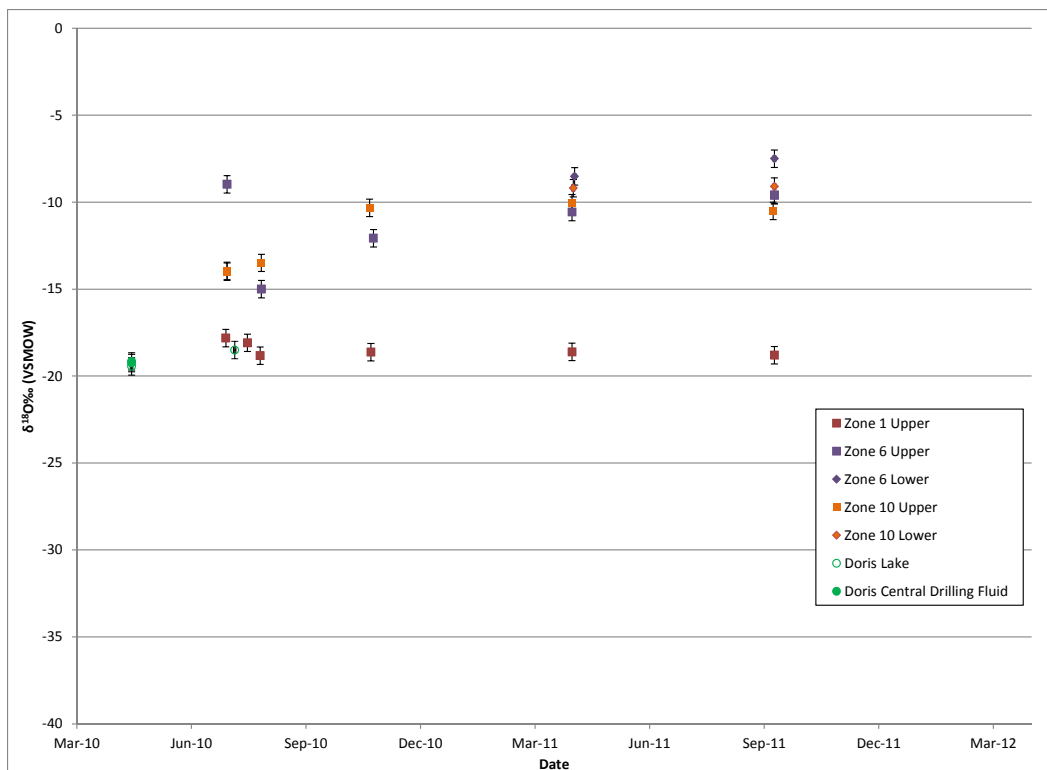


Figure 6: Plot of $\delta^{18}\text{O}$ Versus Time for the Samples from Doris Central

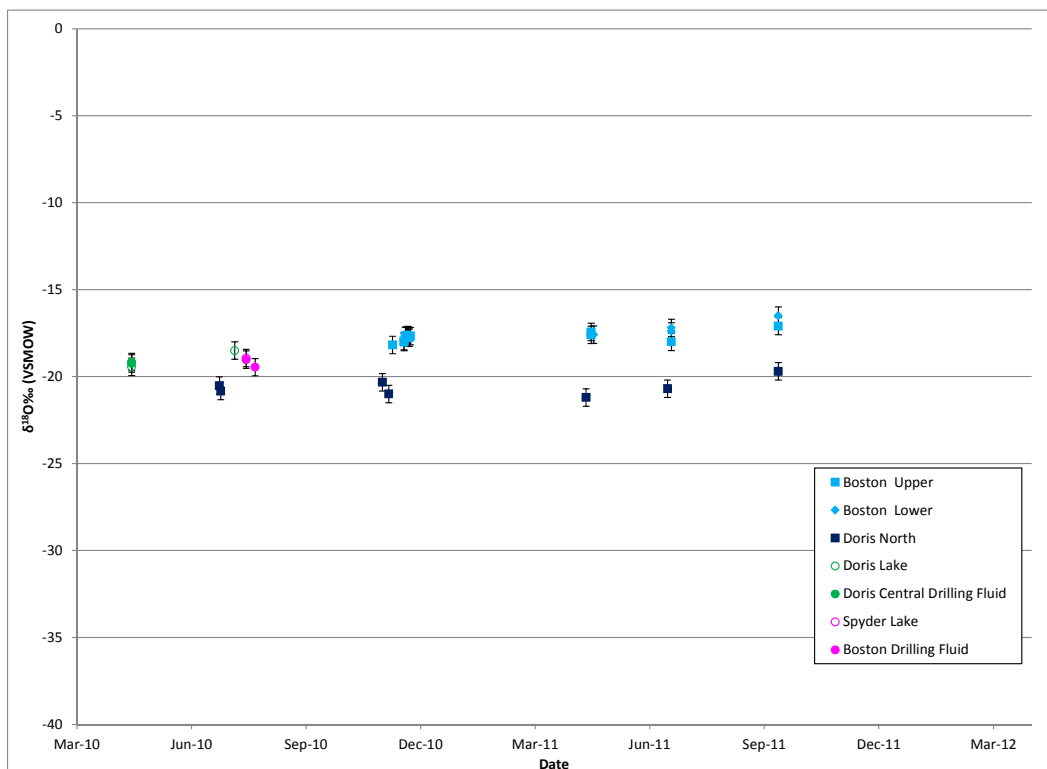


Figure 7: Plot of $\delta^{18}\text{O}$ Versus Time from Doris North and Boston

5 Conclusions

The 2011 groundwater chemistry results from both Doris Central and Boston have shown evidence of stabilization. The groundwater across the Hope Bay Belt is saline, but not quite to the same extent as seawater. Doris Central groundwater is a sodium and chloride type groundwater while Boston groundwater is a calcium and chloride type. The results from these analysis have shown that Doris Central has similar chemistry in Zones 6 and 10 (the upper zones) while Zone 1 (the lower zone), which is below a large diabase dyke, has higher calcium and lower concentrations of most other parameters.

Although chemistry between these locations has some differences, there are comparable similarities to the deep Doris Central groundwater and Boston as well as significant similarities between Zones 6 and 10 in Doris Central. The Westbay at Doris North is subject to rock mass with very low hydraulic conductivity and has been difficult to develop.

Doris Central Zones 6 and 10 had fluctuations of some parameters, such as zinc and iron where no discernible trend exists. Arsenic and selenium were below detection limits on most samples in these zones while ammonia has been high in the 2011 sampling events, exceeding 3 mg/L. Doris North had the highest concentration of ammonia across the belt, at 8 mg/L. Doris North chemistry supports that drilling brine is still present with high concentrations of calcium and chloride and no obvious trends for other parameters. Boston may be a mixture of drilling brine and natural formation water as the general chemistry has moderate concentrations of calcium and constant concentrations of sodium and magnesium, which are lower than that of Doris Central.

The isotope (δD and $\delta^{18}O$) values from Doris Central Zones 6 and 10 show that the drilling water and the water from the groundwater zones sampled had different isotopic signatures, indicating the water present in the zones is not drilling water, but likely formation water. The isotope values for the zones and specifically the ports sampled in each of the zones varied little during the 2011 sampling period indicating that these zones have reached steady state conditions. Isotope data from Doris Central Zone 1, Doris North and Boston differed from that of drilling water. However, the differences were more subtle and therefore it was not clear whether all of the drilling water has been removed from these installations. It is recommended that additional samples be collected from the current Westbay systems installed at Hope Bay to aid in continuing to characterize the groundwater quality. Since the water in the zones appears to have slight differences in analytical results it is recommended that samples for chemistry be collected from both ports in a zone where possible.

This report, "**Hope Bay – 2011 Groundwater Quality Report**", was prepared by

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6 References

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Appendix A – Groundwater Chemistry

Sample Location	Sample label	Deposit	Zone	Sample Source	Location of port in zone	Cumulative Purge Volume	Field Data	Field pH	Field Electrical Conductivity	Field Turbidity	Field DO	Field Temperature	Field Dep	Field Salinity	Field TDS	Field oT	Field ORP	ALS DATA	ALS File No.	Date Lab Received	ALS Report Date	RESULTS OF ANALYSIS	ALS SRK Sample ID	ALS Date Sampled	ALS Time Sampled	ALS Sample ID	Matrix	Physical Tests	Conductivity (EC)	Density	Hardness (as CaCO3)	pH	
						Litres			mS/cm	NTU	mg/L	°C	m	%															uS/cm	kg/L	mg/L	pH	
Doris Central Zone 1																																	
10WBW001	10WBW001-Zone 1-Port Initial-S01b	Doris Central	1	Westbay Port	Meas Port Upper	0		8.03	>20	-	-	-	-	-	-	-	-	-	L909782	17-Jul-10 13:05	28-Jul-10		10WBW001-01	08-JUL-10	15:00	L909782-1	Water		47600	1.02	11700	7.67	
10WBW001	10WBW001-Zone 1-Port Purge-S17	Doris Central	1	Westbay Port	Meas Port Upper	1189		8	>20	-	-	14.4	-	-	-	-	-	-	L915201	01-Aug-10 11:24	13-Aug-10		10WBW001-17	25-JUL-10	11:25	L915201-3	Water		47400	-	11500	7.91	
10WBW001	10WBW001-Zone 1-Airlift Purge - S20	Doris Central	1	Westbay airlift	Pump Port Middle	1368		8.19	>20	-	-	3.9	-	-	-	-	-	-	L915201	01-Aug-10 11:24	13-Aug-10		10WBW001-20	25-JUL-10	17:11	L915201-6	Water		47500	-	10900	7.83	
10WBW001	10WBW001-Zone 1-Airlift Final-S25	Doris Central	1	Westbay airlift	Pump Port Middle	3065		8.24	>20	-	-	-	-	-	-	-	-	-	L915201	01-Aug-10 11:24	13-Aug-10		10WBW001-25	25-JUL-10	12:37	L915201-13	Water		47600	-	11500	7.65	
10WBW001	10WBW001-Zone 1-Airlift Final-S26D	Doris Central	1	Westbay airlift	Pump Port Middle	3065		8.24	>20	-	-	-	-	-	-	-	-	-	L915201	01-Aug-10 11:24	13-Aug-10		10WBW001-26	25-JUL-10	12:37	L915201-14	Water		47600	-	11100	7.72	
10WBW001	10WBW001-Zone 1-Port Final-S35	Doris Central	1	Westbay Port	Meas Port Upper	3186		8.44	>20	-	-	-	-	-	-	-	-	-	L917645	09-Aug-10 09:10	20-Aug-10		10WBW001-35	04-AUG-10	13:42	L917645-1	Seawater		46600	-	12700	7.43	
10WBW001	10WBW001-Zone 1-Port after 2mths-S100	Doris Central	1	Westbay Port	Meas Port Upper	3189		7.73	52	72.85	11.2	11.79	-0.5	3.5	32.5	26.5	39.5		L946743	25-Oct-10 11:21	10-Dec-10		10WBW001-100	19-OCT-10	12:00	L946743-1	Seawater		46700	1.01	12600	7.38	
10WBW001	10WBW001-Zone 1-Port after bulk-S106	Doris Central	1	Westbay Port	Meas Port Upper	3192		6.00	52.65	211	11.43	4.51	-1.00	3.50	32.00	26.50	15.00		L949713	02-Nov-10 10:21	01-Dec-10		10WBW001-106	30-OCT-10	13:00	L949713-3	Seawater		46900	1.03	12100	7.69	
10WBW001	10WBW001-Zone 1-Final-S300	Doris Central	1	Westbay Port	Meas Port Upper	3192		7.79	>40	-	-	11.7	-	-	-	-	-	-	L994212	11-Apr-11 16:00	02-May-11		10WBW001-Z1-300	06-APR-11	09:00	L994212-1	Water		46700	1.03	12200	7.09	
10WBW001	10WBW001 - Zone 1	Doris Central	1	Westbay Port	Meas Port Upper	3195		6.93	48.32	-1.1	9.24	6.04	-	30.8	31.29	-	199.7		L1060818				10WBW001-Z1-501	12-SEP-11	07:00	L1060818-2	Water		48500	1.02	12300	7.21	
Doris Central Zone 6																																	
10WBW001	10WBW001-Zone 6-Port Initial-S02b	Doris Central	6	Westbay Port	Meas Port Upper	0		6.975	>20	-	-	-	-	-	-	-	-	-	L909782	17-Jul-10 13:05	28-Jul-10		10WBW001-02	09-JUL-10	14:00	L909782-2	Water		52800	1.02	9980	6.90	
10WBW001	10WBW001-Zone 6-Airlift Purge -S28	Doris Central	6	Westbay airlift	Pump Port Lower	516		8.04	>20	-	-	2.8	-	-	-	-	-	-	L915201	01-Aug-10 11:24	13-Aug-10		10WBW001-28	26-JUL-10	16:23	L915201-16	Water		41600	-	7280	7.58	
10WBW001	10WBW001-Zone 6-Airlift Purge-S31	Doris Central	6	Westbay airlift	Pump Port Lower	1515		7.78	>20	-	-	2.6	-	-	-	-	-	-	L915201	01-Aug-10 11:24	13-Aug-10		10WBW001-31	27-JUL-10	10:35	L915201-19	Water		42900	-	8550	7.51	
10WBW001	10WBW001-Zone 6-Airlift Final-S33	Doris Central	6	Westbay airlift	Pump Port Lower	6433		7.52	>20	-	-	3.1	-	-	-	-	-	-	L915201	01-Aug-10 11:24	13-Aug-10		10WBW001-33	27-JUL-10	15:21	L915201-21	Water		44400	-	8870	7.43	
10WBW001	10WBW001-Zone 6-Port Final-S36	Doris Central	6	Westbay Port	Meas Port Upper	8096		8.27	>20	-	-	9.6	-	-	-	-	-	-	L917645	09-Aug-10 09:10	20-Aug-10		10WBW001-36	05-AUG-10	09:00	L917645-2	Seawater		24600	-	4760	7.83	
10WBW001	10WBW001-Zone 6-Port after 2mths-S101	Doris Central	6	Westbay Port	Meas Port Upper	8099		7.91	40.3	118	12.23	7.44	-1	2.5	25	20	10		L946743	25-Oct-10 11:21	10-Dec-10		10WBW001-101	19-OCT-10	15:00	L946743-2	Seawater		34900	1.01	6720	7.79	
10WBW001	10WBW001-Zone 6-Airlift 160L sample-S103	Doris Central	6	Westbay airlift	Pump Port Lower	10639		5.59	60.13	7.30	11.52	2.66	-1.00	3.77	36.00	30.00	-115.00		L948685	29-Oct-10 10:28	22-Nov-10		10WBW001-103	25-OCT-10	00:00	L948685-2	Water		48500	-	10000	7.04	
10WBW001	10WBW001-Zone 6-Airlift 80L sample-S107	Doris Central	6	Westbay airlift	Pump Port Lower	13589		6.35	62.75	6.20	12.33	1.73	0.00	3.90	37.50	31.50	-110.00		L949713	02-Nov-10 10:21	01-Dec-10		10WBW001-107	30-OCT-10	14:00	L949713-4	Seawater		48800	1.03	9760	7.46	
10WBW001	10WBW001-Zone 6-Port after bulk-S108	Doris Central	6	Westbay Port	Meas Port Upper	13592		7.29	44.10	38.90	8.26	6.47	0.00	2.75	27.00	21.50	-55.00		L951724	08-Nov-10 09:23	16-Dec-10		10WBW001-108	01-NOV-10	15:00	L951724-2	Water and Seawater		37000	1.03	7340	7.59	
10WBW001	10WBW001-Zone 6-Final-S301	Doris Central	6	Westbay Port	Meas Port Upper	13592		7.71	>20	-	-	8.5	-	-	-	-	-	-	L994212	11-Apr-11 16:00	02-May-11		10WBW001-Z6-301	06-APR-11	14:00	L994212-2	Water		45500	1.03	8720	7.67	
10WBW001	10WBW001-Zone 6 Lower-Final-S304	Doris Central	6	Westbay Port	Meas Port Lower	13595		7.07	>20	-	-	11.7	-	-	-	-	-	-	L994212	11-Apr-11 16:00	02-May-11		10WBW001-Z6-304	08-APR-11	16:00	L994212-5	Water		57300	1.03	11800	7.37	
10WBW001	10WBW001 - Zone 6 upper (duplicate)	Doris Central	6	Westbay Port	Meas Port Upper	13598		6.91	50.02	12.3	9.35	5.65	-	32.12	32.43	-	-66.7		L1060818	20-Sep-11	21-Oct-11		10WBW001-Z6-502	12-SEP-11	10:30	L1060818-3	Water		49300	1.02	9220	7.63	
10WBW001	10WBW001 - Zone 6 upper (duplicate)	Doris Central	6	Westbay Port	Meas Port Upper	13600		6.91	50.02	12.3	9.35	5.65	-	32.12	32.43	-	-66.7		L1060818	20-Sep-11	21-Oct-11		10WBW001-Z6-503	12-SEP-11	10:30	L1060818-4	Water		47000	1.02	9270	7.35	
10WBW001	10WBW001 - Zone 6 lower	Doris Central	6	Westbay Port	Meas Port Lower	13603		7.07	62.28	1.8	11.37	3.3	-	40.54	40.45	-	-70.4		L1060818	20-Sep-11	21-Oct-11		10WBW001-Z6-504	12-SEP-11	02:00	L1060818-5	Water		56800	1	12200	7.09	
Doris Central Zone 10																																	
10WBW001	10WBW001-Zone 10-Port Initial-S03b	Doris Central	10																														

Sample Location	Sample label	Salinity (EC)	Total Dissolved Solids	Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Total (as CaCO3)	Ammonia as N	Bromide (Br)	Chloride (Cl)	Fluoride (F)	Nitrate (as N)	Nitrite (as N)	Ortho Phosphate as P	Total Phosphate as P	Silicate (as SiO2)	Sulfate (SO4)	Additional Anions and Nutrients	Bicarbonate (HCO3)	Carbonate (CO3)	Hydroxide (OH)	Ion Balance	Nitrate and Nitrite as N	TDS (Calculated)	Total Metals	Aluminum (Al)-Total	Antimony (Sb)-Total	Arsenic (As)-Total	
		g/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	mg/L	%	mg/L	mg/L		mg/L	mg/L	mg/L
Doris Central Zone 1																														
10WBW001	10WBW001-Zone 1-Port Initial-S01b	-	33100		8.4	-	-	-	-	-	18200	<5	<5	<5	-	-	-	1020		10.2	<5	<5	100	<7.1	30700		0.42	<0.008	<0.08	
10WBW001	10WBW001-Zone 1-Port Purge-S17	-	32400		9.7	-	-	-	-	-	19100	<1	<1	<1	-	-	-	1010		11.9	<5	<5	094	<1.4	31500		<2	<0.08	0.113	
10WBW001	10WBW001-Zone 1-Airlift Purge - S20	-	33200		9.3	-	-	-	-	-	19000	<1	<1	<1	-	-	-	0997		011	<5	<5	89.9	<1.4	30800		<2	<0.08	0.114	
10WBW001	10WBW001-Zone 1-Airlift Final-S25	-	33300		8.2	-	-	-	-	-	18700	<1	<1	<1	-	-	-	0960		010	<5	<5	95.5	<1.4	31000		<2	<0.08	0.296	
10WBW001	10WBW001-Zone 1-Airlift Final-S26D	-	32400		7.9	-	-	-	-	-	18800	<1	<1	<1	-	-	-	0964		010	<5	<5	89.8	<1.4	30500		<2	<0.08	0.101	
10WBW001	10WBW001-Zone 1-Port Final-S35	-	47800		<2	-	-	-	-	100	19000	<0.75	<0.5	<0.1	-	-	-	0981		-	-	-	001	-	-	0.0992	<0.0005	<0.002		
10WBW001	10WBW001-Zone 1-Port after 2mths-S100	30.50	42300		<2	<2	<2	<2	-	101	19000	<0.75	0.96	<0.1	0.0264	-	7.8	980		-	-	-	-	-	-	0.0136	<0.0005	<0.002		
10WBW001	10WBW001-Zone 1-Port after bulk-S106	31.2	47500		<2	<2	<2	<2	0.0631	101	18400	<0.75	<0.5	<0.1	0.0086	0.0163	<10	935		-	-	-	-	-	-	0.0086	<0.0005	<0.002		
10WBW001	10WBW001-Zone 1-Final-S300	-	41200		2.7	<2.0	<2.0	2.7	0.0619	100	19000	<0.75	<0.50	<0.10	<0.0010	0.0094	<10	944		-	-	-	-	-	-	0.0109	0.00081	<0.0020		
10WBW001	10WBW001 - Zone 1	-	36500		<2.0	<2.0	<2.0	<2.0	0.0538	122	18600	0.057	<0.50	<0.10	0.0031	0.0194	5.3	972		-	-	-	-	-	-	0.0089	0.00063	<0.0050		
Doris Central Zone 6																														
10WBW001	10WBW001-Zone 6-Port Initial-S02b	-	36900		-	-	-	87.3	-	-	20100	<5	<5	<5	-	-	-	2090		106.0	<5	<5	098	<7.1	34600		<0.2	<0.008	<0.08	
10WBW001	10WBW001-Zone 6-Airlift Purge -S28	-	29000		-	-	-	63.4	-	-	15900	<1	<1	<1	-	-	-	1690		77.3	<5	<5	089	<1.4	26500		<2	<0.08	0.085	
10WBW001	10WBW001-Zone 6-Airlift Purge-S31	-	30000		-	-	-	67.7	-	-	16500	<1	<1	<1	-	-	-	1760		82.7	<5	<5	103.0	<1.4	29000		<2	<0.08	0.095	
10WBW001	10WBW001-Zone 6-Airlift Final-S33	-	30400		-	-	-	70.8	-	-	17100	<1	<1	<1	-	-	-	1820		86.4	<5	<5	103.0	<1.4	30000		<2	<0.08	0.121	
10WBW001	10WBW001-Zone 6-Port Final-S36	-	19600		-	-	-	44.2	-	21.2	09130	<0.75	<0.5	<0.1	-	-	-	0940		-	-	-	-	-	-	0.0281	0.00745	0.003		
10WBW001	10WBW001-Zone 6-Port after 2mths-S101	22.10	28900		44.2	<2	<2	44.2	-	38.1	13400	<0.75	<0.5	<0.1	0.0017	-	5.0	1390		-	-	-	-	-	-	0.0052	0.005	<0.002		
10WBW001	10WBW001-Zone 6-Airlift 160L sample-S103	32.4	35400		-	-	-	72.4	3.14	49.1	19000	0.091	<0.5	<0.1	-	0.0262	6.1	2020		-	-	-	-	-	-	0.0318	0.00127	0.007		
10WBW001	10WBW001-Zone 6-Airlift 80L sample-S107	32.6	39000		76.5	<1	<1	76.5	3.37	52	19100	<0.75	<1	<0.2	<0.001	0.0124	9.7	2000		-	-	-	-	-	-	0.0053	0.00115	0.0068		
10WBW001	10WBW001-Zone 6-Port after bulk-S108	23.5	25500		43.7	<2	<2	43.7	2.32	41.3	14200	<0.75	<0.5	<0.1	<0.001	0.0162	5.8	1500		-	-	-	-	-	-	0.0059	0.00461	<0.002		
10WBW001	10WBW001-Zone 6-Final-S301	-	36100		49.8	<2.0	<2.0	49.8	2.90	67	18300	<0.75	<1.0	<0.20	0.0012	0.0314	9.0	1780		-	-	-	-	-	-	0.0058	<0.00050	<0.0020		
10WBW001	10WBW001-Zone 6 Lower-Final-S304	-	48300		102	<2.0	<2.0	102	3.65	84	24000	<0.75	<1.0	<0.20	<0.0010	0.0145	9.1	2450		-	-	-	-	-	-	0.168	<0.00050	<0.0020		
10WBW001	10WBW001 - Zone 6 upper (duplicate)	-	34600		44.1	<2.0	<2.0	44.1	3.22	67.3	18800	0.087	0.53	<0.10	<0.0010	0.0316	9.9	2000		-	-	-	-	-	-	0.0102	0.00067	<0.020		
10WBW001	10WBW001 - Zone 6 upper (duplicate)	-	33500		44.7	<2.0	<2.0	44.7	3.16	68	19000	0.083	0.6	<0.10	<0.0010	0.0306	8.2	2030		-	-	-	-	-	-	<0.0050	0.00058	<0.0030		
10WBW001	10WBW001 - Zone 6 lower	-	40200		47.4	<2.0	<2.0	47.4	3.87	83.6	23600	0.075	0.61	<0.10	<0.0010	0.0137	12.2	2510		-	-	-	-	-	-	0.015	0.00069	<0.010		
Doris Central Zone 10																														
10WBW001	10WBW001-Zone 10-Port Initial-S03b	-	18700		-	-	-	66.3	-	-	9650	<5	<5	<5	-	-	-	995		80.9	<5	<5	101	<7.1	16800		<0.2	<0.008	<0.08	
10WBW001	10WBW001-Zone 10-Port InitialD-S04b	-	18500		-	-	-	64.8	-	-	9610	<5	<5	<5	-	-	-	991		79.0	<5	<5	103	<7.1	16900		<0.2	<0.008	<0.08	
10WBW001	10WBW001-Zone 10-Airlift Purge-S12	-	27700		-	-	-	90.6	-	-	15200	<2.5	<2.5	<2.5	-	-	-	1490		111	<5	<5	99.4	<3.5	26300		<2	<0.08	<0.08	
10WBW001	10WBW001-Zone 10-Airlift Purge-S14	-	31000		-	-	-	83.3	-	-	17100	<2.5	<2.5	<2.5	-	-	-	1700		102	<5	<5	96.7	<3.5	29300		<2	<0.08	0.098	
10WBW001	10WBW001-Zone 10-Airlift Purge-S15	-	32200		-	-	-	82.3	-	-	17700	<1	<1	<1	-	-	-	1750												

Sample Location	Sample label	Barium (Ba)- Total	Beryllium (Be)- Total	Bismuth (Bi)- Total	Boron (B)- Total	Cadmium (Cd)- Total	Calcium (Ca)- Total	Cesium (Cs)- Total	Chromium (Cr)-Total	Cobalt (Co)- Total	Copper (Cu)- Total	Gallium (Ga)- Total	Iron (Fe)-Total	Lead (Pb)-Total	Lithium (Li)-Total	Magnesium (Mg)-Total	Manganese (Mn)-Total	Mercury (Hg)- Total	Molybdenum (Mo)-Total	Nickel (Ni)- Total	Phosphorus (P)- Total	Potassium (K)- Total	Rhenium (Re)- Total	Rubidium (Rb)-Total	Selenium (Se)- Total	Silicon (Si)- Total	Silver (Ag)-Total	Sodium (Na)- Total
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Doris Central Zone 1																												
10WBW001	10WBW001-Zone 1-Port Initial-S01b	0.059	<0.2	-	3.11	<0.001	4650	-	0.036	0.0046	<0.02	-	2.27	0.0021	0.37	181	1.44	<0.0001	0.0411	0.0774	-	057	-	-	<0.4	-	<0.002	7390
10WBW001	10WBW001-Zone 1-Port Purge-S17	0.046	<0.2	-	2.38	<0.01	4100	-	0.960	<0.04	<0.2	-	0.51	<0.02	<1.2	076	0.77	<0.0001	0.0200	0.0740	-	036	-	-	<0.4	-	<0.02	6290
10WBW001	10WBW001-Zone 1-Airlift Purge- S20	0.054	<0.2	-	2.59	<0.01	4430	-	0.95	<0.04	<0.2	-	0.68	<0.02	<1.2	066	0.71	<0.0001	<0.02	0.071	-	035	-	-	<0.4	-	<0.02	6580
10WBW001	10WBW001-Zone 1-Airlift Final-S25	0.054	<0.2	-	2.56	<0.01	4430	-	0.62	<0.04	<0.2	-	0.15	<0.02	<1.2	0051	0.62	<0.0001	<0.02	0.068	-	044	-	-	<0.4	-	<0.02	7420
10WBW001	10WBW001-Zone 1-Airlift Final-S26D	0.059	<0.2	-	2.50	<0.01	4380	-	0.74	<0.04	<0.2	-	0.16	<0.02	<1.2	0053	0.64	<0.0001	<0.02	0.074	-	045	-	-	<0.4	-	<0.02	7870
10WBW001	10WBW001-Zone 1-Port Final-S35	0.051	<0.0005	<0.0005	2.93	<0.00012	5070	0.00105	0.01	<0.0005	0.0018	<0.0005	0.46	0.0013	0.37	0071	0.72	-	0.0136	0.00437	<1	040	<0.0005	000	<0.002	2.61	<0.0002	7470
10WBW001	10WBW001-Zone 1-Port after 2mths-S100	0.053	<0.0005	<0.0005	2.89	0.000066	4960	0.00102	0.0006	0.000073	0.00059	<0.0005	0.24	<0.0003	0.346	064	0.72	<0.00001	0.0089	0.00075	<1	040	<0.0005	0.0526	<0.002	2.79	<0.0001	7200
10WBW001	10WBW001-Zone 1-Port after bulk-S106	0.0521	<0.0005	<0.0005	3.25	0.000085	4700	0.0011	0.0002	0.000051	0.00102	<0.0005	0.197	<0.0003	0.381	67.8	0.712	<0.00001	0.0088	0.00265	<1	39	<0.0005	0.0531	<0.002	2.47	<0.0001	6850
10WBW001	10WBW001-Zone 1-Final-S300	0.0539	<0.00050	<0.00050	3.05	<0.000050	4930	0.00101	0.0139	0.000241	0.00354	<0.00050	0.256	0.00061	0.375	74.9	0.750	<0.000010	0.0145	0.00733	<1.0	41	<0.00050	0.0546	<0.0020	2.51	<0.00010	7290
10WBW001	10WBW001 - Zone 1	0.0477	<0.00050	<0.00050	2.48	<0.00012	5010	0.00095	0.00481	0.000322	0.00064	<0.00050	0.274	<0.00030	0.301	71.4	0.69	<0.000050	0.0107	0.00346	<1.0	39	<0.00050	0.0481	<0.030	2.55	<0.00010	7130
Doris Central Zone 6																												
10WBW001	10WBW001-Zone 6-Port Initial-S02b	0.072	<0.2	-	2.88	<0.001	1750	-	0.033	<0.004	<0.02	-	12.00	0.002	0.37	1540	2.62	<0.0001	0.0059	0.0335	-	268	-	-	<0.4	-	<0.002	9750
10WBW001	10WBW001-Zone 6-Airlift Purge- S28	0.139	<0.2	-	1.54	<0.01	1180	-	0.660	<0.04	<0.2	-	4.74	<0.02	<1.2	1120	1.27	<0.0001	0.0250	<0.04	-	185	-	-	<0.4	-	<0.02	6830
10WBW001	10WBW001-Zone 6-Airlift Purge-S31	0.125	<0.2	-	1.64	<0.01	1370	-	0.72	<0.04	<0.2	-	3.33	<0.02	<1.2	1290	1.73	<0.0001	0.02	<0.04	-	227	-	-	<0.4	-	<0.02	8290
10WBW001	10WBW001-Zone 6-Airlift Final-S33	0.107	<0.2	-	1.91	<0.01	1280	-	0.86	<0.04	<0.2	-	3.54	<0.02	<1.2	1210	1.81	<0.0001	<0.02	<0.04	-	203	-	-	<0.4	-	<0.02	7450
10WBW001	10WBW001-Zone 6-Port Final-S36	0.130	<0.0005	<0.0005	1.04	<0.00012	0805	0.00072	0.00	<0.0005	<0.001	<0.0005	1.60	<0.001	0.093	0739	0.56		0.0403	0.00159	<1	125	<0.0005	0.0765	<0.002	2.88	<0.0002	4460
10WBW001	10WBW001-Zone 6-Port after 2mths-S101	0.175	<0.0005	<0.0005	1.38	<0.00005	1140	0.00091	0.00	0.000092	<0.0005	<0.0005	2.94	0.00035	0.117	1010	0.95	<0.00001	0.037	0.00059	<1	171	<0.0005	0.104	<0.002	3.5	<0.0001	6410
10WBW001	10WBW001-Zone 6-Airlift 160L sample-S103	0.117	<0.0005	<0.0005	2.65	<0.00005	1600	0.00155	<0.0005	0.000381	<0.0005	<0.0005	4.53	<0.0003	0.228	1510	2.08	<0.00005	0.0140	0.00095	<1	240	<0.0005	0.1420	<0.002	3.68	<0.0001	9350
10WBW001	10WBW001-Zone 6-Airlift 80L sample-S107	0.112	<0.0005	<0.0005	2.66	<0.00005	1570	0.00155	<0.0001	0.000356	<0.0005	<0.0005	4.56	<0.0003	0.217	1480	2.13	<0.00001	0.012	0.00098	<1	233	<0.0005	0.141	<0.002	3.48	<0.0001	9170
10WBW001	10WBW001-Zone 6-Port after bulk-S108	0.169	<0.0005	<0.0005	1.50	<0.00005	1170	0.00095	<0.0005	0.000103	0.00061	<0.0005	2.28	<0.0003	0.131	1080	0.892		0.0361	0.00120	<1	172	<0.0005	0.102	<0.002	3.82	0.00018	6790
10WBW001	10WBW001-Zone 6-Final-S301	0.181	<0.00050	<0.00050	1.79	<0.000050	1420	0.00114	0.00163	0.000078	0.00065	<0.00050	4.41	0.00044	0.167	1280	1.25	<0.000010	0.0292	0.00169	<1.0	210	<0.00050	0.133	<0.0020	3.36	<0.00010	8390
10WBW001	10WBW001-Zone 6 Lower-Final-S304	0.0615	<0.00050	<0.00050	3.33	0.000130	2140	0.00203	0.00321	0.000535	0.00181	<0.00050	10.3	0.00111	0.470	1760	2.45	<0.000010	0.0051	0.00192	<1.0	286	<0.00050	0.193	<0.0020	4.1	<0.00010	11300
10WBW001	10WBW001 - Zone 6 upper (duplicate)	0.131	<0.00050	<0.00050	1.74	0.000076	1490	0.00127	0.00471	0.00019	0.00061	<0.00050	7.08	0.00051	0.158	1340	1.63	<0.000050	0.0211	0.00343	<1.0	213	<0.00050	0.128	<0.050	3.08	<0.00010	8560
10WBW001	10WBW001 - Zone 6 upper (duplicate)	0.135	<0.00050	<0.00050	1.9	0.000112	1490	0.00134	0.00697	0.000224	0.00057	<0.00050	7.29	<0.00030	0.171	1360	1.65	<0.000050	0.0225	0.00486	<1.0	218	<0.00050	0.141	<0.030	3.11	<0.00010	8720
10WBW001	10WBW001 - Zone 6 lower	0.0589	<0.00050	<0.00050	2.72	0.000087	1990	0.00194	0.004	0.00018	0.00061	<0.00050	9.46	0.00054	0.368	1670	2.4	<0.000050	0.0052	0.0029	<1.0	277	<0.00050	0.178	<0.050	3.6	<0.00010	10700
Doris Central Zone 10																												
10WBW001	10WBW001-Zone 10-Port Initial-S03b	0.187	<0.2	-	1.34	<0.001	851	-	<0.016	<0.004	<0.02	-	3.53	<0.002	0.13	726	1.04	<0.0001	0.0244	0.0138	-	114	-	-	<0.4	-	<0.002	4860
10WBW001	10WBW001-Zone 10-Port InitialD-S04b	0.185	<0.2	-	1.37	<0.001	867	-	0.024	<0.004	<0.02	-	3.65	<0.002	0.14	736	1.06	<0.0001	0.0237	0.0144	-	116	-	-	<0.4	-	<0.002	4930
10WBW001	10WBW001-Zone 10-Airlift Purge-S12	0.125	<0.2	-	1.91	<0.01	1120	-	<0.16	<0.04	<0.2	-	7.51	<0.02	<1.2	914	1.23	<0.0001	<0.02	<0.04	-	211	-	-	0.106	-	<0.02	6640
10WBW001	10WBW001-Zone 10-Airlift Purge-S14	0.136	<0.2	-	2.22	<0.01	1290	-	0.55	<0.04	<0.2	-	5.08	<0.02	<1.2	1020	1.40	<0.0001	<0.02	<0.04	-	223	-	-	0.147	-	<0.02	7150
10WBW001	10WBW001-Zone 10-Airlift Purge-S15	0.102	<0.2	-	2.32	<0.01	1590	-	0.61	<0.04	<0.2	-	7.15	<0.02	<1.2	1290	1.73	<0.0001	<0.02	<0.04	-	294	-	-	<0.4	-	<0.02	9260
10WBW001	10WBW001-Zone 10-Airlift Final-S16D	0.113	<0.2	-	2.31	<0.01	1580	-	0.66	<0.04	<0.2	-	7.14	<0.02	<1.2	1290	1.76	<0.0001	<0.02	<0.04	-	292	-	-	<0.4	-	<0.02	9580
10WBW001	10WBW001-Zone 10-Port Final-S37	0.179	<0.0005	<0.0005	1.51	<0.00012	1020	0.00097	0.0030	<0.0005	<0.001	<0.0005	3.95	<0.001	0.128	867	1.09	-	0.0225	0.00237	<1	166	<0.0005	0.0816	<0.002	2.12	<0.0002	5590
10WBW001	10WBW001-Zone 10-Port after 2mths-S102	0.177	<0.0005	<0.0005	1.53	<0.00005	1080	0.001	0.00011	0.000084	<0.0005	<0.0005	4.31	<0.0003	0.128	797	1.15	<0.00001	0.0244	<0.0005	<1	166	<0.0005	0.0842	<0.002	2.42	<0.0001	5530
10WBW001	10WBW001-Zone 10-Port after bulk-S105	0.129	<0.0005	<0.0005	2.8	<0.00005	1540	0.00151	0.00016	0.000132	<0.0005	<0.0005	11	<0.0003	0.2	1230	1.73	<0.00001	0.0072	<0.0005	<1	262	<0.0005	0.104	<0.002	3.51	<0.0001	8990
10WBW001	10WBW001-Zone 10-Final-S302	0.105	<0.00050	<0.00050	2.72	0.000411	1630	0.00120	0.00132	0.000159	0.00122	<0.00050	9.52	0.00051	0.194	1250	1.29	<0.000010	0.0056	0.00230	<1.0	261	<0.00050	0.114	<0.0020	3.22	<0.00010	9090
10WBW001	10WBW001-Zone 10 Lower-Final-S303	0.0680	<0.00050	<0.00050	2.81	0.000095	2130	0.00085	0.00294	0.000171	<0.00050	<0.00050	1.45	0.00083	0.192	1480	2.04	<0.000010	<0.0020	0.00185	<1.0	282	<0.00050	0.115	<0.0020	3.6	<0.00010	10200
10WBW001	10WBW001 - Zone 10 upper	0.111	<0.00050	<0.00050	1.92	<0.000050	1580	0.00105	0.00364	0.000235	0.00346	<0.00050	6.7	<0.00030	0.143	1230	1.3	<0.000050	0.0062	0.00363	<1.0	243	<0.00050	0.0949	<0.030	3.38	<0.00010	8680
10WBW001	10WBW001 - Zone 10 lower	0.0647																										

Sample Location	Sample label	Strontium (Sr)-Total	Tellurium (Te)-Total	Thallium (Tl)-Total	Thorium (Th)-Total	Tin (Sn)-Total	Titanium (Ti)-Total	Tungsten (W)-Total	Uranium (U)-Total	Vanadium (V)-Total	Yttrium (Y)-Total	Zinc (Zn)-Total	Zirconium (Zr)-Total	Dissolved Metals	Aluminum (Al)-Dissolved	Antimony (Sb)-Dissolved	Arsenic (As)-Dissolved	Barium (Ba)-Dissolved	Beryllium (Be)-Dissolved	Bismuth (Bi)-Dissolved	Boron (B)-Dissolved	Cadmium (Cd)-Dissolved	Calcium (Ca)-Dissolved	Cesium (Cs)-Dissolved
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Doris Central Zone 1																								
10WBW001	10WBW001-Zone 1-Port Initial-S01b	-	-	<0.002	-	<0.05	0.052	-	<0.002	<0.1	-	<0.08	-		0.12	<0.008	<0.08	0.057	<0.01	-	3.19	<0.001	4390	-
10WBW001	10WBW001-Zone 1-Port Purge-S17	-	-	<0.02	-	<0.08	<0.12	-	<0.02	0.31	-	<0.8	-		<1	<0.08	0.103	0.052	<0.1	-	2.64	<0.01	4480	-
10WBW001	10WBW001-Zone 1-Airlift Purge-S20	-	-	<0.02	-	<0.08	<0.12	-	<0.02	0.33	-	<0.8	-		<1	<0.08	0.103	0.048	<0.1	-	2.62	<0.01	4260	-
10WBW001	10WBW001-Zone 1-Airlift Final-S25	-	-	<0.02	-	<0.08	<0.12	-	<0.02	0.21	-	<0.8	-		<1	<0.08	<0.08	0.051	<0.1	-	2.87	<0.01	4520	-
10WBW001	10WBW001-Zone 1-Airlift Final-S26D	-	-	<0.02	-	<0.08	<0.12	-	<0.02	0.23	-	<0.8	-		<1	<0.08	0.090	0.052	<0.1	-	2.74	<0.01	4360	-
10WBW001	10WBW001-Zone 1-Port Final-S35	0060	<0.0005	<0.0005	<0.0005	<0.001	0.0082	<0.001	<0.0005	0.00	<0.0005	0.503	<0.0005		<0.005	<0.0005	<0.002	0.052	<0.0005	<0.0005	2.99	<0.00012	4960	0.00105
10WBW001	10WBW001-Zone 1-Port after 2mths-S100	57.2	<0.0005	<0.00005	<0.0005	<0.001	<0.005	0.0014	<0.00005	<0.0005	0.00052	0.279	<0.0005		<0.005	<0.0005	<0.002	0.053	<0.0005	<0.0005	2.92	0.000083	4920	0.00102
10WBW001	10WBW001-Zone 1-Port after bulk-S106	54.6	<0.0005	<0.00005	<0.0005	<0.001	<0.005	0.0016	<0.00005	<0.0005	0.00057	0.285	<0.0005		0.005	<0.0005	<0.002	0.0526	<0.0005	<0.0005	3.3	0.000097	4730	0.0011
10WBW001	10WBW001-Zone 1-Final-S300	57.7	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0018	<0.000050	<0.00050	<0.00050	0.150	<0.00050		<0.0050	<0.00050	<0.0020	0.0522	<0.00050	<0.00050	3.05	<0.000050	4770	0.00103
10WBW001	10WBW001-Zone 1	52.9	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0018	<0.000050	0.00138	<0.00050	0.279	<0.00050		<0.0050	<0.00050	<0.0020	0.051	<0.00050	<0.00050	2.54	0.000195	4820	0.00103
Doris Central Zone 6																								
10WBW001	10WBW001-Zone 6-Port Initial-S02b	-	-	<0.002	-	<0.05	<0.012	-	<0.002	0.17	-	0.088	-		<0.1	<0.008	<0.08	0.062	<0.01	-	2.44	<0.001	1640	-
10WBW001	10WBW001-Zone 6-Airlift Purge-S28	-	-	<0.02	-	<0.08	<0.12	-	<0.02	0.22	-	<0.8	-		<1	<0.08	<0.08	0.143	<0.1	-	1.64	<0.01	1150	-
10WBW001	10WBW001-Zone 6-Airlift Purge-S31	-	-	<0.02	-	<0.08	<0.12	-	<0.02	0.25	-	<0.8	-		<1	<0.08	<0.08	0.115	<0.1	-	2.03	<0.01	1330	-
10WBW001	10WBW001-Zone 6-Airlift Final-S33	-	-	<0.02	-	<0.08	<0.12	-	<0.02	0.27	-	<0.8	-		<1	<0.08	0.102	0.120	<0.1	-	1.97	<0.01	1390	-
10WBW001	10WBW001-Zone 6-Port Final-S36	9.72	<0.0005	<0.0005	<0.0005	<0.001	<0.005	0.0334	<0.0005	<0.0005	<0.0005	0.195	<0.0005		<0.005	0.00703	<0.002	0.120	<0.0005	<0.0005	0.94	<0.00012	749	0.00069
10WBW001	10WBW001-Zone 6-Port after 2mths-S101	13.9	<0.0005	<0.00005	<0.0005	<0.001	<0.005	0.0247	<0.00005	<0.0005	<0.0005	0.236	<0.0005		<0.005	0.0048	<0.002	0.178	<0.0005	<0.0005	1.38	<0.00005	1100	0.00094
10WBW001	10WBW001-Zone 6-Airlift 160L sample-S103	21.2	<0.0005	<0.00005	<0.0005	<0.001	<0.005	0.0056	0.00023	0.00054	<0.0005	0.046	<0.0005		<0.005	0.00121	0.0066	0.113	<0.0005	<0.0005	2.64	<0.00005	1550	0.00154
10WBW001	10WBW001-Zone 6-Airlift 80L sample-S107	19.9	<0.0005	<0.00005	<0.0005	<0.001	<0.005	0.0049	0.000228	<0.0005	<0.0005	0.0241	<0.0005		<0.005	0.00116	0.0069	0.115	<0.0005	<0.0005	2.61	<0.00005	1520	0.00159
10WBW001	10WBW001-Zone 6-Port after bulk-S108	14.6	<0.0005	<0.00005	<0.0005	<0.001	<0.005	0.0227	0.000059	<0.0005	<0.0005	0.115	<0.0005		<0.005	0.00393	<0.002	0.169	<0.0005	<0.0005	1.48	<0.00005	1160	0.00097
10WBW001	10WBW001-Zone 6-Final-S301	18.4	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0163	<0.000050	<0.00050	<0.00050	0.335	<0.00050		<0.0050	<0.00050	<0.0020	0.182	<0.00050	<0.00050	1.86	<0.000050	1400	0.00119
10WBW001	10WBW001-Zone 6 Lower-Final-S304	29.4	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0026	<0.000050	0.00157	<0.00050	0.217	<0.00050		<0.0050	<0.00050	<0.0020	0.0576	<0.00050	<0.00050	3.05	0.000100	2010	0.00180
10WBW001	10WBW001-Zone 6 upper (duplicate)	18	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0096	<0.000050	<0.00050	<0.00050	1.82	<0.00050		<0.0050	<0.00050	<0.0020	0.129	<0.00050	<0.00050	1.86	<0.000050	1480	0.00132
10WBW001	10WBW001-Zone 6 upper (duplicate)	18.7	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0096	<0.000050	<0.00050	<0.00050	0.376	<0.00050		<0.0050	<0.00050	<0.0020	0.125	<0.00050	<0.00050	1.98	<0.000050	1490	0.00132
10WBW001	10WBW001-Zone 6 lower	27.2	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0025	<0.000050	<0.00050	<0.00050	1.71	<0.00050		<0.0050	<0.00050	<0.0050	0.0568	<0.00050	<0.00050	2.83	0.000083	2030	0.00193
Doris Central Zone 10																								
10WBW001	10WBW001-Zone 10-Port Initial-S03b	-	-	<0.002	-	<0.05	<0.012	-	<0.002	<0.1	-	<0.08	-		0.13	<0.008	<0.08	0.186	<0.01	-	1.31	<0.001	822	-
10WBW001	10WBW001-Zone 10-Port InitialD-S04b	-	-	<0.002	-	<0.05	<0.012	-	<0.002	<0.1	-	<0.08	-		<0.1	<0.008	<0.08	0.188	<0.01	-	1.38	<0.001	837	-
10WBW001	10WBW001-Zone 10-Airlift Purge-S12	-	-	<0.02	-	<0.08	<0.12	-	<0.02	<0.1	-	<0.8	-		<1	<0.08	0.100	0.135	<0.1	-	2.06	<0.01	1230	-
10WBW001	10WBW001-Zone 10-Airlift Purge-S14	-	-	<0.02	-	<0.08	<0.12	-	<0.02	0.18	-	<0.8	-		<1	<0.08	0.116	0.105	<0.1	-	2.43	<0.01	1340	-
10WBW001	10WBW001-Zone 10-Airlift Purge-S15	-	-	<0.02	-	<0.08	<0.12	-	<0.02	0.20	-	<0.8	-		<1	<0.08	0.091	0.100	<0.1	-	2.23	<0.01	1420	-
10WBW001	10WBW001-Zone 10-Airlift Final-S16D	-	-	<0.02	-	<0.08	<0.12																	

Sample Location	Sample label	Chromium (Cr)-Dissolved	Cobalt (Co)-Dissolved	Copper (Cu)-Dissolved	Gallium (Ga)-Dissolved	Iron (Fe)-Dissolved	Lead (Pb)-Dissolved	Lithium (Li)-Dissolved	Magnesium (Mg)-Dissolved	Manganese (Mn)-Dissolved	Mercury (Hg)-Dissolved	Molybdenum (Mo)-Dissolved	Nickel (Ni)-Dissolved	Phosphorus (P)-Dissolved	Potassium (K)-Dissolved	Rhenium (Re)-Dissolved	Rubidium (Rb)-Dissolved	Selenium (Se)-Dissolved	Silicon (Si)-Dissolved	Silver (Ag)-Dissolved	Sodium (Na)-Dissolved
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Doris Central Zone 1																					
10WBW001	10WBW001-Zone 1-Port Initial-S01b	0.0444	0.0043	0.014	-	0.22	<0.002	0.370	172	1.34	<0.0001	0.0411	0.0817	-	054	-	-	<0.4	-	<0.002	6840
10WBW001	10WBW001-Zone 1-Port Purge-S17	0.8840	<0.02	<0.12	-	<0.15	<0.02	<0.6	080	0.81	<0.0001	0.0200	0.0640	-	043	-	-	<0.4	-	<0.02	6810
10WBW001	10WBW001-Zone 1-Airlift Purge - S20	0.899	<0.02	<0.12	-	<0.15	<0.02	<0.6	066	0.694	<0.0001	<0.02	0.055	-	039	-	-	<0.4	-	<0.02	6480
10WBW001	10WBW001-Zone 1-Airlift Final-S25	0.351	<0.02	<0.12	-	<0.15	<0.02	<0.6	0046	0.544	<0.0001	<0.02	0.061	-	039	-	-	<0.4	-	<0.02	6730
10WBW001	10WBW001-Zone 1-Airlift Final-S26D	0.532	<0.02	<0.12	-	<0.15	<0.02	<0.6	0045	0.53	<0.0001	<0.02	0.066	-	037	-	-	<0.4	-	<0.02	6260
10WBW001	10WBW001-Zone 1-Port Final-S35	<0.001	<0.0005	<0.001	<0.0005	<0.05	<0.001	0.37	0070	0.69	<	0.0128	<0.0005	<1	039	<0.0005	000	<0.002	2.3	<0.0002	7290
10WBW001	10WBW001-Zone 1-Port after 2mths-S100	<0.0001	<0.00005	<0.0005	<0.0005	0.06	<0.0003	0.350	064	0.71	<0.00001	0.0092	<0.0005	<1	039	<0.0005	0.0528	<0.002	2.42	<0.0001	7200
10WBW001	10WBW001-Zone 1-Port after bulk-S106	<0.0001	<0.00005	0.00067	<0.0005	0.075	<0.0003	0.39	68.1	0.725	<0.00001	0.009	0.00237	<1	40	<0.0005	0.0532	<0.002	2.43	<0.0001	6910
10WBW001	10WBW001-Zone 1-Final-S300	<0.00050	0.000059	0.00083	<0.00050	0.034	<0.00030	0.371	71.2	0.731	<0.000010	0.0112	0.00163	<1.0	39	<0.00050	0.0529	<0.0020	2.42	<0.00010	7020
10WBW001	10WBW001 - Zone 1	<0.00050	<0.000050	<0.00050	<0.00050	0.02	<0.00030	0.309	67.9	0.736	<0.000050	0.0102	0.0005	<1.0	38	<0.00050	0.0502	<0.0040	2.35	<0.00010	7030
Doris Central Zone 6																					
10WBW001	10WBW001-Zone 6-Port Initial-S02b	0.0385	<0.002	<0.012	-	9.26	<0.002	0.297	1430	2.48	<0.0001	<0.005	0.0289	-	251	-	-	<0.4	-	<0.002	9080
10WBW001	10WBW001-Zone 6-Airlift Purge -S28	0.3130	<0.02	<0.12	-	1.54	<0.02	<0.6	1070	1.17	<0.0001	0.0280	<0.02	-	170	-	-	<0.4	-	<0.02	6450
10WBW001	10WBW001-Zone 6-Airlift Purge-S31	0.451	<0.02	<0.12	-	2.87	<0.02	<0.6	1270	1.7	<0.0001	0.023	<0.02	-	186	-	-	<0.4	-	<0.02	7910
10WBW001	10WBW001-Zone 6-Airlift Final-S33	0.682	<0.02	<0.12	-	3.32	<0.02	<0.6	1310	1.96	<0.0001	<0.02	<0.02	-	194	-	-	<0.4	-	<0.02	8160
10WBW001	10WBW001-Zone 6-Port Final-S36	<0.001	<0.0005	<0.001	<0.0005	0.06	<0.001	0.087	702	0.53	-	0.0379	0.00076	<1	117	<0.0005	0.073	<0.002	2.48	<0.0002	4130
10WBW001	10WBW001-Zone 6-Port after 2mths-S101	<0.0001	0.000087	<0.0005	<0.0005	0.13	<0.0003	0.12	964	0.94	<0.00001	0.037	<0.0005	<1	160	<0.0005	0.109	<0.002	2.88	<0.0001	6010
10WBW001	10WBW001-Zone 6-Airlift 160L sample-S103	<0.0005	0.000315	<0.0005	<0.0005	4.31	<0.003	0.223	1490	2.03	<0.00005	0.0138	0.00101	<1	233	<0.0005	0.1400	<0.002	3.49	<0.0001	9130
10WBW001	10WBW001-Zone 6-Airlift 80L sample-S107	<0.0001	0.000312	<0.0005	<0.0005	4.55	<0.0003	0.223	1450	2.11	<0.00001	0.0122	0.00094	<1	229	<0.0005	0.139	<0.002	3.38	<0.0001	8980
10WBW001	10WBW001-Zone 6-Port after bulk-S108	<0.0005	0.000091	<0.0005	<0.0005	0.503	<0.0003	0.127	1080	0.888	-	0.0345	0.00158	<1	172	<0.0005	0.106	<0.002	3.33	<0.0001	6810
10WBW001	10WBW001-Zone 6-Final-S301	<0.00050	<0.000050	<0.00050	<0.00050	0.624	<0.00030	0.175	1270	1.22	<0.000010	0.0311	0.00100	<1.0	208	<0.00050	0.140	<0.0020	3.00	<0.00010	8270
10WBW001	10WBW001-Zone 6 Lower-Final-S304	<0.00050	0.000153	<0.00050	<0.00050	7.28	<0.00030	0.428	1640	2.15	<0.000010	0.0054	0.00140	<1.0	268	<0.00050	0.172	<0.0020	3.4	<0.00010	10600
10WBW001	10WBW001 - Zone 6 upper (duplicate)	<0.00050	0.000067	<0.00050	<0.00050	3.81	<0.00030	0.165	1340	1.7	<0.000050	0.0181	0.00063	<1.0	217	<0.00050	0.136	<0.010	3.24	<0.00010	8650
10WBW001	10WBW001 - Zone 6 upper (duplicate)	<0.00050	0.000075	<0.00050	<0.00050	3.96	<0.00030	0.173	1350	1.75	<0.000050	0.0187	0.00066	<1.0	218	<0.00050	0.141	<0.020	3.25	<0.00010	8670
10WBW001	10WBW001 - Zone 6 lower	<0.00050	0.000093	0.00054	<0.00050	8.91	<0.00030	0.379	1720	2.48	<0.000050	0.0044	0.00057	<1.0	282	<0.00050	0.182	<0.030	3.6	<0.00010	10900
Doris Central Zone 10																					
10WBW001	10WBW001-Zone 10-Port Initial-S03b	0.0178	<0.002	<0.012	-	1.88	<0.002	0.128	707	1.01	<0.0001	0.0240	0.0146	-	129	-	-	<0.4	-	<0.002	4470
10WBW001	10WBW001-Zone 10-Port InitialD-S04b	0.0264	<0.002	<0.012	-	1.63	<0.002	0.136	721	1.01	<0.0001	0.0239	0.0159	-	131	-	-	<0.4	-	<0.002	4540
10WBW001	10WBW001-Zone 10-Airlift Purge-S12	<0.8	<0.02	0.13	-	-	<0.02	<0.6	990	-	<0.0001	<0.02	0.032	-	225	-	-	0.107	-	<0.02	7130
10WBW001	10WBW001-Zone 10-Airlift Purge-S14	0.739	<0.02	<0.12	-	-	<0.02	<0.6	1070	-	<0.0001	<0.02	0.043	-	245	-	-	0.139	-	<0.02	7840
10WBW001	10WBW001-Zone 10-Airlift Purge-S15	0.747	<0.02	0.19	-	5.77	<0.02	<0.6	1170	1.56	<0.0001	<0.02	<0.02	-	206	-	-	<0.4	-	<0.02	7970
10WBW001	10WBW001-Zone 10-Airlift Final-S16D	0.874	<0.02	<0.12	-	6.25	<0.02	<0.6	1300	1.72	<0.0001	<0.02	<0.02	-	294	-	-	<0.4	-	<0.02	9450
10WBW001	10WBW001-Zone 10-Port Final-S37	<																			

Sample Location	Sample label	Strontium (Sr)-Dissolved	Tellurium (Te)-Dissolved	Thallium (Tl)-Dissolved	Thorium (Th)-Dissolved	Tin (Sn)-Dissolved	Titanium (Ti)-Dissolved	Tungsten (W)-Dissolved	Uranium (U)-Dissolved	Vanadium (V)-Dissolved	Yttrium (Y)-Dissolved	Zinc (Zn)-Dissolved	Zirconium (Zr)-Dissolved	Cation Balance	Anion Balance	Ion Balance	Isotope Chemistry	Delta 2H x 1000	Delta 18O x 1000
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L						
Doris Central Zone 1																			
10WBW001	10WBW001-Zone 1-Port Initial-S01b	-	-	<0.001	-	<0.05	0.0124	-	<0.002	0.129	-	0.044	-	531.98	-	-		-130.59	-17.82
10WBW001	10WBW001-Zone 1-Port Purge-S17	-	-	0.01	-	<0.05	<0.06	-	<0.02	0.291	-	<0.2	-	527.33	-	-		-134.14	-18.09
10WBW001	10WBW001-Zone 1-Airlift Purge - S20	-	-	0.013	-	<0.05	<0.06	-	<0.02	0.302	-	0.31	-	500.71	-	-		-135.5	-18.43
10WBW001	10WBW001-Zone 1-Airlift Final-S25	-	-	<0.01	-	<0.05	<0.06	-	<0.02	0.122	-	<0.2	-	522.93	-	-		-138.13	-19.06
10WBW001	10WBW001-Zone 1-Airlift Final-S26D	-	-	<0.01	-	<0.05	<0.06	-	<0.02	0.174	-	<0.2	-	494.39	-	-		-138.57	-19.07
10WBW001	10WBW001-Zone 1-Port Final-S35	58.9	<0.0005	<0.0005	<0.0005	<0.001	<0.005	<0.001	<0.0005	<0.0005	<0.0005	0.0897	<0.0005	571.18	-	-		-138	-18.83
10WBW001	10WBW001-Zone 1-Port after 2mths-S100	56.7	<0.0005	<0.00005	<0.0005	<0.001	<0.005	0.0014	<0.00005	<0.0005	0.00051	0.1130	<0.0005	-	-	-		-	-
10WBW001	10WBW001-Zone 1-Port after bulk-S106	55.1	<0.0005	<0.00005	<0.0005	<0.001	<0.005	0.0015	<0.00005	<0.0005	0.00054	0.137	<0.0005	-	-	-		-135.4	-18.63
10WBW001	10WBW001-Zone 1-Final-S300	55.8	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0018	<0.000050	<0.00050	<0.00050	0.157	<0.00050	550.10	554.92	0.44		-136.7	-18.61
10WBW001	10WBW001 - Zone 1	54.1	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0018	<0.000050	<0.00050	<0.00050	0.116	<0.00050	552.73	-	-		-138.1	-18.8
Doris Central Zone 6																			
10WBW001	10WBW001-Zone 6-Port Initial-S02b	-	-	<0.001	-	<0.05	<0.006	-	<0.002	0.152	-	0.041	-	600.69	611.46	0.89		-69.03	-8.98
10WBW001	10WBW001-Zone 6-Airlift Purge -S28	-	-	<0.01	-	<0.05	<0.06	-	<0.02	0.128	-	<0.2	-	430.20	484.34	5.92		-89.73	-11.49
10WBW001	10WBW001-Zone 6-Airlift Purge-S31	-	-	<0.01	-	<0.05	<0.06	-	<0.02	0.176	-	<0.2	-	519.52	502.79	1.64		-88.14	-11.09
10WBW001	10WBW001-Zone 6-Airlift Final-S33	-	-	<0.01	-	<0.05	<0.06	-	<0.02	0.229	-	<0.2	-	536.88	521.00	1.50		-85.71	-10.9
10WBW001	10WBW001-Zone 6-Port Final-S36	8.99	<0.0005	<0.0005	<0.0005	<0.001	<0.005	0.0316	<0.0005	<0.0005	<0.0005	0.02	<0.0005	277.69	277.64	0.01		-117.72	-15
10WBW001	10WBW001-Zone 6-Port after 2mths-S101	13.1	<0.0005	<0.00005	<0.0005	<0.001	<0.005	0.0246	<0.00005	<0.0005	<0.0005	0.0705	<0.0005	399.60	407.29	0.95		-	-
10WBW001	10WBW001-Zone 6-Airlift 160L sample-S103	21.1	<0.0005	<0.00005	<0.0005	<0.001	<0.005	0.0053	0.000231	<0.0005	<0.0005	0.0384	<0.0005	602.84	578.72	2.04		-	-
10WBW001	10WBW001-Zone 6-Airlift 80L sample-S107	19.4	<0.0005	<0.00005	<0.0005	<0.001	<0.005	0.0048	0.000234	<0.0005	<0.0005	0.0243	<0.0005	591.43	581.20	0.87		-74.6	-9.82
10WBW001	10WBW001-Zone 6-Port after bulk-S108	14.6	<0.0005	<0.00005	<0.0005	<0.001	<0.005	0.0231	0.000058	<0.0005	<0.0005	0.0295	<0.0005	447.22	432.10	1.72		-96.7	-12.08
10WBW001	10WBW001-Zone 6-Final-S301	18.1	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0159	<0.000050	<0.00050	<0.00050	0.154	<0.00050	539.23	553.55	1.31		-82.2	-10.57
10WBW001	10WBW001-Zone 6 Lower-Final-S304	27.6	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0021	0.000054	<0.00050	<0.00050	0.669	<0.00050	702.95	729.11	1.83		-62.3	-8.52
10WBW001	10WBW001 - Zone 6 upper (duplicate)	18.2	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0086	<0.000050	<0.00050	<0.00050	0.252	<0.00050	565.73	572.10	0.56		-76.8	-9.6
10WBW001	10WBW001 - Zone 6 upper (duplicate)	18.8	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0087	<0.000050	<0.00050	<0.00050	0.304	<0.00050	567.95	578.37	0.91		-75.6	-9.6
10WBW001	10WBW001 - Zone 6 lower	27.3	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0026	<0.000050	<0.00050	<0.00050	0.114	<0.00050	723.93	718.00	0.41		-58.2	-7.5
Doris Central Zone 10																			
10WBW001	10WBW001-Zone 10-Port Initial-S03b	-	-	<0.001	-	<0.05	0.0135	-	<0.002	0.077	-	0.026	-	296.83	293.87	0.50		-110.12	-14
10WBW001	10WBW001-Zone 10-Port InitialD-S04b	-	-	<0.001	-	<0.05	0.0081	-	<0.002	0.099	-	0.022	-	301.83	292.63	1.55		-109.57	-13.96
10WBW001	10WBW001-Zone 10-Airlift Purge-S12	-	-	<0.01	-	<0.05	<0.06	-	<0.02	0.221	-	<0.2	-	458.58	461.00	0.26		-	-
10WBW001	10WBW001-Zone 10-Airlift Purge-S14	-	-	<0.01	-	<0.05	<0.06	-	<0.02	0.214	-	<0.2	-	502.03	518.75	1.64		-79.08	-10.16
10WBW001	10WBW001-Zone 10-Airlift Purge-S15	-	-	<0.01	-	<0.05	<0.06	-	<0.02	0.259	-	0.22	-	518.91	536.67	1.68		-77.72	-10
10WBW001	10WBW001-Zone 10-Airlift Final-S16D	-	-	0.010	-	<0.05	<0.06	-	<0.02	0.292	-	<0.2	-	603.18	551.58	4.47		-77.67	-10.18
10WBW001	10WBW001-Zone 10-Port Final-S37	11.3	<0.0005	<0.0005	<0.0005	<0.001	<0.005	0.0059	<0.0005	<0.0005	<0.0005	0.0504	<0.0005	359.12	349.09	1.42		-106.52	-13.49
10WBW001	10WBW001-Zone 10-Port after 2mths-S102	11.7	<0.0005	<0.00005	<0.0005	<0.001	<0.005	0.005	0.000059	<0.0005	<0.0005	0.061	<0.0005	382.61	396.17	1.74		-	-
10WBW001	10WBW001-Zone 10-Port after bulk-S105	16.8	<0.0005	<0.00005	<0.0005	<0.001	<0.005	0.006	<0.00005	<0.0005	<0.0005	0.0851	<0.0005	565.31	499.80	6.15		-78	-10.33
10WBW001	10WBW001-Zone 10-Final-S302	17.0	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0082	<0.000050	<0.00050	<0.00050	0.0708	<0.00050	561.25	567.98	0.60		-79.2	-10.06
10WBW001	10WBW001-Zone 10 Lower-Final-S303	21.8	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0020	<0.000050	0.00058	<0.00050	0.0049	<0.00050	651.68	639.14	0.97		-73.4	-9.2
10WBW001	10WBW001 - Zone 1																		

Sample Location	Sample label	Deposit	Zone	Sample Source	Location of port in zone	Cumulative Purge Volume	Field Data	Field pH	Field Electrical Conductivity	Field Turbidity	Field DO	Field Temperature	Field Dep	Field Salinity	Field TDS	Field oT	Field ORP	ALS DATA	ALS File No.	Date Lab Received	ALS Report Date	RESULTS OF ANALYSIS	ALS SRK Sample ID	ALS Date Sampled	ALS Time Sampled	ALS Sample ID	Matrix	Physical Tests	Conductivity (EC)	Density	Hardness (as CaCO3)	pH	
						Litres			mS/cm	NTU	mg/L	°C	m	%															uS/cm	kg/L	mg/L	pH	
10WBW004	10WBW004 - Zone 6 Lower (Duplicate)	Boston	6	Westbay Port	Meas Port Lower	127.77		6.63	33.1	244	13.58	7.87	0	2	20	16	36		L1023975	28-Jun-11	9-Aug-11		10WBW004-Z6-404	23-JUN-11	12:00	L1023975-1	Water		36500	1.02	11900	6.67	
10WBW004	10WBW004 - Zone 6 Lower (Duplicate)	Boston	6	Westbay Port	Meas Port Lower	127.77		6.63	33.1	244	13.58	7.87	0	2	20	16	36		L1023975	28-Jun-11	9-Aug-11		10WBW004-Z6-405	23-JUN-11	12:00	L1023975-2	Water		36600	1.02	11900	6.72	
10WBW004	10WBW004 - Zone 6 Upper	Boston	6	Westbay Port	Meas Port Upper	130.77		7.12	30.5	86.6	13.02	11.45	0	1.9	19	14	-17		L1023975	28-Jun-11	9-Aug-11		10WBW004-Z6-406	23-JUN-11	16:00	L1023975-3	Water		32100	1.02	11400	7	
10WBW004	10WBW004 - Zone 6 lower	Boston	6	Westbay Port	Meas Port Lower	134.02		7.12	36.07	5.1	11.04	6.28	-	22.47	23.44	-	-63		L1060807	20-Sep-11	18-Oct-11		10WBW004-Z6-508	15-SEP-11	09:00	L1060807-1	Water		37400	1	14300	6.66	
10WBW004	10WBW004 - Zone 6 upper	Boston	6	Westbay Port	Meas Port Upper	137.02		7.04	31.27	0.5	9.57	8.86	-	19.34	20.31	-	-35.7		L1060807	20-Sep-11	18-Oct-11		10WBW004-Z6-509	15-SEP-11	12:00	L1060807-2	Water		31500	1.02	13000	6.74	
QAQC Samples - Field Blanks and Rinsates																																	
10WBW001	Equipment blank DI	Doris Central	n/a	Other	n/a	n/a		-	-	-	-	-	-	-	-	-	-		L880950	27-Apr-10 15:23	06-May-10		10WBW001-05	25-APR-10	00:00	L880950-5	Water		-	-	-	-	
DI blank	10WBW004-DI blank-311	Boston	n/a	Other	n/a	n/a		-	-	-	-	-	-	-	-	-	-		L998529	26-Apr-11 11:00	24-May-11		10WBW004-311	21-APR-11	11:30	L998529-2	Water		<2.0	-	<0.50	5.78	
Equipment blank	Westbay Sampler Bottles Equipment blank	Other	n/a	Other	n/a	n/a		-	-	-	-	-	-	-	-	-	-		L915201	01-Aug-10 11:24	13-Aug-10		10WBW001-34	28-JUL-10	11:00	L915201-22	Water		24.7	-	<1	6.11	
n/a	10WBW004 Rinsate blank	Other	n/a	Other	n/a	n/a		-	-	-	-	-	-	-	-	-	-		L960194	03-Dec-10 17:00	22-Dec-10		10WBW004-127	26-NOV-10	18:00	L960194-8	Water		28.3	1.01	-	6.34	
Rinsate blank	10WBW004-Rinsate blank-310	Boston	n/a	Other	n/a	n/a		-	-	-	-	-	-	-	-	-	-		L998529	26-Apr-11 11:00	24-May-11		10WBW004-310	21-APR-11	11:00	L998529-1	Water		4.0	-	1.15	6.35	
Rinsate blank	Gas Can Rinsate blank	Other	n/a	Other	n/a	n/a		-	-	-	-	-	-	-	-	-	-		L948685	29-Oct-10 10:28	22-Nov-10		10WBW001-104	25-OCT-10	00:00	L948685-1	Water		<2	1.00	0.56	7.29	
Rinsate blank	DI/Rinsate	-	n/a	Other	n/a	n/a		-	-	-	-	-	-	-	-	-	-		L1021760	22-Jun-11	27-Sep-11		10WBW002-402	20-JUN-11	17:00	L1021760-3	Water		70.2	-	6.65	7.13	
DI blank	DI Blank	-	n/a	Other	n/a	n/a		-	-	-	-	-	-	-	-	-	-		L1023975	28-Jun-11	9-Aug-11		10WBW004-407	23-JUN-11	8:00	L1023975-4	Water		<2.0	-	<1.3	5.78	
DI blank	DI Blank	-	n/a	Other	n/a	n/a		-	-	-	-	-	-	-	-	-	-		L1060818	20-Sep-11	21-Oct-11		10WBW001-506	12-SEP-11	11:00	L1060818-7	Water		3.4	1	<0.50	5.83	
Rinsate blank	Rinsate Blank	-	n/a	Other	n/a	n/a		-	-	-	-	-	-	-	-	-	-		L1060818	20-Sep-11	21-Oct-11		10WBW001-507	12-SEP-11	12:00	L1060818-8	Water		6.1	0.995	<0.50	5.93	
Lakes and Other Water Sources																																	
10WBW001	10WBW001 Drill Tank	Doris Central	n/a	Drill Water	n/a	n/a		-	-	-	-	-	-	-	-	-	-		L880950	27-Apr-10 15:23	06-May-10		10WBW001-02	25-APR-10	16:00	L880950-2	Water		335	-	57.8	7.20	
10WBW001	10WBW001 Drill Tank Dup	Doris Central	n/a	Drill Water	n/a	n/a		-	-	-	-	-	-	-	-	-	-		L880950	27-Apr-10 15:23	06-May-10		10WBW001-04	25-APR-10	16:00	L880950-4	Water		339	-	59.8	7.26	
10WBW001	10WBW001 Casing Flow	Doris Central	n/a	Casing Flow	n/a	n/a		-	-	-	-	-	-	-	-	-	-		L880950	27-Apr-10 15:23	06-May-10		10WBW001-03	25-APR-10	16:45	L880950-3	Water		6430	-	854	8.16	
10WBW002	Glycol & water mix from inside Westbay 10WBW002	Other	n/a	Other	n/a	n/a		6.15	48.4	319	15.73	2.47	0	0.9	29.0	23	74		L956881	24-Nov-10 10:53	08-Dec-10		10WBW002-120	12-NOV-10	17:00	L956881-3	Water		19200	1.08	73600	6.63	
10WBW004	10WBW004 -Drill Tank Beginning	Boston	Drill Water	Drill Water	n/a	n/a		7.7	>20	-	-	22.2	-	-	-	-	-		L915201	01-Aug-10 11:24	13-Aug-10		10WBW004-1	24-JUL-10	15:00	L915201-11	Water		39600	-	21100	6.31	
10WBW004	10WBW004 - Drill Tank End	Boston	Drill Water	Drill Water	n/a	n/a		7.56	>20	-	-	17.5	-	-	-	-	-		L917645	09-Aug-10 09:10	20-Aug-10		10WBW004-03	31-JUL-10	15:00	L917645-4	Water		19800	1	10900	7.03	
Doris Lake	Doris Lake Winter	Doris Central	n/a	Lake	n/a	n/a		-	-	-	-	-	-	-	-	-	-		L880950	27-Apr-10 15:23	06-May-10		10WBW001-01	26-APR-10	12:30	L880950-1	Water		324	-	53.6	7.10	
Doris Lake	Doris Lake Summer	Doris Central	n/a	Lake	n/a	n/a		-	-	-	-	-	-	-	-	-	-		L909782	17-Jul-10 13:05	28-Jul-10		10WBW001-07	15-JUL-10	14:00	L909782-7	Water		304	0.998	48.8	8.52	
Spyder Lake	Spyder Lake	Boston	n/a	Lake	n/a	n/a		6.93	0.0425	-	-	20.4	-	-	-	-	-		L915201	01-Aug-10 11:24	13-Aug-10		10WBW004-2	24-JUL-10	14:30	L915201-12	Water		44.0	0.996	13.3	6.99	
RO Water	RO Water	Other	n/a	Other	n/a	n/a		6.92	0	-	-	-	-	-	-	-	-		L915201	01-Aug-10 11:24	13-Aug-10		10WBW001-22	26-JUL-10	09:10	L915201-8	Water		5.97	-	2.4	6.38	
Glycol	Glycol & water mix prepared at camp	Other	n/a	Other	n/a	n/a		-	-	-	-	-	-	-	-	-	-		L956881	24-Nov-10 10:53	08-Dec-10		10WBW002-122	14-NOV-10	18:00	L956881-5	Water		152	1.02	45.7	7.56	

Sample Location	Sample label	Salinity (EC)	Total Dissolved Solids	Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3)	Alkalinity, Carbonate (as CaCO3)	Alkalinity, Hydroxide (as CaCO3)	Alkalinity, Total (as CaCO3)	Ammonia as N	Bromide (Br)	Chloride (Cl)	Fluoride (F)	Nitrate (as N)	Nitrite (as N)	Ortho Phosphate as P	Total Phosphate as P	Silicate (as SiO2)	Sulfate (SO4)	Additional Anions and Nutrients	Bicarbonate (HCO3)	Carbonate (CO3)	Hydroxide (OH)	Ion Balance	Nitrate and Nitrite as N	TDS (Calculated)	Total Metals	Aluminum (Al)-Total	Antimony (Sb) Total	Arsenic (As)-Total
10WBW004	10WBW004 - Zone 6 Lower (Duplicate)	-	38800		32.5	<1.0	<1.0	32.5	2.38	12.1	14700	0.749	<0.50	<0.10	-	0.0787	<10	385		-	-	-	-	-	-		0.0105	0.0134	<0.0020
10WBW004	10WBW004 - Zone 6 Lower (Duplicate)	-	39000		34.7	<1.0	<1.0	34.7	2.44	14.2	14900	0.727	<0.50	<0.10	-	0.0897	<10	405		-	-	-	-	-	-		0.039	0.0139	<0.0020
10WBW004	10WBW004 - Zone 6 Upper	-	35300		45.6	<1.0	<1.0	45.6	2.45	11	12400	0.587	<0.50	<0.10	-	0.11	<10	325		-	-	-	-	-	-		0.0068	0.0161	<0.0020
10WBW004	10WBW004 - Zone 6 lower	-	28200		17.4	<2.0	<2.0	17.4	2.28	18.2	13800	0.618	0.88	<0.10	<0.0010	0.145	<10	405		-	-	-	-	-	-		0.02	0.0167	<0.0050
10WBW004	10WBW004 - Zone 6 upper	-	21900		23.3	<2.0	<2.0	23.3	2.48	16.6	13000	0.528	0.84	<0.10	<0.0010	0.0918	<10	361		-	-	-	-	-	-		0.0078	0.0136	<0.0080
QAQC Samples - Field Blanks and Rinsates																													
10WBW001	equipment blank DI	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		<0.010	<0.00040	<0.00040
	DI blank	-	<10		<2.0	<2.0	<2.0	<2.0	-	<0.050	<0.50	<0.020	<0.0050	<0.0010	-	-	-	<0.50		-	-	-	-	-	-		<0.0030	<0.000010	<0.000050
Equipment blank	Westbay Sampler Bottles Equipment blank	-	18.0		-	-	-	<5	-	-	7.03	<0.05	<0.05	<0.05	-	-	-	<0.5		<5	<5	<5	Low EC	<0.071	8.7		<0.01	<0.0004	<0.0004
n/a	10WBW004 Rinsate blank	-	12		<1.0	<1.0	<1.0	<1.0	-	<0.050	6.33	<0.020	<0.0050	<0.0010	-	-	-	<0.50		-	-	-	-	-	-		-	-	-
Rinsate blank	10WBW004-Rinsate blank-310	-	<10		<2.0	<2.0	<2.0	<2.0	-	<0.050	0.65	<0.020	<0.0050	<0.0010	-	-	-	<0.50		-	-	-	-	-	-		<0.0030	0.000477	<0.000050
Rinsate blank	Gas Can Rinsate blank	-	<10		<2	<2	<2	<2	<0.005	<0.05	<0.5	<0.02	<0.005	<0.001	-	0.0052	<1	<0.5		-	-	-	-	-	-		0.0086	<0.00001	<0.00005
Rinsate blank	DI/Rinsate	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-		0.0052	0.000186	<0.000050
DI blank	DI Blank	-	-		1.2	<1.0	<1.0	1.2	-	<0.050	<0.50	<0.030	<0.0050	<0.0010	-	<0.0020	-	<0.50		-	-	-	-	-	-		-	-	-
DI blank	DI Blank	-	<10		<2.0	<2.0	<2.0	<2.0	<0.0050	<0.050	<0.50	0.022	<0.0050	<0.0010	<0.0010	<0.0020	<1.0	<0.50		-	-	-	-	-	-		<0.0050	<0.00050	<0.0020
Rinsate blank	Rinsate Blank	-	<10		<2.0	<2.0	<2.0	<2.0	0.0072	<0.050	1.56	<0.020	<0.0050	<0.0010	<0.0010	<0.0020	<1.0	<0.50		-	-	-	-	-	-		<0.0050	<0.00050	<0.0020
Lakes and Other Water Sources																													
10WBW001	10WBW001 Drill Tank	-	197		-	-	-	35.6	-	-	83.4	0.069	0.053	<0.050	-	-	-	4.05		43.4	<5.0	<5.0	93.7	<0.071	170		0.014	<0.00040	0.00076
10WBW001	10WBW001 Drill Tank Dup	-	202		-	-	-	35.2	-	-	82.5	0.069	<0.050	<0.050	-	-	-	3.70		43.0	<5.0	<5.0	99.3	<0.071	171		0.021	<0.00040	0.00067
10WBW001	10WBW001 Casing Flow	-	3790		-	-	-	52.9	-	-	1960	<0.50	<0.50	<0.50	-	-	-	195		64.5	<5.0	<5.0	110	<0.71	3580		2.10	<0.0080	0.0134
10WBW002	Glycol & water mix from inside Westbay 10WBW002	-	116000		42.8	<1	<1	42.8	1.91	<50	46800	<20	<5	<1	0.45	10.3	<100	<500		-	-	-	-	-	-		1.40	0.0081	0.027
10WBW004	10WBW004 -Drill Tank Beginning	-	26000		-	-	-	41.9	-	-	16400	<1	<1	<1	-	-	-	50		51.1	<5	<5	95.4	<1.4	25400		4.6	<0.08	<0.08
10WBW004	10WBW004 - Drill Tank End	-	12400		-	-	-	13.0	-	-	7530	1.4	<0.05	<0.05	-	-	-	5.28		15.9	<5	<5	104	<0.071	12000		13.7	<0.08	<0.08
Doris Lake	Doris Lake Winter	-	192		-	-	-	34.4	-	-	76.6	0.069	0.053	<0.050	-	-	-	3.44		41.9	<5.0	<5.0	95.1	<0.071	158		<0.010	<0.00040	0.00074
Doris Lake	Doris Lake Summer	-	188		-	-	-	31.8	-	-	60.3	<0.05	<0.05	<0.05	-	-	-	2.42		27.2	5.7	<5	97.0	<0.071	129		0.048	<0.0004	0.00055
Spyder Lake	Spyder Lake	-	32.0		-	-	-	7.9	-	-	7.58	<0.05	<0.05	<0.05	-	-	-	1.63		9.6	<5	<5	Low EC	<0.071	22.9		0.061	<0.0004	<0.0004
RO Water	RO Water	-	10.0		-	-	-	<5	-	-	0.65	<0.05	<0.05	<0.05	-	-	-	<0.5		<5	<5	<5	Low EC	<0.071	2.9		<0.01	<0.0004	<0.0004
Glycol	Glycol & water mix prepared at camp	-	187		46.1	<1	<1	46.1	0.040	<5	53	<2	<0.5	<0.1	12.1	10.3	<20	<50		-	-	-	-	-	-		0.0795	<0.0005	0.0111

Sample Location	Sample label	Barium (Ba)- Total	Beryllium (Be)- Total	Bismuth (Bi)- Total	Boron (B)- Total	Cadmium (Cd)- Total	Calcium (Ca)- Total	Cesium (Cs)- Total	Chromium (Cr)- Total	Cobalt (Co)- Total	Copper (Cu)- Total	Gallium (Ga)- Total	Iron (Fe)- Total	Lead (Pb)- Total	Lithium (Li)- Total	Magnesium (Mg)- Total	Manganese (Mn)- Total	Mercury (Hg)- Total	Molybdenum (Mo)- Total	Nickel (Ni)- Total	Phosphorus (P)- Total	Potassium (K)- Total	Rhenium (Re)- Total	Rubidium (Rb)- Total	Selenium (Se)- Total	Silicon (Si)- Total	Silver (Ag)- Total	Sodium (Na)- Total
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
10WBW004	10WBW004 - Zone 6 Lower (Duplicate)	0.467	<0.00050	<0.00050	0.87	<0.000050	4510	0.00806	0.00251	0.00295	<0.00050	<0.00050	13.3	0.00045	0.043	476	0.847	<0.000050	0.0968	0.0109	<1.0	48	<0.00050	0.0473	<0.0020	1.54	<0.00010	2840
10WBW004	10WBW004 - Zone 6 Lower (Duplicate)	0.494	<0.00050	<0.00050	0.88	<0.000050	4530	0.00821	0.00834	0.00306	<0.00050	<0.00050	13.4	0.00046	0.044	475	0.864	<0.000050	0.1	0.0147	<1.0	48	<0.00050	0.0484	<0.0020	1.62	<0.00010	2850
10WBW004	10WBW004 - Zone 6 Upper	0.528	<0.00050	<0.00050	0.77	<0.000050	4630	0.00589	0.00591	0.00477	<0.00050	<0.00050	6.7	<0.00030	0.04	417	0.841	<0.000050	0.0908	0.0187	<1.0	51	<0.00050	0.0476	<0.0020	1.92	<0.00010	2370
10WBW004	10WBW004 - Zone 6 lower	0.466	<0.00050	<0.00050	0.83	<0.000050	5490	0.00815	0.00903	0.00298	<0.00050	<0.00050	10.5	0.00071	0.045	519	0.841	<0.000050	0.101	0.0165	<1.0	52	<0.00050	0.0481	<0.0080	1.88	<0.00010	3110
10WBW004	10WBW004 - Zone 6 upper	0.537	<0.00050	<0.00050	0.89	<0.000050	4580	0.00682	0.00521	0.00341	<0.00050	<0.00050	10.4	0.0004	0.043	452	0.855	<0.000050	0.101	0.015	<1.0	52	<0.00050	0.0526	<0.020	1.88	<0.00010	2770
QAQC Samples - Field Blanks and Rinsates																												
10WBW001	Equipment blank DI	<0.0030	<0.0010	-	<0.050	<0.000050	<0.50	-	<0.0050	<0.0020	<0.0010	-	<0.010	<0.00010	<0.010	<0.10	<0.0020	<0.00010	<0.0050	<0.0020	-	<0.10	-	-	<0.00040	-	<0.00050	<1.0
DI blank	10WBW004-DI blank-311	<0.00010	<0.0000050	<0.000050	<0.0050	<0.0000050	<0.050	<0.0000050	<0.000050	<0.000050	<0.00050	<0.000050	<0.030	<0.000050	<0.00030	<0.10	<0.00020	-	<0.000050	<0.00020	<0.30	<2.0	<0.0000050	<0.000020	<0.00020	<0.050	<0.0000050	<2.0
Equipment blank	Westbay Sampler Bottles Equipment blank	<0.003	<0.001	-	<0.05	0.000190	<0.5	-	<0.005	<0.002	<0.001	-	0.037	0.00067	<0.01	<0.1	0.0023	<0.0001	<0.005	<0.002	-	<0.1	-	-	<0.0004	-	<0.0001	<1
n/a	10WBW004 Rinsate blank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rinsate blank	10WBW004-Rinsate blank-310	0.00020	<0.0000050	<0.000050	0.0096	0.0000252	0.715	<0.0000050	0.00074	<0.000050	<0.00050	<0.000050	<0.030	0.000056	<0.00020	<0.10	0.00041	-	0.000170	0.00040	<0.30	<2.0	<0.0000050	0.000023	<0.00020	<0.050	<0.0000050	<2.0
Rinsate blank	Gas Can Rinsate blank	0.00017	<0.000005	<0.00005	0.0097	<0.000005	<0.05	<0.000005	<0.0005	<0.00005	0.0161	<0.00005	<0.03	0.00114	<0.0002	<0.1	<0.0002	<0.00005	<0.00005	<0.0002	<0.3	<2	<0.000005	<0.00002	<0.0002	<0.05	0.0000058	<2
Rinsate blank	DI/Rinsate	0.00037	<0.0000050	<0.000050	<0.0060	<0.0000050	12.9	<0.0000050	<0.00050	<0.000050	0.00066	<0.000050	<0.030	0.000088	<0.00020	<0.10	0.00022	-	0.00013	<0.00020	<0.30	<2.0	<0.0000050	<0.000020	<0.00020	<0.050	<0.0000050	<2.0
DI blank	DI Blank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DI blank	DI Blank	<0.0010	<0.00050	<0.00050	<0.10	<0.0000050	<0.050	<0.0000050	<0.00050	<0.000050	<0.00050	<0.00050	<0.010	<0.00030	<0.020	<0.10	<0.00020	<0.000050	<0.0020	<0.00050	<1.0	<2.0	<0.00050	<0.0050	<0.0020	<0.050	<0.00010	<2.0
Rinsate blank	Rinsate Blank	<0.0010	<0.00050	<0.00050	<0.10	0.000161	1.06	<0.00050	0.00073	<0.000050	<0.00050	<0.00050	0.015	<0.00030	<0.020	0.65	0.00206	<0.000050	<0.0020	0.001	<1.0	<2.0	<0.00050	<0.0050	<0.0020	<0.050	<0.00010	3.9
Lakes and Other Water Sources																												
10WBW001	10WBW001 Drill Tank	0.0050	<0.0010	-	<0.050	<0.000050	10.5	-	<0.0050	<0.0020	0.0040	-	0.118	0.00063	<0.010	8.59	0.0066	<0.00010	<0.0050	<0.0020	-	3.13	-	-	0.00058	-	<0.00050	43.0
10WBW001	10WBW001 Drill Tank Dup	0.0057	<0.0010	-	<0.050	<0.000050	10.8	-	<0.0050	<0.0020	0.0054	-	0.149	0.00018	<0.010	8.73	0.0072	<0.00010	<0.0050	<0.0020	-	3.14	-	-	0.00057	-	<0.00050	43.9
10WBW001	10WBW001 Casing Flow	0.0232	<0.020	-	0.387	<0.0010	105	-	0.051	<0.0040	<0.020	-	4.04	<0.0020	<0.12	131	0.238	<0.00010	0.0364	0.0043	-	35.7	-	-	0.0153	-	<0.0020	1060
10WBW002	Glycol & water mix from inside Westbay 10WBW002	0.280	<0.0025	<0.0025	<0.5	<0.001	25200	<0.0025	0.0243	0.00200	0.0217	<0.0025	5.50	0.0116	<0.1	56	0.786	<0.00005	0.058	0.0174	6.5	<200	<0.0025	<0.025	<0.07	<5	<0.0005	<200
10WBW004	10WBW004 -Drill Tank Beginning	0.681	<0.2	-	1.25	<0.01	7820	-	0.46	<0.04	<0.2	-	23.1	<0.02	<1.2	82.0	2.09	<0.0001	0.075	0.191	-	70.4	-	-	<0.4	-	<0.02	378
10WBW004	10WBW004 - Drill Tank End	0.262	<0.2	-	<0.8	<0.01	4750	-	0.35	<0.04	<0.2	-	58.6	0.086	<1.2	24.1	1.03	<0.0001	0.073	0.151	-	16.1	-	-	<0.08	-	<0.02	61.5
Doris Lake	Doris Lake Winter	0.0036	<0.0010	-	<0.050	<0.000050	8.47	-	<0.0050	<0.0020	0.0023	-	0.017	0.00089	<0.010	6.73	0.0035	<0.00010	<0.0050	<0.0020	-	2.30	-	-	0.00056	-	<0.00050	34.2
Doris Lake	Doris Lake Summer	0.0034	<0.001	-	<0.05	<0.00005	9.47	-	<0.005	<0.002	0.0019	-	0.108	<0.0001	<0.01	5.87	0.0154	<0.0001	<0.005	<0.002	-	2.13	-	-	<0.002	-	<0.0001	29.2
Spyder Lake	Spyder Lake	<0.003	<0.001	-	<0.05	<0.00005	<10	-	<0.005	<0.002	0.0013	-	0.22	<0.0001	<0.01	<2	<0.04	<0.0001	<0.005	<0.002	-	<2	-	-	<0.0004	-	<0.0001	<20
RO Water	RO Water	<0.003	<0.001	-	<0.05	<0.00005	<0.5	-	<0.005	<0.002	0.0807	-	<0.01	0.00244	<0.01	<0.1	<0.002	<0.0001	<0.005	<0.002	-	<0.1	-	-	<0.0004	-	<0.0001	<1
Glycol	Glycol & water mix prepared at camp	0.0026	<0.0005	<0.0005	<0.1	<0.00005	8.53	<0.0005	0.00160	<0.00005	0.00234	<0.0005	0.078	<0.0003	<0.02	5.3	0.00476	<0.00005	<0.002	0.00064	9.8	28	<0.0005	<0.005	<0.02	1.23	<0.0001	26

Sample Location	Sample label	Strontium (Sr)-Total	Tellurium (Te)-Total	Thallium (Tl)-Total	Thorium (Th)-Total	Tin (Sn)-Total	Titanium (Ti)-Total	Tungsten (W)-Total	Uranium (U)-Total	Vanadium (V)-Total	Yttrium (Y)-Total	Zinc (Zn)-Total	Zirconium (Zr)-Total	Dissolved Metals	Aluminum (Al)-Dissolved	Antimony (Sb)-Dissolved	Arsenic (As)-Dissolved	Barium (Ba)-Dissolved	Beryllium (Be)-Dissolved	Bismuth (Bi)-Dissolved	Boron (B)-Dissolved	Cadmium (Cd)-Dissolved	Calcium (Ca)-Dissolved	Cesium (Cs)-Dissolved
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
10WBW004	10WBW004 - Zone 6 Lower (Duplicate)	25.3	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	<0.0010	0.00398	<0.00050	<0.00050	0.125	<0.02		<0.0050	0.0152	<0.0020	0.496	<0.00050	<0.00050	0.9	<0.000050	4700	0.00786
10WBW004	10WBW004 - Zone 6 Lower (Duplicate)	26.3	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.0012	0.00435	<0.00050	<0.00050	0.867	<0.00050		<0.0050	0.0153	<0.0020	0.528	<0.00050	<0.00050	0.9	<0.000050	4530	0.00852
10WBW004	10WBW004 - Zone 6 Upper	21.6	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	<0.0010	0.00799	<0.00050	<0.00050	0.133	<0.00050		<0.0050	0.0157	<0.0030	0.541	<0.00050	<0.00050	0.81	<0.000050	4530	0.00618
10WBW004	10WBW004 - Zone 6 lower	27.1	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	0.001	0.0047	<0.00050	<0.00050	0.881	<0.00050		<0.0050	0.0151	<0.0050	0.496	<0.00050	<0.00050	0.94	<0.00010	4860	0.00874
10WBW004	10WBW004 - Zone 6 upper	25.4	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	<0.0010	0.00604	<0.00050	<0.00050	0.377	<0.00050		<0.0050	0.0122	<0.0030	0.533	<0.00050	<0.00050	0.85	<0.000050	4490	0.00658
QAQC Samples - Field Blanks and Rinsates																								
10WBW001	equipment blank DI	-	-	<0.00010	-	<0.050	<0.0010	-	<0.00010	<0.0010	-	<0.0040	-		<0.010	<0.00040	<0.00040	<0.0030	<0.0010	-	<0.060	<0.000050	-	-
DI blank	10WBW004-DI blank-311	<0.000050	<0.000010	<0.0000020	<0.0000050	<0.00020	<0.00020	<0.000010	<0.0000020	<0.000050	<0.0000050	<0.0030	<0.000050		<0.0030	<0.000010	<0.000050	<0.00010	<0.0000050	<0.000050	<0.0050	<0.0000050	<0.050	<0.0000050
Equipment blank	Westbay Sampler Bottles Equipment blank	-	-	<0.0001	-	<0.05	<0.001	-	<0.0001	<0.001	-	0.0300	-		<0.01	<0.0004	<0.0004	<0.003	<0.001	-	<0.05	<0.00005	<0.5	-
n/a	10WBW004 Rinsate blank	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-
Rinsate blank	10WBW004-Rinsate blank-310	0.000553	<0.000010	<0.0000020	<0.0000050	<0.00020	<0.00020	0.000046	<0.0000020	<0.000050	<0.0000050	0.0393	<0.000050		<0.0030	0.000163	<0.000050	0.00086	<0.0000050	<0.000050	<0.0050	<0.0000050	0.459	<0.0000050
Rinsate blank	Gas Can Rinsate blank	<0.005	<0.00001	<0.000002	<0.000005	<0.0002	<0.0002	<0.00001	0.0000020	<0.00005	<0.000005	0.0056	<0.00005		<0.003	0.000021	<0.00005	0.00044	<0.000005	<0.00005	<0.005	0.0000102	0.224	<0.000005
Rinsate blank	DI/Rinsate	0.00711	<0.000010	<0.0000020	0.0000069	0.0012	<0.00020	0.000057	0.0000302	<0.000050	<0.0000050	0.0204	<0.000050		<0.0030	0.000071	<0.000050	0.00069	<0.0000050	<0.000050	<0.0050	<0.0000050	2.66	<0.0000050
DI blank	DI Blank	-	-	-	-	-	-	-	-	-	-	-	-		<0.0030	<0.000010	<0.000050	<0.00010	<0.0000050	<0.000050	<0.0050	<0.0000050	0.085	<0.0000050
DI blank	DI Blank	<0.010	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	<0.0010	<0.000050	<0.00050	<0.00050	<0.0030	<0.00050		<0.0050	<0.00050	<0.0020	<0.0010	<0.00050	<0.00050	<0.10	<0.000050	<0.050	<0.00050
Rinsate blank	Rinsate Blank	0.013	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	<0.0010	<0.000050	<0.00050	<0.00050	0.0555	<0.00050		<0.0050	<0.00050	<0.0020	<0.0010	<0.00050	<0.00050	<0.10	<0.000050	0.088	<0.00050
Lakes and Other Water Sources																								
10WBW001	10WBW001 Drill Tank	-	-	<0.00010	-	<0.050	<0.0010	-	<0.00010	<0.0010	-	0.0131	-		<0.010	<0.00040	0.00066	0.0040	<0.0010	-	<0.050	<0.000050	10.1	-
10WBW001	10WBW001 Drill Tank Dup	-	-	<0.00010	-	<0.050	<0.0010	-	<0.00010	<0.0010	-	0.0252	-		<0.010	<0.00040	0.00068	0.0042	<0.0010	-	<0.050	<0.000050	10.3	-
10WBW001	10WBW001 Casing Flow	-	-	<0.00020	-	<0.050	0.029	-	<0.00020	0.014	-	<0.080	-		2.07	<0.0080	0.0131	0.0232	<0.010	-	0.377	<0.0010	111	-
10WBW002	Glycol & water mix from inside Westbay 10WBW002	9.71	<0.0025	<0.00025	<0.0025	<0.005	0.083	<0.005	<0.00025	0.0049	<0.0025	3.12	<0.0025		<0.025	0.0076	0.027	0.308	<0.0025	<0.0025	<0.5	<0.0012	29400	<0.0025
10WBW004	10WBW004 -Drill Tank Beginning	-	-	<0.02	-	<0.08	<0.12	-	<0.02	0.15	-	<0.8	-		<1	<0.08	<0.08	0.700	<0.1	-	1.31	<0.01	8320	-
10WBW004	10WBW004 - Drill Tank End	-	-	<0.02	-	<0.08	<0.12	-	<0.02	<0.1	-	<0.8	-		<0.1	<0.008	0.0537	0.188	<0.01	-	0.102	<0.001	4330	-
Doris Lake	Doris Lake Winter	-	-	<0.00010	-	<0.050	<0.0010	-	<0.00010	<0.0010	-	0.0090	-		<0.010	<0.00040	0.00057	0.0037	<0.0010	-	<0.050	<0.000050	9.30	-
Doris Lake	Doris Lake Summer	-	-	<0.0001	-	<0.05	0.0013	-	<0.0001	<0.001	-	<0.004	-		<0.01	<0.0004	0.00068	0.0036	<0.001	-	<0.05	<0.00005	9.70	-
Spyder Lake	Spyder Lake	-	-	<0.0001	-	<0.05	0.0017	-	<0.0001	<0.001	-	<0.004	-		0.014	<0.0004	<0.0004	<0.003	<0.001	-	<0.05	<0.00005	3.00	-
RO Water	RO Water	-	-	<0.0001	-	<0.05	<0.001	-	<0.0001	<0.001	-	0.0408	-		<0.01	<0.0004	<0.0004	<0.003	<0.001	-	<0.05	<0.00005	0.75	-
Glycol	Glycol & water mix prepared at camp	0.036	<0.0005	<0.00005	<0.0005	<0.001	0.0051	<0.001	0.000151	0.00166	<0.0005	0.0150	<0.0005		<0.005	<0.0005	0.0103	0.0034	<0.0005	<0.0005	<0.1	<0.00005	8.55	<0.0005

Sample Location	Sample label	Chromium (Cr)-Dissolved	Cobalt (Co)-Dissolved	Copper (Cu)-Dissolved	Gallium (Ga)-Dissolved	Iron (Fe)-Dissolved	Lead (Pb)-Dissolved	Lithium (Li)-Dissolved	Magnesium (Mg)-Dissolved	Manganese (Mn)-Dissolved	Mercury (Hg)-Dissolved	Molybdenum (Mo)-Dissolved	Nickel (Ni)-Dissolved	Phosphorus (P)-Dissolved	Potassium (K)-Dissolved	Rhenium (Re)-Dissolved	Rubidium (Rb)-Dissolved	Selenium (Se)-Dissolved	Silicon (Si)-Dissolved	Silver (Ag)-Dissolved	Sodium (Na)-Dissolved
10WBW004	10WBW004 - Zone 6 Lower (Duplicate)	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		<0.00050	0.00323	<0.00050	<0.00050	8.51	<0.00030	0.045	496	0.891	<0.000050	0.1	0.0122	<1.0	50	<0.00050	0.0494	<0.0020	1.67	<0.00010	2960
10WBW004	10WBW004 - Zone 6 Lower (Duplicate)	<0.00050	0.00346	<0.00050	<0.00050	10	<0.00030	0.047	473	0.97	<0.000050	0.104	0.0129	<1.0	49	<0.00050	0.0525	<0.0020	1.6	<0.00010	2850
10WBW004	10WBW004 - Zone 6 Upper	<0.00050	0.00314	<0.00050	<0.00050	10.3	<0.00030	0.042	425	0.881	<0.000050	0.095	0.0115	<1.0	51	<0.00050	0.0503	<0.0030	1.79	<0.00010	2400
10WBW004	10WBW004 - Zone 6 lower	<0.00050	0.00275	<0.00050	<0.00050	10.9	<0.00030	0.048	525	0.88	<0.000050	0.11	0.00999	<1.0	53	<0.00050	0.052	<0.020	1.83	<0.00010	3170
10WBW004	10WBW004 - Zone 6 upper	<0.00050	0.00374	0.00187	<0.00050	8.68	<0.00030	0.043	441	0.849	<0.000050	0.0988	0.0131	<1.0	51	<0.00050	0.051	<0.010	1.87	<0.00010	2670
QAQC Samples - Field Blanks and Rinsates																					
10WBW001	equipment blank DI	<0.0050	<0.0020	<0.0010	-	-	<0.00010	<0.0030	-	-	<0.00010	<0.0050	<0.0020	-	-	-	-	<0.00040	-	<0.00010	-
DI blank	10WBW004-DI blank-311	<0.00050	<0.000050	<0.00050	<0.000050	<0.030	<0.000050	<0.00030	<0.10	<0.00020	-	<0.000050	<0.00020	<0.30	<2.0	<0.0000050	<0.000020	<0.00020	<0.050	<0.0000050	<2.0
Equipment blank	Westbay Sampler Bottles Equipment blank	<0.005	<0.002	<0.001	-	<0.03	<0.0001	<0.003	0.24	<0.005	<0.0001	<0.005	<0.002	-	<0.5	-	-	<0.0004	-	<0.0001	1.4
n/a	10WBW004 Rinsate blank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rinsate blank	10WBW004-Rinsate blank-310	<0.00050	<0.000050	0.00077	<0.000050	<0.030	<0.000050	0.00020	<0.10	0.00032	-	0.000129	<0.00020	<0.30	<2.0	<0.0000050	<0.000020	<0.00020	0.052	<0.0000050	<2.0
Rinsate blank	Gas Can Rinsate blank	<0.0005	<0.00005	0.0123	<0.00005	<0.03	0.00114	<0.0002	<0.1	<0.0002	<0.00005	<0.00005	<0.0002	<0.3	<2	<0.000005	<0.00002	<0.0002	<0.05	<0.000005	<2
Rinsate blank	DI/Rinsate	<0.00050	<0.000050	<0.00050	<0.000050	<0.030	<0.000050	<0.00020	<0.10	0.00069	-	0.000158	0.00049	<0.30	<2.0	<0.0000050	<0.000020	<0.00020	<0.050	<0.0000050	<2.0
DI blank	DI Blank	<0.00050	<0.000050	<0.00050	<0.000050	<0.030	<0.000050	<0.00020	<0.10	<0.00020	-	<0.000050	<0.00020	<0.30	<2.0	<0.0000050	<0.000020	<0.00020	<0.050	<0.0000050	<2.0
DI blank	DI Blank	<0.00050	<0.000050	<0.00050	<0.00050	<0.010	<0.00030	<0.020	<0.10	<0.00020	<0.000050	<0.0020	<0.00050	<1.0	<2.0	<0.00050	<0.0050	<0.0020	<0.050	<0.00010	<2.0
Rinsate blank	Rinsate Blank	<0.00050	<0.000050	<0.00050	<0.00050	<0.010	<0.00030	<0.020	<0.10	<0.00020	<0.000050	<0.0020	<0.00050	<1.0	<2.0	<0.00050	<0.0050	<0.0020	<0.050	<0.00010	<2.0
Lakes and Other Water Sources																					
10WBW001	10WBW001 Drill Tank	<0.0050	<0.0020	0.0028	-	0.072	0.00015	0.0034	7.90	0.0054	<0.00010	<0.0050	<0.0020	-	2.47	-	-	0.00044	-	<0.00010	40.0
10WBW001	10WBW001 Drill Tank Dup	<0.0050	<0.0020	0.0028	-	0.075	0.00012	<0.0030	8.28	0.0056	<0.00010	<0.0050	<0.0020	-	2.67	-	-	0.00060	-	<0.00010	42.0
10WBW001	10WBW001 Casing Flow	0.0122	<0.0020	<0.012	-	3.91	<0.0020	<0.060	140	0.245	<0.00010	0.0345	0.0046	-	34.2	-	-	0.0167	-	<0.0020	1110
10WBW002	Glycol & water mix from inside Westbay 10WBW002	<0.0025	0.00052	0.0101	<0.0025	<0.05	<0.015	<0.1	65	0.741	<0.00005	0.063	0.0096	<5	<200	<0.0025	<0.025	<0.07	<5	<0.0005	<200
10WBW004	10WBW004 -Drill Tank Beginning	0.519	0.033	<0.12	-	12.7	<0.02	<0.6	84.7	2.09	<0.0001	0.074	0.190	-	83.0	-	-	<0.4	-	<0.02	439
10WBW004	10WBW004 - Drill Tank End	0.0139	0.0053	<0.012	-	0.091	<0.002	<0.06	18.7	0.615	<0.0001	0.0310	0.0764	-	12.6	-	-	<0.04	-	<0.002	62.7
Doris Lake	Doris Lake Winter	<0.0050	<0.0020	0.0022	-	<0.030	0.00069	0.0032	7.37	<0.0050	<0.00010	<0.0050	<0.0020	-	2.31	-	-	0.00058	-	<0.00010	38.0
Doris Lake	Doris Lake Summer	<0.005	<0.002	0.0016	-	0.035	<0.0001	0.0040	5.96	0.0060	<0.0001	<0.005	<0.002	-	2.11	-	-	<0.002	-	<0.0001	29.6
Spyder Lake	Spyder Lake	<0.005	<0.002	0.0015	-	0.068	<0.0001	<0.003	1.42	0.0064	<0.0001	<0.005	<0.002	-	0.72	-	-	<0.0004	-	<0.0001	3.8
RO Water	RO Water	<0.005	<0.002	0.0031	-	<0.03	<0.0001	<0.003	0.12	<0.005	<0.0001	<0.005	<0.002	-	<0.5	-	-	<0.0004	-	<0.0001	1.4
Glycol	Glycol & water mix prepared at camp	<0.0005	<0.00005	0.00180	<0.0005	<0.01	<0.003	<0.02	5.9	0.00109	<0.00005	<0.002	<0.0005	11.4	31	<0.0005	<0.005	<0.02	1.32	<0.0001	30

Sample Location	Sample label	Strontium (Sr)-Dissolved	Tellurium (Te)-Dissolved	Thallium (Tl)-Dissolved	Thorium (Th)-Dissolved	Tin (Sn)-Dissolved	Titanium (Ti)-Dissolved	Tungsten (W)-Dissolved	Uranium (U)-Dissolved	Vanadium (V)-Dissolved	Yttrium (Y)-Dissolved	Zinc (Zn)-Dissolved	Zirconium (Zr)-Dissolved	Cation Balance	Anion Balance	Ion Balance	Isotope Chemistry	Delta 2H x 1000	Delta 18O x 1000
10WBW004	10WBW004 - Zone 6 Lower (Duplicate)	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	405.31	422.75	2.11		-135.5	17.2
10WBW004	10WBW004 - Zone 6 Lower (Duplicate)	26.8	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	<0.0010	0.00617	<0.00050	<0.00050	0.153	<0.0149	390.13	428.84	4.73		-136.7	-17.4
10WBW004	10WBW004 - Zone 6 Upper	23.1	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	<0.0010	0.00508	<0.00050	<0.00050	0.0548	<0.00050	366.67	356.97	1.34		-140.4	-18
10WBW004	10WBW004 - Zone 6 lower	27.6	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	<0.0010	0.00469	<0.00050	<0.00050	0.456	<0.00050	424.89	397.51	3.33		-132	-16.5
10WBW004	10WBW004 - Zone 6 upper	24.7	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	<0.0010	0.0067	<0.00050	<0.00050	0.161	<0.00050	377.72	374.18	0.47		-135.8	-17.1
QAQC Samples - Field Blanks and Rinsates																			
10WBW001	equipment blank DI	-	-	<0.00010	-	<0.050	<0.0010	-	<0.00010	<0.0010	-	<0.0020	-	-	-	-		-144.31	-15.6
DI blank	10WBW004-DI blank-311	<0.000050	<0.000010	<0.0000020	<0.0000050	<0.00020	<0.00020	<0.000010	<0.0000020	<0.000050	<0.0000050	<0.0000050	<0.0000050	-	-	-		-	-
Equipment blank	Westbay Sampler Bottles Equipment blank	-	-	<0.0001	-	<0.05	<0.001	-	<0.0001	<0.001	-	0.0031	-	-	-	-		-	-
n/a	10WBW004 Rinsate blank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Rinsate blank	10WBW004-Rinsate blank-310	0.00154	<0.000010	<0.0000020	<0.0000050	<0.00020	<0.00020	0.000050	<0.0000020	<0.000050	<0.0000050	0.0076	<0.000050	-	-	-		-	-
Rinsate blank	Gas Can Rinsate blank	<0.005	<0.00001	<0.000002	<0.000005	<0.0002	<0.0002	<0.00001	<0.000002	<0.00005	<0.000005	0.0109	<0.00005	-	-	-		-	-
Rinsate blank	DI/Rinsate	0.00245	<0.000010	<0.0000020	<0.0000050	<0.00020	<0.00020	0.000032	<0.0000020	<0.000050	<0.0000050	0.0064	<0.000050	-	-	-		-	-
DI blank	DI Blank	0.000182	<0.000010	<0.0000020	<0.0000050	<0.00020	<0.00020	<0.000010	<0.0000020	<0.000050	<0.0000050	<0.0030	<0.000050	-	-	-		-	-
DI blank	DI Blank	<0.010	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	<0.0010	<0.000050	<0.00050	<0.00050	<0.0030	<0.00050	-	-	-		-	-
Rinsate blank	Rinsate Blank	<0.010	<0.00050	<0.000050	<0.00050	<0.0010	<0.0050	<0.0010	<0.000050	<0.00050	<0.00050	<0.0030	<0.00050	-	-	-		-	-
Lakes and Other Water Sources																			
10WBW001	10WBW001 Drill Tank	-	-	<0.00010	-	<0.050	<0.0010	-	<0.00010	<0.0010	-	0.0032	-	2.96	3.15	3.10		-157.78	-19.16
10WBW001	10WBW001 Drill Tank Dup	-	-	<0.00010	-	<0.050	<0.0010	-	<0.00010	<0.0010	-	0.0038	-	3.09	3.10	0.25		-159.7	-19.25
10WBW001	10WBW001 Casing Flow	-	-	<0.0010	-	<0.050	0.0359	-	<0.0020	0.0140	-	0.029	-	66.19	60.33	4.63		-152.87	-18.34
10WBW002	Glycol & water mix from inside Westbay 10WBW002	11.0	<0.0025	<0.00025	<0.0025	<0.005	<0.025	<0.005	<0.00025	<0.0025	<0.0025	1.99	<0.0025	-	-	-		-	-
10WBW004	10WBW004 -Drill Tank Beginning	-	-	<0.01	-	<0.05	<0.06	-	<0.02	0.205	-	<0.2	-	443.35	463.85	2.26		-151.63	-19.03
10WBW004	10WBW004 - Drill Tank End	-	-	<0.001	-	<0.05	<0.006	-	<0.002	0.0555	-	<0.02	-	220.65	212.48	1.89		-154.5	-19.46
Doris Lake	Doris Lake Winter	-	-	<0.00010	-	<0.050	<0.0010	-	<0.00010	<0.0010	-	0.0061	-	2.78	2.92	2.38		-156.3	-19.44
Doris Lake	Doris Lake Summer	-	-	<0.0001	-	<0.05	<0.001	-	<0.0001	0.0011	-	<0.002	-	2.32	2.38	1.48		-146.79	-18.5
Spyder Lake	Spyder Lake	-	-	<0.0001	-	<0.05	<0.001	-	<0.0001	<0.001	-	0.0032	-	0.45	0.41	5.23		-149.48	-18.93
RO Water	RO Water	-	-	<0.0001	-	<0.05	<0.001	-	<0.0001	<0.001	-	0.0030	-	-	-	-		-149.55	-18.97
Glycol	Glycol & water mix prepared at camp	0.038	<0.0005	<0.00005	<0.0005	<0.001	<0.005	<0.001	0.000155	0.00166	<0.0005	0.0069	<0.0005	3.01	-	-		-	-

Appendix B - 2011 Lab Reports



SRK CONSULTING (CANADA) INC.
ATTN: MELISSA PITZ
SUITE 205
2100 AIRPORT DRIVE
SASKATOON SK S7L 6M6

Date Received: 11-APR-11
Report Date: 24-MAY-11 11:48 (MT)
Version: FINAL REV. 2

Client Phone: 306-955-4732

Certificate of Analysis

Lab Work Order #: L994212
Project P.O. #: NOT SUBMITTED
Job Reference: 1CH008.052
Legal Site Desc:
C of C Numbers: 1

Comments: ADDITIONAL 18-MAY-11 15:06

24-MAY-11: Revised report.
Total Kjeldahl Nitrogen (TKN) have been added to this samples. No other data have changed.

Andre Langlais
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

L994212 CONTD....
 PAGE 2 of 7
 24-MAY-11 11:48 (MT)
 Version: FINAL REV. 2

Sample ID Description Sampled Date Sampled Time Client ID		L994212-1 WATER 06-APR-11 09:00 10WBW001-Z1-300	L994212-2 WATER 06-APR-11 14:00 10WBW001-Z6-301	L994212-3 WATER 06-APR-11 09:00 10WBW001-Z10-302	L994212-4 WATER 07-APR-11 11:00 10WBW001-Z10-303	L994212-5 WATER 08-APR-11 16:00 10WBW001-Z6-304
Grouping	Analyte					
SEAWATER						
Physical Tests	Conductivity (uS/cm)	46700	45500	47000	51800	57300
	Hardness (as CaCO3) (mg/L)	12200	8720	8810	11000	11800
	pH (pH)	7.09	7.67	7.59	7.56	7.37
	Total Dissolved Solids (mg/L)	41200	36100	37800	40800	48300
Leachable Anions & Nutrients	Anion Sum (meq/L)	557	554	569	640	730
	Cation Sum (meq/L)	550	539	562	652	704
	Cation - Anion Balance (%)	-0.6	-1.4	-0.7	0.9	-1.8
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	2.7	49.8	119	115	102
	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)	2.7	49.8	119	115	102
	Ammonia as N (mg/L)	0.0619	2.90	3.54	4.05	3.65
	Bromide (Br) (mg/L)	100	67	63	77	84
	Chloride (Cl) (mg/L)	19000	18300	18800	21100	24000
	Fluoride (F) (mg/L)	<0.75	<0.75	<0.75	<0.75	<0.75
	Nitrate (as N) (mg/L)	<0.50	<1.0	<1.0	<1.0	<1.0
	Nitrite (as N) (mg/L)	<0.10	<0.20	<0.20	<0.20	<0.20
	Total Kjeldahl Nitrogen (mg/L)	0.27	3.86	4.38	5.68	4.33
	Orthophosphate-Dissolved (as P) (mg/L)	<0.0010	0.0012	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	0.0094	0.0314	0.0644	0.0150	0.0145
	Silicate (as SiO2) (mg/L)	<10	9.0	5.7	8.8	9.1
	Sulfate (SO4) (mg/L)	944	1780	1730	2040	2450
Total Metals	Aluminum (Al)-Total (mg/L)	0.0109	0.0058	0.0242	0.0740	0.168
	Antimony (Sb)-Total (mg/L)	0.00081	<0.00050	0.00131	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Barium (Ba)-Total (mg/L)	0.0539	0.181	0.105	0.0680	0.0615
	Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	3.05	1.79	2.72	2.81	3.33
	Cadmium (Cd)-Total (mg/L)	<0.000050	<0.000050	0.000411	0.000095	0.000130
	Calcium (Ca)-Total (mg/L)	4930	1420	1630	2130	2140
	Cesium (Cs)-Total (mg/L)	0.00101	0.00114	0.00120	0.00085	0.00203
	Chromium (Cr)-Total (mg/L)	0.0139	0.00163	0.00132	0.00294	0.00321
	Cobalt (Co)-Total (mg/L)	0.000241	0.000078	0.000159	0.000171	0.000535
	Copper (Cu)-Total (mg/L)	0.00354	0.00065	0.00122	<0.00050	0.00181
	Gallium (Ga)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

L994212 CONTD....
 PAGE 3 of 7
 24-MAY-11 11:48 (MT)
 Version: FINAL REV. 2

Sample ID Description Sampled Date Sampled Time Client ID		L994212-1 WATER 06-APR-11 09:00 10WBW001-Z1-300	L994212-2 WATER 06-APR-11 14:00 10WBW001-Z6-301	L994212-3 WATER 06-APR-11 09:00 10WBW001-Z10-302	L994212-4 WATER 07-APR-11 11:00 10WBW001-Z10-303	L994212-5 WATER 08-APR-11 16:00 10WBW001-Z6-304
Grouping	Analyte					
SEAWATER						
Total Metals	Iron (Fe)-Total (mg/L)	0.256	4.41	9.52	1.45	10.3
	Lead (Pb)-Total (mg/L)	0.00061	0.00044	0.00051	0.00083	0.00111
	Lithium (Li)-Total (mg/L)	0.375	0.167	0.194	0.192	0.470
	Magnesium (Mg)-Total (mg/L)	74.9	1280	1250	1480	1760
	Manganese (Mn)-Total (mg/L)	0.750	1.25	1.29	2.04	2.45
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.0145	0.0292	0.0056	<0.0020	0.0051
	Nickel (Ni)-Total (mg/L)	0.00733	0.00169	0.00230	0.00185	0.00192
	Phosphorus (P)-Total (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Potassium (K)-Total (mg/L)	41	210	261	282	286
	Rhenium (Re)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Rubidium (Rb)-Total (mg/L)	0.0546	0.133	0.114	0.115	0.193
	Selenium (Se)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicon (Si)-Total (mg/L)	2.51	3.36	3.22	3.6	4.1
	Silver (Ag)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Sodium (Na)-Total (mg/L)	7290	8390	9090	10200	11300
	Strontium (Sr)-Total (mg/L)	57.7	18.4	17.7	22.7	29.4
	Tellurium (Te)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Thallium (Tl)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Thorium (Th)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Tin (Sn)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Titanium (Ti)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0303
	Tungsten (W)-Total (mg/L)	0.0018	0.0163	0.0088	0.0021	0.0026
	Uranium (U)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050	0.00087	0.00157
	Yttrium (Y)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Total (mg/L)	0.150	0.335	0.278	0.212	0.217
	Zirconium (Zr)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Barium (Ba)-Dissolved (mg/L)	0.0522	0.182	0.0973	0.0651	0.0576
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	3.05	1.86	2.67	2.75	3.05
	Cadmium (Cd)-Dissolved (mg/L)	<0.000050	<0.000050	0.000138	0.000082	0.000100
	Calcium (Ca)-Dissolved (mg/L)	4770	1400	1560	2050	2010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

L994212 CONTD....

PAGE 4 of 7

24-MAY-11 11:48 (MT)

Version: FINAL REV. 2

Sample ID Description Sampled Date Sampled Time Client ID		L994212-1 WATER 06-APR-11 09:00 10WBW001-Z1-300	L994212-2 WATER 06-APR-11 14:00 10WBW001-Z6-301	L994212-3 WATER 06-APR-11 09:00 10WBW001-Z10-302	L994212-4 WATER 07-APR-11 11:00 10WBW001-Z10-303	L994212-5 WATER 08-APR-11 16:00 10WBW001-Z6-304
Grouping	Analyte					
SEAWATER						
Dissolved Metals	Cesium (Cs)-Dissolved (mg/L)	0.00103	0.00119	0.00116	0.00081	0.00180
	Chromium (Cr)-Dissolved (mg/L)	<0.00050 ^{DLM}	<0.00050 ^{DLM}	<0.00050 ^{DLM}	<0.00050 ^{DLM}	<0.00050 ^{DLM}
	Cobalt (Co)-Dissolved (mg/L)	0.000059	<0.000050	<0.000050	<0.000050	0.000153
	Copper (Cu)-Dissolved (mg/L)	0.00083	<0.00050	<0.00050	<0.00050	<0.00050
	Gallium (Ga)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Iron (Fe)-Dissolved (mg/L)	0.034	0.624	5.83	0.881	7.28
	Lead (Pb)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Lithium (Li)-Dissolved (mg/L)	0.371	0.175	0.190	0.189	0.428
	Magnesium (Mg)-Dissolved (mg/L)	71.2	1270	1200	1420	1640
	Manganese (Mn)-Dissolved (mg/L)	0.731	1.22	1.20	2.01	2.15
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.0112	0.0311	0.0038	<0.0020	0.0054
	Nickel (Ni)-Dissolved (mg/L)	0.00163	0.00100	0.00073	<0.00050	0.00140
	Phosphorus (P)-Dissolved (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Potassium (K)-Dissolved (mg/L)	39	208	251	270	268
	Rhenium (Re)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Rubidium (Rb)-Dissolved (mg/L)	0.0529	0.140	0.109	0.112	0.172
	Selenium (Se)-Dissolved (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicon (Si)-Dissolved (mg/L)	2.42	3.00	2.88	3.2	3.4
	Silver (Ag)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Sodium (Na)-Dissolved (mg/L)	7020	8270	8700	9790	10600
	Strontium (Sr)-Dissolved (mg/L)	55.8	18.1	17.0	21.8	27.6
	Tellurium (Te)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Thallium (Tl)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Thorium (Th)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Tin (Sn)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Titanium (Ti)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Tungsten (W)-Dissolved (mg/L)	0.0018	0.0159	0.0082	0.0020	0.0021
	Uranium (U)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	0.000054
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	0.00058	<0.00050
	Yttrium (Y)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)	0.157	0.154	0.0708	0.0049	0.669
	Zirconium (Zr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

* 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

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted For Sample Matrix Effects
MB-LOR	Method Blank exceeds ALS DQO. LORs adjusted for samples with positive hits below 5 times blank level. Please contact ALS if re-analysis is required.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-C-SCR-VA	Seawater	Alk. by colour or titration (seawater)	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.			
ANIONS-C-BR-IC-VA	Seawater	Bromide by IC (seawater)	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".			
ANIONS-C-CL-IC-VA	Seawater	Chloride by IC (seawater)	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".			
ANIONS-C-NO2-IC-VA	Seawater	Nitrite in Seawater by IC	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.			
ANIONS-C-NO3-IC-VA	Seawater	Nitrate in Seawater by IC	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.			
ANIONS-C-SO4-IC-VA	Seawater	Sulfate by IC (seawater)	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".			
DENSITY-ED	Water	Density	CSSS-Gravimetric
EC-C-PCT-VA	Seawater	Conductivity (Automated) (seawater)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
F-ISE-VA	Seawater	Fluoride by SIE	BASED ON APHA 4500-F FLUORIDE
This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using an ion selective electrode.			
HARDNESS-CALC-VA	Seawater	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.			
HG-DIS-C-CVAFS-VA	Seawater	Diss. Mercury in Seawater by CVAFS	PUGET SOUND PROTOCOLS, EPA 245.7
This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified seawater sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
HG-TOT-C-CVAFS-VA	Seawater	Total Mercury in Seawater by CVAFS	PUGET SOUND PROTOCOLS, EPA 245.7
This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedure involves a cold-oxidation of the acidified seawater sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
IONBALANCE-VA	Seawater	Ion Balance Calculation (seawater)	APHA 1030E
MET-D-L-HRMS-VA	Seawater	Diss. Metals in Seawater by HR-ICPMS	EPA 200.8
Trace metals in seawater are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) based on US EPA Method 200.8, (Revision 5.5). The procedures may involve laboratory sample filtration based on APHA Method 3030B.			
MET-DIS-C-ICP-VA	Seawater	Diss. Metals in Seawater by ICPOES	PUGET SOUND PROTOCOLS, EPA 6010B
This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			

Reference Information

MET-T-L-HRMS-VA	Seawater	Tot. Metals in Seawater by HR-ICPMS	EPA 200.8
Trace metals in seawater are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) based on US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion based on APHA Method 3030E.			
MET-TOT-C-ICP-VA	Seawater	Total Metals in Seawater by ICPOES	PUGET SOUND PROTOCOLS, EPA 6010B
This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
NH3-C-COL-VA	Seawater	Ammonia in Seawater by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)
This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the phenate colourimetric method.			
P-T-COL-VA	Seawater	Total P in Seawater 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-C-PCT-VA	Seawater	pH by Meter (Automated) (seawater)	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	Seawater	D-Orthophosphate in Seawater 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.			
SILICATE-C-COL-VA	Seawater	Silicate by Colourimetric (seawater)	APHA 4500-SIO2 D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdsilicate-heteropoly blue colourimetric method.			
TDS-VA	Seawater	Total Dissolved Solids by Gravimetric	APHA 2540 Gravimetric
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TKN-C-SIE-VA	Seawater	TKN in Seawater by SIE	APHA 4500-NORG (TKN)
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined using an ammonia selective electrode.			

** 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
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, 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.

[illegible]



SRK CONSULTING (CANADA) INC.
ATTN: MELISSA PITZ
SUITE 205
2100 AIRPORT DRIVE
SASKATOON SK S7L 6M6

Date Received: 20-APR-11
Report Date: 12-MAY-11 11:08 (MT)
Version: FINAL

Client Phone: 306-955-4732

Certificate of Analysis

Lab Work Order #: L996991
Project P.O. #: NOT SUBMITTED
Job Reference: 1CH008.052
Legal Site Desc:
C of C Numbers: 1

Comments: Please note that these samples were anomaly high in Calcium and needed high dilution for some of the analyses. Consequently the detection limits were increased.

Andre Langlais
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		L996991-1 WATER 16-APR-11 15:18 10WBW002-Z1-305	L996991-2 WATER 16-APR-11 17:18 10WBW002-Z1-306	L996991-3 WATER 17-APR-11 14:00 10WBW002-Z1-307	L996991-4 WATER 17-APR-11 18:10 10WBW002-Z1-308	L996991-5 WATER 18-APR-11 13:30 10WBW002-Z1-309
Grouping	Analyte					
SEAWATER						
Physical Tests	Conductivity (uS/cm)	182000		183000	176000	39400
	Hardness (as CaCO3) (mg/L)		172000	178000	164000	57600
	pH (pH)	7.22		8.10	7.95	7.50
	Total Dissolved Solids (mg/L)	207000		202000	205000	97600
Leachable Anions & Nutrients	Anion Sum (meq/L)			3900	3650	1230
	Cation Sum (meq/L)			3640	3310	1150
	Cation - Anion Balance (%)			-3.4	-4.9	-3.4
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	220		160	145	97.7
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0		<1.0	<1.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0		<1.0	<1.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	220		160	145	97.7
	Ammonia (as N) (mg/L)			6.4	6.3	
	Bromide (Br) (mg/L)	10.6		58.9	<5.0	<5.0
	Chloride (Cl) (mg/L)	138000		138000	129000	43600
	Fluoride (F) (mg/L)	<30 ^{DLM}		<30 ^{DLM}	<30 ^{DLM}	<30 ^{DLM}
	Nitrate (as N) (mg/L)	<0.50		<0.50	<0.50	<0.50
	Nitrite (as N) (mg/L)	<0.10		<0.10	<0.10	<0.10
	Phosphorus (P)-Total Dissolved (mg/L)	0.53		0.41	0.57	
	Phosphorus (P)-Total (mg/L)	0.62		0.81 ^{DLM}	0.57 ^{DLM}	
	Silicate (as SiO2) (mg/L)			<100	<100	
	Sulfate (SO4) (mg/L)	<50		70	78	<50
	Total Metals					
	Aluminum (Al)-Total (mg/L)		6.24	7.04	0.254	0.256
	Antimony (Sb)-Total (mg/L)		0.0110	0.0109	0.0085	0.0065
	Arsenic (As)-Total (mg/L)		<0.020 ^{DLA}	<0.020 ^{DLA}	<0.020 ^{DLA}	0.038
	Barium (Ba)-Total (mg/L)		0.808	0.845	0.964	0.276
	Beryllium (Be)-Total (mg/L)		<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0025 ^{DLA}
	Bismuth (Bi)-Total (mg/L)		<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0025 ^{DLA}
	Boron (B)-Total (mg/L)		1.0 ^{DLA}	<1.0 ^{DLM}	<1.0 ^{DLA}	<0.50 ^{DLA}
	Cadmium (Cd)-Total (mg/L)		<0.00050	<0.00060	<0.00050	0.00115
	Calcium (Ca)-Total (mg/L)		68800	70800	65900	22600
	Cesium (Cs)-Total (mg/L)		0.0064	0.0066	<0.0050 ^{DLA}	<0.0025 ^{DLA}
	Chromium (Cr)-Total (mg/L)		0.0707	0.0783	0.0178	0.00534
	Cobalt (Co)-Total (mg/L)		0.00610	0.00725	<0.00050 ^{DLA}	0.00071
	Copper (Cu)-Total (mg/L)		0.0409	0.0406	0.0127	0.0174
	Gallium (Ga)-Total (mg/L)		<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0025 ^{DLA}
	Iron (Fe)-Total (mg/L)		27.0	28.4	0.94	1.30

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

L996991 CONTD....
 PAGE 3 of 7
 12-MAY-11 11:08 (MT)
 Version: FINAL

Sample ID Description Sampled Date Sampled Time Client ID		L996991-1 WATER 16-APR-11 15:18 10WBW002-Z1-305	L996991-2 WATER 16-APR-11 17:18 10WBW002-Z1-306	L996991-3 WATER 17-APR-11 14:00 10WBW002-Z1-307	L996991-4 WATER 17-APR-11 18:10 10WBW002-Z1-308	L996991-5 WATER 18-APR-11 13:30 10WBW002-Z1-309
Grouping	Analyte					
SEAWATER						
Total Metals	Lead (Pb)-Total (mg/L)		0.0403	0.0336	<0.0030 ^{DLA}	0.0154 ^{DLA}
	Lithium (Li)-Total (mg/L)		1.01	0.51	0.21	<0.10
	Magnesium (Mg)-Total (mg/L)		101	110	103	41.8
	Manganese (Mn)-Total (mg/L)		0.642	0.759	0.0460	0.150
	Mercury (Hg)-Total (mg/L)			<0.000010	<0.000010	
	Molybdenum (Mo)-Total (mg/L)		0.166	0.165	0.221	0.049
	Nickel (Ni)-Total (mg/L)		0.0321	0.0299	0.0220	0.0145
	Phosphorus (P)-Total (mg/L)		<10 ^{DLA}	<10 ^{DLA}	<10 ^{DLA}	<5.0 ^{DLA}
	Potassium (K)-Total (mg/L)		<200	<200	<200	<100
	Rhenium (Re)-Total (mg/L)		<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0025 ^{DLA}
	Rubidium (Rb)-Total (mg/L)		0.070	0.060	0.054	<0.025 ^{DLA}
	Selenium (Se)-Total (mg/L)		<0.020 ^{DLA}	<0.020 ^{DLA}	<0.020 ^{DLA}	<0.10 ^{DLM}
	Silicon (Si)-Total (mg/L)		9.8	11.2	<5.0	<2.5
	Silver (Ag)-Total (mg/L)		0.0016	0.0016	<0.0010 ^{DLA}	<0.00050 ^{DLA}
	Sodium (Na)-Total (mg/L)		4070	1930	880	<100
	Strontium (Sr)-Total (mg/L)		94.3	60.3	33.7	9.76
	Tellurium (Te)-Total (mg/L)		<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0025 ^{DLA}
	Thallium (Tl)-Total (mg/L)		0.00056	0.00057	<0.00050 ^{DLA}	<0.00025 ^{DLA}
	Thorium (Th)-Total (mg/L)		<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0025 ^{DLA}
	Tin (Sn)-Total (mg/L)		<0.010 ^{DLA}	<0.010 ^{DLA}	<0.010 ^{DLA}	<0.0050 ^{DLA}
	Titanium (Ti)-Total (mg/L)		0.315	0.386	<0.050 ^{DLA}	<0.025 ^{DLA}
	Tungsten (W)-Total (mg/L)		0.030	0.028	0.018	<0.0050 ^{DLA}
	Uranium (U)-Total (mg/L)		<0.00050 ^{DLA}	<0.00050 ^{DLA}	<0.00050 ^{DLA}	<0.00025 ^{DLA}
	Vanadium (V)-Total (mg/L)		0.0223	0.0243	<0.0050 ^{DLA}	<0.0025 ^{DLA}
	Yttrium (Y)-Total (mg/L)		<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0025 ^{DLA}
	Zinc (Zn)-Total (mg/L)		2.51	1.91	0.703	76.7
	Zirconium (Zr)-Total (mg/L)		<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0025 ^{DLA}
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)			<0.050 ^{DLA}	0.052	<0.025 ^{DLA}
	Antimony (Sb)-Dissolved (mg/L)			0.0087 ^{DLA}	0.0082 ^{DLA}	0.0044
	Arsenic (As)-Dissolved (mg/L)			<0.020 ^{DLA}	<0.020 ^{DLA}	0.029
	Barium (Ba)-Dissolved (mg/L)			0.815 ^{DLA}	0.986 ^{DLA}	0.265 ^{DLA}
	Beryllium (Be)-Dissolved (mg/L)			<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0025 ^{DLA}
	Bismuth (Bi)-Dissolved (mg/L)			<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0025 ^{DLA}
	Boron (B)-Dissolved (mg/L)			<1.0 ^{DLA}	<1.0 ^{DLA}	<0.50 ^{DLA}
	Cadmium (Cd)-Dissolved (mg/L)			<0.00050 ^{DLA}	<0.00050 ^{DLA}	0.00094
	Calcium (Ca)-Dissolved (mg/L)			71100	65300	23000
	Cesium (Cs)-Dissolved (mg/L)			0.0065	0.0052	<0.0025 ^{DLA}

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

L996991 CONTD....
 PAGE 4 of 7
 12-MAY-11 11:08 (MT)
 Version: FINAL

Sample ID Description Sampled Date Sampled Time Client ID		L996991-1 WATER 16-APR-11 15:18 10WBW002-Z1-305	L996991-2 WATER 16-APR-11 17:18 10WBW002-Z1-306	L996991-3 WATER 17-APR-11 14:00 10WBW002-Z1-307	L996991-4 WATER 17-APR-11 18:10 10WBW002-Z1-308	L996991-5 WATER 18-APR-11 13:30 10WBW002-Z1-309
Grouping	Analyte					
SEAWATER						
Dissolved Metals	Chromium (Cr)-Dissolved (mg/L)			^{DLM} <0.0020	^{DLA} <0.0010	^{DLA} <0.00050
	Cobalt (Co)-Dissolved (mg/L)			^{DLA} <0.00050	^{DLA} <0.00050	0.00038
	Copper (Cu)-Dissolved (mg/L)			0.0123	0.0115	0.0094
	Gallium (Ga)-Dissolved (mg/L)			^{DLA} <0.0050	^{DLA} <0.0050	^{DLA} <0.0025
	Iron (Fe)-Dissolved (mg/L)			^{DLA} <0.10	^{DLA} <0.10	^{DLA} <0.050
	Lead (Pb)-Dissolved (mg/L)			^{DLA} <0.0030	^{DLA} <0.0030	0.0024
	Lithium (Li)-Dissolved (mg/L)			0.50	0.22	^{DLA} <0.10
	Magnesium (Mg)-Dissolved (mg/L)			102	102	42.4
	Manganese (Mn)-Dissolved (mg/L)			0.0182	0.0372	0.120
	Molybdenum (Mo)-Dissolved (mg/L)			0.157	0.220	0.047
	Nickel (Ni)-Dissolved (mg/L)			0.0059	0.0098	0.0103
	Phosphorus (P)-Dissolved (mg/L)			^{DLA} <10	^{DLA} <10	^{DLA} <5.0
	Potassium (K)-Dissolved (mg/L)			<200	<200	<100
	Rhenium (Re)-Dissolved (mg/L)			^{DLA} <0.0050	^{DLA} <0.0050	^{DLA} <0.0025
	Rubidium (Rb)-Dissolved (mg/L)			0.059	0.057	^{DLA} <0.025
	Selenium (Se)-Dissolved (mg/L)			^{DLA} <0.020	^{DLA} <0.020	^{DLM} <0.10
	Silicon (Si)-Dissolved (mg/L)			<5.0	<5.0	<2.5
	Silver (Ag)-Dissolved (mg/L)			^{DLA} <0.0010	^{DLA} <0.0010	^{DLA} <0.00050
	Sodium (Na)-Dissolved (mg/L)			1830	900	<100
	Strontium (Sr)-Dissolved (mg/L)			58.6	33.2	9.98
	Tellurium (Te)-Dissolved (mg/L)			^{DLA} <0.0050	^{DLA} <0.0050	^{DLA} <0.0025
	Thallium (Tl)-Dissolved (mg/L)			0.00054	^{DLA} <0.00050	^{DLA} <0.00025
	Thorium (Th)-Dissolved (mg/L)			^{DLA} <0.0050	^{DLA} <0.0050	^{DLA} <0.0025
	Tin (Sn)-Dissolved (mg/L)			^{DLA} <0.010	^{DLA} <0.010	^{DLA} <0.0050
	Titanium (Ti)-Dissolved (mg/L)			^{DLA} <0.050	^{DLA} <0.050	^{DLA} <0.025
	Tungsten (W)-Dissolved (mg/L)			0.024	0.019	^{DLA} <0.0050
	Uranium (U)-Dissolved (mg/L)			^{DLA} <0.00050	^{DLA} <0.00050	^{DLA} <0.00025
	Vanadium (V)-Dissolved (mg/L)			^{DLA} <0.0050	^{DLA} <0.0050	^{DLA} <0.0025
	Yttrium (Y)-Dissolved (mg/L)			^{DLA} <0.0050	^{DLA} <0.0050	^{DLA} <0.0025
	Zinc (Zn)-Dissolved (mg/L)			0.294	0.180	35.2
	Zirconium (Zr)-Dissolved (mg/L)			^{DLA} <0.0050	^{DLA} <0.0050	^{DLA} <0.0025

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

L996991 CONTD....
 PAGE 5 of 7
 12-MAY-11 11:08 (MT)
 Version: FINAL

		Sample ID	L996991-1	L996991-3	L996991-4	L996991-5	
		Description	WATER	WATER	WATER	WATER	
		Sampled Date	16-APR-11	17-APR-11	17-APR-11	18-APR-11	
		Sampled Time	15:18	14:00	18:10	13:30	
		Client ID	10WBW002-Z1-305	10WBW002-Z1-307	10WBW002-Z1-308	10WBW002-Z1-309	
Grouping	Analyte						
WATER							
Physical Tests	Density (kg/L)	1.16	1.16	1.15	1.07		

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit Adjusted For required dilution
DLM	Detection Limit Adjusted For Sample Matrix Effects
MB-LOR	Method Blank exceeds ALS DQO. LORs adjusted for samples with positive hits below 5 times blank level. Please contact ALS if re-analysis is required.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-C-PCT-VA	Seawater	Alkalinity by Titration (seawater)	APHA 2320 Alkalinity
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.			
ALK-C-SCR-VA	Seawater	Alk. by colour or titration (seawater)	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.			
ANIONS-C-BR-IC-VA	Seawater	Bromide by IC (seawater)	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".			
ANIONS-C-CL-IC-VA	Seawater	Chloride by IC (seawater)	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".			
ANIONS-C-NO2-IC-VA	Seawater	Nitrite in Seawater by IC	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.			
ANIONS-C-NO3-IC-VA	Seawater	Nitrate in Seawater by IC	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.			
ANIONS-C-SO4-IC-VA	Seawater	Sulfate by IC (seawater)	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".			
DENSITY-ED	Water	Density	CSSS-Gravimetric
EC-C-PCT-VA	Seawater	Conductivity (Automated) (seawater)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
F-ISE-VA	Seawater	Fluoride by SIE	BASED ON APHA 4500-F FLUORIDE
This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using an ion selective electrode.			
HARDNESS-CALC-VA	Seawater	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.			
HG-TOT-C-CVAFS-VA	Seawater	Total Mercury in Seawater by CVAFS	PUGET SOUND PROTOCOLS, EPA 245.7
This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedure involves a cold-oxidation of the acidified seawater sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
IONBALANCE-VA	Seawater	Ion Balance Calculation (seawater)	APHA 1030E
MET-D-L-HRMS-VA	Seawater	Diss. Metals in Seawater by HR-ICPMS	EPA 200.8
Trace metals in seawater are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) based on US EPA Method 200.8, (Revision 5.5). The procedures may involve laboratory sample filtration based on APHA Method 3030B.			
MET-DIS-C-ICP-VA	Seawater	Diss. Metals in Seawater by ICPOES	PUGET SOUND PROTOCOLS, EPA 6010B
This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-T-L-HRMS-VA	Seawater	Tot. Metals in Seawater by HR-ICPMS	EPA 200.8

Reference Information

Trace metals in seawater are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) based on US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion based on APHA Method 3030E.

MET-TOT-C-ICP-VA Seawater Total Metals in Seawater by ICPOES PUGET SOUND PROTOCOLS, EPA 6010B

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

NH3-F-VA Seawater Ammonia in Seawater 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 Seawater Total P in Seawater 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.

P-TD-COL-VA Seawater Total Dissolved P in Seawater by Colour APHA 4500-P Phosphorous

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

PH-C-PCT-VA Seawater pH by Meter (Automated) (seawater) 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.

SILICATE-C-COL-VA Seawater Silicate by Colourimetric (seawater) APHA 4500-SiO2 D.

This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdsilicate-heteropoly blue colourimetric method.

TDS-VA Seawater Total Dissolved Solids by Gravimetric APHA 2540 Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

** 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
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

1

GLOSSARY OF REPORT TERMS

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

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

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

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

mg/L - milligrams per litre.

< - Less than.

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

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

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

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

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



CTD

2996991

COC #

Page 1 of 1

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SRK CONSULTING (CANADA) INC.
ATTN: MELISSA PITZ
SUITE 205
2100 AIRPORT DRIVE
SASKATOON SK S7L 6M6

Date Received: 26-APR-11
Report Date: 24-MAY-11 11:59 (MT)
Version: FINAL

Client Phone: 306-955-4732

Certificate of Analysis

Lab Work Order #: L998529
Project P.O. #: NOT SUBMITTED
Job Reference: 1CH008.052
Legal Site Desc:
C of C Numbers: 1

Comments:

Andre Langlais
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
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ALS ENVIRONMENTAL ANALYTICAL REPORT

L998529 CONTD....
 PAGE 2 of 17
 24-MAY-11 11:59 (MT)
 Version: FINAL

Sample ID Description Sampled Date Sampled Time Client ID		L998529-3 BRINE 21-APR-11 16:00 10WBW004-Z6-312	L998529-4 BRINE 21-APR-11 16:00 10WBW004-Z6-313	L998529-5 BRINE 22-APR-11 08:00 10WBW004-Z6-314	L998529-6 BRINE 22-APR-11 15:40 10WBW004-Z6-315	L998529-7 BRINE 23-APR-11 09:00 10WBW004-Z6-316
Grouping	Analyte					
SEAWATER						
Physical Tests	Conductivity (uS/cm)	30800	30700	41000	31200	34200
	Hardness (as CaCO3) (mg/L)	14300	12900	14800	13800	14400
	pH (pH)	6.63	6.59	6.41	6.94	6.91
	Total Dissolved Solids (mg/L)	24200	25000	33500	25100	27500
Leachable Anions & Nutrients	Anion Sum (meq/L)	348	364	497	354	388
	Cation Sum (meq/L)	401	363	408	386	412
	Cation - Anion Balance (%)	7.1	-0.2	-9.9	4.3	3.0
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	24.5	25.3	11.6	34.9	33.0
	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)	24.5	25.3	11.6	34.9	33.0
	Ammonia (as N) (mg/L)	2.38	2.37			
	Bromide (Br) (mg/L)	5.1	7.3	7.3	6.8	8.0
	Chloride (Cl) (mg/L)	12100	12700	17400	12300	13500
	Fluoride (F) (mg/L)	0.76	0.78	1.48	0.83	0.94
	Nitrate (as N) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Nitrite (as N) (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Total Kjeldahl Nitrogen (mg/L)	7.56	7.10			
	Orthophosphate-Dissolved (as P) (mg/L)	<0.0010	<0.0010			
	Phosphorus (P)-Total (mg/L)	0.190	0.189			
	Silicate (as SiO2) (mg/L)	<10 ^{DLM}	<10 ^{DLM}			
	Sulfate (SO4) (mg/L)	271	285	300	278	330
Total Metals	Aluminum (Al)-Total (mg/L)	0.0123	0.0069	0.0118		
	Antimony (Sb)-Total (mg/L)	0.0179	0.0163	0.0139		
	Arsenic (As)-Total (mg/L)	<0.0020	<0.0020	<0.0020		
	Barium (Ba)-Total (mg/L)	0.553	0.500	0.532		
	Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Boron (B)-Total (mg/L)	0.90	0.84	0.92		
	Cadmium (Cd)-Total (mg/L)	<0.00010 ^{DLM}	<0.00010 ^{DLM}	<0.00010 ^{DLM}		
	Calcium (Ca)-Total (mg/L)	4730	4560	5360	4830	4960
	Cesium (Cs)-Total (mg/L)	0.00619	0.00565	0.00809		
	Chromium (Cr)-Total (mg/L)	0.00106	<0.00070 ^{DLB}	<0.00050 ^{DLB}		
	Cobalt (Co)-Total (mg/L)	0.00352	0.00313	0.00482		
	Copper (Cu)-Total (mg/L)	0.00592	0.00286	<0.00050		
	Gallium (Ga)-Total (mg/L)	<0.00050	<0.00050	<0.00050		

* 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	L998529-8 BRINE 23-APR-11 15:00 10WBW004-Z6-317	L998529-9 BRINE 23-APR-11 16:30 10WBW004-Z6-318		
Grouping	Analyte					
SEAWATER						
Physical Tests	Conductivity (uS/cm)		31400	34400		
	Hardness (as CaCO3) (mg/L)		12900	13700		
	pH (pH)		7.00	6.98		
	Total Dissolved Solids (mg/L)		25300	27700		
Leachable Anions & Nutrients	Anion Sum (meq/L)		375	421		
	Cation Sum (meq/L)		364	401		
	Cation - Anion Balance (%)		-1.5	-2.3		
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		35.4	34.0		
	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)		35.4	34.0		
	Ammonia (as N) (mg/L)		2.38			
	Bromide (Br) (mg/L)		7.3	9.4		
	Chloride (Cl) (mg/L)		13000	14600		
	Fluoride (F) (mg/L)		0.83	0.95		
	Nitrate (as N) (mg/L)		<0.50	<0.50		
	Nitrite (as N) (mg/L)		<0.10	<0.10		
	Total Kjeldahl Nitrogen (mg/L)		6.92			
	Orthophosphate-Dissolved (as P) (mg/L)		<0.0010			
	Phosphorus (P)-Total (mg/L)		0.196			
	Silicate (as SiO2) (mg/L)		<10 ^{DLM}			
	Sulfate (SO4) (mg/L)		295	360		
Total Metals	Aluminum (Al)-Total (mg/L)		<0.0050	0.0071		
	Antimony (Sb)-Total (mg/L)		0.0204	0.0178		
	Arsenic (As)-Total (mg/L)		<0.0020	0.0021		
	Barium (Ba)-Total (mg/L)		0.577	0.479		
	Beryllium (Be)-Total (mg/L)		<0.00050	<0.00050		
	Bismuth (Bi)-Total (mg/L)		<0.00050	<0.00050		
	Boron (B)-Total (mg/L)		0.89	0.88		
	Cadmium (Cd)-Total (mg/L)		<0.00010 ^{DLM}	<0.00010 ^{DLM}		
	Calcium (Ca)-Total (mg/L)		4590	4710		
	Cesium (Cs)-Total (mg/L)		0.00622	0.00674		
	Chromium (Cr)-Total (mg/L)		0.00155	0.00213		
	Cobalt (Co)-Total (mg/L)		0.00509	0.00339		
	Copper (Cu)-Total (mg/L)		<0.00050	<0.00050		
	Gallium (Ga)-Total (mg/L)		<0.00050	<0.00050		

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

L998529 CONTD....
 PAGE 4 of 17
 24-MAY-11 11:59 (MT)
 Version: FINAL

		Sample ID Description Sampled Date Sampled Time Client ID	L998529-3 BRINE 21-APR-11 16:00 10WBW004-Z6-312	L998529-4 BRINE 21-APR-11 16:00 10WBW004-Z6-313	L998529-5 BRINE 22-APR-11 08:00 10WBW004-Z6-314	L998529-6 BRINE 22-APR-11 15:40 10WBW004-Z6-315	L998529-7 BRINE 23-APR-11 09:00 10WBW004-Z6-316
Grouping	Analyte						
SEAWATER							
Total Metals	Iron (Fe)-Total (mg/L)	12.1	10.8	15.7			
	Lead (Pb)-Total (mg/L)	0.00067	<0.00030	<0.00030			
	Lithium (Li)-Total (mg/L)	0.046	0.047	0.053			
	Magnesium (Mg)-Total (mg/L)	415	408	447	422	481	
	Manganese (Mn)-Total (mg/L)	0.890	0.814	0.989			
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010				
	Molybdenum (Mo)-Total (mg/L)	0.0975	0.0914	0.110			
	Nickel (Ni)-Total (mg/L)	0.0130	0.0123	0.0121			
	Phosphorus (P)-Total (mg/L)	<1.0	<1.0	<1.0			
	Potassium (K)-Total (mg/L)	52	51	51	54	53	
	Rhenium (Re)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Rubidium (Rb)-Total (mg/L)	0.0540	0.0502	0.0523			
	Selenium (Se)-Total (mg/L)	<0.0020	<0.0020	<0.0020			
	Silicon (Si)-Total (mg/L)	1.81	1.76	1.47			
	Silver (Ag)-Total (mg/L)	<0.00010	<0.00010	<0.00010			
	Sodium (Na)-Total (mg/L)	2450	2430	2600	2500	2830	
	Strontium (Sr)-Total (mg/L)	24.7	26.6	28.4			
	Tellurium (Te)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Thallium (Tl)-Total (mg/L)	0.000055	<0.000050	<0.000050			
	Thorium (Th)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Tin (Sn)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Titanium (Ti)-Total (mg/L)	<0.0050	<0.0050	<0.0050			
	Tungsten (W)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Uranium (U)-Total (mg/L)	0.00395	0.00389	0.00299			
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Yttrium (Y)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Zinc (Zn)-Total (mg/L)	0.156	0.145	0.139			
	Zirconium (Zr)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050			
	Antimony (Sb)-Dissolved (mg/L)	0.0156	0.0160	0.0118			
	Arsenic (As)-Dissolved (mg/L)	<0.0020	<0.0020	<0.0020			
	Barium (Ba)-Dissolved (mg/L)	0.544	0.554	0.491			
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Boron (B)-Dissolved (mg/L)	0.86	0.91	0.83			
	Cadmium (Cd)-Dissolved (mg/L)	<0.00010 ^{DLM}	<0.00010 ^{DLM}	<0.00010 ^{DLM}			
	Calcium (Ca)-Dissolved (mg/L)	5040	4490	5200			

* 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	L998529-8 BRINE 23-APR-11 15:00 10WBW004-Z6-317	L998529-9 BRINE 23-APR-11 16:30 10WBW004-Z6-318		
Grouping	Analyte					
SEAWATER						
Total Metals	Iron (Fe)-Total (mg/L)	4.74	5.05			
	Lead (Pb)-Total (mg/L)	<0.00030	0.00802			
	Lithium (Li)-Total (mg/L)	0.048	0.047			
	Magnesium (Mg)-Total (mg/L)	411	494			
	Manganese (Mn)-Total (mg/L)	0.847	0.826			
	Mercury (Hg)-Total (mg/L)	<0.000010				
	Molybdenum (Mo)-Total (mg/L)	0.0968	0.0966			
	Nickel (Ni)-Total (mg/L)	0.0180	0.0143			
	Phosphorus (P)-Total (mg/L)	<1.0	<1.0			
	Potassium (K)-Total (mg/L)	52	53			
	Rhenium (Re)-Total (mg/L)	<0.00050	<0.00050			
	Rubidium (Rb)-Total (mg/L)	0.0529	0.0496			
	Selenium (Se)-Total (mg/L)	<0.0020	<0.0020			
	Silicon (Si)-Total (mg/L)	1.88	1.92			
	Silver (Ag)-Total (mg/L)	<0.00010	<0.00010			
	Sodium (Na)-Total (mg/L)	2440	2900			
	Strontium (Sr)-Total (mg/L)	26.4	30.2			
	Tellurium (Te)-Total (mg/L)	<0.00050	<0.00050			
	Thallium (Tl)-Total (mg/L)	<0.000050	<0.000050			
	Thorium (Th)-Total (mg/L)	<0.00050	<0.00050			
	Tin (Sn)-Total (mg/L)	<0.0010	<0.0010			
	Titanium (Ti)-Total (mg/L)	<0.0050	<0.0050			
	Tungsten (W)-Total (mg/L)	<0.0010	0.0066			
	Uranium (U)-Total (mg/L)	0.00822	0.00783			
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050			
	Yttrium (Y)-Total (mg/L)	<0.00050	<0.00050			
	Zinc (Zn)-Total (mg/L)	0.180	0.265			
	Zirconium (Zr)-Total (mg/L)	<0.00050	<0.00050			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050			
	Antimony (Sb)-Dissolved (mg/L)	0.0180	0.0176			
	Arsenic (As)-Dissolved (mg/L)	<0.0020	<0.0020			
	Barium (Ba)-Dissolved (mg/L)	0.564	0.499			
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050			
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050			
	Boron (B)-Dissolved (mg/L)	0.88	0.88			
	Cadmium (Cd)-Dissolved (mg/L)	<0.00010 ^{DLM}	<0.00010 ^{DLM}			
	Calcium (Ca)-Dissolved (mg/L)	4500	4690			

* 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	L998529-3 BRINE 21-APR-11 16:00 10WBW004-Z6-312	L998529-4 BRINE 21-APR-11 16:00 10WBW004-Z6-313	L998529-5 BRINE 22-APR-11 08:00 10WBW004-Z6-314	L998529-6 BRINE 22-APR-11 15:40 10WBW004-Z6-315	L998529-7 BRINE 23-APR-11 09:00 10WBW004-Z6-316
Grouping	Analyte						
SEAWATER							
Dissolved Metals	Cesium (Cs)-Dissolved (mg/L)	0.00605	0.00612	0.00737			
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010			
	Cobalt (Co)-Dissolved (mg/L)	0.00452	0.00465	0.00434			
	Copper (Cu)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Gallium (Ga)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Iron (Fe)-Dissolved (mg/L)	3.50	3.54	11.8			
	Lead (Pb)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030			
	Lithium (Li)-Dissolved (mg/L)	0.044	0.049	0.048			
	Magnesium (Mg)-Dissolved (mg/L)	425	403	435			
	Manganese (Mn)-Dissolved (mg/L)	0.859	0.853	0.889			
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010				
	Molybdenum (Mo)-Dissolved (mg/L)	0.0852	0.0868	0.0956			
	Nickel (Ni)-Dissolved (mg/L)	0.0157	0.0163	0.0110			
	Phosphorus (P)-Dissolved (mg/L)	<1.0	<1.0	<1.0			
	Potassium (K)-Dissolved (mg/L)	55	51	51			
	Rhenium (Re)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Rubidium (Rb)-Dissolved (mg/L)	0.0531	0.0533	0.0483			
	Selenium (Se)-Dissolved (mg/L)	<0.0020	<0.0020	<0.0020			
	Silicon (Si)-Dissolved (mg/L)	1.93	1.75	1.31			
	Silver (Ag)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010			
	Sodium (Na)-Dissolved (mg/L)	2600	2390	2540			
	Strontium (Sr)-Dissolved (mg/L)	26.3	26.2	27.5			
	Tellurium (Te)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Thallium (Tl)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050			
	Thorium (Th)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Tin (Sn)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010			
	Titanium (Ti)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050			
	Tungsten (W)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010			
	Uranium (U)-Dissolved (mg/L)	0.00621	0.00655	0.00281			
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Yttrium (Y)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Zinc (Zn)-Dissolved (mg/L)	0.298	0.296	0.105			
	Zirconium (Zr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			

* 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	L998529-8 BRINE 23-APR-11 15:00 10WBW004-Z6-317	L998529-9 BRINE 23-APR-11 16:30 10WBW004-Z6-318		
Grouping	Analyte					
SEAWATER						
Dissolved Metals	Cesium (Cs)-Dissolved (mg/L)	0.00618	0.00693			
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010			
	Cobalt (Co)-Dissolved (mg/L)	0.00504	0.00327			
	Copper (Cu)-Dissolved (mg/L)	<0.00050	<0.00050			
	Gallium (Ga)-Dissolved (mg/L)	<0.00050	<0.00050			
	Iron (Fe)-Dissolved (mg/L)	0.233	3.48			
	Lead (Pb)-Dissolved (mg/L)	<0.00030	<0.00030			
	Lithium (Li)-Dissolved (mg/L)	0.048	0.047			
	Magnesium (Mg)-Dissolved (mg/L)	404	492			
	Manganese (Mn)-Dissolved (mg/L)	0.840	0.836			
	Mercury (Hg)-Dissolved (mg/L)	<0.000010				
	Molybdenum (Mo)-Dissolved (mg/L)	0.0878	0.0970			
	Nickel (Ni)-Dissolved (mg/L)	0.0167	0.0138			
	Phosphorus (P)-Dissolved (mg/L)	<1.0	<1.0			
	Potassium (K)-Dissolved (mg/L)	51	52			
	Rhenium (Re)-Dissolved (mg/L)	<0.00050	<0.00050			
	Rubidium (Rb)-Dissolved (mg/L)	0.0533	0.0499			
	Selenium (Se)-Dissolved (mg/L)	<0.0020	<0.0020			
	Silicon (Si)-Dissolved (mg/L)	1.75	1.86			
	Silver (Ag)-Dissolved (mg/L)	<0.00010	<0.00010			
	Sodium (Na)-Dissolved (mg/L)	2400	2890			
	Strontium (Sr)-Dissolved (mg/L)	26.0	30.1			
	Tellurium (Te)-Dissolved (mg/L)	<0.00050	<0.00050			
	Thallium (Tl)-Dissolved (mg/L)	<0.000050	<0.000050			
	Thorium (Th)-Dissolved (mg/L)	<0.00050	<0.00050			
	Tin (Sn)-Dissolved (mg/L)	<0.0010	<0.0010			
	Titanium (Ti)-Dissolved (mg/L)	<0.0050	<0.0050			
	Tungsten (W)-Dissolved (mg/L)	<0.0010	0.0054			
	Uranium (U)-Dissolved (mg/L)	0.00848	0.00823			
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050			
	Yttrium (Y)-Dissolved (mg/L)	<0.00050	<0.00050			
	Zinc (Zn)-Dissolved (mg/L)	0.104	0.194			
	Zirconium (Zr)-Dissolved (mg/L)	<0.00050	<0.00050			

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ALS ENVIRONMENTAL ANALYTICAL REPORT

L998529 CONTD....
 PAGE 8 of 17
 24-MAY-11 11:59 (MT)
 Version: FINAL

		Sample ID Description Sampled Date Sampled Time Client ID	L998529-1 WATER 21-APR-11 11:00 10WBW004-310	L998529-2 WATER 21-APR-11 11:30 10WBW004-311	L998529-3 BRINE 21-APR-11 16:00 10WBW004-Z6-312	L998529-4 BRINE 21-APR-11 16:00 10WBW004-Z6-313	L998529-5 BRINE 22-APR-11 08:00 10WBW004-Z6-314
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)	4.0	<2.0				
	Density (kg/L)				1.02	1.02	1.02
	Hardness (as CaCO3) (mg/L)	1.15	<0.50				
	pH (pH)	6.35	5.78				
	Total Dissolved Solids (mg/L)	<10	<10				
Leachable Anions & Nutrients	Anion Sum (meq/L)	<0.10	<0.10				
	Cation Sum (meq/L)	<0.10	<0.10				
	Cation - Anion Balance (%)	12.8	0.0				
Anions and Nutrients	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				
	Bromide (Br) (mg/L)	<0.050	<0.050				
	Chloride (Cl) (mg/L)	0.65	<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				
	Sulfate (SO4) (mg/L)	<0.50	<0.50				
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0030	<0.0030				
	Antimony (Sb)-Total (mg/L)	0.000477	<0.000010				
	Arsenic (As)-Total (mg/L)	<0.000050	<0.000050				
	Barium (Ba)-Total (mg/L)	0.00020	<0.00010				
	Beryllium (Be)-Total (mg/L)	<0.0000050	<0.0000050				
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050				
	Boron (B)-Total (mg/L)	0.0096	<0.0050				
	Cadmium (Cd)-Total (mg/L)	0.0000252	<0.0000050				
	Calcium (Ca)-Total (mg/L)	0.715	<0.050				
	Cesium (Cs)-Total (mg/L)	<0.0000050	<0.0000050				
	Chromium (Cr)-Total (mg/L)	0.00074	<0.00050				
	Cobalt (Co)-Total (mg/L)	<0.000050	<0.000050				
	Copper (Cu)-Total (mg/L)	<0.00050	<0.00050				
	Gallium (Ga)-Total (mg/L)	<0.000050	<0.000050				
	Iron (Fe)-Total (mg/L)	<0.030	<0.030				
	Lead (Pb)-Total (mg/L)	0.000056	<0.000050				
	Lithium (Li)-Total (mg/L)	<0.00020	<0.00030				
	Magnesium (Mg)-Total (mg/L)	<0.10	<0.10				

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ALS ENVIRONMENTAL ANALYTICAL REPORT

L998529 CONTD....
 PAGE 9 of 17
 24-MAY-11 11:59 (MT)
 Version: FINAL

Sample ID Description Sampled Date Sampled Time Client ID		L998529-8 BRINE 23-APR-11 15:00 10WBW004-Z6-317	L998529-9 BRINE 23-APR-11 16:30 10WBW004-Z6-318			
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)					
	Density (kg/L)	1.02	1.02			
	Hardness (as CaCO3) (mg/L)					
	pH (pH)					
	Total Dissolved Solids (mg/L)					
Leachable Anions & Nutrients	Anion Sum (meq/L)					
	Cation Sum (meq/L)					
	Cation - Anion Balance (%)					
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)					
	Alkalinity, Carbonate (as CaCO3) (mg/L)					
	Alkalinity, Hydroxide (as CaCO3) (mg/L)					
	Alkalinity, Total (as CaCO3) (mg/L)					
	Bromide (Br) (mg/L)					
	Chloride (Cl) (mg/L)					
	Fluoride (F) (mg/L)					
	Nitrate (as N) (mg/L)					
	Nitrite (as N) (mg/L)					
	Sulfate (SO4) (mg/L)					
Total Metals	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)					
	Bismuth (Bi)-Total (mg/L)					
	Boron (B)-Total (mg/L)					
	Cadmium (Cd)-Total (mg/L)					
	Calcium (Ca)-Total (mg/L)					
	Cesium (Cs)-Total (mg/L)					
	Chromium (Cr)-Total (mg/L)					
	Cobalt (Co)-Total (mg/L)					
	Copper (Cu)-Total (mg/L)					
	Gallium (Ga)-Total (mg/L)					
	Iron (Fe)-Total (mg/L)					
	Lead (Pb)-Total (mg/L)					
	Lithium (Li)-Total (mg/L)					
	Magnesium (Mg)-Total (mg/L)					

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

L998529 CONTD....
 PAGE 10 of 17
 24-MAY-11 11:59 (MT)
 Version: FINAL

		Sample ID Description Sampled Date Sampled Time Client ID	L998529-1 WATER 21-APR-11 11:00 10WBW004-310	L998529-2 WATER 21-APR-11 11:30 10WBW004-311	L998529-3 BRINE 21-APR-11 16:00 10WBW004-Z6-312	L998529-4 BRINE 21-APR-11 16:00 10WBW004-Z6-313	L998529-5 BRINE 22-APR-11 08:00 10WBW004-Z6-314
Grouping	Analyte						
WATER							
Total Metals	Manganese (Mn)-Total (mg/L)	0.00041	<0.00020				
	Molybdenum (Mo)-Total (mg/L)	0.000170	<0.000050				
	Nickel (Ni)-Total (mg/L)	0.00040	<0.00020				
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30				
	Potassium (K)-Total (mg/L)	<2.0	<2.0				
	Rhenium (Re)-Total (mg/L)	<0.0000050	<0.0000050				
	Rubidium (Rb)-Total (mg/L)	0.000023	<0.000020				
	Selenium (Se)-Total (mg/L)	<0.00020	<0.00020				
	Silicon (Si)-Total (mg/L)	<0.050	<0.050				
	Silver (Ag)-Total (mg/L)	<0.0000050	<0.0000050				
	Sodium (Na)-Total (mg/L)	<2.0	<2.0				
	Strontium (Sr)-Total (mg/L)	0.000553	<0.000050				
	Tellurium (Te)-Total (mg/L)	<0.000010	<0.000010				
	Thallium (Tl)-Total (mg/L)	<0.0000020	<0.0000020				
	Thorium (Th)-Total (mg/L)	<0.0000050	<0.0000050				
	Tin (Sn)-Total (mg/L)	<0.00020	<0.00020				
	Titanium (Ti)-Total (mg/L)	<0.00020	<0.00020				
	Tungsten (W)-Total (mg/L)	0.000046	<0.000010				
	Uranium (U)-Total (mg/L)	<0.0000020	<0.0000020				
	Vanadium (V)-Total (mg/L)	<0.000050	<0.000050				
	Yttrium (Y)-Total (mg/L)	<0.0000050	<0.0000050				
	Zinc (Zn)-Total (mg/L)	0.0393	<0.0030				
	Zirconium (Zr)-Total (mg/L)	<0.000050	<0.000050				
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0030	<0.0030				
	Antimony (Sb)-Dissolved (mg/L)	0.000163	<0.000010				
	Arsenic (As)-Dissolved (mg/L)	<0.000050	<0.000050				
	Barium (Ba)-Dissolved (mg/L)	0.00086	<0.00010				
	Beryllium (Be)-Dissolved (mg/L)	<0.0000050	<0.0000050				
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050				
	Boron (B)-Dissolved (mg/L)	<0.0050	<0.0050				
	Cadmium (Cd)-Dissolved (mg/L)	<0.0000050	<0.0000050				
	Calcium (Ca)-Dissolved (mg/L)	0.459	<0.050				
	Cesium (Cs)-Dissolved (mg/L)	<0.0000050	<0.0000050				
	Chromium (Cr)-Dissolved (mg/L)	<0.00050	<0.00050				
	Cobalt (Co)-Dissolved (mg/L)	<0.000050	<0.000050				
	Copper (Cu)-Dissolved (mg/L)	0.00077	<0.00050				
	Gallium (Ga)-Dissolved (mg/L)	<0.000050	<0.000050				

* 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	L998529-8 BRINE 23-APR-11 15:00 10WBW004-Z6-317	L998529-9 BRINE 23-APR-11 16:30 10WBW004-Z6-318			
Grouping	Analyte						
WATER							
Total Metals	Manganese (Mn)-Total (mg/L)						
	Molybdenum (Mo)-Total (mg/L)						
	Nickel (Ni)-Total (mg/L)						
	Phosphorus (P)-Total (mg/L)						
	Potassium (K)-Total (mg/L)						
	Rhenium (Re)-Total (mg/L)						
	Rubidium (Rb)-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)						
	Tellurium (Te)-Total (mg/L)						
	Thallium (Tl)-Total (mg/L)						
	Thorium (Th)-Total (mg/L)						
	Tin (Sn)-Total (mg/L)						
	Titanium (Ti)-Total (mg/L)						
	Tungsten (W)-Total (mg/L)						
	Uranium (U)-Total (mg/L)						
	Vanadium (V)-Total (mg/L)						
	Yttrium (Y)-Total (mg/L)						
	Zinc (Zn)-Total (mg/L)						
	Zirconium (Zr)-Total (mg/L)						
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)						
	Antimony (Sb)-Dissolved (mg/L)						
	Arsenic (As)-Dissolved (mg/L)						
	Barium (Ba)-Dissolved (mg/L)						
	Beryllium (Be)-Dissolved (mg/L)						
	Bismuth (Bi)-Dissolved (mg/L)						
	Boron (B)-Dissolved (mg/L)						
	Cadmium (Cd)-Dissolved (mg/L)						
	Calcium (Ca)-Dissolved (mg/L)						
	Cesium (Cs)-Dissolved (mg/L)						
	Chromium (Cr)-Dissolved (mg/L)						
	Cobalt (Co)-Dissolved (mg/L)						
	Copper (Cu)-Dissolved (mg/L)						
	Gallium (Ga)-Dissolved (mg/L)						

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

L998529 CONTD....
 PAGE 12 of 17
 24-MAY-11 11:59 (MT)
 Version: FINAL

Sample ID Description Sampled Date Sampled Time Client ID		L998529-1 WATER 21-APR-11 11:00 10WBW004-310	L998529-2 WATER 21-APR-11 11:30 10WBW004-311	L998529-3 BRINE 21-APR-11 16:00 10WBW004-Z6-312	L998529-4 BRINE 21-APR-11 16:00 10WBW004-Z6-313	L998529-5 BRINE 22-APR-11 08:00 10WBW004-Z6-314
Grouping	Analyte					
WATER						
Dissolved Metals	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030			
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050			
	Lithium (Li)-Dissolved (mg/L)	0.00020	<0.00030			
	Magnesium (Mg)-Dissolved (mg/L)	<0.10	<0.10			
	Manganese (Mn)-Dissolved (mg/L)	0.00032	<0.00020			
	Molybdenum (Mo)-Dissolved (mg/L)	0.000129	<0.000050			
	Nickel (Ni)-Dissolved (mg/L)	<0.00020	<0.00020			
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30			
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0			
	Rhenium (Re)-Dissolved (mg/L)	<0.0000050	<0.0000050			
	Rubidium (Rb)-Dissolved (mg/L)	<0.000020	<0.000020			
	Selenium (Se)-Dissolved (mg/L)	<0.00020	<0.00020			
	Silicon (Si)-Dissolved (mg/L)	0.052	<0.050			
	Silver (Ag)-Dissolved (mg/L)	<0.0000050	<0.0000050			
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0			
	Strontium (Sr)-Dissolved (mg/L)	0.00154	<0.000050			
	Tellurium (Te)-Dissolved (mg/L)	<0.000010	<0.000010			
	Thallium (Tl)-Dissolved (mg/L)	<0.0000020	<0.0000020			
	Thorium (Th)-Dissolved (mg/L)	<0.0000050	<0.0000050			
	Tin (Sn)-Dissolved (mg/L)	<0.00020	<0.00020			
	Titanium (Ti)-Dissolved (mg/L)	<0.00020	<0.00020			
	Tungsten (W)-Dissolved (mg/L)	0.000050	<0.000010			
	Uranium (U)-Dissolved (mg/L)	<0.0000020	<0.0000020			
	Vanadium (V)-Dissolved (mg/L)	<0.000050	<0.000050			
	Yttrium (Y)-Dissolved (mg/L)	<0.0000050	<0.0000050			
	Zinc (Zn)-Dissolved (mg/L)	0.0076	<0.0030			
	Zirconium (Zr)-Dissolved (mg/L)	<0.000050	<0.000050			

* 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		L998529-8 BRINE 23-APR-11 15:00 10WBW004-Z6-317	L998529-9 BRINE 23-APR-11 16:30 10WBW004-Z6-318			
Grouping	Analyte					
WATER						
Dissolved Metals	Iron (Fe)-Dissolved (mg/L)					
	Lead (Pb)-Dissolved (mg/L)					
	Lithium (Li)-Dissolved (mg/L)					
	Magnesium (Mg)-Dissolved (mg/L)					
	Manganese (Mn)-Dissolved (mg/L)					
	Molybdenum (Mo)-Dissolved (mg/L)					
	Nickel (Ni)-Dissolved (mg/L)					
	Phosphorus (P)-Dissolved (mg/L)					
	Potassium (K)-Dissolved (mg/L)					
	Rhenium (Re)-Dissolved (mg/L)					
	Rubidium (Rb)-Dissolved (mg/L)					
	Selenium (Se)-Dissolved (mg/L)					
	Silicon (Si)-Dissolved (mg/L)					
	Silver (Ag)-Dissolved (mg/L)					
	Sodium (Na)-Dissolved (mg/L)					
	Strontium (Sr)-Dissolved (mg/L)					
	Tellurium (Te)-Dissolved (mg/L)					
	Thallium (Tl)-Dissolved (mg/L)					
	Thorium (Th)-Dissolved (mg/L)					
	Tin (Sn)-Dissolved (mg/L)					
	Titanium (Ti)-Dissolved (mg/L)					
	Tungsten (W)-Dissolved (mg/L)					
	Uranium (U)-Dissolved (mg/L)					
	Vanadium (V)-Dissolved (mg/L)					
	Yttrium (Y)-Dissolved (mg/L)					
	Zinc (Zn)-Dissolved (mg/L)					
	Zirconium (Zr)-Dissolved (mg/L)					

* 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.
DLM	Detection Limit Adjusted For Sample Matrix Effects
DUP-H,J	Duplicate results outside ALS DQO, due to sample heterogeneity. Duplicate results and limits are expressed in terms of absolute difference.
MB-LOR	Method Blank exceeds ALS DQO. LORs adjusted for samples with positive hits below 5 times blank level. Please contact ALS if re-analysis is required.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-C-SCR-VA	Seawater	Alk. by colour or titration (seawater)	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.			
ALK-SCR-VA	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.			
ANIONS-BR-IC-VA	Water	Bromide 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".			
ANIONS-C-BR-IC-VA	Seawater	Bromide by IC (seawater)	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".			
ANIONS-C-CL-IC-VA	Seawater	Chloride by IC (seawater)	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".			
ANIONS-C-NO2-IC-VA	Seawater	Nitrite in Seawater by IC	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.			
ANIONS-C-NO3-IC-VA	Seawater	Nitrate in Seawater by IC	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.			
ANIONS-C-SO4-IC-VA	Seawater	Sulfate by IC (seawater)	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".			
ANIONS-CL-IC-VA	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".			
ANIONS-F-IC-VA	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".			
ANIONS-NO2-IC-VA	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.			
ANIONS-NO3-IC-VA	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.			
ANIONS-SO4-IC-VA	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".			
DENSITY-ED	Water	Density	CSSS-Gravimetric
EC-C-PCT-VA	Seawater	Conductivity (Automated) (seawater)	APHA 2510 Auto. Conduc.

Reference Information

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

EC-PCT-VA 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.

F-ISE-VA Seawater Fluoride by SIE BASED ON APHA 4500-F FLUORIDE

This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using an ion selective electrode.

HARDNESS-CALC-VA 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.

HARDNESS-CALC-VA Seawater 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.

HG-DIS-C-CVAFS-VA Seawater Diss. Mercury in Seawater by CVAFS PUGET SOUND PROTOCOLS, EPA 245.7

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified seawater sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-C-CVAFS-VA Seawater Total Mercury in Seawater by CVAFS PUGET SOUND PROTOCOLS, EPA 245.7

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedure involves a cold-oxidation of the acidified seawater sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence 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:

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

IONBALANCE-VA Seawater Ion Balance Calculation (seawater) APHA 1030E

MET-D-L-HRMS-VA Water Diss. Metals in Water by HR-ICPMS EPA 200.8

Trace metals in water are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) modified from US EPA Method 200.8, (Revision 5.5). The procedures may involve laboratory sample filtration modified from APHA Method 3030B.

MET-D-L-HRMS-VA Seawater Diss. Metals in Seawater by HR-ICPMS EPA 200.8

Trace metals in seawater are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) based on US EPA Method 200.8, (Revision 5.5). The procedures may involve laboratory sample filtration based on APHA Method 3030B.

MET-DIS-C-ICP-VA Seawater Diss. Metals in Seawater by ICPOES PUGET SOUND PROTOCOLS, EPA 6010B

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-ICP-VA Water Dissolved 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 procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-T-L-HRMS-VA Water Total Metals in Water by HR-ICPMS EPA 200.8

Trace metals in water are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) modified from US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion modified from APHA Method 3030E.

MET-T-L-HRMS-VA Seawater Tot. Metals in Seawater by HR-ICPMS EPA 200.8

Trace metals in seawater are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) based on US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion based on APHA Method 3030E.

MET-TOT-C-ICP-VA Seawater Total Metals in Seawater by ICPOES PUGET SOUND PROTOCOLS, EPA 6010B

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and

Reference Information

Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

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).			
NH3-F-VA	Seawater	Ammonia in Seawater 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	Seawater	Total P in Seawater 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-C-PCT-VA	Seawater	pH by Meter (Automated) (seawater)	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.			
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	Seawater	D-Orthophosphate in Seawater 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.			
SILICATE-C-COL-VA	Seawater	Silicate by Colourimetric (seawater)	APHA 4500-SIO2 D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TDS-VA	Seawater	Total Dissolved Solids by Gravimetric	APHA 2540 Gravimetric
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TKN-C-SIE-VA	Seawater	TKN in Seawater by SIE	APHA 4500-NORG (TKN)
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined using an ammonia selective electrode.			

** 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
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

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

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

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

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

mg/L - milligrams per litre.

< - Less than.

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

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

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

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

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



Report To				Service Requested (Rush for routine analysis subject to availability)																											
Company SRK Consulting																															
Contact Melissa Pitz				Surcharges apply																											
Address Suite 205, 2100 Airport Drive				Email 1 mpitz@srk.com																											
Saskatoon, SK, Canada, S7L 6M6				Email 2 jhenshaw@srk.com																											
Phone (306) 955-4732 Fax (306) 955-4750				Analysis Request																											
Invoice To Same as Report ?				Client / Project Information				Please indicate below Filtered, Preserved or both (F, P, F/P)																							
Company				Job # 1CH008.052				F/P		P		P		P		P															
Contact																															
Address				LSD:																											
Phone: Fax				Quote # Q25959																											
Lab Work Order # (lab use only) 1998529				ALS Contact: Andre Langlais				Sampler: J Jarolim																							
Sample #	Sample Identification (This description will appear on the report)	Date (dd mm yy)	Time (hh mm)	Sample Type	Routine	MET-D-ICP-HRMS-VA	MET-T-ICP-HRMS-VA	Density	TDS	PO4 (total & ortho)	Silicates	Ammonia	Mercury	ICP-OES for Ca, Mg, K, ...	Number of Containers																
	10WBW004-310	21 Apr 2011	11:00	Water	x	x	x		x							4															
	10WBW004-311	21 Apr 2011	11:30	Water	x	x	x		x							4															
	10WBW004-Z6-312	21 Apr 2011	16:00	Water	x	x	x	x	x	x	x	x	x			4															
	10WBW004-Z6-313	21 Apr 2011	16:00	Water	x	x	x	x	x	x	x	x	x			4															
	10WBW004-Z6-314	22 Apr 2011	8:00	Water	x	x	x	x	x							4															
	10WBW004-Z6-315	22 Apr 2011	15:40	Water	x										x	4															
	10WBW004-Z6-316	23 Apr 2011	9:00	Water	x										x	4															
	10WBW004-Z6-317	23 Apr 2011	15:00	Water	x	x	x	x	x	x	x	x	x			4															
	10WBW004-Z6-318	23 Apr 2011	16:30	Water	x	x	x	x	x							4															
Special Instructions / Regulations / Hazardous Details																															
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / p for common analyses.																															
SHIPMENT RELEASE (client use)				SHIPMENT RECEPTION (lab use only)				SHIPMENT IDENTIFICATION (lab use only)																							
Time of release				Received by				Time				Temperature				Verified by				Date				Time				Observations:			
				96 April				11:00				✓																			



SRK CONSULTING (CANADA) INC.
ATTN: MELISSA PITZ
SUITE 205
2100 AIRPORT DRIVE
SASKATOON SK S7L 6M6

Date Received: 22-JUN-11
Report Date: 27-SEP-11 12:48 (MT)
Version: DRAFT REV. 2

Client Phone: 306-955-4732

Certificate of Analysis

Lab Work Order #: **L1021760**
Project P.O. #: NOT SUBMITTED
Job Reference: 1CH008.052
C of C Numbers: 1
Legal Site Desc:

Comments:

27-SEP-11: Report - September 2011

Andre Langlais
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		L1021760-1 WATER 20-JUN-11 11:00 10WBW002-Z1-400	L1021760-2 WATER 20-JUN-11 15:00 10WBW002-Z1-401	L1021760-4 WATER 21-JUN-11 11:00 10WBW002-Z3-403		
Grouping	Analyte					
SEAWATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	208000	187000	158000		
Total Metals	Aluminum (Al)-Total (mg/L)			0.172		
	Antimony (Sb)-Total (mg/L)			0.0068 ^{DLM}		
	Arsenic (As)-Total (mg/L)			<0.020		
	Barium (Ba)-Total (mg/L)			0.715		
	Beryllium (Be)-Total (mg/L)			<0.0025 ^{DLA}		
	Bismuth (Bi)-Total (mg/L)			<0.0025 ^{DLA}		
	Boron (B)-Total (mg/L)			0.91 ^{DLM}		
	Cadmium (Cd)-Total (mg/L)			<0.00050		
	Calcium (Ca)-Total (mg/L)			57600		
	Cesium (Cs)-Total (mg/L)			0.0045 ^{DLM}		
	Chromium (Cr)-Total (mg/L)			<0.0090		
	Cobalt (Co)-Total (mg/L)			0.00063		
	Copper (Cu)-Total (mg/L)			0.0231 ^{DLA}		
	Gallium (Ga)-Total (mg/L)			<0.0025		
	Iron (Fe)-Total (mg/L)			0.734		
	Lead (Pb)-Total (mg/L)			0.0041		
	Lithium (Li)-Total (mg/L)			0.33		
	Magnesium (Mg)-Total (mg/L)			102		
	Manganese (Mn)-Total (mg/L)			0.181		
	Molybdenum (Mo)-Total (mg/L)			0.190		
	Nickel (Ni)-Total (mg/L)			0.0231 ^{DLA}		
	Phosphorus (P)-Total (mg/L)			<5.0		
	Potassium (K)-Total (mg/L)			<200 ^{DLA}		
	Rhenium (Re)-Total (mg/L)			<0.0025 ^{DLA}		
	Rubidium (Rb)-Total (mg/L)			0.050 ^{DLM}		
	Selenium (Se)-Total (mg/L)			<0.030		
	Silicon (Si)-Total (mg/L)			<5.0		
	Silver (Ag)-Total (mg/L)			0.00180		
	Sodium (Na)-Total (mg/L)			1530		
	Strontium (Sr)-Total (mg/L)			31.9 ^{DLA}		
	Tellurium (Te)-Total (mg/L)			<0.0025 ^{DLA}		
	Thallium (Tl)-Total (mg/L)			<0.00025 ^{DLA}		
	Thorium (Th)-Total (mg/L)			<0.0025 ^{DLA}		
	Tin (Sn)-Total (mg/L)			0.0052 ^{DLA}		
	Titanium (Ti)-Total (mg/L)			<0.025		
	Tungsten (W)-Total (mg/L)			0.0121		

* 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		L1021760-1 WATER 20-JUN-11 11:00 10WBW002-Z1-400	L1021760-2 WATER 20-JUN-11 15:00 10WBW002-Z1-401	L1021760-4 WATER 21-JUN-11 11:00 10WBW002-Z3-403		
Grouping	Analyte					
SEAWATER						
Total Metals	Uranium (U)-Total (mg/L)			<0.00025 ^{DLA}		
	Vanadium (V)-Total (mg/L)			<0.0025 ^{DLA}		
	Yttrium (Y)-Total (mg/L)			<0.0025 ^{DLA}		
	Zinc (Zn)-Total (mg/L)			1.71		
	Zirconium (Zr)-Total (mg/L)			<0.0025 ^{DLA}		
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.040	0.042	<0.025 ^{DLA}		
	Antimony (Sb)-Dissolved (mg/L)	0.0087	0.0085	0.0075		
	Arsenic (As)-Dissolved (mg/L)	<0.020 ^{DLM}	<0.010	<0.020 ^{DLM}		
	Barium (Ba)-Dissolved (mg/L)	0.829	0.818	0.795		
	Beryllium (Be)-Dissolved (mg/L)	<0.0025 ^{DLA}	<0.0025 ^{DLA}	<0.0025 ^{DLA}		
	Bismuth (Bi)-Dissolved (mg/L)	<0.0025 ^{DLA}	<0.0025 ^{DLA}	<0.0025 ^{DLA}		
	Boron (B)-Dissolved (mg/L)	1.48	1.03	0.90		
	Cadmium (Cd)-Dissolved (mg/L)	<0.00050 ^{DLM}	<0.00050 ^{DLM}	<0.00050 ^{DLM}		
	Calcium (Ca)-Dissolved (mg/L)	83000	74600	63100		
	Cesium (Cs)-Dissolved (mg/L)	0.0057	0.0061	0.0050		
	Chromium (Cr)-Dissolved (mg/L)	<0.0020 ^{DLM}	<0.00050 ^{DLA}	<0.00050 ^{DLA}		
	Cobalt (Co)-Dissolved (mg/L)	<0.00025 ^{DLA}	<0.00025 ^{DLA}	0.00039		
	Copper (Cu)-Dissolved (mg/L)	0.0155	0.0134	0.0186		
	Gallium (Ga)-Dissolved (mg/L)	<0.0025 ^{DLA}	<0.0025 ^{DLA}	<0.0025 ^{DLA}		
	Iron (Fe)-Dissolved (mg/L)	<0.050 ^{DLA}	0.058	<0.050 ^{DLA}		
	Lead (Pb)-Dissolved (mg/L)	<0.0015 ^{DLA}	<0.0015 ^{DLA}	<0.0015 ^{DLA}		
	Lithium (Li)-Dissolved (mg/L)	0.10	0.29	0.37		
	Magnesium (Mg)-Dissolved (mg/L)	125	111	111		
	Manganese (Mn)-Dissolved (mg/L)	0.0088	0.0151	0.185		
	Molybdenum (Mo)-Dissolved (mg/L)	0.189	0.195	0.199		
	Nickel (Ni)-Dissolved (mg/L)	0.0113	0.0080	0.0177		
	Phosphorus (P)-Dissolved (mg/L)	<5.0 ^{DLA}	<5.0 ^{DLA}	<5.0 ^{DLA}		
	Potassium (K)-Dissolved (mg/L)	<200	<200	<200		
	Rhenium (Re)-Dissolved (mg/L)	<0.0025 ^{DLA}	<0.0025 ^{DLA}	<0.0025 ^{DLA}		
	Rubidium (Rb)-Dissolved (mg/L)	0.056	0.056	0.054		
	Selenium (Se)-Dissolved (mg/L)	<0.010 ^{DLM}	<0.010 ^{DLM}	<0.050 ^{DLM}		
	Silicon (Si)-Dissolved (mg/L)	<5.0	<5.0	<5.0		
	Silver (Ag)-Dissolved (mg/L)	0.00086	0.00109	0.00179		
	Sodium (Na)-Dissolved (mg/L)	470	1160	1680		
	Strontium (Sr)-Dissolved (mg/L)	37.5	46.0	35.1		
	Tellurium (Te)-Dissolved (mg/L)	<0.0025 ^{DLA}	<0.0025 ^{DLA}	<0.0025 ^{DLA}		
	Thallium (Tl)-Dissolved (mg/L)	<0.00025 ^{DLA}	<0.00025 ^{DLA}	<0.00025 ^{DLA}		

* 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		L1021760-1 WATER 20-JUN-11 11:00 10WBW002-Z1-400	L1021760-2 WATER 20-JUN-11 15:00 10WBW002-Z1-401	L1021760-4 WATER 21-JUN-11 11:00 10WBW002-Z3-403		
Grouping	Analyte					
SEAWATER						
Dissolved Metals	Thorium (Th)-Dissolved (mg/L)	^{DLA} <0.0025	^{DLA} <0.0025	^{DLA} <0.0025		
	Tin (Sn)-Dissolved (mg/L)	^{DLA} <0.0050	0.0068	^{DLA} <0.0050		
	Titanium (Ti)-Dissolved (mg/L)	^{DLA} <0.025	^{DLA} <0.025	^{DLA} <0.025		
	Tungsten (W)-Dissolved (mg/L)	0.0233	0.0229	0.0131		
	Uranium (U)-Dissolved (mg/L)	^{DLA} <0.00025	^{DLA} <0.00025	^{DLA} <0.00025		
	Vanadium (V)-Dissolved (mg/L)	^{DLA} <0.0025	^{DLA} <0.0025	^{DLA} <0.0025		
	Yttrium (Y)-Dissolved (mg/L)	^{DLA} <0.0025	^{DLA} <0.0025	^{DLA} <0.0025		
	Zinc (Zn)-Dissolved (mg/L)	0.052	0.060	0.828		
	Zirconium (Zr)-Dissolved (mg/L)	^{DLA} <0.0025	^{DLA} <0.0025	^{DLA} <0.0025		

* 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		L1021760-1 WATER 20-JUN-11 11:00 10WBW002-Z1-400	L1021760-2 WATER 20-JUN-11 15:00 10WBW002-Z1-401	L1021760-3 WATER 20-JUN-11 17:00 10WBW002-402	L1021760-4 WATER 21-JUN-11 11:00 10WBW002-Z3-403	
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	181000	182000	70.2	159000	
	Density (kg/L)	1.16	1.16			
	Hardness (as CaCO3) (mg/L)			6.65		
	pH (pH)	7.57	8.12	7.13	7.03	
	Total Dissolved Solids (mg/L)		193000		169000	
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		49.8			
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<1.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<1.0			
	Alkalinity, Total (as CaCO3) (mg/L)		49.8			
	Ammonia (as N) (mg/L)		8.3			
	Phosphorus (P)-Total (mg/L)		0.58			
Total Metals	Aluminum (Al)-Total (mg/L)			0.0052		
	Antimony (Sb)-Total (mg/L)			0.000186		
	Arsenic (As)-Total (mg/L)			<0.000050		
	Barium (Ba)-Total (mg/L)			0.00037		
	Beryllium (Be)-Total (mg/L)			<0.0000050		
	Bismuth (Bi)-Total (mg/L)			<0.000050		
	Boron (B)-Total (mg/L)			^{DLB} <0.0060		
	Cadmium (Cd)-Total (mg/L)			<0.0000050		
	Calcium (Ca)-Total (mg/L)			12.9		
	Cesium (Cs)-Total (mg/L)			<0.0000050		
	Chromium (Cr)-Total (mg/L)			<0.00050		
	Cobalt (Co)-Total (mg/L)			<0.000050		
	Copper (Cu)-Total (mg/L)			0.00066		
	Gallium (Ga)-Total (mg/L)			<0.000050		
	Iron (Fe)-Total (mg/L)			<0.030		
	Lead (Pb)-Total (mg/L)			0.000088		
	Lithium (Li)-Total (mg/L)			<0.00020		
	Magnesium (Mg)-Total (mg/L)			<0.10		
	Manganese (Mn)-Total (mg/L)			0.00022		
	Mercury (Hg)-Total (mg/L)		<0.000050		<0.000050	
	Molybdenum (Mo)-Total (mg/L)			0.000130		
	Nickel (Ni)-Total (mg/L)			<0.00020		
	Phosphorus (P)-Total (mg/L)			<0.30		
	Potassium (K)-Total (mg/L)			<2.0		
	Rhenium (Re)-Total (mg/L)			<0.0000050		
	Rubidium (Rb)-Total (mg/L)			<0.000020		

* 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	L1021760-1 WATER 20-JUN-11 11:00 10WBW002-Z1-400	L1021760-2 WATER 20-JUN-11 15:00 10WBW002-Z1-401	L1021760-3 WATER 20-JUN-11 17:00 10WBW002-402	L1021760-4 WATER 21-JUN-11 11:00 10WBW002-Z3-403	
Grouping	Analyte						
WATER							
Total Metals	Selenium (Se)-Total (mg/L)				<0.00020		
	Silicon (Si)-Total (mg/L)				<0.050		
	Silver (Ag)-Total (mg/L)				<0.0000050		
	Sodium (Na)-Total (mg/L)				<2.0		
	Strontium (Sr)-Total (mg/L)				0.00711		
	Tellurium (Te)-Total (mg/L)				<0.000010		
	Thallium (Tl)-Total (mg/L)				<0.0000020		
	Thorium (Th)-Total (mg/L)				0.0000069		
	Tin (Sn)-Total (mg/L)				0.00120		
	Titanium (Ti)-Total (mg/L)				<0.00020		
	Tungsten (W)-Total (mg/L)				0.000057		
	Uranium (U)-Total (mg/L)				0.0000302		
	Vanadium (V)-Total (mg/L)				<0.000050		
	Yttrium (Y)-Total (mg/L)				<0.0000050		
	Zinc (Zn)-Total (mg/L)				0.0204		
	Zirconium (Zr)-Total (mg/L)				<0.000050		
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)				<0.0030		
	Antimony (Sb)-Dissolved (mg/L)				0.000071		
	Arsenic (As)-Dissolved (mg/L)				<0.000050		
	Barium (Ba)-Dissolved (mg/L)				0.00069		
	Beryllium (Be)-Dissolved (mg/L)				<0.0000050		
	Bismuth (Bi)-Dissolved (mg/L)				<0.000050		
	Boron (B)-Dissolved (mg/L)				<0.0050		
	Cadmium (Cd)-Dissolved (mg/L)				<0.0000050		
	Calcium (Ca)-Dissolved (mg/L)				2.66		
	Cesium (Cs)-Dissolved (mg/L)				<0.0000050		
	Chromium (Cr)-Dissolved (mg/L)				<0.00050		
	Cobalt (Co)-Dissolved (mg/L)				<0.000050		
	Copper (Cu)-Dissolved (mg/L)				<0.00050		
	Gallium (Ga)-Dissolved (mg/L)				<0.000050		
	Iron (Fe)-Dissolved (mg/L)				<0.030		
	Lead (Pb)-Dissolved (mg/L)				<0.000050		
	Lithium (Li)-Dissolved (mg/L)				<0.00020		
	Magnesium (Mg)-Dissolved (mg/L)				<0.10		
	Manganese (Mn)-Dissolved (mg/L)				0.00069		
	Mercury (Hg)-Dissolved (mg/L)			<0.000050		<0.000050	
	Molybdenum (Mo)-Dissolved (mg/L)				0.000158		

* 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		L1021760-1 WATER 20-JUN-11 11:00 10WBW002-Z1-400	L1021760-2 WATER 20-JUN-11 15:00 10WBW002-Z1-401	L1021760-3 WATER 20-JUN-11 17:00 10WBW002-402	L1021760-4 WATER 21-JUN-11 11:00 10WBW002-Z3-403	
Grouping	Analyte					
WATER						
Dissolved Metals	Nickel (Ni)-Dissolved (mg/L)			0.00049		
	Phosphorus (P)-Dissolved (mg/L)			<0.30		
	Potassium (K)-Dissolved (mg/L)			<2.0		
	Rhenium (Re)-Dissolved (mg/L)			<0.0000050		
	Rubidium (Rb)-Dissolved (mg/L)			<0.000020		
	Selenium (Se)-Dissolved (mg/L)			<0.00020		
	Silicon (Si)-Dissolved (mg/L)			<0.050		
	Silver (Ag)-Dissolved (mg/L)			<0.0000050		
	Sodium (Na)-Dissolved (mg/L)			<2.0		
	Strontium (Sr)-Dissolved (mg/L)			0.00245		
	Tellurium (Te)-Dissolved (mg/L)			<0.000010		
	Thallium (Tl)-Dissolved (mg/L)			<0.0000020		
	Thorium (Th)-Dissolved (mg/L)			<0.0000050		
	Tin (Sn)-Dissolved (mg/L)			<0.00020		
	Titanium (Ti)-Dissolved (mg/L)			<0.00020		
	Tungsten (W)-Dissolved (mg/L)			0.000032		
	Uranium (U)-Dissolved (mg/L)			<0.0000020		
	Vanadium (V)-Dissolved (mg/L)			<0.000050		
	Yttrium (Y)-Dissolved (mg/L)			<0.0000050		
	Zinc (Zn)-Dissolved (mg/L)			0.0064		
	Zirconium (Zr)-Dissolved (mg/L)			<0.000050		

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Boron (B)-Total	DLB	L1021760-3
Method Blank	Boron (B)-Total	MB-LOR	L1021760-3, -4
Method Blank	Tin (Sn)-Total	MB-LOR	L1021760-3, -4
Method Blank	Chromium (Cr)-Total	MB-LOR	L1021760-3, -4

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 For Sample Matrix Effects
MB-LOR	Method Blank exceeds ALS DQO. LORs adjusted for samples with positive hits below 5 times blank level. Please contact ALS if re-analysis is required.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
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.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
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.			
DENSITY-ED	Water	Density	CSSS-Gravimetric
EC-PCT-VA	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.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HARDNESS-CALC-VA	Seawater	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-DIS-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS	EPA SW-846 3005A & 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 procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and 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 (EPA Method 245.7).			
HG-TOT-CVAFS-VA	Water	Total Mercury in Water 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). 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 (EPA Method 245.7).			
MET-D-L-HRMS-VA	Water	Diss. Metals in Water by HR-ICPMS	EPA 200.8
Trace metals in water are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) modified from US EPA Method 200.8, (Revision 5.5). The procedures may involve laboratory sample filtration modified from APHA Method 3030B.			
MET-D-L-HRMS-VA	Seawater	Diss. Metals in Seawater by HR-ICPMS	EPA 200.8
Trace metals in seawater are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) based on US EPA Method 200.8, (Revision 5.5). The procedures may involve laboratory sample filtration based on APHA Method 3030B.			
MET-DIS-C-ICP-VA	Seawater	Diss. Metals in Seawater by ICPOES	PUGET SOUND PROTOCOLS, EPA 6010B
This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-ICP-VA	Water	Dissolved 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 procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma -			

Reference Information

optical emission spectrophotometry (EPA Method 6010B).

MET-T-L-HRMS-VA Water Total Metals in Water by HR-ICPMS EPA 200.8

Trace metals in water are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) modified from US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion modified from APHA Method 3030E.

MET-T-L-HRMS-VA Seawater Tot. Metals in Seawater by HR-ICPMS EPA 200.8

Trace metals in seawater are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) based on US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion based on APHA Method 3030E.

MET-TOT-C-ICP-VA Seawater Total Metals in Seawater by ICPOES PUGET SOUND PROTOCOLS, EPA 6010B

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

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).

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.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

** 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
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

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

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

mg/kg 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.

DRAFT

GENF 18.02 Front



SRK CONSULTING (CANADA) INC.
ATTN: MELISSA PITZ
SUITE 205
2100 AIRPORT DRIVE
SASKATOON SK S7L 6M6

Date Received: 28-JUN-11
Report Date: 09-AUG-11 16:30 (MT)
Version: FINAL

Client Phone: 306-955-4732

Certificate of Analysis

Lab Work Order #: L1023975
Project P.O. #: NOT SUBMITTED
Job Reference: 1CH008.052
C of C Numbers: 1
Legal Site Desc:

Andre Langlais
Account Manager

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ADDRESS: 75 Con Road, PO. Box 2801, Yellowknife, NT, X1A 2R2 Canada | Phone: +1 867 873 5593 | Fax: +1 867 920 4238
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		L1023975-1 WATER 23-JUN-11 12:00 10WBW004-Z6-404	L1023975-2 WATER 23-JUN-11 12:00 10WBW004-Z6-405	L1023975-3 WATER 23-JUN-11 16:00 10WBW004-Z6-406	L1023975-4 WATER 25-JUN-11 08:00 10WBW004-407	
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	36500	36600	32100	<2.0	
	Density (kg/L)	1.02	1.02	1.02		
	Hardness (as CaCO3) (mg/L)	11900	11900	11400	<1.3	
	pH (pH)	6.67	6.72	7.00	5.78	
	Total Dissolved Solids (mg/L)	38800	39000	35300		
Leachable Anions & Nutrients	Anion Sum (meq/L)	422	430	359	<0.10	
	Cation Sum (meq/L)	406	391	367	<0.10	
	Cation - Anion Balance (%)	-2.0	-4.7	1.2	-60.9	
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	32.5	34.7	45.6	1.2	
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	
	Alkalinity, Total (as CaCO3) (mg/L)	32.5	34.7	45.6	1.2	
	Ammonia (as N) (mg/L)	2.38	2.44	2.45		
	Bromide (Br) (mg/L)	12.1	14.2	11.0	<0.050	
	Chloride (Cl) (mg/L)	14700	14900	12400	<0.50	
	Fluoride (F) (mg/L)	0.749	0.727	0.587	<0.030	
	Nitrate (as N) (mg/L)	<0.50	<0.50	<0.50	<0.0050	
	Nitrite (as N) (mg/L)	<0.10	<0.10	<0.10	<0.0010	
	Phosphorus (P)-Total (mg/L)	0.0787	0.0897	0.110	<0.0020	
	Silicate (as SiO2) (mg/L)	<10 ^{DLM}	<10 ^{DLM}	<10 ^{DLM}		
	Sulfate (SO4) (mg/L)	385	405	325	<0.50	
Total Metals	Aluminum (Al)-Total (mg/L)	0.0105	0.0390	0.0068		
	Antimony (Sb)-Total (mg/L)	0.0134	0.0139	0.0161		
	Arsenic (As)-Total (mg/L)	<0.0020	<0.0020	<0.0020		
	Barium (Ba)-Total (mg/L)	0.467	0.494	0.528		
	Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Boron (B)-Total (mg/L)	0.87	0.88	0.77		
	Cadmium (Cd)-Total (mg/L)	<0.000050	<0.000050	<0.000050		
	Calcium (Ca)-Total (mg/L)	4510	4530	4630		
	Cesium (Cs)-Total (mg/L)	0.00806	0.00821	0.00589		
	Chromium (Cr)-Total (mg/L)	0.00251	0.00834	0.00591		
	Cobalt (Co)-Total (mg/L)	0.00295	0.00306	0.00477		
	Copper (Cu)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Gallium (Ga)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Iron (Fe)-Total (mg/L)	13.3	13.4	6.70		

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1023975-1	L1023975-2	L1023975-3	L1023975-4	
		Description	WATER	WATER	WATER	WATER	
		Sampled Date	23-JUN-11	23-JUN-11	23-JUN-11	25-JUN-11	
		Sampled Time	12:00	12:00	16:00	08:00	
		Client ID	10WBW004-Z6-404	10WBW004-Z6-405	10WBW004-Z6-406	10WBW004-407	
Grouping	Analyte						
WATER							
Total Metals	Lead (Pb)-Total (mg/L)	0.00045	0.00046	<0.00030			
	Lithium (Li)-Total (mg/L)	0.043	0.044	0.040			
	Magnesium (Mg)-Total (mg/L)	476	475	417			
	Manganese (Mn)-Total (mg/L)	0.847	0.864	0.841			
	Mercury (Hg)-Total (mg/L)	<0.000050	<0.000050	<0.000050			
	Molybdenum (Mo)-Total (mg/L)	0.0968	0.100	0.0908			
	Nickel (Ni)-Total (mg/L)	0.0109	0.0147	0.0187			
	Phosphorus (P)-Total (mg/L)	<1.0	<1.0	<1.0			
	Potassium (K)-Total (mg/L)	48	48	51			
	Rhenium (Re)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Rubidium (Rb)-Total (mg/L)	0.0473	0.0484	0.0476			
	Selenium (Se)-Total (mg/L)	<0.0020	<0.0020	<0.0020			
	Silicon (Si)-Total (mg/L)	1.54	1.62	1.92			
	Silver (Ag)-Total (mg/L)	<0.00010	<0.00010	<0.00010			
	Sodium (Na)-Total (mg/L)	2840	2850	2370			
	Strontium (Sr)-Total (mg/L)	25.3	26.3	21.6			
	Tellurium (Te)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Thallium (Tl)-Total (mg/L)	<0.000050	<0.000050	<0.000050			
	Thorium (Th)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Tin (Sn)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Titanium (Ti)-Total (mg/L)	<0.0050	<0.0050	<0.0050			
	Tungsten (W)-Total (mg/L)	<0.0010	0.0012	<0.0010			
	Uranium (U)-Total (mg/L)	0.00398	0.00435	0.00799			
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Yttrium (Y)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Zinc (Zn)-Total (mg/L)	0.125	0.867	0.133			
	Zirconium (Zr)-Total (mg/L)	<0.02	<0.00050	<0.00050			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0030		
	Antimony (Sb)-Dissolved (mg/L)	0.0152	0.0153	0.0157 ^{DLM}	<0.000010		
	Arsenic (As)-Dissolved (mg/L)	<0.0020	<0.0020	<0.0030	<0.000050		
	Barium (Ba)-Dissolved (mg/L)	0.496	0.528	0.541	<0.00010		
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.0000050		
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.000050		
	Boron (B)-Dissolved (mg/L)	0.90	0.90	0.81	<0.0050		
	Cadmium (Cd)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.0000050		
	Calcium (Ca)-Dissolved (mg/L)	4700	4530	4530	0.085		
	Cesium (Cs)-Dissolved (mg/L)	0.00786	0.00852	0.00618	<0.0000050		

* 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	L1023975-1 WATER 23-JUN-11 12:00 10WBW004-Z6-404	L1023975-2 WATER 23-JUN-11 12:00 10WBW004-Z6-405	L1023975-3 WATER 23-JUN-11 16:00 10WBW004-Z6-406	L1023975-4 WATER 25-JUN-11 08:00 10WBW004-407	
Grouping	Analyte						
WATER							
Dissolved Metals	Chromium (Cr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050		
	Cobalt (Co)-Dissolved (mg/L)	0.00323	0.00346	0.00314	<0.000050		
	Copper (Cu)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050		
	Gallium (Ga)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.000050		
	Iron (Fe)-Dissolved (mg/L)	8.51	10.0	10.3	<0.030		
	Lead (Pb)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.000050		
	Lithium (Li)-Dissolved (mg/L)	0.045	0.047	0.042	<0.00020		
	Magnesium (Mg)-Dissolved (mg/L)	496	473	425	<0.10		
	Manganese (Mn)-Dissolved (mg/L)	0.891	0.970	0.881	<0.00020		
	Mercury (Hg)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050			
	Molybdenum (Mo)-Dissolved (mg/L)	0.100	0.104	0.0950	<0.000050		
	Nickel (Ni)-Dissolved (mg/L)	0.0122	0.0129	0.0115	<0.00020		
	Phosphorus (P)-Dissolved (mg/L)	<1.0	<1.0	<1.0	<0.30		
	Potassium (K)-Dissolved (mg/L)	50	49	51	<2.0		
	Rhenium (Re)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.0000050		
	Rubidium (Rb)-Dissolved (mg/L)	0.0494	0.0525	0.0503	<0.000020		
	Selenium (Se)-Dissolved (mg/L)	<0.0020	<0.0020	<0.0030 ^{DLM}	<0.00020		
	Silicon (Si)-Dissolved (mg/L)	1.67	1.60	1.79	<0.050		
	Silver (Ag)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.0000050		
	Sodium (Na)-Dissolved (mg/L)	2960	2850	2400	<2.0		
	Strontium (Sr)-Dissolved (mg/L)	26.8	28.0	23.1	0.000182		
	Tellurium (Te)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.000010		
	Thallium (Tl)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.0000020		
	Thorium (Th)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.0000050		
	Tin (Sn)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.00020		
	Titanium (Ti)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.00020		
	Tungsten (W)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.000010		
	Uranium (U)-Dissolved (mg/L)	0.00617	0.00599	0.00508	<0.0000020		
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.000050		
	Yttrium (Y)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.0000050		
	Zinc (Zn)-Dissolved (mg/L)	0.153	0.125	0.0548	<0.0030		
	Zirconium (Zr)-Dissolved (mg/L)	<0.0149	<0.01536	<0.00050	<0.000050		

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

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted For Sample Matrix Effects
MB-LOR	Method Blank exceeds ALS DQO. LORs adjusted for samples with positive hits below 5 times blank level. Please contact ALS if re-analysis is required.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
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.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
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.			
ANIONS-BR-IC-VA	Water	Bromide 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".			
ANIONS-CL-IC-VA	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".			
ANIONS-NO2-IC-VA	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.			
ANIONS-NO3-IC-VA	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.			
ANIONS-SO4-IC-VA	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".			
DENSITY-ED	Water	Density	CSSS-Gravimetric
EC-PCT-VA	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.			
F-SIE-VA	Water	Fluoride by SIE	APHA 4500-F "Fluoride"
This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using a selective ion electrode. This method has a significant negative interference (i.e. results could be biased low) when Al ³⁺ is present in the sample at a concentration greater than 2.5 mg/L.			
F-SIE-VA	Water	Fluoride by SIE	APHA 4500-F Fluoride
This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using a selective ion electrode. This method has a significant negative interference (i.e. results could be biased low) when Al ³⁺ is present in the sample at a concentration greater than 2.5 mg/L.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-DIS-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS	EPA SW-846 3005A & 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 procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and 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 (EPA Method 245.7).			
HG-TOT-CVAFS-VA	Water	Total Mercury in Water 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). 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 (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.			

Reference Information

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-D-L-HRMS-VA Water Diss. Metals in Water by HR-ICPMS EPA 200.8

Trace metals in water are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) modified from US EPA Method 200.8, (Revision 5.5). The procedures may involve laboratory sample filtration modified from APHA Method 3030B.

MET-DIS-ICP-VA Water Dissolved 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 procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-T-L-HRMS-VA Water Total Metals in Water by HR-ICPMS EPA 200.8

Trace metals in water are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) modified from US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion modified from APHA Method 3030E.

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).

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-MAN-VA Water pH by Manual Meter 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-MAN-VA Water pH by Manual Meter 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.

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.

SILICATE-COL-VA Water Silicate by Colourimetric analysis APHA 4500-SiO2 D.

This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

** 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 Location

Reference Information

Laboratory Definition Code	
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, 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.



SRK CONSULTING (CANADA) INC.
ATTN: MELISSA PITZ
SUITE 205
2100 AIRPORT DRIVE
SASKATOON SK S7L 6M6

Date Received: 20-SEP-11
Report Date: 18-OCT-11 14:47 (MT)
Version: FINAL

Client Phone: 306-955-4732

Certificate of Analysis

Lab Work Order #: L1060807
Project P.O. #: NOT SUBMITTED
Job Reference: 1CH008.052
C of C Numbers: 1 of 1
Legal Site Desc:

Comments: ADDITIONAL 18-OCT-11 09:48

JUDY BETHUNE
Supervisor

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1060807-1	L1060807-2	L1060807-3	L1060807-4	L1060807-5
		Description	WATER	WATER	WATER	WATER	WATER
		Sampled Date	15-SEP-11	15-SEP-11	15-SEP-11	15-SEP-11	15-SEP-11
		Sampled Time	09:00	12:00	08:00	10:30	13:30
		Client ID	10WBW004-Z6-508	10WBW004-Z6-509	10WBW004-Z1-510	10WBW004-Z1-511	10WBW004-Z3-512
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		37400	31500	189000	189000	155000
	Density (kg/L)		1.00	1.02	1.10	1.11	1.10
	Hardness (as CaCO3) (mg/L)		14300	13000	179000	200000	161000
	pH (pH)		6.66	6.74	7.16	7.72	7.41
	Total Dissolved Solids (mg/L)		28200	21900	205000	204000	171000
Leachable Anions & Nutrients	Anion Sum (meq/L)		399	374	3560	3530	2800
	Cation Sum (meq/L)		426	379	3620	4040	3310
	Cation - Anion Balance (%)		3.3	0.6	0.7	6.7	8.3
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		17.4	23.3	40.2	44.9	47.3
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<2.0	<2.0	<1.0	<1.0	<1.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<2.0	<2.0	<1.0	<1.0	<1.0
	Alkalinity, Total (as CaCO3) (mg/L)		17.4	23.3	40.2	44.9	47.3
	Ammonia (as N) (mg/L)		2.28	2.48		7.22	
	Bromide (Br) (mg/L)		18.2	16.6	30.9	30.5	28.8
	Chloride (Cl) (mg/L)		13800	13000	126000	125000	99200
	Fluoride (F) (mg/L)		0.618	0.528	2.31	2.31	2.65
	Nitrate (as N) (mg/L)		0.88	0.84	1.75	0.91	1.62
	Nitrite (as N) (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Orthophosphate-Dissolved (as P) (mg/L)		<0.0010	<0.0010		0.021	
	Phosphorus (P)-Total (mg/L)		0.145	0.0918		0.336	
	Silicate (as SiO2) (mg/L)		<10 ^{DLM}	<10 ^{DLM}		386	
	Sulfate (SO4) (mg/L)		405	361	55	55	170
Total Metals	Aluminum (Al)-Total (mg/L)		0.0200	0.0078		0.308	
	Antimony (Sb)-Total (mg/L)		0.0167	0.0136		0.0091	
	Arsenic (As)-Total (mg/L)		<0.0050 ^{DLM}	<0.0080 ^{DLM}		<0.050 ^{DLM}	
	Barium (Ba)-Total (mg/L)		0.466	0.537		0.741	
	Beryllium (Be)-Total (mg/L)		<0.00050	<0.00050		<0.0050 ^{DLA}	
	Bismuth (Bi)-Total (mg/L)		<0.00050	<0.00050		<0.0050 ^{DLA}	
	Boron (B)-Total (mg/L)		0.83	0.89		<1.0 ^{DLA}	
	Cadmium (Cd)-Total (mg/L)		<0.000050	<0.000050		<0.00050 ^{DLA}	
	Calcium (Ca)-Total (mg/L)		5490	4580		76500	
	Cesium (Cs)-Total (mg/L)		0.00815	0.00682		0.0055	
	Chromium (Cr)-Total (mg/L)		0.00903	0.00521		0.0111	
	Cobalt (Co)-Total (mg/L)		0.00298	0.00341		0.00055	
	Copper (Cu)-Total (mg/L)		<0.00050	<0.00050		0.0135	
	Gallium (Ga)-Total (mg/L)		<0.00050	<0.00050		<0.0050 ^{DLA}	

* 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	L1060807-1 WATER 15-SEP-11 09:00 10WBW004-Z6-508	L1060807-2 WATER 15-SEP-11 12:00 10WBW004-Z6-509	L1060807-3 WATER 15-SEP-11 08:00 10WBW004-Z1-510	L1060807-4 WATER 15-SEP-11 10:30 10WBW004-Z1-511	L1060807-5 WATER 15-SEP-11 13:30 10WBW004-Z3-512
Grouping	Analyte						
WATER							
Total Metals	Iron (Fe)-Total (mg/L)	10.5	10.4			1.19 ^{DLA}	
	Lead (Pb)-Total (mg/L)	0.00071	0.00040			<0.0030 ^{DLA}	
	Lithium (Li)-Total (mg/L)	0.045	0.043			<0.20 ^{DLA}	
	Magnesium (Mg)-Total (mg/L)	519	452			111	
	Manganese (Mn)-Total (mg/L)	0.841	0.855			0.0347	
	Mercury (Hg)-Total (mg/L)	<0.000050	<0.000050			<0.000050	
	Molybdenum (Mo)-Total (mg/L)	0.101	0.101			0.177	
	Nickel (Ni)-Total (mg/L)	0.0165	0.0150			0.0133 ^{DLA}	
	Phosphorus (P)-Total (mg/L)	<1.0	<1.0			<10 ^{DLA}	
	Potassium (K)-Total (mg/L)	52	52			<200 ^{DLA}	
	Rhenium (Re)-Total (mg/L)	<0.00050	<0.00050			<0.0050 ^{DLA}	
	Rubidium (Rb)-Total (mg/L)	0.0481 ^{DLM}	0.0526 ^{DLM}			0.050 ^{DLM}	
	Selenium (Se)-Total (mg/L)	<0.0080 ^{DLM}	<0.020 ^{DLM}			<0.020 ^{DLM}	
	Silicon (Si)-Total (mg/L)	1.88	1.88			<5.0 ^{DLA}	
	Silver (Ag)-Total (mg/L)	<0.00010	<0.00010			<0.0010 ^{DLA}	
	Sodium (Na)-Total (mg/L)	3110	2770			810	
	Strontium (Sr)-Total (mg/L)	27.1	25.4			35.5 ^{DLA}	
	Tellurium (Te)-Total (mg/L)	<0.00050	<0.00050			<0.0050 ^{DLA}	
	Thallium (Tl)-Total (mg/L)	<0.000050	<0.000050			<0.00050 ^{DLA}	
	Thorium (Th)-Total (mg/L)	<0.00050	<0.00050			<0.0050 ^{DLA}	
	Tin (Sn)-Total (mg/L)	<0.0010	<0.0010			<0.010 ^{DLA}	
	Titanium (Ti)-Total (mg/L)	<0.0050	<0.0050			<0.050 ^{DLA}	
	Tungsten (W)-Total (mg/L)	0.0010	<0.0010			0.023 ^{DLA}	
	Uranium (U)-Total (mg/L)	0.00470	0.00604			<0.00050 ^{DLA}	
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050			<0.0050 ^{DLA}	
	Yttrium (Y)-Total (mg/L)	<0.00050	<0.00050			<0.0050 ^{DLA}	
	Zinc (Zn)-Total (mg/L)	0.881	0.377			0.658 ^{DLA}	
	Zirconium (Zr)-Total (mg/L)	<0.00050	<0.00050			<0.0050 ^{DLA}	
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050		<0.050 ^{DLA}	<0.050 ^{DLA}	<0.050 ^{DLA}
	Antimony (Sb)-Dissolved (mg/L)	0.0151 ^{DLM}	0.0122 ^{DLM}		0.0095 ^{DLM}	0.0092 ^{DLM}	0.0088 ^{DLM}
	Arsenic (As)-Dissolved (mg/L)	<0.0050	<0.0030		<0.20 ^{DLM}	<0.20 ^{DLM}	<0.20 ^{DLM}
	Barium (Ba)-Dissolved (mg/L)	0.496	0.533		0.820 ^{DLA}	0.851 ^{DLA}	0.728 ^{DLA}
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050		<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050		<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}
	Boron (B)-Dissolved (mg/L)	0.94 ^{DLM}	0.85		<1.0 ^{DLA}	<1.0 ^{DLA}	<1.0 ^{DLA}
	Cadmium (Cd)-Dissolved (mg/L)	<0.00010 ^{DLM}	<0.000050		<0.00050 ^{DLA}	<0.00050 ^{DLA}	0.00059
	Calcium (Ca)-Dissolved (mg/L)	4860	4490		71600	80000	64300

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

18-OCT-11 14:47 (MT)

Version: FINAL

Sample ID Description Sampled Date Sampled Time Client ID		L1060807-1 WATER 15-SEP-11 09:00 10WBW004-Z6-508	L1060807-2 WATER 15-SEP-11 12:00 10WBW004-Z6-509	L1060807-3 WATER 15-SEP-11 08:00 10WBW004-Z1-510	L1060807-4 WATER 15-SEP-11 10:30 10WBW004-Z1-511	L1060807-5 WATER 15-SEP-11 13:30 10WBW004-Z3-512
Grouping	Analyte					
WATER						
Dissolved Metals	Cesium (Cs)-Dissolved (mg/L)	0.00874	0.00658	0.0061 ^{DLA}	0.0063 ^{DLA}	0.0052 ^{DLA}
	Chromium (Cr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}
	Cobalt (Co)-Dissolved (mg/L)	0.00275	0.00374	<0.00050 ^{DLA}	<0.00050 ^{DLA}	<0.00050 ^{DLA}
	Copper (Cu)-Dissolved (mg/L)	<0.00050	0.00187	0.0129 ^{DLA}	0.0133 ^{DLA}	0.0123 ^{DLA}
	Gallium (Ga)-Dissolved (mg/L)	<0.00050	<0.00050	<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}
	Iron (Fe)-Dissolved (mg/L)	10.9	8.68	<0.10 ^{DLA}	<0.10 ^{DLA}	<0.10 ^{DLA}
	Lead (Pb)-Dissolved (mg/L)	<0.00030	<0.00030	<0.0030 ^{DLA}	<0.0030 ^{DLA}	<0.0030 ^{DLA}
	Lithium (Li)-Dissolved (mg/L)	0.048	0.043	<0.20 ^{DLA}	<0.20 ^{DLA}	0.39
	Magnesium (Mg)-Dissolved (mg/L)	525	441	108	116	112
	Manganese (Mn)-Dissolved (mg/L)	0.880	0.849	0.0116	0.0120	0.252
	Mercury (Hg)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.110	0.0988	0.196	0.209	0.210
	Nickel (Ni)-Dissolved (mg/L)	0.00999	0.0131	0.0069 ^{DLA}	0.0082 ^{DLA}	0.0101 ^{DLA}
	Phosphorus (P)-Dissolved (mg/L)	<1.0	<1.0	<10 ^{DLA}	<10 ^{DLA}	<10 ^{DLA}
	Potassium (K)-Dissolved (mg/L)	53	51	<200 ^{DLA}	<200 ^{DLA}	<200 ^{DLA}
	Rhenium (Re)-Dissolved (mg/L)	<0.00050	<0.00050	<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}
	Rubidium (Rb)-Dissolved (mg/L)	0.0520 ^{DLM}	0.0510 ^{DLM}	0.052 ^{DLM}	0.053 ^{DLM}	0.052 ^{DLM}
	Selenium (Se)-Dissolved (mg/L)	<0.020 ^{DLM}	<0.010 ^{DLM}	<0.030 ^{DLM}	<0.040 ^{DLM}	<0.050 ^{DLM}
	Silicon (Si)-Dissolved (mg/L)	1.83	1.87	<5.0 ^{DLA}	<5.0 ^{DLA}	<5.0 ^{DLA}
	Silver (Ag)-Dissolved (mg/L)	<0.00010	<0.00010	<0.0010 ^{DLA}	<0.0010 ^{DLA}	<0.0010 ^{DLA}
	Sodium (Na)-Dissolved (mg/L)	3170	2670	810	870	2170
	Strontium (Sr)-Dissolved (mg/L)	27.6	24.7	39.8 ^{DLA}	41.3 ^{DLA}	34.2 ^{DLA}
	Tellurium (Te)-Dissolved (mg/L)	<0.00050	<0.00050	<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}
	Thallium (Tl)-Dissolved (mg/L)	<0.000050	<0.000050	<0.00050 ^{DLA}	<0.00050 ^{DLA}	<0.00050 ^{DLA}
	Thorium (Th)-Dissolved (mg/L)	<0.00050	<0.00050	<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}
	Tin (Sn)-Dissolved (mg/L)	<0.0010	<0.0010	<0.010 ^{DLA}	<0.010 ^{DLA}	<0.010 ^{DLA}
	Titanium (Ti)-Dissolved (mg/L)	<0.0050	<0.0050	<0.050 ^{DLA}	<0.050 ^{DLA}	<0.050 ^{DLA}
	Tungsten (W)-Dissolved (mg/L)	<0.0010	<0.0010	0.026 ^{DLA}	0.026 ^{DLA}	0.013 ^{DLA}
	Uranium (U)-Dissolved (mg/L)	0.00469	0.00670	<0.00050 ^{DLA}	<0.00050 ^{DLA}	<0.00050 ^{DLA}
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}
	Yttrium (Y)-Dissolved (mg/L)	<0.00050	<0.00050	<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}
	Zinc (Zn)-Dissolved (mg/L)	0.456	0.161	0.085 ^{DLA}	0.197 ^{DLA}	0.084 ^{DLA}
	Zirconium (Zr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.0050 ^{DLA}	<0.0050 ^{DLA}	<0.0050 ^{DLA}

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Calcium (Ca)-Total	MB-LOR	L1060807-1, -2, -4
Method Blank	Boron (B)-Total	MB-LOR	L1060807-1, -2, -4

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit Adjusted For required dilution
DLM	Detection Limit Adjusted For Sample Matrix Effects
MB-LOR	Method Blank exceeds ALS DQO. LORs adjusted for samples with positive hits below 5 times blank level. Please contact ALS if re-analysis is required.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
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.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
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.			
ALK-SCR-VA	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.			
ANIONS-BR-IC-VA	Water	Bromide 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".			
ANIONS-CL-IC-VA	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".			
ANIONS-NO2-IC-VA	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.			
ANIONS-NO3-IC-VA	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.			
ANIONS-SO4-IC-VA	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".			
DENSITY-ED	Water	Density	CSSS-Gravimetric
EC-PCT-VA	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.			
F-SIE-VA	Water	Fluoride by SIE	APHA 4500-F "Fluoride"
This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using a selective ion electrode. This method has a significant negative interference (i.e. results could be biased low) when Al3+ is present in the sample at a concentration greater than 2.5 mg/L.			
F-SIE-VA	Water	Fluoride by SIE	APHA 4500-F Fluoride
This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using a selective ion electrode. This method has a significant negative interference (i.e. results could be biased low) when Al3+ is present in the sample at a concentration greater than 2.5 mg/L.			
HARDNESS-CALC-VA	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.			
HG-DIS-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS	EPA SW-846 3005A & 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			

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and 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 (EPA Method 245.7).

HG-TOT-CVAFS-VA Water Total Mercury in Water 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). 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 (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-D-L-HRMS-VA Water Diss. Metals in Water by HR-ICPMS EPA 200.8

Trace metals in water are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) modified from US EPA Method 200.8, (Revision 5.5). The procedures may involve laboratory sample filtration modified from APHA Method 3030B.

MET-DIS-ICP-VA Water Dissolved 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 procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-T-L-HRMS-VA Water Total Metals in Water by HR-ICPMS EPA 200.8

Trace metals in water are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) modified from US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion modified from APHA Method 3030E.

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).

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.

SILICATE-COL-VA Water Silicate by Colourimetric analysis APHA 4500-SiO2 D.

This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.

TDS-VA Water Total Dissolved Solids by Gravimetric APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

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
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

1 of 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).

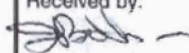
N/A - Result not available. Refer to qualifier code and definition for explanation.

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.

Page 1 of 1

Report To			Report Format / Distribution			Service Requested (Flush for routine analysis subject to availability)														
Company: SRK Consulting																				
Contact: Melissa Pitz						Surcharges apply														
Address: Suite 205, 2100 Airport Drive			Email 1: mpitz@srk.com																	
Saskatoon, SK, Canada, S7L 6M6			Email 2: jhenshaw@srk.com																	
Phone: (306) 955-4732 Fax: (306) 955-4750																				
Invoice To Same as Report ?			Client / Project Information			Analysis Request														
Company:			Job #: 1CH008.052			Please indicate below Filtered, Preserved or both (F, P, F/P)														
Contact:			PO / AFE:																	
Address:			LSD:																	
Phone:			Quote #: Q25959																	
			ALS Contact: Andre Langlais Sampler: J Jarolim																	
Sample Identification			Date		Time	Sample Type									Number of Containers					
(This description will appear on the report)			(dd-mm-yy)		(hh:mm)															
Sample #								Routine	F/P	P						P	P	P		
	10WBW004-Z6-508		15-Sep-11		9:00	Water														4
	10WBW004-Z6-509		15-Sep-11		12:00	Water														4
	10WBW002-Z1-510		17-Sep-11		8:00	Water														2
	10WBW002-Z1-511		17-Sep-11		10:30	Water														4
	10WBW002-Z3-512		17-Sep-11		1:30	Water														2
Special Instructions / Regulations / Hazardous Details																				
* HOLD FOR INSTRUCTIONS FROM MELISSA PITZ *																				
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab. Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.																				
SHIPMENT RELEASE (client use)					SHIPMENT RECEPTION (lab use only)					SHIPMENT VERIFICATION (lab use only)										
Released by:		Date (dd-mm-yy)		Time (hh:mm)	Received by:		Date:	Time:	Temperature:	Verified by:		Date:	Time:	Observations:						
J Henshaw							Aug-11	6:05	3.4 °C					Yes / No ? If Yes add Sig						



SRK CONSULTING (CANADA) INC.
ATTN: MELISSA PITZ
SUITE 205
2100 AIRPORT DRIVE
SASKATOON SK S7L 6M6

Date Received: 20-SEP-11
Report Date: 21-OCT-11 17:02 (MT)
Version: FINAL

Client Phone: 306-955-4732

Certificate of Analysis

Lab Work Order #: L1060818
Project P.O. #: NOT SUBMITTED
Job Reference: 1CH008.052
C of C Numbers: 1 of 1
Legal Site Desc:

Comments: ADDITIONAL 18-OCT-11 09:47

JUDY BETHUNE
Supervisor

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ADDRESS: 75 Con Road, PO. Box 2801, Yellowknife, NT, X1A 2R2 Canada | Phone: +1 867 873 5593 | Fax: +1 867 920 4238
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		L1060818-1 WATER 11-SEP-11 15:00 10WBW001-Z10-500	L1060818-2 WATER 12-SEP-11 07:00 10WBW001-Z1-501	L1060818-3 WATER 12-SEP-11 10:30 10WBW001-Z6-502	L1060818-4 WATER 12-SEP-11 10:30 10WBW001-Z6-503	L1060818-5 WATER 12-SEP-11 02:00 10WBW001-Z6-504
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	47600	48500	49300	47000	56800
	Density (kg/L)	1.02	1.02	1.02	1.02	1.00
	Hardness (as CaCO3) (mg/L)	9000	12300	9220	9270	12200
	pH (pH)	7.68	7.21	7.63	7.35	7.09
	Total Dissolved Solids (mg/L)	32400	36500	34600	33500	40200
Leachable Anions & Nutrients	Anion Sum (meq/L)	548	546	574	580	720
	Cation Sum (meq/L)	558	553	566	568	725
	Cation - Anion Balance (%)	0.9	0.7	-0.7	-1.0	0.3
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	115	<2.0	44.1	44.7	47.4
	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)	115	<2.0	44.1	44.7	47.4
	Ammonia (as N) (mg/L)	3.29	0.0538	3.22	3.16	3.87
	Bromide (Br) (mg/L)	63.5	122	67.3	68.0	83.6
	Chloride (Cl) (mg/L)	18100	18600	18800	19000	23600
	Fluoride (F) (mg/L)	0.094	0.057	0.087	0.083	0.075
	Nitrate (as N) (mg/L)	0.72	<0.50	0.53	0.60	0.61
	Nitrite (as N) (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Orthophosphate-Dissolved (as P) (mg/L)	<0.0010	0.0031	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	0.0433	0.0194 ^{DLM}	0.0316	0.0306	0.0137
	Silicate (as SiO2) (mg/L)	11.3	5.3 ^{DLM}	9.9	8.2	12.2
	Sulfate (SO4) (mg/L)	1720	972	2000	2030	2510
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	0.0089	0.0102	<0.0050	0.0150
	Antimony (Sb)-Total (mg/L)	<0.00050 ^{DLM}	0.00063 ^{DLM}	0.00067 ^{DLM}	0.00058 ^{DLM}	0.00069 ^{DLM}
	Arsenic (As)-Total (mg/L)	<0.0050 ^{DLM}	<0.0050 ^{DLM}	<0.020 ^{DLM}	<0.0030 ^{DLM}	<0.010 ^{DLM}
	Barium (Ba)-Total (mg/L)	0.111	0.0477	0.131	0.135	0.0589
	Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	1.92	2.48	1.74	1.90	2.72
	Cadmium (Cd)-Total (mg/L)	<0.000050	0.000120	0.000076	0.000112	0.000087
	Calcium (Ca)-Total (mg/L)	1580	5010	1490	1490	1990
	Cesium (Cs)-Total (mg/L)	0.00105	0.00095	0.00127	0.00134	0.00194
	Chromium (Cr)-Total (mg/L)	0.00364	0.00481	0.00471	0.00697	0.00400
	Cobalt (Co)-Total (mg/L)	0.000235	0.000322	0.000190	0.000224	0.000180
	Copper (Cu)-Total (mg/L)	0.00346	0.00064	0.00061	0.00057	0.00061
	Gallium (Ga)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

* 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	L1060818-6 WATER 12-SEP-11 07:00 10WBW001-Z10-505	L1060818-7 WATER 12-SEP-11 11:00 10WBW001-506	L1060818-8 WATER 12-SEP-11 12:00 10WBW001-507		
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)	51300	3.4	6.1			
	Density (kg/L)	1.03	1.00	0.995			
	Hardness (as CaCO3) (mg/L)	10300	<0.50	<0.50			
	pH (pH)	7.23	5.83	5.93			
	Total Dissolved Solids (mg/L)	41400	<10	<10			
Leachable Anions & Nutrients	Anion Sum (meq/L)	639	<0.10	<0.10			
	Cation Sum (meq/L)	627	<0.10	<0.10			
	Cation - Anion Balance (%)	-1.0	12.8	-75.7			
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	97.7	<2.0	<2.0			
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0			
	Alkalinity, Total (as CaCO3) (mg/L)	97.7	<2.0	<2.0			
	Ammonia (as N) (mg/L)	4.20	<0.0050	0.0072			
	Bromide (Br) (mg/L)	75.3	<0.050	<0.050			
	Chloride (Cl) (mg/L)	21000	<0.50	1.56			
	Fluoride (F) (mg/L)	0.097	0.022	<0.020			
	Nitrate (as N) (mg/L)	0.64	<0.0050	<0.0050			
	Nitrite (as N) (mg/L)	<0.10	<0.0010	<0.0010			
	Orthophosphate-Dissolved (as P) (mg/L)	<0.0010	<0.0010	<0.0010			
	Phosphorus (P)-Total (mg/L)	0.0180	<0.0020	<0.0020			
	Silicate (as SiO2) (mg/L)	18.1	<1.0	<1.0			
	Sulfate (SO4) (mg/L)	2150	<0.50	<0.50			
Total Metals	Aluminum (Al)-Total (mg/L)	0.0537	<0.0050	<0.0050			
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Arsenic (As)-Total (mg/L)	<0.0040 ^{DLM}	<0.0020	<0.0020			
	Barium (Ba)-Total (mg/L)	0.0647	<0.0010	<0.0010			
	Beryllium (Be)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Boron (B)-Total (mg/L)	2.56	<0.10	<0.10			
	Cadmium (Cd)-Total (mg/L)	0.000163	<0.000050	0.000161			
	Calcium (Ca)-Total (mg/L)	1880	<0.050	1.06			
	Cesium (Cs)-Total (mg/L)	0.00102	<0.00050	<0.00050			
	Chromium (Cr)-Total (mg/L)	0.00307	<0.00050	0.00073			
	Cobalt (Co)-Total (mg/L)	0.000209	<0.000050	<0.000050			
	Copper (Cu)-Total (mg/L)	0.00070	<0.00050	<0.00050			
	Gallium (Ga)-Total (mg/L)	<0.00050	<0.00050	<0.00050			

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ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L1060818-1 WATER 11-SEP-11 15:00 10WBW001-Z10-500	L1060818-2 WATER 12-SEP-11 07:00 10WBW001-Z1-501	L1060818-3 WATER 12-SEP-11 10:30 10WBW001-Z6-502	L1060818-4 WATER 12-SEP-11 10:30 10WBW001-Z6-503	L1060818-5 WATER 12-SEP-11 02:00 10WBW001-Z6-504
Grouping	Analyte						
WATER							
Total Metals	Iron (Fe)-Total (mg/L)	6.70	0.274	7.08	7.29	9.46	
	Lead (Pb)-Total (mg/L)	<0.00030	<0.00030	0.00051	<0.00030	0.00054	
	Lithium (Li)-Total (mg/L)	0.143	0.301	0.158	0.171	0.368	
	Magnesium (Mg)-Total (mg/L)	1230	71.4	1340	1360	1670	
	Manganese (Mn)-Total (mg/L)	1.30	0.690	1.63	1.65	2.40	
	Mercury (Hg)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
	Molybdenum (Mo)-Total (mg/L)	0.0062	0.0107	0.0211	0.0225	0.0052	
	Nickel (Ni)-Total (mg/L)	0.00363	0.00346	0.00343	0.00486	0.00290	
	Phosphorus (P)-Total (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	
	Potassium (K)-Total (mg/L)	243	39	213	218	277	
	Rhenium (Re)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Rubidium (Rb)-Total (mg/L)	0.0949	0.0481	0.128	0.141	0.178	
	Selenium (Se)-Total (mg/L)	<0.030 ^{DLM}	<0.030 ^{DLM}	<0.050 ^{DLM}	<0.030 ^{DLM}	<0.050 ^{DLM}	
	Silicon (Si)-Total (mg/L)	3.38	2.55	3.08	3.11	3.6	
	Silver (Ag)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
	Sodium (Na)-Total (mg/L)	8680	7130	8560	8720	10700	
	Strontium (Sr)-Total (mg/L)	15.6	52.9	18.0	18.7	27.2	
	Tellurium (Te)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Thallium (Tl)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
	Thorium (Th)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Tin (Sn)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Titanium (Ti)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
	Tungsten (W)-Total (mg/L)	0.0085	0.0018	0.0096	0.0096	0.0025	
	Uranium (U)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
	Vanadium (V)-Total (mg/L)	<0.00050	0.00138	<0.00050	<0.00050	<0.00050	
	Yttrium (Y)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Zinc (Zn)-Total (mg/L)	0.259	0.279	1.82	0.376	1.71	
	Zirconium (Zr)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Arsenic (As)-Dissolved (mg/L)	<0.0040 ^{DLM}	<0.0020 ^{DLM}	<0.0020 ^{DLM}	<0.0020 ^{DLM}	<0.0050 ^{DLM}	
	Barium (Ba)-Dissolved (mg/L)	0.0986	0.0510	0.129	0.125	0.0568	
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Boron (B)-Dissolved (mg/L)	2.13	2.54	1.86	1.98	2.83	
	Cadmium (Cd)-Dissolved (mg/L)	<0.000050	0.000195	<0.000050	<0.000050	0.000083	
	Calcium (Ca)-Dissolved (mg/L)	1590	4820	1480	1490	2030	

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ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L1060818-6 WATER 12-SEP-11 07:00 10WBW001-Z10-505	L1060818-7 WATER 12-SEP-11 11:00 10WBW001-506	L1060818-8 WATER 12-SEP-11 12:00 10WBW001-507		
Grouping	Analyte						
WATER							
Total Metals	Iron (Fe)-Total (mg/L)	4.03	<0.010	0.015			
	Lead (Pb)-Total (mg/L)	0.00103	<0.00030	<0.00030			
	Lithium (Li)-Total (mg/L)	0.169	<0.020	<0.020			
	Magnesium (Mg)-Total (mg/L)	1360	<0.10	0.65			
	Manganese (Mn)-Total (mg/L)	2.07	<0.00020	0.00206			
	Mercury (Hg)-Total (mg/L)	<0.000050	<0.000050	<0.000050			
	Molybdenum (Mo)-Total (mg/L)	<0.0020	<0.0020	<0.0020			
	Nickel (Ni)-Total (mg/L)	0.00201	<0.00050	0.00100			
	Phosphorus (P)-Total (mg/L)	<1.0	<1.0	<1.0			
	Potassium (K)-Total (mg/L)	262	<2.0	<2.0			
	Rhenium (Re)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Rubidium (Rb)-Total (mg/L)	0.115	<0.0050	<0.0050			
	Selenium (Se)-Total (mg/L)	<0.030 ^{DLM}	<0.0020	<0.0020			
	Silicon (Si)-Total (mg/L)	3.03	<0.050	<0.050			
	Silver (Ag)-Total (mg/L)	<0.00010	<0.00010	<0.00010			
	Sodium (Na)-Total (mg/L)	9440	<2.0	3.9			
	Strontium (Sr)-Total (mg/L)	20.8	<0.010	0.013			
	Tellurium (Te)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Thallium (Tl)-Total (mg/L)	<0.000050	<0.000050	<0.000050			
	Thorium (Th)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Tin (Sn)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Titanium (Ti)-Total (mg/L)	<0.0050	<0.0050	<0.0050			
	Tungsten (W)-Total (mg/L)	0.0027	<0.0010	<0.0010			
	Uranium (U)-Total (mg/L)	0.000201	<0.000050	<0.000050			
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Yttrium (Y)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Zinc (Zn)-Total (mg/L)	0.761	<0.0030	0.0555			
	Zirconium (Zr)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050			
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Arsenic (As)-Dissolved (mg/L)	<0.0080 ^{DLM}	<0.0020	<0.0020			
	Barium (Ba)-Dissolved (mg/L)	0.0621	<0.0010	<0.0010			
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Boron (B)-Dissolved (mg/L)	2.52	<0.10	<0.10			
	Cadmium (Cd)-Dissolved (mg/L)	0.000108	<0.000050	<0.000050			
	Calcium (Ca)-Dissolved (mg/L)	1870	<0.050	0.088			

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1060818-1 WATER 11-SEP-11 15:00 10WBW001-Z10-500	L1060818-2 WATER 12-SEP-11 07:00 10WBW001-Z1-501	L1060818-3 WATER 12-SEP-11 10:30 10WBW001-Z6-502	L1060818-4 WATER 12-SEP-11 10:30 10WBW001-Z6-503	L1060818-5 WATER 12-SEP-11 02:00 10WBW001-Z6-504
Grouping	Analyte					
WATER						
Dissolved Metals	Cesium (Cs)-Dissolved (mg/L)	0.00114	0.00103	0.00132	0.00132	0.00193
	Chromium (Cr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Cobalt (Co)-Dissolved (mg/L)	0.000120	<0.000050	0.000067	0.000075	0.000093
	Copper (Cu)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.00054
	Gallium (Ga)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Iron (Fe)-Dissolved (mg/L)	6.72	0.020	3.81	3.96	8.91
	Lead (Pb)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Lithium (Li)-Dissolved (mg/L)	0.156	0.309	0.165	0.173	0.379
	Magnesium (Mg)-Dissolved (mg/L)	1220	67.9	1340	1350	1720
	Manganese (Mn)-Dissolved (mg/L)	1.36	0.736	1.70	1.75	2.48
	Mercury (Hg)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.0052	0.0102	0.0181	0.0187	0.0044
	Nickel (Ni)-Dissolved (mg/L)	0.00102	0.00050	0.00063	0.00066	0.00057
	Phosphorus (P)-Dissolved (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Potassium (K)-Dissolved (mg/L)	244	38	217	218	282
	Rhenium (Re)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Rubidium (Rb)-Dissolved (mg/L)	0.101	0.0502	0.136	0.141	0.182
	Selenium (Se)-Dissolved (mg/L)	<0.040 ^{DLM}	<0.0040 ^{DLM}	<0.010 ^{DLM}	<0.020 ^{DLM}	<0.030 ^{DLM}
	Silicon (Si)-Dissolved (mg/L)	2.91	2.35	3.24	3.25	3.6
	Silver (Ag)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Sodium (Na)-Dissolved (mg/L)	8540	7030	8650	8670	10900
	Strontium (Sr)-Dissolved (mg/L)	16.5	54.1	18.2	18.8	27.3
	Tellurium (Te)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Thallium (Tl)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Thorium (Th)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Tin (Sn)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Titanium (Ti)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Tungsten (W)-Dissolved (mg/L)	0.0072	0.0018	0.0086	0.0087	0.0026
	Uranium (U)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Yttrium (Y)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)	0.0511	0.116	0.252	0.304	0.114
	Zirconium (Zr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L1060818-6 WATER 12-SEP-11 07:00 10WBW001-Z10-505	L1060818-7 WATER 12-SEP-11 11:00 10WBW001-506	L1060818-8 WATER 12-SEP-11 12:00 10WBW001-507		
Grouping	Analyte						
WATER							
Dissolved Metals	Cesium (Cs)-Dissolved (mg/L)	0.00102	<0.00050	<0.00050			
	Chromium (Cr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Cobalt (Co)-Dissolved (mg/L)	0.000067	<0.000050	<0.000050			
	Copper (Cu)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Gallium (Ga)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Iron (Fe)-Dissolved (mg/L)	3.87	<0.010	<0.010			
	Lead (Pb)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030			
	Lithium (Li)-Dissolved (mg/L)	0.166	<0.020	<0.020			
	Magnesium (Mg)-Dissolved (mg/L)	1370	<0.10	<0.10			
	Manganese (Mn)-Dissolved (mg/L)	2.09	<0.00020	<0.00020			
	Mercury (Hg)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050			
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0020	<0.0020	<0.0020			
	Nickel (Ni)-Dissolved (mg/L)	0.00053	<0.00050	<0.00050			
	Phosphorus (P)-Dissolved (mg/L)	<1.0	<1.0	<1.0			
	Potassium (K)-Dissolved (mg/L)	264	<2.0	<2.0			
	Rhenium (Re)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Rubidium (Rb)-Dissolved (mg/L)	0.115	<0.0050	<0.0050			
	Selenium (Se)-Dissolved (mg/L)	<0.050 ^{DLM}	<0.0020	<0.0020			
	Silicon (Si)-Dissolved (mg/L)	3.00	<0.050	<0.050			
	Silver (Ag)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010			
	Sodium (Na)-Dissolved (mg/L)	9500	<2.0	<2.0			
	Strontium (Sr)-Dissolved (mg/L)	19.9	<0.010	<0.010			
	Tellurium (Te)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Thallium (Tl)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050			
	Thorium (Th)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Tin (Sn)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010			
	Titanium (Ti)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050			
	Tungsten (W)-Dissolved (mg/L)	0.0025	<0.0010	<0.0010			
	Uranium (U)-Dissolved (mg/L)	0.000194	<0.000050	<0.000050			
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Yttrium (Y)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Zinc (Zn)-Dissolved (mg/L)	0.0337	<0.0030	<0.0030			
	Zirconium (Zr)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Arsenic (As)-Total	DLM	L1060818-1, -2, -3, -4, -5, -6, -7, -8
Duplicate	Selenium (Se)-Total	DLM	L1060818-1, -2, -3, -4, -5, -6, -7, -8
Method Blank	Boron (B)-Total	MB-LOR	L1060818-1, -2, -3, -4, -5, -6, -7, -8

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted For Sample Matrix Effects
MB-LOR	Method Blank exceeds ALS DQO. LORs adjusted for samples with positive hits below 5 times blank level. Please contact ALS if re-analysis is required.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-SCR-VA	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.			
ANIONS-BR-IC-VA	Water	Bromide 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".			
ANIONS-CL-IC-VA	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".			
ANIONS-F-IC-VA	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".			
ANIONS-NO2-IC-VA	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.			
ANIONS-NO3-IC-VA	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.			
ANIONS-SO4-IC-VA	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".			
DENSITY-ED	Water	Density	CSSS-Gravimetric
EC-PCT-VA	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.			
F-SIE-VA	Water	Fluoride by SIE	APHA 4500-F "Fluoride"
This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using a selective ion electrode. This method has a significant negative interference (i.e. results could be biased low) when Al ³⁺ is present in the sample at a concentration greater than 2.5 mg/L.			
F-SIE-VA	Water	Fluoride by SIE	APHA 4500-F Fluoride
This analysis is carried out using procedures adapted from APHA Method 4500-F "Fluoride". Fluoride is determined using a selective ion electrode. This method has a significant negative interference (i.e. results could be biased low) when Al ³⁺ is present in the sample at a concentration greater than 2.5 mg/L.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-DIS-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS	EPA SW-846 3005A & 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 procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and 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 (EPA Method 245.7).			

Reference Information

HG-TOT-CVAFS-VA Water Total Mercury in Water 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). 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 (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-D-L-HRMS-VA Water Diss. Metals in Water by HR-ICPMS EPA 200.8

Trace metals in water are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) modified from US EPA Method 200.8, (Revision 5.5). The procedures may involve laboratory sample filtration modified from APHA Method 3030B.

MET-DIS-ICP-VA Water Dissolved 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 procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-T-L-HRMS-VA Water Total Metals in Water by HR-ICPMS EPA 200.8

Trace metals in water are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) modified from US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion modified from APHA Method 3030E.

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).

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-MAN-VA Water pH by Manual Meter 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-MAN-VA Water pH by Manual Meter 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.

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

Reference Information

colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

SILICATE-COL-VA	Water	Silicate by Colourimetric analysis	APHA 4500-SiO ₂ D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO ₂ D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			

** 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
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

1 of 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.

Page 1 of 1

Report To	Report Format / Distribution						Service Requested (Rush for routine analysis subject to availability)															
Company:																						
Contact:							Surcharges apply															
Address:	Suite 205, 2100 Airport Drive Saskatoon, SK, Canada, S7L 6M6						Email 1:	mpitz@srk.com														
Phone:	(306) 955-4732	Fax:	(306) 955-4750			Email 2:	jhenshaw@srk.com															
Invoice To Same as Report ?	Client / Project Information						Analysis Request Please indicate below Filtered, Preserved or both (F, P, F/P)															
Company:	Job #:						1CH008.052	P/F	P						P	P	P					
Contact:	PO / AFE:																					
Address:	LSD:																					
Quote #:	Q25959						Routine	MET-D-ICP-HRMS-VA	MET-T-ICP-HRMS-VA	Density	TDS	PO4 (total & ortho)	Silicates	Ammonia	Mercury							
ALS Contact:	Andre Langlais						Sampler:	J Jarolim														
#	Sample Identification (This description will appear on the report)						Date (dd-mmm-yy)	Time (hh:mm)	Sample Type													Number of Containers
	10WBW001-Z10-500						11-Sep-11	15:00	Water													4
	10WBW001-Z1-501						12-Sep-11	7:00	Water													4
	10WBW001-Z6-502						12-Sep-11	10:30	Water													4
	10WBW001-Z6-503						12-Sep-11	10:30	Water													4
	10WBW001-Z6-504						12-Sep-11	2:00	Water													4
	10WBW001-Z10-505						13-Sep-11	7:00	Water													4
	10WBW001-506						13-Sep-11	11:00	Water													4
	10WBW004-507						14-Sep-11	12:00	Water													4
Special Instructions / Regulations / Hazardous Details																						
* HOLD FOR INSTRUCTIONS FROM MELISSA PITZ*																						
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.																						
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.																						
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.																						
SHIPMENT RELEASE (client use)						SHIPMENT RECEPTION (lab use only)						SHIPMENT VERIFICATION (lab use only)										
Released by:	Date (dd-mm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIP#												
J Henshaw			[Signature]	15-Sep-11	6:15pm	4.6°C																

RECHECK ANALYSIS REPORT

RC24608

Date: 17-MAY-11 12:05

Loginum L994212
Acctnum SRK100
Client SRK CONSULTING (CANADA) INC. ~VAN
Deptnum 85110

Requestby CLIENT
Due Date 19-MAY-11
Issued To THARLEY
Issued By ALANGLAIS
Date Initiated 17-MAY-11

Recheck Comments

Recheck Reason

Result appears too high,
Please check for interferences, do spiking, use the -F method.

Action to Take

Samplenum	Prod	Mat	Parm Syn	Result	Units	Measdate	RCResult	UCL	RC RPD	RCWork#	RCMeasdate	Initials
L994212-1	NH3-C-COL-VA	38	Ammonia as N	0.0619	mg/L	15-APR-11	0.0711	No Chart	NA		17-May-11	VCT
L994212-2	NH3-C-COL-VA	38	Ammonia as N	2.90	mg/L	15-APR-11	2.82	No Chart	NA		17-May-11	VCT
L994212-3	NH3-C-COL-VA	38	Ammonia as N	3.54	mg/L	15-APR-11	3.60	No Chart	NA		17-May-11	VCT
L994212-4	NH3-C-COL-VA	38	Ammonia as N	4.05	mg/L	15-APR-11	4.06	No Chart	NA		17-May-11	VCT
L994212-5	NH3-C-COL-VA	38	Ammonia as N	3.65	mg/L	15-APR-11	3.59	No Chart	NA		17-May-11	VCT

Sample Comments:

L994212-1 20110421 Redo:SELENIUM,SELENIUM 20110420 Redo:CHROMIUM,SELENIUM,CHROMIUM,SELENIUM ** HOLD for 90 days in case reanalysis is required
L994212-2 20110420 Redo:SELENIUM,CHROMIUM,CHROMIUM,SELENIUM ** HOLD for 90 days in case reanalysis is required
L994212-3 20110420 Redo:CHROMIUM,CHROMIUM ** HOLD for 90 days in case reanalysis is required
L994212-4 20110421 Redo:SELENIUM,SELENIUM 20110420 Redo:ZINC,ZINC 20110420 Redo:CHROMIUM,SELENIUM,CHROMIUM,SELENIUM ** HOLD for 90 days in case reanalysis is required
L994212-5 20110427 Redo:SELENIUM,SELENIUM 20110427 Redo:COBALT,COBALT 20110421 Redo:SELENIUM,SELENIUM 20110421 Redo:COBALT,COBALT 20110420 Redo:SELENIUM,ZINC,SELENIUM,ZINC 20110420 Redo:COBALT,CHROMIUM,SELENIUM,CHROMIUM,COBALT,SELENIUM ** HOLD for 90

Analyst Comments:

RAW Arc 90-114
Using preserved cuts for FIA method
Spike recoveries
-1 104% recovery
-2 100% recovery
-3 104% recovery
-4 103% recovery
-5 106% recovery

Dilution
-1 2x 0.005 mg/L
-2 20x 0.1 mg/L
-3 20x 0.1 mg/L
-4 20x 0.1 mg/L
-5 20x 0.1 mg/L

1266194

ARC 90-114

RECHECK ANALYSIS REPORT

RC24603

Date: 17-MAY-11 07:11

Loginum L998529
Acctnum SRK100
Client SRK CONSULTING (CANADA) INC. ~VAN
Deptnum 85110

Requestby IN-HOUSE
Due Date 18-MAY-11
Issued To THARLEY
Issued By ALANGLAIS
Date Initiated 16-MAY-11

Recheck Comments

Recheck Reason

Other; Details: Maybe too high.
Do a spike on each of them at about the same level of concentration.
Could it be other interferences?

Action to Take

Samplenum	Prod	Mat	Parm Syn	Result	Units	Measdate	RCResult	UCL	RC RPD	RCWork#	RCMeasdate	Initials
L998529-3	NH3-F-VA	38	Ammonia (as N)	2.38	mg/L	13-MAY-11	2.26	20	NA	W61280658	17-May-11	MGJ
L998529-4	NH3-F-VA	38	Ammonia (as N)	2.37	mg/L	13-MAY-11	2.20	20	NA	W61280658	17-May-11	MGJ
L998529-8	NH3-F-VA	38	Ammonia (as N)	2.38	mg/L	13-MAY-11	2.06	20	NA	W61280658	17-May-11	MGJ

Sample Comments:

L998529-3 ***PLASE HOLD SAMPLES FOR 90 DAYS in case re-analysis is required
L998529-4 20110510 Redo:ALUMINUM,SELENIUM,ALUMINUM,SELENIUM ***PLASE HOLD SAMPLES FOR 90 DAYS in case re-analysis is required
L998529-8 ***PLASE HOLD SAMPLES FOR 90 DAYS in case re-analysis is required

Analyst Comments:

Spike recoveries	Dilution	DL
-3 102% recovery	-3 20x	0.1mg/L
-4 91% recovery	-4 20x	0.1mg/L
-8 106% recovery	-8 20x	0.1mg/L

Appendix C - Groundwater Parameter Graphs

