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REPORT ON

Baker Creek Reach 7 Overflow Monitoring Program - Final Report

Submitted to:

Public Works and Government Services Canada
5101 – 50th Ave
P.O. Box 518 Yellowknife, NT X1A 2N4

Attention: Robert Girvan, Project Manager,
Northern Contaminated Sites Western Region

REPORT



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Executive Summary

In May 2011, icing in upper Baker Creek caused changes to the regular flow path of the creek near Giant Mine (the Mine). The normal flow path of Baker Creek is from little Martin Lake to Baker Pond through a series of wetlands and a waterfall upstream of the pond. Over the past winter, ice built up over a distance of approximately one kilometre upstream of Baker Pond, causing early spring flows from Martin Lake to flow northeast around the ice jam instead of the usual flow path through the ice (referred to as “the overflow event” below). The diverted flow eroded an old mine road and entered historic Jo Jo Lake, where sediments have been impacted by mine tailings during the early years of mining (SRK 2009). The flow of water through historic Jo Jo Lake resulted in re-suspension and transport of tailings impacted sediments through lower Baker Creek to Yellowknife Bay. Sediment quality in the area affected by tailings has most notably been characterized by elevated concentrations of metals and metalloids (e.g., arsenic, cadmium, aluminum, chromium) (Jacques-Whitford-Axys 2006).

The event timeline for the sediment release and subsequent monitoring was as follows:

- May 14, 2011 – Spring flows from Martin Lake deviate from regular flow path and enter historic Jo Jo Lake; regulatory consultation initiated.
- May 16, 2011 – Acute toxicity and water quality sampling of creek initiated.
- May 17, 2011 – Continued sampling and mobilization of response team.
- May 18, 2011 – Project engineers divert overflow back to the original channel; coarse fill laid in the tailings area of Reach 6 prevent flows from circulating upstream.
- May 18 onwards – Continued sampling in Baker Creek and Yellowknife Bay and subsequent data analysis.

The main objective of the Baker Creek overflow monitoring program was to characterize water and sediment quality at various locations in Baker Creek and Yellowknife Bay on several occasions during and after the overflow event. To address this objective, water quality data collected between May 16 and June 17, 2011 were evaluated by comparing concentrations of individual parameters with water quality guidelines for the protection of aquatic life and human health (*i.e.*, drinking water) (CCME 1999, with updates to 2011; Health Canada 2010). Concentrations were also compared to the limits outlined in the Metal Mining Effluent Regulations (MMER) (Government of Canada 2002, 2006).

The key findings from the Baker Creek Reach 7 overflow monitoring program include the following:

- In-stream concentrations of TSS and other parameters associated with Mine tailings (*i.e.*, sulphate and metals) indicate that during the overflow event, sediment and tailings in historic Jo Jo Lake were re-suspended and discharged through lower Baker Creek into Yellowknife Bay.
- Toxicity testing conducted during the overflow event indicated that stream water downstream of the tailings impacted area was not acutely toxic.



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- TSS concentrations were high during the overflow event, but declined to levels within the typical background range in approximately 10 days. A slight increase in TSS concentration followed, but values subsequently declined and were near or within the background range and below the CCME aquatic life guideline by June 3.
- Levels of cyanide and ammonia, which were historically high at Giant Mine, were within the typical background range for Baker Creek after mitigation.
- Sulphate concentrations in the lower reaches of Baker Creek were higher than typically observed in Baker Creek during spring.
- Concentrations of total metals and metalloids in Baker Creek were elevated during the overflow event, and there was a strong relationship between TSS and total metal concentrations. At high concentrations, such as those observed immediately after the overflow event, only a small proportion of the total metal concentration was in the dissolved form. After mitigation, both total metal concentrations and the percentage of metals in the dissolved form approached values typically measured in Baker Creek.
- A combination of the overflow event and wind-induced mixing likely resulted in elevated TSS and total metals concentrations in Yellowknife Bay, near the mouth of Baker Creek on May 31. Elevated concentrations in the Back Bay public dock area on the same day were likely due to wind-induced mixing and turbulence. By June 8, TSS levels were low, and although concentrations of several metals were above aquatic life guidelines (*i.e.*, aluminum, antimony, arsenic and copper), concentrations were within the typical background ranges.

Water quality monitoring was discontinued on June 17 in Baker Creek, and on June 8 in Yellowknife Bay, because concentrations of TSS and metals had returned to background levels. A shoreline sediment investigation to identify areas of visual sediment deposition will occur in July (weather permitting), followed by a detailed sediment survey in September. Sediment quality data will be reported in a subsequent report, to be issued once monitoring has been completed and a final set of sampling results have been received and analyzed. Fish monitoring in Baker Creek was initiated on June 1, in consultation with Fisheries and Oceans Canada. Findings from that study will also be reported in a separate report at a later date.



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1.0 INTRODUCTION

1.1 Background

In May 2011, icing in upper Baker Creek caused changes to the normal flow path of the creek near Giant Mine (the Mine). The normal flow path of Baker Creek is from upper Baker Creek into Baker Pond, through the lower portion of Baker Creek and then into Yellowknife Bay (Figures 1 and 2). The mouth of Baker Creek is located approximately three kilometres north of the City of Yellowknife.

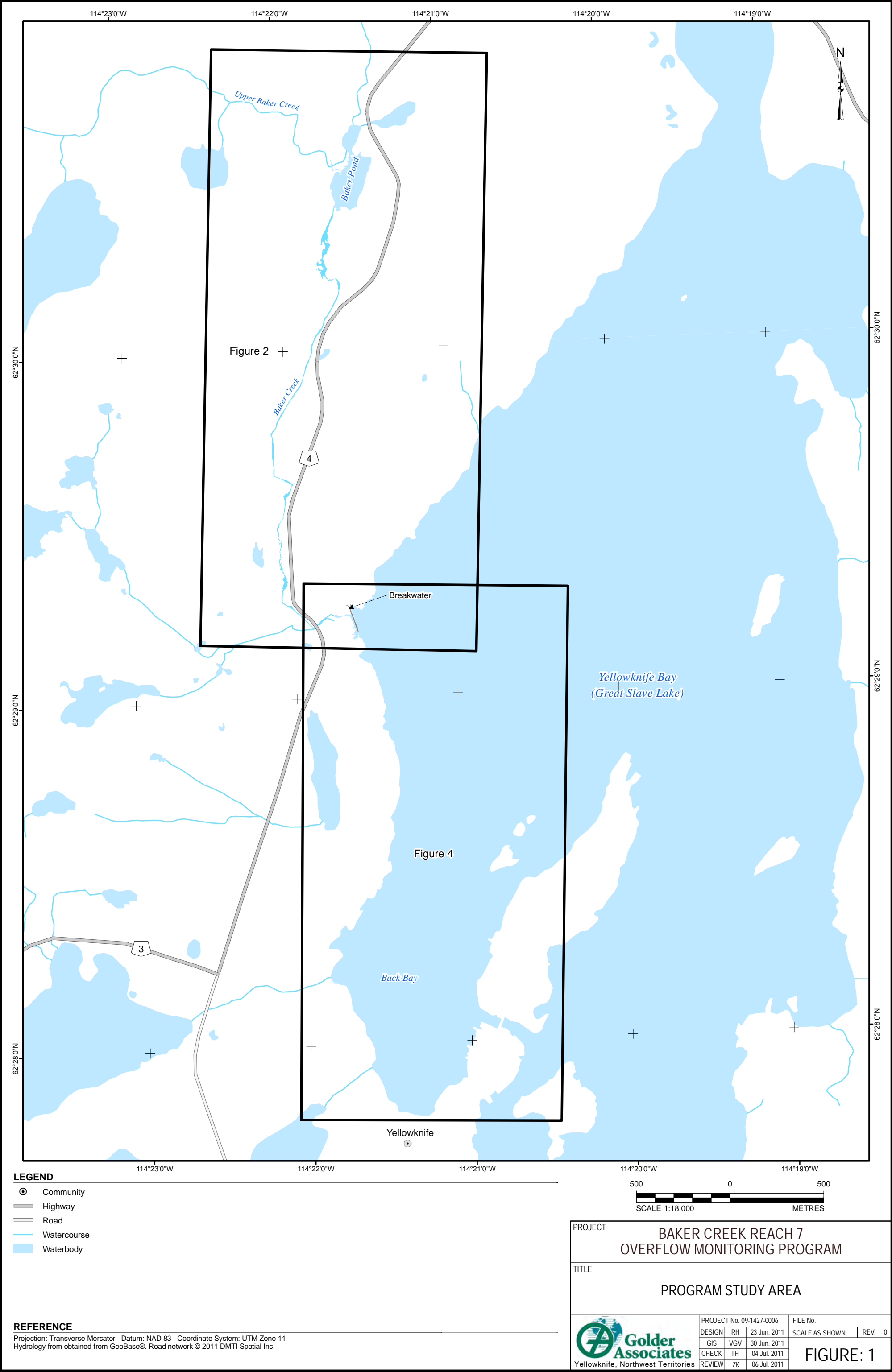
Upper Baker Creek typically flows from little Martin Lake to Baker Pond through a series of wetlands and a waterfall upstream of the pond (Figure 2). However, over the winter of 2010/2011, ice built up over a distance of approximately one kilometre upstream of Baker Pond, causing early spring runoff waters flows from Martin Lake to flow northeast around the ice jam instead of the usual flow path through the ice (Figure 3). This change in flow path will herein be referred to as “the overflow event”. The diverted flow eroded an old mine road and entered historic Jo Jo Lake, where sediments have been impacted by mine tailings during the early years of mining (SRK 2009). The flow of water through historic Jo Jo Lake resulted in re-suspension and transport of tailings impacted sediments through lower Baker Creek to Yellowknife Bay. Sediment quality in historic Jo Jo Lake has been characterized by elevated concentrations of metals and metalloids (e.g., arsenic, cadmium, aluminum and chromium) (Jacques-Whitford-Axys 2006).

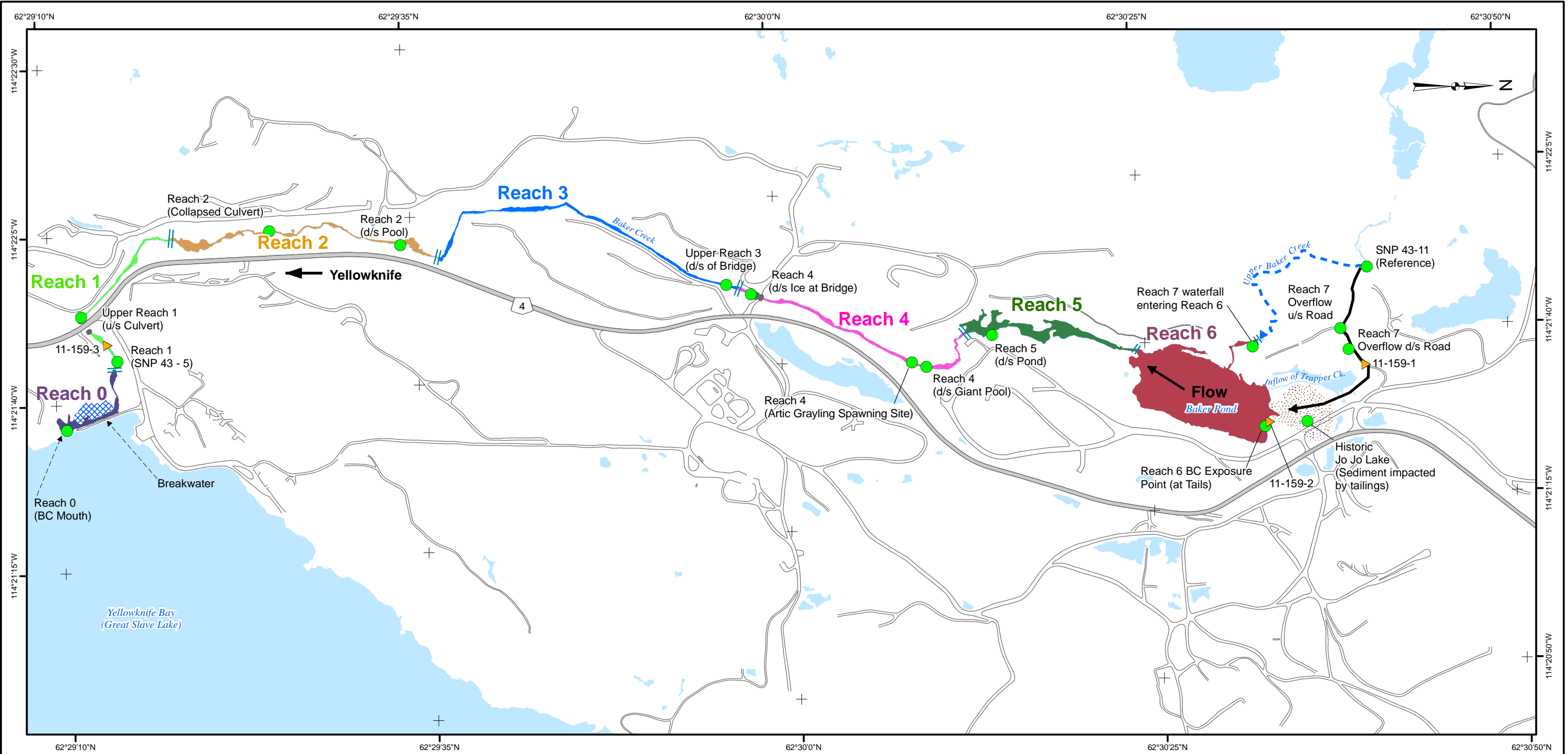
Golder Associates Ltd. (Golder) was retained by Public Works Government Services of Canada (PWGSC) through AECOM Engineering to complete a water quality monitoring program in Baker Creek and Yellowknife Bay during and after the overflow event and summarize the resulting data. The scope of the monitoring program included collecting data to characterize in-stream water quality, and using this information in conjunction with supplemental data collected by Indian and Northern Affairs Canada (INAC) and available historical data, to determine if the sediment release negatively affected water quality in Baker Creek. The study area included Baker Creek from immediately upstream of the overflow location to its mouth (Figure 2), Yellowknife Bay near the mouth of Baker Creek and the Back Bay public dock area (Figure 4).

1.2 Event Timeline

The event timeline for the sediment release and subsequent monitoring was as follows:

- May 14, 2011 – Spring flows from Martin Lake deviate from the normal flow path and enter historic Jo Jo Lake; regulatory consultation initiated.
- May 16, 2011 – Acute toxicity and water quality sampling of creek initiated.
- May 17, 2011 – Continued sampling and mobilization of response team.
- May 18, 2011 – Project engineers divert overflow back to the original channel; coarse fill laid in the tailings area of Reach 6 prevent flows from circulating upstream.
- May 18 onwards – Continued sampling in Baker Creek and Yellowknife Bay and subsequent data analysis.



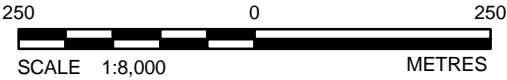


LEGEND

- | | |
|--------------------------------|-----------|
| Baker Creek Sample Station | Reach 0 |
| INAC Inspector Sample (May 16) | Reach 1 |
| Approximate Overflow Path | Reach 2 |
| Normal Flow Path | Reach 3 |
| Culvert | Reach 4 |
| Reach Break | Reach 5 |
| Road | Reach 6 |
| Highway | Waterbody |
| Historic Jo Jo Lake | |
| Marsh Habitat | |

REFERENCE

Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 11
Base Data: CAD derived shapefiles



PROJECT	BAKER CREEK REACH 7 OVERFLOW MONITORING PROGRAM			
TITLE	SAMPLING LOCATIONS ON BAKER CREEK			
Golder Associates Yellowknife, Northwest Territories	PROJECT No. 09-1427-0006		SCALE AS SHOWN	REV. 0
	DESIGN	TH	01 Jun. 2011	FIGURE: 2
	GIS	VG	30 Jun. 2011	
	CHECK	TH	04 Jul. 2011	
	REVIEW	ZK	06 Jul. 2011	



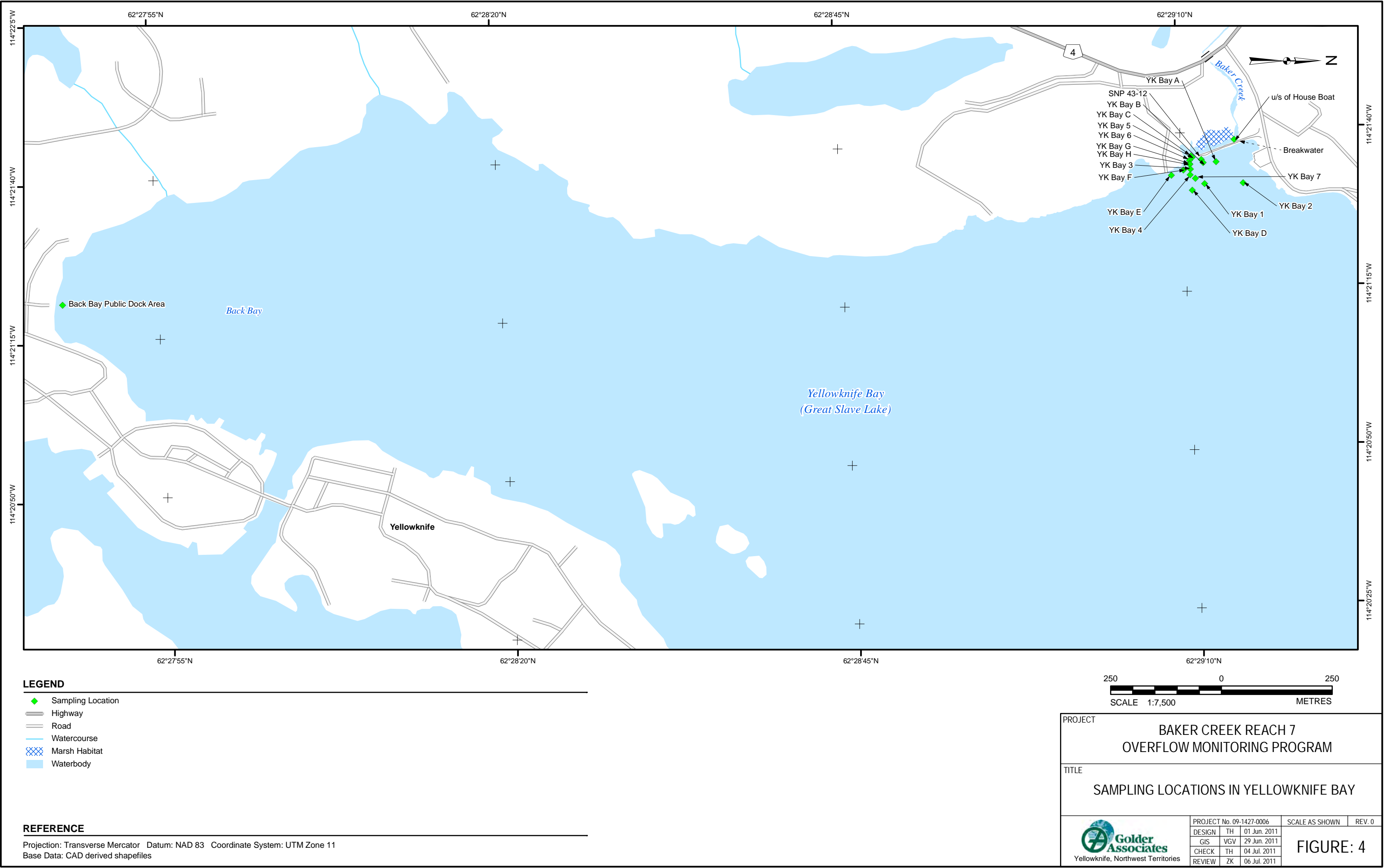
Photo taken by Golder Associates Ltd., courtesy INAC Cumulative Impact Monitoring Program

Figure 3: Aerial View of Reaches 6 and 7 of Baker Creek, May 13, 2011

1.3 Study Objectives

The main objective of the Baker Creek overflow monitoring program was to characterize water and sediment quality at various locations in Baker Creek and Yellowknife Bay on several occasions during and after the overflow event. Specifically, monitoring in Baker Creek and Yellowknife Bay was initiated to address the following questions:

- 1) Was stream water downstream of the tailings impacted area acutely toxic to fish and other aquatic life during the overflow event?
- 2) What was the concentration of total suspended solids (TSS) in Baker Creek from upstream of the Mine to Yellowknife Bay during the overflow event and after mitigation?
- 3) What was the detailed water chemistry in Baker Creek during the overflow event and after mitigation?
- 4) What was the detailed water chemistry in Yellowknife Bay after mitigation?
- 5) What was the composition (*i.e.*, chemistry and particle size) of suspended sediments in Baker Creek?
- 6) In areas of visible sediment deposition in Baker Creek, what was the chemistry of the sediment?





1.4 Scope

The scope of this report is to address the first four questions listed in Section 1.3, using recently collected water quality information. The last two questions, related to sediment composition and chemistry, will be addressed at a later date, once a full set of monitoring data are available. Sediment collection will occur in September. The purpose of this report is to provide a summary of the water quality results, to be submitted as part of the record on the sediment release, which will be filed with the appropriate regulators by PWGSC. The scope of this report is as follows:

- Present final results from the toxicity bioassays completed on May 16, 2011;
- Characterize water quality in Baker Creek from upstream of the overflow location to Yellowknife Bay using data collected between May 16 and June 17, 2011 (as received by June 25);
- Characterize water quality in Yellowknife Bay using data collected between May 24 and June 8 (as received by June 25);
- Compare water quality data to applicable background concentrations, aquatic life and drinking water guidelines (CCME 1999; with updates), and limits outlined in the Metal Mining Effluent Regulations (MMER) (Government of Canada 2002, 2006); and
- Describe potential spatial (*i.e.*, with distance downstream) and temporal (*i.e.*, through time) trends in the water quality.

Sediment quality data will be reported in a subsequent report, to be issued once monitoring has been completed and a final set of sampling results have been received and analyzed. Fish monitoring in Baker Creek was initiated on June 1, in consultation with Fisheries and Oceans Canada. Findings from that study will also be reported in a separate report at a later date.

1.5 Report Organization

A description of methods, including sample collection procedures and data analysis methods are provided in Section 2. Study results are presented in Section 3, followed by a summary of key findings in Section 4. Quality assurance and quality control (QA/QC) information is presented in Appendix A, followed by detailed water quality results in Appendix B. A comparison of laboratory TSS measurements and field turbidity readings is presented in Appendix C, and a copy of the final laboratory results and supporting information are provided in Appendix D.



2.0 METHODS

2.1 Sample Locations

Water samples were collected and in-situ measurements were made at the sample stations shown in Figure 2 (Baker Creek) and Figure 3 (Yellowknife Bay). A description of the sampling stations is provided below:

- *Reference Point (SNP43-11)¹* – Baker Creek, upstream of the overflow location;
- *Reach 7 Overflow, upstream (u/s) of road* – immediately downstream of diversion, u/s of an old mine road;
- *Reach 7 Overflow, downstream (d/s) of road* – downstream of diversion and eroded road, but upstream of tailings deposit;
- *Reach 6, Baker Creek Exposure Point* – near the tailings impacted area;
- *Reach 5, d/s pond* – upper portion of Reach 5, just downstream of Baker Pond;
- *Reach 4, d/s Giant Pool* – upper portion of Reach 4, in a pool area;
- *Reach 4, Arctic Grayling spawning site* – just downstream of the Reach 4 pool area;
- *Reach 4, d/s ice at bridge* – lower portion of Reach 4, taken near the bridge crossing;
- *Reach 3, d/s bridge* – upper portion of Reach 3, downstream of bridge crossing;
- *Reach 2, d/s pool* – lower portion of Reach 2, downstream of pool area;
- *Reach 2, collapsed culvert* – middle portion of Reach 2, near the collapsed culvert;
- *Reach 1, u/s culvert* – middle portion of Reach 1, upstream of culvert;
- *Reach 1 (SNP43-5)* – downstream of the culvert at Highway 4 (i.e., Ingraham Trail) near the mouth of the creek;
- *Reach 0* – mouth of Baker Creek;
- *Yellowknife Bay, stations 1 to 7 and A to H* - near the mouth of Baker Creek; and
- *Yellowknife Bay, Back Bay public dock area* - within the public use area for the City of Yellowknife.

In addition to the sampling that Golder conducted, Inspectors from INAC collected samples from three locations (Figure 2). Indian and Northern Affairs Canada has made these data available for this assessment; sampling locations and sample names are as follows:

- INAC sample near Golder sample “Reach 7 Overflow, d/s road” (11-159-1);
- INAC sample in Reach 6 (11-159-2); and
- INAC sample in Reach 1 (11-159-3).

¹ Station numbers containing ‘SNP’ refer to historical sampling stations established as part of the Surveillance Network Program for Giant Mine.



2.2 Field Program

Prior to collecting water samples, water depth (m), temperature (°C), pH, dissolved oxygen (DO) concentration (mg/L), specific conductivity (µS/cm), and turbidity measurements were recorded. A YSI 650 MDS water quality meter connected to an YSI 600 QS multi-parameter water quality probe was used for the physico-chemical field measurements, and field turbidity measurements were obtained using a LaMotte turbidity meter. Surface water samples were collected in accordance with the Mine's Standard Operating Procedure (SOP) (INAC 2010) and specific laboratory instructions. Samples for biological toxicity testing were collected in 20-L plastic carboys, and kept cool (4°C) prior to submitting to the laboratory. All toxicity tests were initiated within five days of sample collection, as required by the SOP.

Sampling frequency and parameters analyzed are provided in Table 1.

2.3 Quality Control

For quality control (QC) purposes, field blanks, travel blanks and a duplicate sample were prepared as part of the sampling program. Field blanks (a deionized water sample prepared at a field site) were used to assess potential sample contamination during collection, handling, shipping and analysis. Travel blanks (bottle pre-filled with deionized water and sealed by the laboratory) were used to detect potential sample contamination during shipping, storage and analysis. The results of the duplicate sample analysis were used to assess within-site variability and precision of the field sampling methods. Detailed information on QC samples is provided in Appendix A.

2.4 Laboratory Analysis

Samples collected for acute toxicity analysis were submitted to HydroQual Laboratories (HydroQual) in Calgary, Alberta. Acute toxicity testing was conducted according to the following methods:

- EPS 1/RM/13 – Reference Method for Determining Acute Lethality of Effluents Using Rainbow Trout (Environment Canada 2007); and
- EPS 1/RM/14 – Reference Method for Determining Acute Lethality of Effluents Using *Daphnia* spp. (Environment Canada 2000).

Surface water samples were submitted to ALS Laboratory Group (ALS) in Yellowknife, Northwest Territories, Edmonton, Alberta and Vancouver, British Columbia for analysis of water quality parameters listed in Table 1.



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Table 1: Sampling Frequency and Parameters Analyzed for the Baker Creek Reach 7 Overflow Monitoring Program, May and June 2011

Component	Location	Frequency	Parameter	Rationale	Status
Acute toxicity (Question 1 in Section 1.3)	Reach 6 - Baker Ck. Exposure Point Reach 1 (SNP 43-5)	Day 1 – May 16, 2011	<i>Lab</i> – Rainbow Trout and <i>Daphnia magna</i> (LC ₅₀). <i>Method</i> – Reference Methods provided by Environment Canada (2000, 2007)	Characterize the acute toxicity of water near the exposure area and near the mouth of Baker Creek	Complete
TSS-Turbidity Characterization (Question 2 in Section 1.3)	Reach 0 to Reach 7 Yellowknife Bay (near the mouth of Baker Creek; Back Bay public dock area)	<i>Baker Creek</i> – approximately once per day <i>Yellowknife Bay</i> - May 24, May 31, and June 8	<i>Lab</i> – TSS, turbidity <i>Field</i> – turbidity, temperature, conductivity, dissolved oxygen, pH, water depth, photographs <i>Method</i> – surface grab samples (TSS); water quality meter and probe (in-situ parameters).	Characterize extent of sediment plume; use data to establish a TSS-turbidity relationship	Complete
Water characterization (Questions 3 and 4 in Section 1.3)	Reference (SNP43-11), Reach 7 waterfall entering Reach 6 Reach 7 overflow – u/s of road Reach 7 overflow – d/s of road Reach 6 - Baker Ck. Exposure Point Reach 5, d/s pond Reach 4, d/s Giant pool Reach 2, d/s pool Reach 1 (SNP 43-5) Reach 0 (mouth of Baker Creek) Yellowknife Bay (near the mouth of Baker Creek; Back Bay public dock area)	<i>Baker Creek</i> - May 16 to 18, 20, 24 - 25, 27, June 6, 8 and 17 <i>Yellowknife Bay</i> - May 24, 31, and June 8	<i>Lab</i> – TSS, turbidity, major ions, nutrients, total and dissolved metals <i>Field</i> – turbidity, temperature, conductivity, dissolved oxygen, pH, water depth, UTM coordinates and photographs <i>Method</i> – surface grab samples; water quality meter and probe (in-situ parameters)	Characterize detailed water quality in Baker Creek and Yellowknife Bay	Complete
Sediment monitoring (Questions 5 and 6 in Section 1.3)	Reach 4 Reach 2 Reach 0 Yellowknife Bay, localized area	TBD	<i>Lab</i> – particle size, TOC, total metals <i>Field</i> – water depth, sediment depth and photographs <i>Method</i> – Ekman grab	Characterize sediment quality in areas of visible deposition, if present; select locations where pre- overflow event sediment data are available	Pending

Notes: TBD = to be determined; Ck = creek; u/s = upstream; d/s = downstream; TOC = total organic carbon; TDS = total dissolved solids; TSS = total suspended solids;
LC₅₀ = concentration of test water resulting in 50% mortality of the test population.



2.5 Data Analysis

Water quality data were plotted spatially (*i.e.*, with distance downstream) and temporally (*i.e.*, through time), then visually examined to identify any potential trends. Emphasis was placed on TSS, because it is a direct measurement of the amount of sediment suspended in the water column. When laboratory TSS was not available, the relationship between field turbidity and laboratory TSS was used to estimate TSS (Appendix C), consistent with methods outlined in CCME (2002). Field turbidity was measured daily. The average of three field turbidity readings was used to represent the daily field turbidity reading at each station during each site visit.

Data from stations “SNP 43-11” and “Reach 7, Overflow u/s of road” were used to represent reference conditions in Baker Creek during and after the overflow event. Reach-specific data collected from Baker Creek in May and June between 2007 and 2010 were used to represent background conditions in the creek (Golder 2011). Water quality in lower Baker Creek was compared to both reference and background data to determine if concentrations had returned to natural conditions. In Yellowknife Bay, data collected near the mouth of Baker Creek in May and June between 2007 and 2010 were used to represent background conditions.

Water quality data were also evaluated by comparing concentrations of individual parameters with water quality guidelines for the protection of aquatic life and human health (*i.e.*, drinking water) (CCME 1999, with updates to 2011; Health Canada 2010). Concentrations were also compared with limits outlined in the Metal Mining Effluent Regulations (MMER) (Government of Canada 2002, 2006).

Water quality guidelines are nationally endorsed indicators of environmental quality for the protection of aquatic ecosystems and designated water uses, to identify parameters of potential concern. Aquatic life guidelines are based on the most current, scientifically defensible toxicological data and are intended to be protective of all forms and life stages of aquatic life (CCME 1999). Exceedance of a guideline does not, therefore, automatically imply unacceptable or harmful conditions.



3.0 RESULTS

Was Stream Water Downstream of the Tailings Impacted Area Acutely Toxic to Fish and Other Aquatic Life During the Overflow Event?

Water is considered to be not acutely toxic if more than 50% of the test organisms survive in full-strength (100%) test water (Government of Canada 2002, 2006). Acute toxicity test results are expressed as an LC_{50} (i.e., percent concentration that results in 50% mortality of the test organisms), with non-toxic samples having an LC_{50} value of greater than 100%. No acutely toxic effects were observed in the rainbow trout (*Oncorhynchus mykiss*) or *Daphnia magna* survival tests ($LC_{50} \geq 100\%$) on the samples collected from Baker Creek on May 16, 2011 (Table 2). Therefore, water downstream of the tailings impacted area was not acutely toxic during the period of overflow. Detailed acute toxicity results and supporting information are provided in Appendix C.

Table 2: Baker Creek Stream Water Toxicity Characterization Results for May 16, 2011

Location	Test Species	Biological Endpoint of Test	Statistic	Test Result (%)	Confidence Limits ^(a)		Pass Limit ^(b)
					Upper	Lower	
Reach 6	<i>Oncorhynchus mykiss</i> (rainbow trout)	Survival	LC_{50}	>100	not determined		$\geq 100\%$
	<i>Daphnia magna</i> (water flea)	Survival	LC_{50}	>100	not determined		$\geq 100\%$
Reach 1 (SNP 43-5)	<i>Oncorhynchus mykiss</i> (rainbow trout)	Survival	LC_{50}	>100	not determined		$\geq 100\%$
	<i>Daphnia magna</i> (water flea)	Survival	LC_{50}	>100	not determined		$\geq 100\%$

(a) Confidence limits cannot be calculated for non-toxic stream water (refer to HydroQual report, Appendix C).

(b) As defined by Government of Canada (2002).

Notes: LC_{50} = concentration expressed as the percentage of test water that results in 50% mortality of the test population; > = greater than; \geq = greater than or equal to; % = percent.

What was the Concentration of Total Suspended Solids in Baker Creek from Upstream of the Mine to Yellowknife Bay During the Overflow Event and After Mitigation?

Temporal Trends

TSS concentrations at four representative reaches in lower Baker Creek (i.e., Reaches 6, 4, 1 and 0) are presented in Figure 5, panels (a) to (d). Concentrations from reference locations, as well as typical background concentrations are provided for comparison in the same figure. The CCME aquatic life guideline is also shown, which was calculated as a maximum average increase of 5 mg/L from background levels for exposures lasting between 24 hours and 30 days during clear flow periods (CCME 2002). The median TSS concentration (i.e., 3 mg/L) from samples collected at the reference locations during the sampling program was used as background. Therefore, the aquatic life guideline was set at 8 mg/L.



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The TSS concentration in Reach 6 was 4,340 milligrams per litre (mg/L) on May 16, indicating that sediment and tailings in historic Jo Jo Lake were re-suspended into the water column. After mitigation (*i.e.*, after May 18), in-stream TSS concentration in Reach 6 declined to 79 mg/L. The TSS concentration then briefly increased to approximately 520 mg/L as a result of re-circulation of water through the tailings. This flow was subsequently blocked with coarse fill, and as a result, TSS values declined again, reaching 5 mg/L on May 27, which was below reference levels on the same date. The TSS concentration increased slightly between May 28 and June 1, with values above the CCME aquatic life guideline. From June 2 to 17, the TSS concentration declined and remained below the guideline and near reference levels (Figure 5; panel a).

In Reach 4, downstream of the pooled area, the post-mitigation TSS concentration declined from 72 mg/L on May 18 to 29 mg/L on May 19. Concentrations remained at this level for one more day, and then increased to 70 mg/L on May 24. The cause of this increase is unknown, although it may have been erosion of a stream bank by instream ice. The TSS concentration declined to 5 and 7 mg/L, on May 25 and 27, respectively, then increased slightly again to levels above the CCME aquatic life guideline between May 28 and June 2, similar to the trend observed in Reach 6. The TSS concentration was below the guideline on June 3 and remained low until June 17, with levels approaching the median historical background concentration of approximately 2 mg/L during spring (Figure 5; panel b).

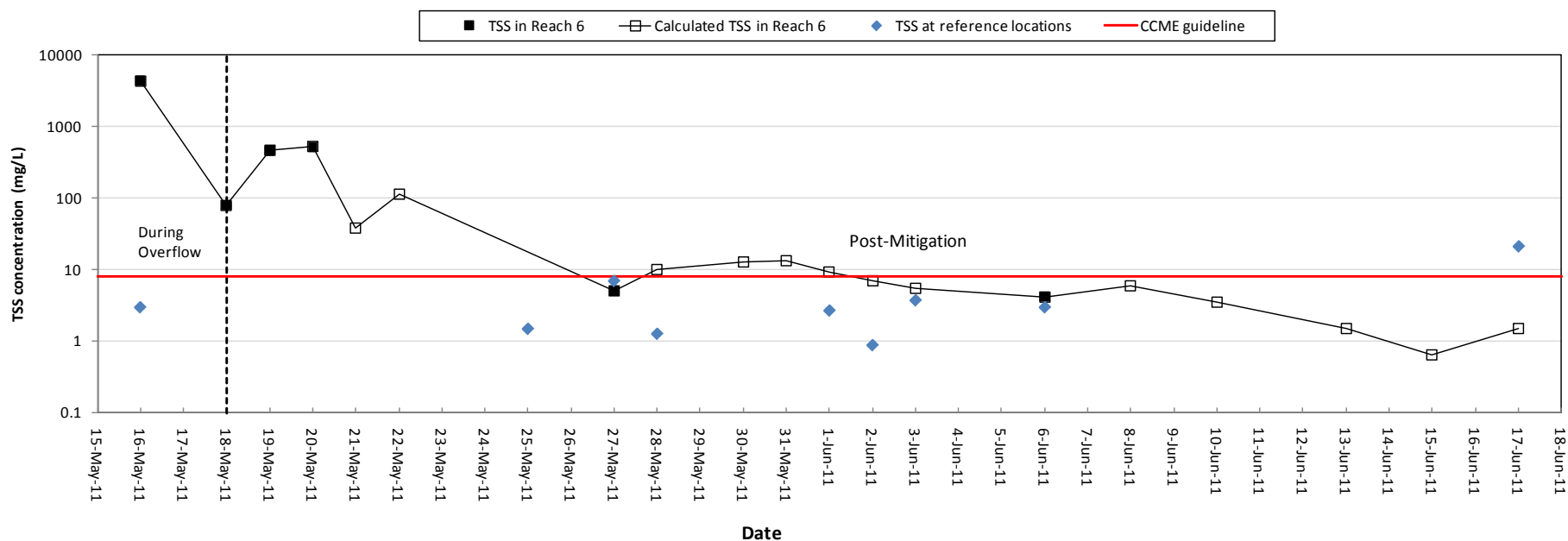
TSS concentrations in Reaches 1 and 0 (*i.e.*, near the mouth of Baker Creek) followed a similar pattern to that observed in Reaches 4 and 6, with values declining after mitigation was in place. In both reaches, TSS concentration was approximately 160 mg/L before mitigation, and then decreased to approximately 10 mg/L on May 27. The TSS concentration was below the CCME aquatic life guideline and within the typical background range in Reach 0 during spring from June 3 to 17 (Figure 5; panels c and d). The exception was the estimated TSS concentration at the mouth of Baker Creek (*i.e.*, Reach 0) on June 13. Strong winds caused the area near the breakwater to be particularly turbulent, which resulted in sediment re-suspension not observed in the other reaches of Baker Creek on that day. The anomalous value was retained in the analysis, but was most likely due to weather-induced mixing of the water column, rather than the overflow event.

In summary, in-stream concentrations of TSS indicate that during the overflow event, sediment and tailings in historic Jo Jo Lake were re-suspended and discharged through lower Baker Creek into Yellowknife Bay. With mitigation in place, TSS levels declined to levels that were within or approaching typical background levels within approximately 10 days. There was a slight increase in TSS levels between May 28 and June 2, but concentrations decreased thereafter, and were below the CCME aquatic life guideline and within the typical background range from June 3 to 17.



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a) Reach 6



Notes: TSS concentration at the reference locations was defined based on samples collected from SNP 43-11 on May 16 and June 6, and from Reach 7 waterfall entering Reach 6 for the remaining dates between May 25 and June 17.

TSS data collected between May 16 and May 20 were collected from Reach 6 BC Exposure Point (at Tails); data from May 27 and June 6 were collected from Reach 5 (d/s Pond).

Calculated TSS was obtained using the TSS/turbidity regression equation presented in Appendix C; calculated TSS on June 17 was set to half the MDL for TSS (*i.e.*, 1.5 mg/L), because the turbidity reading was 0 NTU.

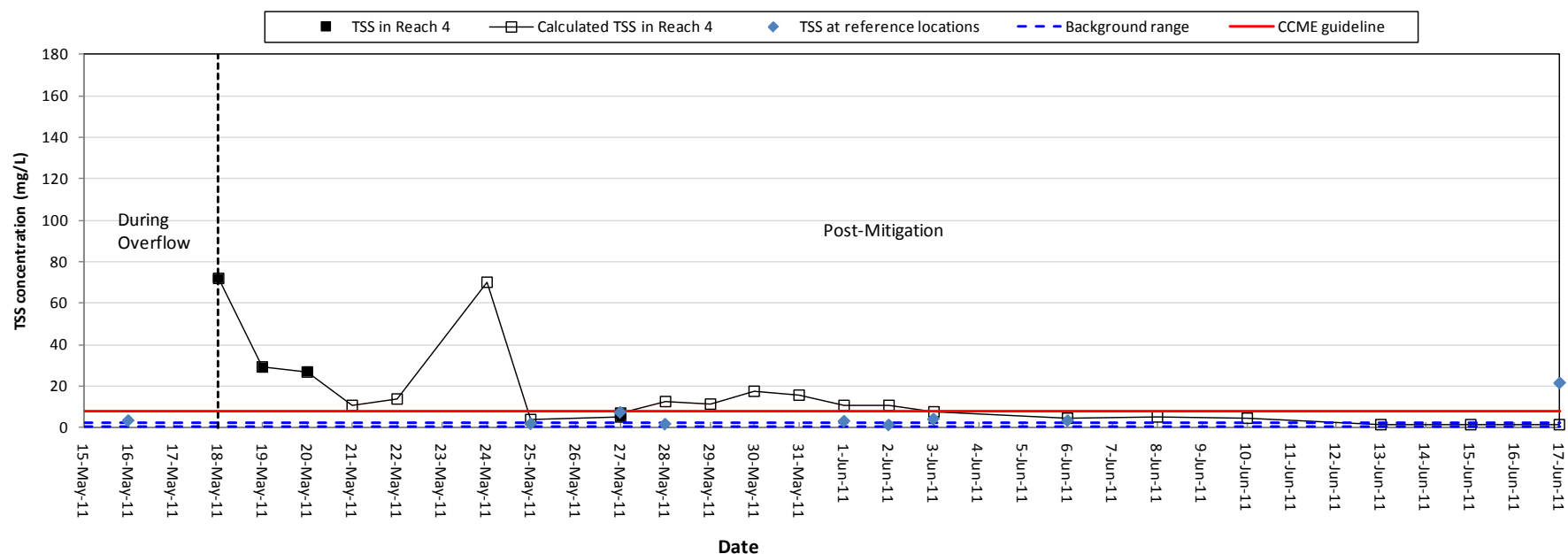
The CCME aquatic life guideline is a maximum average increase of 5 mg/L from background levels for exposures lasting between 24 hours and 30 days; background was set to 3 mg/L using the median TSS concentration calculated from samples collected at the reference locations during the sampling program.

Figure 5: Total Suspended Solids Concentrations at Representative Locations in Baker Creek



BAKER CREEK REACH 7 OVERFLOW MONITORING PROGRAM

b) Reach 4



Notes: TSS concentration at the reference locations was defined based on samples collected from SNP 43-11 on May 16 and June 6, and from Reach 7 waterfall entering Reach 6 for the remaining dates between May 25 and June 17.

Reach 4 TSS data were from Reach 4 (d/s Giant Pool), with the exception of May 29, which was collected from Reach 4 (Arctic Grayling spawning site).

Background range was defined by minimum and maximum of samples collected in from Reach 4 in May and June between 2007 and 2009 (Golder 2011).

Calculated TSS was obtained using the TSS/turbidity regression equation presented in Appendix C; calculated TSS on June 17 was set to half the MDL for TSS (*i.e.*, 1.5 mg/L), because the turbidity reading was 0 NTU.

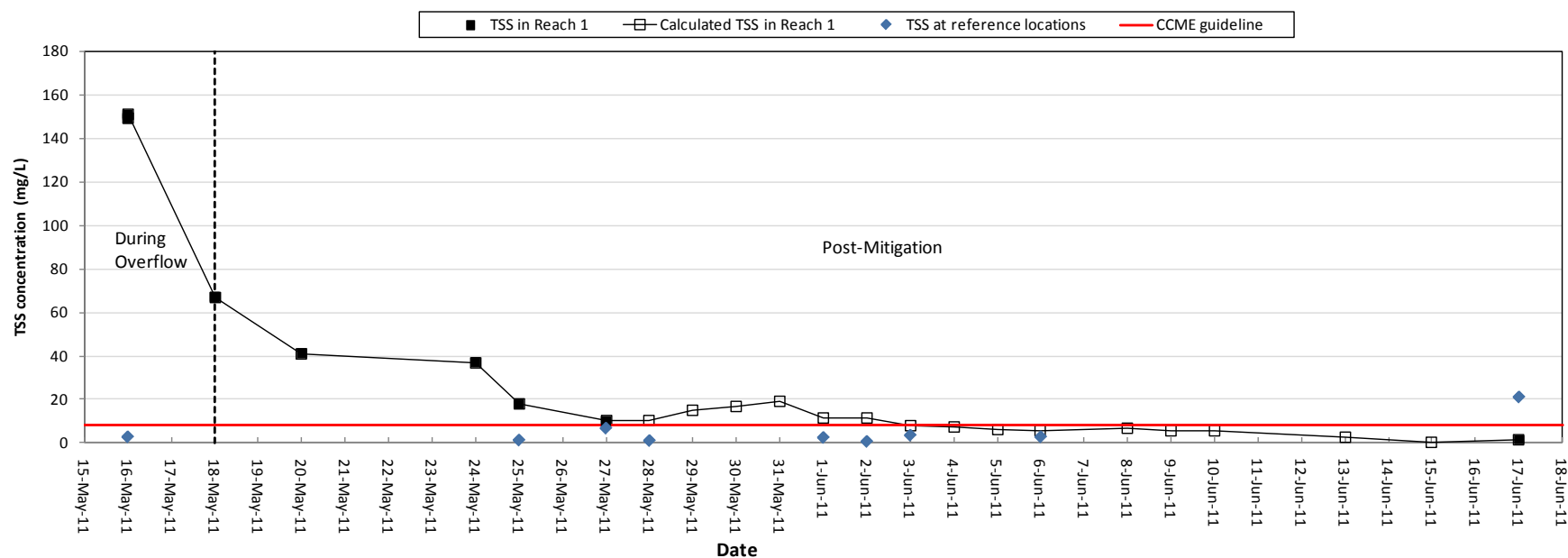
The CCME aquatic life guideline is a maximum average increase of 5 mg/L from background levels for exposures lasting between 24 hours and 30 days; background was set to 3 mg/L, using the median TSS concentration calculated from samples collected at the reference locations during the sampling program.

Figure 5: Total Suspended Solids Concentrations at Representative Locations in Baker Creek (continued)



BAKER CREEK REACH 7 OVERFLOW MONITORING PROGRAM

c) Reach 1



Notes: TSS concentration at the reference locations was defined based on samples collected from SNP 43-11 on May 16 and June 6, and from Reach 7 waterfall entering Reach 6 for the remaining dates between May 25 and June 17.

Calculated TSS was obtained using the TSS/turbidity regression equation presented in Appendix C.

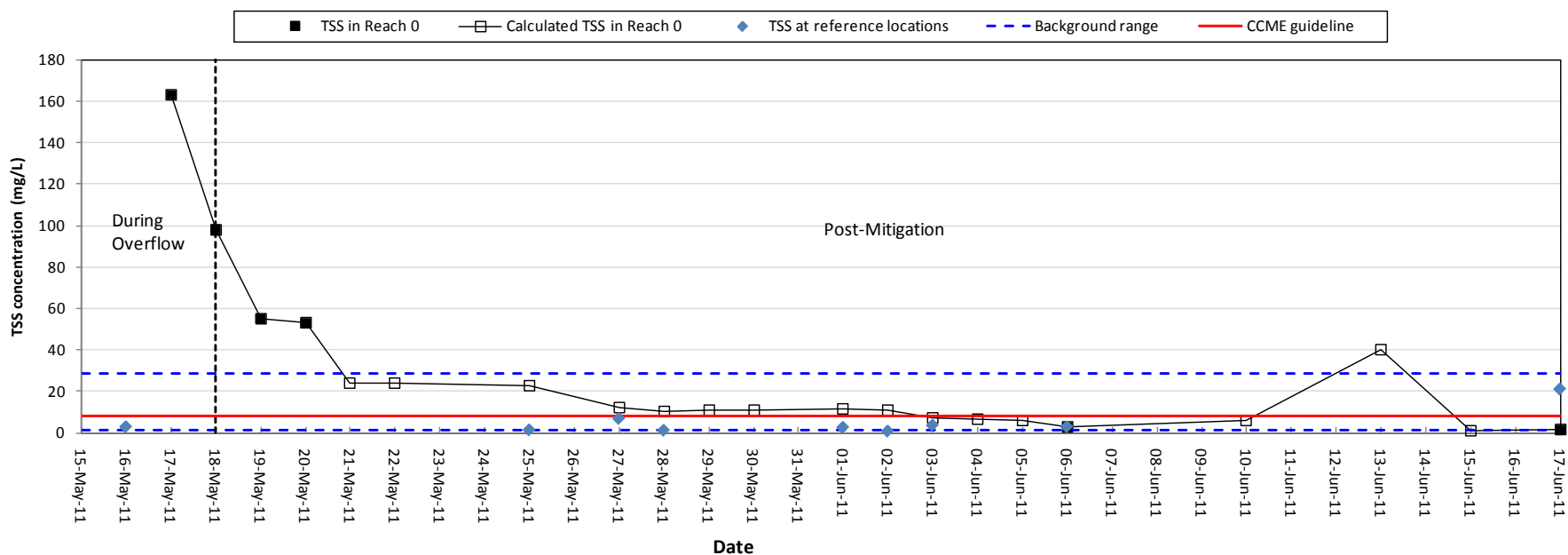
The CCME aquatic life guideline is a maximum average increase of 5 mg/L from background levels for exposures lasting between 24 hours and 30 days; background was set to 3 mg/L, using the median TSS concentration calculated from samples collected at the reference locations during the sampling program.

Figure 5: Total Suspended Solids Concentrations at Representative Locations in Baker Creek (continued)



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d) Reach 0



Notes: TSS concentration at the reference locations was defined based on samples collected from SNP 43-11 on May 16 and June 6, and from Reach 7 waterfall entering Reach 6 for the remaining dates between May 25 and June 17.

Background range was defined by minimum and maximum of samples collected from Reach 4 in May and June between 2007 and 2009 (Golder 2011).

Calculated TSS was obtained using the TSS/turbidity regression equation presented in Appendix C.

The CCME aquatic life guideline is a maximum average increase of 5 mg/L from background levels for exposures lasting between 24 hours and 30 days; background was set to 3 mg/L, using the median TSS concentration calculated from samples collected at the reference locations during the sampling program.

Figure 5: Total Suspended Solids Concentrations at Representative Locations in Baker Creek (continued)



Spatial Trends

Total suspended solids concentrations at all monitored locations in Baker Creek were plotted for comparison in Figure 6. TSS concentrations were lowest at the reference locations and in Reach 7 (upstream of the old Mine road) during the overflow event. Concentrations were elevated in Reach 7 (downstream of the old Mine road) due to the re-suspension of sediments by water flowing along the old Mine road. Concentrations in Reach 6 were typically the highest, as a result of re-suspension of sediments in the tailings impacted area. In the lower reaches of Baker Creek (*i.e.*, Reaches 4, 3, 2, 1, 0), TSS concentrations were similar and lower than in Reach 6, but slightly above the background range. By May 27, the differences in TSS concentrations among reaches were small, and concentrations at all locations declined to levels within the background range characteristic of lower Baker Creek. There was a slight increase in TSS between May 28 and June 2, but concentrations subsequently decreased, and were below the CCME aquatic life guideline and within the typical background range from June 3 to 17.

What was the Detailed Water Chemistry in Baker Creek during the Overflow Event and after Mitigation?

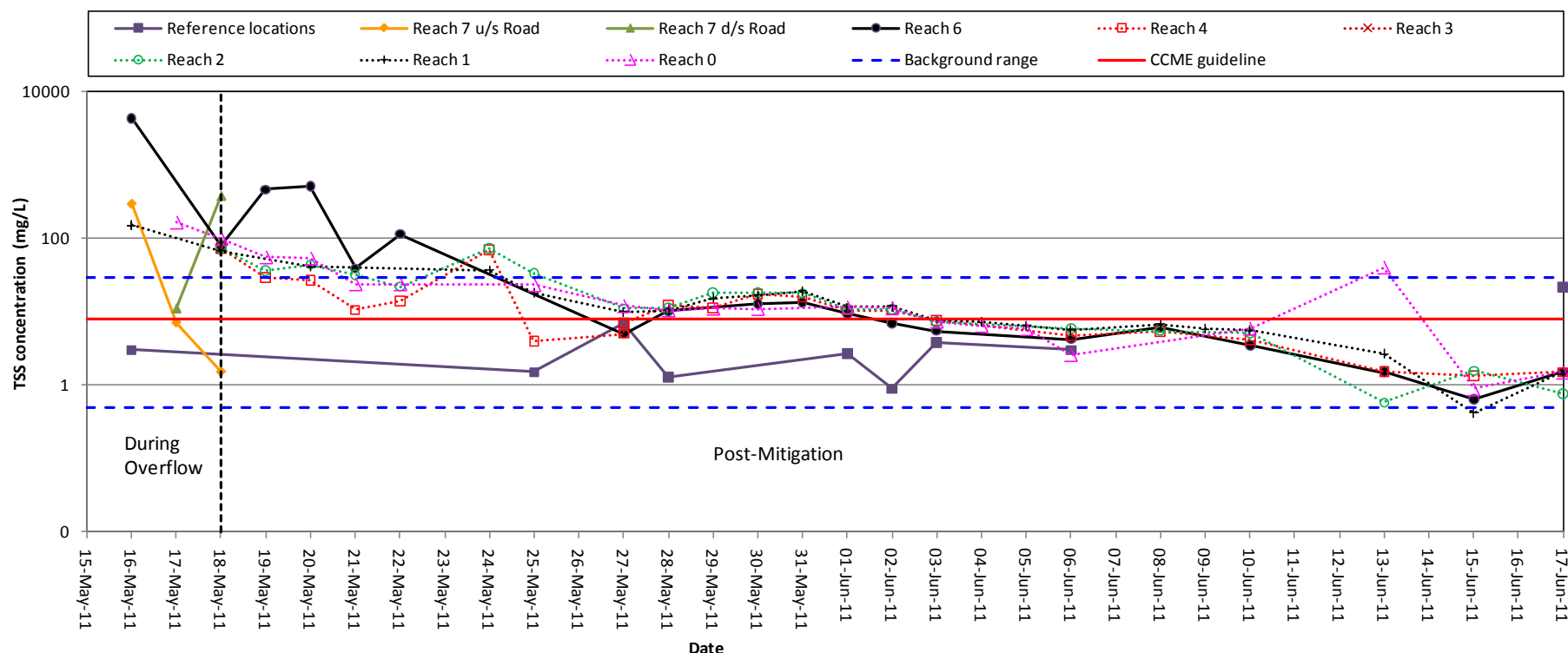
Between May 16 and June 17, 2011, waters from Baker Creek were well-oxygenated and slightly alkaline (Appendix B; Table B-1). Conductivity and total dissolved solids concentrations were higher downstream of the tailings impacted area than in the upstream reference area, but remained within the ranges previously measured in Baker Creek (Appendix B; Tables B-1 and B-2). Ammonia and cyanide concentrations have historically been high at Giant Mine (Golder 2003, 2005). Although cyanide concentrations were above the water quality guideline for the protection of aquatic life during this study, values were within the background range. Nutrient levels in Baker Creek were generally low during and after the overflow event.

Sulphate concentrations were elevated downstream of the tailings impacted area, which may have resulted from contact of water released during the overflow event with treatment chemical residue present in materials at the bottom of historical Jo Jo Lake. Ferric sulphate is used in the water treatment process at the Mine (INAC 2011). Levels of sulphate in the lower reaches of Baker Creek were higher than typically observed in Baker Creek during spring (Appendix B; Table B-2).

Concentrations of metals and metalloids (herein referred to as metals), were also elevated in lower Baker Creek during the overflow event (Appendix B; Table B-2). With the exception of manganese and arsenic, total metal concentrations were below guidelines in the sample collected from the upstream reference site on May 16. Downstream of the tailings impacted area, total aluminum, antimony, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, silver and zinc were measured at concentrations above water quality guidelines for the protection of aquatic life and/or human health on May 16, indicating contact with tailings. After mitigation, concentrations of total metals decreased to background levels, although some were still above aquatic life and drinking water guidelines at more than one location on June 17 (*i.e.*, aluminum, antimony, arsenic and copper). Levels of total metals above guidelines have historically been observed within Baker Creek (Appendix B; Table B-2).



BAKER CREEK REACH 7 OVERFLOW MONITORING PROGRAM



Notes: TSS concentration at the reference locations was defined based on samples collected from SNP 43-11 on May 16 and June 6, and from Reach 7 waterfall entering Reach 6 for the remaining dates between May 25 and June 17.

TSS data collected between May 16 and May 20 were collected from Reach 6 BC Exposure Point (at Tails); data from May 27 and June 6 were collected from Reach 5 (d/s Pond). Calculated TSS was obtained using the TSS/turbidity regression equation presented in Appendix C; calculated TSS on June 17 was set to half the MDL for TSS (*i.e.*, 1.5 mg/L), because the turbidity reading was 0 NTU.

The CCME aquatic life guideline is a maximum average increase of 5 mg/L from background levels for exposures lasting between 24 hours and 30 days; background was set to 3 mg/L, which is the median TSS concentration from samples collected at the reference locations during the sampling program.

The background range was defined by the minimum and maximum values for samples collected from lower Baker Creek (*i.e.*, Reaches 4 and 0) in May and June between 2007 and 2009 (Golder 2011).

Figure 6: Total Suspended Solids Concentrations at Locations Monitored in Baker Creek



BAKER CREEK REACH 7 OVERFLOW MONITORING PROGRAM

Total metals measured at concentrations above guidelines were primarily associated with suspended sediments, as shown by the strong correlation between TSS and total metal concentrations in stream water (Table 3). TSS concentrations in lower Baker Creek declined between May 16 and June 17, and were within background levels by the end of the sampling program (Figures 5 and 6). Total metals followed a similar trend, as expected based on the strong relationships between TSS and total metals.

The dissolved portion of metals is not associated with suspended sediments and does not settle out of the water column. Dissolved metal concentrations are bioavailable and readily taken up by aquatic organisms. Dissolved metal concentration as a percentage of total metal concentration in Baker Creek was plotted for two representative metals (*i.e.*, arsenic and aluminum) in Figure 7, to investigate whether increases total metal concentrations also resulted in proportional increases in dissolved metal concentrations. At high concentrations, such as those observed immediately after the overflow event, only a small proportion (<5%) of the total metal concentration was contributed by dissolved metals, indicating that increases in total metal concentrations were not accompanied by proportional increases in dissolved metal concentrations. After mitigation, both the total metal concentrations and the percentage in the dissolved form approached values typically measured in Baker Creek.

With the exception of Reach 6, dissolved arsenic concentrations in Baker Creek were within the background range, and remained similar during the overflow event and after mitigation (Figure 8). In Reach 6, dissolved arsenic concentrations were elevated during the overflow event, but declined to levels consistent with those at stations in lower Baker Creek and within the background range by June 8. The dissolved arsenic concentrations in Reaches 1, 4, and 6 on June 17 were higher than the corresponding total metal concentrations, indicating a potential analytical error (see Appendix A for details).

Table 3: Correlations between Total Suspended Solids and Total Metal Concentrations

Metal	Correlation Coefficient (<i>r</i>) ^(a)
Aluminum	0.98
Antimony	0.65
Arsenic	0.75
Cadmium	0.75
Chromium	0.82 ^(b)
Cobalt	0.73 ^(b)
Copper	0.70
Iron	0.98
Lead	0.85
Manganese	0.69
Mercury	0.80
Nickel	0.75
Zinc	0.79

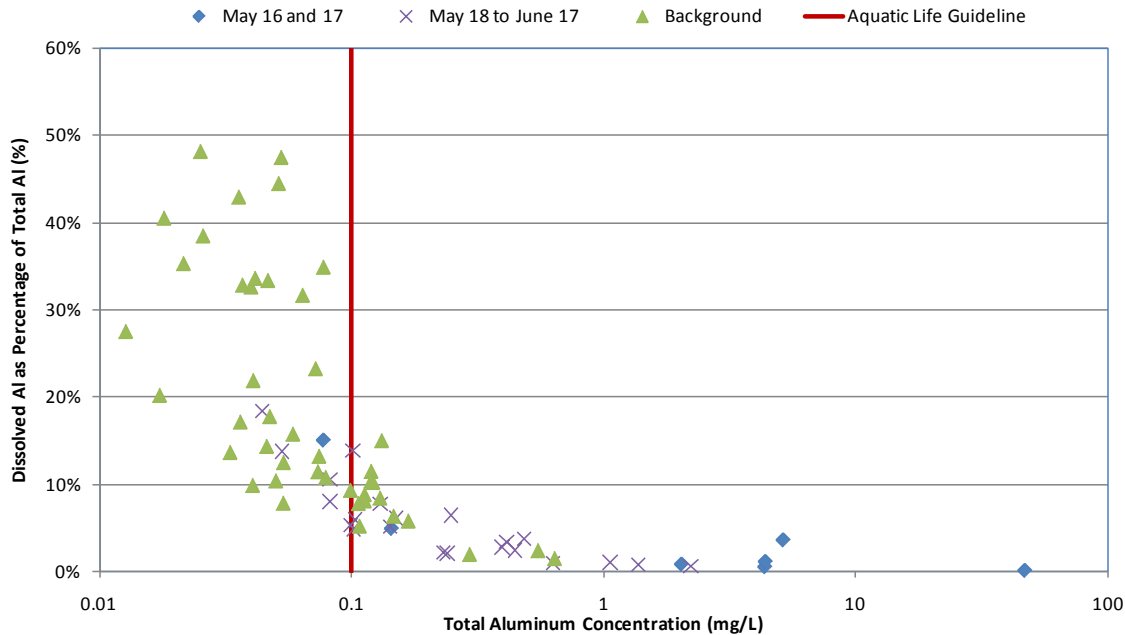
a) Pearson correlations were run for total metals measured above water quality guidelines, after verifying that relationships were linear; *n* = 29 to 31. Silver and selenium were excluded from this analysis, because a high proportion of values were below method detection limits.

b) Data from June 6 to 17 were excluded from the analysis, because a high proportion of values were below method detection limits. *n* = 21.

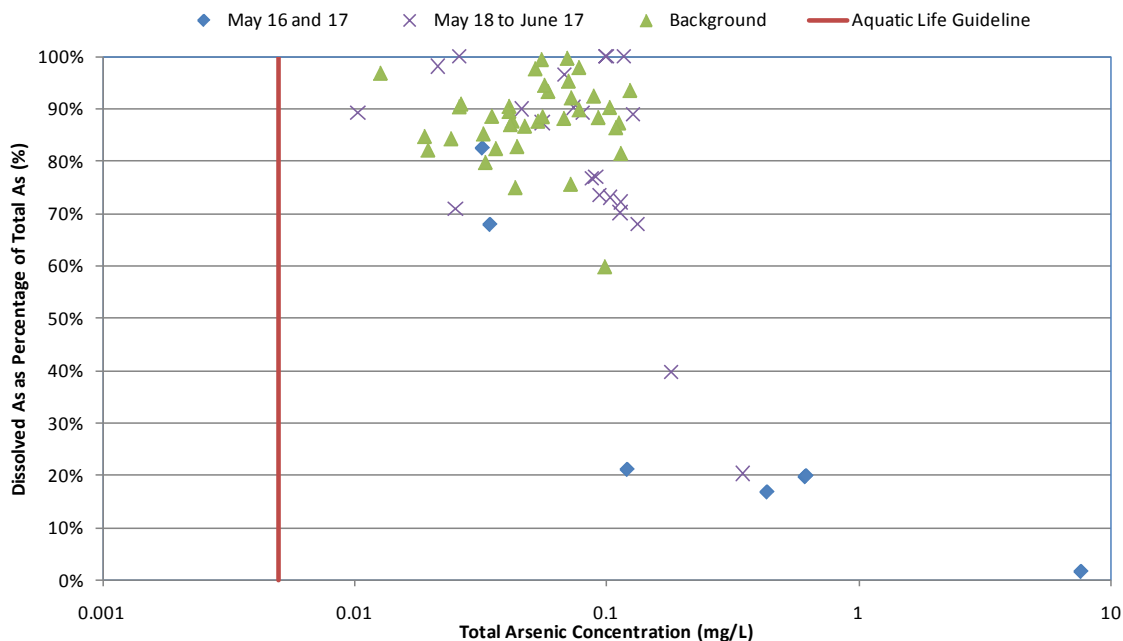


BAKER CREEK REACH 7 OVERFLOW MONITORING PROGRAM

a) Aluminum



b) Arsenic



Notes: Al = aluminum; As = arsenic; % = percent; mg/L = milligrams per litre.

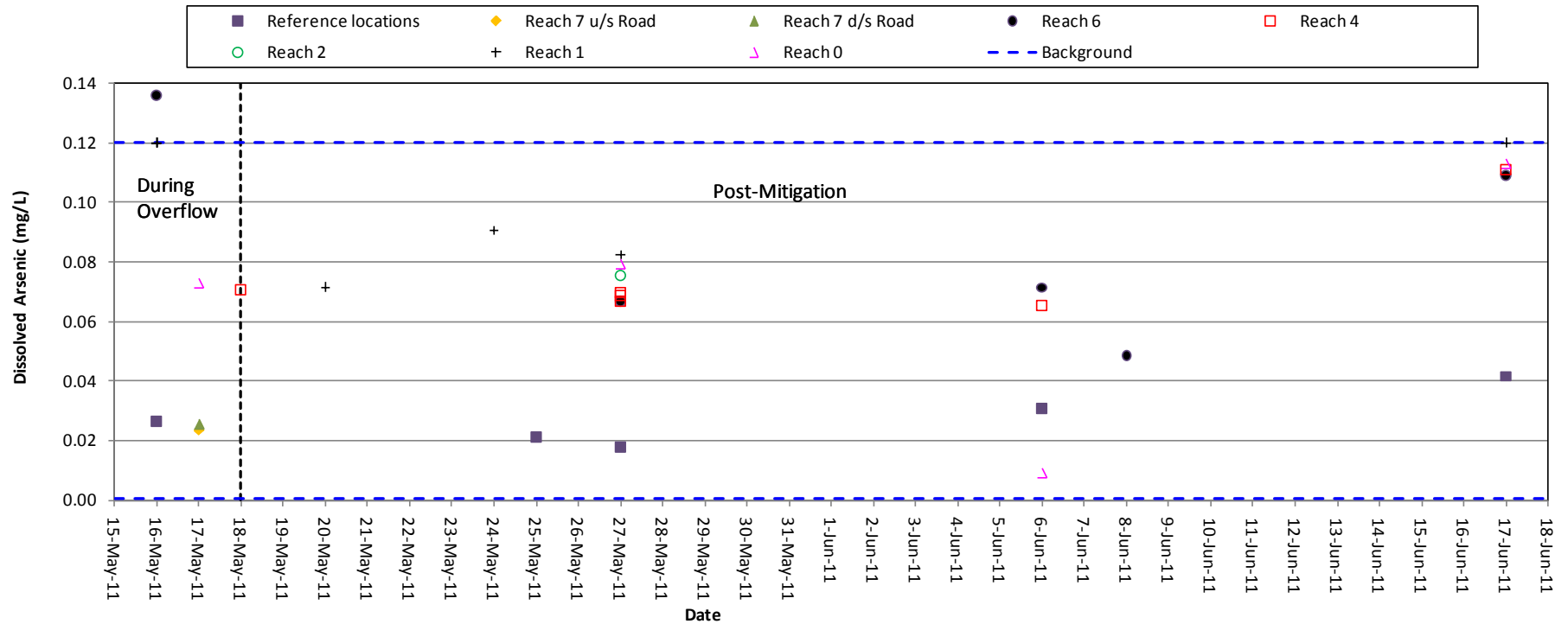
The proportion of dissolved metal was calculated as: $(\text{dissolved metal concentration} / \text{total metal concentration}) \times 100$.

The proportion of dissolved metal was set to 100% for three samples on June 17 and one sample on June 6, because the dissolved metal concentration was higher than the total metal concentration, indicating a potential analytical error (Appendix A).

Figure 7: Percentage of the Total Metal Concentration in the Dissolved Form



BAKER CREEK REACH 7 OVERFLOW MONITORING PROGRAM



Notes: Dissolved arsenic concentration at the reference locations was defined based on samples collected from SNP 43-11 on May 16 and June 6, and from Reach 7 waterfall entering Reach 6 for the remaining dates between May 25 and June 17.

Dissolved arsenic data collected between May 16 and May 20 were collected from Reach 6 BC Exposure Point (at Tails); data from May 27 and June 6 were collected from Reach 5 (d/s Pond).

Dissolved arsenic concentrations in Reaches 1, 4, and 6 on June 17 were higher than the corresponding total metal concentrations, indicating a potential analytical error (Appendix A).

The background range was defined by the minimum and maximum concentrations in samples collected from lower Baker Creek (*i.e.*, Reaches 4 and 0) in May and June, between 2007 and 2009 (Golder 2011).

Figure 8: Dissolved Arsenic Concentrations at Locations Monitored in Baker Creek



What was the Detailed Water Chemistry in Yellowknife Bay after Mitigation?

Near the Mouth of Baker Creek

Waters from Yellowknife Bay, near the mouth of Baker Creek, were well-oxygenated, slightly alkaline and low in nutrients for the duration of sampling (*i.e.*, between May 24 and June 8) (Appendix B; Table B-3 and B-4). Concentrations of TSS and metals were highest at Station YK Bay 1 on May 31, with total aluminum, antimony, arsenic, chromium, copper, iron, lead, and manganese measured at concentrations above water quality guidelines for the protection of aquatic life and/or human health. Concentrations of total antimony, arsenic, chromium and copper were also above the typical background ranges, indicating contact with tailings as concentrations of these metals were also above aquatic life guidelines in lower Baker Creek after the overflow event. The field crew noted that May 31 was a very windy day and a sediment plume was visible from shore. The sediment likely originated from the overflow event, with wind-induced mixing causing it to remain in suspension. At other locations (*i.e.*, YK Bay 2, 3, 4), total metal concentrations were within background ranges on May 31; only total aluminum was above an aquatic life guideline.

On June 8, the TSS concentration was below the CCME aquatic life guideline at all locations in Yellowknife Bay (Figure 9; Appendix B, Table B-4). Concentrations of total aluminum, arsenic, antimony and copper were still above aquatic life guidelines, but were within the typical background ranges. Total and dissolved arsenic concentrations in Yellowknife Bay are presented in Figure 10 and 11.

Back Bay Public Dock Area

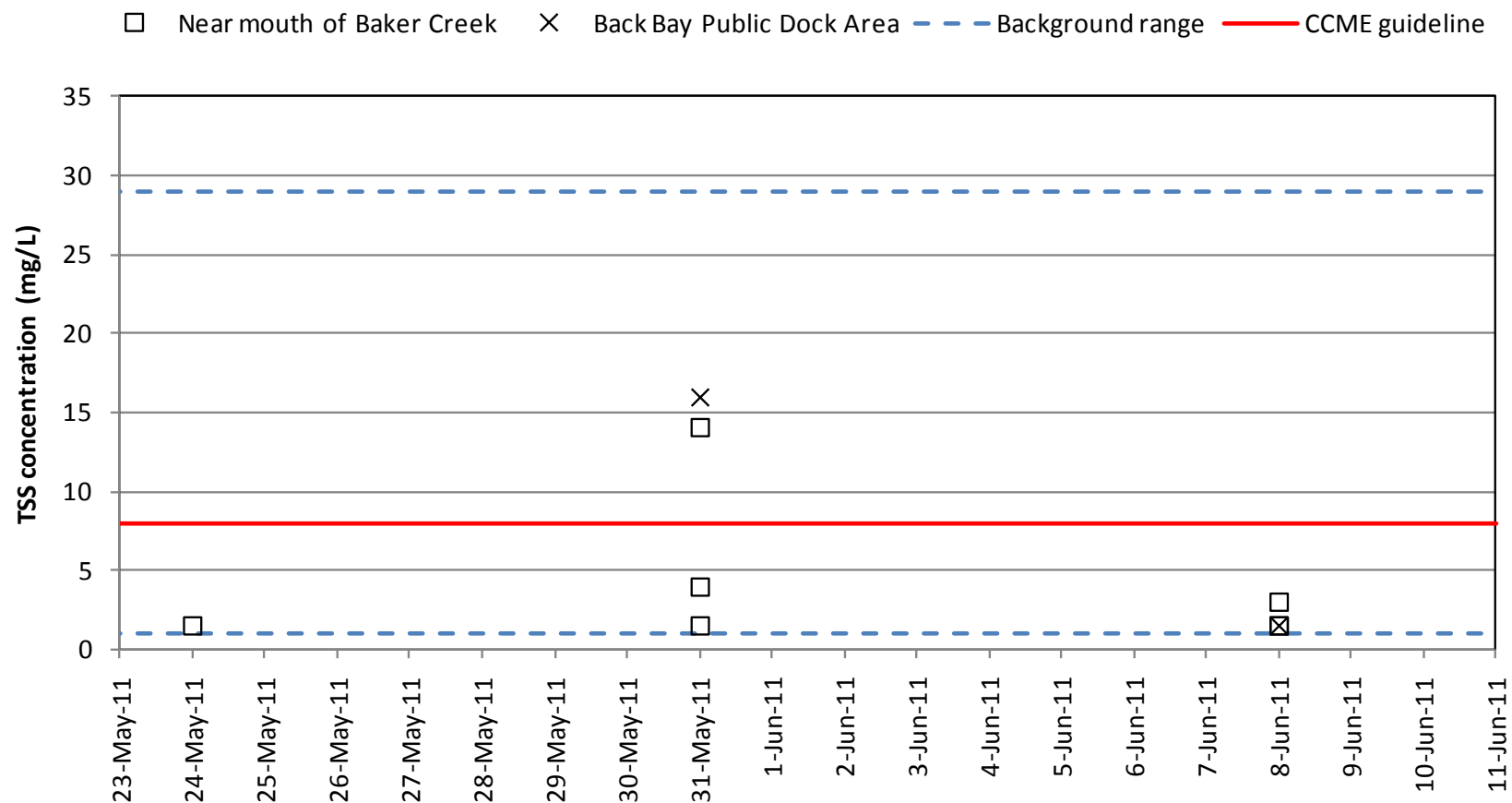
Samples collected from the Back Bay public dock area on May 31 and June 8 were well-oxygenated, slightly alkaline and low in nutrients and ions. The TSS concentration was elevated in the first sample (*i.e.*, May 31), and total aluminum, arsenic, copper and iron concentrations were above aquatic life guidelines. Total aluminum and copper were also above drinking water guidelines. A distinct sediment plume was not visible on May 31; the entire shoreline was turbid due to wind-induced turbulence. On June 8, which was a calm day, concentrations of TSS and total metals were low, and only total aluminum was measured at concentrations above the aquatic life and drinking water guideline. Total aluminum concentrations were within the typical background range for Yellowknife Bay.

Summary

In summary, a combination of the overflow event and wind-induced mixing likely resulted in elevated TSS and total metals concentrations in Yellowknife Bay, near the mouth of Baker Creek on May 31. Elevated concentrations in the Back Bay public dock area on the same day were likely due to wind-induced mixing and turbulence. By June 8, TSS levels were low, and although concentrations of several metals were above aquatic life guidelines (*i.e.*, aluminum, antimony, arsenic and copper), concentrations were within the typical background ranges.



BAKER CREEK REACH 7 OVERFLOW MONITORING PROGRAM



Notes: Data from "Near mouth of Baker Creek" includes samples YK Bay 1 to 4, B, C, G and H.

A strong TSS/turbidity relationship was not evident in Yellowknife Bay due to the high proportion of non-detectable values in the dataset (Appendix C). Therefore, only measured TSS values are presented.

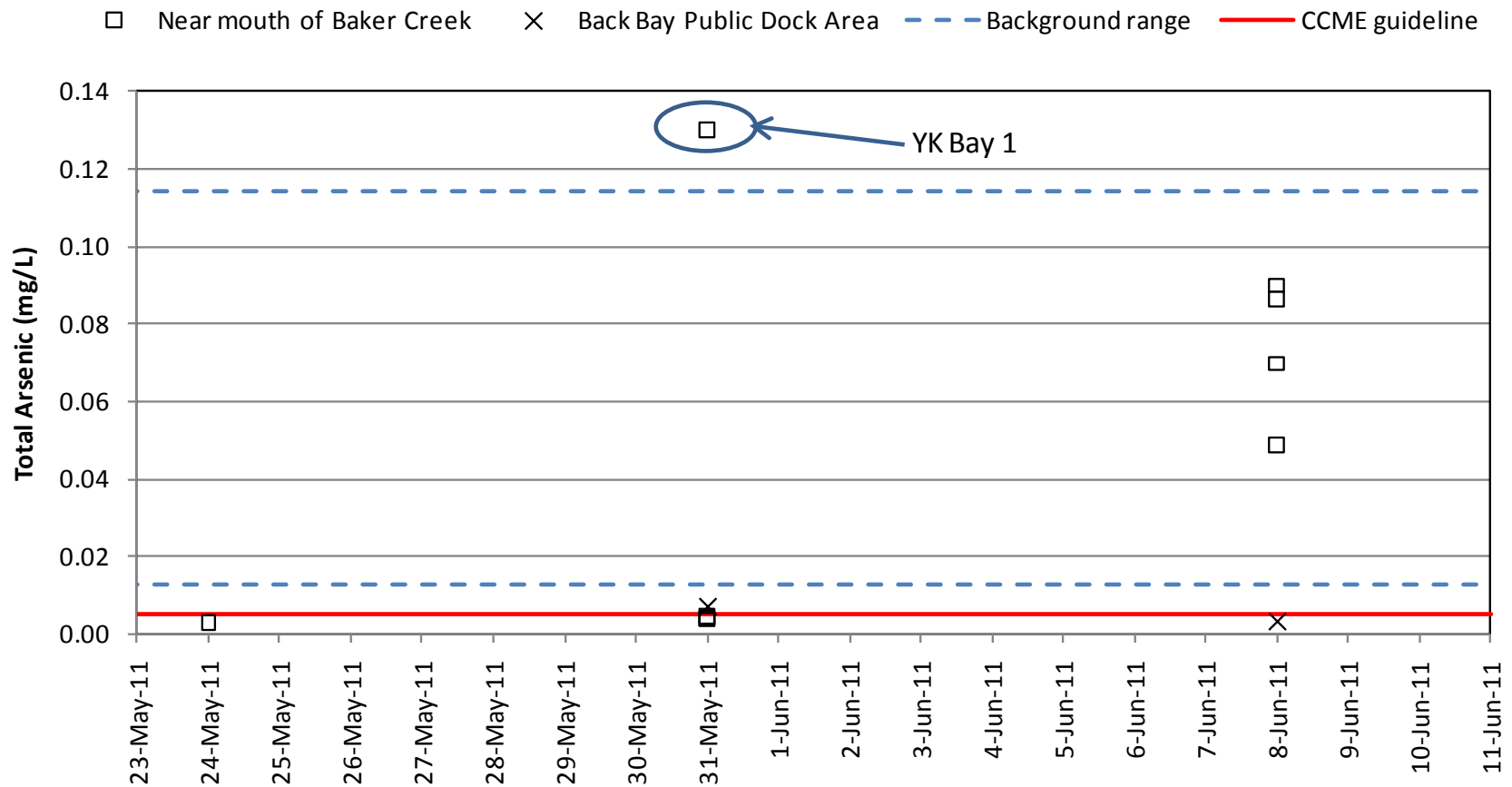
The background range was defined by the minimum and maximum concentrations in samples collected from Surveillance Network Program site SNP 43-12 in May and June, between 2007 and 2010 (Golder 2011).

The CCME aquatic life guideline is a maximum average increase of 5 mg/L from background levels for exposures lasting between 24 hours and 30 days; background was set to the historical median TSS concentration of 3 mg/L.

Figure 9: Total Suspended Solids Concentrations in Yellowknife Bay



BAKER CREEK REACH 7 OVERFLOW MONITORING PROGRAM



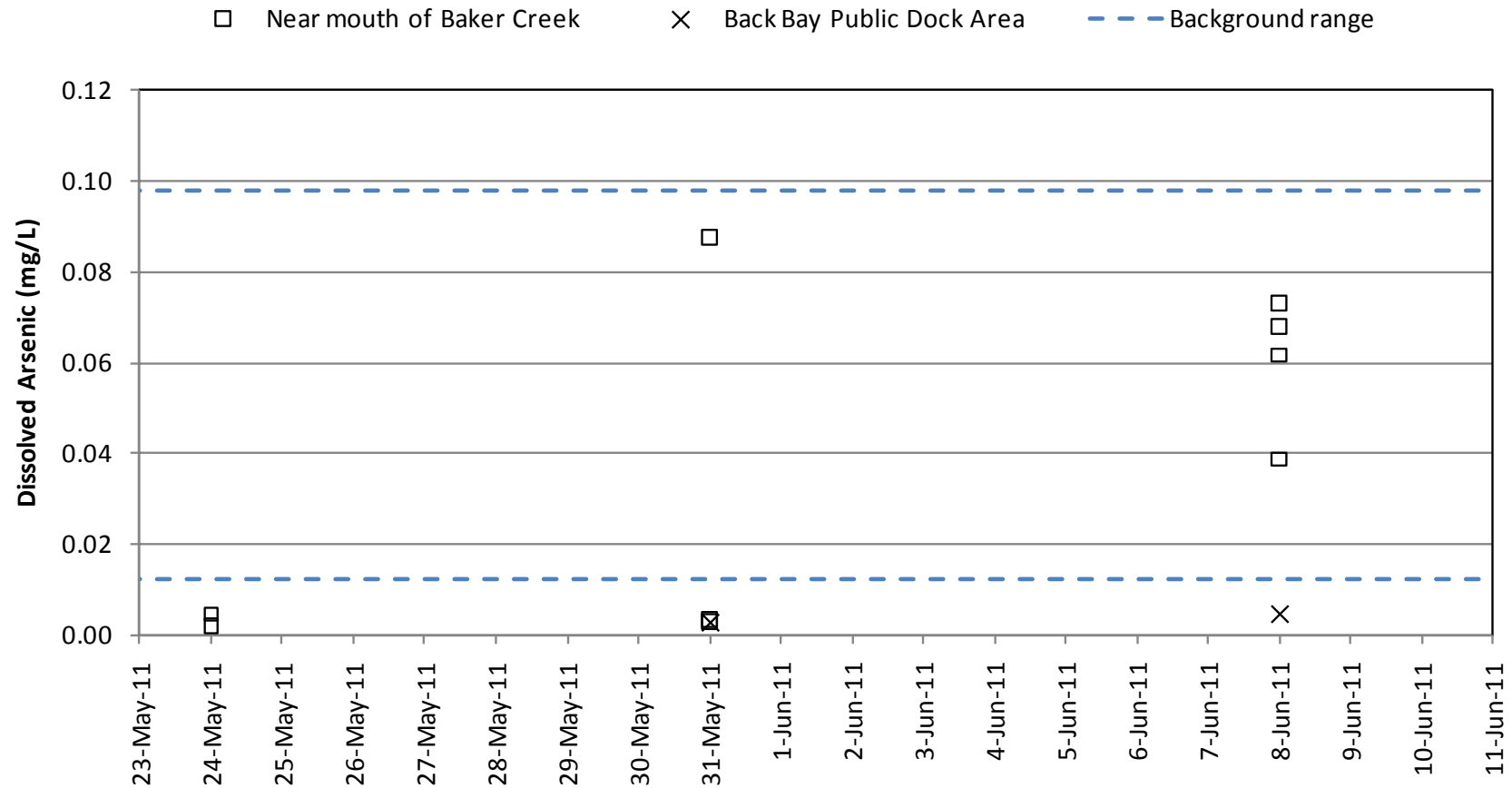
Notes: Data from "Near mouth of Baker Creek" includes samples YK Bay 1 to 4, B, C, G and H.

The background range was defined by the minimum and maximum concentrations in samples collected from Surveillance Network Program site SNP 42-12 in May and June, between 2007 and 2010 (Golder 2011).

Figure 10: Total Arsenic Concentration in Yellowknife Bay



BAKER CREEK REACH 7 OVERFLOW MONITORING PROGRAM



Notes: Data from "Near mouth of Baker Creek" includes samples YK Bay 1 to 4, B, C, G and H.

The background range was defined by the minimum and maximum concentrations in samples collected from Surveillance Network Program site SNP 42-12 in May and June, between 2007 and 2010 (Golder 2011).

Figure 11: Dissolved Arsenic Concentration in Yellowknife Bay



4.0 SUMMARY OF KEY FINDINGS

The interim key findings from the Baker Creek Reach 7 overflow monitoring program include the following:

- In-stream concentrations of TSS and other parameters associated with Mine tailings (*i.e.*, sulphate and metals) indicate that during the overflow event, sediment and tailings in historic Jo Jo Lake were re-suspended and discharged through lower Baker Creek into Yellowknife Bay.
- Toxicity testing conducted during the overflow event indicated that stream water downstream of the tailings impacted area was not acutely toxic.
- TSS concentrations were high during the overflow event, but declined to levels within the typical background range in approximately 10 days. A slight increase in TSS concentration followed, but values subsequently declined and were near or within the background range and below the CCME aquatic life guideline by June 3.
- Levels of cyanide and ammonia, which were historically high at Giant Mine, were within the typical background range for Baker Creek after mitigation.
- Sulphate concentrations in the lower reaches of Baker Creek were higher than typically observed in Baker Creek during spring.
- Concentrations of total metals and metalloids in Baker Creek were elevated during the overflow event, and there was a strong relationship between TSS and total metal concentrations. At high concentrations, such as those observed immediately after the overflow event, only a small proportion of the total metal concentration was in the dissolved form. After mitigation, both total metal concentrations and the percentage of metals in the dissolved form approached values typically measured in Baker Creek.
- A combination of the overflow event and wind-induced mixing likely resulted in elevated TSS and total metals concentrations in Yellowknife Bay, near the mouth of Baker Creek on May 31. Elevated concentrations in the Back Bay public dock area on the same day were likely due to wind-induced mixing and turbulence. By June 8, TSS levels were low, and although concentrations of several metals were above aquatic life guidelines (*i.e.*, aluminum, antimony, arsenic and copper), concentrations were within the typical background ranges.



5.0 NEXT STEPS

Water quality monitoring was discontinued on June 17 in Baker Creek, and on June 8 in Yellowknife Bay, because concentrations of TSS and metals had returned to background levels. A shoreline sediment investigation to identify areas of visual sediment deposition will occur in July (weather permitting), followed by a detailed sediment survey in September.



6.0 CLOSURE

GOLDER ASSOCIATES LTD.

Rie Hatsushika, B.Sc.
Water Quality Specialist

Hilary Machtans, M.Sc.
Senior Fisheries Biologist

Tasha Hall, B.Sc.
Water Quality Specialist

Zsolt Kovats, M.Sc.
Associate, Senior Water Quality Specialist

RH/HM/TH/ZK/rs

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APPENDIX A

Quality Assurance and Quality Control



QUALITY ASSURANCE

Golder Associates Ltd. (Golder) has developed Quality Assurance (QA) protocols designed to ensure production of data of known and defensible quality. Golder's QA procedures cover three areas of internal and external management, as outlined in more detail below.

Field Staff Training and Operations

It is important that field data collected are of known, acceptable and defensible quality. Golder field staff are trained to be proficient in standardized field sampling procedures, data recording and equipment operations, and all field work is completed according to specified instructions and established technical procedures.

Surface water samples were collected in accordance with the Mine's Standard Operating Procedure (SOP) (INAC 2010) and specific laboratory instructions. Field crews also use Specific Work Instructions (SWIs), which are standardized forms that detail specific sampling instructions, equipment needs, required technical procedures, sample labelling and shipping protocols, and laboratory contacts.

Laboratory Analysis

To ensure that data of acceptable quality are generated, laboratories used for the water sample analysis are accredited by the Canadian Association for Laboratory Accreditation (CALA). Under CALA's accreditation program, laboratory procedures, methods and internal quality control are evaluated annually.

Office Operations

A data management system is in place to ensure that an organized, consistent system of data control, data analysis and filing was used for the Baker Creek Reach 7 overflow monitoring program. Relevant elements of this system included the following:

- Pre-field meeting to discuss SWIs and review relevant technical procedures with field crew(s);
- Field crews checking-in with task managers every 24 to 48 hours with an update on work completed;
- Designation of one Golder field crew member who is responsible for managing the sample shipping process to ensure that:
 - *All required samples are collected;*
 - *Chain-of-custody/analytical request forms are completed and checked to ensure they are correct;*
 - *Proper labelling and documentation procedures are followed;*
 - *Samples are delivered to shipping agents in a timely manner;*
 - *Samples arrive at the designated laboratory(ies) within two days of being shipped;*



- Checking of chain-of-custody/analytical request forms by the task manager to ensure the correct analysis package(s) had been requested;
- Reviewing laboratory data upon receipt to ensure data quality;
- Creating backup files before each major operation as data are manipulated; and
- Completing appropriate logic checks to ensure the accuracy of calculations.

QUALITY CONTROL

Quality Control (QC) is a specific aspect of QA that refers to the internal techniques used to measure and assess data quality. The water quality QC program consisted of the preparation and analysis of the a field blank, a travel blank and one duplicate water sample during the field program in Baker Creek.

For the purposes of this study, field blank, travel blank and duplicate samples were defined as follows:

Field Blank

A separate sample prepared in the field using laboratory-provided deionized water to fill a set of sample containers, which are then submitted to the appropriate laboratories for the same analysis as the field water samples. Field blanks are used to detect potential sample contamination during collection, handling, shipping and analysis.

Travel Blank

A separate sample prepared and sealed by the laboratory using laboratory deionized water. The containers are to be taken into the field and then submitted to the appropriate laboratory for the same analysis as the field water samples. Travel blanks are used to detect potential sample contamination during shipping, storage and analysis.

Duplicate Sample

Two samples are collected from one location using identical sampling procedures. They are labelled, preserved individually and submitted separately to the analytical laboratories for identical analyses.

Duplicate samples are used to check within-site variation and the precision of the field sampling methods. The following sections contain a description of the assessment criteria used to determine if QC sample results were indicative of sample contamination or sampling imprecision, along with a discussion of the key findings of the water quality QC program.



Quality Control Assessment Criteria

Field Blanks and Travel Blanks

Although most parameters should not be at detectable concentrations in the field and travel blanks, concentrations were considered notable if they were greater than five times the corresponding Method Detection Limit (MDL). This threshold is based on the Practical Quantitation Limit defined by the United States Environmental Protection Agency (U.S. EPA 1985), which takes into account the potential for data accuracy errors when concentrations approach or are below MDLs.

Notable results observed in the field and travel blanks were evaluated relative to concentrations observed in field samples collected during the sampling trip to determine if sample contamination was limited to the QC sample, or apparent in other samples. If, based on this comparison, sample contamination did not appear to have been an isolated error; field data were flagged and interpreted with this limitation in mind.

Duplicate Samples

One duplicate sample was collected from Reach 4 in the Baker Creek on May 31, 2011. The duplicate sample was used to evaluate within-site variability and precision of the sampling method by calculating the relative percent difference (RPD) between samples. Differences between concentrations measured in duplicate water samples were considered notable if:

- Results in the duplicate samples were greater than five times the relevant reported MDL; and
- Relative percent difference was greater than 20%.

These criteria are consistent with those used by the analytical laboratories for their internal QC procedures and take into account the potential for data accuracy error as concentrations approach MDLs.

Within-site variability and field sampling precision was rated as:

- Low and high, respectively, if less than 10% of the parameters included in the duplicate sample analysis were notably different from one another;
- Moderate if 10 to 30% of the parameters included in the duplicate sample analysis were notably different from one another; or
- High and low, respectively, if more than 30% of the parameters included in the duplicate sample analysis were notably different from one another.



Quality Control Sample Results

Potential Sample Contamination

With the exception of dissolved arsenic on June 8, parameter concentrations in the blank samples were all either below the MDLs or within five times of the relevant MDL (Table A-1). Dissolved arsenic concentrations in the field samples collected during the corresponding sampling trip were an order of magnitude higher, so the sample contamination was likely an isolated error and limited to that particular QC sample. These QC results indicate that, for most part, samples were free of contamination during collection, shipping and analysis.

Within-Site Variability and Field Sampling Precision

Differences of the analytical results between the duplicate samples collected from Reach 4 were generally within the assessment criteria with some exceptions (Table A-2). Notable differences (*i.e.*, RPD greater than 20%) were observed in turbidity and concentrations of dissolved iron, lead and zinc in the duplicate sample. Within-site variability and sampling precision were, therefore, rated as low and high, respectively, with the differences representing less than 10% of the parameters included in the duplicate sample analysis.



BAKER CREEK REACH 7 OVERFLOW MONITORING PROGRAM

Table A-1: Blank Sample Results for the Baker Creek Reach 7 Overflow Monitoring Program, May and June 2011

Parameter	Units	Method Detection Limit	Field Blanks			Travel Blanks			Method Detection Limit	Field Blanks		Travel Blanks	
			20-May-11	6-Jun-11	17-Jun-11	20-May-11	6-Jun-11	17-Jun-11		31-May-11	8-Jun-11	31-May-11	8-Jun-11
Conventional Parameters													
Acidity (to pH 8.3; as calcium carbonate)	mg/L	1.0	1.8	-	-	2.9	-	-	-	-	-	-	-
Hardness (as calcium carbonate)	mg/L	0.5	0.57	<0.5	<0.5	<0.5	<0.5	<0.5	1.3	<1.3	<1	<1.3	<1
Total Alkalinity (as calcium carbonate)	mg/L	1.0	1.1	-	-	<1	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	3	<3	-	-	<3	-	-	-	-	-	-	-
Total Suspended Solids	mg/L	1	<1	<1	<3	<1	<1	<3	3	<3	<3	<3	<3
Turbidity	NTU	0.1	0.34	0.25	<0.1	0.27	0.55	<0.1	0.1	<0.1	0.11	0.11	<0.1
Ions													
Bromide	mg/L	0.05	<0.05	-	-	<0.05	-	-	-	-	-	-	-
Calcium	mg/L	0.05	0.229	<0.05	<0.05	<0.05	<0.05	<0.05	0.5	<0.5	<0.5	<0.5	<0.5
Chloride	mg/L	0.5	<0.5	-	-	<0.5	-	-	-	-	-	-	-
Fluoride	mg/L	0.02	<0.02	-	-	<0.02	-	-	-	-	-	-	-
Magnesium	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	2	<2	<2	<2	<2	<2	<2	0.1	<0.1	<0.1	<0.1	<0.1
Sodium	mg/L	2	<2	<2	<2	<2	<2	<2	0.5	<0.5	<0.5	<0.5	<0.5
Sulphate	mg/L	0.5	<0.5	-	-	<0.5	-	-	-	-	-	-	-
Total Cyanide	mg/L	0.005	<0.005	-	-	<0.005	-	-	-	-	-	-	-
Nutrients													
Ammonia (as nitrogen)	mg/L	0.005	<0.005	-	-	<0.005	-	-	-	-	-	-	-
Nitrate and Nitrite (as nitrogen)	mg/L	0.0051	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	0.006	<0.006	<0.006	<0.006	<0.006
Nitrate (as nitrogen)	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.006	<0.006	<0.006	<0.006
Nitrite (as nitrogen)	mg/L	0.001	<0.001	<0.001	<0.0051	<0.001	<0.001	<0.0051	0.002	<0.002	<0.002	<0.002	<0.002
Total Kjeldahl Nitrogen	mg/L	0.05	<0.05	0.092	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05
Total Dissolved Phosphorus	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.001
Total Phosphorus	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.001
Carbon													
Dissolved Organic Carbon	mg/L	0.5	<0.5	-	-	<0.5	-	-	0.5	<0.5	-	<0.5	-
Total Organic Carbon	mg/L	0.5	0.59	-	-	0.6	-	-	0.5	<0.5	-	<0.5	-
Total Metals													
Aluminum	mg/L	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.02	<0.02	<0.02	<0.02	<0.02
Antimony	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Arsenic	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Barium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Beryllium	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.001	<0.001	<0.001	<0.001	<0.001
Bismuth	mg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Boron	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.02	<0.02	<0.02	<0.02	<0.02
Cadmium	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Chromium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Cobalt	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Copper	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.001	<0.001	<0.001	<0.001	<0.001
Iron	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Lead	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.0001	<0.0001	<0.0001	<0.0001	<0.0001



BAKER CREEK REACH 7 OVERFLOW MONITORING PROGRAM

Table A-1: Blank Sample Results for the Baker Creek Reach 7 Overflow Monitoring Program, May and June 2011 (continued)

Parameter	Units	Method Detection Limit	Field Blanks			Travel Blanks			Method Detection Limit	Field Blanks		Travel Blanks	
			20-May-11	6-Jun-11	17-Jun-11	20-May-11	6-Jun-11	17-Jun-11		31-May-11	8-Jun-11	31-May-11	8-Jun-11
Manganese	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.002	<0.002	<0.002	<0.002	<0.002
Mercury	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Molybdenum	mg/L	0.0005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Selenium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Silver	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Strontium	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Thallium	mg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Tin	mg/L	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Titanium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.005	<0.005	<0.005	<0.005	<0.005
Uranium	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Vanadium	mg/L	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.004	<0.004	<0.004	<0.004	<0.004
Dissolved Metals													
Aluminum	mg/L	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.01	<0.01	<0.01	<0.01	<0.01
Antimony	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Arsenic	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	<0.0004	0.00665	<0.0004	<0.0004
Barium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Beryllium	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	mg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Boron	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.002	<0.002	<0.002	<0.002	<0.002
Cadmium	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Cobalt	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0006	<0.0006	<0.0006	<0.0006
Iron	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Lead	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Manganese	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.002	<0.002	<0.002	<0.002	<0.002
Molybdenum	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00002	<0.00002	<0.0001	<0.00002	<0.0001
Mercury	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.0001	<0.0001	<0.00002	<0.0001	<0.00002
Nickel	mg/L	0.00005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Selenium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Silver	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Strontium	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin	mg/L	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Titanium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Uranium	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Vanadium	mg/L	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Zinc	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.001	0.0012	0.0013	0.001	<0.001

Note: mg/L = milligrams per litre; µg/L = micrograms per litre; NTU = nephelometric turbidity units; < = concentration of analyte was less than the method detection limit.

Notable sample results are in **bold**.



BAKER CREEK REACH 7 OVERFLOW MONITORING PROGRAM

Table A-2: Duplicate Sample Results for the Baker Creek Reach 7 Overflow Monitoring Program, May 31 2011

Parameter	Units	Method Detection Limit	Duplicate Samples Collected at Reach 4 (d/s Giant Pool)		Relative Percent Difference
			Sample 1	Sample 2	
Conventional Parameters					
Total Suspended Solids	mg/L	3.0	5.0	7.0	-
Turbidity	NTU	0.10	8.5	7.0	20%
Total Metals					
Aluminum	mg/L	0.02	0.24	0.25	3%
Antimony	mg/L	0.0004	0.022	0.022	1%
Arsenic	mg/L	0.0004	0.091	0.094	3%
Barium	mg/L	0.0002	0.01	0.011	4%
Beryllium	mg/L	0.001	0.001	0.0011	-
Bismuth	mg/L	0.0002	<0.0002	<0.0002	-
Boron	mg/L	0.02	<0.02	<0.02	-
Cadmium	mg/L	0.0002	<0.0002	<0.0002	-
Calcium	mg/L	0.5	13	13	0%
Chromium	mg/L	0.0008	<0.0008	<0.0008	-
Cobalt	mg/L	0.0002	0.00094	0.00099	-
Copper	mg/L	0.001	0.0095	0.0096	1%
Iron	mg/L	0.01	0.43	0.42	2%
Lead	mg/L	0.0001	0.0028	0.003	7%
Magnesium	mg/L	0.1	3.7	3.6	1%
Manganese	mg/L	0.002	0.15	0.15	1%
Mercury	mg/L	0.00002	<0.00002	<0.00002	-
Molybdenum	mg/L	0.0001	0.0012	0.0014	11%
Nickel	mg/L	0.0002	0.006	0.0063	6%
Potassium	mg/L	0.1	1.3	1.2	1%
Selenium	mg/L	0.0004	<0.0004	<0.0004	-
Silver	mg/L	0.0004	<0.0004	<0.0004	-
Sodium	mg/L	1.0	3.3	3.2	-
Strontium	mg/L	0.0002	0.058	0.06	3%
Thallium	mg/L	0.0001	<0.0001	<0.0001	-
Tin	mg/L	0.0004	<0.0004	<0.0004	-
Titanium	mg/L	0.005	0.0078	0.0084	-
Uranium	mg/L	0.0001	0.00036	0.00041	-
Vanadium	mg/L	0.0005	0.00093	0.00092	-
Zinc	mg/L	0.004	0.0087	0.01	-
Dissolved Metals					
Aluminum	mg/L	0.01	<0.01	0.016	-
Antimony	mg/L	0.0004	0.02	0.019	3%



BAKER CREEK REACH 7 OVERFLOW MONITORING PROGRAM

Table A-2: Duplicate Sample Results for the Baker Creek Reach 7 Overflow Monitoring Program, May 31 2011 (continued)

Parameter	Units	Method Detection Limit	Duplicate Samples Collected at Reach 4 (d/s Giant Pool)		Relative Percent Difference
			Sample 1	Sample 2	
Arsenic	mg/L	0.0004	0.07	0.069	1%
Barium	mg/L	0.0001	0.0092	0.0088	5%
Beryllium	mg/L	0.0005	<0.0005	<0.0005	-
Bismuth	mg/L	0.00005	0.00007	0.00005	-
Boron	mg/L	0.002	0.017	0.017	1%
Cadmium	mg/L	0.0001	0.0001	0.00025	-
Calcium	mg/L	0.5	14	14	1%
Chromium	mg/L	0.0004	0.00051	0.00062	-
Cobalt	mg/L	0.0001	0.00084	0.00076	10%
Copper	mg/L	0.0006	0.0057	0.0059	3%
Iron	mg/L	0.01	0.071	0.091	25%
Lead	mg/L	0.0001	0.0013	0.001	20%
Magnesium	mg/L	0.1	4.0	3.9	1%
Manganese	mg/L	0.002	0.15	0.15	3%
Molybdenum	mg/L	0.0001	0.0014	0.0014	3%
Mercury	mg/l	0.00002	<0.00002	<0.00002	-
Nickel	mg/L	0.0001	0.0058	0.0056	3%
Potassium	mg/L	0.1	1.3	1.3	6%
Selenium	mg/L	0.0004	<0.0004	0.00049	-
Silver	mg/L	0.0002	<0.0002	<0.0002	-
Sodium	mg/L	0.5	3.5	3.5	0%
Strontium	mg/L	0.0001	0.059	0.057	4%
Thallium	mg/L	0.00005	0.00012	0.000095	-
Tin	mg/L	0.0002	<0.0002	<0.0002	-
Titanium	mg/L	0.0003	0.0023	0.0025	6%
Uranium	mg/L	0.0001	0.00041	0.00039	-
Vanadium	mg/L	0.0001	0.00051	0.00056	9%
Zinc	mg/L	0.001	0.009	0.007	25%

Notes: mg/L = milligrams per litre; µg/L = micrograms per litre; NTU = nephelometric turbidity units; < = concentration of analyte was less than the method detection limit.

Percent difference was calculated using the following formula: (maximum concentration - minimum concentration)/average concentration.

Notable sample results are in **bold**.

- = not applicable, no data, or the percent difference was not calculated, because concentration in one or both of the duplicate samples was <5 times the method detection limit.



Dissolved and Total Metal Concentrations in Water Samples

Between May 18 and June 17, 51 water samples were submitted for total and dissolved metal analyses, including blank samples. Several of those samples contained dissolved metals at a concentration at least 20% greater than the corresponding total metal concentration. The frequency of exceedance varies by metal and is presented in Table A-3. In addition, dissolved arsenic concentrations in one field blank (*i.e.*, June 8) exceeded the total arsenic concentrations by more than 20%. Dissolved concentrations should be lower than total concentrations. Although these exceedances indicate potential analytical errors, some variability is expected. Results for metals with notable results in more than 10% of samples (*i.e.*, boron, cadmium, chromium and thallium), should be interpreted with caution.

Table A-3: Frequency of Dissolved Metal Concentration at Least 20% Higher than the Total Metal Concentration

Metal	Number of Samples	Frequency of Occurrence
Arsenic	3	6%
Beryllium	2	4%
Boron	10	20%
Cadmium	6	12%
Chromium	7	14%
Cobalt	1	2%
Copper	2	4%
Manganese	1	2%
Mercury	3	6%
Selenium	3	6%
Strontium	2	4%
Thallium	7	14%
Uranium	2	4%
Zinc	2	4%

Notes: % = percent

Total number of samples submitted for total and dissolved metals analyses was 51.



APPENDIX B

Detailed Water Quality Results

Table B-1: Field and Laboratory Data for the Baker Creek Reach 7 Overflow Monitoring Program, May and June 2011

Parameter		Field Measured				Laboratory Measured	
		pH	Specific Conductivity	Temperature	Dissolved Oxygen	Total Suspended Solids	Turbidity
Units		-	(µS/cm)	(°C)	(mg/L)	(mg/L)	(NTU)
Canadian Water Quality Guidelines for the Protection of Aquatic Life ^(a)		6.5-9.0	-	-	<6.5	max avg increase of 5 mg/L ^(c)	max avg increase of 5 NTU ^(b)
Canadian Drinking Water Quality Guidelines ^(d)		6.5-8.5	-	-	-	1 ^(e)	1 ^(e)
Maximum Authorized Concentration ^(f)		6.0-9.0	-	-	-	30	-
Baker Creek Background Conditions ^(g)							
Median		-	-	-	-	3	2.3 ^W
Minimum		-	-	-	-	<1	0.7
Maximum		-	-	-	-	29 ^C	9 ^{C,W}
n		-	-	-	-	44	26
n less than the MDL		-	-	-	-	4	0
During Overflow Event	Sample ID	Date Sampled	Lab Sample ID	Collected by			
	SNP 43-11	16-May-11	L1005341-3	DCNJV	-	-	3 ^W
	Reach 7 Overflow u/s Road	16-May-11	11-159-1(Taiga)	INAC	-	-	288 ^{M,C}
	Reach 6 BC Exposure Point (at Tails)	16-May-11	L100576-1	Golder	7.8	165	1.9
	Reach 6 BC Exposure Point (in pond)	16-May-11	11-159-2(Taiga)	INAC	-	-	834 ^{C,W}
	SNP 43-5	16-May-11	L1005341-1	DCNJV	-	-	374 ^{M,C}
	SNP 43-5	16-May-11	L1005341-2	DCNJV	-	-	149 ^{M,C}
	Reach 7 overflow u/s Road	17-May-11	L1008285-1	Golder	7.4	61	0.7
	Reach 7 Overflow d/s Road	17-May-11	L1008285-2	Golder	7.4	61	0.9
	Reach 0 (BC Mouth)	17-May-11	L1008285-3	Golder	7.6	176	0.9
	Reach 7 Overflow u/s Road	18-May-11	L1006655-1	Golder	7.3	63	4.5
	Reach 7 Overflow d/s Road	18-May-11	L1006655-2	Golder	7.4	64	4.5
	Reach 6 BC Exposure Point (at Tails)	18-May-11	L1006655-3	Golder	7.7	140	2.6
	Reach 4 (d/s Giant Pool)	18-May-11	L1006658-1	Golder	7.8	126	0.8
	Reach 3 (d/s of Bridge)	18-May-11	L1006655-4	Golder	7.8	128	0.7
Post-Mitigation	Reach 2 (d/s Pool)	18-May-11	L1006655-5	Golder	7.7	152	0.4
	Reach 1 (u/s Culvert)	18-May-11	L1006655-6	Golder	7.7	148	0.2
	SNP 43-5	18-May-11	L1006655-7	Golder	7.7	153	0.4
	Reach 0 (BC Mouth)	18-May-11	L1006655-8	Golder	7.6	155	1.0
	Reach 6 BC Exposure Point (at Tails)	19-May-11	L1007648-3	Golder	7.5	421	3.4
	Reach 2 (d/s Pool)	19-May-11	L1007648-1	Golder	7.6	134	0.4
	Reach 4 (d/s Giant Pool)	19-May-11	L1007648-2	Golder	7.6	129	1.5
	Reach 0 (BC Mouth)	19-May-11	L1007648-4	Golder	7.6	158	0.9
	Reach 6 BC Exposure Point (at Tails)	20-May-11	L1007649-7	Golder	7.5	220	3.0
	Reach 4 (d/s Giant Pool)	20-May-11	L1007649-5	Golder	7.4	146	2.4
	Reach 2 (d/s Pool)	20-May-11	L1007649-6	Golder	7.5	141	0.6
	Reach 0 (BC Mouth)	20-May-11	L1007649-4	Golder	7.5	153	2.1
	SNP 43-5	20-May-11	L1007649-1	Golder	7.6	143	0.2
	Reach 6 BC Exposure Point (at Tails)	21-May-11	-	-	7.2	-	4.7
	Reach 4 (d/s Giant Pool)	21-May-11	-	-	7.3	-	5.8
	Reach 2 (d/s Pool)	21-May-11	-	-	7.4	-	1.3
	Reach 0 (BC Mouth)	21-May-11	-	-	7.5	-	5.5
	Reach 6 BC Exposure Point (at Tails)	22-May-11	-	-	7.5	-	5.8
	Reach 4 (d/s Giant Pool)	22-May-11	-	-	7.3	-	2.9
	Reach 2 (d/s Pool)	22-May-11	-	-	7.3	-	1.2
	Reach 0 (BC Mouth)	22-May-11	-	-	8.7 ^W	-	6.6
	Reach 4 (d/s Giant Pool)	24-May-11	L1008512-4	Golder	7.4	-	3.6
	Reach 2 (d/s Pool)	24-May-11	L1008512-5	Golder	7.4	-	2.2
	SNP 43-5	24-May-11	L1008512-3	Golder	7.5	-	1.6
	Reach 7 waterfall entering Reach 6	25-May-11	L1009010-1	Golder	7.5	86	8.8
	Reach 4 (d/s Giant Pool)	25-May-11	L1009010-2	Golder	7.4	124	3.6
	Reach 2 (d/s Pool)	25-May-11	L1009010-3	Golder	-	168	1.9
	Reach 0 (BC Mouth)	25-May-11	L1009010-5	Golder	7.5	164	1.5
	SNP 43-5 (above)	25-May-11	L1009010-4	Golder	7.5	-	1.6
	Reach 7 waterfall entering Reach 6	27-May-11	L1010143-1	Golder	7.5	87	10.6
	Reach 5 (d/s Pond)	27-May-11	L1010143-2	Golder	7.3	110	6.5
	Reach 4 (d/s Giant Pool)	27-May-11	L1010143-3	Golder	7.3	119	4.8
	Reach 4 (d/s Giant Pool) dup	27-May-11	L1010143-4	Golder	-	-	-
	Reach 4 (d/s Ice at Bridge)	27-May-11	L1010143-5	Golder	7.3	120	2.6
	Reach 2 (d/s Pool)	27-May-11	L1010143-6	Golder	-	131	3.7
	SNP 43-5	27-May-11	L1010143-7	Golder	-	-	-
	Reach 0 (BC Mouth)	27-May-11	L1010143-8	Golder	7.4	116	3.3
	Reach 7 waterfall entering Reach 6	28-May-11	-	-	7.5	89	10.9
	Reach 5 (d/s Pond)	28-May-11	-	-	7.3	120	6.7
	Reach 4 (d/s Giant Pool)	28-May-11	-	-	7.3	128	5.6
	Reach 4 (Arctic Grayling Spawning Site)	28-May-11	-	-	7.3	127	6.2
	Reach 4 (d/s Ice at Bridge)	28-May-11	-	-	7.4	136	4.8
	Upper Reach 2	28-May-11	-	-	7.4	149	4.1
	Reach 1 (SNP 43-5)	28-May-11	-	-	7.4	161	2.8
	Reach 0 Mouth of Baker Creek	28-May-11	-	-	7.4	177	3.8
	Reach 4 (Arctic Grayling Spawning Site)	29-May-11	-	-	7.2	122	8.9
	Upper Reach 2	29-May-11	-	-	7.4	139	4.9
	Reach 1 (SNP 43-5)	29-May-11	-	-	7.4	148	4.4
	Reach 0 Mouth of Baker Creek	29-May-11	-	-	7.4	176	4.8
	Reach 5 (d/s Pond)	30-May-11	-	-	7.3	147	11.2
	Reach 4 (d/s Giant Pool)	30-May-11	-	-	7.3	137	10.5
	Reach 4 (d/s Bridge no Ice)	30-May-11	-	-	7.3	132	8.2
	Upper Reach 2	30-May-11	-	-	7.4	139	7.7
	Reach 1 (SNP 43-5)	30-May-11	-	-	7.4	144	7.1
	Reach 0 Mouth of Baker Creek	30-May-11	-	-	7.5	140	7.7
	d/s of Reach 1 (SNP 43-5)	31-May-11	-	-	7.5	155	10.1
	Reach 5 (d/s Pond)	31-May-11	-	-	7.4	131	12.4
	Reach 4 (d/s Giant Pool)	31-May-11	-	-	7.4	124	12.7
	Reach 4 (d/s Bridge no Ice)	31-May-11	-	-	7.4	127	12.4
	Upper Reach 2	31-May-11	-	-	7.5	139	11.4
	Reach 5 (d/s Pond)	1-Jun-11	-	-	7.3	143	12.5
	Reach 4 (d/s Giant Pool)	1-Jun-11	-	-	7.4	129	13.6
	Reach 2 (d/s Pool)	1-Jun-11	-	-	7.5	147	13.2
	Reach 0 (BC Mouth)	1-Jun-11	-	-	7.5	152	13.0
	SNP43-5	1-Jun-11	-	-	7.5	151	12.8
	Reach 7 waterfall entering Reach 6	2-Jun-11	-	-	7.6	88	11.6
	Reach 5 (d/s Pond)	2-Jun-11	-	-	7.4	139	10.4
	Reach 4 (d/s Giant Pool)	2-Jun-11	-	-	7.5	110	10.1
	Reach 2 (Collapsed Culvert)	2-Jun-11	-	-	7.5	137	9.3
	Reach 2 (d/s Pool)	2-Jun-11	-	-	7.5	141	9.4
	Reach 0 (BC Mouth)	2-Jun-11	-	-	7.6	151	9.4
	SNP43-5	2-Jun-11	-	-	7.5	146	9.3
	Reach 7 waterfall entering Reach 6	3-Jun-11	-	-	7.6	94	8.8
	Reach 5 (d/s Pond)	3-Jun-11	-	-	7.3	112	8.6
	Reach 4 (d/s Giant Pool)	3-Jun-11	-	-	7.5	142	8.5
	Reach 2 (Collapsed Culvert)	3-Jun-11	-	-	7.6	150	8.1
	Reach 2 (d/s Pool)	3-Jun-11	-	-	7.5	157	8.2
	Reach 0 (BC Mouth)	3-Jun-11	-	-	7.6	159	9.0
	SNP43-5	3-Jun-11	-	-	7.6	157	8.1
	Reach 0 (BC Mouth)	4-Jun-11	-	-	7.6	148	7.4
	SNP43-5	4-Jun-11	-	-	7.6	160	7.5
	Reach 0 (BC Mouth)	5-Jun-11	-	-	7.7	142	8.9
	SNP43-5	5-Jun-11	-	-	7.6	138	8.7
	Reach 5 (d/s Pond)	6-Jun-11	L1013401-3	Golder	7.1	123	10.4
	Reach 4 (d/s Bridge no Ice)	6-Jun-11	L1013401-2	Golder	7.5	88	10.5
	Reach 4 (d/s Giant Pool)	6-Jun-11	-	-	7.4	118	10.7
	Reach 2 (d/s Pool)	6-Jun-11	-	-	7.6	124	10.3
	Reach 0 (BC Mouth)	6-Jun-11	L1013401-1	Golder	7.7	92	9.3
	SNP43-5	6-Jun-11	-	-	7.6	128	10.2
	SNP 43-11	6-Jun-11	L1019377-1	DCNJV	-	-	-
	Reach 6 - Baker Pond Outflow	8-Jun-11	-	-	7.6	107	11.7
	Reach 5 (d/s Pond)	8-Jun-11	-	-	7.5	115	11.3
	Reach 4 (d/s Bridge no Ice)	8-Jun-11	-	-	7.5	92	11.3
	Reach 4 (d/s Giant Pool)	8-Jun-11	-	-	7.5	112	11.3
	Reach 2 (d/s Pool)	8-Jun-11	-	-	7.5	109	11.2
	SNP43-5	8-Jun-11	-	-	7.5	125	11.4
	SNP43-5	9-Jun-11	-	-	7.7	116	11.7
	Reach 5 (d/s Pond)	10-Jun-11	-	-	7.5	120	13.1
	Reach 5 (old beaver dam)	10-Jun-11	-	-	7.7	103	13.6
	Reach 4 (d/s Giant pool)	10-Jun-11	-	-	7.5	104	13.9
	Reach 2 (Collapsed Culvert)	10-Jun-11	-	-	7.7	119	14.4
	Reach 2 (d/s Pool)	10-Jun-11	-	-	7.7	120	14.5
	Reach 0 (BC Mouth)	10-Jun-11	-	-	7.7	124	14.6
	SNP43-5	10-Jun-11	-	-	7.7	123	14.5
	Reach 5 (d/s Pond)	13-Jun-11	-	-	7.5	68	15.5
	Reach 5 (old beaver dam)	13-Jun-11	-	-	7.5	103	15.5
	Reach 4 (d/s Bridge no Ice)	13-Jun-11	-	-	7.5	114	15.8
	Reach 4 (d/s Giant Pool)	13-Jun-11	-	-	7.3	109	15.3
	Reach 2 (Collapsed Culvert)	13-Jun-11	-	-	7.6	120	16.3
	Reach 2 (d/s Pool)	13-Jun-11	-	-	7.5	118	15.4
	Reach 0 (BC Mouth)	13-Jun-11	-	-	7.6	128	15.0
	SNP43-5	13-Jun-11	-	-	7.6	127	16.2
	Reach 7 waterfall entering Reach 6	15-Jun-11	-	-	7.7	96	17.8
	Reach 5 (d/s Pond)	15-Jun-11	-	-	7.4	115	18.9
	Reach 4 (d/s Bridge no Ice)	15-Jun-11	-	-	7.6	111	19.7
	Reach 4 (d/s Giant Pool)	15-Jun-11	-	-	7.4	115	19.3
	Reach 2 (Collapsed Culvert)	15-Jun-11	-	-	7.6	120	19.8
	Reach 2 (d/s Pool)	15-Jun-11	-	-	7.6	120	20.0
	Reach 0 (BC Mouth)	15-Jun-11	-	-	7.7	126	20.1
	SNP43-5	15-Jun-11	-	-	7.6	124	19.2
	Reach 6 (Baker Pond Outflow)	17-Jun-11	L1019377-4	Golder	-	-	-
	Reach 7 waterfall entering Reach 6	17-Jun-11	L1019377-5	Golder	7.8	98	16.6
	Reach 5 (old beaver dam)	17-Jun-11	-	-	7.6	109	18.1
	Reach 5 (d/s Pond)	17-Jun-11	-	-	7.3	145	17.2
	Reach 4 (d/s Giant Pool)	17-Jun-11	-	-	7.5	113	18.0
	Reach 4 (d/s Bridge no Ice)	17-Jun-11	L1019377-3	Golder	-	-	-
	Reach 2 (d/s Pool)	17-Jun-11	-	-	7.6	120	17.6
	Reach 0 (BC Mouth)	17-Jun-11	L1019377-1	Golder	7.3	128	17.4
	Reach 1 (SNP43-5)	17-Jun-11	L1019377-2	Golder	7.5	102	17.4

Notes: u/s = upstream; d/s= downstream; mg/L = milligrams per litre; NTU = nephelometric turbidity units; MDL = method detection limit; dup = duplicate; max = maximum; n = sample size; avg = average.

- = no data or guideline available.

Values in **bold** are above water quality guidelines.

^(a) Source: Canadian Council of Ministers of the Environment (CCME) 2011.

^(b) The CCME narrative states that during clear flow periods, the guideline is a maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30 day period).

Background was set to the median turbidity of 2.3 and 5 NTU for field and laboratory measurements, respectively, at reference locations (i.e., SNP 43-11 on May 16, and from Reach 7 waterfall entering Reach 6 between May 25 and June 17).

Turbidity measurements from the reference locations were not compared to CCME guideline.

^(c) The CCME narrative states that during clear flow periods, the guideline is a maximum average increase of 5 mg/L from background levels for longer term exposures (i.e. 24 h to 30 days).

The median TSS concentration of at the reference locations (i.e., 3 mg/L) was used for the background concentration; the reference locations defined SNP 43-11 on May 16, and from Reach 7 waterfall entering Reach 6 between May 25 and June 17.

TSS concentrations collected from the reference locations were not compared to CCME guideline.

^(d) Source: Health Canada (2010).

^(e) Aesthetic objective.

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Table B-2: Water Quality in Baker Creek during the Reach 7 Overflow Monitoring Program, May and June 2011

Parameter	Units	Canadian Water Quality Guidelines for the Protection of Aquatic Life ^(a)	Canadian Drinking Water Quality Guidelines ^(b)	Maximum Authorized Concentration ^(c)	Baker Creek Background Conditions ^(d)										During Overflow Event										Post-Mitigation																																																																																																																																																																																																																																											
					SNP 43-11 (Reference)					Reach 7 Overflow u/s Road	Reach 6 BC Exposure Point (in Tails)	Reach 6 BC Exposure Point (in pond)	SNP 43-5	SNP 43-5	SNP 43-5	Reach 7 overflow u/s Road	Reach 7 Overflow Road	Reach 0 (BC Mouth)	Reach 4 (d/s Gant Pond)	SNP 43-5	SNP 43-5	Reach 7 waterfall entering Reach 6	Reach 7 waterfall entering Reach 6	Reach 6 Exposure Point (at Tails)	Reach 5 (d/s Pond)	Reach 4 (d/s Gant Pond)	Reach 4 (d/s Gant Pond) Duplicate	Reach 4 (d/s Ice at Bridge)	Reach 2 (d/s Pond)	Reach 0 (BC Mouth)	SNP 43-5	SNP 43-5	Reach 5 (d/s Pond)	Reach 4 (d/s Bridge)	Reach 0 (BC Mouth)	Reach 6 (Baker Pond Outflow)	Reach 6 (Baker Pond Outflow)	Reach 7 Waterfall	Reach 4 (d/s Bridge)	Reach 0 (BC Mouth)	SNP 43-5																																																																																																																																																																																																																											
					Median	Minimum	Maximum	n	n less than MDL	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)	16-May-11 11-159-1 (Tagg)

Table B-3: Field and Laboratory Measured Data for Yellowknife Bay - Baker Creek Reach 7 Overflow Monitoring Program, May and June 2011

Parameter					Field Measured					Laboratory Measured	
					pH	Specific Conductivity	Temperature	Dissolved Oxygen	Turbidity	Total Suspended Solids	Turbidity
Units					-	(µS/cm)	(°C)	(mg/L)	(NTU)	(mg/L)	(NTU)
Canadian Water Quality Guidelines for the Protection of Aquatic Life ^(a)					6.5-9.0	-	-	< 6.5	max avg increase of 2 NTU ^(b)	max avg increase of 5 mg/L ^(c)	max avg increase of 2 NTU ^(b)
Canadian Drinking Water Quality Guidelines ^(d)					6.5-8.5	-	-	-	1 ^(e)	-	1 ^(e)
Maximum Authorized Concentration ^(f)					6.0-9.0	-	-	-	-	30	-
Yellowknife Bay Background Conditions ^(g)											
Median					-	-	-	-	-	3	2.4
Minimum					-	-	-	-	-	1	1.7
Maximum					-	-	-	-	-	29 ^C	8 ^C
n					-	-	-	-	-	25	14
n less than the MDL					-	-	-	-	-	0	0
Sample ID		Date Sampled	Lab Sample ID	Collected by							
YK Bay 1	surface	24-May-11	L1008512-1	Golder	7.5	68	7.3	12.5	8 ^{CW}	<3	6 ^{CW}
YK Bay 1	bottom	24-May-11	-	-	7.5	69	7.3	12.5	-	-	-
YK Bay 2	surface	24-May-11	L1008512-2	Golder	7.6	67	7.8	12.5	7 ^{CW}	<3	5 ^W
YK Bay 2	bottom	24-May-11	-	-	7.5	74	6.1	12.6	-	-	-
u/s of House Boat	surface	31-May-11	-	-	7.5	156	10.1	10.0	25 ^{CW}	-	-
YK Bay # 1 (Reach 0 BC Mouth)	surface	31-May-11	L1011399-2	Golder	7.5	100	10.7	11.2	7.9 ^{CW}	4	5.5 ^{CW}
YK Bay #2 (d/s of House Boat)	surface	31-May-11	L1011399-1	Golder	7.4	222	10.9	9.9	29 ^{CW}	14 ^C	18 ^{CW}
YK Bay #2 (d/s of House Boat)	bottom	31-May-11	-	-	7.4	167	10.3	10.0	-	-	-
YK Bay # 3	surface	31-May-11	L1011399-3	Golder	7.7	66	10.5	12.0	8 ^{CW}	<3.0	6.4 ^{CW}
YK Bay # 3	bottom	31-May-11	-	-	7.5	96	10.5	11.1	-	-	-
YK Bay # 4	surface	31-May-11	L1011399-4	Golder	7.7	68	10.4	12.0	7.3 ^{CW}	<3.0	6.2 ^{CW}
YK Bay # 4	bottom	31-May-11	-	-	7.6	104	10.6	11.6	-	-	-
YK Bay # 5	surface	31-May-11	-	-	7.5	155	10.2	10.2	21 ^{CW}	-	-
YK Bay # 5	bottom	31-May-11	-	-	7.4	167	10.3	10.1	-	-	-
YK Bay # 6	surface	31-May-11	-	-	7.5	138	10.5	10.4	21 ^{CW}	-	-
YK #7	surface	31-May-11	-	-	7.7	67	10.4	12.0	7.3 ^{CW}	-	-
YK #7	bottom	31-May-11	-	-	7.7	69	9.6	12.1	-	-	-
YK Bay A	surface	8-Jun-11	-	-	7.7	88	9.2	12.1	3.8 ^W	-	-
YK Bay A	bottom	8-Jun-11	-	-	7.6	84	8.9	12.2	-	-	-
YK Bay B	surface	8-Jun-11	L1014834-1	Golder	7.7	86	9.0	12.2	3.7 ^W	<3.0	3.2 ^W
YK Bay B	bottom	8-Jun-11	-	-	7.8	83	8.9	12.3	-	-	-
YK Bay C	surface	8-Jun-11	L1014834-2	Golder	7.6	136	11.4	10.4	4.5 ^W	<3.0	3.3 ^W
YK Bay D	surface	8-Jun-11	-	-	7.7	88	9.3	12.1	3.8 ^W	-	-
YK Bay D	bottom	8-Jun-11	-	-	7.6	84	8.8	12.3	-	-	-
YK Bay E	surface	8-Jun-11	-	-	7.8	86	9.1	12.4	4.1 ^W	-	-
YK Bay E	bottom	8-Jun-11	-	-	7.8	84	8.9	12.3	-	-	-
YK Bay F	surface	8-Jun-11	L1014834-3	Golder	7.7	91	9.2	12.1	3.8 ^W	3	2.6 ^W
YK Bay F	bottom	8-Jun-11	-	-	7.8	83	8.9	12.2	-	-	-
YK Bay G	surface	8-Jun-11	L1014834-4	Golder	7.6	126	11.0	11.0	4.0 ^W	<3	2.4 ^W
YK Bay G	bottom	8-Jun-11	-	-	7.7	89	9.2	12.1	-	-	-
Back Bay Public Dock Area	surface	31-May-11	L1011399-5	Golder	7.7	88	14.3	11.0	11 ^{CW}	16 ^C	14 ^{CW}
Back Bay Public Dock Area	surface	8-Jun-11	L1014834-5	Golder	7.7	99	8.0	11.8	3.2 ^W	<3.0	1.9 ^W

Notes: u/s = upstream; d/s = downstream; mg/L = milligrams per litre; NTU = nephelometric turbidity units; MDL = method detection limit; < = less than; ≤ = less than or equal to; max = maximum; n = sample size; avg = average; YK = Yellowknife.

- = no data or guideline available.

Values in **bold** are above water quality guidelines.

^(a) Source: Canadian Council of Ministers of the Environment (CCME) 2011.

^(b) The CCME narrative states that during clear flow periods, the guideline is a maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30 day period).

Because a reference site was not sampled, background was set to the historical median turbidity of 3 NTU (Golder 2011).

^(c) The CCME narrative states that during clear flow periods, the guideline is a maximum average increase of 5 mg/L from background levels for longer term exposures (i.e. 24 h to 30 day).

Because a reference site was not sampled, background was set to the historical median TSS value of 3 mg/L (Golder 2011).

^(d) Source: Health Canada (2010).

^(e) Aesthetic objective.

^(f) Source: Metal Mining Effluent Regulations (Government of Canada).

^(g) Background concentrations were calculated using data collected from Yellowknife Bay (SNP 43-12) in May and June between 2007 and 2010 (Golder 2011).

^C = concentration is higher than the relevant chronic aquatic life guideline or outside the recommended pH range.

Table B-4: Water Quality in Yellowknife Bay during the Baker Creek Reach 7 Overflow Monitoring Program, May and June 2011

Parameter	Units	Canadian Water Quality Guidelines for the Protection of Aquatic Life ^(A)	Canadian Drinking Water Quality Guidelines ^(B)	Maximum Authorized Concentration ^(C)	Yellowknife Bay Background Conditions ^(D)					Post-Mitigation																															
										YK Bay 1	YK Bay 2	YK Back Bay 1	YK Back Bay 2	YK Back Bay 3	YK Back Bay 4	YK Bay B	YK Bay C	YK Bay F	YK Bay G	Back Bay Dock Area	Bay Back Dock Area																				
					Median	Minimum	Maximum	n	n less than MDL	24-May-11	24-May-11	31-May-11	31-May-11	31-May-11	31-May-11	8-Jun-11	8-Jun-11	8-Jun-11	8-Jun-11	31-May-11	8-Jun-11																				
					L1008512-1	L1008512-2	L1011399-2	L1011399-1	L1011399-3	L1011399-4	L1014834-1	L1014834-2	L1014834-3	L1014834-4	L1011399-5	L1014834-5																									
																			Goldier	Goldier	Goldier	Goldier	Goldier	Goldier	Goldier	Goldier	Goldier	Goldier	Goldier	Goldier	Goldier										
																			7.5	7.6	7.5	7.4	7.7	7.7	7.7	7.6	7.7	7.6	7.7	7.7	7.7										
																			68	67	100	222	66	67	86	136	91	126	88	99											
																			7.3	7.8	11	11	10.5	10	9	11	9	11	14	8											
																			13	13	11.1	9.9	11.9	12	12.2	10.4	12.1	10.9	10.9	11.8											
																			7.5 ^C	7 ^C	7.9 ^C	29.5 ^C	8 ^C	7.7 ^C	3.7	4.5	3.8	4	11 ^C	3.2											
Conventional Parameters																																									
Hardness (as calcium carbonate)																			mg/L	-	-	-	52.6	37.3	91.4	25	0	28	27	76.5	24.9	25	25.4	40.0	52.3	50	51.7	33.1	36.8		
Total Suspended Solids																			mg/L	-	-	-	30	3	1	29 ^C	25	0	<3	<3	14 ^C	4	<3	<3	<3	<3	3	<3	16 ^C	<3	
Turbidity																			mg/L	-	-	-	2.4	1.7	8 ^C	14	0	6 ^C	5 ^C	17.5 ^C	5.5 ^C	6.4 ^C	6.2 ^C	3.2	3.3	2.6	2.4	13.5 ^C	1.9		
Ions																																									
Calcium																			mg/L	-	-	-	-	-	-	-	-	7.3	6.9	21.6	6.36	6.32	6.39	11.3	15	14.3	14.9	8.76	10.3		
Magnesium																			mg/L	-	-	-	-	-	-	-	-	2.5	2.3	5.48	2.18	2.25	2.3	2.87	3.61	3.46	3.52	2.72	2.69		
Potassium																			mg/L	-	-	-	-	-	-	-	-	1.1	1.0	1.68	0.71	0.84	0.85	1.05	1.28	1.32	1.26	0.98	1.1		
Sodium																			mg/L	-	-	-	-	-	-	-	-	2.6	2.4	9.36	2.19	2.16	2.2	2.92	4.03	4.04	4.03	2.71	3.02		
Nutrients																																									
Ammonia (as nitrogen)																			mg/L	-	-	-	-	0.02	<0.005	0.236	21	8	-	-	-	-	-	-	-	-	-	-	-	-	
Nitrate and Nitrite (as nitrogen)																			mg/L	-	-	-	-	0.0307	<0.005	0.752	11	1	-	-	0.04	<0.006	<0.006	<0.006	0.006	0.008	0.009	0.01	<0.006	<0.006	
Nitrate (as nitrogen)																			mg/L	-	-	-	-	-	-	-	-	-	-	-	0.039	<0.006	<0.006	<0.006	0.006	0.008	0.009	0.011	<0.006	<0.006	
Nitrite (as nitrogen)																			mg/L	-	-	-	-	-	-	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Total Kjeldahl Nitrogen																			mg/L	-	-	-	-	-	-	-	-	-	-	-	0.6	0.2	0.2	0.5	0.7	0.6	0.9	0.5	0.2		
Total Dissolved Phosphorus																			mg/L	-	-	-	-	-	-	-	-	-	-	-	0.051	0.009	0.01	0.01	0.017	0.025	0.023	0.026	0.055	0.01	
Total Phosphorus																			mg/L	-	-	-	-	-	-	-	-	-	-	-	0.011	0.003	0.003	0.003	0.004	0.015	0.006	0.007	0.006	0.002	
Carbon																																									
Dissolved Organic Carbon																			mg/L	-	-	-	-	-	-	-	-	-	-	-	11	4.77	4.79	4.88	-	-	-	-	5.28	-	
Total Organic Carbon																			mg/L	-	-	-	-	-	-	-	-	-	-	-	11.2	5.04	5.19	5.15	-	-	-	-	5.64	-	
Total Metals																																									
Aluminum																			mg/L	-	-	-	-	0.110 ^{C-W}	0.04 ^{C-W}	0.634 ^{C-W}	24	0	0.172 ^{C-W}	0.161 ^{C-W}	0.577 ^{C-W}	0.196 ^{C-W}	0.203 ^{C-W}	0.207 ^{C-W}	0.104 ^{C-W}	0.12 ^{C-W}	0.104 ^{C-W}	0.113 ^{C-W}	0.315 ^{C-W}	0.237 ^{C-W}	
Antimony																			mg/L	-	-	-	-	0.0041 ^{C-W}	0.0006 ^C	0.0196 ^{C-W}	24	0	0.0008	0.0007	0.0309 ^C	0.0006	0.0009	0.0008	0.0072 ^C	0.0135 ^{C-W}	0.0107 ^{C-W}	0.0131 ^{C-W}	0.0007	0.0005	
Arsenic																			mg/L	-	-	-	-	0.0535 ^{C-W}	0.0127 ^{C-W}	0.114 ^{C-W}	23	0	0.0029	0.003	0.013 ^{C-W}	0.0037	0.0041	0.0044	0.0487 ^{C-W}	0.09 ^{C-W}	0.0697 ^{C-W}	0.0864 ^{C-W}	0.0069 ^C	0.0034	
Barium																			mg/L	-	-	-	-	0.01	< 0.01	0.019	24	10	0.0084	0.0088	0.0161	0.0091	0.0091	0.009	0.0087	0.0086	0.0085	0.0083	0.0149	0.0133	
Beryllium																			mg/L	-	-	-	-	<0.005	<0.005	<0.005	24	24	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Bismuth																			mg/L	-	-	-	-	<0.2	<0.2	<0.2	24	24	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Boron																			mg/L	-	-	-	-	<0.1	<0.2	<0.1	24	24	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Cadmium																			mg/L	-	-	-	-	<0.00005 ^{C-W}	<0.00005 ^{C-W}	<0.00005 ^{C-W}	24	24	<0.0002 ^{C-W}	<0.0002 ^{C-W}	<0.0002 ^{C-W}	<0.0002 ^{C-W}	<0.0002 ^{C-W}	<0.0002 ^{C-W}	<0.0002 ^{C-W}	<0.0002 ^{C-W}	<0.0002 ^{C-W}	<0.0002 ^{C-W}	<0.0002 ^{C-W}		
Chromium																			mg/L	-	-	-	-	0.06 ^(P)	<0.01 ^{C-W}	<0.01 ^{C-W}	24	24	<0.0008	<0.0008	0.0013 ^C	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	0.0009	<0.0008	
Cobalt																			mg/L	-	-	-	-	<0.01	<0.01	<0.01	24	24	<0.0002	<0.0002	0.0012	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	0.0002	0.0002	0.0003	<0.0002	
Copper																			mg/L	-	-	-	-	0.0046 ^C	0.0013 ^C	0.0084 ^C	24	0	0.0012	0.0012	0.0141 ^C	0.0013	0.0015	0.0014	0.0041 ^C	0.0069 ^C	0.0055 ^C	0.0066 ^C	0.0023 ^C	0.002	
Iron																			mg/L	-	-	-	-	≤ 0.3 ^(R)	1.03 ^(R)	0.18 ^(R)	24	0	0.18	0.12	0.83 ^{C-W}	0.17	0.17	0.17	0.18	0.25	0.2	0.24	0.61 ^{C-W}	0.1	
Lead																			mg/L	-	-	-	-	0.0003 ^C	0.00007 ^C	0.0048 ^C	24	0	0.0002	0.0002	0.0041 ^C	0.0002	0.0002	0.0002	0.0005	0.0008	0.0007	0.0008	0.0006	0.0002	
Manganese																			mg/L	-	-	-	-	0.0191 ^{C-W}	0.0052 ^{C-W}	0.127 ^C	24	0	0.006	0.0052	0.119 ^{C-W}	0.0079	0.0076	0.0077	0.0116	0.0198	0.0153	0.019	0.0309	0.0032	
Mercury																			mg/L	-	-	-	-	<0.00001 ^{C-W}	<0.00001 ^{C-W}	<0.00002 ^{C-W}	24	24	0.000057 ^C	<0.00002	< 0.00002	< 0.00002	0.000023	< 0.00002	<0.00002	<0.00002	<0.00002	<0.00002	< 0.00002	<0.00002	
Molybdenum																			mg/L	-	-	-	-	0.0005	0.0002	0.0007	24	0	0.0001	0.0001	0.0015	0.0002	0.0002	0.0006	0.0008	0.0007	0.0009	0.0002	0.0003		
Nickel																			mg/L	-	-	-	-	1	0.0011	0.0006	0.0043	24	0	0.0007	<0.0002	0.0081	0.0009	0.0009	0.0009	0.0014	0.0024	0.0018	0.0022	0.0014	0.0008
Selenium																			mg/L	-	-	-	-	<0.001	<0.001	<0.001	22	22	<0.0004	<0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	<0.0004	<0.0004	<0.0004	<0.0004	< 0.0004	<0.0004	
Silver																			mg/L	-	-	-	-	<0.01 ^{C-W}	<0.01 ^{C-W}	<0.01 ^{C-W}	24	24	<0.0004 ^{C-W}	<0.0004 ^{C-W}	<0.0004 ^{C-W}	<0.0004 ^{C-W}	<0.0004 ^{C-W}	<0.0004 ^{C-W}	<0.0004 ^{C-W}	<0.0004 ^{C-W}	<0.0004 ^{C-W}	<0.0004 ^{C-W}	<0.0004 ^{C-W}	<0.0004 ^{C-W}	
Strontium																			mg/L	-	-	-	-	0.049	0.0394	0.0741	24	0	0.03	0.031	0.096	0.0342	0.0336	0.0332	0.051	0.0677	0.0608	0.066	0.0422	0.053	
Thallium																			mg/L	-	-	-	-	<0.2	<0.2	<0.2	24	24	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Tin																			mg/L	-	-	-	-	<0.03	<0.03	<0.03	24	24	0.00072	<0.0004	<0.0004	<0.0004	0.00092	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	
Titanium																			mg/L	-	-	-	-	<0.01	<0.01	0.02	24	22	<0.005	0.0052	0.0245	0.0067	0.0072	0.0102	<0.005	<0.005	<0.005	0.0109	<0.005	<0.005	
Uranium																			mg/L	-	-	-	-	0.00028	0.00022	0.00068	24	0	0.00026	0.00028	0.00039	0.00026	0.00025	0.00025	0.00028	0.0003	0.00028	0.00029	0.00027	0.00031	
Vanadium																			mg/L	-	-	-	-	<0.03	<0.03	<0.03	24	24	<0.0005	<0.0005	0.0014	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Zinc																			mg/L	-	-	-	-	<0.004	<0.004	0.018	24	20	<0.004	<0.004	0.01	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.006	0.007
Dissolved Metals																																									
Aluminum																			mg/L	-	-	-	-	0.0092	0.0042	0.0197	25	1	0.016	0.013	<0.01	0.014	0.011	0.012	<0.01	<0.01	0.01	<0.01	<0.01	0.011	
Antimony																			mg/L	-	-	-	-	0.0036	0.00061	0.0182	25	0	0.00047	<0.0004	0.0027	0.0005	0.0007	0.0006	0.0063	0.0111	0.0103	0.0122	0.0005	0.0005	
Arsenic																			mg/L	-	-	-	-	0.05275	0.0123	0.0978	24	0	0.002	0.0045	0.0877	0.003	0.003	0.0033	0.0388	0.068	0.0617	0.073	0.0027	0.0044	
Barium																			mg/L	-	-	-	-	<0.01	<0.01	0.069	25	20	0.0068	0.0072	0.0123	0.0074									



APPENDIX C

Total Suspended Solids/Turbidity Relationship



TSS/Turbidity Relationship

Baker Creek

Relationships between turbidity and TSS are site-specific, as turbidity is affected by concentration, size and shape of sediment suspended in the water column (CCME 2002). At sites where the relationship between TSS and turbidity is known, turbidity can be used as a surrogate to predict TSS concentrations.

Figure A-1 illustrates the strong relationship between TSS and turbidity in Baker Creek. Using SYSTAT version 11 (SYSTAT 2004), the following two data points were identified as outliers and were removed from the analysis:

- On May 16, the field turbidity in Reach 6 was 834 NTU and the corresponding TSS concentration was 4,340 mg/L. There was a large gap between this point and all others, resulting in a large leverage of this point in the regression analysis.
- On June 6, the field turbidity in Reach 5 was 380 NTU, while the TSS concentration was 4.2 mg/L. There was a large discrepancy between the field turbidity (*i.e.*, 380 NTU) and the laboratory-measured turbidity (*i.e.*, 4.0); therefore, the field measurement was assumed to be an error.

The regression equation based on the remaining data ($Y = 0.6213X + 0.4314$) had a slope that was significantly different from zero ($P < 0.001$, $n = 41$) and a coefficient of determination (r^2) of 0.73, indicating a strong relationship (Figure C-1). Based on this regression, TSS concentrations were calculated using the following equation: $TSS_{calc} = 10^{(0.6213 \cdot \text{Log Field Turbidity} + 0.4314)}$.

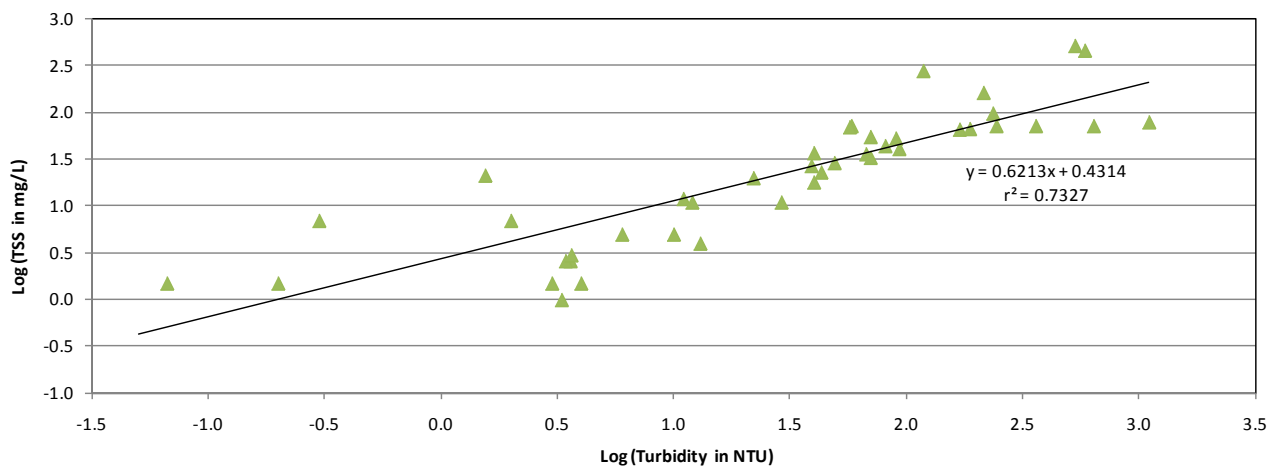


Figure C-1: Relationship between Field Turbidity and Total Suspended Solids Concentration in Baker Creek



Yellowknife Bay

A strong TSS/turbidity relationship was not evident in Yellowknife Bay due to the high proportion of non-detectable TSS values in the dataset (Figure C-2). Eight of the 12 samples analyzed from Yellowknife Bay contained TSS at concentrations less than the method detection limit. TSS concentrations could not be reliably be calculated from field turbidity data in Yellowknife Bay.

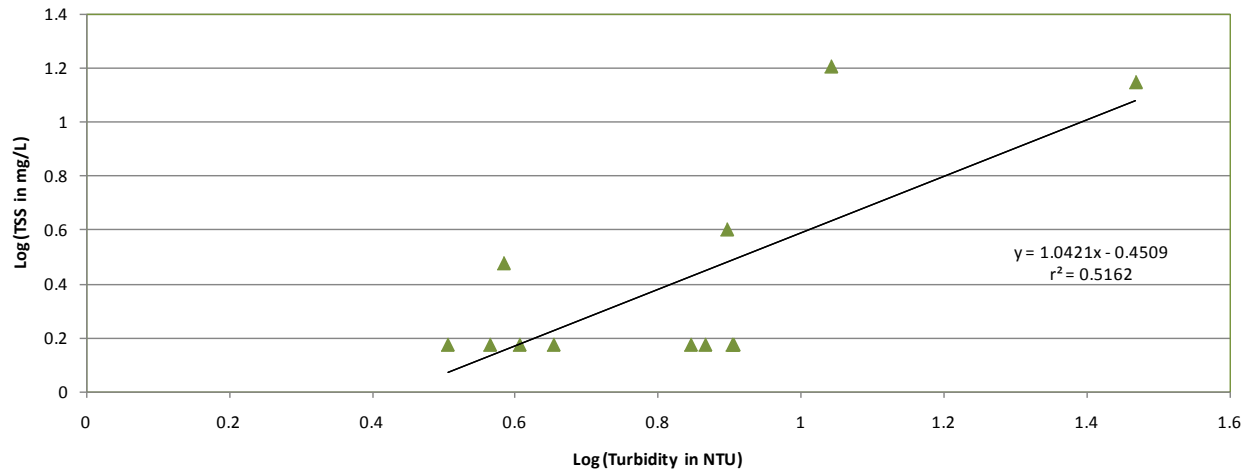


Figure C-2: Relationship between Field Turbidity and Total Suspended Solids Concentration in Yellowknife Bay



APPENDIX D

Laboratory Results



GOLDER ASSOCIATES LTD.

ATTN: Hilary Machtans

9 - 4905 48th Street

Yellowknife NW X1A 3S3

Date Received: 17-MAY-11

Report Date: 03-JUN-11 17:05 (MT)

Version: FINAL

Client Phone: 867-873-6319

Certificate of Analysis

Lab Work Order #: L1005761

Project P.O. #: 606989

Job Reference: 09-1427-0006

Legal Site Desc:

C of C Numbers: 1

Comments: Radium-226 was subcontracted to SRC Analytical in Saskatoon, Saskatchewan. Refer to their report appended for detail.

Can Dang
Senior Account Manager

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

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L1005761-1 WATER 16-MAY-11 16:45 BAKER CREEK EXPOSURE POINT (ABOVE)				
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		204				
	Hardness (as CaCO3) (mg/L)		106				
	pH (pH)		7.88				
	Total Suspended Solids (mg/L)		4340				
	Total Dissolved Solids (mg/L)		148				
	Turbidity (NTU)		2740				
Leachable Anions & Nutrients	Anion Sum (meq/L)		2.19				
	Cation Sum (meq/L)		2.36				
	Cation - Anion Balance (%)		3.5				
Anions and Nutrients	Acidity (as CaCO3) (mg/L)		4.0				
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		56.7				
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<1.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<1.0				
	Alkalinity, Total (as CaCO3) (mg/L)		56.7				
	Ammonia (as N) (mg/L)		0.149				
	Bromide (Br) (mg/L)		<0.050				
	Chloride (Cl) (mg/L)		6.64				
	Fluoride (F) (mg/L)		0.285				
	Nitrate and Nitrite (as N) (mg/L)		0.0722				
	Nitrate (as N) (mg/L)		0.0722				
	Nitrite (as N) (mg/L)		<0.0010				
	Total Kjeldahl Nitrogen (mg/L)		1.24				
	Phosphorus (P)-Total Dissolved (mg/L)		0.0100				
	Phosphorus (P)-Total (mg/L)		2.35				
	Sulfate (SO4) (mg/L)		41.0				
	Sulphide as S (mg/L)		0.033				
Cyanides	Cyanide, Total (mg/L)		0.0849				
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		14.5				
	Total Organic Carbon (mg/L)		18.5				
Total Metals	Aluminum (Al)-Total (mg/L)		46.5				
	Antimony (Sb)-Total (mg/L)		1.53				
	Arsenic (As)-Total (mg/L)		7.55				
	Barium (Ba)-Total (mg/L)		0.087				
	Beryllium (Be)-Total (mg/L)		<0.0050				
	Bismuth (Bi)-Total (mg/L)		<0.20				

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
WATER						
Total Metals	Boron (B)-Total (mg/L)	<0.10				
	Cadmium (Cd)-Total (mg/L)	0.0108				
	Calcium (Ca)-Total (mg/L)	182				
	Chromium (Cr)-Total (mg/L)	0.115				
	Cobalt (Co)-Total (mg/L)	0.045				
	Copper (Cu)-Total (mg/L)	0.647				
	Iron (Fe)-Total (mg/L)	99.9				
	Lead (Pb)-Total (mg/L)	1.62				
	Lithium (Li)-Total (mg/L)	0.068				
	Magnesium (Mg)-Total (mg/L)	66.8				
	Manganese (Mn)-Total (mg/L)	3.27				
	Mercury (Hg)-Total (mg/L)	0.000331 ^{DLM}				
	Molybdenum (Mo)-Total (mg/L)	0.00259				
	Nickel (Ni)-Total (mg/L)	0.126				
	Phosphorus (P)-Total (mg/L)	1.29				
	Potassium (K)-Total (mg/L)	5.4				
	Selenium (Se)-Total (mg/L)	0.00128				
	Silicon (Si)-Total (mg/L)	44.0				
	Silver (Ag)-Total (mg/L)	<0.010				
	Sodium (Na)-Total (mg/L)	6.6				
	Strontium (Sr)-Total (mg/L)	0.193				
	Thallium (Tl)-Total (mg/L)	<0.20				
	Tin (Sn)-Total (mg/L)	<0.030				
	Titanium (Ti)-Total (mg/L)	0.238				
	Uranium (U)-Total (mg/L)	0.00122				
	Vanadium (V)-Total (mg/L)	0.117				
	Zinc (Zn)-Total (mg/L)	2.04				
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0240				
	Antimony (Sb)-Dissolved (mg/L)	0.0716				
	Arsenic (As)-Dissolved (mg/L)	0.136				
	Barium (Ba)-Dissolved (mg/L)	<0.010				
	Beryllium (Be)-Dissolved (mg/L)	<0.0050				
	Bismuth (Bi)-Dissolved (mg/L)	<0.20				
	Boron (B)-Dissolved (mg/L)	<0.10				
	Cadmium (Cd)-Dissolved (mg/L)	0.00025				
	Calcium (Ca)-Dissolved (mg/L)	30.9				
	Chromium (Cr)-Dissolved (mg/L)	<0.010				

* 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		L1005761-1 WATER 16-MAY-11 16:45 BAKER CREEK EXPOSURE POINT (ABOVE)				
Grouping	Analyte					
WATER						
Dissolved Metals	Cobalt (Co)-Dissolved (mg/L)	<0.010				
	Copper (Cu)-Dissolved (mg/L)	0.0210				
	Iron (Fe)-Dissolved (mg/L)	0.028				
	Lead (Pb)-Dissolved (mg/L)	0.00076				
	Lithium (Li)-Dissolved (mg/L)	<0.010				
	Magnesium (Mg)-Dissolved (mg/L)	7.05				
	Manganese (Mn)-Dissolved (mg/L)	0.261				
	Mercury (Hg)-Dissolved (mg/L)	^{DLM} <0.000050				
	Molybdenum (Mo)-Dissolved (mg/L)	0.00134				
	Nickel (Ni)-Dissolved (mg/L)	0.0021				
	Phosphorus (P)-Dissolved (mg/L)	<0.30				
	Potassium (K)-Dissolved (mg/L)	<2.0				
	Selenium (Se)-Dissolved (mg/L)	^{DLA} <0.00020				
	Silicon (Si)-Dissolved (mg/L)	0.649				
	Silver (Ag)-Dissolved (mg/L)	<0.010				
	Sodium (Na)-Dissolved (mg/L)	4.8				
	Strontium (Sr)-Dissolved (mg/L)	0.0689				
	Thallium (Tl)-Dissolved (mg/L)	<0.20				
	Tin (Sn)-Dissolved (mg/L)	<0.030				
	Titanium (Ti)-Dissolved (mg/L)	<0.010				
	Uranium (U)-Dissolved (mg/L)	0.000524				
	Vanadium (V)-Dissolved (mg/L)	<0.030				
	Zinc (Zn)-Dissolved (mg/L)	0.0197				
Aggregate Organics	Oil and Grease (mg/L)	<1.0				

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

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit Adjusted For required dilution
DLM	Detection Limit Adjusted For Sample Matrix Effects

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
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-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-N+N-CALC-VA	Water	Nitrite & Nitrate in Water (Calculation)	EPA 300.0
Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).			
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".			
CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CN-T-MID-HH-COL-VA	Water	Total Cyanide by HH Distillation	APHA 4500-CN Cyanide
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
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 CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-DIS-LOW-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS(Low)	EPA SW-846 3005A & EPA 245.7

Reference Information

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-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (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-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

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

MET-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-DIS-LOW-ICP-VA Water Dissolved Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

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

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

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

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

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

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

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.

OGG-LL-SF-VA Water Oil & Grease by Gravimetric BCMOE GRAVIMETRIC

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3510 & 9071, published by the United States Environmental Protection Agency (EPA), "Standard Methods for the Examination of Water and Wastewater", 20th ed., Method 5520, published by the American Public Health Association, and "BC Environmental Laboratory Manual for the Analysis of Water, Wastewater, Sediment and Biological Materials," 5th ed., published by the B.C. Ministry of Environment, Lands & Parks, 1994. The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease. ALS Environmental's routine detection limit, or Limit of Reporting (LOR), for this method is 2 mg/L for a 1L sample volume. By request, a LOR of 1 mg/L is sometimes applied for this method. The 1 mg/L LOR is equal to the 99% confidence limit Method Detection Limit as defined by the US EPA. A higher degree of variability is expected at levels below 2 mg/L.

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

Reference Information

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 Water Total Dissolved P in Water 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-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.

S2-T-COL-VA Water Total Sulphide by Colorimetric APHA 4500-S2 Sulphide

This analysis is carried out using procedures adapted from APHA Method 4500-S2 "Sulphide". Sulphide is determined using the methylene blue colourimetric method.

TDS-LOW-VA Water Low Level TDS (3.0mg/L) 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-COL-VA Water TKN in Water by Colour 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 automated colourimetry.

TSS-LOW-VA Water Total Suspended Solids by Grav. (1 mg/L) APHA 2540 Gravimetric

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

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

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

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

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

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

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

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, 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.



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Client: GOLDER ASSOCIATES LTD.

9 - 4905 48th Street

Yellowknife NW X1A 3S3

Contact: Hilary Machtans

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ACY-PCT-VA		Water						
Batch	R2192283							
WG1282623-8 CRM		VA-ACY-CONTROL						
Acidity (as CaCO ₃)			101		%		85-115	20-MAY-11
WG1282623-11 DUP		L1005761-1						
Acidity (as CaCO ₃)		4.0	2.5	J	mg/L	1.5	2	20-MAY-11
ALK-PCT-VA		Water						
Batch	R2192211							
WG1282633-8 CRM		VA-ALK-PCT-CONTROL						
Alkalinity, Total (as CaCO ₃)			102		%		85-115	20-MAY-11
WG1282633-1 MB								
Alkalinity, Total (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
Alkalinity, Bicarbonate (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
Alkalinity, Carbonate (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
WG1282633-2 MB								
Alkalinity, Total (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
Alkalinity, Bicarbonate (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
Alkalinity, Carbonate (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
Alkalinity, Hydroxide (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
WG1282633-3 MB								
Alkalinity, Total (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
Alkalinity, Bicarbonate (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
Alkalinity, Carbonate (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
Alkalinity, Hydroxide (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
WG1282633-4 MB								
Alkalinity, Total (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
Alkalinity, Bicarbonate (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
Alkalinity, Carbonate (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
Alkalinity, Hydroxide (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
WG1282633-7 MB								
Alkalinity, Total (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
Alkalinity, Bicarbonate (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
Alkalinity, Carbonate (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
Alkalinity, Hydroxide (as CaCO ₃)			<1.0		mg/L		1	20-MAY-11
ANIONS-BR-IC-VA		Water						
Batch	R2191948							
WG1281739-11 CRM		VA-IC-IVA2-ION23110						
Bromide (Br)			95		%		85-115	19-MAY-11
WG1281739-2 CRM		VA-IC-IVA2-ION23110						



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ANIONS-BR-IC-VA		Water						
Batch	R2191948							
WG1281739-2	CRM	VA-IC-IVA2-ION23110						
Bromide (Br)			101		%		85-115	19-MAY-11
WG1281739-1	MB							
Bromide (Br)			<0.050		mg/L		0.05	19-MAY-11
WG1281739-10	MB							
Bromide (Br)			<0.050		mg/L		0.05	19-MAY-11
WG1281739-4	MB							
Bromide (Br)			<0.050		mg/L		0.05	19-MAY-11
WG1281739-6	MB							
Bromide (Br)			<0.050		mg/L		0.05	19-MAY-11
WG1281739-8	MB							
Bromide (Br)			<0.050		mg/L		0.05	19-MAY-11
ANIONS-CL-IC-VA		Water						
Batch	R2191948							
WG1281739-11	CRM	VA-IC-IVA2-ION23110						
Chloride (Cl)			100		%		85-115	19-MAY-11
WG1281739-2	CRM	VA-IC-IVA2-ION23110						
Chloride (Cl)			101		%		85-115	19-MAY-11
WG1281739-1	MB							
Chloride (Cl)			<0.50		mg/L		0.5	19-MAY-11
WG1281739-10	MB							
Chloride (Cl)			<0.50		mg/L		0.5	19-MAY-11
WG1281739-4	MB							
Chloride (Cl)			<0.50		mg/L		0.5	19-MAY-11
WG1281739-6	MB							
Chloride (Cl)			<0.50		mg/L		0.5	19-MAY-11
WG1281739-8	MB							
Chloride (Cl)			<0.50		mg/L		0.5	19-MAY-11
ANIONS-F-IC-VA		Water						
Batch	R2191948							
WG1281739-11	CRM	VA-IC-IVA2-ION23110						
Fluoride (F)			105		%		85-115	19-MAY-11
WG1281739-2	CRM	VA-IC-IVA2-ION23110						
Fluoride (F)			105		%		85-115	19-MAY-11
WG1281739-1	MB							
Fluoride (F)			<0.020		mg/L		0.02	19-MAY-11
WG1281739-10	MB							
Fluoride (F)			<0.020		mg/L		0.02	19-MAY-11



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ANIONS-F-IC-VA		Water						
Batch	R2191948							
WG1281739-4	MB							
Fluoride (F)			<0.020		mg/L		0.02	19-MAY-11
WG1281739-6	MB							
Fluoride (F)			<0.020		mg/L		0.02	19-MAY-11
WG1281739-8	MB							
Fluoride (F)			<0.020		mg/L		0.02	19-MAY-11
ANIONS-NO2-IC-VA		Water						
Batch	R2191948							
WG1281739-11	CRM	VA-IC-IVA2-ION23110						
Nitrite (as N)		95			%		85-115	19-MAY-11
WG1281739-2	CRM	VA-IC-IVA2-ION23110						
Nitrite (as N)		95			%		85-115	19-MAY-11
WG1281739-1	MB							
Nitrite (as N)			<0.0010		mg/L		0.001	19-MAY-11
WG1281739-10	MB							
Nitrite (as N)			<0.0010		mg/L		0.001	19-MAY-11
WG1281739-4	MB							
Nitrite (as N)			<0.0010		mg/L		0.001	19-MAY-11
WG1281739-6	MB							
Nitrite (as N)			<0.0010		mg/L		0.001	19-MAY-11
WG1281739-8	MB							
Nitrite (as N)			<0.0010		mg/L		0.001	19-MAY-11
ANIONS-NO3-IC-VA		Water						
Batch	R2191948							
WG1281739-11	CRM	VA-IC-IVA2-ION23110						
Nitrate (as N)		98			%		85-115	19-MAY-11
WG1281739-2	CRM	VA-IC-IVA2-ION23110						
Nitrate (as N)		102			%		85-115	19-MAY-11
WG1281739-1	MB							
Nitrate (as N)			<0.0050		mg/L		0.005	19-MAY-11
WG1281739-10	MB							
Nitrate (as N)			<0.0050		mg/L		0.005	19-MAY-11
WG1281739-4	MB							
Nitrate (as N)			<0.0050		mg/L		0.005	19-MAY-11
WG1281739-6	MB							
Nitrate (as N)			<0.0050		mg/L		0.005	19-MAY-11
WG1281739-8	MB							
Nitrate (as N)			<0.0050		mg/L		0.005	19-MAY-11

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EC-PCT-VA		Water						
Batch	R2192211							
WG1282633-9	CRM	VA-EC-PCT-CONTROL						
Conductivity			102		%		90-110	20-MAY-11
WG1282633-1	MB							
Conductivity			<2.0		uS/cm		2	20-MAY-11
WG1282633-2	MB							
Conductivity			<2.0		uS/cm		2	20-MAY-11
WG1282633-3	MB							
Conductivity			<2.0		uS/cm		2	20-MAY-11
WG1282633-4	MB							
Conductivity			<2.0		uS/cm		2	20-MAY-11
WG1282633-5	MB							
Conductivity			<2.0		uS/cm		2	20-MAY-11
WG1282633-7	MB							
Conductivity			<2.0		uS/cm		2	20-MAY-11
HG-DIS-LOW-CVAFS-VA		Water						
Batch	R2192101							
WG1282760-2	CRM	VA-HG-WATRM						
Mercury (Hg)-Dissolved			94		%		80-120	20-MAY-11
WG1282089-1	MB							
Mercury (Hg)-Dissolved			<0.000010		mg/L		0.00001	20-MAY-11
WG1282760-1	MB							
Mercury (Hg)-Dissolved			<0.000010		mg/L		0.00001	20-MAY-11
HG-TOT-LOW-CVAFS-VA		Water						
Batch	R2192101							
WG1282760-2	CRM	VA-HG-WATRM						
Mercury (Hg)-Total			94		%		80-120	20-MAY-11
WG1282760-1	MB							
Mercury (Hg)-Total			<0.000010		mg/L		0.00001	20-MAY-11
MET-D-CCMS-VA		Water						
Batch	R2192161							
WG1282089-1	MB							
Aluminum (Al)-Dissolved			<0.0030		mg/L		0.003	20-MAY-11
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	20-MAY-11
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	20-MAY-11
Cadmium (Cd)-Dissolved			<0.000010		mg/L		0.00001	20-MAY-11
Copper (Cu)-Dissolved			<0.00050		mg/L		0.0005	20-MAY-11
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	20-MAY-11



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-VA		Water						
Batch	R2192161							
WG1282089-1	MB							
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	20-MAY-11
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	20-MAY-11
Selenium (Se)-Dissolved			<0.00010		mg/L		0.0001	20-MAY-11
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	20-MAY-11
Batch	R2193180							
WG1282089-2	CRM	VA-HIGH-WATRM						
Aluminum (Al)-Dissolved			105		%		80-120	20-MAY-11
Antimony (Sb)-Dissolved			103		%		80-120	20-MAY-11
Arsenic (As)-Dissolved			104		%		80-120	20-MAY-11
Cadmium (Cd)-Dissolved			106		%		80-120	20-MAY-11
Copper (Cu)-Dissolved			101		%		80-120	20-MAY-11
Lead (Pb)-Dissolved			101		%		80-120	20-MAY-11
Molybdenum (Mo)-Dissolved			103		%		80-120	20-MAY-11
Nickel (Ni)-Dissolved			105		%		80-120	20-MAY-11
Selenium (Se)-Dissolved			106		%		80-120	20-MAY-11
Uranium (U)-Dissolved			105		%		80-120	20-MAY-11
MET-DIS-ICP-VA		Water						
Batch	R2192175							
WG1282089-2	CRM	VA-HIGH-WATRM						
Barium (Ba)-Dissolved			98		%		80-120	19-MAY-11
Beryllium (Be)-Dissolved			97		%		80-120	19-MAY-11
Bismuth (Bi)-Dissolved			99		%		80-120	19-MAY-11
Boron (B)-Dissolved			100		%		80-120	19-MAY-11
Calcium (Ca)-Dissolved			101		%		80-120	19-MAY-11
Chromium (Cr)-Dissolved			98		%		80-120	19-MAY-11
Cobalt (Co)-Dissolved			97		%		80-120	19-MAY-11
Lithium (Li)-Dissolved			100		%		80-120	19-MAY-11
Magnesium (Mg)-Dissolved			100		%		80-120	19-MAY-11
Manganese (Mn)-Dissolved			98		%		80-120	19-MAY-11
Phosphorus (P)-Dissolved			100		%		80-120	19-MAY-11
Potassium (K)-Dissolved			101		%		80-120	19-MAY-11
Silicon (Si)-Dissolved			102		%		80-120	19-MAY-11
Silver (Ag)-Dissolved			96		%		80-120	19-MAY-11
Sodium (Na)-Dissolved			99		%		80-120	19-MAY-11



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-TOT-ICP-VA		Water						
Batch	R2192175							
WG1282145-4 CRM		VA-HIGH-WATRM						
Barium (Ba)-Total			102		%		80-120	19-MAY-11
Beryllium (Be)-Total			100		%		80-120	19-MAY-11
Bismuth (Bi)-Total			101		%		80-120	19-MAY-11
Boron (B)-Total			101		%		80-120	19-MAY-11
Calcium (Ca)-Total			105		%		80-120	19-MAY-11
Chromium (Cr)-Total			102		%		80-120	19-MAY-11
Cobalt (Co)-Total			99		%		80-120	19-MAY-11
Lithium (Li)-Total			104		%		80-120	19-MAY-11
Magnesium (Mg)-Total			102		%		80-120	19-MAY-11
Manganese (Mn)-Total			101		%		80-120	19-MAY-11
Phosphorus (P)-Total			103		%		80-120	19-MAY-11
Potassium (K)-Total			104		%		80-120	19-MAY-11
Silicon (Si)-Total			105		%		80-120	19-MAY-11
Silver (Ag)-Total			101		%		80-120	19-MAY-11
Sodium (Na)-Total			103		%		80-120	19-MAY-11
Strontium (Sr)-Total			105		%		80-120	19-MAY-11
Thallium (Tl)-Total			101		%		80-120	19-MAY-11
Tin (Sn)-Total			100		%		80-120	19-MAY-11
Titanium (Ti)-Total			108		%		80-120	19-MAY-11
Vanadium (V)-Total			102		%		80-120	19-MAY-11
WG1282145-1 MB								
Barium (Ba)-Total			<0.010		mg/L		0.01	19-MAY-11
Beryllium (Be)-Total			<0.0050		mg/L		0.005	19-MAY-11
Bismuth (Bi)-Total			<0.20		mg/L		0.2	19-MAY-11
Boron (B)-Total			<0.10		mg/L		0.1	19-MAY-11
Calcium (Ca)-Total			<0.050		mg/L		0.05	19-MAY-11
Chromium (Cr)-Total			<0.010		mg/L		0.01	19-MAY-11
Cobalt (Co)-Total			<0.010		mg/L		0.01	19-MAY-11
Lithium (Li)-Total			<0.010		mg/L		0.01	19-MAY-11
Magnesium (Mg)-Total			<0.10		mg/L		0.1	19-MAY-11
Manganese (Mn)-Total			<0.0050		mg/L		0.005	19-MAY-11
Phosphorus (P)-Total			<0.30		mg/L		0.3	19-MAY-11
Potassium (K)-Total			<2.0		mg/L		2	19-MAY-11
Silicon (Si)-Total			<0.050		mg/L		0.05	19-MAY-11



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-TOT-ICP-VA		Water						
Batch	R2192175							
WG1282145-1 MB								
Silver (Ag)-Total			<0.010		mg/L		0.01	19-MAY-11
Sodium (Na)-Total			<2.0		mg/L		2	19-MAY-11
Strontium (Sr)-Total			<0.0050		mg/L		0.005	19-MAY-11
Thallium (Tl)-Total			<0.20		mg/L		0.2	19-MAY-11
Tin (Sn)-Total			<0.030		mg/L		0.03	19-MAY-11
Titanium (Ti)-Total			<0.010		mg/L		0.01	19-MAY-11
Vanadium (V)-Total			<0.030		mg/L		0.03	19-MAY-11
MET-TOT-LOW-ICP-VA		Water						
Batch	R2192175							
WG1282145-4 CRM		VA-HIGH-WATRM						
Iron (Fe)-Total			99		%		80-120	19-MAY-11
Zinc (Zn)-Total			97		%		80-120	19-MAY-11
WG1282145-1 MB								
Iron (Fe)-Total			<0.010		mg/L		0.01	19-MAY-11
Zinc (Zn)-Total			<0.0040		mg/L		0.004	19-MAY-11
NH3-F-VA		Water						
Batch	R2196517							
WG1287502-2 CRM		VA-NH3-F						
Ammonia (as N)			97		%		85-115	31-MAY-11
WG1287502-4 CRM		VA-NH3-F						
Ammonia (as N)			99		%		85-115	31-MAY-11
WG1287502-6 CRM		VA-NH3-F						
Ammonia (as N)			100		%		85-115	31-MAY-11
WG1287502-8 CRM		VA-NH3-F						
Ammonia (as N)			98		%		85-115	31-MAY-11
WG1287502-1 MB								
Ammonia (as N)			<0.0050		mg/L		0.005	31-MAY-11
WG1287502-3 MB								
Ammonia (as N)			<0.0050		mg/L		0.005	31-MAY-11
WG1287502-5 MB								
Ammonia (as N)			<0.0050		mg/L		0.005	31-MAY-11
WG1287502-7 MB								
Ammonia (as N)			<0.0050		mg/L		0.005	31-MAY-11
WG1287502-10 MS		L1010134-7						
Ammonia (as N)			106		%		75-125	31-MAY-11
WG1287502-12 MS		L1010175-14						



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-F-VA	Water							
Batch R2196517								
WG1287502-12 MS		L1010175-14						
Ammonia (as N)			101		%		75-125	31-MAY-11
OGG-LL-SF-VA	Water							
Batch R2193752								
WG1283339-2 LCS								
Oil and Grease			97		%		50-150	21-MAY-11
P-T-COL-VA	Water							
Batch R2192232								
WG1282843-11 CRM		VA-ERA-PO4						
Phosphorus (P)-Total			98		%		80-120	20-MAY-11
WG1282843-14 CRM		VA-ERA-PO4						
Phosphorus (P)-Total			98		%		80-120	20-MAY-11
WG1282843-17 CRM		VA-ERA-PO4						
Phosphorus (P)-Total			94		%		80-120	20-MAY-11
WG1282843-2 CRM		VA-ERA-PO4						
Phosphorus (P)-Total			96		%		80-120	20-MAY-11
WG1282843-5 CRM		VA-ERA-PO4						
Phosphorus (P)-Total			97		%		80-120	20-MAY-11
WG1282843-8 CRM		VA-ERA-PO4						
Phosphorus (P)-Total			99		%		80-120	20-MAY-11
WG1282843-1 MB								
Phosphorus (P)-Total			<0.0020		mg/L		0.002	20-MAY-11
WG1282843-10 MB								
Phosphorus (P)-Total			<0.0020		mg/L		0.002	20-MAY-11
WG1282843-13 MB								
Phosphorus (P)-Total			<0.0020		mg/L		0.002	20-MAY-11
WG1282843-16 MB								
Phosphorus (P)-Total			<0.0020		mg/L		0.002	20-MAY-11
WG1282843-4 MB								
Phosphorus (P)-Total			<0.0020		mg/L		0.002	20-MAY-11
WG1282843-7 MB								
Phosphorus (P)-Total			<0.0020		mg/L		0.002	20-MAY-11
P-TD-COL-VA	Water							



Quality Control Report

Workorder: L1005761

Report Date: 03-JUN-11

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TDS-LOW-VA	Water							
Batch R2192615								
WG1282218-2 LCS								
Total Dissolved Solids			94		%		85-115	19-MAY-11
WG1282218-1 MB								
Total Dissolved Solids			<3.0		mg/L		3	19-MAY-11
TKN-COL-VA	Water							
Batch R2195902								
WG1286162-2 CRM		VA-TKN-CSPK1						
Total Kjeldahl Nitrogen			111		%		75-125	28-MAY-11
WG1286162-5 CRM		VA-TKN-CSPK1						
Total Kjeldahl Nitrogen			109		%		75-125	28-MAY-11
WG1286162-1 MB								
Total Kjeldahl Nitrogen			<0.060		mg/L		0.06	28-MAY-11
WG1286162-4 MB								
Total Kjeldahl Nitrogen			<0.060		mg/L		0.06	28-MAY-11
TSS-LOW-VA	Water							
Batch R2191889								
WG1282190-2 LCS								
Total Suspended Solids			91		%		85-115	19-MAY-11
WG1282190-4 LCS								
Total Suspended Solids			98		%		85-115	19-MAY-11
WG1282190-1 MB								
Total Suspended Solids			<1.0		mg/L		1	19-MAY-11
WG1282190-3 MB								
Total Suspended Solids			<1.0		mg/L		1	19-MAY-11
TURBIDITY-VA	Water							
Batch R2191616								
WG1281945-11 CRM		VA-TURB-SPK-8						
Turbidity			104		%		85-115	19-MAY-11
WG1281945-14 CRM		VA-TURB-SPK-8						
Turbidity			106		%		85-115	19-MAY-11
WG1281945-2 CRM		VA-TURB-SPK-8						
Turbidity			105		%		85-115	19-MAY-11
WG1281945-5 CRM		VA-TURB-SPK-8						
Turbidity			104		%		85-115	19-MAY-11
WG1281945-8 CRM		VA-TURB-SPK-8						
Turbidity			105		%		85-115	19-MAY-11
WG1281945-1 MB								
Turbidity			<0.10		NTU		0.1	19-MAY-11



Quality Control Report

Workorder: L1005761

Report Date: 03-JUN-11

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TURBIDITY-VA		Water						
Batch	R2191616							
WG1281945-10	MB							
Turbidity			<0.10		NTU		0.1	19-MAY-11
WG1281945-13	MB							
Turbidity			<0.10		NTU		0.1	19-MAY-11
WG1281945-4	MB							
Turbidity			<0.10		NTU		0.1	19-MAY-11
WG1281945-7	MB							
Turbidity			<0.10		NTU		0.1	19-MAY-11

Quality Control Report

Workorder: L1005761

Report Date: 03-JUN-11

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Workorder: L1005761

Report Date: 03-JUN-11

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH by Meter (Automated)	1	16-MAY-11 16:45	20-MAY-11 14:03	0.25	93	hours	EHTR-FM

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.

Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1005761 were received on 17-MAY-11 10:56.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

SRC ANALYTICAL

422 Downey Road
Saskatoon, Saskatchewan, Canada
S7N 4N1
(306) 933-6932 or 1-800-240-8808
Fax: (306) 933-7922

Jun 03, 2011

ALS Laboratory Group
8081 Lougheed Hwy
Burnaby, BC V5A 1W9
Attn: Can Dang

Page 1 of 1

Sample # **14946** Client PO #: **L1005761**
Date Sampled: **May 16, 2011** Date Received: **May 20, 2011**
Sample Matrix: **WATER**
Description: **L1005761-1 BAKER CREEK EXPOSURE POINT (ABOVE)**

Analyte	Units	Result	DL
Radio Chemistry			
Radium-226	Bq/L	0.03	0.01



COC #

4

Mexico
TSS



DETON'CHO \ NUNA JOINT VENTURE
ATTN: KATRINA NOKLEBY
GIANT MINESITE
PO BOX 2951
Yellowknife NT X1A 2R2

Date Received: 24-MAY-11
Report Date: 26-MAY-11 18:19 (MT)
Version: FINAL

Client Phone: 604-253-4188

Certificate of Analysis

Lab Work Order #: L1008285
Project P.O. #: 606989
Job Reference: 09-1427-0006
Legal Site Desc:
C of C Numbers:

Can Dang
Senior Account Manager

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ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1008285-1	L1008285-2	L1008285-3		
Grouping Analyte						
WATER						
Physical Tests	Hardness (as CaCO ₃) (mg/L)	34.5	35.7	99.5		
	Total Suspended Solids (mg/L)	6.7	279	163		
	Total Dissolved Solids (mg/L)	59.5	61.9	146		
	Turbidity (NTU)	3.05	94.9	134		
Anions and Nutrients	Acidity (as CaCO ₃) (mg/L)	3.4	3.3	2.3		
	Alkalinity, Bicarbonate (as CaCO ₃) (mg/L)	32.4	33.6	53.2		
	Alkalinity, Carbonate (as CaCO ₃) (mg/L)	<1.0	<1.0	<1.0		
	Alkalinity, Hydroxide (as CaCO ₃) (mg/L)	<1.0	<1.0	<1.0		
	Alkalinity, Total (as CaCO ₃) (mg/L)	32.4	33.6	53.2		
	Ammonia (as N) (mg/L)	0.105	0.104	0.123		
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050		
	Chloride (Cl) (mg/L)	2.07	2.06	10.6		
	Fluoride (F) (mg/L)	0.075	0.076	0.075		
	Nitrate and Nitrite (as N) (mg/L)	0.0345	0.0352	0.136		
	Nitrate (as N) (mg/L)	0.0345	0.0352	0.133		
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	0.0034		
	Total Kjeldahl Nitrogen (mg/L)	0.941	0.957	0.948		
	Phosphorus (P)-Total Dissolved (mg/L)	0.0087	0.0086	0.0083		
	Phosphorus (P)-Total (mg/L)	0.0357	0.175	0.077		
	Sulfate (SO ₄) (mg/L)	3.21	3.26	39.3		
	Sulphide as S (mg/L)	<0.020	<0.020	0.025		
Cyanides	Cyanide, Total (mg/L)	0.0088	0.0072	0.0098		
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	10.4	10.3	11.5		
	Total Organic Carbon (mg/L)	11.7	13.2	12.9		
Total Metals	Aluminum (Al)-Total (mg/L)	0.144	5.13	2.03		
	Antimony (Sb)-Total (mg/L)	0.00168	0.00420	0.124		
	Arsenic (As)-Total (mg/L)	0.0343	0.120	0.430		
	Barium (Ba)-Total (mg/L)	0.012	0.064	0.022		
	Beryllium (Be)-Total (mg/L)	<0.0050	<0.0050	<0.0050		
	Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20		
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10		
	Cadmium (Cd)-Total (mg/L)	<0.000050	<0.000050	0.000569		
	Calcium (Ca)-Total (mg/L)	8.93	11.2	30.2		
	Chromium (Cr)-Total (mg/L)	<0.010	0.012	<0.010		
	Cobalt (Co)-Total (mg/L)	<0.010	<0.010	<0.010		
	Copper (Cu)-Total (mg/L)	0.00068	0.00763	0.0413		

* 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		L1008285-1	L1008285-2	L1008285-3		
Grouping Analyte						
WATER						
Total Metals	Iron (Fe)-Total (mg/L)	0.405	6.02	3.82		
	Lead (Pb)-Total (mg/L)	0.000186	0.00519	0.0729		
	Lithium (Li)-Total (mg/L)	<0.010	0.011	<0.010		
	Magnesium (Mg)-Total (mg/L)	2.81	5.05	7.98		
	Manganese (Mn)-Total (mg/L)	0.479	0.584	0.401		
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	0.000028		
	Molybdenum (Mo)-Total (mg/L)	0.000405	0.000481	0.00108		
	Nickel (Ni)-Total (mg/L)	<0.00050	0.00738	0.00961		
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30		
	Potassium (K)-Total (mg/L)	<2.0	2.5	2.4		
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010	0.00015		
	Silicon (Si)-Total (mg/L)	0.544	9.40	3.31		
	Silver (Ag)-Total (mg/L)	<0.010	<0.010	<0.010		
	Sodium (Na)-Total (mg/L)	2.0	2.7	6.6		
	Strontium (Sr)-Total (mg/L)	0.0327	0.0484	0.0820		
	Thallium (Tl)-Total (mg/L)	<0.20	<0.20	<0.20		
	Tin (Sn)-Total (mg/L)	<0.030	<0.030	<0.030		
	Titanium (Ti)-Total (mg/L)	<0.010	0.199	0.039		
	Uranium (U)-Total (mg/L)	0.000329	0.000673	0.000723		
	Vanadium (V)-Total (mg/L)	<0.030	<0.030	<0.030		
	Zinc (Zn)-Total (mg/L)	<0.0040	0.0174	0.122		
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0070	0.182	0.0157		
	Antimony (Sb)-Dissolved (mg/L)	0.00156	0.00166	0.0359		
	Arsenic (As)-Dissolved (mg/L)	0.0233	0.0255	0.0729		
	Barium (Ba)-Dissolved (mg/L)	<0.010	0.013	<0.010		
	Beryllium (Be)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050		
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20		
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10		
	Cadmium (Cd)-Dissolved (mg/L)	<0.000050	<0.000050	0.000164		
	Calcium (Ca)-Dissolved (mg/L)	9.08	9.45	29.0		
	Chromium (Cr)-Dissolved (mg/L)	<0.010	<0.010	<0.010		
	Cobalt (Co)-Dissolved (mg/L)	<0.010	<0.010	<0.010		
	Copper (Cu)-Dissolved (mg/L)	<0.00050	0.00086	0.0118		
	Iron (Fe)-Dissolved (mg/L)	0.086	0.252	0.041		
	Lead (Pb)-Dissolved (mg/L)	<0.000050	0.000177	0.000840		
	Lithium (Li)-Dissolved (mg/L)	<0.010	<0.010	<0.010		
	Magnesium (Mg)-Dissolved (mg/L)	2.86	2.93	6.58		

* 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		L1008285-1	L1008285-2	L1008285-3		
Grouping	Analyte					
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	<0.0050	0.0776	0.296		
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010		
	Molybdenum (Mo)-Dissolved (mg/L)	0.000350	0.000390	0.00117		
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	0.00264		
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30		
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	2.1		
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		
	Silicon (Si)-Dissolved (mg/L)	0.326	1.08	0.702		
	Silver (Ag)-Dissolved (mg/L)	<0.010	<0.010	<0.010		
	Sodium (Na)-Dissolved (mg/L)	2.1	2.1	6.7		
	Strontium (Sr)-Dissolved (mg/L)	0.0327	0.0357	0.0786		
	Thallium (Tl)-Dissolved (mg/L)	<0.20	<0.20	<0.20		
	Tin (Sn)-Dissolved (mg/L)	<0.030	<0.030	<0.030		
	Titanium (Ti)-Dissolved (mg/L)	<0.010	0.015	<0.010		
	Uranium (U)-Dissolved (mg/L)	0.000211	0.000231	0.000579		
	Vanadium (V)-Dissolved (mg/L)	<0.030	<0.030	<0.030		
	Zinc (Zn)-Dissolved (mg/L)	<0.0040	<0.0040	0.0174		

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

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
SFPL	Sample was Filtered and Preserved at the laboratory - dissolved metals

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
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-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-N+N-CALC-VA	Water	Nitrite & Nitrate in Water (Calculation)	EPA 300.0
Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).			
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".			
CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CN-T-MID-HH-COL-VA	Water	Total Cyanide by HH Distillation	APHA 4500-CN Cyanide
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			
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-LOW-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS(Low)	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-LOW-CVAFS-VA	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7

Reference Information

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

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

MET-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-DIS-LOW-ICP-VA Water Dissolved Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

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

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

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

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

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

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

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.

OGG-LL-SF-VA Water Oil & Grease by Gravimetric BCMOE GRAVIMETRIC

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3510 & 9071, published by the United States Environmental Protection Agency (EPA), "Standard Methods for the Examination of Water and Wastewater", 20th ed., Method 5520, published by the American Public Health Association, and "BC Environmental Laboratory Manual for the Analysis of Water, Wastewater, Sediment and Biological Materials," 5th ed., published by the B.C. Ministry of Environment, Lands & Parks, 1994. The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease. ALS Environmental's routine detection limit, or Limit of Reporting (LOR), for this method is 2 mg/L for a 1L sample volume. By request, a LOR of 1 mg/L is sometimes applied for this method. The 1 mg/L LOR is equal to the 99% confidence limit Method Detection Limit as defined by the US EPA. A higher degree of variability is expected at levels below 2 mg/L.

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.

P-TD-COL-VA Water Total Dissolved P in Water 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.

S2-T-COL-VA Water Total Sulphide by Colorimetric APHA 4500-S2 Sulphide

This analysis is carried out using procedures adapted from APHA Method 4500-S2 "Sulphide". Sulphide is determined using the methylene blue colourimetric method.

TDS-LOW-VA Water Low Level TDS (3.0mg/L) 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-SIE-VA Water TKN in Water by SIE APHA 4500-NORG (TKN)

Reference Information

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.

TSS-LOW-VA Water Total Suspended Solids by Grav. (1 mg/L) APHA 2540 Gravimetric

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

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

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

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

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

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

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

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

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

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

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

mg/kg 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.

RUSH

Chain C

COC #

Page 1 of 3

Priority processing

[illegible]



GOLDER ASSOCIATES LTD
ATTN: JUSTINE CROWE
9 - 4905 48 Street
Yellowknife NT X1A 3S3

Date Received: 18-MAY-11
Report Date: 25-MAY-11 15:35 (MT)
Version: FINAL

Client Phone: 897-669-6735

Certificate of Analysis

Lab Work Order #: L1006658
Project P.O. #: 606989
Job Reference: 09-1427-0006
Legal Site Desc:
C of C Numbers: 1

Shannon Luchka
Account Manager

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ADDRESS: 9936-67 Avenue, Edmonton, AB T6E 0P5 Canada | Phone: +1 780 413 5227 | Fax: +1 780 437 2311
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	L1006658-1 WATER 18-MAY-11 REACH 4 (GIANT POOL)				
Grouping	Analyte						
WATER							
Physical Tests	Total Suspended Solids (mg/L)	72.0					
	Total Dissolved Solids (mg/L)	123					
	Turbidity (NTU)	142					
Anions and Nutrients	Acidity (as CaCO ₃) (mg/L)	<5.0					
	Alkalinity, Total (as CaCO ₃) (mg/L)	45.8					
	Ammonia (as N) (mg/L)	0.145					
	Bicarbonate (HCO ₃) (mg/L)	55.9					
	Bromide (Br) (mg/L)	<0.10					
	Carbonate (CO ₃) (mg/L)	<5.0					
	Chloride (Cl) (mg/L)	5.34					
	Conductivity (EC) (uS/cm)	160					
	Fluoride (F) (mg/L)	<0.050					
	Hardness (as CaCO ₃) (mg/L)	64.9					
	Hydroxide (OH) (mg/L)	<5.0					
	Ion Balance (%)	97.4					
	Nitrate and Nitrite (as N) (mg/L)	0.0503					
	Nitrate (as N) (mg/L)	0.0475					
	Nitrite (as N) (mg/L)	0.0028					
	Total Kjeldahl Nitrogen (mg/L)	1.03					
	pH (pH)	7.89					
	Phosphorus (P)-Total Dissolved (mg/L)	0.0080					
	Phosphorus (P)-Total (mg/L)	0.0995					
	TDS (Calculated) (mg/L)	84.2					
	Sulfate (SO ₄) (mg/L)	22.9					
	Sulphide (mg/L)	0.0027					
Cyanides	Cyanide, Total (mg/L)	0.0080					
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	11.8					
	Total Organic Carbon (mg/L)	12.5					
Total Metals	Aluminum (Al)-Total (mg/L)	2.21					
	Antimony (Sb)-Total (mg/L)	0.124					
	Arsenic (As)-Total (mg/L)	0.346					
	Barium (Ba)-Total (mg/L)	0.0177					
	Beryllium (Be)-Total (mg/L)	<0.0010					
	Bismuth (Bi)-Total (mg/L)	<0.00020					
	Boron (B)-Total (mg/L)	<0.020					
	Cadmium (Cd)-Total (mg/L)	0.00052					

* 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	L1006658-1 WATER 18-MAY-11 REACH 4 (GIANT POOL)				
Grouping	Analyte						
WATER							
Total Metals	Calcium (Ca)-Total (mg/L)	22.0					
	Chromium (Cr)-Total (mg/L)	0.00524					
	Cobalt (Co)-Total (mg/L)	0.00318					
	Copper (Cu)-Total (mg/L)	0.0342					
	Iron (Fe)-Total (mg/L)	4.17					
	Lead (Pb)-Total (mg/L)	0.0660					
	Magnesium (Mg)-Total (mg/L)	6.22					
	Manganese (Mn)-Total (mg/L)	0.447					
	Mercury (Hg)-Total (mg/L)	0.000030					
	Molybdenum (Mo)-Total (mg/L)	0.00111					
	Nickel (Ni)-Total (mg/L)	0.00969					
	Potassium (K)-Total (mg/L)	1.89					
	Selenium (Se)-Total (mg/L)	<0.00040					
	Silver (Ag)-Total (mg/L)	<0.00040					
	Sodium (Na)-Total (mg/L)	4.0					
	Strontium (Sr)-Total (mg/L)	0.0624					
	Thallium (Tl)-Total (mg/L)	<0.00010					
	Tin (Sn)-Total (mg/L)	<0.00040					
	Titanium (Ti)-Total (mg/L)	0.0430					
	Uranium (U)-Total (mg/L)	0.00048					
	Vanadium (V)-Total (mg/L)	0.00583					
	Zinc (Zn)-Total (mg/L)	0.0936					
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.014					
	Antimony (Sb)-Dissolved (mg/L)	0.0233					
	Arsenic (As)-Dissolved (mg/L)	0.0707					
	Barium (Ba)-Dissolved (mg/L)	0.00526					
	Beryllium (Be)-Dissolved (mg/L)	<0.00050					
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050					
	Boron (B)-Dissolved (mg/L)	0.0131					
	Cadmium (Cd)-Dissolved (mg/L)	0.00015					
	Calcium (Ca)-Dissolved (mg/L)	18.6					
	Chromium (Cr)-Dissolved (mg/L)	<0.00040					
	Cobalt (Co)-Dissolved (mg/L)	0.00109					
	Copper (Cu)-Dissolved (mg/L)	0.00929					
	Iron (Fe)-Dissolved (mg/L)	0.045					
	Lead (Pb)-Dissolved (mg/L)	0.00092					
	Magnesium (Mg)-Dissolved (mg/L)	4.48					

* 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		L1006658-1 WATER 18-MAY-11 REACH 4 (GIANT POOL)				
Grouping	Analyte					
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	0.344				
	Mercury (Hg)-Dissolved (mg/L)	<0.000020				
	Molybdenum (Mo)-Dissolved (mg/L)	0.00098				
	Nickel (Ni)-Dissolved (mg/L)	0.00318				
	Potassium (K)-Dissolved (mg/L)	1.50				
	Selenium (Se)-Dissolved (mg/L)	<0.00040				
	Silver (Ag)-Dissolved (mg/L)	<0.00020				
	Sodium (Na)-Dissolved (mg/L)	3.7				
	Strontium (Sr)-Dissolved (mg/L)	0.0541				
	Thallium (Tl)-Dissolved (mg/L)	<0.000050				
	Tin (Sn)-Dissolved (mg/L)	<0.00020				
	Titanium (Ti)-Dissolved (mg/L)	0.00045				
	Uranium (U)-Dissolved (mg/L)	0.00040				
	Vanadium (V)-Dissolved (mg/L)	0.00021				
	Zinc (Zn)-Dissolved (mg/L)	0.0150				
Aggregate Organics	Oil and Grease (mg/L)	<1.0				

* 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
E	Matrix Spike recovery outside ALS DQO due to analyte background in sample.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACIDITY-ED	Water	Acidity (as CaCO ₃)	APHA 2310 B - Potentiometric Titration
BR-IC-ED	Water	Bromide by IC	APHA 4110 B-ION CHROMATOGRAPHY
C-DIS-ORG-ED	Water	Dissolved Organic Carbon	APHA 5310 B-Instrumental
C-TOT-ORG-ED	Water	Total Organic Carbon	APHA 5310 B-Instrumental
CL-IC-ED	Water	Chloride by IC	APHA 4110 B-ION CHROMATOGRAPHY
CN-TOT-YL	Water	Cyanide, Total	APHA 4500 CN-O
Total Cyanide in Water: Simple cyanides are converted to hydrogen cyanide (HCN) by distillation. Complex cyanides are not easily decomposed. Low power UV radiation is used to break down organic, metallic and alkali complexed compounds to free cyanide. The distillation step isolates HCN from simple cyanides under specific acidic conditions. The liberated HCN is converted to cyanogen chloride with chloramine-T. This further reacts with barbituric acid and isonicotinic acid to form a highly coloured complex.			
F-IC-ED	Water	Fluoride by IC	APHA 4110 B-ION CHROMATOGRAPHY
HG-D-L-CVAA-ED	Water	Mercury (Hg) - Dissolved	EPA 245.7 / EPA 245.1
HG-T-L-CVAA-ED	Water	Mercury (Hg)	EPA 245.7 / EPA 245.1
IONBALANCE-ED	Water	Ion Balance Calculation	APHA 1030E
MET-D-L-ICP-ED	Water	Diss. Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-D-L-MS-ED	Water	Diss. Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
MET-T-L-ICP-ED	Water	Total Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-T-L-MS-ED	Water	Total Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
NH3-L-CFA-ED	Water	Ammonia in Water 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 automated phenate colourimetric method.			
NO2+NO3-L-CFA-ED	Water	Nitrite & Nitrate in Water by Colour	APHA 4500 NO3-F
This analysis is carried out using procedures adapted from APHA Method 4500 NO3-F "Automated Cadmium Reduction Method".			
NO2-L-CFA-ED	Water	Nitrite in Water by Colour	APHA 4500 NO2-A and NO3-F
This analysis is carried out using procedures adapted from APHA Method 4500 NO3-F "Automated Cadmium Reduction Method", omitting the Cu-Cd reduction step to be selective for nitrite.			
NO3-L-CALC-ED	Water	Nitrate in Water (Calculation)	APHA 4500 NO3-F
Nitrate (as N) is a calculated parameter. Nitrate (as N) = [Nitrate and Nitrite (as N)] - Nitrite (as N).			
OGG-ED	Water	Oil and Grease-Gravimetric	APHA 5520 G HEXANE MTBE EXT. GRAVIME
P-T-L-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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-L-COL-ED	Water	Total Dissolved P in Water by Colour	APHA 4500-P PHOSPHORUS
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/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320
SO4-L-IC-ED	Water	Sulfate by IC (Low Level)	APHA 4110 B-ION CHROMATOGRAPHY
SOLIDS-TDS-ED	Water	Total Dissolved Solids	APHA 2540 C
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
SULPHIDE-ED	Water	Sulphide	APHA 4500 -S E-Auto-Colorimetry
TKN-L-CFA-ED	Water	TKN in Water by Colour	APHA 4500-NORG (TKN)
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 celcius with analysis using an automated colourimetric finish.			
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer

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
YL	ALS ENVIRONMENTAL - YELLOWKNIFE, NW, 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.



L1006658

COC #

Page ____ of ____

Report To		F		Service Requested (Rush for routine analysis subject to availability)															
Company: Deton/Cho/Nuna Joint Venture AND Golder As. Ltd.		<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other		<input type="radio"/> Regular (Standard Turnaround Times - Business Days)															
Contact: DCNJV: Katrina Nokleby; Golder: Justine Crowe		<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax		<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT															
Address:		Email 1: jcrowe@golder.com		<input checked="" type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT															
		Email 2: hmachtans@golder.com		<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT															
Phone: 867 669 6735 Fax:		Email 3: KatrinaN@nunalogistics.com		Analysis Request															
Invoice To Same as Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Client / Project Information		Please indicate below Filtered, Preserved or both (F, P, F/P)															
Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Job #: 09-1427-0006																	
Company: Deton/Cho/Nuna Joint Venture		PO / AFE: 606989																	
Contact: Brenda Kalis		LSD:																	
Address: 9838-31st Avenue., Edmonton AB, T6N 1C5																			
Phone: 780 408 2897 Fax: 780 408 5472		Quote #:																	
Lab Work Order # (lab use only)		ALS Contact: Can Dang		Sampler: Justine Crowe															
Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Physical Parameters	Major Ions	Cyanide	TSS and Turbidity	Nutrients	NH3 / TKN	Oil and Grease	TOC	DOC	Low Level Total Metals	Low Level Dissolved Metals	Sulphide	Number of Containers		
	Reach 3 (Surface Water)	18-May-11		Surface Water				X									1		
	Reach 5 (Shallow d/s Road)	18-May-11		Surface Water				X									1		
	Reach 8 (BC Exposure Unit (P.M.))	18-May-11		Surface Water				X									1		
	Reach 4 (Giant Pool)	18-May-11		Surface Water	X	X	X	X	X	X	X	X	X	X	X	X	9		
	Upper Reach 1 (d/s of bridge)	18-May-11		Surface Water				X									1		
	Upper Reach 2 (pool)	18-May-11		Surface Water				X									1		
	Upper Reach 1 (d/s culvert)	18-May-11		Surface Water				X									1		
	SNP 10-9	18-May-11		Surface Water				X									1		
	Reach 9 (BC Mouth)	18-May-11		Surface Water				X									1		
	SNP 13-11	18-May-11		Surface Water				X									1		
Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details																			
Please Analyze As and Se by Hydride*. Note - This water might contain high amounts of metals. All Samples are RUSH / EMERGENCY!!!!																			
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.																			
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.																			
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.																			
SHIPMENT RELEASE (client use)				SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)											
Released by:	Date (dd-mmm-yy)	Time (hh-mm)		Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:		Observations:							
J. Crowe	18-May	16:10			18-May	16:10	6.6 °C					Yes / No ?							
													If Yes add SIF						



Golder Associates Ltd.
ATTN: Hilary Machtans
9 - 4905 48 Street
Yellowknife NT X1A 3S3

Date Received: 18-MAY-11
Report Date: 21-MAY-11 14:16 (MT)
Version: FINAL

Client Phone: 867-873-6319

Certificate of Analysis

Lab Work Order #: L1006655
Project P.O. #: 606989
Job Reference: 09-1427-0006
Legal Site Desc:
C of C Numbers: 1

Shannon Luchka
Account Manager

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ADDRESS: 9936-67 Avenue, Edmonton, AB T6E 0P5 Canada | Phone: +1 780 413 5227 | Fax: +1 780 437 2311
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

		Sample ID	L1006655-1	L1006655-2	L1006655-3	L1006655-4	L1006655-5
		Description	WATER	WATER	WATER	WATER	WATER
		Sampled Date	18-MAY-11	18-MAY-11	18-MAY-11	18-MAY-11	18-MAY-11
		Sampled Time					
		Client ID	REACH 7 OVERFLOW U/S ROAD	REACH 7 OVERFLOW D/S ROAD	REACH 6 BC EXPOSURE POINT (ABOVE)	UPPER REACH 3 (D/S OF BRIDGE)	UPPER REACH 2 (POOL)
Grouping	Analyte						
WATER							
Physical Tests	Total Suspended Solids (mg/L)	<3.0	11.0	79.0	72.0	72.0	
	Turbidity (NTU)	7.69	30.7	491	130	129	

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1006655-6	L1006655-7	L1006655-8		
		Description	WATER	WATER	WATER		
		Sampled Date	18-MAY-11	18-MAY-11	18-MAY-11		
		Sampled Time					
		Client ID	UPPER REACH 1 (U/S CULVERT)	SNP 43-5	REACH 0 (BC MOUTH)		
Grouping	Analyte						
WATER							
Physical Tests	Total Suspended Solids (mg/L)		66.0	67.0	98.0		
	Turbidity (NTU)		117	149	160		

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer

** 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

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.



L/006655

COC #

Page of

Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)													
Company: Deton'Cho/Nuna Joint Venture AND Golder As. Ltd.		<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other		<input type="radio"/> Regular (Standard Turnaround Times - Business Days) <input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT <input checked="" type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT													
Contact: DCNJV: Katrina Nokleby; Golder: Justine Crowe		<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax															
Address:		Email 1: jcrowe@golder.com															
		Email 2: hmachtans@golder.com															
Phone: 867 669 6735 Fax:		Email 3: KatrinaN@nunalogistics.com															
Invoice To Same as Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Client / Project Information		Analysis Request													
Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Job #: 09-1427-0006		Please indicate below Filtered, Preserved or both (F, P, F/P)													
Company: Deton'Cho/Nuna Joint Venture		PO / AFE: 606989															
Contact: Brenda Kalls		LSD:															
Address: 9838-31st Avenue., Edmonton AB, T6N 1C5																	
Phone: 780 408 2897 Fax: 780 408 5472		Quote #:															
Lab Work Order # (lab use only)		ALS Contact: Can Dang		Sampler: Justine Crowe													
Sample #	Sample Identification (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	Physical Parameters	Major Ions	Cyanide	TSS and Turbidity	Nutrients	NH3 / TKN	Oil and Grease	TOC	DOC	Low Level Total Metals	Low Level Dissolved Metals	Sulphide	Number of Containers
	Reach 7 Overflow u/s Road	18-May-11		Surface Water				X									1
	Reach 7 Overflow d/s Road	18-May-11		Surface Water				X									1
	Reach 6 BC Exposure Point (Above)	18-May-11		Surface Water				X									1
	Reach 4 (Plant Pool)	18-May-11		Surface Water	X	X	X	X	X	X	X	X	X	X	X	X	1
	Upper Reach 3 (d/s of bridge)	18-May-11		Surface Water				X									1
	Upper Reach 2 (pool)	18-May-11		Surface Water				X									1
	Upper Reach 1 (u/s culvert)	18-May-11		Surface Water				X									1
	SNP43-5	18-May-11		Surface Water				X									1
	Reach 0 (BC Mouth)	18-May-11		Surface Water				X									1
	SNP43-11	18-May-11		Surface Water				X									1
Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details																	
Please Analyze As and Se by Hydride*. Note - This water might contain high amounts of metals. All Samples are RUSH / EMERGENCY!!!!																	
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:							
<i>J. Crowe</i>	18-May-11	16:10	<i>RJS</i>	18-May-11	16:10	6.6 °C				Yes / No ? If Yes add SIF							



Golder Associates Ltd.
ATTN: Justine Crowe
9 - 4905 48 Street
Yellowknife NT X1A 3S3

Date Received: 20-MAY-11
Report Date: 21-MAY-11 14:17 (MT)
Version: FINAL

Client Phone: 867-873-6319

Certificate of Analysis

Lab Work Order #: L1007648
Project P.O. #: 606989
Job Reference: 09-1427-0006
Legal Site Desc:
C of C Numbers:

Shannon Luchka
Account Manager

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ADDRESS: 9936-67 Avenue, Edmonton, AB T6E 0P5 Canada | Phone: +1 780 413 5227 | Fax: +1 780 437 2311
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		L1007648-1 SURFACE WATE 19-MAY-11 11:05 REACH 2 (POOL)	L1007648-2 SURFACE WATE 19-MAY-11 10:40 REACH 4 (GIANT POOL)	L1007648-3 SURFACE WATE 19-MAY-11 10:25 REACH 6 BC EXPOSURE POINT (ABOVE)	L1007648-4 SURFACE WATE 19-MAY-11 11:40 REACH 0 (BC MOUTH)	
Grouping	Analyte					
WATER						
Physical Tests	Total Suspended Solids (mg/L)	36.0	29.0	460	55.0	
	Turbidity (NTU)	63.8	53.0	468	67.9	

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer

** 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

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

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

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

mg/kg 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]



DETON'CHO \ NUNA JOINT VENTURE
ATTN: KATRINA NOKLEBY AND GOLDER
GIANT MINESITE
PO BOX 2951
Yellowknife NT X1A 2R2

Date Received: 20-MAY-11
Report Date: 26-MAY-11 18:24 (MT)
Version: FINAL

Client Phone: 604-253-4188

Certificate of Analysis

Lab Work Order #: L1007649
Project P.O. #: 606989
Job Reference: 09-1427-0006
Legal Site Desc:
C of C Numbers: 1

Comments:

Can Dang
Senior Account Manager

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ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1007649-1 WATER 20-MAY-11 SNP 43-5	L1007649-2 20-MAY-11 FIELD BLANK	L1007649-3 20-MAY-11 TRAVEL BLANK	L1007649-4 20-MAY-11 REACH 0 (BC MOUTH)	L1007649-5 20-MAY-11 REACH 4 (GIANT POOL)
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	74.0	0.57	<0.50		
	Total Suspended Solids (mg/L)	41.1	<1.0	<1.0	53.2	26.8
	Total Dissolved Solids (mg/L)	125	<3.0	<3.0		
	Turbidity (NTU)	47.1	0.34	0.27	48.4	30.3
Anions and Nutrients	Acidity (as CaCO3) (mg/L)	3.2	1.8	2.9		
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	45.6	1.1	<1.0		
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0		
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0		
	Alkalinity, Total (as CaCO3) (mg/L)	45.6	1.1	<1.0		
	Ammonia (as N) (mg/L)	0.0922	<0.0050	<0.0050		
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050		
	Chloride (Cl) (mg/L)	8.80	<0.50	<0.50		
	Fluoride (F) (mg/L)	0.074	<0.020	<0.020		
	Nitrate and Nitrite (as N) (mg/L)	0.0458	<0.0051	<0.0051		
	Nitrate (as N) (mg/L)	0.0458	<0.0050	<0.0050		
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010		
	Total Kjeldahl Nitrogen (mg/L)	0.852	<0.050	<0.050		
	Phosphorus (P)-Total Dissolved (mg/L)	0.0083	<0.0020	<0.0020		
	Phosphorus (P)-Total (mg/L)	0.0677	<0.0020	<0.0020		
	Sulfate (SO4) (mg/L)	28.7	<0.50	<0.50		
	Sulphide as S (mg/L)	<0.020	<0.020	<0.020		
Cyanides	Cyanide, Total (mg/L)	0.0059	<0.0050	<0.0050		
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	11.0	<0.50	<0.50		
	Total Organic Carbon (mg/L)	12.2	0.59 ^{RRV}	0.60 ^{RRV}		
Total Metals	Aluminum (Al)-Total (mg/L)	1.37	<0.0030	<0.0030		
	Antimony (Sb)-Total (mg/L)	0.0554	<0.00010	<0.00010		
	Arsenic (As)-Total (mg/L)	0.180	<0.00010	<0.00010		
	Barium (Ba)-Total (mg/L)	0.021	<0.010	<0.010		
	Beryllium (Be)-Total (mg/L)	<0.0050	<0.0050	<0.0050		
	Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20		
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10		
	Cadmium (Cd)-Total (mg/L)	0.000167	<0.000050	<0.000050		
	Calcium (Ca)-Total (mg/L)	21.9	<0.050	<0.050		
	Chromium (Cr)-Total (mg/L)	<0.010	<0.010	<0.010		
	Cobalt (Co)-Total (mg/L)	<0.010	<0.010	<0.010		
	Copper (Cu)-Total (mg/L)	0.0181	<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		L1007649-6 20-MAY-11 REACH 2 (POOL)	L1007649-7 20-MAY-11 REACH 6 EXPOSURE POINT (ABOVE)		
Grouping	Analyte				
WATER					
Physical Tests	Hardness (as CaCO3) (mg/L)				
	Total Suspended Solids (mg/L)	43.6	517		
	Total Dissolved Solids (mg/L)				
	Turbidity (NTU)	44.2	349		
Anions and Nutrients	Acidity (as CaCO3) (mg/L)				
	Alkalinity, Bicarbonate (as CaCO3) (mg/L)				
	Alkalinity, Carbonate (as CaCO3) (mg/L)				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)				
	Alkalinity, Total (as CaCO3) (mg/L)				
	Ammonia (as N) (mg/L)				
	Bromide (Br) (mg/L)				
	Chloride (Cl) (mg/L)				
	Fluoride (F) (mg/L)				
	Nitrate and Nitrite (as N) (mg/L)				
	Nitrate (as N) (mg/L)				
	Nitrite (as N) (mg/L)				
	Total Kjeldahl Nitrogen (mg/L)				
	Phosphorus (P)-Total Dissolved (mg/L)				
	Phosphorus (P)-Total (mg/L)				
	Sulfate (SO4) (mg/L)				
	Sulphide as S (mg/L)				
Cyanides	Cyanide, Total (mg/L)				
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)				
	Total Organic Carbon (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)				
	Chromium (Cr)-Total (mg/L)				
	Cobalt (Co)-Total (mg/L)				
	Copper (Cu)-Total (mg/L)				

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L1007649-1 WATER 20-MAY-11 SNP 43-5	L1007649-2 20-MAY-11 FIELD BLANK	L1007649-3 20-MAY-11 TRAVEL BLANK	L1007649-4 20-MAY-11 REACH 0 (BC MOUTH)	L1007649-5 20-MAY-11 REACH 4 (GIANT POOL)
Grouping	Analyte						
WATER							
Total Metals	Iron (Fe)-Total (mg/L)	2.10	<0.010	<0.010			
	Lead (Pb)-Total (mg/L)	0.0206	<0.000050	<0.000050			
	Lithium (Li)-Total (mg/L)	<0.010	<0.010	<0.010			
	Magnesium (Mg)-Total (mg/L)	6.04	<0.10	<0.10			
	Manganese (Mn)-Total (mg/L)	0.335	<0.0050	<0.0050			
	Mercury (Hg)-Total (mg/L)	0.000011	<0.000010	<0.000010			
	Molybdenum (Mo)-Total (mg/L)	0.000932	<0.000050	<0.000050			
	Nickel (Ni)-Total (mg/L)	0.00638	<0.00050	<0.00050			
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30			
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0			
	Selenium (Se)-Total (mg/L)	0.00010	<0.00010	<0.00010			
	Silicon (Si)-Total (mg/L)	2.73	<0.050	<0.050			
	Silver (Ag)-Total (mg/L)	<0.010	<0.010	<0.010			
	Sodium (Na)-Total (mg/L)	5.5	<2.0	<2.0			
	Strontium (Sr)-Total (mg/L)	0.0784	<0.0050	<0.0050			
	Thallium (Tl)-Total (mg/L)	<0.20	<0.20	<0.20			
	Tin (Sn)-Total (mg/L)	<0.030	<0.030	<0.030			
	Titanium (Ti)-Total (mg/L)	0.037	<0.010	<0.010			
	Uranium (U)-Total (mg/L)	0.000597	<0.000010	<0.000010			
	Vanadium (V)-Total (mg/L)	<0.030	<0.030	<0.030			
	Zinc (Zn)-Total (mg/L)	0.0379	<0.0040	<0.0040			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0116	<0.0030	<0.0030			
	Antimony (Sb)-Dissolved (mg/L)	0.0228	<0.00010	<0.00010			
	Arsenic (As)-Dissolved (mg/L)	0.0715	<0.00010	<0.00010			
	Barium (Ba)-Dissolved (mg/L)	0.010	<0.010	<0.010			
	Beryllium (Be)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050			
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20			
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10			
	Cadmium (Cd)-Dissolved (mg/L)	0.000081	<0.000050	<0.000050			
	Calcium (Ca)-Dissolved (mg/L)	21.0	0.229	<0.050			
	Chromium (Cr)-Dissolved (mg/L)	<0.010	<0.010	<0.010			
	Cobalt (Co)-Dissolved (mg/L)	<0.010	<0.010	<0.010			
	Copper (Cu)-Dissolved (mg/L)	0.00722	<0.00050	<0.00050			
	Iron (Fe)-Dissolved (mg/L)	0.059	<0.010	<0.010			
	Lead (Pb)-Dissolved (mg/L)	0.000741	<0.000050	<0.000050			
	Lithium (Li)-Dissolved (mg/L)	<0.010	<0.010	<0.010			
	Magnesium (Mg)-Dissolved (mg/L)	5.23	<0.10	<0.10			

* 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	L1007649-6 20-MAY-11 REACH 2 (POOL)	L1007649-7 20-MAY-11 REACH 6 EXPOSURE POINT (ABOVE)			
Grouping	Analyte						
WATER							
Total Metals	Iron (Fe)-Total (mg/L)						
	Lead (Pb)-Total (mg/L)						
	Lithium (Li)-Total (mg/L)						
	Magnesium (Mg)-Total (mg/L)						
	Manganese (Mn)-Total (mg/L)						
	Mercury (Hg)-Total (mg/L)						
	Molybdenum (Mo)-Total (mg/L)						
	Nickel (Ni)-Total (mg/L)						
	Phosphorus (P)-Total (mg/L)						
	Potassium (K)-Total (mg/L)						
	Selenium (Se)-Total (mg/L)						
	Silicon (Si)-Total (mg/L)						
	Silver (Ag)-Total (mg/L)						
	Sodium (Na)-Total (mg/L)						
	Strontium (Sr)-Total (mg/L)						
	Thallium (Tl)-Total (mg/L)						
	Tin (Sn)-Total (mg/L)						
	Titanium (Ti)-Total (mg/L)						
	Uranium (U)-Total (mg/L)						
	Vanadium (V)-Total (mg/L)						
	Zinc (Zn)-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)						
	Chromium (Cr)-Dissolved (mg/L)						
	Cobalt (Co)-Dissolved (mg/L)						
	Copper (Cu)-Dissolved (mg/L)						
	Iron (Fe)-Dissolved (mg/L)						
	Lead (Pb)-Dissolved (mg/L)						
	Lithium (Li)-Dissolved (mg/L)						
	Magnesium (Mg)-Dissolved (mg/L)						

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1007649-1 WATER 20-MAY-11 SNP 43-5	L1007649-2 20-MAY-11 FIELD BLANK	L1007649-3 20-MAY-11 TRAVEL BLANK	L1007649-4 20-MAY-11 REACH 0 (BC MOUTH)	L1007649-5 20-MAY-11 REACH 4 (GIANT POOL)
Grouping	Analyte					
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	0.300	<0.0050	<0.0050		
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010		
	Molybdenum (Mo)-Dissolved (mg/L)	0.000865	<0.000050	<0.000050		
	Nickel (Ni)-Dissolved (mg/L)	0.00341	<0.00050	<0.00050		
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30		
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0		
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		
	Silicon (Si)-Dissolved (mg/L)	0.550	<0.050	<0.050		
	Silver (Ag)-Dissolved (mg/L)	<0.010	<0.010	<0.010		
	Sodium (Na)-Dissolved (mg/L)	5.2	<2.0	<2.0		
	Strontium (Sr)-Dissolved (mg/L)	0.0736	<0.0050	<0.0050		
	Thallium (Tl)-Dissolved (mg/L)	<0.20	<0.20	<0.20		
	Tin (Sn)-Dissolved (mg/L)	<0.030	<0.030	<0.030		
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010		
	Uranium (U)-Dissolved (mg/L)	0.000530	<0.000010	<0.000010		
	Vanadium (V)-Dissolved (mg/L)	<0.030	<0.030	<0.030		
	Zinc (Zn)-Dissolved (mg/L)	0.0088	<0.0040	<0.0040		

* 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		L1007649-6 20-MAY-11 REACH 2 (POOL)	L1007649-7 20-MAY-11 REACH 6 EXPOSURE POINT (ABOVE)			
Grouping	Analyte					
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)					
	Mercury (Hg)-Dissolved (mg/L)					
	Molybdenum (Mo)-Dissolved (mg/L)					
	Nickel (Ni)-Dissolved (mg/L)					
	Phosphorus (P)-Dissolved (mg/L)					
	Potassium (K)-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)					
	Thallium (Tl)-Dissolved (mg/L)					
	Tin (Sn)-Dissolved (mg/L)					
	Titanium (Ti)-Dissolved (mg/L)					
	Uranium (U)-Dissolved (mg/L)					
	Vanadium (V)-Dissolved (mg/L)					
	Zinc (Zn)-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
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 "Acidity"
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
ACY-PCT-VA	Water	Acidity by Automatic Titration	APHA 2310 Acidity
This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.			
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-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-N+N-CALC-VA	Water	Nitrite & Nitrate in Water (Calculation)	EPA 300.0
Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).			
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".			
AS-D-CCMS-VA	Water	Dissolved Arsenic in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
AS-T-CCMS-VA	Water	Total Arsenic in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CN-T-MID-HH-COL-VA	Water	Total Cyanide by HH Distillation	APHA 4500-CN Cyanide
This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method.			

Reference Information

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-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) 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-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

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

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

MET-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-DIS-LOW-ICP-VA Water Dissolved Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

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

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

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

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

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

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

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.

OGG-LL-SF-VA Water Oil & Grease by Gravimetric BCMOE GRAVIMETRIC

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3510 & 9071, published by the United States Environmental Protection Agency (EPA), "Standard Methods for the Examination of Water and Wastewater", 20th ed., Method 5520, published by the American Public Health Association, and "BC Environmental Laboratory Manual for the Analysis of Water, Wastewater, Sediment and Biological Materials," 5th ed., published by the B.C. Ministry of Environment, Lands & Parks, 1994. The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease. ALS Environmental's routine detection limit, or Limit of Reporting (LOR), for this method is 2 mg/L for a 1L sample volume. By request, a LOR of 1 mg/L is sometimes applied for this method. The 1 mg/L LOR is equal to the 99% confidence limit Method Detection Limit as defined by the US EPA. A higher degree of variability is expected at levels below 2 mg/L.

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.

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

Reference Information

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.

S2-T-COL-VA Water Total Sulphide by Colorimetric APHA 4500-S2 Sulphide

This analysis is carried out using procedures adapted from APHA Method 4500-S2 "Sulphide". Sulphide is determined using the methylene blue colourimetric method.

SE-D-CCMS-VA Water Dissolved Selenium in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

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

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

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

TDS-LOW-VA Water Low Level TDS (3.0mg/L) 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-SIE-VA Water TKN in Water 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.

TSS-LOW-VA Water Total Suspended Solids by Grav. (1 mg/L) APHA 2540 Gravimetric

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

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

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

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

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

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

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

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, 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.



COC #

Report To

Serviceability	
----------------	--

⊗ R_{fit}

[illegible]

Ad

Phone:	Quote #:
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Lab Work Order # 7100764

Quote #:

ALS Contact:	Can Dang	Sampler:	Justine Crowe
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Sample	Sample Identification	Date	Time	Sample Type
#	(This description will appear on the report)	(dd-mm-yy)	(hh:mm)	

(This description will appear on the report)

Date
(dd-mm-yy)

Time
(hh:mm)

Sample Type

$$F/P\}$$

Number of Containers

[illegible][illegible]

X	X	X	X	X	X	X	X	X	X	X									
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[illegible][illegible]

			X								1
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[illegible][illegible][illegible][illegible][illegible][illegible]

3 Tier 1 - Natural, etc) / Hazardous Details

SURVIVANT MEDICATION (last use only)

Verified by:	Date:	Time:	Observations:
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			YES / NO
			If Yes, add \$

GENE 18 01 Front

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:
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[illegible]

I. Growth		May 90	13.50	7.5	2.60	13.50	5	%C				II Yes add SI
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GENE 18.01 Front

GENF 18 01 Front



GOLDER ASSOCIATES LTD
ATTN: Justine Crowe
9 - 4905 48 Street
Yellowknife NT X1A 3S3

Date Received: 24-MAY-11
Report Date: 27-MAY-11 20:37 (MT)
Version: FINAL

Client Phone: 867-873-6319

Certificate of Analysis

Lab Work Order #: L1008512
Project P.O. #: 606989
Job Reference: 09-1427-0006-20000-20500
Legal Site Desc:
C of C Numbers: 1

Shannon Luchka
Account Manager

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

ADDRESS: 9936-67 Avenue, Edmonton, AB T6E 0P5 Canada | Phone: +1 780 413 5227 | Fax: +1 780 437 2311
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		L1008512-1 WATER 24-MAY-11 YK BACK BAY 1	L1008512-2 WATER 24-MAY-11 YK BACK BAY 2	L1008512-3 WATER 24-MAY-11 SNP 43-5 (ABOVE)	L1008512-4 WATER 24-MAY-11 REACH 4 (D/S GIANT POOL)	L1008512-5 WATER 24-MAY-11 REACH 2 (POOL)
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	28.4	26.8	68.1		
	Total Suspended Solids (mg/L)	<3.0	<3.0	37.0	70.0	72.0
	Turbidity (NTU)	5.78	5.48	37.7	53.1	51.4
Total Metals	Aluminum (Al)-Total (mg/L)	0.172	0.161	1.06		
	Antimony (Sb)-Total (mg/L)	0.00080	0.00068	0.0314		
	Arsenic (As)-Total (mg/L)	0.00294	0.00299	0.133		
	Barium (Ba)-Total (mg/L)	0.00843	0.00880	0.0194		
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Bismuth (Bi)-Total (mg/L)	<0.00020	<0.00020	<0.00020		
	Boron (B)-Total (mg/L)	<0.020	<0.020	<0.020		
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020		
	Calcium (Ca)-Total (mg/L)	7.28	5.08	18.2		
	Chromium (Cr)-Total (mg/L)	<0.00080	<0.00080	<0.00080		
	Cobalt (Co)-Total (mg/L)	<0.00020	<0.00020	0.00191		
	Copper (Cu)-Total (mg/L)	0.0012	0.0012	0.0125		
	Iron (Fe)-Total (mg/L)	0.182	0.123	1.57		
	Lead (Pb)-Total (mg/L)	0.00020	0.00024	0.00734		
	Magnesium (Mg)-Total (mg/L)	2.54	1.74	4.99		
	Manganese (Mn)-Total (mg/L)	0.0060	0.0052	0.267		
	Mercury (Hg)-Total (mg/L)	0.000057	<0.000020	<0.000020		
	Molybdenum (Mo)-Total (mg/L)	0.00014	0.00013	0.00116		
	Nickel (Ni)-Total (mg/L)	0.00069	<0.00020	0.00703		
	Potassium (K)-Total (mg/L)	1.10	0.74	1.54		
	Selenium (Se)-Total (mg/L)	<0.00040	<0.00040	<0.00040		
	Silver (Ag)-Total (mg/L)	<0.00040	<0.00040	<0.00040		
	Sodium (Na)-Total (mg/L)	2.5	1.8	4.5		
	Strontium (Sr)-Total (mg/L)	0.0295	0.0307	0.0745		
	Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Tin (Sn)-Total (mg/L)	0.00072	<0.00040	<0.00040		
	Titanium (Ti)-Total (mg/L)	<0.0050	0.0052	0.0333		
	Uranium (U)-Total (mg/L)	0.00026	0.00028	0.00060		
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	0.00260		
	Zinc (Zn)-Total (mg/L)	<0.0040	<0.0040	0.0179		
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.016	0.013	0.011		
	Antimony (Sb)-Dissolved (mg/L)	0.00047	<0.00040	0.0246		
	Arsenic (As)-Dissolved (mg/L)	0.00201	0.00454 ^{RRV}	0.0905		
	Barium (Ba)-Dissolved (mg/L)	0.00684	0.00716	0.0111		

* 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		L1008512-1 WATER 24-MAY-11 YK BACK BAY 1	L1008512-2 WATER 24-MAY-11 YK BACK BAY 2	L1008512-3 WATER 24-MAY-11 SNP 43-5 (ABOVE)	L1008512-4 WATER 24-MAY-11 REACH 4 (D/S GIANT POOL)	L1008512-5 WATER 24-MAY-11 REACH 2 (POOL)
Grouping	Analyte					
WATER						
Dissolved Metals	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050		
	Boron (B)-Dissolved (mg/L)	0.0035	0.0039	0.0120		
	Cadmium (Cd)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		
	Calcium (Ca)-Dissolved (mg/L)	7.28	6.94	19.2		
	Chromium (Cr)-Dissolved (mg/L)	0.00177	0.00177	0.00157		
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	<0.00010	0.00108		
	Copper (Cu)-Dissolved (mg/L)	0.00077	0.00078	0.00481		
	Iron (Fe)-Dissolved (mg/L)	0.014	<0.010	0.065		
	Lead (Pb)-Dissolved (mg/L)	<0.00010	<0.00010	0.00055		
	Magnesium (Mg)-Dissolved (mg/L)	2.49	2.31	4.90		
	Manganese (Mn)-Dissolved (mg/L)	0.0026	0.0031	0.267		
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020		
	Molybdenum (Mo)-Dissolved (mg/L)	<0.00010	0.00011	0.00111		
	Nickel (Ni)-Dissolved (mg/L)	<0.0001	<0.0001	0.00630		
	Potassium (K)-Dissolved (mg/L)	1.08	1.03	1.48		
	Selenium (Se)-Dissolved (mg/L)	<0.00040	<0.00040	<0.00040		
	Silver (Ag)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020		
	Sodium (Na)-Dissolved (mg/L)	2.55	2.42	4.70		
	Strontium (Sr)-Dissolved (mg/L)	0.0306	0.0315	0.0806		
	Thallium (Tl)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050		
	Tin (Sn)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020		
	Titanium (Ti)-Dissolved (mg/L)	0.00032	<0.00030	<0.00030		
	Uranium (U)-Dissolved (mg/L)	0.00024	0.00024	0.00055		
	Vanadium (V)-Dissolved (mg/L)	<0.00010	<0.00010	0.00023		
	Zinc (Zn)-Dissolved (mg/L)	0.0073	<0.0010	0.0051		

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

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ETL-HARDNESS-DIS-ED	Water	Hardness (from Dissolved Ca and Mg)	APHA 2340 B-Calculation
HG-D-L-CVAA-ED	Water	Mercury (Hg) - Dissolved	EPA 245.7 / EPA 245.1
HG-T-L-CVAA-ED	Water	Mercury (Hg)	EPA 245.7 / EPA 245.1
MET-D-ICP-ED	Water	Dissolved Metals in Water by ICPOES	APHA 3120 B-ICP-OES
MET-D-L-ICP-ED	Water	Diss. Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-D-L-MS-ED	Water	Diss. Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
MET-T-L-ICP-ED	Water	Total Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-T-L-MS-ED	Water	Total Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer

** 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

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.



Page of

Report To					
Company:	Deton/Cho/Nuna Joint Venture AND Golder As. Ltd.				
Contact:	DCNUJ: Katrina Nokleby; Golder: Justine Crowe				
Address:					
Phone:	867 669 6735		Fax:		
Invoice To	Same as Report ? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Client / Project Information		
Hardcopy of Invoice with Report?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Job #: 09-1427-0006-20000-20500		
Company:	Deton/Cho/Nuna Joint Venture				
Contact:	Brenda Kalis				
Address:	9838-31st Avenue., Edmonton AB, T6N 1C5				
Phone:	780 408 2897		Fax:	780 408 5472	
Lab Work Order #	(lab use only)		ALS Contact:	Can Dang	Sampler:
Sample #	Sample Identification (This description will appear on the report)		Date (dd-mm-yy)	Time (hh:mm)	Sample Type
	YK Back Bay 1		24-May-11		Surface Water
	YK Back Bay 2		24-May-11		Surface Water
	Reach 1 (d/s BC Mount)		24-May-11		Surface Water
	SNP43-5 (above)		24-May-11		Surface Water
	Reach 4 (d/s Giant Pool)		24-May-11		Surface Water
	Reach 2 (Pool)		24-May-11		Surface Water
Special Instructions / Regulations with water or land use (GCME-Freshwater Aquatic Life/BC CSR - Commercial/LAB Tier 1 - Natural, etc) / Hazardous Details					
Please Analyze As and Se by Hydride*. Please include Mercury in the metals analysis. Note - This water might contain high amounts of metals. All Samples are RUSH / EMERGENCY!!!!!! 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)		
Released by:	Date (dd-mm-yy)	Time (hh:mm)	Received by:	Date:	Time:
J. Crowe	24 May 11	4:45pm	TJB	24 May 11	16:50
Temperature:			5 °C		
Verified by:			Date:		
SHIPMENT VERIFICATION (lab use only)			Observations: Yes / No ? If Yes add SIF		



GOLDER ASSOCIATES LTD
ATTN: Justine Crowe
9 - 4905 48 Street
Yellowknife NT X1A 3S3

Date Received: 25-MAY-11
Report Date: 28-MAY-11 19:46 (MT)
Version: FINAL

Client Phone: 867-873-6319

Certificate of Analysis

Lab Work Order #: L1009010
Project P.O. #: 606989
Job Reference: 09-1427-0006-20000-20500
Legal Site Desc:
C of C Numbers: 1

Shannon Luchka
Account Manager

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ADDRESS: 9936-67 Avenue, Edmonton, AB T6E 0P5 Canada | Phone: +1 780 413 5227 | Fax: +1 780 437 2311
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1009010-1 REACH 6 (GIANT FALLS)							
Sampled By: JC on 25-MAY-11							
Matrix: WATER							
Hardness							
Dissolved Metals in Water by ICPOES							
Calcium (Ca)-Dissolved	10.6		0.50	mg/L		27-MAY-11	R2194912
Magnesium (Mg)-Dissolved	3.22		0.10	mg/L		27-MAY-11	R2194912
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	39.7		1.3	mg/L		27-MAY-11	
Dissolved Metals							
Diss. Metals in Water by ICPMS (Low)							
Aluminum (Al)-Dissolved	0.0087		0.010	mg/L		27-MAY-11	R2195149
Antimony (Sb)-Dissolved	0.00165		0.00040	mg/L		27-MAY-11	R2195149
Arsenic (As)-Dissolved	0.0210		0.00040	mg/L		27-MAY-11	R2195149
Barium (Ba)-Dissolved	0.00943		0.00010	mg/L		27-MAY-11	R2195149
Beryllium (Be)-Dissolved	<0.00050		0.00050	mg/L		27-MAY-11	R2195149
Bismuth (Bi)-Dissolved	<0.00005		0.000050	mg/L		27-MAY-11	R2195149
Boron (B)-Dissolved	0.0094		0.0020	mg/L		27-MAY-11	R2195149
Cadmium (Cd)-Dissolved	<0.0001		0.00010	mg/L		27-MAY-11	R2195149
Chromium (Cr)-Dissolved	0.00065		0.00040	mg/L		27-MAY-11	R2195149
Cobalt (Co)-Dissolved	<0.0001		0.00010	mg/L		27-MAY-11	R2195149
Copper (Cu)-Dissolved	0.00476		0.00060	mg/L		27-MAY-11	R2195149
Lead (Pb)-Dissolved	<0.0001		0.00010	mg/L		27-MAY-11	R2195149
Molybdenum (Mo)-Dissolved	0.00059		0.00010	mg/L		27-MAY-11	R2195149
Nickel (Ni)-Dissolved	0.00047		0.00010	mg/L		27-MAY-11	R2195149
Selenium (Se)-Dissolved	0.00028		0.00040	mg/L		27-MAY-11	R2195149
Silver (Ag)-Dissolved	<0.00020		0.00020	mg/L		27-MAY-11	R2195149
Strontium (Sr)-Dissolved	0.0361		0.00010	mg/L		27-MAY-11	R2195149
Thallium (Tl)-Dissolved	0.000021		0.000050	mg/L		27-MAY-11	R2195149
Tin (Sn)-Dissolved	<0.00020		0.00020	mg/L		27-MAY-11	R2195149
Titanium (Ti)-Dissolved	0.00037		0.00030	mg/L		27-MAY-11	R2195149
Uranium (U)-Dissolved	0.00033		0.00010	mg/L		27-MAY-11	R2195149
Vanadium (V)-Dissolved	0.00026		0.00010	mg/L		27-MAY-11	R2195149
Zinc (Zn)-Dissolved	0.0011		0.0010	mg/L		27-MAY-11	R2195149
Diss. Metals in Water by ICPOES (Low)							
Calcium (Ca)-Dissolved	10.6		0.50	mg/L		27-MAY-11	R2194912
Iron (Fe)-Dissolved	0.051		0.010	mg/L		27-MAY-11	R2194912
Magnesium (Mg)-Dissolved	3.22		0.10	mg/L		27-MAY-11	R2194912
Manganese (Mn)-Dissolved	0.0392		0.0020	mg/L		27-MAY-11	R2194912
Potassium (K)-Dissolved	1.04		0.10	mg/L		27-MAY-11	R2194912
Sodium (Na)-Dissolved	2.52		0.50	mg/L		27-MAY-11	R2194912
Total Metals							
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	0.082		0.020	mg/L		27-MAY-11	R2195047
Antimony (Sb)-Total	0.00157		0.00040	mg/L		27-MAY-11	R2195047
Arsenic (As)-Total	0.0214		0.00040	mg/L		27-MAY-11	R2195047
Barium (Ba)-Total	0.00957		0.00020	mg/L		27-MAY-11	R2195047
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		27-MAY-11	R2195047
Bismuth (Bi)-Total	<0.00020		0.00020	mg/L		27-MAY-11	R2195047
Boron (B)-Total	<0.020		0.020	mg/L		27-MAY-11	R2195047
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		27-MAY-11	R2195047
Chromium (Cr)-Total	0.00655		0.00080	mg/L		27-MAY-11	R2195047
Cobalt (Co)-Total	<0.00020		0.00020	mg/L		27-MAY-11	R2195047
Copper (Cu)-Total	0.0011		0.0010	mg/L		27-MAY-11	R2195047
Lead (Pb)-Total	0.00027		0.00010	mg/L		27-MAY-11	R2195047
Molybdenum (Mo)-Total	0.00043		0.00010	mg/L		27-MAY-11	R2195047

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1009010-1	REACH 6 (GIANT FALLS)							
Sampled By:	JC on 25-MAY-11							
Matrix:	WATER							
Total Metals in Water by ICPMS (Low)								
Nickel (Ni)-Total	0.00396			0.00020	mg/L		27-MAY-11	R2195047
Selenium (Se)-Total	<0.00040			0.00040	mg/L		27-MAY-11	R2195047
Silver (Ag)-Total	<0.00040			0.00040	mg/L		27-MAY-11	R2195047
Strontium (Sr)-Total	0.0355			0.00020	mg/L		27-MAY-11	R2195047
Thallium (Tl)-Total	<0.00010			0.00010	mg/L		27-MAY-11	R2195047
Tin (Sn)-Total	<0.00040			0.00040	mg/L		27-MAY-11	R2195047
Titanium (Ti)-Total	<0.0050			0.0050	mg/L		27-MAY-11	R2195047
Uranium (U)-Total	0.00021			0.00010	mg/L		27-MAY-11	R2195047
Vanadium (V)-Total	<0.00050			0.00050	mg/L		27-MAY-11	R2195047
Zinc (Zn)-Total	<0.0040			0.0040	mg/L		27-MAY-11	R2195047
Total Metals in Water by ICPOES (Low)								
Calcium (Ca)-Total	10.7			0.50	mg/L		27-MAY-11	R2194913
Iron (Fe)-Total	0.211			0.010	mg/L		27-MAY-11	R2194913
Magnesium (Mg)-Total	3.17			0.10	mg/L		27-MAY-11	R2194913
Manganese (Mn)-Total	0.0481			0.0020	mg/L		27-MAY-11	R2194913
Potassium (K)-Total	1.11			0.10	mg/L		27-MAY-11	R2194913
Sodium (Na)-Total	2.8			1.0	mg/L		27-MAY-11	R2194913
Miscellaneous Parameters								
Mercury (Hg)-Total	<0.000020			0.000020	mg/L		28-MAY-11	R2195281
Mercury (Hg)-Dissolved	<0.000020			0.000020	mg/L		28-MAY-11	R2195281
Total Suspended Solids	<3.0			3.0	mg/L		27-MAY-11	R2194886
Turbidity	2.56			0.10	NTU		27-MAY-11	R2194859
L1009010-2	REACH 4 (D/S GIANT POOL)							
Sampled By:	JC on 25-MAY-11							
Matrix:	WATER							
Miscellaneous Parameters								
Total Suspended Solids	4.0			3.0	mg/L		27-MAY-11	R2194886
Turbidity	9.02			0.10	NTU		27-MAY-11	R2194859
L1009010-3	REACH 2 (POOL)							
Sampled By:	JC on 25-MAY-11							
Matrix:	WATER							
Miscellaneous Parameters								
Total Suspended Solids	33.0			3.0	mg/L		27-MAY-11	R2194886
Turbidity	40.3			0.10	NTU		27-MAY-11	R2194859
L1009010-4	SNP 43-5 (ABOVE)							
Sampled By:	JC on 25-MAY-11							
Matrix:	WATER							
Miscellaneous Parameters								
Total Suspended Solids	18.0			3.0	mg/L		27-MAY-11	R2194886
Turbidity	32.7			0.10	NTU		27-MAY-11	R2194859
L1009010-5	REACH 0 (BC MOUTH)							
Sampled By:	JC on 25-MAY-11							
Matrix:	WATER							
Miscellaneous Parameters								
Total Suspended Solids	23.0			3.0	mg/L		27-MAY-11	R2194886
Turbidity	32.9			0.10	NTU		27-MAY-11	R2194859

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ETL-HARDNESS-DIS-ED	Water	Hardness (from Dissolved Ca and Mg)	APHA 2340 B-Calculation
HG-D-L-CVAA-ED	Water	Mercury (Hg) - Dissolved	EPA 245.7 / EPA 245.1
HG-T-L-CVAA-ED	Water	Mercury (Hg)	EPA 245.7 / EPA 245.1
MET-D-ICP-ED	Water	Dissolved Metals in Water by ICPOES	APHA 3120 B-ICP-OES
MET-D-L-ICP-ED	Water	Diss. Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-D-L-MS-ED	Water	Diss. Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
MET-T-L-ICP-ED	Water	Total Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-T-L-MS-ED	Water	Total Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer

** 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

Chain of Custody Numbers:

1

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

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

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

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 ____ of ____

[illegible]



GOLDER ASSOCIATES LTD
ATTN: JUSTINE CROWE
9 - 4905 48 Street
Yellowknife NT X1A 3S3

Date Received: 27-MAY-11
Report Date: 30-MAY-11 16:00 (MT)
Version: FINAL

Client Phone: 897-669-6735

Certificate of Analysis

Lab Work Order #: L1010143
Project P.O. #: 606989
Job Reference: 09-1427-0006-20000-20500
Legal Site Desc:
C of C Numbers: 1

Shannon Luchka
Account Manager

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

30-MAY-11 16:00 (MT)

Version: FINAL

Sample ID Description Sampled Date Sampled Time Client ID		L1010143-1 WATER 27-MAY-11 REACH 6 (GIANT FALLS)	L1010143-2 WATER 27-MAY-11 REACH 5 (D/S POND)	L1010143-3 WATER 27-MAY-11 REACH 4 (D/S GIANT POOL)	L1010143-4 WATER 27-MAY-11 REACH 4 (D/S GIANT POOL) DUP	L1010143-5 WATER 27-MAY-11 REACH 4 (UNDER ICE)
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	33.1	45.4	51.4	51.6	44.5
	Total Suspended Solids (mg/L)	7.0	5.0	5.0	7.0	20.0
	Turbidity (NTU)	2.33	8.76	8.54	6.97	17.3
Total Metals	Aluminum (Al)-Total (mg/L)	0.102	0.231	0.239	0.247	0.481
	Antimony (Sb)-Total (mg/L)	0.00176	0.0178	0.0219	0.0221	0.0186
	Arsenic (As)-Total (mg/L)	0.0251	0.0869	0.0905	0.0935	0.0741
	Barium (Ba)-Total (mg/L)	0.00976	0.0110	0.0104	0.0108	0.0108
	Beryllium (Be)-Total (mg/L)	0.0012	0.0013	0.0010	0.0011	0.0017
	Bismuth (Bi)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Boron (B)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	9.47	11.7	12.9	12.9	12.0
	Chromium (Cr)-Total (mg/L)	<0.00080	<0.00080	<0.00080	<0.00080	0.00110
	Cobalt (Co)-Total (mg/L)	<0.00020	0.00089	0.00094	0.00099	0.00100
	Copper (Cu)-Total (mg/L)	<0.0010	0.0092	0.0095	0.0096	0.0089
	Iron (Fe)-Total (mg/L)	0.183	0.421	0.433	0.423	0.691
	Lead (Pb)-Total (mg/L)	0.00026	0.00483	0.00276	0.00295	0.00341
	Magnesium (Mg)-Total (mg/L)	2.94	3.48	3.69	3.64	3.46
	Manganese (Mn)-Total (mg/L)	0.0427	0.122	0.150	0.149	0.155
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Total (mg/L)	0.00065	0.00093	0.00123	0.00138	0.00116
	Nickel (Ni)-Total (mg/L)	0.00087	0.00324	0.00595	0.00630	0.00632
	Potassium (K)-Total (mg/L)	0.99	1.18	1.25	1.24	1.19
	Selenium (Se)-Total (mg/L)	<0.0020 ^{DLM}	<0.00040	<0.00040	<0.00040	<0.00040
	Silver (Ag)-Total (mg/L)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
	Sodium (Na)-Total (mg/L)	2.1	2.9	3.3	3.2	3.0
	Strontium (Sr)-Total (mg/L)	0.0370	0.0525	0.0577	0.0595	0.0493
	Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
	Titanium (Ti)-Total (mg/L)	<0.0050	0.0079	0.0078	0.0084	0.0169
	Uranium (U)-Total (mg/L)	0.00026	0.00029	0.00036	0.00041	0.00036
	Vanadium (V)-Total (mg/L)	0.00057	0.00087	0.00093	0.00092	0.00138
	Zinc (Zn)-Total (mg/L)	0.0044	0.0147	0.0087	0.0101	0.0149
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.010	<0.010	<0.010	0.016	0.018
	Antimony (Sb)-Dissolved (mg/L)	0.00151	0.0159	0.0199	0.0193	0.0210
	Arsenic (As)-Dissolved (mg/L)	0.0178	0.0667	0.0697	0.0687	0.0669
	Barium (Ba)-Dissolved (mg/L)	0.00768	0.00978	0.00924	0.00875	0.00876

* 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		L1010143-6 WATER 27-MAY-11 REACH 2 (POOL)	L1010143-7 WATER 27-MAY-11 SNP 43-5 (ABOVE)	L1010143-8 WATER 27-MAY-11 REACH 0 (BC MOUTH)	L1010143-9 WATER 21-MAY-11 REACH 6 EXPOSURE POINT (ABOVE)	
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	53.1	59.6	55.3		
	Total Suspended Solids (mg/L)	11.0	10.0	12.0		
	Turbidity (NTU)	11.2	9.88	10.9		
Total Metals	Aluminum (Al)-Total (mg/L)	0.412	0.446	0.395	1.76	
	Antimony (Sb)-Total (mg/L)	0.0240	0.0279	0.0261	0.127	
	Arsenic (As)-Total (mg/L)	0.103	0.114	0.113	0.445	
	Barium (Ba)-Total (mg/L)	0.0127	0.0128	0.0126	0.0408	
	Beryllium (Be)-Total (mg/L)	<0.0010	0.0018	0.0017	0.0011	
	Bismuth (Bi)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
	Boron (B)-Total (mg/L)	<0.020	<0.020	<0.020	0.146	
	Cadmium (Cd)-Total (mg/L)	<0.00020	0.00021	<0.00020	0.00038	
	Calcium (Ca)-Total (mg/L)	12.5	16.1	14.8	50.0	
	Chromium (Cr)-Total (mg/L)	0.00088	0.00097	0.00097	0.00435	
	Cobalt (Co)-Total (mg/L)	0.00117	0.00151	0.00150	0.00698	
	Copper (Cu)-Total (mg/L)	0.0105	0.0100	0.0118	0.0242	
	Iron (Fe)-Total (mg/L)	0.541	0.733	0.604	3.65	
	Lead (Pb)-Total (mg/L)	0.00374	0.00334	0.00299	0.0497	
	Magnesium (Mg)-Total (mg/L)	3.45	4.29	3.94	16.5	
	Manganese (Mn)-Total (mg/L)	0.152	0.232	0.217	0.613	
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	0.000038	
	Molybdenum (Mo)-Total (mg/L)	0.00146	0.00167	0.00156	0.00280	
	Nickel (Ni)-Total (mg/L)	0.00753	0.00820	0.00810	0.0160	
	Potassium (K)-Total (mg/L)	1.09	1.20	1.29	3.74	
	Selenium (Se)-Total (mg/L)	<0.00040	<0.00040	0.00079	0.00079	
	Silver (Ag)-Total (mg/L)	<0.00040	<0.00040	<0.00040	<0.00040	
	Sodium (Na)-Total (mg/L)	3.2	3.8	3.8	15.9	
	Strontium (Sr)-Total (mg/L)	0.0640	0.0711	0.0715	0.215	
	Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Tin (Sn)-Total (mg/L)	<0.00040	<0.00040	<0.00040	<0.00040	
	Titanium (Ti)-Total (mg/L)	0.0141	0.0143	0.0138	0.0208	
	Uranium (U)-Total (mg/L)	0.00044	0.00045	0.00048	0.00204	
	Vanadium (V)-Total (mg/L)	0.00123	0.00144	0.00124	0.00546	
	Zinc (Zn)-Total (mg/L)	0.0122	0.0108	0.0113	0.0646	
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.014	0.011	0.011		
	Antimony (Sb)-Dissolved (mg/L)	0.0220	0.0242	0.0240		
	Arsenic (As)-Dissolved (mg/L)	0.0753	0.0824	0.0793		
	Barium (Ba)-Dissolved (mg/L)	0.00882	0.00968	0.00928		

* 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		L1010143-1 WATER 27-MAY-11 REACH 6 (GIANT FALLS)	L1010143-2 WATER 27-MAY-11 REACH 5 (D/S POND)	L1010143-3 WATER 27-MAY-11 REACH 4 (D/S GIANT POOL)	L1010143-4 WATER 27-MAY-11 REACH 4 (D/S GIANT POOL) DUP	L1010143-5 WATER 27-MAY-11 REACH 4 (UNDER ICE)
Grouping	Analyte					
WATER						
Dissolved Metals	Beryllium (Be)-Dissolved (mg/L)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Bismuth (Bi)-Dissolved (mg/L)	0.000080	0.000100	0.000070	0.000050	0.000075
	Boron (B)-Dissolved (mg/L)	0.0114	0.0158	0.0168	0.0166	0.0186
	Cadmium (Cd)-Dissolved (mg/L)	0.00023	0.00025	0.00010	0.00025	0.00024
	Calcium (Ca)-Dissolved (mg/L)	8.86	12.4	14.1	14.2	12.3
	Chromium (Cr)-Dissolved (mg/L)	<0.00040	0.00046	0.00051	0.00062	0.00083
	Cobalt (Co)-Dissolved (mg/L)	0.00013	0.00070	0.00084	0.00076	0.00076
	Copper (Cu)-Dissolved (mg/L)	0.00061	0.00529	0.00572	0.00590	0.00595
	Iron (Fe)-Dissolved (mg/L)	0.030	0.059	0.071	0.091	0.054
	Lead (Pb)-Dissolved (mg/L)	0.00027	0.00079	0.00125	0.00102	0.00080
	Magnesium (Mg)-Dissolved (mg/L)	2.66	3.52	3.96	3.93	3.38
	Manganese (Mn)-Dissolved (mg/L)	0.0084	0.106	0.152	0.147	0.140
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	0.00079	0.00115	0.00139	0.00135	0.00160
	Nickel (Ni)-Dissolved (mg/L)	0.00074	0.00296	0.00579	0.00564	0.00652
	Potassium (K)-Dissolved (mg/L)	0.86	1.21	1.34	1.26	1.04
	Selenium (Se)-Dissolved (mg/L)	<0.0020 ^{DLM}	<0.00040	<0.00040	0.00049	0.00059
	Silver (Ag)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Sodium (Na)-Dissolved (mg/L)	1.92	3.03	3.47	3.46	2.88
	Strontium (Sr)-Dissolved (mg/L)	0.0315	0.0528	0.0590	0.0567	0.0599
	Thallium (Tl)-Dissolved (mg/L)	0.000265	0.000135	0.000120	0.000095	0.000090
	Tin (Sn)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Titanium (Ti)-Dissolved (mg/L)	0.00181	0.00206	0.00231	0.00245	0.00220
	Uranium (U)-Dissolved (mg/L)	0.00022	0.00032	0.00041	0.00039	0.00041
	Vanadium (V)-Dissolved (mg/L)	0.00049	0.00056	0.00051	0.00056	0.00057
	Zinc (Zn)-Dissolved (mg/L)	0.0034	0.0058	0.0090	0.0070	0.0045

* 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		L1010143-6 WATER 27-MAY-11 REACH 2 (POOL)	L1010143-7 WATER 27-MAY-11 SNP 43-5 (ABOVE)	L1010143-8 WATER 27-MAY-11 REACH 0 (BC MOUTH)	L1010143-9 WATER 21-MAY-11 REACH 6 EXPOSURE POINT (ABOVE)	
Grouping	Analyte					
WATER						
Dissolved Metals	Beryllium (Be)-Dissolved (mg/L)	0.00234	0.00204	0.00205		
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050		
	Boron (B)-Dissolved (mg/L)	0.0189	0.0186	0.0192		
	Cadmium (Cd)-Dissolved (mg/L)	0.00021	0.00023	0.00023		
	Calcium (Ca)-Dissolved (mg/L)	14.7	16.7	15.5		
	Chromium (Cr)-Dissolved (mg/L)	0.00099	0.00124	0.00126		
	Cobalt (Co)-Dissolved (mg/L)	0.00089	0.00121	0.00118		
	Copper (Cu)-Dissolved (mg/L)	0.00585	0.00540	0.00527		
	Iron (Fe)-Dissolved (mg/L)	0.072	0.093	0.073		
	Lead (Pb)-Dissolved (mg/L)	0.00061	0.00073	0.00062		
	Magnesium (Mg)-Dissolved (mg/L)	3.96	4.36	4.02		
	Manganese (Mn)-Dissolved (mg/L)	0.168	0.230	0.216		
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020		
	Molybdenum (Mo)-Dissolved (mg/L)	0.00158	0.00163	0.00173		
	Nickel (Ni)-Dissolved (mg/L)	0.00691	0.00708	0.00716		
	Potassium (K)-Dissolved (mg/L)	1.24	1.33	1.23		
	Selenium (Se)-Dissolved (mg/L)	<0.00040	<0.00040	<0.00040		
	Silver (Ag)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020		
	Sodium (Na)-Dissolved (mg/L)	3.52	3.91	3.74		
	Strontium (Sr)-Dissolved (mg/L)	0.0643	0.0697	0.0698		
	Thallium (Tl)-Dissolved (mg/L)	0.000065	0.000065	0.000055		
	Tin (Sn)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020		
	Titanium (Ti)-Dissolved (mg/L)	0.00220	0.00141	0.00208		
	Uranium (U)-Dissolved (mg/L)	0.00040	0.00046	0.00045		
	Vanadium (V)-Dissolved (mg/L)	0.00052	0.00055	0.00051		
	Zinc (Zn)-Dissolved (mg/L)	0.0088	0.0060	0.00330		

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

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
SRUL	Sample Received Unpreserved. Results may be biased low for indicated parameter(s) - dissolved metal
SFPL	Sample was Filtered and Preserved at the laboratory - dissolved metal

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted For Sample Matrix Effects

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ETL-HARDNESS-DIS-ED	Water	Hardness (from Dissolved Ca and Mg)	APHA 2340 B-Calculation
HG-D-L-CVAA-ED	Water	Mercury (Hg) - Dissolved	EPA 245.7 / EPA 245.1
HG-T-L-CVAA-ED	Water	Mercury (Hg)	EPA 245.7 / EPA 245.1
MET-D-L-ICP-ED	Water	Diss. Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-D-L-MS-ED	Water	Diss. Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
MET-T-L-ICP-ED	Water	Total Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-T-L-MS-ED	Water	Total Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer

** 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

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.



Report To			Report Format / Distribution			Service Requested (Rush for routine analysis subject to availability)												
Company: Deton'Cho/Nuna Joint Venture AND Golder As. Ltd.			<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other			<input type="radio"/> Regular (Standard Turnaround Times - Business Days)												
Contact: DCNJV: Katrina Nokleby; Golder: Justine Crowe			<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax			<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT												
Address:			Email 1: jcrowe@golder.com			<input checked="" type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT												
			Email 2: hmachtans@golder.com			<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT												
Phone: 867 669 6735 Fax:			Email 3: KatrinaN@munalogistics.com			Analysis Request												
Invoice To Same as Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Client / Project Information			Please indicate below Filtered, Preserved or both (F, P, F/P)												
Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Job #: 09-1427-0006-20000-20500															
Company: Deton'Cho/Nuna Joint Venture			PO / AFE: 606989															
Contact: Brenda Kalis			LSD:															
Address: 9838-31st Avenue., Edmonton AB, T6N 1C5																		
Phone: 780 408 2897 Fax: 780 408 5472			Quote #:															
Lab Work Order # L1010143 (lab use only)			ALS Contact: Can Dang		Sampler: <i>Mitch Stacey</i> <i>Justine Crowe</i>													
Sample #	Sample Identification (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type		Physical Parameters	Cyanide	Hardness	TSS and Turbidity	Nutrients	NH3 / TKN	Oil and Grease	TOC	DOC	Low Level Total Metals	Low Level Dissolved Metals	Sulphide	Number of Containers
	Reach 6 (Giant Falls)	27-May-11		Surface Water				X	X						X	X		3
	Reach 5 (d/s Pond)	27-May-11		Surface Water				X	X						X	X		3
	Reach 4 (d/s Giant Pool)	27-May-11		Surface Water				X	X						X	X		3
	Reach 4 (d/s Giant Pool) DUP	27-May-11		Surface Water				X	X						X	X		3
	Reach 4 (Under ice)	27-May-11		Surface Water				X	X						X	X		3
	Reach 2 (Pool)	27-May-11		Surface Water				X	X						X	X		3
	SNP43-5 (above)	27-May-11		Surface Water				X	X						X	X		3
	Reach 0 (BC Mouth)	27-May-11		Surface Water				X	X						X	X		3
	Reach 6 Exposure Point (Above)	21-May-11		Surface Water											X			1
Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details																		
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: <i>M. Stacey</i>	Date (dd-mm-yy): 27-May-11	Time (hh:mm):	Received by: <i>T. Smith</i>	Date: 27-May-11	Time: 16:35	Temperature: 18 °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF								



GOLDER ASSOCIATES LTD
ATTN: Justine Crowe
9 - 4905 48 Street
Yellowknife NT X1A 3S3

Date Received: 01-JUN-11
Report Date: 22-JUN-11 13:05 (MT)
Version: FINAL REV. 2

Client Phone: 867-873-6319

Certificate of Analysis

Lab Work Order #: L1011399
Project P.O. #: 606989
Job Reference: 09-1427-0006-20000-20500
Legal Site Desc:
C of C Numbers:

Comments:

22-JUN-11: IDs fixed

Shannon Luchka
Account Manager

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

ADDRESS: 9936-67 Avenue, Edmonton, AB T6E 0P5 Canada | Phone: +1 780 413 5227 | Fax: +1 780 437 2311
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		L1011399-1 WATER 31-MAY-11 YK BACK BAY 1	L1011399-2 WATER 31-MAY-11 YK BACK BAY 2	L1011399-3 WATER 31-MAY-11 YK BACK BAY 3	L1011399-4 WATER 31-MAY-11 YK BACK BAY 4	L1011399-5 WATER 31-MAY-11 BACK BAY DOCK AREA
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO ₃) (mg/L)	76.5	24.9	25.0	25.4	33.1
	Total Suspended Solids (mg/L)	14.0	4.0	<3.0	<3.0	16.0
	Turbidity (NTU)	17.5	5.48	6.41	6.20	13.5
Anions and Nutrients	Nitrate and Nitrite (as N) (mg/L)	0.0388	<0.0060	<0.0060	<0.0060	<0.0060
	Nitrate (as N) (mg/L)	0.0388	<0.0060	<0.0060	<0.0060	<0.0060
	Nitrite (as N) (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Total Kjeldahl Nitrogen (mg/L)	0.629	0.198	0.174	0.203	0.467
	Phosphorus (P)-Total Dissolved (mg/L)	0.0113	0.0026	0.0029	0.0033	0.0060
	Phosphorus (P)-Total (mg/L)	0.0509	0.0090	0.0100	0.0097	0.0545
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	11.0	4.77	4.79	4.88	5.28
	Total Organic Carbon (mg/L)	11.2	5.04	5.19	5.15	5.64
Total Metals	Aluminum (Al)-Total (mg/L)	0.577	0.196	0.203	0.207	0.315
	Antimony (Sb)-Total (mg/L)	0.0309	0.00057	0.00091	0.00078	0.00066
	Arsenic (As)-Total (mg/L)	0.130	0.00373	0.00407	0.00444	0.00693
	Barium (Ba)-Total (mg/L)	0.0161	0.00910	0.00911	0.00896	0.0149
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Boron (B)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	22.2	7.84	6.63	6.53	9.05
	Chromium (Cr)-Total (mg/L)	0.00126	<0.00080	<0.00080	<0.00080	0.00087
	Cobalt (Co)-Total (mg/L)	0.00115	<0.00020	<0.00020	<0.00020	0.00030
	Copper (Cu)-Total (mg/L)	0.0141	0.0013	0.0015	0.0014	0.0029
	Iron (Fe)-Total (mg/L)	0.831	0.173	0.168	0.170	0.606
	Lead (Pb)-Total (mg/L)	0.00412	0.00017	0.00022	0.00023	0.00056
	Magnesium (Mg)-Total (mg/L)	5.89	2.71	2.40	2.36	2.95
	Manganese (Mn)-Total (mg/L)	0.119	0.0079	0.0076	0.0077	0.0309
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	0.000023	<0.000020	<0.000020
	Molybdenum (Mo)-Total (mg/L)	0.00148	0.00019	0.00017	0.00017	0.00022
	Nickel (Ni)-Total (mg/L)	0.00809	0.00087	0.00089	0.00090	0.00140
	Potassium (K)-Total (mg/L)	1.96	1.26	1.12	1.12	1.28
	Selenium (Se)-Total (mg/L)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
	Silver (Ag)-Total (mg/L)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
	Sodium (Na)-Total (mg/L)	6.4	2.6	2.2	2.2	3.0
	Strontium (Sr)-Total (mg/L)	0.0960	0.0342	0.0336	0.0332	0.0422
	Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	Description	Sampled Date	Sampled Time	Client ID
		L1011399-6	WATER	31-MAY-11		
		L1011399-7	WATER	31-MAY-11		
			FIELD BLANK			TRAVEL BLANK
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO ₃) (mg/L)	<1.3	<1.3			
	Total Suspended Solids (mg/L)	<3.0	<3.0			
	Turbidity (NTU)	<0.10	0.11			
Anions and Nutrients	Nitrate and Nitrite (as N) (mg/L)	<0.0060	<0.0060			
	Nitrate (as N) (mg/L)	<0.0060	<0.0060			
	Nitrite (as N) (mg/L)	<0.0020	<0.0020			
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050			
	Phosphorus (P)-Total Dissolved (mg/L)	<0.0010	<0.0010			
	Phosphorus (P)-Total (mg/L)	<0.0010	<0.0010			
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	<0.50	<0.50			
	Total Organic Carbon (mg/L)	<0.50	<0.50			
Total Metals	Aluminum (Al)-Total (mg/L)	<0.020	<0.020			
	Antimony (Sb)-Total (mg/L)	<0.00040	<0.00040			
	Arsenic (As)-Total (mg/L)	<0.00040	<0.00040			
	Barium (Ba)-Total (mg/L)	<0.00020	<0.00020			
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010			
	Bismuth (Bi)-Total (mg/L)	<0.00020	<0.00020			
	Boron (B)-Total (mg/L)	<0.020	<0.020			
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020			
	Calcium (Ca)-Total (mg/L)	<0.50	<0.50			
	Chromium (Cr)-Total (mg/L)	<0.00080	<0.00080			
	Cobalt (Co)-Total (mg/L)	<0.00020	<0.00020			
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010			
	Iron (Fe)-Total (mg/L)	<0.010	<0.010			
	Lead (Pb)-Total (mg/L)	<0.00010	<0.00010			
	Magnesium (Mg)-Total (mg/L)	<0.10	<0.10			
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020			
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020			
	Molybdenum (Mo)-Total (mg/L)	<0.00010	<0.00010			
	Nickel (Ni)-Total (mg/L)	<0.00020	<0.00020			
	Potassium (K)-Total (mg/L)	<0.10	<0.10			
	Selenium (Se)-Total (mg/L)	<0.00040	<0.00040			
	Silver (Ag)-Total (mg/L)	<0.00040	<0.00040			
	Sodium (Na)-Total (mg/L)	<1.0	<1.0			
	Strontium (Sr)-Total (mg/L)	<0.00020	<0.00020			
	Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1011399-1 WATER 31-MAY-11 YK BACK BAY 1	L1011399-2 WATER 31-MAY-11 YK BACK BAY 2	L1011399-3 WATER 31-MAY-11 YK BACK BAY 3	L1011399-4 WATER 31-MAY-11 YK BACK BAY 4	L1011399-5 WATER 31-MAY-11 BACK BAY DOCK AREA
Grouping	Analyte					
WATER						
Total Metals	Tin (Sn)-Total (mg/L)	<0.00040	<0.00040	0.00092	<0.00040	<0.00040
	Titanium (Ti)-Total (mg/L)	0.0245	0.0067	0.0072	0.0102	0.0109
	Uranium (U)-Total (mg/L)	0.00039	0.00026	0.00025	0.00025	0.00027
	Vanadium (V)-Total (mg/L)	0.00139	<0.00050	<0.00050	<0.00050	0.00082
	Zinc (Zn)-Total (mg/L)	0.0100	<0.0040	<0.0040	<0.0040	0.0057
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.010	0.014	0.011	0.012	<0.010
	Antimony (Sb)-Dissolved (mg/L)	0.0270	0.00047	0.00066	0.00060	0.00053
	Arsenic (As)-Dissolved (mg/L)	0.0877	0.00302	0.00298	0.00329	0.00268
	Barium (Ba)-Dissolved (mg/L)	0.0123	0.00739	0.00671	0.00682	0.0105
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)	0.0252	0.0048	0.0058	0.0053	0.0069
	Cadmium (Cd)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Calcium (Ca)-Dissolved (mg/L)	21.6	6.36	6.32	6.39	8.76
	Chromium (Cr)-Dissolved (mg/L)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
	Cobalt (Co)-Dissolved (mg/L)	0.00057	<0.00010	<0.00010	<0.00010	<0.00010
	Copper (Cu)-Dissolved (mg/L)	0.00663	0.00081	0.00088	0.00085	0.00105
	Iron (Fe)-Dissolved (mg/L)	0.053	<0.010	0.012	<0.010	0.030
	Lead (Pb)-Dissolved (mg/L)	0.00050	<0.00010	<0.00010	<0.00010	<0.00010
	Magnesium (Mg)-Dissolved (mg/L)	5.48	2.18	2.25	2.30	2.72
	Manganese (Mn)-Dissolved (mg/L)	0.0631	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	0.00128	0.00014	0.00015	0.00015	0.00019
	Nickel (Ni)-Dissolved (mg/L)	0.00582	0.00040	0.00038	0.00042	0.00054
	Potassium (K)-Dissolved (mg/L)	1.68	0.71	0.84	0.85	0.98
	Selenium (Se)-Dissolved (mg/L)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
	Silver (Ag)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Sodium (Na)-Dissolved (mg/L)	9.36	2.19	2.16	2.20	2.71
	Strontium (Sr)-Dissolved (mg/L)	0.0904	0.0315	0.0309	0.0305	0.0388
	Thallium (Tl)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Tin (Sn)-Dissolved (mg/L)	<0.00020	<0.00020	0.00045	0.00022	<0.00020
	Titanium (Ti)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Uranium (U)-Dissolved (mg/L)	0.00047	0.00023	0.00023	0.00023	0.00019
	Vanadium (V)-Dissolved (mg/L)	0.00027	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Dissolved (mg/L)	0.0036	<0.0010	<0.0010	<0.0010	<0.0010

* 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		L1011399-6 WATER 31-MAY-11 FIELD BLANK	L1011399-7 WATER 31-MAY-11 TRAVEL BLANK			
Grouping	Analyte					
WATER						
Total Metals	Tin (Sn)-Total (mg/L)	<0.00040	<0.00040			
	Titanium (Ti)-Total (mg/L)	<0.0050	<0.0050			
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010			
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050			
	Zinc (Zn)-Total (mg/L)	<0.0040	<0.0040			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.010	<0.010			
	Antimony (Sb)-Dissolved (mg/L)	<0.00040	<0.00040			
	Arsenic (As)-Dissolved (mg/L)	<0.00040	<0.00040			
	Barium (Ba)-Dissolved (mg/L)	<0.00010	<0.00010			
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050			
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050			
	Boron (B)-Dissolved (mg/L)	<0.0020	<0.0020			
	Cadmium (Cd)-Dissolved (mg/L)	<0.00010	<0.00010			
	Calcium (Ca)-Dissolved (mg/L)	<0.50	<0.50			
	Chromium (Cr)-Dissolved (mg/L)	<0.00040	<0.00040			
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	<0.00010			
	Copper (Cu)-Dissolved (mg/L)	<0.00060	<0.00060			
	Iron (Fe)-Dissolved (mg/L)	<0.010	<0.010			
	Lead (Pb)-Dissolved (mg/L)	<0.00010	<0.00010			
	Magnesium (Mg)-Dissolved (mg/L)	<0.10	<0.10			
	Manganese (Mn)-Dissolved (mg/L)	<0.0020	<0.0020			
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020			
	Molybdenum (Mo)-Dissolved (mg/L)	<0.00010	<0.00010			
	Nickel (Ni)-Dissolved (mg/L)	<0.00010	<0.00010			
	Potassium (K)-Dissolved (mg/L)	<0.10	<0.10			
	Selenium (Se)-Dissolved (mg/L)	<0.00040	<0.00040			
	Silver (Ag)-Dissolved (mg/L)	<0.00020	<0.00020			
	Sodium (Na)-Dissolved (mg/L)	<0.50	<0.50			
	Strontium (Sr)-Dissolved (mg/L)	<0.00010	<0.00010			
	Thallium (Tl)-Dissolved (mg/L)	<0.000050	<0.000050			
	Tin (Sn)-Dissolved (mg/L)	<0.00020	<0.00020			
	Titanium (Ti)-Dissolved (mg/L)	<0.00030	<0.00030			
	Uranium (U)-Dissolved (mg/L)	<0.00010	<0.00010			
	Vanadium (V)-Dissolved (mg/L)	<0.00010	<0.00010			
	Zinc (Zn)-Dissolved (mg/L)	0.0012	0.0010			

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

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
SPL	Sample was Preserved at the laboratory - TOC-LOW
SFPL	Sample was Filtered and Preserved at the laboratory - DOC-LOW, TDP-LOW

Qualifiers for Individual Parameters Listed:

Qualifier	Description
RRVAP	Reported Result Verified by Alternate Process

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-DIS-ORG-LOW-ED	Water	Dissolved Organic Carbon	APHA 5310 B-Instrumental
C-TOT-ORG-LOW-ED	Water	Total Organic Carbon	APHA 5310 B-Instrumental
ETL-HARDNESS-DIS-ED	Water	Hardness (from Dissolved Ca and Mg)	APHA 2340 B-Calculation
HG-D-L-CVAA-ED	Water	Mercury (Hg) - Dissolved	EPA 245.7 / EPA 245.1
HG-T-L-CVAA-ED	Water	Mercury (Hg)	EPA 245.7 / EPA 245.1
MET-D-L-ICP-ED	Water	Diss. Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-D-L-MS-ED	Water	Diss. Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
MET-T-L-ICP-ED	Water	Total Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-T-L-MS-ED	Water	Total Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
NO2+NO3-L-CFA-ED	Water	Nitrite & Nitrate in Water by Colour	APHA 4500 NO3-F

This analysis is carried out using procedures adapted from APHA Method 4500 NO3-F "Automated Cadmium Reduction Method".

NO2-L-CFA-ED	Water	Nitrite in Water by Colour	APHA 4500 NO2-A and NO3-F
This analysis is carried out using procedures adapted from APHA Method 4500 NO3-F "Automated Cadmium Reduction Method", omitting the Cu-Cd reduction step to be selective for nitrite.			
NO3-L-CALC-ED	Water	Nitrate in Water (Calculation)	APHA 4500 NO3-F
Nitrate (as N) is a calculated parameter. Nitrate (as N) = [Nitrate and Nitrite (as N)] - Nitrite (as N).			

P-T-L-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			

P-TD-L-COL-ED	Water	Total Dissolved P in Water by Colour	APHA 4500-P PHOSPHORUS
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.			

SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
TKN-L-CFA-ED	Water	TKN in Water by Colour	APHA 4500-NORG (TKN)
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 celcius with analysis using an automated colourimetric finish.			

TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer
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** 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

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.

Quality Control Report

Workorder: L1011399

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-L-ICP-ED		Water						
Batch	R2197107							
WG1288034-2 CRM		EU-H-3_OPTWATER						
Calcium (Ca)-Dissolved			99		%		80-120	01-JUN-11
Iron (Fe)-Dissolved			98		%		80-120	01-JUN-11
Magnesium (Mg)-Dissolved			110		%		80-120	01-JUN-11
Manganese (Mn)-Dissolved			99		%		80-120	01-JUN-11
Potassium (K)-Dissolved			93		%		80-120	01-JUN-11
Sodium (Na)-Dissolved			95		%		80-120	01-JUN-11
WG1288034-1 MB								
Calcium (Ca)-Dissolved			<0.20		mg/L		0.2	01-JUN-11
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	01-JUN-11
Magnesium (Mg)-Dissolved			<0.10		mg/L		0.1	01-JUN-11
Manganese (Mn)-Dissolved			<0.0020		mg/L		0.002	01-JUN-11
Potassium (K)-Dissolved			<0.1		mg/L		0.1	01-JUN-11
Sodium (Na)-Dissolved			<0.50		mg/L		0.5	01-JUN-11
MET-D-L-MS-ED		Water						
Batch	R2197547							
WG1288060-2 CRM		ED-HIGH-WATRM						
Aluminum (Al)-Dissolved			97		%		80-120	01-JUN-11
Antimony (Sb)-Dissolved			97		%		80-120	01-JUN-11
Arsenic (As)-Dissolved			97		%		80-120	01-JUN-11
Barium (Ba)-Dissolved			98		%		80-120	01-JUN-11
Beryllium (Be)-Dissolved			99		%		80-120	01-JUN-11
Bismuth (Bi)-Dissolved			99		%		80-120	01-JUN-11
Boron (B)-Dissolved			92		%		80-120	01-JUN-11
Cadmium (Cd)-Dissolved			99		%		80-120	01-JUN-11
Chromium (Cr)-Dissolved			97		%		80-120	01-JUN-11
Cobalt (Co)-Dissolved			97		%		80-120	01-JUN-11
Copper (Cu)-Dissolved			94		%		80-120	01-JUN-11
Lead (Pb)-Dissolved			98		%		80-120	01-JUN-11
Molybdenum (Mo)-Dissolved			98		%		80-120	01-JUN-11
Nickel (Ni)-Dissolved			97		%		80-120	01-JUN-11
Selenium (Se)-Dissolved			100		%		80-120	01-JUN-11
Silver (Ag)-Dissolved			97		%		80-120	01-JUN-11
Strontium (Sr)-Dissolved			101		%		80-120	01-JUN-11
Thallium (Tl)-Dissolved			102		%		80-120	01-JUN-11



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-L-MS-ED		Water						
Batch	R2197547							
WG1288060-2 CRM		ED-HIGH-WATRM						
Tin (Sn)-Dissolved			97		%		80-120	01-JUN-11
Titanium (Ti)-Dissolved			88		%		80-120	01-JUN-11
Uranium (U)-Dissolved			99		%		80-120	01-JUN-11
Vanadium (V)-Dissolved			96		%		80-120	01-JUN-11
Zinc (Zn)-Dissolved			96		%		80-120	01-JUN-11
WG1288060-1 MB								
Aluminum (Al)-Dissolved			<0.0050		mg/L		0.005	01-JUN-11
Antimony (Sb)-Dissolved			<0.00040		mg/L		0.0004	01-JUN-11
Arsenic (As)-Dissolved			<0.00040		mg/L		0.0004	01-JUN-11
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-11
Beryllium (Be)-Dissolved			<0.00050		mg/L		0.0005	01-JUN-11
Bismuth (Bi)-Dissolved			<0.000050		mg/L		0.00005	01-JUN-11
Boron (B)-Dissolved			<0.0020		mg/L		0.002	01-JUN-11
Cadmium (Cd)-Dissolved			<0.000050		mg/L		0.00005	01-JUN-11
Chromium (Cr)-Dissolved			<0.00040		mg/L		0.0004	01-JUN-11
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-11
Copper (Cu)-Dissolved			<0.00060		mg/L		0.0006	01-JUN-11
Lead (Pb)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-11
Molybdenum (Mo)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-11
Nickel (Ni)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-11
Selenium (Se)-Dissolved			<0.00040		mg/L		0.0004	01-JUN-11
Silver (Ag)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-11
Strontium (Sr)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-11
Thallium (Tl)-Dissolved			<0.000050		mg/L		0.00005	01-JUN-11
Tin (Sn)-Dissolved			<0.00020		mg/L		0.0002	01-JUN-11
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	01-JUN-11
Uranium (U)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-11
Vanadium (V)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-11
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	01-JUN-11
MET-T-L-ICP-ED		Water						
Batch	R2197819							
WG1288816-2 DUP		L1011399-7						
Calcium (Ca)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	02-JUN-11
Iron (Fe)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	02-JUN-11



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-ICP-ED		Water						
Batch	R2197819							
WG1288816-2 DUP		L1011399-7						
Magnesium (Mg)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	02-JUN-11
Manganese (Mn)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	02-JUN-11
Potassium (K)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	02-JUN-11
Sodium (Na)-Total		<1.0	<1.0	RPD-NA	mg/L	N/A	20	02-JUN-11
WG1288797-2 LCS								
Calcium (Ca)-Total			104		%		80-120	02-JUN-11
Iron (Fe)-Total			103		%		80-120	02-JUN-11
Magnesium (Mg)-Total			104		%		80-120	02-JUN-11
Manganese (Mn)-Total			104		%		80-120	02-JUN-11
Potassium (K)-Total			100		%		80-120	02-JUN-11
Sodium (Na)-Total			104		%		80-120	02-JUN-11
WG1288797-1 MB								
Calcium (Ca)-Total			<0.50		mg/L		0.5	02-JUN-11
Iron (Fe)-Total			<0.010		mg/L		0.01	02-JUN-11
Magnesium (Mg)-Total			<0.10		mg/L		0.1	02-JUN-11
Manganese (Mn)-Total			<0.0020		mg/L		0.002	02-JUN-11
Potassium (K)-Total			<0.10		mg/L		0.1	02-JUN-11
Sodium (Na)-Total			<1.0		mg/L		1	02-JUN-11
WG1288816-1 MB								
Calcium (Ca)-Total			<0.50		mg/L		0.5	02-JUN-11
Iron (Fe)-Total			<0.010		mg/L		0.01	02-JUN-11
Magnesium (Mg)-Total			<0.10		mg/L		0.1	02-JUN-11
Manganese (Mn)-Total			<0.0020		mg/L		0.002	02-JUN-11
Potassium (K)-Total			<0.10		mg/L		0.1	02-JUN-11
Sodium (Na)-Total			<1.0		mg/L		1	02-JUN-11
WG1288816-3 MS		L1011399-7						
Calcium (Ca)-Total			98		%		70-130	02-JUN-11
Iron (Fe)-Total			96		%		70-130	02-JUN-11
Magnesium (Mg)-Total			100		%		70-130	02-JUN-11
Manganese (Mn)-Total			98		%		70-130	02-JUN-11
Potassium (K)-Total			93		%		70-130	02-JUN-11
Sodium (Na)-Total			98		%		70-130	02-JUN-11

MET-T-L-MS-ED

Water



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-MS-ED		Water						
Batch	R2197838							
WG1288816-2	DUP	L1011399-7						
Aluminum (Al)-Total		<0.020	<0.010	RPD-NA	mg/L	N/A	20	02-JUN-11
Antimony (Sb)-Total		<0.00040	<0.00040	RPD-NA	mg/L	N/A	20	02-JUN-11
Arsenic (As)-Total		<0.00040	<0.00040	RPD-NA	mg/L	N/A	20	02-JUN-11
Barium (Ba)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	02-JUN-11
Beryllium (Be)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-JUN-11
Bismuth (Bi)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	02-JUN-11
Boron (B)-Total		<0.020	<0.0040	RPD-NA	mg/L	N/A	20	02-JUN-11
Cadmium (Cd)-Total		<0.00020	<0.000050	RPD-NA	mg/L	N/A	20	02-JUN-11
Chromium (Cr)-Total		<0.00080	<0.00080	RPD-NA	mg/L	N/A	20	02-JUN-11
Cobalt (Co)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	02-JUN-11
Copper (Cu)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-JUN-11
Lead (Pb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-JUN-11
Molybdenum (Mo)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-JUN-11
Nickel (Ni)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	02-JUN-11
Selenium (Se)-Total		<0.00040	<0.00040	RPD-NA	mg/L	N/A	20	02-JUN-11
Silver (Ag)-Total		<0.00040	<0.00010	RPD-NA	mg/L	N/A	20	02-JUN-11
Strontium (Sr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	02-JUN-11
Thallium (Tl)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-JUN-11
Tin (Sn)-Total		<0.00040	<0.00040	RPD-NA	mg/L	N/A	20	02-JUN-11
Titanium (Ti)-Total		<0.0050	<0.00060	RPD-NA	mg/L	N/A	20	02-JUN-11
Uranium (U)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-JUN-11
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-JUN-11
Zinc (Zn)-Total		<0.0040	<0.0040	RPD-NA	mg/L	N/A	20	02-JUN-11
WG1288797-2	LCS							
Aluminum (Al)-Total			98		%		80-120	02-JUN-11
Antimony (Sb)-Total			101		%		80-120	02-JUN-11
Arsenic (As)-Total			99		%		80-120	02-JUN-11
Barium (Ba)-Total			104		%		80-120	02-JUN-11
Beryllium (Be)-Total			98		%		80-120	02-JUN-11
Bismuth (Bi)-Total			100		%		80-120	02-JUN-11
Boron (B)-Total			100		%		80-120	02-JUN-11
Cadmium (Cd)-Total			100		%		80-120	02-JUN-11
Chromium (Cr)-Total			102		%		80-120	02-JUN-11
Cobalt (Co)-Total			105		%		80-120	02-JUN-11



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-MS-ED	Water							
Batch	R2197838							
WG1288797-2 LCS								
Copper (Cu)-Total			104		%		80-120	02-JUN-11
Lead (Pb)-Total			97		%		80-120	02-JUN-11
Molybdenum (Mo)-Total			102		%		80-120	02-JUN-11
Nickel (Ni)-Total			105		%		80-120	02-JUN-11
Selenium (Se)-Total			103		%		80-120	02-JUN-11
Silver (Ag)-Total			95		%		80-120	02-JUN-11
Strontium (Sr)-Total			103		%		80-120	02-JUN-11
Thallium (Tl)-Total			104		%		80-120	02-JUN-11
Tin (Sn)-Total			101		%		80-120	02-JUN-11
Titanium (Ti)-Total			100		%		80-120	02-JUN-11
Uranium (U)-Total			92		%		80-120	02-JUN-11
Vanadium (V)-Total			100		%		80-120	02-JUN-11
Zinc (Zn)-Total			99		%		80-120	02-JUN-11
WG1288797-1 MB								
Aluminum (Al)-Total			<0.010		mg/L		0.01	02-JUN-11
Antimony (Sb)-Total			<0.00040		mg/L		0.0004	02-JUN-11
Arsenic (As)-Total			<0.00040		mg/L		0.0004	02-JUN-11
Barium (Ba)-Total			<0.00020		mg/L		0.0002	02-JUN-11
Beryllium (Be)-Total			<0.0010		mg/L		0.001	02-JUN-11
Bismuth (Bi)-Total			<0.00020		mg/L		0.0002	02-JUN-11
Boron (B)-Total			<0.0040		mg/L		0.004	02-JUN-11
Cadmium (Cd)-Total			<0.000050		mg/L		0.00005	02-JUN-11
Chromium (Cr)-Total			<0.00080		mg/L		0.0008	02-JUN-11
Cobalt (Co)-Total			<0.00020		mg/L		0.0002	02-JUN-11
Copper (Cu)-Total			<0.0010		mg/L		0.001	02-JUN-11
Lead (Pb)-Total			<0.00010		mg/L		0.0001	02-JUN-11
Molybdenum (Mo)-Total			<0.00010		mg/L		0.0001	02-JUN-11
Nickel (Ni)-Total			<0.00020		mg/L		0.0002	02-JUN-11
Selenium (Se)-Total			<0.00040		mg/L		0.0004	02-JUN-11
Silver (Ag)-Total			<0.00010		mg/L		0.0001	02-JUN-11
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	02-JUN-11
Thallium (Tl)-Total			<0.00010		mg/L		0.0001	02-JUN-11
Tin (Sn)-Total			<0.00040		mg/L		0.0004	02-JUN-11
Titanium (Ti)-Total			<0.00060		mg/L		0.0006	02-JUN-11



Quality Control Report

Workorder: L1011399

Report Date: 22-JUN-11

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-MS-ED								
Water								
Batch	R2197838							
WG1288797-1 MB								
Uranium (U)-Total			<0.00010		mg/L		0.0001	02-JUN-11
Vanadium (V)-Total			<0.00050		mg/L		0.0005	02-JUN-11
Zinc (Zn)-Total			<0.0040		mg/L		0.004	02-JUN-11
WG1288816-1 MB								
Aluminum (Al)-Total			<0.010		mg/L		0.01	02-JUN-11
Antimony (Sb)-Total			<0.00040		mg/L		0.0004	02-JUN-11
Arsenic (As)-Total			<0.00040		mg/L		0.0004	02-JUN-11
Barium (Ba)-Total			<0.00020		mg/L		0.0002	02-JUN-11
Beryllium (Be)-Total			<0.0010		mg/L		0.001	02-JUN-11
Bismuth (Bi)-Total			<0.00020		mg/L		0.0002	02-JUN-11
Boron (B)-Total			<0.0040		mg/L		0.004	02-JUN-11
Cadmium (Cd)-Total			<0.000050		mg/L		0.00005	02-JUN-11
Chromium (Cr)-Total			<0.00080		mg/L		0.0008	02-JUN-11
Cobalt (Co)-Total			<0.00020		mg/L		0.0002	02-JUN-11
Copper (Cu)-Total			<0.0010		mg/L		0.001	02-JUN-11
Lead (Pb)-Total			<0.00010		mg/L		0.0001	02-JUN-11
Molybdenum (Mo)-Total			<0.00010		mg/L		0.0001	02-JUN-11
Nickel (Ni)-Total			<0.00020		mg/L		0.0002	02-JUN-11
Selenium (Se)-Total			<0.00040		mg/L		0.0004	02-JUN-11
Silver (Ag)-Total			<0.00010		mg/L		0.0001	02-JUN-11
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	02-JUN-11
Thallium (Tl)-Total			<0.00010		mg/L		0.0001	02-JUN-11
Tin (Sn)-Total			<0.00040		mg/L		0.0004	02-JUN-11
Titanium (Ti)-Total			<0.00060		mg/L		0.0006	02-JUN-11
Uranium (U)-Total			<0.00010		mg/L		0.0001	02-JUN-11
Vanadium (V)-Total			<0.00050		mg/L		0.0005	02-JUN-11
Zinc (Zn)-Total			<0.0040		mg/L		0.004	02-JUN-11
WG1288816-3 MS		L1011399-7						
Aluminum (Al)-Total			118		%		70-130	02-JUN-11
Antimony (Sb)-Total			100		%		70-130	02-JUN-11
Arsenic (As)-Total			119		%		70-130	02-JUN-11
Barium (Ba)-Total			121		%		70-130	02-JUN-11
Beryllium (Be)-Total			115		%		70-130	02-JUN-11
Bismuth (Bi)-Total			97		%		70-130	02-JUN-11
Boron (B)-Total			118		%		70-130	02-JUN-11



Quality Control Report

Workorder: L1011399

Report Date: 22-JUN-11

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-MS-ED								
Water								
Batch	R2197838							
WG1288816-3 MS		L1011399-7						
Cadmium (Cd)-Total			119		%		70-130	02-JUN-11
Chromium (Cr)-Total			119		%		70-130	02-JUN-11
Cobalt (Co)-Total			123		%		70-130	02-JUN-11
Copper (Cu)-Total			126		%		70-130	02-JUN-11
Lead (Pb)-Total			115		%		70-130	02-JUN-11
Molybdenum (Mo)-Total			102		%		70-130	02-JUN-11
Nickel (Ni)-Total			126		%		70-130	02-JUN-11
Selenium (Se)-Total			126		%		70-130	02-JUN-11
Silver (Ag)-Total			102		%		70-130	02-JUN-11
Strontium (Sr)-Total			119		%		70-130	02-JUN-11
Thallium (Tl)-Total			117		%		70-130	02-JUN-11
Tin (Sn)-Total			98		%		70-130	02-JUN-11
Titanium (Ti)-Total			101		%		70-130	02-JUN-11
Uranium (U)-Total			121		%		70-130	02-JUN-11
Vanadium (V)-Total			118		%		70-130	02-JUN-11
Zinc (Zn)-Total			124		%		70-130	02-JUN-11
NO2+NO3-L-CFA-ED								
Water								
Batch	R2197387							
WG1288495-6 DUP		L1011399-7						
Nitrate and Nitrite (as N)		<0.0060	<0.0060	RPD-NA	mg/L	N/A	20	01-JUN-11
WG1288495-3 LCS								
Nitrate and Nitrite (as N)			99		%		85-115	01-JUN-11
WG1288495-2 MB								
Nitrate and Nitrite (as N)			<0.0060		mg/L		0.006	01-JUN-11
WG1288495-5 MS		L1010772-1						
Nitrate and Nitrite (as N)			97		%		75-125	01-JUN-11
NO2-L-CFA-ED								
Water								
Batch	R2197387							
WG1288495-6 DUP		L1011399-7						
Nitrite (as N)		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	01-JUN-11
WG1288495-3 LCS								
Nitrite (as N)			105		%		85-115	01-JUN-11
WG1288495-2 MB								
Nitrite (as N)			<0.0020		mg/L		0.002	01-JUN-11
WG1288495-5 MS		L1010772-1						
Nitrite (as N)			102		%		75-125	01-JUN-11



Quality Control Report

Workorder: L1011399

Report Date: 22-JUN-11

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-L-COL-ED								
Water								
Batch	R2197652							
WG1288728-4 DUP		L1011399-6						
Phosphorus (P)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-JUN-11
WG1288728-3 LCS								
Phosphorus (P)-Total			103		%		80-120	02-JUN-11
WG1288728-2 MB								
Phosphorus (P)-Total			<0.0010		mg/L		0.001	02-JUN-11
WG1288728-5 MS		L1011399-6						
Phosphorus (P)-Total			112		%		70-130	02-JUN-11
P-TD-L-COL-ED								
Water								
Batch	R2197652							
WG1288728-3 LCS								
Phosphorus (P)-Total Dissolved			103		%		80-120	02-JUN-11
WG1288728-2 MB								
Phosphorus (P)-Total Dissolved			<0.0010		mg/L		0.001	02-JUN-11
SOLIDS-TOTSUS-ED								
Water								
Batch	R2197604							
WG1288619-6 DUP		L1011399-2						
Total Suspended Solids		4.0	14.0		mg/L	0.0	20	02-JUN-11
WG1288619-2 LCS								
Total Suspended Solids			98		%		85-115	02-JUN-11
WG1288619-1 MB								
Total Suspended Solids			<3.0		mg/L		3	02-JUN-11
TKN-L-CFA-ED								
Water								
Batch	R2197489							
WG1288662-5 DUP		L1011399-6						
Total Kjeldahl Nitrogen		<0.050	<0.050	RPD-NA	mg/L	N/A	20	02-JUN-11
WG1288662-2 LCS								
Total Kjeldahl Nitrogen			98		%		75-125	02-JUN-11
WG1288662-3 LCS								
Total Kjeldahl Nitrogen			94		%		75-125	02-JUN-11
WG1288662-4 LCS								
Total Kjeldahl Nitrogen			92		%		75-125	02-JUN-11
WG1288662-1 MB								
Total Kjeldahl Nitrogen			<0.050		mg/L		0.05	02-JUN-11
WG1288662-6 MS		L1011399-7						
Total Kjeldahl Nitrogen			87		%		61-140	02-JUN-11
TURBIDITY-ED								
Water								



Quality Control Report

Workorder: L1011399

Report Date: 22-JUN-11

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TURBIDITY-ED	Water							
Batch	R2197450							
WG1288858-1	MB							
Turbidity			<0.10		NTU		0.1	02-JUN-11

Quality Control Report

Workorder: L1011399

Report Date: 22-JUN-11

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Workorder: L1011399

Report Date: 22-JUN-11

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Anions and Nutrients							
Nitrate in Water (Calculation)							
	1	31-MAY-11	06-JUN-11 15:08	48	147	hours	EHT
	2	31-MAY-11	06-JUN-11 15:08	48	147	hours	EHT
	3	31-MAY-11	02-JUN-11 13:28	48	49	hours	EHT
	4	31-MAY-11	02-JUN-11 13:28	48	49	hours	EHT
	5	31-MAY-11	02-JUN-11 13:28	48	49	hours	EHT
	6	31-MAY-11	02-JUN-11 13:28	48	49	hours	EHT
	7	31-MAY-11	02-JUN-11 13:28	48	49	hours	EHT

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1011399 were received on 01-JUN-11 10:29.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)	
Company: Deton/Cho/Nuna Joint Venture AND Golder As. Ltd.		<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other		<input type="radio"/> Regular (Standard Turnaround Times - Business Days)	
Contact: DCNUV: Katrina Nogleby, Golder: Justine Crowe		<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax		<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT	
Address:		Email 1: jcrowe@golder.com		<input checked="" type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT	
Phone: 867 669 6735 Fax:		Email 2: hmachtans@golder.com		<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT	
Invoice To		Email 3: KatrinaN@nunaanalytics.com		Analysis Request	
Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Client / Project Information		Please indicate below Filtered, Preserved or both (F, P, F/P)	
Company: Deton/Cho/Nuna Joint Venture		Job #: 09-1427-0006-20000-20500		<input type="checkbox"/> Filtered <input type="checkbox"/> Preserved <input type="checkbox"/> Both	
Contact: Brenda Kalis		PO / AFE: 606989		Physical Parameters/Major Ions	
Address: 9838-31st Avenue., Edmonton AB, T6N 1C5		LSD:		Cyanide	
Phone: 780 408 2897 Fax: 780 408 5472		Quote #:		Hardness	
Lab Work Order # (lab use only)		ALS Contact:		TSS and Turbidity	
Sample #		Date (dd-mm-yy)		Nutrients	
YK Back Bay 1 (Reach of mouth)		31-May-11		NH3 / TKN	
YK Back Bay 2 (d/s house boat)		31-May-11		Oil and Grease	
YK Back Bay 3		31-May-11		DOC	
YK Back Bay 4		31-May-11		TOC	
YK Back Bay 5 (house boat)		31-May-11		Low Level Total Metals	
Back Bay Dock Area		31-May-11		Low Level Dissolved Metals	
Field Blank		31-May-11		Sulphide	
Travel Blank		31-May-11		Number of Containers	

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details			
Please Analyze As and Se by Hydride*. Please include Mercury in the metals analysis. Note - This water might contain high amounts of metals. All Samples are RUSH / EMERGENCY!!!!			
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 VERIFICATION (lab use only)	
Released by: J Crowe	Date (dd-mm-yy): 31-May-11 15:55	Received by: RS	Date: 1-Jun-11 10:29
Time (hh-mm): 15:55		Temperature: 11.8 °C	Time: 10:29
Temp at 15:55 on May 31-11 was ~10 °C		Verified by:	Date:
Golder		Observations: Yes / No ?	If Yes add SIF
		GENF 18.01 Front	



DETON'CHO \ NUNA JOINT VENTURE
ATTN: KATRINA NOKLEBY
GIANT MINESITE
PO BOX 2951
Yellowknife NT X1A 2R2

Date Received: 06-JUN-11
Report Date: 10-JUN-11 18:27 (MT)
Version: FINAL

Client Phone: 604-253-4188

Certificate of Analysis

Lab Work Order #: L1013401
Project P.O. #: 606989
Job Reference: 09-1427-0006-20000-20500
Legal Site Desc:
C of C Numbers: 1

Comments:

Can Dang
Senior Account Manager

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

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1013401-1 WATER 06-JUN-11 12:00 REACH 0 (BC MOUTH)	L1013401-2 WATER 06-JUN-11 12:00 REACH 4 (D/S ICE AT BRIDGE)	L1013401-3 WATER 06-JUN-11 12:00 REACH 5 (D/S POND)	L1013401-4 WATER 06-JUN-11 12:00 FIELD BLANK	L1013401-5 WATER 06-JUN-11 12:00 TRAVEL BLANK
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO ₃) (mg/L)	32.2	52.3	53.5	<0.50	<0.50
	Total Suspended Solids (mg/L)	2.6	2.6	4.2	<1.0	<1.0
	Turbidity (NTU)	3.88	3.64	3.98	0.25	0.55
Anions and Nutrients	Nitrate and Nitrite (as N) (mg/L)	<0.0051	0.0106	0.0177	<0.0051	<0.0051
	Nitrate (as N) (mg/L)	<0.0050	0.0106	0.0177	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.296	0.763	0.726	0.092	<0.050
	Phosphorus (P)-Total Dissolved (mg/L)	0.0031	0.0080	0.0076	<0.0020	<0.0020
	Phosphorus (P)-Total (mg/L)	0.0105	0.0226	0.0246	<0.0020	<0.0020
Total Metals	Aluminum (Al)-Total (mg/L)	0.130	0.150	0.103	<0.0030	<0.0030
	Antimony (Sb)-Total (mg/L)	0.00140	0.0102	0.0120	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.0103	0.0678	0.0799	<0.00010	<0.00010
	Barium (Ba)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Beryllium (Be)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Calcium (Ca)-Total (mg/L)	8.33	13.7	14.3	<0.050	<0.050
	Chromium (Cr)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cobalt (Co)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Copper (Cu)-Total (mg/L)	0.00443	0.00614	0.0150	<0.00050	<0.00050
	Iron (Fe)-Total (mg/L)	0.133	0.238	0.235	<0.010	<0.010
	Lead (Pb)-Total (mg/L)	0.000521	0.000753	0.00120	<0.000050	<0.000050
	Lithium (Li)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Magnesium (Mg)-Total (mg/L)	2.68	3.81	3.88	<0.10	<0.10
	Manganese (Mn)-Total (mg/L)	0.0059	0.0212	0.0287	<0.0050	<0.0050
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.000206	0.000763	0.000794	<0.000050	<0.000050
	Nickel (Ni)-Total (mg/L)	0.00066	0.00196	0.00215	<0.00050	<0.00050
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Total (mg/L)	0.580	0.368	0.279	<0.050	<0.050
	Silver (Ag)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Sodium (Na)-Total (mg/L)	2.6	3.1	3.2	<2.0	<2.0
	Strontium (Sr)-Total (mg/L)	0.0368	0.0547	0.0574	<0.0050	<0.0050
	Thallium (Tl)-Total (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20

* 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		L1013401-1 WATER 06-JUN-11 12:00 REACH 0 (BC MOUTH)	L1013401-2 WATER 06-JUN-11 12:00 REACH 4 (D/S ICE AT BRIDGE)	L1013401-3 WATER 06-JUN-11 12:00 REACH 5 (D/S POND)	L1013401-4 WATER 06-JUN-11 12:00 FIELD BLANK	L1013401-5 WATER 06-JUN-11 12:00 TRAVEL BLANK
Grouping	Analyte					
WATER						
Total Metals	Tin (Sn)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.000254	0.000241	0.000223	<0.000010	<0.000010
	Vanadium (V)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Zinc (Zn)-Total (mg/L)	<0.0040	<0.0040	0.0062	<0.0040	<0.0040
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0101	0.0092	0.0061	<0.0030	<0.0030
	Antimony (Sb)-Dissolved (mg/L)	0.00133	0.0108	0.0117	<0.00010	<0.00010
	Arsenic (As)-Dissolved (mg/L)	0.00919	0.0654	0.0714	<0.00010	<0.00010
	Barium (Ba)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Beryllium (Be)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Calcium (Ca)-Dissolved (mg/L)	8.46	14.4	14.9	<0.050	<0.050
	Chromium (Cr)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cobalt (Co)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Copper (Cu)-Dissolved (mg/L)	0.00120	0.00437	0.00919	<0.00050	<0.00050
	Iron (Fe)-Dissolved (mg/L)	<0.010	0.047	0.044	<0.010	<0.010
	Lead (Pb)-Dissolved (mg/L)	<0.000050	0.000191	0.000194	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Magnesium (Mg)-Dissolved (mg/L)	2.68	3.95	3.98	<0.10	<0.10
	Manganese (Mn)-Dissolved (mg/L)	<0.0050	<0.0050	0.0113	<0.0050	<0.0050
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.000209	0.000791	0.000770	<0.000050	<0.000050
	Nickel (Ni)-Dissolved (mg/L)	0.00064	0.00181	0.00186	<0.00050	<0.00050
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Dissolved (mg/L)	0.365	0.142	0.126	<0.050	<0.050
	Silver (Ag)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Sodium (Na)-Dissolved (mg/L)	2.6	3.3	3.4	<2.0	<2.0
	Strontium (Sr)-Dissolved (mg/L)	0.0369	0.0571	0.0585	<0.0050	<0.0050
	Thallium (Tl)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Tin (Sn)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.000240	0.000239	0.000219	<0.000010	<0.000010
	Vanadium (V)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030

* 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
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**
ANIONS-N+N-CALC-VA	Water	Nitrite & Nitrate in Water (Calculation)	EPA 300.0
Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).			
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.			
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-LOW-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS(Low)	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-LOW-CVAFS-VA	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
MET-D-CCMS-VA	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
MET-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-DIS-LOW-ICP-VA	Water	Dissolved Metals in Water by ICPOES	EPA 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-T-CCMS-VA	Water	Total Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
MET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-LOW-ICP-VA	Water	Total Metals in Water by ICPOES	EPA 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or			

Reference Information

microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

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.

P-TD-COL-VA Water Total Dissolved P in Water 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.

TKN-COL-VA Water TKN in Water by Colour 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 automated colourimetry.

TSS-LOW-VA Water Total Suspended Solids by Grav. (1 mg/L) APHA 2540 Gravimetric

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

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

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

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

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

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

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

Laboratory Definition Code	Laboratory Location
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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.



Quality Control Report

Workorder: L1013401

Report Date: 16-JUN-11

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Client: DETON'CHO \ NUNA JOINT VENTURE
GIANT MINESITE PO BOX 2951
Yellowknife NT X1A 2R2

Contact: KATRINA NOKLEBY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ANIONS-NO2-IC-VA		Water						
Batch	R2202243							
WG1292761-11	CRM	VA-IC-IVA2-ION23110						
Nitrite (as N)			94		%		85-115	09-JUN-11
WG1292761-2	CRM	VA-IC-IVA2-ION23110						
Nitrite (as N)			98		%		85-115	09-JUN-11
WG1292761-1	MB							
Nitrite (as N)			<0.0010		mg/L		0.001	09-JUN-11
WG1292761-10	MB							
Nitrite (as N)			<0.0010		mg/L		0.001	09-JUN-11
WG1292761-4	MB							
Nitrite (as N)			<0.0010		mg/L		0.001	09-JUN-11
WG1292761-6	MB							
Nitrite (as N)			<0.0010		mg/L		0.001	09-JUN-11
WG1292761-8	MB							
Nitrite (as N)			<0.0010		mg/L		0.001	09-JUN-11
ANIONS-NO3-IC-VA		Water						
Batch	R2202243							
WG1292761-11	CRM	VA-IC-IVA2-ION23110						
Nitrate (as N)			102		%		85-115	09-JUN-11
WG1292761-2	CRM	VA-IC-IVA2-ION23110						
Nitrate (as N)			101		%		85-115	09-JUN-11
WG1292761-1	MB							
Nitrate (as N)			<0.0050		mg/L		0.005	09-JUN-11
WG1292761-10	MB							
Nitrate (as N)			<0.0050		mg/L		0.005	09-JUN-11
WG1292761-4	MB							
Nitrate (as N)			<0.0050		mg/L		0.005	09-JUN-11
WG1292761-6	MB							
Nitrate (as N)			<0.0050		mg/L		0.005	09-JUN-11
WG1292761-8	MB							
Nitrate (as N)			<0.0050		mg/L		0.005	09-JUN-11
HG-DIS-LOW-CVAFS-VA		Water						
Batch	R2200780							
WG1292392-2	CRM	VA-HG-WATRM						
Mercury (Hg)-Dissolved			95		%		80-120	08-JUN-11
WG1292392-1	MB							
Mercury (Hg)-Dissolved			<0.000010		mg/L		0.00001	08-JUN-11



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-DIS-LOW-CVAFS-VA Water								
Batch	R2201429							
WG1292302-2 DUP		L1013401-1						
Mercury (Hg)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	09-JUN-11
WG1293039-2 LCS								
Mercury (Hg)-Dissolved			100		%		70-130	09-JUN-11
WG1292281-1 MB								
Mercury (Hg)-Dissolved			<0.000010		mg/L		0.00001	09-JUN-11
WG1292302-1 MB								
Mercury (Hg)-Dissolved			<0.000010		mg/L		0.00001	09-JUN-11
WG1292302-4 MB								
Mercury (Hg)-Dissolved			<0.000010		mg/L		0.00001	09-JUN-11
WG1293039-1 MB								
Mercury (Hg)-Dissolved			<0.000010		mg/L		0.00001	09-JUN-11
HG-TOT-LOW-CVAFS-VA Water								
Batch	R2200780							
WG1292392-2 CRM		VA-HG-WATRM						
Mercury (Hg)-Total			95		%		80-120	08-JUN-11
WG1292392-12 DUP		L1013401-3						
Mercury (Hg)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	08-JUN-11
WG1292392-1 MB								
Mercury (Hg)-Total			<0.000010		mg/L		0.00001	08-JUN-11
Batch	R2201429							
WG1293039-2 LCS								
Mercury (Hg)-Total			100		%		70-130	09-JUN-11
WG1293039-1 MB								
Mercury (Hg)-Total			<0.000010		mg/L		0.00001	09-JUN-11
MET-D-CCMS-VA Water								
Batch	R2201396							
WG1292281-1 MB								
Aluminum (Al)-Dissolved			<0.0030		mg/L		0.003	08-JUN-11
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	08-JUN-11
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	08-JUN-11
Cadmium (Cd)-Dissolved			<0.000010		mg/L		0.00001	08-JUN-11
Copper (Cu)-Dissolved			<0.00050		mg/L		0.0005	08-JUN-11
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	08-JUN-11
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	08-JUN-11
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	08-JUN-11
Selenium (Se)-Dissolved			<0.00010		mg/L		0.0001	08-JUN-11



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-VA		Water						
Batch R2201396								
WG1292281-1 MB								
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	08-JUN-11
Batch R2201600								
WG1292302-1 MB								
Aluminum (Al)-Dissolved			<0.0030		mg/L		0.003	09-JUN-11
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	09-JUN-11
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	09-JUN-11
Cadmium (Cd)-Dissolved			<0.000010		mg/L		0.00001	09-JUN-11
Copper (Cu)-Dissolved			<0.00050		mg/L		0.0005	09-JUN-11
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	09-JUN-11
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	09-JUN-11
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	09-JUN-11
Selenium (Se)-Dissolved			<0.00010		mg/L		0.0001	09-JUN-11
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	09-JUN-11
WG1292302-4 MB								
Aluminum (Al)-Dissolved			<0.0030		mg/L		0.003	09-JUN-11
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	09-JUN-11
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	09-JUN-11
Cadmium (Cd)-Dissolved			<0.000010		mg/L		0.00001	09-JUN-11
Copper (Cu)-Dissolved			<0.00050		mg/L		0.0005	09-JUN-11
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	09-JUN-11
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	09-JUN-11
Selenium (Se)-Dissolved			<0.00010		mg/L		0.0001	09-JUN-11
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	09-JUN-11
Batch R2201855								
WG1292302-2 DUP		L1013401-1						
Aluminum (Al)-Dissolved		0.0101	0.0097		mg/L	3.8	20	09-JUN-11
Antimony (Sb)-Dissolved		0.00133	0.00135		mg/L	1.5	20	09-JUN-11
Arsenic (As)-Dissolved		0.00919	0.00923		mg/L	0.51	20	09-JUN-11
Cadmium (Cd)-Dissolved		<0.000050	<0.000010	RPD-NA	mg/L	N/A	20	09-JUN-11
Copper (Cu)-Dissolved		0.00120	0.00119		mg/L	0.43	20	09-JUN-11
Lead (Pb)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	09-JUN-11
Molybdenum (Mo)-Dissolved		0.000209	0.000202		mg/L	3.5	20	09-JUN-11
Nickel (Ni)-Dissolved		0.00064	0.00057		mg/L	12	20	09-JUN-11
Selenium (Se)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	09-JUN-11



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-VA								
Water								
Batch	R2201855							
WG1292302-2	DUP	L1013401-1						
Uranium (U)-Dissolved		0.000240	0.000240		mg/L	0.12	20	09-JUN-11
Batch	R2201972							
WG1292302-4	MB							
Lead (Pb)-Dissolved			0.000112	MB-LOR	mg/L		0.00005	09-JUN-11
Batch	R2202037							
WG1292281-2	CRM	VA-HIGH-WATRM						
Aluminum (Al)-Dissolved			101		%		80-120	09-JUN-11
Antimony (Sb)-Dissolved			106		%		80-120	09-JUN-11
Arsenic (As)-Dissolved			103		%		80-120	09-JUN-11
Cadmium (Cd)-Dissolved			102		%		80-120	09-JUN-11
Copper (Cu)-Dissolved			99		%		80-120	09-JUN-11
Lead (Pb)-Dissolved			102		%		80-120	09-JUN-11
Molybdenum (Mo)-Dissolved			102		%		80-120	09-JUN-11
Nickel (Ni)-Dissolved			104		%		80-120	09-JUN-11
Selenium (Se)-Dissolved			100		%		80-120	09-JUN-11
Uranium (U)-Dissolved			98		%		80-120	09-JUN-11
WG1292302-3	CRM	VA-HIGH-WATRM						
Aluminum (Al)-Dissolved			101		%		80-120	09-JUN-11
Antimony (Sb)-Dissolved			106		%		80-120	09-JUN-11
Arsenic (As)-Dissolved			103		%		80-120	09-JUN-11
Cadmium (Cd)-Dissolved			102		%		80-120	09-JUN-11
Copper (Cu)-Dissolved			99		%		80-120	09-JUN-11
Lead (Pb)-Dissolved			102		%		80-120	09-JUN-11
Molybdenum (Mo)-Dissolved			102		%		80-120	09-JUN-11
Nickel (Ni)-Dissolved			104		%		80-120	09-JUN-11
Selenium (Se)-Dissolved			100		%		80-120	09-JUN-11
Uranium (U)-Dissolved			98		%		80-120	09-JUN-11
MET-DIS-ICP-VA								
Water								
Batch	R2201423							
WG1292281-2	CRM	VA-HIGH-WATRM						
Barium (Ba)-Dissolved			98		%		80-120	08-JUN-11
Beryllium (Be)-Dissolved			97		%		80-120	08-JUN-11
Bismuth (Bi)-Dissolved			98		%		80-120	08-JUN-11

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-ICP-VA		Water						
Batch	R2201423							
WG1292281-2 CRM		VA-HIGH-WATRM						
Boron (B)-Dissolved			98		%		80-120	08-JUN-11
Calcium (Ca)-Dissolved			103		%		80-120	08-JUN-11
Chromium (Cr)-Dissolved			96		%		80-120	08-JUN-11
Cobalt (Co)-Dissolved			97		%		80-120	08-JUN-11
Lithium (Li)-Dissolved			100		%		80-120	08-JUN-11
Magnesium (Mg)-Dissolved			99		%		80-120	08-JUN-11
Manganese (Mn)-Dissolved			97		%		80-120	08-JUN-11
Phosphorus (P)-Dissolved			100		%		80-120	08-JUN-11
Potassium (K)-Dissolved			99		%		80-120	08-JUN-11
Silicon (Si)-Dissolved			109		%		80-120	08-JUN-11
Silver (Ag)-Dissolved			95		%		80-120	08-JUN-11
Sodium (Na)-Dissolved			98		%		80-120	08-JUN-11
Strontium (Sr)-Dissolved			99		%		80-120	08-JUN-11
Thallium (Tl)-Dissolved			97		%		80-120	08-JUN-11
Tin (Sn)-Dissolved			99		%		80-120	08-JUN-11
Titanium (Ti)-Dissolved			102		%		80-120	08-JUN-11
Vanadium (V)-Dissolved			98		%		80-120	08-JUN-11
WG1292302-3 CRM		VA-HIGH-WATRM						
Barium (Ba)-Dissolved			98		%		80-120	08-JUN-11
Beryllium (Be)-Dissolved			97		%		80-120	08-JUN-11
Bismuth (Bi)-Dissolved			98		%		80-120	08-JUN-11
Boron (B)-Dissolved			98		%		80-120	08-JUN-11
Calcium (Ca)-Dissolved			103		%		80-120	08-JUN-11
Chromium (Cr)-Dissolved			96		%		80-120	08-JUN-11
Cobalt (Co)-Dissolved			97		%		80-120	08-JUN-11
Lithium (Li)-Dissolved			100		%		80-120	08-JUN-11
Magnesium (Mg)-Dissolved			99		%		80-120	08-JUN-11
Manganese (Mn)-Dissolved			97		%		80-120	08-JUN-11
Phosphorus (P)-Dissolved			100		%		80-120	08-JUN-11
Potassium (K)-Dissolved			99		%		80-120	08-JUN-11
Silicon (Si)-Dissolved			109		%		80-120	08-JUN-11
Silver (Ag)-Dissolved			95		%		80-120	08-JUN-11
Sodium (Na)-Dissolved			98		%		80-120	08-JUN-11
Strontium (Sr)-Dissolved			99		%		80-120	08-JUN-11

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-ICP-VA	Water							
Batch	R2201423							
WG1292302-3 CRM		VA-HIGH-WATRM						
Thallium (Tl)-Dissolved			97		%		80-120	08-JUN-11
Tin (Sn)-Dissolved			99		%		80-120	08-JUN-11
Titanium (Ti)-Dissolved			102		%		80-120	08-JUN-11
Vanadium (V)-Dissolved			98		%		80-120	08-JUN-11
WG1292281-1 MB								
Barium (Ba)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Beryllium (Be)-Dissolved			<0.0050		mg/L		0.005	08-JUN-11
Bismuth (Bi)-Dissolved			<0.20		mg/L		0.2	08-JUN-11
Boron (B)-Dissolved			<0.10		mg/L		0.1	08-JUN-11
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	08-JUN-11
Chromium (Cr)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Cobalt (Co)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Lithium (Li)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Magnesium (Mg)-Dissolved			<0.10		mg/L		0.1	08-JUN-11
Manganese (Mn)-Dissolved			<0.0050		mg/L		0.005	08-JUN-11
Phosphorus (P)-Dissolved			<0.30		mg/L		0.3	08-JUN-11
Potassium (K)-Dissolved			<2.0		mg/L		2	08-JUN-11
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	08-JUN-11
Silver (Ag)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Sodium (Na)-Dissolved			<2.0		mg/L		2	08-JUN-11
Strontium (Sr)-Dissolved			<0.0050		mg/L		0.005	08-JUN-11
Thallium (Tl)-Dissolved			<0.20		mg/L		0.2	08-JUN-11
Tin (Sn)-Dissolved			<0.030		mg/L		0.03	08-JUN-11
Titanium (Ti)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Vanadium (V)-Dissolved			<0.030		mg/L		0.03	08-JUN-11
WG1292302-1 MB								
Barium (Ba)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Beryllium (Be)-Dissolved			<0.0050		mg/L		0.005	08-JUN-11
Bismuth (Bi)-Dissolved			<0.20		mg/L		0.2	08-JUN-11
Boron (B)-Dissolved			<0.10		mg/L		0.1	08-JUN-11
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	08-JUN-11
Chromium (Cr)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Cobalt (Co)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Lithium (Li)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Magnesium (Mg)-Dissolved			<0.10		mg/L		0.1	08-JUN-11

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-ICP-VA		Water						
Batch	R2201423							
WG1292302-1 MB								
Manganese (Mn)-Dissolved			<0.0050		mg/L		0.005	08-JUN-11
Phosphorus (P)-Dissolved			<0.30		mg/L		0.3	08-JUN-11
Potassium (K)-Dissolved			<2.0		mg/L		2	08-JUN-11
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	08-JUN-11
Silver (Ag)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Sodium (Na)-Dissolved			<2.0		mg/L		2	08-JUN-11
Strontium (Sr)-Dissolved			<0.0050		mg/L		0.005	08-JUN-11
Thallium (Tl)-Dissolved			<0.20		mg/L		0.2	08-JUN-11
Tin (Sn)-Dissolved			<0.030		mg/L		0.03	08-JUN-11
Titanium (Ti)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Vanadium (V)-Dissolved			<0.030		mg/L		0.03	08-JUN-11
WG1292302-4 MB								
Barium (Ba)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Beryllium (Be)-Dissolved			<0.0050		mg/L		0.005	08-JUN-11
Bismuth (Bi)-Dissolved			<0.20		mg/L		0.2	08-JUN-11
Boron (B)-Dissolved			<0.10		mg/L		0.1	08-JUN-11
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	08-JUN-11
Chromium (Cr)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Cobalt (Co)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Lithium (Li)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Magnesium (Mg)-Dissolved			<0.10		mg/L		0.1	08-JUN-11
Manganese (Mn)-Dissolved			<0.0050		mg/L		0.005	08-JUN-11
Phosphorus (P)-Dissolved			<0.30		mg/L		0.3	08-JUN-11
Potassium (K)-Dissolved			<2.0		mg/L		2	08-JUN-11
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	08-JUN-11
Silver (Ag)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Sodium (Na)-Dissolved			<2.0		mg/L		2	08-JUN-11
Strontium (Sr)-Dissolved			<0.0050		mg/L		0.005	08-JUN-11
Thallium (Tl)-Dissolved			<0.20		mg/L		0.2	08-JUN-11
Tin (Sn)-Dissolved			<0.030		mg/L		0.03	08-JUN-11
Titanium (Ti)-Dissolved			<0.010		mg/L		0.01	08-JUN-11
Vanadium (V)-Dissolved			<0.030		mg/L		0.03	08-JUN-11



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed	
MET-DIS-LOW-ICP-VA		Water							
Batch	R2201423								
WG1292302-4 MB									
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	08-JUN-11	
Zinc (Zn)-Dissolved			<0.0040		mg/L		0.004	08-JUN-11	
Batch	R2202236								
WG1292302-2 DUP		L1013401-1							
Iron (Fe)-Dissolved			<0.010	0.011	RPD-NA	mg/L	N/A	20	09-JUN-11
Zinc (Zn)-Dissolved			<0.0040	<0.0040	RPD-NA	mg/L	N/A	20	09-JUN-11
MET-T-CCMS-VA		Water							
Batch	R2201600								
WG1292293-1 MB									
Aluminum (Al)-Total			<0.0030		mg/L		0.003	09-JUN-11	
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	09-JUN-11	
Arsenic (As)-Total			<0.00010		mg/L		0.0001	09-JUN-11	
Cadmium (Cd)-Total			<0.000010		mg/L		0.00001	09-JUN-11	
Copper (Cu)-Total			<0.00050		mg/L		0.0005	09-JUN-11	
Lead (Pb)-Total			<0.000050		mg/L		0.00005	09-JUN-11	
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	09-JUN-11	
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	09-JUN-11	
Selenium (Se)-Total			<0.00010		mg/L		0.0001	09-JUN-11	
Uranium (U)-Total			<0.000010		mg/L		0.00001	09-JUN-11	
WG1292406-1 MB									
Aluminum (Al)-Total			<0.0030		mg/L		0.003	09-JUN-11	
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	09-JUN-11	
Arsenic (As)-Total			<0.00010		mg/L		0.0001	09-JUN-11	
Cadmium (Cd)-Total			<0.000010		mg/L		0.00001	09-JUN-11	
Copper (Cu)-Total			<0.00050		mg/L		0.0005	09-JUN-11	
Lead (Pb)-Total			<0.000050		mg/L		0.00005	09-JUN-11	
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	09-JUN-11	
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	09-JUN-11	
Selenium (Se)-Total			<0.00010		mg/L		0.0001	09-JUN-11	
Uranium (U)-Total			<0.000010		mg/L		0.00001	09-JUN-11	
Batch	R2202037								
WG1292293-2 CRM		VA-HIGH-WATRM							
Aluminum (Al)-Total			101		%		80-120	09-JUN-11	
Antimony (Sb)-Total			105		%		80-120	09-JUN-11	
Arsenic (As)-Total			100		%		80-120	09-JUN-11	

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-VA		Water						
Batch	R2202037							
WG1292293-2 CRM		VA-HIGH-WATRM						
Cadmium (Cd)-Total			100		%		80-120	09-JUN-11
Copper (Cu)-Total			97		%		80-120	09-JUN-11
Lead (Pb)-Total			101		%		80-120	09-JUN-11
Molybdenum (Mo)-Total			101		%		80-120	09-JUN-11
Nickel (Ni)-Total			100		%		80-120	09-JUN-11
Selenium (Se)-Total			98		%		80-120	09-JUN-11
Uranium (U)-Total			95		%		80-120	09-JUN-11
WG1292406-3 CRM		VA-HIGH-WATRM						
Aluminum (Al)-Total			104		%		80-120	09-JUN-11
Antimony (Sb)-Total			108		%		80-120	09-JUN-11
Arsenic (As)-Total			103		%		80-120	09-JUN-11
Cadmium (Cd)-Total			103		%		80-120	09-JUN-11
Copper (Cu)-Total			100		%		80-120	09-JUN-11
Lead (Pb)-Total			104		%		80-120	09-JUN-11
Molybdenum (Mo)-Total			105		%		80-120	09-JUN-11
Nickel (Ni)-Total			104		%		80-120	09-JUN-11
Selenium (Se)-Total			100		%		80-120	09-JUN-11
Uranium (U)-Total			98		%		80-120	09-JUN-11
MET-TOT-ICP-VA		Water						
Batch	R2201423							
WG1292406-3 CRM		VA-HIGH-WATRM						
Barium (Ba)-Total			101		%		80-120	08-JUN-11
Beryllium (Be)-Total			100		%		80-120	08-JUN-11
Bismuth (Bi)-Total			97		%		80-120	08-JUN-11
Boron (B)-Total			99		%		80-120	08-JUN-11
Calcium (Ca)-Total			105		%		80-120	08-JUN-11
Chromium (Cr)-Total			100		%		80-120	08-JUN-11
Cobalt (Co)-Total			99		%		80-120	08-JUN-11
Lithium (Li)-Total			106		%		80-120	08-JUN-11
Magnesium (Mg)-Total			102		%		80-120	08-JUN-11
Manganese (Mn)-Total			100		%		80-120	08-JUN-11
Phosphorus (P)-Total			101		%		80-120	08-JUN-11
Potassium (K)-Total			103		%		80-120	08-JUN-11
Silicon (Si)-Total			112		%		80-120	08-JUN-11



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-TOT-ICP-VA		Water						
Batch	R2201423							
WG1292406-3 CRM		VA-HIGH-WATRM						
Silver (Ag)-Total			101		%		80-120	08-JUN-11
Sodium (Na)-Total			102		%		80-120	08-JUN-11
Strontium (Sr)-Total			103		%		80-120	08-JUN-11
Thallium (Tl)-Total			99		%		80-120	08-JUN-11
Tin (Sn)-Total			100		%		80-120	08-JUN-11
Titanium (Ti)-Total			105		%		80-120	08-JUN-11
Vanadium (V)-Total			102		%		80-120	08-JUN-11
WG1292406-1 MB								
Barium (Ba)-Total			<0.010		mg/L		0.01	08-JUN-11
Beryllium (Be)-Total			<0.0050		mg/L		0.005	08-JUN-11
Bismuth (Bi)-Total			<0.20		mg/L		0.2	08-JUN-11
Boron (B)-Total			<0.10		mg/L		0.1	08-JUN-11
Calcium (Ca)-Total			<0.050		mg/L		0.05	08-JUN-11
Chromium (Cr)-Total			<0.010		mg/L		0.01	08-JUN-11
Cobalt (Co)-Total			<0.010		mg/L		0.01	08-JUN-11
Lithium (Li)-Total			<0.010		mg/L		0.01	08-JUN-11
Magnesium (Mg)-Total			<0.10		mg/L		0.1	08-JUN-11
Manganese (Mn)-Total			<0.0050		mg/L		0.005	08-JUN-11
Phosphorus (P)-Total			<0.30		mg/L		0.3	08-JUN-11
Potassium (K)-Total			<2.0		mg/L		2	08-JUN-11
Silicon (Si)-Total			<0.050		mg/L		0.05	08-JUN-11
Silver (Ag)-Total			<0.010		mg/L		0.01	08-JUN-11
Sodium (Na)-Total			<2.0		mg/L		2	08-JUN-11
Strontium (Sr)-Total			<0.0050		mg/L		0.005	08-JUN-11
Thallium (Tl)-Total			<0.20		mg/L		0.2	08-JUN-11
Tin (Sn)-Total			<0.030		mg/L		0.03	08-JUN-11
Titanium (Ti)-Total			<0.010		mg/L		0.01	08-JUN-11
Vanadium (V)-Total			<0.030		mg/L		0.03	08-JUN-11
MET-TOT-LOW-ICP-VA		Water						
Batch	R2201423							
WG1292293-2 CRM		VA-HIGH-WATRM						
Iron (Fe)-Total			98		%		80-120	08-JUN-11
Zinc (Zn)-Total			96		%		80-120	08-JUN-11
WG1292406-3 CRM		VA-HIGH-WATRM						
Iron (Fe)-Total			101		%		80-120	08-JUN-11

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MET-TOT-LOW-ICP-VA Water								
Batch	R2201423							
WG1292406-3 CRM		VA-HIGH-WATRM						
Zinc (Zn)-Total			97		%		80-120	08-JUN-11
WG1292293-1 MB								
Iron (Fe)-Total			<0.010		mg/L		0.01	08-JUN-11
Zinc (Zn)-Total			<0.0040		mg/L		0.004	08-JUN-11
WG1292406-1 MB								
Iron (Fe)-Total			<0.010		mg/L		0.01	08-JUN-11
Zinc (Zn)-Total			<0.0040		mg/L		0.004	08-JUN-11
P-T-COL-VA Water								
Batch	R2201594							
WG1292767-11 CRM		VA-ERA-PO4						
Phosphorus (P)-Total			101		%		80-120	09-JUN-11
WG1292767-15 CRM		VA-ERA-PO4						
Phosphorus (P)-Total			102		%		80-120	09-JUN-11
WG1292767-2 CRM		VA-ERA-PO4						
Phosphorus (P)-Total			96		%		80-120	09-JUN-11
WG1292767-5 CRM		VA-ERA-PO4						
Phosphorus (P)-Total			100		%		80-120	09-JUN-11
WG1292767-8 CRM		VA-ERA-PO4						
Phosphorus (P)-Total			100		%		80-120	09-JUN-11
WG1292767-1 MB								
Phosphorus (P)-Total			<0.0020		mg/L		0.002	09-JUN-11
WG1292767-10 MB								
Phosphorus (P)-Total			<0.0020		mg/L		0.002	09-JUN-11
WG1292767-14 MB								
Phosphorus (P)-Total			<0.0020		mg/L		0.002	10-JUN-11
WG1292767-4 MB								
Phosphorus (P)-Total			<0.0020		mg/L		0.002	09-JUN-11
WG1292767-7 MB								
Phosphorus (P)-Total			<0.0020		mg/L		0.002	09-JUN-11
P-TD-COL-VA Water								
Batch	R2201594							
WG1292767-11 CRM		VA-ERA-PO4						
Phosphorus (P)-Total Dissolved			103		%		80-120	09-JUN-11
WG1292767-15 CRM		VA-ERA-PO4						
Phosphorus (P)-Total Dissolved			103		%		80-120	09-JUN-11
WG1292767-2 CRM		VA-ERA-PO4						
Phosphorus (P)-Total Dissolved			101		%		80-120	09-JUN-11

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-TD-COL-VA		Water						
Batch	R2201594							
WG1292767-5 CRM		VA-ERA-PO4						
Phosphorus (P)-Total	Dissolved		101		%		80-120	09-JUN-11
WG1292767-8 CRM		VA-ERA-PO4						
Phosphorus (P)-Total	Dissolved		101		%		80-120	09-JUN-11
WG1292767-1 MB								
Phosphorus (P)-Total	Dissolved		<0.0020		mg/L		0.002	09-JUN-11
WG1292767-10 MB								
Phosphorus (P)-Total	Dissolved		<0.0020		mg/L		0.002	09-JUN-11
WG1292767-14 MB								
Phosphorus (P)-Total	Dissolved		<0.0020		mg/L		0.002	09-JUN-11
WG1292767-4 MB								
Phosphorus (P)-Total	Dissolved		<0.0020		mg/L		0.002	09-JUN-11
WG1292767-7 MB								
Phosphorus (P)-Total	Dissolved		<0.0020		mg/L		0.002	09-JUN-11
TKN-COL-VA		Water						
Batch	R2201486							
WG1292538-2 CRM		VA-TKN-CSPK1						
Total Kjeldahl Nitrogen			100		%		75-125	09-JUN-11
WG1292538-5 CRM		VA-TKN-CSPK1						
Total Kjeldahl Nitrogen			95		%		75-125	09-JUN-11
WG1292538-1 MB								
Total Kjeldahl Nitrogen			<0.050		mg/L		0.05	09-JUN-11
WG1292538-4 MB								
Total Kjeldahl Nitrogen			<0.050		mg/L		0.05	09-JUN-11
Batch	R2202276							
WG1293235-2 CRM		VA-TKN-CSPK1						
Total Kjeldahl Nitrogen			102		%		75-125	10-JUN-11
WG1293235-5 CRM		VA-TKN-CSPK1						
Total Kjeldahl Nitrogen			95		%		75-125	10-JUN-11
WG1293235-1 MB								
Total Kjeldahl Nitrogen			<0.050		mg/L		0.05	10-JUN-11
WG1293235-4 MB								
Total Kjeldahl Nitrogen			<0.050		mg/L		0.05	10-JUN-11
TSS-LOW-VA		Water						
Batch	R2201403							
WG1292512-2 LCS								
Total Suspended Solids			104		%		85-115	08-JUN-11
WG1292512-1 MB								



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TSS-LOW-VA								
Water								
Batch R2201403								
WG1292512-1 MB								
Total Suspended Solids			<1.0		mg/L		1	08-JUN-11
TURBIDITY-VA								
Water								
Batch R2201648								
WG1292885-11 CRM								
Turbidity		VA-TURB-SPK-8	105		%		85-115	09-JUN-11
WG1292885-14 CRM								
Turbidity		VA-TURB-SPK-8	105		%		85-115	09-JUN-11
WG1292885-2 CRM								
Turbidity		VA-TURB-SPK-8	106		%		85-115	09-JUN-11
WG1292885-5 CRM								
Turbidity		VA-TURB-SPK-8	105		%		85-115	09-JUN-11
WG1292885-8 CRM								
Turbidity		VA-TURB-SPK-8	105		%		85-115	09-JUN-11
WG1292885-1 MB								
Turbidity			<0.10		NTU		0.1	09-JUN-11
WG1292885-10 MB								
Turbidity			<0.10		NTU		0.1	09-JUN-11
WG1292885-13 MB								
Turbidity			<0.10		NTU		0.1	09-JUN-11
WG1292885-4 MB								
Turbidity			<0.10		NTU		0.1	09-JUN-11
WG1292885-7 MB								
Turbidity			<0.10		NTU		0.1	09-JUN-11

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
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.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



GOLDER ASSOCIATES LTD
ATTN: Justine Crowe
9 - 4905 48 Street
Yellowknife NT X1A 3S3

Date Received: 08-JUN-11
Report Date: 17-JUN-11 16:27 (MT)
Version: FINAL

Client Phone: 867-873-6319

Certificate of Analysis

Lab Work Order #: L1014834
Project P.O. #: 606989
Job Reference: 09-1427-0006-20000-20500
Legal Site Desc:
C of C Numbers: 1

Comments: ADDITIONAL 16-JUN-11 11:57

Shannon Luchka
Account Manager

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ADDRESS: 9936-67 Avenue, Edmonton, AB T6E 0P5 Canada | Phone: +1 780 413 5227 | Fax: +1 780 437 2311
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		L1014834-1 WATER 08-JUN-11 YK BAY B	L1014834-2 WATER 08-JUN-11 YK BAY C	L1014834-3 WATER 08-JUN-11 YK BAY F	L1014834-4 WATER 08-JUN-11 YK BAY G	L1014834-5 WATER 08-JUN-11 BACK BAY DOCK AREA
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO ₃) (mg/L)	40.0	52.3	50.0	51.7	36.8
	Total Suspended Solids (mg/L)	<3.0	<3.0	3.0	<3.0	<3.0
	Turbidity (NTU)	3.23	3.31	2.56	2.37	1.92
Anions and Nutrients	Nitrate and Nitrite (as N) (mg/L)	0.0060	0.0084	0.0087	0.0111	<0.0060
	Nitrate (as N) (mg/L)	0.0060	0.0084	0.0087	0.0111	<0.0060
	Nitrite (as N) (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Total Kjeldahl Nitrogen (mg/L)	0.486	0.732	0.552	0.918	0.238
	Phosphorus (P)-Total Dissolved (mg/L)	0.0044	0.0152	0.0056	0.0074	0.0018
	Phosphorus (P)-Total (mg/L)	0.0173	0.0249	0.0231	0.0259	0.0095
Total Metals	Aluminum (Al)-Total (mg/L)	0.104	0.120	0.104	0.113	0.237
	Antimony (Sb)-Total (mg/L)	0.00722	0.0135	0.0107	0.0131	0.00050
	Arsenic (As)-Total (mg/L)	0.0487	0.0900	0.0697	0.0864	0.00336
	Barium (Ba)-Total (mg/L)	0.00873	0.00861	0.00854	0.00830	0.0133
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Boron (B)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	12.1	16.8	14.3	16.4	10.6
	Chromium (Cr)-Total (mg/L)	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
	Cobalt (Co)-Total (mg/L)	<0.00020	0.00025	0.00020	0.00024	<0.00020
	Copper (Cu)-Total (mg/L)	0.0041	0.0069	0.0055	0.0066	0.0020
	Iron (Fe)-Total (mg/L)	0.177	0.249	0.200	0.241	0.104
	Lead (Pb)-Total (mg/L)	0.00048	0.00084	0.00067	0.00084	0.00017
	Magnesium (Mg)-Total (mg/L)	3.56	4.62	4.03	4.53	3.23
	Manganese (Mn)-Total (mg/L)	0.0116	0.0198	0.0153	0.0190	0.0032
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Total (mg/L)	0.00055	0.00082	0.00073	0.00085	0.00025
	Nickel (Ni)-Total (mg/L)	0.00138	0.00239	0.00180	0.00218	0.00084
	Potassium (K)-Total (mg/L)	1.26	1.41	1.40	1.42	1.21
	Selenium (Se)-Total (mg/L)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
	Silver (Ag)-Total (mg/L)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
	Sodium (Na)-Total (mg/L)	3.2	5.0	4.0	4.8	3.2
	Strontium (Sr)-Total (mg/L)	0.0510	0.0677	0.0608	0.0660	0.0530
	Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Tin (Sn)-Total (mg/L)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
	Titanium (Ti)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Uranium (U)-Total (mg/L)	0.00028	0.00030	0.00028	0.00029	0.00031

* 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		L1014834-6 WATER 08-JUN-11 FIELD BLANK	L1014834-7 WATER 08-JUN-11 TRAVEL BLANK	L1014834-8 WATER 08-JUN-11 BAKER POND OUTFLOW		
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	<1.0	<1.0	42.0		
	Total Suspended Solids (mg/L)	<3.0	<3.0	3.0		
	Turbidity (NTU)	0.11	<0.10	2.97		
Anions and Nutrients	Nitrate and Nitrite (as N) (mg/L)	<0.0060	<0.0060	0.0065		
	Nitrate (as N) (mg/L)	<0.0060	<0.0060	<0.0063		
	Nitrite (as N) (mg/L)	<0.0020	<0.0020	0.0029		
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050	0.808		
	Phosphorus (P)-Total Dissolved (mg/L)	<0.0010	<0.0010	0.0067		
	Phosphorus (P)-Total (mg/L)	<0.0010	<0.0010	0.0220		
Total Metals	Aluminum (Al)-Total (mg/L)	<0.020	<0.020	0.101		
	Antimony (Sb)-Total (mg/L)	<0.00040	<0.00040	0.00621		
	Arsenic (As)-Total (mg/L)	<0.00040	<0.00040	0.0554		
	Barium (Ba)-Total (mg/L)	<0.00020	<0.00020	0.00812		
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Bismuth (Bi)-Total (mg/L)	<0.00020	<0.00020	<0.00020		
	Boron (B)-Total (mg/L)	<0.020	<0.020	<0.020		
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020		
	Calcium (Ca)-Total (mg/L)	<0.50	<0.50	12.3		
	Chromium (Cr)-Total (mg/L)	<0.00080	<0.00080	<0.00080		
	Cobalt (Co)-Total (mg/L)	<0.00020	<0.00020	<0.00020		
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	0.0021		
	Iron (Fe)-Total (mg/L)	<0.010	<0.010	0.182		
	Lead (Pb)-Total (mg/L)	<0.00010	<0.00010	0.00079		
	Magnesium (Mg)-Total (mg/L)	<0.10	<0.10	3.73		
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	0.0222		
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020		
	Molybdenum (Mo)-Total (mg/L)	<0.00010	<0.00010	0.00057		
	Nickel (Ni)-Total (mg/L)	<0.00020	<0.00020	0.00080		
	Potassium (K)-Total (mg/L)	<0.10	<0.10	1.27		
	Selenium (Se)-Total (mg/L)	<0.00040	<0.00040	<0.00040		
	Silver (Ag)-Total (mg/L)	<0.00040	<0.00040	<0.00040		
	Sodium (Na)-Total (mg/L)	<1.0	<1.0	2.8		
	Strontium (Sr)-Total (mg/L)	<0.00020	<0.00020	0.0468		
	Thallium (Tl)-Total (mg/L)	<0.00010	<0.00010	<0.00010		
	Tin (Sn)-Total (mg/L)	<0.00040	<0.00040	<0.00040		
	Titanium (Ti)-Total (mg/L)	<0.0050	<0.0050	<0.0050		
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	0.00024		

* 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		L1014834-1 WATER 08-JUN-11 YK BAY B	L1014834-2 WATER 08-JUN-11 YK BAY C	L1014834-3 WATER 08-JUN-11 YK BAY F	L1014834-4 WATER 08-JUN-11 YK BAY G	L1014834-5 WATER 08-JUN-11 BACK BAY DOCK AREA
Grouping	Analyte					
WATER						
Total Metals	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Total (mg/L)	<0.0040	<0.0040	<0.0040	<0.0040	0.0069
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.010	<0.010	0.010	<0.010	0.011
	Antimony (Sb)-Dissolved (mg/L)	0.00626	0.0111	0.0103	0.0122	0.00046
	Arsenic (As)-Dissolved (mg/L)	0.0388	0.0680	0.0617	0.0730	0.00443
	Barium (Ba)-Dissolved (mg/L)	0.00752	0.00735	0.00739	0.00733	0.0112
	Beryllium (Be)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)	0.0081	0.0114	0.0110	0.0121	0.0066
	Cadmium (Cd)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Calcium (Ca)-Dissolved (mg/L)	11.3	15.0	14.3	14.9	10.3
	Chromium (Cr)-Dissolved (mg/L)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	0.00015	0.00013	0.00015	<0.00010
	Copper (Cu)-Dissolved (mg/L)	0.00273	0.00430	0.00413	0.00504	0.00096
	Iron (Fe)-Dissolved (mg/L)	0.030	0.046	0.048	0.048	0.016
	Lead (Pb)-Dissolved (mg/L)	<0.00010	0.00015	0.00015	0.00022	<0.00010
	Magnesium (Mg)-Dissolved (mg/L)	2.87	3.61	3.46	3.52	2.69
	Manganese (Mn)-Dissolved (mg/L)	0.0044	0.0088	0.0084	0.0104	<0.0020
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	0.00049	0.00073	0.00068	0.00081	0.00022
	Nickel (Ni)-Dissolved (mg/L)	0.00121	0.00187	0.00172	0.00198	0.00048
	Potassium (K)-Dissolved (mg/L)	1.05	1.28	1.32	1.26	1.10
	Selenium (Se)-Dissolved (mg/L)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
	Silver (Ag)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Sodium (Na)-Dissolved (mg/L)	2.92	4.03	4.04	4.03	3.02
	Strontium (Sr)-Dissolved (mg/L)	0.0478	0.0607	0.0595	0.0632	0.0480
	Thallium (Tl)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Tin (Sn)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Titanium (Ti)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Uranium (U)-Dissolved (mg/L)	0.00026	0.00028	0.00027	0.00027	0.00028
	Vanadium (V)-Dissolved (mg/L)	0.00012	0.00018	0.00022	0.00025	<0.00010
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	0.0016	0.0016	0.0026	<0.0010

* 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	L1014834-6 WATER 08-JUN-11 FIELD BLANK	L1014834-7 WATER 08-JUN-11 TRAVEL BLANK	L1014834-8 WATER 08-JUN-11 BAKER POND OUTFLOW		
Grouping	Analyte						
WATER							
Total Metals	Vanadium (V)-Total (mg/L)		<0.00050	<0.00050	<0.00050		
	Zinc (Zn)-Total (mg/L)		<0.0040	<0.0040	<0.0040		
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		<0.010	<0.010	0.014		
	Antimony (Sb)-Dissolved (mg/L)		<0.00040	<0.00040	0.00546		
	Arsenic (As)-Dissolved (mg/L)		0.00665 ^{RRV}	<0.00040	0.0484		
	Barium (Ba)-Dissolved (mg/L)		<0.00010	<0.00010	0.00738		
	Beryllium (Be)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050		
	Bismuth (Bi)-Dissolved (mg/L)		<0.000050	<0.000050	<0.000050		
	Boron (B)-Dissolved (mg/L)		<0.0020	<0.0020	0.0081		
	Cadmium (Cd)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010		
	Calcium (Ca)-Dissolved (mg/L)		<0.50	<0.50	11.8		
	Chromium (Cr)-Dissolved (mg/L)		<0.00040	<0.00040	<0.00040		
	Cobalt (Co)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010		
	Copper (Cu)-Dissolved (mg/L)		<0.00060	<0.00060	0.00150		
	Iron (Fe)-Dissolved (mg/L)		<0.010	<0.010	0.038		
	Lead (Pb)-Dissolved (mg/L)		<0.00010	<0.00010	0.00011		
	Magnesium (Mg)-Dissolved (mg/L)		<0.10	<0.10	3.05		
	Manganese (Mn)-Dissolved (mg/L)		<0.0020	<0.0020	0.0034		
	Mercury (Hg)-Dissolved (mg/L)		<0.000020	<0.000020	<0.000020		
	Molybdenum (Mo)-Dissolved (mg/L)		<0.00010	<0.00010	0.00058		
	Nickel (Ni)-Dissolved (mg/L)		<0.00010	<0.00010	0.00063		
	Potassium (K)-Dissolved (mg/L)		<0.10	<0.10	1.06		
	Selenium (Se)-Dissolved (mg/L)		<0.00040	<0.00040	<0.00040		
	Silver (Ag)-Dissolved (mg/L)		<0.00020	<0.00020	<0.00020		
	Sodium (Na)-Dissolved (mg/L)		<0.50	<0.50	2.67		
	Strontium (Sr)-Dissolved (mg/L)		<0.00010	<0.00010	0.0450		
	Thallium (Tl)-Dissolved (mg/L)		<0.000050	<0.000050	<0.000050		
	Tin (Sn)-Dissolved (mg/L)		<0.00020	<0.00020	<0.00020		
	Titanium (Ti)-Dissolved (mg/L)		<0.00030	<0.00030	<0.00030		
	Uranium (U)-Dissolved (mg/L)		<0.00010	<0.00010	0.00022		
	Vanadium (V)-Dissolved (mg/L)		<0.00010	<0.00010	0.00019		
	Zinc (Zn)-Dissolved (mg/L)		0.0013	<0.0010	<0.0010		

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

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
SFPL	Sample was Filtered and Preserved at the laboratory - TDP-low

Qualifiers for Individual Parameters Listed:

Qualifier	Description
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ETL-HARDNESS-DIS-ED	Water	Hardness (from Dissolved Ca and Mg)	APHA 2340 B-Calculation
HG-D-L-CVAA-ED	Water	Mercury (Hg) - Dissolved	EPA 245.7 / EPA 245.1
HG-T-L-CVAA-ED	Water	Mercury (Hg)	EPA 245.7 / EPA 245.1
MET-D-L-ICP-ED	Water	Diss. Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-D-L-MS-ED	Water	Diss. Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
MET-T-L-ICP-ED	Water	Total Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-T-L-MS-ED	Water	Total Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
NO2+NO3-L-CFA-ED	Water	Nitrite & Nitrate in Water by Colour	APHA 4500 NO3-F
This analysis is carried out using procedures adapted from APHA Method 4500 NO3-F "Automated Cadmium Reduction Method".			
NO2-L-CFA-ED	Water	Nitrite in Water by Colour	APHA 4500 NO2-A and NO3-F
This analysis is carried out using procedures adapted from APHA Method 4500 NO3-F "Automated Cadmium Reduction Method", omitting the Cu-Cd reduction step to be selective for nitrite.			
NO3-L-CALC-ED	Water	Nitrate in Water (Calculation)	APHA 4500 NO3-F
Nitrate (as N) is a calculated parameter. Nitrate (as N) = [Nitrate and Nitrite (as N)] - Nitrite (as N).			
P-T-L-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
P-TD-L-COL-ED	Water	Total Dissolved P in Water by Colour	APHA 4500-P PHOSPHORUS
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.			
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
TKN-L-CFA-ED	Water	TKN in Water by Colour	APHA 4500-NORG (TKN)
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 celcius with analysis using an automated colourimetric finish.			
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer

** 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

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.



Quality Control Report

Workorder: L1014834

Report Date: 17-JUN-11

Page 1 of 13

Client: GOLDER ASSOCIATES LTD
9 - 4905 48 Street
Yellowknife NT X1A 3S3

Contact: Justine Crowe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-D-L-CVAA-ED Water								
Batch	R2205708							
WG1297758-2 LCS								
Mercury (Hg)-Dissolved			115		%		80-120	17-JUN-11
WG1297758-1 MB								
Mercury (Hg)-Dissolved			<0.000020		mg/L		0.00002	17-JUN-11
HG-T-L-CVAA-ED Water								
Batch	R2205708							
WG1297758-4 DUP		L1014834-7						
Mercury (Hg)-Total		<0.000020	<0.000020	RPD-NA	mg/L	N/A	20	17-JUN-11
WG1297758-2 LCS								
Mercury (Hg)-Total			115		%		80-120	17-JUN-11
WG1297758-3 LCSD		WG1297758-2						
Mercury (Hg)-Total		115	119		%	3.6	20	17-JUN-11
WG1297758-1 MB								
Mercury (Hg)-Total			<0.000020		mg/L		0.00002	17-JUN-11
WG1297758-5 MS		L1014834-7						
Mercury (Hg)-Total			115		%		70-130	17-JUN-11
MET-D-L-ICP-ED Water								
Batch	R2203495							
WG1294988-2 CRM		EU-H-3_OPTWATER						
Calcium (Ca)-Dissolved			110		%		80-120	13-JUN-11
Iron (Fe)-Dissolved			111		%		80-120	13-JUN-11
Magnesium (Mg)-Dissolved			106		%		80-120	13-JUN-11
Manganese (Mn)-Dissolved			111		%		80-120	13-JUN-11
Potassium (K)-Dissolved			101		%		80-120	13-JUN-11
Sodium (Na)-Dissolved			110		%		80-120	13-JUN-11
WG1294988-1 MB								
Calcium (Ca)-Dissolved			<0.20		mg/L		0.2	13-JUN-11
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	13-JUN-11
Magnesium (Mg)-Dissolved			<0.10		mg/L		0.1	13-JUN-11
Manganese (Mn)-Dissolved			<0.0020		mg/L		0.002	13-JUN-11
Potassium (K)-Dissolved			<0.10		mg/L		0.1	13-JUN-11
Sodium (Na)-Dissolved			<0.50		mg/L		0.5	13-JUN-11
MET-D-L-MS-ED Water								
Batch	R2204986							
WG1296180-2 CRM		ED-HIGH-WATRM						
Aluminum (Al)-Dissolved			102		%		80-120	15-JUN-11
Antimony (Sb)-Dissolved			101		%		80-120	15-JUN-11

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-L-MS-ED		Water						
Batch	R2204986							
WG1296180-2 CRM		ED-HIGH-WATRM						
Arsenic (As)-Dissolved			102		%		80-120	15-JUN-11
Barium (Ba)-Dissolved			101		%		80-120	15-JUN-11
Beryllium (Be)-Dissolved			102		%		80-120	15-JUN-11
Bismuth (Bi)-Dissolved			102		%		80-120	15-JUN-11
Boron (B)-Dissolved			96		%		80-120	15-JUN-11
Cadmium (Cd)-Dissolved			103		%		80-120	15-JUN-11
Chromium (Cr)-Dissolved			101		%		80-120	15-JUN-11
Cobalt (Co)-Dissolved			96		%		80-120	15-JUN-11
Copper (Cu)-Dissolved			101		%		80-120	15-JUN-11
Lead (Pb)-Dissolved			100		%		80-120	15-JUN-11
Molybdenum (Mo)-Dissolved			95		%		80-120	15-JUN-11
Nickel (Ni)-Dissolved			102		%		80-120	15-JUN-11
Selenium (Se)-Dissolved			105		%		80-120	15-JUN-11
Silver (Ag)-Dissolved			95		%		80-120	15-JUN-11
Strontium (Sr)-Dissolved			105		%		80-120	15-JUN-11
Thallium (Tl)-Dissolved			104		%		80-120	15-JUN-11
Tin (Sn)-Dissolved			97		%		80-120	15-JUN-11
Titanium (Ti)-Dissolved			103		%		80-120	15-JUN-11
Uranium (U)-Dissolved			95		%		80-120	15-JUN-11
Vanadium (V)-Dissolved			101		%		80-120	15-JUN-11
Zinc (Zn)-Dissolved			96		%		80-120	15-JUN-11
WG1296180-1 MB								
Aluminum (Al)-Dissolved			<0.0050		mg/L		0.005	15-JUN-11
Antimony (Sb)-Dissolved			<0.00040		mg/L		0.0004	15-JUN-11
Arsenic (As)-Dissolved			<0.00040		mg/L		0.0004	15-JUN-11
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	15-JUN-11
Beryllium (Be)-Dissolved			<0.00050		mg/L		0.0005	15-JUN-11
Bismuth (Bi)-Dissolved			<0.000050		mg/L		0.00005	15-JUN-11
Boron (B)-Dissolved			<0.0020		mg/L		0.002	15-JUN-11
Cadmium (Cd)-Dissolved			<0.000050		mg/L		0.00005	15-JUN-11
Chromium (Cr)-Dissolved			<0.00040		mg/L		0.0004	15-JUN-11
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	15-JUN-11
Copper (Cu)-Dissolved			<0.00060		mg/L		0.0006	15-JUN-11
Lead (Pb)-Dissolved			<0.00010		mg/L		0.0001	15-JUN-11



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-ICP-ED	Water							
Batch	R2203497							
WG1294464-2 MB								
Calcium (Ca)-Total			<0.50		mg/L		0.5	14-JUN-11
Iron (Fe)-Total			<0.010		mg/L		0.01	14-JUN-11
Magnesium (Mg)-Total			<0.10		mg/L		0.1	14-JUN-11
Manganese (Mn)-Total			<0.0020		mg/L		0.002	14-JUN-11
Potassium (K)-Total			<0.10		mg/L		0.1	14-JUN-11
Sodium (Na)-Total			<1.0		mg/L		1	14-JUN-11
WG1294485-1 MB								
Calcium (Ca)-Total			<0.50		mg/L		0.5	13-JUN-11
Iron (Fe)-Total			<0.010		mg/L		0.01	13-JUN-11
Magnesium (Mg)-Total			<0.10		mg/L		0.1	13-JUN-11
Manganese (Mn)-Total			<0.0020		mg/L		0.002	13-JUN-11
Potassium (K)-Total			<0.10		mg/L		0.1	13-JUN-11
Sodium (Na)-Total			<1.0		mg/L		1	13-JUN-11
WG1294464-6 MS		L1014355-1						
Calcium (Ca)-Total			105		%		70-130	15-JUN-11
Iron (Fe)-Total			109		%		70-130	15-JUN-11
Magnesium (Mg)-Total			116		%		70-130	15-JUN-11
Manganese (Mn)-Total			110		%		70-130	15-JUN-11
Potassium (K)-Total			107		%		70-130	15-JUN-11
Sodium (Na)-Total			105		%		70-130	15-JUN-11
WG1294464-8 MS		L1013733-3						
Calcium (Ca)-Total			110		%		70-130	15-JUN-11
Iron (Fe)-Total			109		%		70-130	15-JUN-11
Magnesium (Mg)-Total			114		%		70-130	15-JUN-11
Manganese (Mn)-Total			110		%		70-130	15-JUN-11
Potassium (K)-Total			107		%		70-130	15-JUN-11
Sodium (Na)-Total			111		%		70-130	15-JUN-11
WG1294485-3 MS		L1014834-7						
Calcium (Ca)-Total			108		%		70-130	13-JUN-11
Iron (Fe)-Total			100		%		70-130	13-JUN-11
Magnesium (Mg)-Total			93		%		70-130	13-JUN-11
Manganese (Mn)-Total			102		%		70-130	13-JUN-11
Potassium (K)-Total			102		%		70-130	13-JUN-11
Sodium (Na)-Total			94		%		70-130	13-JUN-11
MET-T-L-MS-ED	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-MS-ED		Water						
Batch	R2204483							
WG1294485-2	DUP	L1014834-7						
Aluminum (Al)-Total		<0.020	<0.010	RPD-NA	mg/L	N/A	20	15-JUN-11
Antimony (Sb)-Total		<0.00040	<0.00040	RPD-NA	mg/L	N/A	20	15-JUN-11
Arsenic (As)-Total		<0.00040	<0.00040	RPD-NA	mg/L	N/A	20	15-JUN-11
Barium (Ba)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	15-JUN-11
Beryllium (Be)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	15-JUN-11
Bismuth (Bi)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	15-JUN-11
Boron (B)-Total		<0.020	<0.0040	RPD-NA	mg/L	N/A	20	15-JUN-11
Cadmium (Cd)-Total		<0.00020	<0.000050	RPD-NA	mg/L	N/A	20	15-JUN-11
Chromium (Cr)-Total		<0.00080	<0.00080	RPD-NA	mg/L	N/A	20	15-JUN-11
Cobalt (Co)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	15-JUN-11
Copper (Cu)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	15-JUN-11
Lead (Pb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	15-JUN-11
Molybdenum (Mo)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	15-JUN-11
Nickel (Ni)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	15-JUN-11
Selenium (Se)-Total		<0.00040	<0.00040	RPD-NA	mg/L	N/A	20	15-JUN-11
Silver (Ag)-Total		<0.00040	<0.00010	RPD-NA	mg/L	N/A	20	15-JUN-11
Strontium (Sr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	15-JUN-11
Thallium (Tl)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	15-JUN-11
Tin (Sn)-Total		<0.00040	<0.00040	RPD-NA	mg/L	N/A	20	15-JUN-11
Titanium (Ti)-Total		<0.0050	<0.00060	RPD-NA	mg/L	N/A	20	15-JUN-11
Uranium (U)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	15-JUN-11
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	15-JUN-11
Zinc (Zn)-Total		<0.0040	<0.0040	RPD-NA	mg/L	N/A	20	15-JUN-11
WG1294464-3	LCS							
Aluminum (Al)-Total			103		%		80-120	15-JUN-11
Antimony (Sb)-Total			105		%		80-120	15-JUN-11
Arsenic (As)-Total			105		%		80-120	15-JUN-11
Barium (Ba)-Total			96		%		80-120	15-JUN-11
Beryllium (Be)-Total			100		%		80-120	15-JUN-11
Bismuth (Bi)-Total			97		%		80-120	15-JUN-11
Boron (B)-Total			92		%		80-120	15-JUN-11
Cadmium (Cd)-Total			106		%		80-120	15-JUN-11
Chromium (Cr)-Total			104		%		80-120	15-JUN-11
Cobalt (Co)-Total			97		%		80-120	15-JUN-11



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-MS-ED	Water							
Batch	R2204483							
WG1294464-3	LCS							
Copper (Cu)-Total			103		%		80-120	15-JUN-11
Lead (Pb)-Total			103		%		80-120	15-JUN-11
Molybdenum (Mo)-Total			94		%		80-120	15-JUN-11
Nickel (Ni)-Total			104		%		80-120	15-JUN-11
Selenium (Se)-Total			107		%		80-120	15-JUN-11
Silver (Ag)-Total			96		%		80-120	15-JUN-11
Strontium (Sr)-Total			105		%		80-120	15-JUN-11
Thallium (Tl)-Total			107		%		80-120	15-JUN-11
Tin (Sn)-Total			99		%		80-120	15-JUN-11
Titanium (Ti)-Total			97		%		80-120	15-JUN-11
Uranium (U)-Total			105		%		80-120	15-JUN-11
Vanadium (V)-Total			104		%		80-120	15-JUN-11
Zinc (Zn)-Total			110		%		80-120	15-JUN-11
WG1294464-4	LCS							
Aluminum (Al)-Total			103		%		80-120	15-JUN-11
Antimony (Sb)-Total			101		%		80-120	15-JUN-11
Arsenic (As)-Total			104		%		80-120	15-JUN-11
Barium (Ba)-Total			96		%		80-120	15-JUN-11
Beryllium (Be)-Total			98		%		80-120	15-JUN-11
Bismuth (Bi)-Total			107		%		80-120	15-JUN-11
Boron (B)-Total			96		%		80-120	15-JUN-11
Cadmium (Cd)-Total			105		%		80-120	15-JUN-11
Chromium (Cr)-Total			103		%		80-120	15-JUN-11
Cobalt (Co)-Total			96		%		80-120	15-JUN-11
Copper (Cu)-Total			102		%		80-120	15-JUN-11
Lead (Pb)-Total			102		%		80-120	15-JUN-11
Molybdenum (Mo)-Total			96		%		80-120	15-JUN-11
Nickel (Ni)-Total			103		%		80-120	15-JUN-11
Selenium (Se)-Total			102		%		80-120	15-JUN-11
Silver (Ag)-Total			95		%		80-120	15-JUN-11
Strontium (Sr)-Total			106		%		80-120	15-JUN-11
Thallium (Tl)-Total			107		%		80-120	15-JUN-11
Tin (Sn)-Total			100		%		80-120	15-JUN-11
Titanium (Ti)-Total			100		%		80-120	15-JUN-11

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-MS-ED		Water						
Batch	R2204483							
WG1294464-4	LCS							
Uranium (U)-Total			107		%		80-120	15-JUN-11
Vanadium (V)-Total			103		%		80-120	15-JUN-11
Zinc (Zn)-Total			107		%		80-120	15-JUN-11
WG1294464-1	MB							
Aluminum (Al)-Total			<0.010		mg/L		0.01	15-JUN-11
Antimony (Sb)-Total			<0.00040		mg/L		0.0004	15-JUN-11
Arsenic (As)-Total			<0.00040		mg/L		0.0004	15-JUN-11
Barium (Ba)-Total			<0.00020		mg/L		0.0002	15-JUN-11
Beryllium (Be)-Total			<0.0010		mg/L		0.001	15-JUN-11
Bismuth (Bi)-Total			<0.00020		mg/L		0.0002	15-JUN-11
Boron (B)-Total			<0.0040		mg/L		0.004	15-JUN-11
Cadmium (Cd)-Total			<0.000050		mg/L		0.00005	15-JUN-11
Chromium (Cr)-Total			<0.00080		mg/L		0.0008	15-JUN-11
Cobalt (Co)-Total			<0.00020		mg/L		0.0002	15-JUN-11
Copper (Cu)-Total			<0.0010		mg/L		0.001	15-JUN-11
Lead (Pb)-Total			<0.00010		mg/L		0.0001	15-JUN-11
Molybdenum (Mo)-Total			<0.00010		mg/L		0.0001	15-JUN-11
Nickel (Ni)-Total			<0.00020		mg/L		0.0002	15-JUN-11
Selenium (Se)-Total			<0.00040		mg/L		0.0004	15-JUN-11
Silver (Ag)-Total			<0.00010		mg/L		0.0001	15-JUN-11
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	15-JUN-11
Thallium (Tl)-Total			<0.00010		mg/L		0.0001	15-JUN-11
Tin (Sn)-Total			<0.00040		mg/L		0.0004	15-JUN-11
Titanium (Ti)-Total			<0.00060		mg/L		0.0006	15-JUN-11
Uranium (U)-Total			<0.00010		mg/L		0.0001	15-JUN-11
Vanadium (V)-Total			<0.00050		mg/L		0.0005	15-JUN-11
Zinc (Zn)-Total			<0.0040		mg/L		0.004	15-JUN-11
WG1294464-2	MB							
Aluminum (Al)-Total			<0.010		mg/L		0.01	15-JUN-11
Antimony (Sb)-Total			<0.00040		mg/L		0.0004	15-JUN-11
Arsenic (As)-Total			<0.00040		mg/L		0.0004	15-JUN-11
Barium (Ba)-Total			<0.00020		mg/L		0.0002	15-JUN-11
Beryllium (Be)-Total			<0.0010		mg/L		0.001	15-JUN-11
Bismuth (Bi)-Total			<0.00020		mg/L		0.0002	15-JUN-11
Boron (B)-Total			<0.0040		mg/L		0.004	15-JUN-11

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-MS-ED	Water							
Batch	R2204483							
WG1294464-2 MB								
Cadmium (Cd)-Total			<0.000050		mg/L		0.00005	15-JUN-11
Chromium (Cr)-Total			<0.00080		mg/L		0.0008	15-JUN-11
Cobalt (Co)-Total			<0.00020		mg/L		0.0002	15-JUN-11
Copper (Cu)-Total			<0.0010		mg/L		0.001	15-JUN-11
Lead (Pb)-Total			<0.00010		mg/L		0.0001	15-JUN-11
Molybdenum (Mo)-Total			<0.00010		mg/L		0.0001	15-JUN-11
Nickel (Ni)-Total			<0.00020		mg/L		0.0002	15-JUN-11
Selenium (Se)-Total			<0.00040		mg/L		0.0004	15-JUN-11
Silver (Ag)-Total			<0.00010		mg/L		0.0001	15-JUN-11
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	15-JUN-11
Thallium (Tl)-Total			<0.00010		mg/L		0.0001	15-JUN-11
Tin (Sn)-Total			<0.00040		mg/L		0.0004	15-JUN-11
Titanium (Ti)-Total			<0.00060		mg/L		0.0006	15-JUN-11
Uranium (U)-Total			<0.00010		mg/L		0.0001	15-JUN-11
Vanadium (V)-Total			<0.00050		mg/L		0.0005	15-JUN-11
Zinc (Zn)-Total			<0.0040		mg/L		0.004	15-JUN-11
WG1294485-1 MB								
Aluminum (Al)-Total			<0.010		mg/L		0.01	15-JUN-11
Antimony (Sb)-Total			<0.00040		mg/L		0.0004	15-JUN-11
Arsenic (As)-Total			<0.00040		mg/L		0.0004	15-JUN-11
Barium (Ba)-Total			<0.00020		mg/L		0.0002	15-JUN-11
Beryllium (Be)-Total			<0.0010		mg/L		0.001	15-JUN-11
Bismuth (Bi)-Total			<0.00020		mg/L		0.0002	15-JUN-11
Boron (B)-Total			<0.0040		mg/L		0.004	15-JUN-11
Cadmium (Cd)-Total			<0.000050		mg/L		0.00005	15-JUN-11
Chromium (Cr)-Total			<0.00080		mg/L		0.0008	15-JUN-11
Cobalt (Co)-Total			<0.00020		mg/L		0.0002	15-JUN-11
Copper (Cu)-Total			<0.0010		mg/L		0.001	15-JUN-11
Lead (Pb)-Total			<0.00010		mg/L		0.0001	15-JUN-11
Molybdenum (Mo)-Total			<0.00010		mg/L		0.0001	15-JUN-11
Nickel (Ni)-Total			<0.00020		mg/L		0.0002	15-JUN-11
Selenium (Se)-Total			<0.00040		mg/L		0.0004	15-JUN-11
Silver (Ag)-Total			<0.00010		mg/L		0.0001	15-JUN-11
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	15-JUN-11



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-MS-ED	Water							
Batch	R2204483							
WG1294485-1 MB								
Thallium (Tl)-Total			<0.00010		mg/L		0.0001	15-JUN-11
Tin (Sn)-Total			<0.00040		mg/L		0.0004	15-JUN-11
Titanium (Ti)-Total			<0.00060		mg/L		0.0006	15-JUN-11
Uranium (U)-Total			<0.00010		mg/L		0.0001	15-JUN-11
Vanadium (V)-Total			<0.00050		mg/L		0.0005	15-JUN-11
Zinc (Zn)-Total			<0.0040		mg/L		0.004	15-JUN-11
NO2+NO3-L-CFA-ED	Water							
Batch	R2204159							
WG1294906-3 LCS								
Nitrate and Nitrite (as N)			96		%		85-115	13-JUN-11
WG1294906-2 MB								
Nitrate and Nitrite (as N)			<0.0060		mg/L		0.006	13-JUN-11
WG1294906-5 MS		L1016211-1						
Nitrate and Nitrite (as N)			102		%		75-125	13-JUN-11
NO2-L-CFA-ED	Water							
Batch	R2204159							
WG1294906-3 LCS								
Nitrite (as N)			99		%		85-115	13-JUN-11
WG1294906-2 MB								
Nitrite (as N)			<0.0020		mg/L		0.002	13-JUN-11
WG1294906-5 MS		L1016211-1						
Nitrite (as N)			103		%		75-125	13-JUN-11
P-T-L-COL-ED	Water							
Batch	R2204296							
WG1295934-4 DUP		L1014834-7						
Phosphorus (P)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	15-JUN-11
WG1295934-3 LCS								
Phosphorus (P)-Total			103		%		80-120	15-JUN-11
WG1295934-2 MB								
Phosphorus (P)-Total			<0.0010		mg/L		0.001	15-JUN-11
WG1295934-5 MS		L1014834-7						
Phosphorus (P)-Total			112		%		70-130	15-JUN-11
WG1295934-7 MS		L1013656-5						
Phosphorus (P)-Total			116		%		70-130	15-JUN-11
P-TD-L-COL-ED	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-TD-L-COL-ED								
Water								
Batch	R2204296							
WG1295934-3	LCS							
Phosphorus (P)-Total	Dissolved		103		%		80-120	15-JUN-11
WG1295934-2	MB							
Phosphorus (P)-Total	Dissolved		<0.0010		mg/L		0.001	15-JUN-11
SOLIDS-TOTSUS-ED								
Water								
Batch	R2203042							
WG1294381-4	DUP	L1014834-4						
Total Suspended Solids		<3.0	<3.0	RPD-NA	mg/L	N/A	20	13-JUN-11
WG1294381-2	LCS							
Total Suspended Solids			110		%		85-115	13-JUN-11
WG1294381-1	MB							
Total Suspended Solids			<3.0		mg/L		3	13-JUN-11
TKN-L-CFA-ED								
Water								
Batch	R2202878							
WG1294400-5	DUP	L1014834-6						
Total Kjeldahl Nitrogen		<0.050	<0.050	RPD-NA	mg/L	N/A	20	13-JUN-11
WG1294400-2	LCS							
Total Kjeldahl Nitrogen			100		%		75-125	13-JUN-11
WG1294400-3	LCS							
Total Kjeldahl Nitrogen			108		%		75-125	13-JUN-11
WG1294400-4	LCS							
Total Kjeldahl Nitrogen			104		%		75-125	13-JUN-11
WG1294400-1	MB							
Total Kjeldahl Nitrogen			<0.050		mg/L		0.05	13-JUN-11
WG1294400-6	MS	L1014834-7						
Total Kjeldahl Nitrogen			106		%		61-140	13-JUN-11
TURBIDITY-ED								
Water								
Batch	R2202622							
WG1294255-3	DUP	L1014834-8						
Turbidity		2.97	2.99		NTU	0.67	8.8	12-JUN-11
WG1294255-1	MB							
Turbidity			<0.10		NTU		0.1	12-JUN-11

Quality Control Report

Workorder: L1014834

Report Date: 17-JUN-11

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Workorder: L1014834

Report Date: 17-JUN-11

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Turbidity							
	1	08-JUN-11	12-JUN-11 00:00	48	84	hours	EHT
	2	08-JUN-11	12-JUN-11 00:00	48	84	hours	EHT
	3	08-JUN-11	12-JUN-11 00:00	48	84	hours	EHT
	4	08-JUN-11	12-JUN-11 00:00	48	84	hours	EHT
	5	08-JUN-11	12-JUN-11 00:00	48	84	hours	EHT
	6	08-JUN-11	12-JUN-11 00:00	48	84	hours	EHT
	7	08-JUN-11	12-JUN-11 00:00	48	84	hours	EHT
	8	08-JUN-11	12-JUN-11 00:00	48	84	hours	EHT
Anions and Nutrients							
Nitrate in Water (Calculation)							
	1	08-JUN-11	15-JUN-11 20:08	48	176	hours	EHT
	2	08-JUN-11	15-JUN-11 20:08	48	176	hours	EHT
	3	08-JUN-11	15-JUN-11 20:08	48	176	hours	EHT
	4	08-JUN-11	15-JUN-11 20:08	48	176	hours	EHT
	5	08-JUN-11	15-JUN-11 20:08	48	176	hours	EHT
	6	08-JUN-11	15-JUN-11 20:08	48	176	hours	EHT
	7	08-JUN-11	15-JUN-11 20:08	48	176	hours	EHT
	8	08-JUN-11	15-JUN-11 20:08	48	176	hours	EHT
Nitrite & Nitrate in Water by Colour							
	1	08-JUN-11	13-JUN-11 00:00	48	108	hours	EHT
	2	08-JUN-11	13-JUN-11 00:00	48	108	hours	EHT
	3	08-JUN-11	13-JUN-11 00:00	48	108	hours	EHT
	4	08-JUN-11	13-JUN-11 00:00	48	108	hours	EHT
	5	08-JUN-11	13-JUN-11 00:00	48	108	hours	EHT
	6	08-JUN-11	13-JUN-11 00:00	48	108	hours	EHT
	7	08-JUN-11	13-JUN-11 00:00	48	108	hours	EHT
	8	08-JUN-11	13-JUN-11 00:00	48	108	hours	EHT
Nitrite in Water by Colour							
	1	08-JUN-11	13-JUN-11 00:00	48	108	hours	EHT
	2	08-JUN-11	13-JUN-11 00:00	48	108	hours	EHT
	3	08-JUN-11	13-JUN-11 00:00	48	108	hours	EHT
	4	08-JUN-11	13-JUN-11 00:00	48	108	hours	EHT
	5	08-JUN-11	13-JUN-11 00:00	48	108	hours	EHT
	6	08-JUN-11	13-JUN-11 00:00	48	108	hours	EHT
	7	08-JUN-11	13-JUN-11 00:00	48	108	hours	EHT
	8	08-JUN-11	13-JUN-11 00:00	48	108	hours	EHT

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
 EHTR: Exceeded ALS recommended hold time prior to sample receipt.
 EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
 EHT: Exceeded ALS recommended hold time prior to analysis.
 Rec. HT: ALS recommended hold time (see units).

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
 Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1014834 were received on 08-JUN-11 16:28.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

Quality Control Report

Workorder: L1014834

Report Date: 17-JUN-11

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The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Report To			Report Contact / Distribution			Service Requested (Rush for routine analysis subject to availability)												
Company: Deton'Cho/Nuna Joint Venture AND Golder As. Ltd.			<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other			<input type="radio"/> Regular (Standard Turnaround Times - Business Days)												
Contact: DCNJV: Katrina Nokleby; Golder: Justine Crowe			<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax			<input checked="" type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT												
Address:			Email 1: jcrowe@golder.com			<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT												
Phone: 867 669 6735 Fax:			Email 2: hmachtans@golder.com			<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT												
Invoice To Same as Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Client / Project Information			Analysis Request												
Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Job #: 09-1427-0006-20000-20500			Please indicate below Filtered, Preserved or both (F, P, F/P)												
Company: Delon'Cho/Nuna Joint Venture			PO / AFE: 606989			Physical Parameters/Major to	Cyanide	Hardness	TSS and Turbidity	Nutrients	NH3 / TKN	Oil and Grease	TOC	DOC	Low Level Total Metals	Low Level Dissolved Metals	Sulphide	Number of Containers
Contact: Brenda Kalis			LSD:															
Address: 9838-31st Avenue., Edmonton AB, T6N 1C5			Quote #:															
Phone: 780 408 2897 Fax: 780 408 5472			ALS Contact: Can Dang			Sampler: Justine Crowe												
Lab Work Order # (lab use only) L1014834																		
Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Cyanide	Hardness	TSS and Turbidity	Nutrients	NH3 / TKN	Oil and Grease	TOC	DOC	Low Level Total Metals	Low Level Dissolved Metals	Sulphide	Number of Containers		
	YK Bay A	08-Jun-11		Surface Water		X	X	X					X	X		4		
	YK Bay B	08-Jun-11		Surface Water		X	X	X					X	X		4		
	YK Bay C	08-Jun-11		Surface Water		X	X	X					X	X		4		
	YK Bay F	08-Jun-11		Surface Water		X	X	X					X	X		4		
	YK Bay G	08-Jun-11		Surface Water		X	X	X					X	X		4		
	Back Bay Dock Area	08-Jun-11		Surface Water		X	X	X					X	X		4		
	Field Blank	08-Jun-11		Surface Water		X	X	X					X	X		4		
	Travel Blank	08-Jun-11		Surface Water		X	X	X					X	X		4		
	Baker Pond Outflow	8-Jun-11		" "		X	X	X					X	X		4		
Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details																		
Please Analyze As and Se by Hydride*. Please include Mercury in the metals analysis. Note - This water might contain high amounts of metals. All Samples are RUSH / EMERGENCY!!!!																		
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.																		
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.																		
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.																		
SHIPMENT RELEASE (client use)				SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)										
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations:								
<i>J. Crowe</i>	8-Jun-11	16:20	<i>RJS</i>	8-Jun-11	16:25	13.8 °C				Yes / No ?								
											If Yes add SIF							



DETON'CHO \ NUNA JOINT VENTURE
ATTN: KATRINA NOKLEBY
GIANT MINESITE
PO BOX 2951
Yellowknife NT X1A 2R2

Date Received: 17-JUN-11
Report Date: 24-JUN-11 18:20 (MT)
Version: FINAL

Client Phone: 604-253-4188

Certificate of Analysis

Lab Work Order #: L1019377
Project P.O. #: 09-1427-0006-20000-205000
Job Reference: 09-1427-0006-20000-20500
Legal Site Desc:
C of C Numbers: 1

Can Dang
Senior Account Manager

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

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

24-JUN-11 18:20 (MT)

Version: FINAL

Sample ID Description Sampled Date Sampled Time Client ID		L1019377-1 WATER 17-JUN-11 REACH 0 (BC MOUTH)	L1019377-2 WATER 17-JUN-11 REACH 1 (SNP 43-5)	L1019377-3 WATER 17-JUN-11 REACH 4 (D/S BRIDGE NO ICE)	L1019377-4 WATER 17-JUN-11 REACH 6 (BAKER POND OUTFLOW)	L1019377-5 WATER 17-JUN-11 REACH 6 (GIANT FALLS)
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	55.0	56.2	51.0	48.9	45.0
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	4.0	21.3
	Turbidity (NTU)	2.47	2.66	1.79	3.56	3.13
Anions and Nutrients	Nitrate and Nitrite (as N) (mg/L)	<0.0051	<0.0051	0.0074	<0.0051	<0.0051
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	0.0074	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.762	0.704	0.800	1.04	0.639
	Phosphorus (P)-Total Dissolved (mg/L)	0.0087	0.0091	0.0082	0.0085	0.0058
	Phosphorus (P)-Total (mg/L)	0.0203	0.0196	0.0203	0.0235	0.0305
Total Metals	Aluminum (Al)-Total (mg/L)	0.0992	0.0820	0.0530	0.142	0.629
	Antimony (Sb)-Total (mg/L)	0.0127	0.0117	0.00981	0.00594	0.00120
	Arsenic (As)-Total (mg/L)	0.127	0.117	0.0996	0.0985	0.0461
	Barium (Ba)-Total (mg/L)	<0.010	<0.010	<0.010	0.011	0.017
	Beryllium (Be)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Calcium (Ca)-Total (mg/L)	15.3	14.8	13.4	12.7	11.9
	Chromium (Cr)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cobalt (Co)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Copper (Cu)-Total (mg/L)	0.00849	0.00758	0.00683	0.00544	0.00097
	Iron (Fe)-Total (mg/L)	0.196	0.174	0.144	0.210	0.736
	Lead (Pb)-Total (mg/L)	0.000434	0.000342	0.000342	0.000380	0.000211
	Lithium (Li)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Magnesium (Mg)-Total (mg/L)	4.15	4.04	3.75	3.69	3.70
	Manganese (Mn)-Total (mg/L)	0.0157	0.0140	0.0138	0.0236	0.231
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	0.000988	0.000966	0.000923	0.000812	0.000519
	Nickel (Ni)-Total (mg/L)	0.00214	0.00183	0.00140	0.00149	0.00071
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Total (mg/L)	0.320	0.293	0.247	0.377	1.46
	Silver (Ag)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Sodium (Na)-Total (mg/L)	3.4	3.3	3.0	2.9	2.6
	Strontium (Sr)-Total (mg/L)	0.0628	0.0607	0.0547	0.0519	0.0462
	Thallium (Tl)-Total (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1019377-6 WATER 17-JUN-11 FIELD BLANK	L1019377-7 WATER 17-JUN-11 TRAVEL BLANK			
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	<0.50	<0.50			
	Total Suspended Solids (mg/L)	<3.0	<3.0			
	Turbidity (NTU)	<0.10	<0.10			
Anions and Nutrients	Nitrate and Nitrite (as N) (mg/L)	<0.0051	<0.0051			
	Nitrate (as N) (mg/L)	<0.0050	<0.0050			
	Nitrite (as N) (mg/L)	<0.0010	<0.0010			
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050			
	Phosphorus (P)-Total Dissolved (mg/L)	<0.0020	<0.0020			
	Phosphorus (P)-Total (mg/L)	<0.0020	<0.0020			
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0030	<0.0030			
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010			
	Arsenic (As)-Total (mg/L)	<0.00010	<0.00010			
	Barium (Ba)-Total (mg/L)	<0.010	<0.010			
	Beryllium (Be)-Total (mg/L)	<0.0050	<0.0050			
	Bismuth (Bi)-Total (mg/L)	<0.20	<0.20			
	Boron (B)-Total (mg/L)	<0.10	<0.10			
	Cadmium (Cd)-Total (mg/L)	<0.000050	<0.000050			
	Calcium (Ca)-Total (mg/L)	<0.050	<0.050			
	Chromium (Cr)-Total (mg/L)	<0.010	<0.010			
	Cobalt (Co)-Total (mg/L)	<0.010	<0.010			
	Copper (Cu)-Total (mg/L)	<0.00050	<0.00050			
	Iron (Fe)-Total (mg/L)	<0.010	<0.010			
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050			
	Lithium (Li)-Total (mg/L)	<0.010	<0.010			
	Magnesium (Mg)-Total (mg/L)	<0.10	<0.10			
	Manganese (Mn)-Total (mg/L)	<0.0050	<0.0050			
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010			
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050			
	Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050			
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30			
	Potassium (K)-Total (mg/L)	<2.0	<2.0			
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010			
	Silicon (Si)-Total (mg/L)	<0.050	<0.050			
	Silver (Ag)-Total (mg/L)	<0.010	<0.010			
	Sodium (Na)-Total (mg/L)	<2.0	<2.0			
	Strontium (Sr)-Total (mg/L)	<0.0050	<0.0050			
	Thallium (Tl)-Total (mg/L)	<0.20	<0.20			

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1019377-1 WATER 17-JUN-11 REACH 0 (BC MOUTH)	L1019377-2 WATER 17-JUN-11 REACH 1 (SNP 43-5)	L1019377-3 WATER 17-JUN-11 REACH 4 (D/S BRIDGE NO ICE)	L1019377-4 WATER 17-JUN-11 REACH 6 (BAKER POND OUTFLOW)	L1019377-5 WATER 17-JUN-11 REACH 6 (GIANT FALLS)
Grouping	Analyte					
WATER						
Total Metals	Tin (Sn)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	0.028
	Uranium (U)-Total (mg/L)	0.000212	0.000202	0.000209	0.000199	0.000334
	Vanadium (V)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Zinc (Zn)-Total (mg/L)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0053	0.0066	0.0073	0.0073	0.0062
	Antimony (Sb)-Dissolved (mg/L)	0.0123	0.0126	0.00922	0.00629	0.00124
	Arsenic (As)-Dissolved (mg/L)	0.113	0.122	0.111	0.109	0.0415
	Barium (Ba)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Beryllium (Be)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Calcium (Ca)-Dissolved (mg/L)	15.2	15.6	14.0	13.3	12.0
	Chromium (Cr)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cobalt (Co)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Copper (Cu)-Dissolved (mg/L)	0.00616	0.00618	0.00571	0.00392	0.00074
	Iron (Fe)-Dissolved (mg/L)	0.045	0.051	0.047	0.049	0.045
	Lead (Pb)-Dissolved (mg/L)	0.000120	0.000104	0.000090	0.000060	<0.000050
	Lithium (Li)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Magnesium (Mg)-Dissolved (mg/L)	4.12	4.22	3.92	3.84	3.63
	Manganese (Mn)-Dissolved (mg/L)	0.0088	0.0085	0.0068	0.0113	0.0149
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.000965	0.000934	0.000825	0.000859	0.000460
	Nickel (Ni)-Dissolved (mg/L)	0.00195	0.00183	0.00144	0.00142	<0.00050
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Silicon (Si)-Dissolved (mg/L)	0.158	0.169	0.161	0.151	0.123
	Silver (Ag)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Sodium (Na)-Dissolved (mg/L)	3.4	3.4	3.1	3.0	2.6
	Strontium (Sr)-Dissolved (mg/L)	0.0619	0.0624	0.0564	0.0537	0.0448
	Thallium (Tl)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Tin (Sn)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.000190	0.000197	0.000181	0.000193	0.000169
	Vanadium (V)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L1019377-6 WATER 17-JUN-11 FIELD BLANK	L1019377-7 WATER 17-JUN-11 TRAVEL BLANK		
Grouping	Analyte					
WATER						
Total Metals	Tin (Sn)-Total (mg/L)	<0.030	<0.030			
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010			
	Uranium (U)-Total (mg/L)	<0.000010	<0.000010			
	Vanadium (V)-Total (mg/L)	<0.030	<0.030			
	Zinc (Zn)-Total (mg/L)	<0.0040	<0.0040			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0030	<0.0030			
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010			
	Arsenic (As)-Dissolved (mg/L)	<0.00010	<0.00010			
	Barium (Ba)-Dissolved (mg/L)	<0.010	<0.010			
	Beryllium (Be)-Dissolved (mg/L)	<0.0050	<0.0050			
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20			
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10			
	Cadmium (Cd)-Dissolved (mg/L)	<0.000050	<0.000050			
	Calcium (Ca)-Dissolved (mg/L)	<0.050	<0.050			
	Chromium (Cr)-Dissolved (mg/L)	<0.010	<0.010			
	Cobalt (Co)-Dissolved (mg/L)	<0.010	<0.010			
	Copper (Cu)-Dissolved (mg/L)	<0.00050	<0.00050			
	Iron (Fe)-Dissolved (mg/L)	<0.010	<0.010			
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050			
	Lithium (Li)-Dissolved (mg/L)	<0.010	<0.010			
	Magnesium (Mg)-Dissolved (mg/L)	<0.10	<0.10			
	Manganese (Mn)-Dissolved (mg/L)	<0.0050	<0.0050			
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010			
	Molybdenum (Mo)-Dissolved (mg/L)	<0.000050	<0.000050			
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050			
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30			
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0			
	Selenium (Se)-Dissolved (mg/L)	<0.00010	<0.00010			
	Silicon (Si)-Dissolved (mg/L)	<0.050	<0.050			
	Silver (Ag)-Dissolved (mg/L)	<0.010	<0.010			
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0			
	Strontium (Sr)-Dissolved (mg/L)	<0.0050	<0.0050			
	Thallium (Tl)-Dissolved (mg/L)	<0.20	<0.20			
	Tin (Sn)-Dissolved (mg/L)	<0.030	<0.030			
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010			
	Uranium (U)-Dissolved (mg/L)	<0.000010	<0.000010			
	Vanadium (V)-Dissolved (mg/L)	<0.030	<0.030			

	Sample ID Description Sampled Date Sampled Time Client ID	L1019377-1 WATER 17-JUN-11 REACH 0 (BC MOUTH)	L1019377-2 WATER 17-JUN-11 REACH 1 (SNP 43-5)	L1019377-3 WATER 17-JUN-11 REACH 4 (D/S BRIDGE NO ICE)	L1019377-4 WATER 17-JUN-11 REACH 6 (BAKER POND OUTFLOW)	L1019377-5 WATER 17-JUN-11 REACH 6 (GIANT FALLS)
Grouping	Analyte					
WATER						
Dissolved Metals	Zinc (Zn)-Dissolved (mg/L)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040

		<div>Sample ID Description Sampled Date Sampled Time Client ID</div>	L1019377-6 WATER 17-JUN-11 FIELD BLANK	L1019377-7 WATER 17-JUN-11 TRAVEL BLANK			
Grouping	Analyte						
WATER							
Dissolved Metals	Zinc (Zn)-Dissolved (mg/L)		<0.0040	<0.0040			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ANIONS-N+N-CALC-VA	Water	Nitrite & Nitrate in Water (Calculation)	EPA 300.0
Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).			
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.			
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-LOW-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS(Low)	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-LOW-CVAFS-VA	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
MET-D-CCMS-VA	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
MET-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-DIS-LOW-ICP-VA	Water	Dissolved Metals in Water by ICPOES	EPA 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-T-CCMS-VA	Water	Total Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
MET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-LOW-ICP-VA	Water	Total Metals in Water by ICPOES	EPA 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
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.			

Reference Information

P-TD-COL-VA	Water	Total Dissolved P in Water 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.			
TKN-SIE-VA	Water	TKN in Water 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.			
TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.			
TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			
TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			

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

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

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, 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).

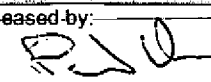
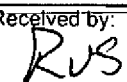
N/A - Result not available. Refer to qualifier code and definition for explanation.

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.



Report To Company: Deton'Cho/Nuna Joint Venture AND Golder As. Ltd. Contact: DCNJV: Katrina Nokleby; Golder: Justine Crowe Address: Phone: 867 669 6735 Fax: Invoice To Same as Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Company: Golder Associates Ltd. Contact: Nancy Sweetman Address: #9, 4905-48th Street, Yellowknife, NWT, X1A 3S3 Phone: 867 873 6319 Fax: 867 873 6379				Report Format / Distribution <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax Email 1: jcrowe@golder.com Email 2: hmachtans@golder.com Email 3: KatrinaN@nunalogistics.com				Service Requested (Rush for routine analysis subject to availability) <input type="radio"/> Regular (Standard Turnaround Times - Business Days) <input checked="" type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT																																																																																																																																																																																																														
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Lab Work Order # 21019377 (lab use only)				ALS Contact: Can Dang		Sampler: Justine Crowe		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Physical Parameters/Major Ions</th> <th>Cyanide</th> <th>Hardness</th> <th>TSS and Turbidity</th> <th>Nutrients</th> <th>NH3 / TKN</th> <th>Oil and Grease</th> <th>TOC</th> <th>DOC</th> <th>Low Level Total Metals</th> <th>Low Level Dissolved Metals</th> <th>Sulphide</th> <th>Number of Containers</th> </tr> <tr> <td>Reach 0 (BC Mouth)</td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td>X</td> <td></td> <td>4</td> </tr> <tr> <td>Reach 1 (SNP43-5)</td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td>X</td> <td></td> <td>4</td> </tr> <tr> <td>Reach 4 (d/s Bridge no Ice)</td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td>X</td> <td></td> <td>4</td> </tr> <tr> <td>Reach 6 (Baker Pond Outflow)</td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td>X</td> <td></td> <td>4</td> </tr> <tr> <td>Reach 6 (Giant Falls)</td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td>X</td> <td></td> <td>4</td> </tr> <tr> <td>Field Blank</td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td>X</td> <td></td> <td>4</td> </tr> <tr> <td>Travel Blank</td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td>X</td> <td></td> <td>4</td> </tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>												Physical Parameters/Major Ions	Cyanide	Hardness	TSS and Turbidity	Nutrients	NH3 / TKN	Oil and Grease	TOC	DOC	Low Level Total Metals	Low Level Dissolved Metals	Sulphide	Number of Containers	Reach 0 (BC Mouth)		X	X	X					X	X		4	Reach 1 (SNP43-5)		X	X	X					X	X		4	Reach 4 (d/s Bridge no Ice)		X	X	X					X	X		4	Reach 6 (Baker Pond Outflow)		X	X	X					X	X		4	Reach 6 (Giant Falls)		X	X	X					X	X		4	Field Blank		X	X	X					X	X		4	Travel Blank		X	X	X					X	X		4																																																																																											
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Please Analyze As and Se by Hydride*. Please include Mercury in the metals analysis. Note - This water might contain high amounts of metals. All Samples are RUSH / EMERGENCY!!!!																																																																																																																																																																																																																						
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Released by: 	Date (dd-mm-yy): 17 June/11	Time (hh:mm): 12:08	Received by: 	Date: 17 June-11	Time: 12:08	Temperature: 17.4 °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF																																																																																																																																																																																																												

At Golder Associates we strive to be the most respected global company providing consulting, design, and construction services in earth, environment, and related areas of energy. Employee owned since our formation in 1960, our focus, unique culture and operating environment offer opportunities and the freedom to excel, which attracts the leading specialists in our fields. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees who operate from offices located throughout Africa, Asia, Australasia, Europe, North America, and South America.

Africa	+ 27 11 254 4800
Asia	+ 86 21 6258 5522
Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 55 21 3095 9500

solutions@golder.com
www.golder.com

Golder Associates Ltd.
500 - 4260 Still Creek Drive
Burnaby, British Columbia, V5C 6C6
Canada
T: +1 (604) 296 4200

