

RECEIVED

By Licensing Administrator at 11:17 am, May 06, 2011

Appendix F2

**Report: *Aquatic Effects Monitoring Program: Core
Receiving Environment Monitoring Program 2010***

FINAL

**Aquatic Effects Monitoring Program –
Core Receiving Environment Monitoring Program 2010**

Meadowbank Mine

Prepared for:

Agnico-Eagle Mines Ltd.
Meadowbank Division
Baker Lake, NU
X0C 0A0

March 2011



Azimuth Consulting Group Inc.
218-2902 West Broadway
Vancouver, BC
V6K 2G8

Project No. AEM-10-02.1

TABLE OF CONTENTS

TABLE OF CONTENTS	i
LIST OF TABLES	iii
LIST OF FIGURES	iv
LIST OF APPENDICES	vi
ACKNOWLEDGEMENTS	vii
PROFESSIONAL LIABILITY STATEMENT	viii
ACRONYMS	ix
EXECUTIVE SUMMARY	ES-1
1. INTRODUCTION.....	1
1.1. Background	1
1.2. Environmental Setting	2
1.3. Overall Program Objectives and Approach	2
1.3.1. Core Monitoring Program (CREMP)	3
1.3.2. Targeted Monitoring Studies	5
1.4. Meadowbank Mine Development and Operation.....	6
1.4.1. Historical and Current Activities	6
1.4.2. Overview of Aquatic Receiving Environment Status.....	7
2. METHODS	13
2.1. 2010 CREMP Program Overview	13
2.2. General Limnology	13
2.3. Water Chemistry	14
2.4. Sediment Chemistry	14
2.5. Phytoplankton.....	16
2.6. Benthic Invertebrates.....	17
2.7. Zooplankton.....	19
2.8. Quality Assurance / Quality Control	20
3. RESULTS AND DISCUSSION	26
3.1. QA/QC	26
3.1.1. Water Chemistry	26
3.1.2. Sediment Chemistry	27
3.1.3. Phytoplankton.....	28
3.1.4. Benthic Invertebrates.....	29
3.1.5. Zooplankton.....	29
3.1.6. Completeness	29
3.2. Limnology and Water Chemistry	44
3.2.1. Meadowbank Study Lakes	44
3.2.2. Baker Lake	48



3.3.	Sediment Chemistry	68
3.3.1.	Meadowbank Study Lakes	68
3.3.2.	Baker Lake	70
3.4.	Phytoplankton.....	73
3.4.1.	Meadowbank Study Lakes	73
3.4.2.	Baker Lake	74
3.5.	Benthic Invertebrates.....	83
3.5.1.	Meadowbank Study Lakes	83
3.5.2.	Baker Lake	85
3.6.	Zooplankton.....	95
4.	SUMMARY.....	100
5.	MONITORING COMPONENTS FOR 2011.....	105
6.	REFERENCES.....	107



LIST OF TABLES

Table 2-1. CREMP sampling location coordinates (GPS, UTM, NAD83), Meadowbank study lakes and Baker Lake, 2010.	24
Table 3-1. QA/QC data for water parameters, Meadowbank study lakes and Baker Lake, 2010.....	31
Table 3-2. QA/QC data for sediment parameters, Meadowbank study lakes and Baker Lake, August 2010.	36
Table 3-3. QA/QC data for phytoplankton, Meadowbank study lakes and Baker Lake, 2010.....	38
Table 3-4. Percent recovery of benthic invertebrate samples, Meadowbank study lakes and Baker Lake, August 2010.....	43
Table 3-5. Conventional water chemistry and total and dissolved metals (mg/L), Meadowbank study lakes and Baker Lake, 2010.	51
Table 3-6. Conventional sediment chemistry, hydrocarbons, PAHs and total metals (mg/kg), Meadowbank study lakes and Baker Lake, August 2010. 71	
Table 3-7. Seasonal density (cells/L) of major phytoplankton groups, Meadowbank study lakes and Baker Lake, 2010.	76
Table 3-8. Seasonal biomass (mg/m ³) and diversity of major phytoplankton groups, Meadowbank study lakes and Baker Lake, 2010.	78
Table 3-9. Benthic invertebrate total abundance (#/m ²), Meadowbank study lakes and Baker Lake, August 2010.	87
Table 3-10. Benthic invertebrate total richness (#taxa), Meadowbank study lakes and Baker Lake, August 2010.	89
Table 3-11. Zooplankton biomass (mg/m ³) (wet and dry weights), Meadowbank study lakes, 2010.....	97
Table 3-12. Mean abundance (#/m ³) per station of taxa identified, Meadowbank study lakes, 2010.....	98



LIST OF FIGURES

Figure 1-1. Water Quality Monitoring Areas and Sampling Stations, 2010.	10
Figure 1-2. Sediment Quality, Benthic Invertebrate, and Zooplankton Sampling Stations, 2010.....	11
Figure 1-3. Baker Lake Water, Sediment, and Benthic Invertebrate Sampling Stations, 2010.....	12
Figure 3-1. Temperature (°C) and dissolved oxygen (mg/L) profiles for Third Portage Lake– East Basin, 2010.	55
Figure 3-2. Temperature (°C) and dissolved oxygen (mg/L) profiles for Third Portage Lake– North Basin, 2010.	56
Figure 3-3. Temperature (°C) and dissolved oxygen (mg/L) profiles for Third Portage Lake– South Basin, 2010.....	57
Figure 3-4. Temperature (°C) and dissolved oxygen (mg/L) profiles for Second Portage Lake, 2010.	58
Figure 3-5. Temperature (°C) and dissolved oxygen (mg/L) profiles for Tehek Lake, 2010.	59
Figure 3-6. Temperature (°C) and dissolved oxygen (mg/L) profiles for Tehek Lake Fairfield, 2010.	60
Figure 3-7. Temperature (°C) and dissolved oxygen (mg/L) profiles for Inuggugayualik Lake, 2010.	61
Figure 3-8. Temperature (°C) and dissolved oxygen (mg/L) profiles for Wally Lake, 2010.	62
Figure 3-9. Temperature (°C) and dissolved oxygen (mg/L) profiles for Pipedream Lake, 2010.	63
Figure 3-10. Temperature (°C) and dissolved oxygen (mg/L) profiles for Baker Lake – Barge Dock, 2010.....	64
Figure 3-11. Temperature (°C) and dissolved oxygen (mg/L) profiles for Baker Lake – Proposed Jetty, 2010.....	65
Figure 3-12. Temperature (°C) and dissolved oxygen (mg/L) profiles for Baker Lake– Akilahaarjuk Point, 2010.	66
Figure 3-13. Seasonal chlorophyll- α concentration boxplots (ug/L) for Meadowbank study lakes, 2010.....	67



Figure 3-14. Seasonal biomass (mg/m^3) of major phytoplankton groups, Meadowbank study lakes & Baker Lake, 2010.	80
Figure 3-15. Phytoplankton mean total biomass (mg/m^3), +/- 1 standard deviation, Meadowbank study lakes & Baker Lake, from July – September 2010.	81
Figure 3-16. Phytoplankton mean total biomass (mg/m^3) from July–September 2006–2010.	82
Figure 3-17. Benthic invertebrate replicates of abundance by major taxa group, Meadowbank study lakes, August 2010.	91
Figure 3-18. Benthic invertebrate replicates of richness by major taxa group, Meadowbank study lakes, August 2010.	92
Figure 3-19. Benthic invertebrate replicates of abundance by major taxa group, Baker Lake, August 2010.	93
Figure 3-20. Benthic invertebrate replicates of richness by major taxa group, Baker Lake, August 2010.	94
Figure 3-21. Zooplankton mean total biomass (mg/m^3 dry weight), +/- 1 standard deviation, Meadowbank study lakes, August 2010.....	99

LIST OF APPENDICES

Appendix A. Presence (+) / Absence (-) Matrix of Phytoplankton Species in Meadowbank Study Lakes and Baker Lake, 2010.

Appendix B. Benthic Invertebrate Raw Data, Meadowbank Study Lakes and Baker Lake, 2010.

Appendix C. Standard Operating Procedures for CREMP Zooplankton Sampling.

Appendix D. Zooplankton Taxonomic Identification raw data, 2010.

Appendix E. Laboratory Reports (ALS and NSC), 2010.



ACKNOWLEDGEMENTS

Azimuth would like to thank AEM for their continued support of this program and for facilitating our work by providing logistical assistance and help whenever needed. Key personnel conducting this project were as follows:

- Gary Mann (Azimuth) – Gary was responsible for overall management of this project. He also provided oversight and logistical support for the field crew, and reviewed the CREMP report.
- Maggie McConnell (Azimuth) – Maggie was responsible for implementing the CREMP field monitoring program in 2010. In addition to participating in summer and fall sampling trips, Maggie conducted most of the data analysis, interpretation, and report writing.
- Morgan Finley (Azimuth) – Morgan was responsible for implementing the sediment trap sampling, as part of the EAS field monitoring in 2010. In addition to leading the sediment sampling, Morgan teamed up with Maggie for summer and fall CREMP sampling trips.
- Randy Baker (Azimuth) – Randy conducted technical review of the CREMP report.
- Other people provided invaluable assistance in the field over the summer and fall: Tom Thompson, Patrick Angoyuaq, and Jessica Fang.



PROFESSIONAL LIABILITY STATEMENT

This report has been prepared by Azimuth Consulting Group Inc. (Azimuth), for the use of Agnico-Eagle Mines Ltd. (AEM), who has been party to the development of the scope of work for this project and understands its limitations. The extent to which previous investigations were relied on is detailed in the report.

In providing this report and performing the services in preparation of this report Azimuth accepts no responsibility in respect of the site described in this report or for any business decisions relating to the site, including decisions in respect of the management, purchase, sale or investment in the site.

This report and the assessments and recommendations contained in it are intended for the sole and exclusive use of AEM.

Any use of, reliance on, or decision made by a third party based on this report, or the services performed by Azimuth in preparation of this report is expressly prohibited, without prior written authorization from Azimuth. Without such prior written authorization, Azimuth accepts no liability or responsibility for any loss, damage, or liability of any kind that may be suffered or incurred by any third party as a result of that third party's use of, reliance on, or any decision made based on this report or the services performed by Azimuth in preparation of this report.

The findings contained in this report are based, in part, upon information provided by others. In preparing this report, Azimuth has assumed that the data or other information provided by others is factual and accurate. If any of the information is inaccurate, site conditions change, new information is discovered, and/or unexpected conditions are encountered in future work, then modifications by Azimuth to the findings, conclusions and recommendations of this report may be necessary.

In addition, the conclusions and recommendations of this report are based upon applicable legislation existing at the time the report was drafted. Changes to legislation, such as an alteration in acceptable limits of contamination, may alter conclusions and recommendations.

This report is time-sensitive and pertains to a specific site and a specific scope of work. It is not applicable to any other site, development or remediation other than that to which it specifically refers. Any change in the site, remediation or proposed development may necessitate a supplementary investigation and assessment.

This report is subject to copyright. Reproduction or publication of this report, in whole or in part, without AEM's prior written authorization, is not permitted.



ACRONYMS

AEMP – Aquatic Effects Monitoring Program¹
ANOVA – Analysis of Variance
AWPAR – All Weather Private Access Road
BACI – Before/After Control/Impact
BBD – Baker Lake – barge dock
BPJ – Baker Lake – proposed jetty
BAP – Baker Lake – Akilahaarjuk Point
CREMP – Core Receiving Environment Monitoring Program
DFO – Department of Fisheries and Oceans
DLs – Detection limits
DQO – Data Quality Objective
EAS – Effects Assessment Strategy
EEM – Environmental Effects Monitoring
EIA – Environmental Impact Assessment
GPS – Global Positioning System
HEPH – Heavy Extractable Petroleum Hydrocarbons
INUG – Inuggugayualik Lake
ISQG – Interim Sediment Quality Guidelines
LEPH – Light Extractable Petroleum Hydrocarbons
MDL – Method detection limit
MMER – Metal Mining Effluent Regulations
PAHs – Polycyclic Aromatic Hydrocarbons
PDL – Pipedream Lake
PEL – Probable Effect Level
QA/QC – Quality Assurance / Quality Control

¹ See text box in **Section 1.1**.



RPD – Relative percent difference

SOP – Standard Operating Procedure

SQG – Sediment Quality Guidelines

SP – Second Portage Lake

TE – Tehek Lake

TEFF – Tehek Lake Farfield

TPE, TPN, TPS – Third Portage Lake – East, North, and South Basins

UTM – Universal Transverse Mercator

WAL – Wally Lake



EXECUTIVE SUMMARY

Overview

This Core Receiving Environment Monitoring Program (CREMP) for the Meadowbank Mine describes the strategy, methodology and results of receiving environment aquatic monitoring during the 2010 open-water and through-ice seasons of the Meadowbank study lakes and, for the third time, at Baker Lake.

Monitoring Strategy and General Study Design

At its core, the CREMP was designed to address key issues identified in the Meadowbank EIA (i.e., mining-related activities with the potential to affect water quality, fish habitat and fish populations). The core program is tailored based on our understanding of mine construction, operation and infrastructure (e.g., dikes, effluents, stream crossings, roads, etc.) and has been developed to detect mine-related impacts at temporal and spatial scales that are ecologically relevant. The core program initially focused solely on the project lakes, but was expanded to Baker Lake in 2008 to ensure that monitoring was also in place to track project-related activities in that area. The 2010 program consisted of 12 stations, each categorized into one of the three main types of stations described below:

Near-field (NF) areas – Stations are situated in close proximity to the development, in particular near dikes, dewatering discharge, or proposed effluent sources. These stations provide the first line of early-warning for introductions of stressors into the receiving environment. For the project lakes area, these stations include: Third Portage Lake North (TPN), Third Portage Lake East (TPE), Second Portage (SP) and Wally Lake (WAL) and Tehek Lake (TE). For Baker Lake, there are two NF stations, one targeting the hamlet's barge landing area (Baker Barge Dock [BBD]) and the other AEM's fuel storage facility (Baker Proposed Jetty [BPJ]).

Far-field (FF) area – The intent of this station is to monitor water and sediment quality downstream of project infrastructure to provide insights into the spatial extent of any effects observed at the near-field stations. The Tehek Farfield (TEFF) station is a key location that will ultimately determine whether or not contaminants are detectable downstream of the entire mine development. Lake waters from Second and Third Portage Lakes and the Vault Lakes (Vault, Wally, Drilltrail) meet at the southern end of Second Portage Lake and discharge via a single channel into Tehek Lake. Monitoring the water and sediment quality and the health of the benthic invertebrate community in the basin adjoining the discharge point from Second Portage Lake will help determine if any effects identified at NF stations are extending into Tehek Lake beyond the first basin located just downstream of the outlet from Second Portage Lake.



-
- *Reference (Ref) areas* – Reference stations are sufficiently removed from the mine that they are presumed to be unaffected by any infrastructure (roads, dikes, runways) and point sources (aerial and aquatic) associated with mine development. Internal (Third Portage Lake South [TPS]) and external (Inuggugayualik Lake [INUG]) reference areas were chosen for the purposes of making comparisons with the Meadowbank study lakes (BAER, 2005). An external reference was added in 2009 in another remote lake, Pipedream Lake (PDL). For Baker Lake, the internal reference area is at Akilahaarjuk Point (BAP).

Other relevant studies conducted in 2010 that complement the CREMP include:

- *Dike construction monitoring* – A detailed monitoring and management program for dike construction was developed as part of the Nunavut Water Board (NWB) A License process. The program was implemented both for the construction of the East Dike (2008) and later for the Bay-Goose Dike (2009, 2010). Monitoring program results are documented in separate reports (Azimuth, 2009b, 2010b; AEM, 2011).
- *Total suspended solids (TSS) effects assessment study (EAS)* – In response to elevated TSS concentrations related to construction of the East Dike and the Bay-Goose Dike, the TSS EAS was implemented to determine the physical and ecological extent and magnitude of these events. A number of components will continue to be monitored as follow-up from effects associated with both dikes (Azimuth, 2009c, 2010c, 2011b).

Meadowbank Mine – Development Status

The construction phase of the Meadowbank Mine officially started in June 2008, upon receipt of the NWB A Water License (2AM-MEA0815) for the project. The Fisheries and Oceans Canada (DFO) *Fisheries Act* Authorization (NU-03-0191) for the project was issued on July 30, 2008, thus allowing the start of in-water construction activities. Major in-water construction activities for 2008 included the East Dike (located in Second Portage Lake) and the Western Channel Dike (located between Third Portage Lake and Second Portage Lake); the closest CREMP station to these activities was the Second Portage Lake station (SP).

Dewatering of the northwest arm of Second Portage Lake began upon completion of the East Dike. The closest CREMP station to dewatering activities was the Third Portage Lake North station (TPN). In-water construction activities for 2009 occurred in the East basin of Third Portage Lake. The north half of the Bay-Goose Dike, that connects the north shore to Goose Island, was initiated on July 27, 2009. The closest CREMP station to the dike construction activities was the Third Portage Lake East station (TPE). Over winter (2009–2010), the south half of the dike, that connects the south end of Goose



Island to the mainland west of the island, began with installation of a narrow causeway that was constructed through the ice. This causeway was designed to act as a barrier against excessive introductions into the East basin of Third Portage Lake during completion of the southern half of Bay-Goose dike during the 2010 open water season.

Meadowbank Study Lakes

- Limnology results show that the lakes are generally cold, clear, isothermal, well mixed, and well oxygenated. These results are consistent among stations and seasons for 2010 and similar to historical data. The temperature profile for TE was unusually high relative to adjacent stations just after ice-off and this is likely attributable to poor instrument calibration since it was not evident several weeks later. During through-ice sampling in winter months, observed differences were colder lake water temperatures and higher dissolved oxygen concentrations, as would be expected.
- Water chemistry results show that the lakes are circum-neutral, with low and consistent conductivity, hardness and ions within and between lakes. TPE had slightly higher values related to TDS and TSS from dike construction. Total and dissolved solids concentrations are very low and typically below detection limits (see exceptions in next bullet). Carbon was also low, close to laboratory detection limits and did not differ appreciably within or among lakes and seasons. Some stations detected nitrogen above DLs and never exceeded guidelines. On a few occasions phosphorus concentrations exceeded the guideline for ultra-oligotrophic lakes in a few lakes. Total and dissolved metals concentrations were consistently low among the project lakes and similar to previous years, most metals were below laboratory detection limits (DLs). Only a few metals (iron, lead, mercury) exceeded DLs and aluminum and copper exceeded guidelines. These results are generally consistent with previous years and confirm their status as ultra-oligotrophic lakes.
- Continued construction of the Bay-Goose Dike introduced suspended sediments into TPE throughout the summer 2010. This resulted in elevated concentrations of total suspended solids (TSS), particularly in August. Also, total phosphate, aluminum, and chromium exceeded guidelines and other metals (arsenic, nickel, titanium, and uranium) that were measured above detection limits in TPE and not in any other lake. The extent and ecological significance of the sediment introductions is assessed in greater detail in the EAS report (Azimuth, 2011b).
- Baseline sediment chemistry results showed naturally elevated metals (primarily arsenic, chromium, and copper which typically exceeded CCME guidelines) at many locations. Cadmium, lead and zinc exceeded guidelines in a few cases, at similar locations to previous years. Total organic carbon concentrations were



consistent with those measured in previous years. Sediment had non-detectable concentrations of PAHs, and LEPHs and HEPHs at all stations, consistent with 2008 and 2009 data; detectable oil and grease at TPS and WAL was attributed to natural material. We recommend moving to a ‘Mineral Oil and Grease’ analysis which will remove the bulk of the naturally-occurring organic material. Overall, the concentrations in study lakes have not changed much from last year. Given that the same is true for the lakes that are removed from mining activity and the reference lakes, then the changes discussed above are most likely due to inter-annual differences attributable to spatial heterogeneity.

- Primary productivity was generally low, as indicated by low phytoplankton biomass and low chlorophyll- α , as expected for these ultra-oligotrophic lakes. Compositionally, the study lakes in 2010 had comparable phytoplankton assemblages to those documented from the same stations in previous years. TPN and TPS have had the lowest mean total biomass over the past few years (2006, 2007). In 2008, biomass in SP decreased during East Dike construction. In 2009 biomass in TPS, TPE, SP, TE all increased noticeably during Bay-Goose Dike construction. Phytoplankton results are quite variable and as such it is often difficult to distinguish an apparent trend in any particular season or year from natural variability. The lack of consistency of this metric is being examined in greater detail (see next bullet).
- In both 2009 and 2010, a large number of extra water, sediment, and phytoplankton samples were collected to better characterize temporal and spatial (horizontal and vertical) variability. Results of statistical analyses to determine which components and how much replication is necessary to detect effects will be discussed in more detail in the CREMP design (Azimuth, 2011a *in progress*).
- Benthic community samples were dominated by chironomid larvae in 2010, consistent with previous years. Most stations had similar results to 2009. Preliminary results, based on statistical analyses from the EAS, show a decrease in abundance at SP in 2010, despite the rebound that was observed in 2009 for this station. These effects in SP did not extend into TE, as most results for TE since 2008 were within the range of baseline results. TPE showed a decrease in abundance for multi-year effect (2009-2010), but no significant adverse effects were observed for benthos at TPN.
- There was considerable variation among zooplankton sampling stations but also among replicates within-station. The current zooplankton data will become more valuable. At least another year of data are needed to characterize the magnitude of inter-annual variability. Consequently, this component will be continued in 2011. We suggest keeping with the current design of one sampling event (August) and



increasing the replicates from 5 to 10 per station. A flow meter will be added to the mouth of the net to measure water volume filtered, rather than assuming there is no net clogging.

Baker Lake

- There is evidence of natural variability of many of the water quality parameters in Baker Lake that are likely related to the influence of wind-driven vertical mixing and inflow from the Thelon River, just east of Baker Lake. Because the sampling stations are situated relatively close to shore, water from the Thelon River could be moving west along shore resulting in changes in water quality that more resemble Thelon River than Baker Lake water. Despite some vertical differences in salinity, oxygen and temperature there was no stratification in temperature.
- Water chemistry results showed that aluminum was the only detectable metal in Baker Lake but concentrations did not exceed guidelines.
- Sediment chemistry showed lower metals concentrations than the Meadowbank study lakes, with only arsenic exceeding CCME guidelines (similar to previous years). The range in metals concentration among stations was relatively small, usually less than 2 times the average concentration. Concentrations of all PAHs, oil and grease, and LEPHs and HEPHs were below detection limits in sediment for the three stations. These data confirm that barge activity and use in the vicinity of the BBD station has not resulted in increased metals or inputs of hydrocarbons to the local sediment.
- Chlorophyll- α concentrations in Baker Lake are typically about 3x those measured in the Meadowbank study lakes which is consistent with results from previous years. Phytoplankton biomass was quite similar within and between stations in Baker Lake, with slightly more biomass at the reference station BAP this year but this has varied over the years.
- Benthic community samples in Baker Lake were dominated by insects; however, there was an unexplained large abundance of oligochaetes at the reference station BAP in 2010. Mean total abundance of organisms was nearly 10x higher at BAP relative to exposure stations. Taxa richness has consistently been highest for insects at all stations from 2008–2010.
- Consideration for changing the location of the Baker Lake reference station (BAP) was discussed in the 2009 report (Azimuth, 2010a). However, during 2010 sample planning both chemistry and benthic biota data from 2008 and 2009 were more carefully reviewed and it was clear that the reference station was not consistently different and the impact stations also varied inconsistently between



the 2 years. Thus, BAP remained as the reference station for 2010 sampling. These differences do not necessarily indicate that the reference area is unsuitable as the monitoring framework targets the relative performance of each of the two impact areas over time. Provided that the areas all respond similarly to broad-scale natural fluctuations (e.g., inter-annual variability), initial differences between control (reference) and impact areas should not preclude the detection of adverse effects. That said, if conditions do vary sufficiently that responses to regional factors (e.g., climatic) differ among areas, then a more suitable reference area may be desirable. This issue is explored in greater detail as part of the CREMP design (Azimuth, 2011a *in progress*).



1. INTRODUCTION

1.1. Background

Agnico-Eagle Mines (AEM) Ltd.'s Meadowbank Mine is situated approximately 75 km north of the hamlet of Baker Lake, Nunavut. The Aquatic Effects Management Program (AEMP, 2005) was developed to address issues identified during the environmental impact assessment (EIA) process that could potentially impact the aquatic receiving environments surrounding the development. Building from earlier baseline monitoring (BAER, 2005), the 2005 AEMP describes the general monitoring strategy designed to detect impacts to the aquatic environment. This strategy relies on two primary components (discussed further in **Section 1.3**): the core monitoring program and targeted studies. Monitoring following the 2005 AEMP strategy has been implemented as follows:

- 2006 and 2007 – The core monitoring program is implemented over two complete cycles (Azimuth, 2008a, 2008b) prior to construction of the mine (i.e., baseline conditions).
- 2008 – 2010 – Mine construction starts in 2008, with dike construction activities occurring directly in the receiving environment. Core receiving environment monitoring (Azimuth, 2009a, 2010a, this

“AEMP” Terminology

The term “AEMP” was first used in the 2005 report *Aquatic Effects Management Program*, which described the rationale, framework, strategy, methods, and scope of receiving environment monitoring for the Meadowbank Mine. Receiving environment monitoring conducted in 2006 and 2007 use this term in the annual report titles.

The Nunavut Water Board A Licence, issued in 2008, defines “AEMP” as the Aquatic Effects Monitoring Program. Annual report titles for 2008 and 2009 (this report) reflect this change.

AEM has a number of monitoring programs (e.g., effluent monitoring, ground water monitoring, air quality monitoring) relevant to tracking potential changes to the aquatic receiving environment surrounding the Meadowbank Mine. One of the requirements of the NWB A Licence is to revise the Aquatic Effects Monitoring Program (AEMP) to consider the results of all these programs; these revisions are currently underway. Previously, the term “AEMP” was essentially synonymous with receiving environment monitoring. However, given the AEMP’s broadened scope, more specific terminology is needed to minimize confusion. To that end, we use the following terms in this report:

CREMP – refers to the “core receiving environment monitoring program”; this is synonymous with “core monitoring program”.

2005 AEMP – refers to the original AEMP, which is essentially the plan for the CREMP; this plan is currently under revision.

AEMP – is used generically when not referring to either of the first two definitions.



report) was complemented by targeted studies on dike construction monitoring (Azimuth, 2009b, 2010b; AEM, 2011) and effects assessment studies for total suspended solids (TSS) (Azimuth, 2009c, 2010c, 2011b).

This CREMP monitoring report documents the strategy, methods and results of aquatic receiving environment monitoring activities undertaken during 2010.

1.2. Environmental Setting

Understanding the environmental setting of the project lakes is integral to understanding the design of the CREMP. The Meadowbank project lakes are situated in the barren-ground central Arctic region of Nunavut within an area of continuous permafrost. These are headwater ultra-oligotrophic/oligotrophic (nutrient poor and unproductive) lakes, situated on the watershed boundary that separates two main drainages – the Arctic and Hudson Bay drainages. Only a few hundred meters to the north of Second and Third Portage lakes is the divide between water that flows north to the Arctic Ocean (via the Meadowbank and Back River system) or to Chesterfield Inlet and Hudson Bay (via the Quoich River system).

The landscape consists of rolling hills and relief with low-growing vegetative cover and poor soil development. Numerous lakes are interspersed among boulder fields, eskers and bedrock outcrops, with indistinct and complex drainages. The main lakes in the Meadowbank project area include: Third Portage Lake (TP), Second Portage Lake (SP), Tehek Lake (TE), and the Vault Lake system – Vault, Wally (WAL) and Drilltrail lakes. As is common of headwater lakes, all of the project lakes have small drainage areas relative to the surface area of the lakes themselves. Local inflow from surrounding terrain is the predominant influence on water movement within the system. Small channels connect the project area lakes, although there is little flow between lakes during most of the year. The ice-free season on these lakes is very short, with ice break-up in late-June to mid-July and ice-up beginning in late September or early October. Maximum ice thickness is at least 2 m by March/April.

Overall, the Meadowbank project lakes support healthy communities of plankton, benthos and fish that are typical of oligotrophic Arctic lakes (BAER, 2005). Biological productivity of the lakes is limited by nutrient availability, cold water and a short growing season.

1.3. Overall Program Objectives and Approach

The 2005 AEMP takes an integrated, ecosystem-based approach that links mitigation and monitoring of physical/chemical effects on key ecological receptors in the receiving environment. At its core, the 2005 AEMP was designed to address key issues identified



in the Meadowbank EIA (i.e., mining-related activities with the potential to affect water quality, fish habitat and fish populations). Monitoring results are intended to inform the adaptive management process, supporting the early identification of potential problems and development of mitigation options to address them. Consistent with the principles of adaptive management, the 2005 AEMP is currently under review to refine and optimize the program. The Meadowbank 2005 AEMP has two primary components, which are described below.

1.3.1. Core Monitoring Program (CREMP)

Under the 2005 AEMP framework, the core monitoring program (CREMP; the focus of this annual monitoring report) consists of a general strategy to monitor water and sediment quality, phytoplankton, periphyton and benthic invertebrates. The core program is tailored based on our understanding of mine construction, operation and infrastructure (e.g., dikes, effluents, stream crossings, roads, etc.) and has been developed to detect mine-related impacts at temporal and spatial scales that are ecologically relevant. The core program initially focused solely on the project lakes, but was expanded to Baker Lake in 2008 to ensure that monitoring was also in place to track project-related activities in that area related primarily to barge traffic and shipping. In 2009, as dike construction and mineral exploration continued to expand, two additional reference areas were added; one far-field reference well downstream of the maximum extent of observed water quality effects within Tehek Lake (Tehek Farfield: TEFF) and another remote external reference in Pipedream Lake (PDL). Also in 2009 and 2010, sampling was conducted on a monthly basis throughout the year where ice conditions permitted and thus was expanded to include May, November–December (2009) and January–April (2010) in addition to the routine July, August and September sampling (requirements of license). Following from the recommendation in the 2008 CREMP (Azimuth, 2009a) to conclude periphyton sampling, these organisms were not collected in 2009 and are no longer part of the CREMP. This decision was based on having collected several years of baseline periphyton data; enough data with which to compare periphyton growth on habitat compensation features, satisfying the purpose of this sampling component. Finally, in 2010 zooplankton sampling was added to the CREMP monitoring strategy which included sampling at all Meadowbank stations (i.e., Baker Lake excluded) during August of the open-water season.

The study design is based on a control-impact approach, but has also incorporated the concept of gradients in exposure. To this end, the 2010 program consisted of 12 stations (see **Figures 1-1 to 1-3**), each categorized into one of the three main types of stations described below:



Near-field (NF) areas – Stations are situated in close proximity to the development, in particular near dikes, dewatering discharge, and proposed effluent sources (**Figures 1-2 and 1-3**). These stations provide the first line of early-warning for introductions of stressors into the receiving environment. For the project lakes area, these stations include: Third Portage Lake North (TPN), Third Portage Lake East (TPE), Second Portage (SP) and Wally Lake (WAL) and Tehek Lake (TE). For Baker Lake, there are two NF stations, one targeting the hamlet's barge landing area (Baker Barge Dock [BBD]) and the other AEM's fuel storage facility (Baker Proposed Jetty [BPJ]).

Far-field (FF) area – The intent of this station is to monitor water and sediment quality downstream of project infrastructure to provide insights into the spatial extent of any effects observed at the near-field stations. The Tehek Farfield (TEFF) station is a key location that will ultimately determine whether or not contaminants are detectable downstream of the entire mine development. Lake waters from Second and Third Portage Lakes and the Vault Lakes (Vault, Wally, Drilltrail) meet at the southern end of Second Portage Lake and discharge via a single channel into Tehek Lake (**Figure 1-1**). Monitoring the water and sediment quality and the health of the benthic invertebrate community in the basin adjoining the discharge point from Second Portage Lake will help determine if any effects identified at NF stations are extending into Tehek Lake beyond the first basin located just downstream of the outlet from Second Portage Lake.

Reference (Ref) areas – By definition, reference stations are sufficiently removed from the mine that they are presumed to be unaffected by any infrastructure (roads, dikes, runways) and point sources (aerial and aquatic) associated with mine development. Internal (Third Portage Lake South [TPS]²) and external (Inuggugayualik Lake [INUG], Pipedream Lake [PDL]) reference areas were chosen for the purposes of making comparisons with the project lakes (BAER, 2005). Monitoring of reference areas is important in order to distinguish between possible mine-related changes in water quality or ecological parameters and natural changes, unrelated to the mine. The internal reference area (at the extreme headwaters of Third Portage Lake) is far removed from the mine, upstream of the development area and is removed from the prevailing wind direction. The external reference area (Inuggugayualik Lake) is situated about 16 km west of the mine site (**Figures 1-1 and 1-2**). Inuggugayualik Lake is a headwater lake of the Meadowbank River system that flows north to the Arctic Ocean. Despite the different drainage basin, Inuggugayualik Lake satisfies the requirements of an external reference lake from a physical/chemical perspective because it is at the same latitude, has similar geology, relief and climate, does not have any significant inflows and has similar

² TPS was originally contemplated as an internal reference area. Its status as such is predicated on the lack of exposure to mine-related activities. Should this status change, then TPS would be redefined as a far-field area.

limnological parameters, water chemistry and aquatic biological community structure to the project lakes (BAER, 2005). Pipedream Lake was investigated as a candidate reference area in 1998 (EVS, 1999) from a fisheries perspective. The fish community of this lake differs from the other lakes in that there was a preponderance of lake trout, very few Arctic char and no round whitefish captured from the 113 fish caught. Further examination of the fish community is planned for 2011 as part of EEM (see Azimuth, 2010f). For Baker Lake, an internal reference area was added several kilometers to the east of the hamlet along the north shore of the lake (Baker Akilahaarjuk Point [BAP]; see **Figure 1-3**).

Thus, the core monitoring program is intended to detect changes and help define the extent (both spatially and temporally) of any adverse effects.

1.3.2. Targeted Monitoring Studies

Under the 2005 AEMP, targeted studies are specific studies that typically have narrower temporal or spatial bounds and are designed to address specific questions related to particular components of mine development during construction or operation (AEMP, 2005). These are integrated with, and complementary to, the core monitoring program. In previous years, Azimuth conducted a number of targeted studies [e.g., in 2009, Dike Construction Monitoring (Azimuth, 2010b); TSS Effects Assessment Strategy (Azimuth, 2010c); East Dike Habitat Monitoring (Azimuth, 2010d); Habitat Mapping of the NW Arm of Second Portage Lake (Azimuth, 2010e)]. Other relevant studies conducted in 2010 that complement the CREMP include:

Dike construction monitoring – A detailed monitoring and management program for dike construction was developed as part of the Nunavut Water Board (NWB) A License process. The program was implemented both for the construction of the East Dike (2008) and later for the Bay-Goose Dike (2009, 2010). Monitoring program results are documented in separate reports (Azimuth, 2009b, 2010b; AEM, 2011).

Total suspended solids (TSS) effects assessment study (EAS) – In response to elevated TSS concentrations related to construction of the East Dike and the Bay-Goose Dike, the TSS EAS was implemented to determine the physical and ecological extent and magnitude of these events. A number of components will continue to be monitored as follow-up from effects associated with both dikes (Azimuth, 2009c, 2010c, 2011b).

1.4. Meadowbank Mine Development and Operation

1.4.1. Historical and Current Activities

The construction phase of the Meadowbank Mine officially started in June 2008, upon receipt of the NWB A Water License (2AM-MEA0815) for the project. The Fisheries and Oceans Canada (DFO) *Fisheries Act* Authorization (NU-03-0191) for the project was issued on July 30, 2008, thus allowing the start of in-water construction activities. Key mine-related activities by year are described below.

2008

Major in-water construction activities for 2008 included the East Dike (located in Second Portage Lake) and the Western Channel Dike (located between Third Portage Lake and Second Portage Lake); the closest CREMP station to these activities was the Second Portage Lake station (SP).

2009

Dewatering of the northwest arm of Second Portage Lake began in March 2009 upon completion of the East Dike. The closest CREMP station to dewatering activities was the Third Portage Lake North station (TPN).

In-water construction activities for 2009 occurred in the East basin of Third Portage Lake. The north half of the Bay-Goose Dike, that connects the north shore to Goose Island, was initiated on July 27, 2009. The closest CREMP station to the dike construction activities was the Third Portage Lake East station (TPE). Most of the roads onsite were completed in 2009.

2010

Over winter (2009–2010), the south half of the dike, that connects the south end of Goose Island to the mainland west of the island, began with installation of a narrow causeway that was constructed through the ice (intended to help contain sediment during dike construction). Construction of the Bay-Goose Dike, on the inside of the causeway, continued through the 2010 open-water season. Dike construction monitoring was conducted by AEM throughout the construction period (i.e., through winter and open water).

Pit development in 2010 was focused on the North Portage and South Portage pits. The mine was officially opened on February 27, 2010, marking the start of the operations period; commercial production of gold was achieved in March 2010. Waste streams from these operations have been directed to the tailings impoundment area and have not been discharged to the receiving environment.



Dewatering continued in 2010, targeting the deep central basin of the Portage Pit (former NW Arm of SP). Once sufficient water has been removed, the Central Dike will be constructed (scheduled for 2011), that is required prior to extending the North Portage Pit further south. The dewatering effluent was subject to *Metal Mining Effluent Regulations* (MMER) requirements (e.g., weekly effluent quality monitoring and periodic receiving environment monitoring) from the start of 2010; this was conducted by AEM's onsite environmental staff. Another MMER requirement was the design of an environmental effects monitoring (EEM) study for the discharge (Azimuth, 2010f); the study design, currently under review, is complementary to the CREMP and is scheduled for implementation in 2011.

1.4.2. Overview of Aquatic Receiving Environment Status

This section provides a brief description of key activities with the greatest potential for affecting the aquatic receiving environment. The information presented comes primarily from targeted studies intended to monitoring those activities at a higher spatial and/or temporal scale than the CREMP. Understanding the status of various basins or lakes provides some context for interpreting the CREMP results, which are intended for making broader scale (temporal and spatial) inferences regarding potential effects. Consequently, and as described in **Section 1.3**, the CREMP and the targeted studies should be viewed as complementary, rather than independent.

Dewatering – At present, discharges from the mine (i.e., the dewatering effluent into the north basin of Third Portage Lake) consist primarily of lake water from inside the impounded areas, along with a small portion of non-contact (i.e., water that has not come into contact with mine wastes such as milled tailings, waste rock, or ARD). The main contaminant of interest in this effluent is total suspended solids (TSS), which was not detectable (<1 mg/L) in the exposure area during four sampling events in 2010 (Azimuth, 2010f). Similar results were found during broad TSS surveys (see Dike Construction below), where estimated TSS concentrations were below 0.5 mg/L throughout the open water period. Consequently, this activity is not expected to result in any broad changes to the north basin of Third Portage Lake.

Dike Construction – Dike construction monitoring was conducted while the Bay-Goose Dike was under construction in the east basin of Third Portage Lake. Despite building on lessons learned in previous years (e.g., use of double silt curtains, more judicious selection of rock, re-alignment of the dike to travel over shallower water with less potential for sediment disturbance) and employing some innovative ideas (e.g., advance construction of the causeway portion of the dike), sediment was nonetheless released from the impoundment into the east basin Third Portage Lake. Dike construction monitoring results from the broad surveys (i.e., surveys of turbidity conducted in up-gradient and down-gradient basins relative to the east basin of Third Portage Lake)



provided by AEM were used to characterize the general conditions within each major basin throughout the open water season:

- North Basin (Third Portage Lake) – As described for dewatering, this area had estimated TSS concentrations < 0.5 mg/L throughout the entire open water season. As expected based on prevailing currents and wind, there was no indication that sediment-laden water moved westward from the east basin.
- East Basin (Third Portage Lake) – This area was the primary focus of dike construction monitoring efforts. Estimated TSS concentrations did not exceed daily maximum trigger values, even at stations in close proximity to the dike. There were six monitoring stations (TPE-1 through TPE-6) that broadly characterized this basin (i.e., outside the immediate zone of influence of dike construction). Estimated maximum TSS concentrations started out around 2-3 mg/L in mid July (just after ice out), decreased to about 1 mg/L for a few weeks, then climbed in late August to 2 to 4 mg/L, and to 2 to 8 mg/L in early September prior to dropping to 1 to 2 mg/L by late September.
- Second Portage Lake – Estimated TSS concentrations were generally around 1 mg/L or less throughout the entire open water season. The highest estimated concentration was 1.7 mg/L in early August.
- Tehek Lake – Estimated TSS concentrations were < 0.5 mg/L in late July, which was the only time this area was sampled (apart from CREMP monitoring in August and September). Additional sampling was not considered warranted given the low TSS concentrations in Second Portage Lake.

The extent of potential impacts resulting from these elevated TSS levels is discussed in greater detail in the 2010 EAS report (Azimuth, 2011b).

Other Site Activities – Due to permanent crusher malfunctioning in 2010, a temporary crusher was installed onsite to maintain mill through-put. A temporary crusher for dike construction material was also installed on the south east side of the waste rock pile. These two crushers were sources of dust in 2010, although effort was made to suppress dust (i.e., watering roads during the summer and wind barriers). There were no spills of significance during dike construction in 2010 as all minor spills were contained. All mine effluent was sent to the reclaim pond and was not directly or indirectly discharged to the receiving environment. There were no other events that had the potential to impact water quality.

All these activities are considered together when monitoring for potential effects to the aquatic receiving environment. The locations for CREMP monitoring stations were chosen for this purpose, but changes are always occurring as the mine continues to expand, and stations can be affected differently. The following is a summary of the status



of stations where major anthropogenic changes have the potential to impact water and sediment quality:

- SP – construction activities on the East Dike started on July 30, 2008.
- TE – this station was also exposed to elevated TSS from East Dike construction activities.
- TPN – dewatering activities started in March, 2009.
- TPE – construction activities on the Bay-Goose Dike started on July 27, 2009.

The onset of construction activities signaled the end of the baseline (i.e., pre-development) phase for certain CREMP stations. Note that the end of the baseline phase is specific to each station. For example, TPE would have still been in the baseline phase in August 2008 (it is up gradient of Second Portage Lake), but not in August 2009.

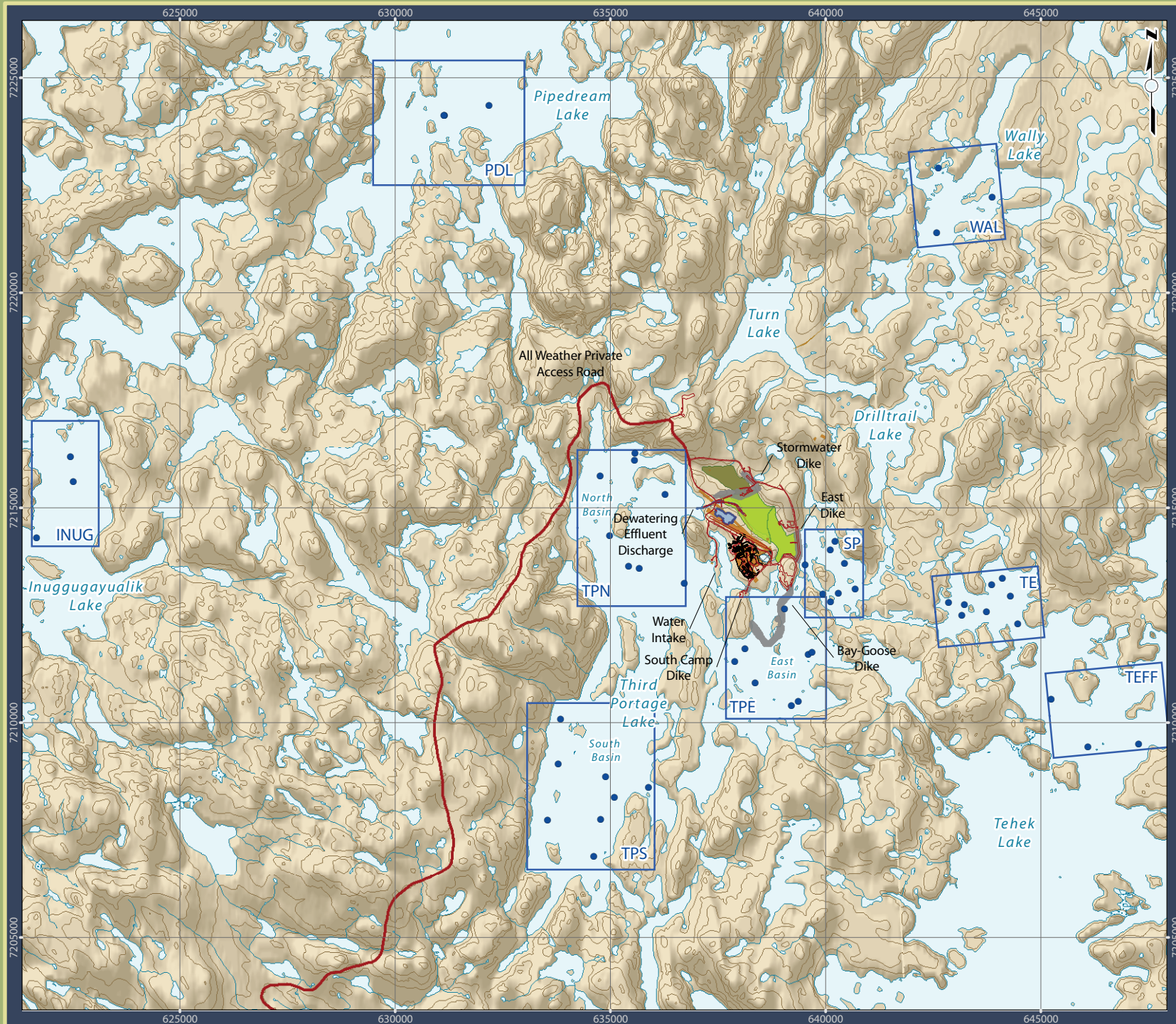
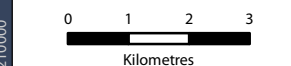


Figure 1-1: Water Quality Monitoring Areas and Sampling Stations - 2010

- Legend**
- Water Sampling Point
 - Water Sampling Area
 - All Weather Private Access Road
- Mine Features**
- Effluent Discharge (Dewatering Pipeline)
 - Facilities
 - Camp
 - Road
 - Dike
 - Waste Area
 - Water Treatment Facility
 - Portage Attenuation Facility
 - Tailings Storage Facility



Projection: UTM Zone 14 NAD83

Data Sources:
 Natural Resources Canada, GeoBase®
 National Topographic Database
 Agnico-Eagle Mines Limited.
 Azimuth Consulting Group Inc.

Meadowbank Gold Project

Prepared for:



By:



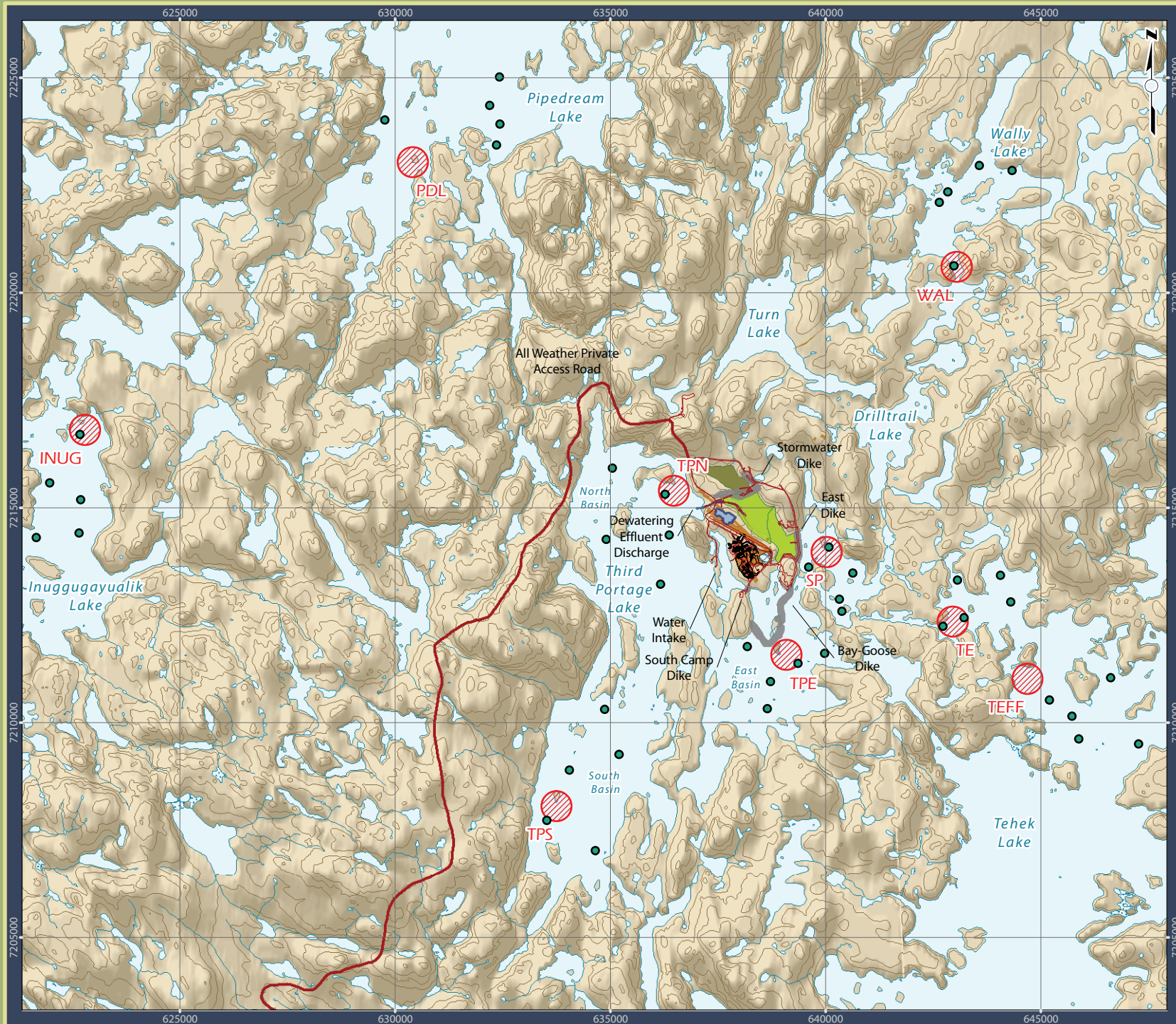
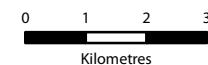


**Figure 1-2:
Sediment Quality,
Benthic Invertebrate,
and Zooplankton
Sampling Stations - 2010**

Legend

- Zooplankton Sampling Points
- All Weather Private Access Road
- ▨ Benthic Invertebrate / Sediment Quality Sampling Station
- Mine Features**
 - Effluent Discharge (Dewatering Pipeline)
 - Facilities
 - Camp
 - Road
 - Dike
 - ▨ Waste Area
 - Water Treatment Facility
 - Portage Attenuation Facility
 - Tailings Storage Facility

Area of Detail



Projection: UTM Zone 14 NAD83

Data Sources:

Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.
Azimuth Consulting Group Inc.

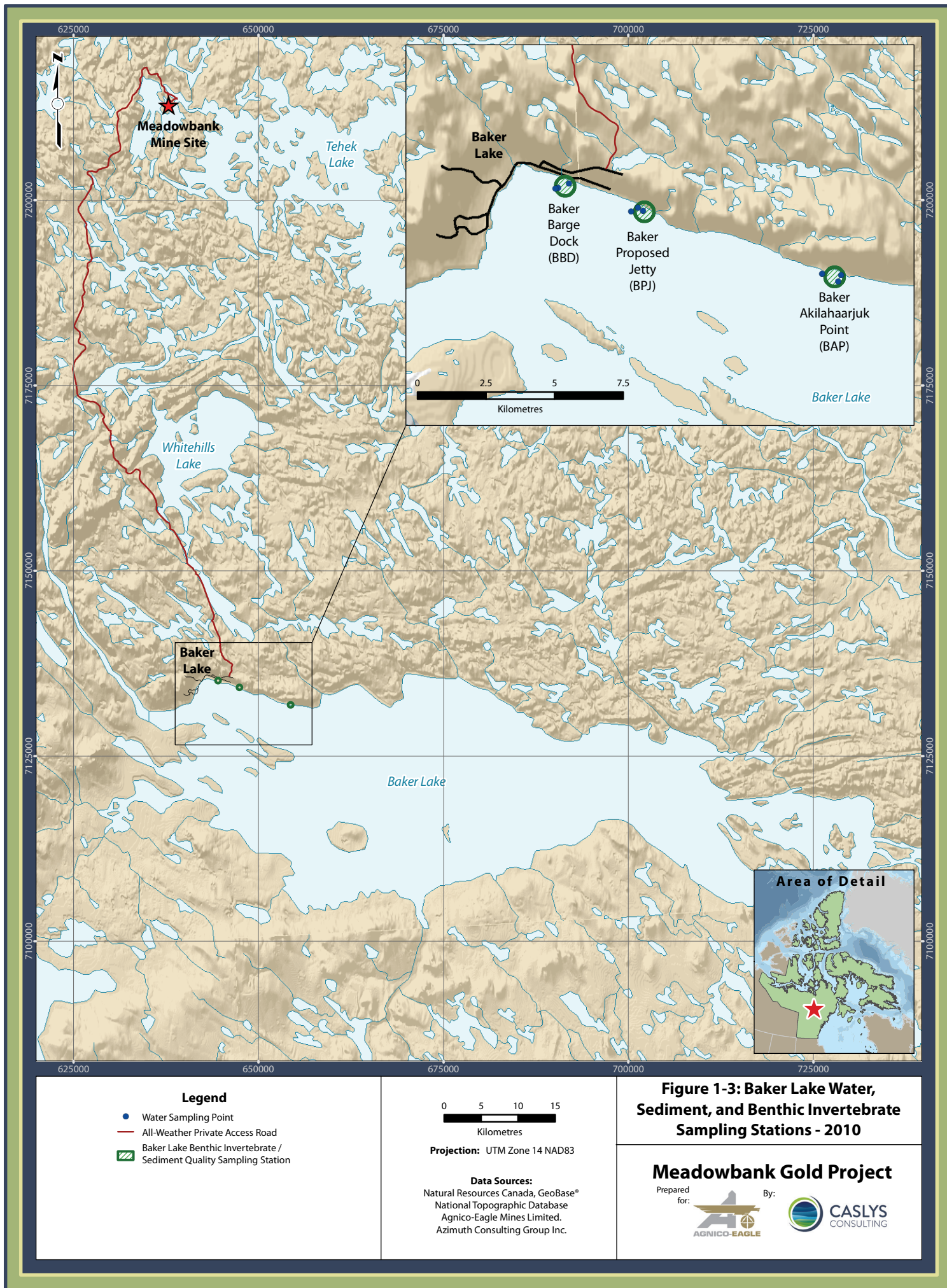
Meadowbank Gold Project

Prepared for:



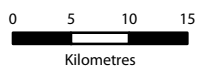
By:





Legend

- Water Sampling Point
- All-Weather Private Access Road
- Baker Lake Benthic Invertebrate / Sediment Quality Sampling Station



Projection: UTM Zone 14 NAD83

Data Sources:

Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.
Azimuth Consulting Group Inc.

Figure 1-3: Baker Lake Water, Sediment, and Benthic Invertebrate Sampling Stations - 2010

Meadowbank Gold Project

Prepared for:



By:



2. METHODS

2.1. 2010 CREMP Program Overview

Open-water field sampling in 2010 was conducted during three time periods; spring (July 16–27), summer (August 18–31) and fall (September 17–27). The water monitoring program was expanded in 2009, to include through-ice sampling during winter months. Samples were collected in January (15–19), February (24–26), March (20–24), April (9–10), and May (20–22). Sampling was not conducted in June and October because of dangerous ice conditions. In order to better characterize the study lakes, the spatial extent of sampling was expanded in 2009 to include the entire basin from each study lake (**Figure 1-1**). Individual sampling stations (for water quality and phytoplankton) were selected at random³ each month from within their respective lake basin.

General limnology, water and phytoplankton samples were collected in three seasons, while sediment and benthos sampling was conducted in summer only (August).

Additional water and phytoplankton samples (some stratified by depth) and sediment replicate samples were again collected at all stations but are not presented here. The additional data will be used to support the CREMP design (Azimuth, 2011a *in progress*).

Global Positioning System (GPS) Universal Transverse Mercator (UTM) coordinates (in NAD 83) for all monitoring components at the sampling stations are shown in **Table 2-1**.

2.2. General Limnology

Vertical temperature (°C), dissolved oxygen (mg/L) and conductivity (µS/cm) depth profiles were acquired from each meter (up to 20 m) using the YSI Professional Plus meter. Profiles were acquired from each station at each sampling event (i.e., coinciding with water chemistry sampling) to track changes in oxygen and temperature profiles. Secchi depth (m) and pH was measured prior to collection of water and sediment samples.

³ Target locations for sampling were randomly pre-determined by bounding the sample areas and using a random number generator to select coordinates within those bounds. Coordinates were then recorded in MapSource and in the hand-held GPS units (NAD 83) before going out into the field.



2.3. Water Chemistry

Water samples were collected monthly from all sampling stations from July to September and at a subset of lakes/stations from January to May through-ice. In all cases, water was collected from approximately 3 m depth by pumping lake water through a flexible (food-grade silicone) tube, attached to a diaphragm pump connected to a 12 volt battery.

Water samples were analyzed for conventional parameters (hardness, conductivity, pH, turbidity, and total dissolved and suspended solids), anions (alkalinity, bromide, chloride, fluoride, silicate and sulfate), nutrients (ammonia, nitrate, nitrite, total Kjeldahl nitrogen, orthophosphate and total phosphate), organic parameters (chlorophyll- α , dissolved and total organic carbon) and total and dissolved metals.

Where filtered samples were required for dissolved constituents (metals, DOC), a 45- μm inline filter was connected to the end of the outflow tube and bottles were filled directly using filtered water. The procedures for collecting the water samples are outlined in detail in the Standard Operating Procedure (SOP) for Water and Phytoplankton Sampling (AEM, 2009). Water quality sampling locations are illustrated in **Figure 1-1** (Meadowbank lakes) and **Figure 1-3** (Baker Lake).

ALS Environmental (Vancouver, BC) provided all of the sampling containers and appropriate preservatives and performed all analyses. All samples were kept on ice following collection and during transport to the laboratory, and stored in a refrigerator prior to shipping. A completed chain-of-custody form accompanied the samples during transport.

Water chemistry concentrations were tabulated and compared against each other, and, when available, the federal Canadian Council of Ministers of the Environment (CCME, 2007) water quality guidelines for the protection of aquatic life. These guidelines are intended to provide a conservative level of protection to freshwater aquatic life from anthropogenic contaminants or other physical changes (suspended solids, temperature).

2.4. Sediment Chemistry

Consistent with previous years, sediment was collected only in August 2010, using proven sample collection and handling techniques (Environment Canada, 1984). The procedures for collecting the sediment samples are outlined in detail in the SOP for Benthos and Sediment Sampling (AEM, 2009). Sediment (top 3–5 cm) was collected from all stations using a Petite Ponar grab (sampling area of 0.023 m²). Two-three grab samples were composited from each station to reduce the influence of within-station

spatial heterogeneity⁴. Sediment chemistry grabs were collected after benthic invertebrate sampling to avoid possible disturbance of biota. Sediment chemistry sampling areas are shown in **Figure 1-2** (Meadowbank lakes) and **Figure 1-3** (Baker Lake); UTM coordinates for each sample are presented in **Table 2-1**.

Sediment quality sampling has been conducted for two purposes under the CREMP: (1) characterization of sediment quality (physical and chemical parameters) within the biologically active zone using grab samples to support the assessment of benthic invertebrate community results, and (2) characterization of sediment chemistry (chemical parameters) in the top 1-cm using core samples to support the identification of potential mine-related changes to this medium. The former has been conducted every year synoptically with collection of the benthic invertebrate samples, and for this reason will be continued. The latter was conducted in 2008 at all CREMP areas just prior to the start of the construction phase at Meadowbank (i.e., to characterize baseline conditions). Follow-up coring was conducted in 2009 at four areas to assess potential changes in sediment chemistry associated with construction of the East Dike (reported in the 2009 EAS [Azimuth, 2010c]). The frequency of future coring events will be assessed as part of the ongoing CREMP design review (Azimuth, 2011a *in progress*).

Only those grab samples that met the following acceptability criteria were retained for analysis: did not contain large foreign objects; adequate penetration depth (i.e., 10–15 cm); not overfilled (sediment surface not touching the top of sampler); did not leak (there was overlying water present and no visible leaks); and was undisturbed (sediment surface was relatively flat). Grabs that did not satisfy these conditions were discarded.

Sampling jars were placed in a cooler with ice packs and transported to ALS Environmental (Vancouver, BC) for analysis. A completed chain-of-custody form accompanied the samples during transport. Sediment samples were analyzed for pH, total organic carbon, moisture content, particle size (% gravel, sand, silt and clay), oil and grease, light & heavy extractable petroleum hydrocarbons (LEPHs and HEPHs), polycyclic aromatic hydrocarbons (PAHs), and total metals concentrations.

Sediment metals concentrations were compared to sediment quality guideline (SQG) concentrations developed by the CCME (2002) for the protection of aquatic life. There are two levels of SQGs: Interim Sediment Quality Guidelines (ISQG) and Probable Effects Level (PEL) concentrations. ISQGs are conservative values that represent the concentration below which adverse effects are unexpected. The PEL is less conservative and represents a concentration above which adverse effects may be observed, based on

⁴ Within-station spatial variability was directly assessed in the targeted sediment coring study which is reported in the 2009 EAS (Azimuth, 2010c).

laboratory studies. It is important to realize that background concentrations of some metals in sediments routinely exceed both ISQG and PEL concentrations. This is common in many in mineralized areas and this does not mean that adverse effects should be expected. All of the measured sediment chemistry concentrations from the study lakes were tabulated and compared against each other and, when available, the SQGs.

Differences in sediment chemistry between stations and over time are being looked at statistically in the CREMP design (Azimuth, 2011a *in progress*) and are not presented herein.

2.5. Phytoplankton

Phytoplankton are microscopic, unicellular plant species that are suspended in the water column and, as primary producers, comprise the base of the food web. There are six major groups of phytoplankton present in lakes: cyanophytes (blue green algae), chlorophytes (green algae), chrysophytes (golden-brown algae), diatoms, cryptophytes and dinoflagellates. Seasonal production of phytoplankton can vary widely depending upon water temperature, nutrient concentration, time of year, water clarity and amount of sunlight and predation by zooplankton. Estimates of phytoplankton biomass (mg/m^3) are useful as gross indicators of lake productivity to determine if there have been potential changes due to nutrient additions as a result of blasting (i.e., addition of nitrogen and ammonia from ammonium nitrate).

Unfiltered water was collected monthly from all sampling stations from July to September and at a subset of stations from January to May through-ice (alongside water chemistry sampling). Water was collected in small (50 mL) vials, from 3 m depth, and preserved with Lugol's solution. The procedures for collecting the phytoplankton samples are outlined in detail in the SOP for Water and Phytoplankton Sampling (AEM, 2009). Phytoplankton samples were collected at water sampling locations; the latter are illustrated in **Figure 1-1** (Meadowbank lakes) and **Figure 1-3** (Baker Lake).

Preserved samples were transported to Winnipeg, MB for taxonomic identification and analysis by Plankton R Us Inc. For the analysis, 10-mL aliquots of preserved sample were gravity settled for 24 hours. Counts were performed on an inverted microscope at magnifications of 125X, 400X, and 1200X with phase contrast illumination. Cell counts were performed using the $\ddot{\text{U}}$ termohl technique as modified by Nauwerck (1963). Cell counts were converted to wet weight biomass (mg/m^3) by estimating cell volume. Estimates of cell volume for each species were obtained by measurements of up to 50 cells of an individual species and applying the geometric formula best fitted to the shape of the cell (Vollenweider, 1968; Rott, 1981). A specific gravity of 1 was assumed for cellular mass. All biomass (mg/m^3) and density (cells/L) estimates are summed by major taxa, per station.



Simpson's diversity index was calculated for each station to quantify phytoplankton species diversity among stations and sampling events (Washington, 1984). Simpson's diversity (D) is calculated as follows:

$$D = \sum \frac{n_i(n_i - 1)}{N(N - 1)}$$

where: N is the total number of organisms/station; n_i is the total number of organisms of the i th taxa/station. The number of species occurring per sample was calculated to measure the species richness among stations and sampling events.

In both 2009 and 2010, a large number of extra samples were collected (targeting better characterization of temporal and spatial [horizontal and vertical] variability). Differences between stations, over time, and spatially/vertically in the water column are being looked at statistically in the CREMP design (Azimuth, 2011a *in progress*) and are not presented herein.

2.6. Benthic Invertebrates

Benthic invertebrates are small animals that live in or on bottom sediments. The most commonly encountered organisms include the aquatic larval stages (i.e., resembling worms) of insects, especially chironomids (i.e., midge larvae). Other common organisms are oligochaete worms, small bivalve clams and amphipods (i.e., crustaceans). Benthic invertebrates form a very important food source for juvenile fish of all species (i.e., lake trout, Arctic char and round whitefish) and adult whitefish and char.

Benthic invertebrates were collected from each sampling station in August 2010, using a Petite Ponar grab (0.023 m²) and a 500-µm sieve at the same time and locations as sediment chemistry samples. Five replicate samples were collected per station. Two independent grabs⁵ per replicate were composited to form a single sample to reduce sampling variation within stations and to increase the surface area sampled. Depths ranged from 6.5 to 9.8 m. Sampling locations are illustrated in **Figure 1-2** (Meadowbank lakes) and **Figure 1-3** (Baker Lake); UTM coordinates for each sample are presented in **Table 2-1**.

Only those grab samples that met the following acceptability criteria outlined in **Section 2.4** (sediment chemistry methods) were retained for analysis. Grabs that did not satisfy

⁵ Based on analyses conducted for the EEM Cycle 1 Study Design document (for more detail see Azimuth, 2010f), we feel that the benefits of relying on compositing two subsamples for each replicate station to reflect the benthic community outweigh the disadvantages of changing methods and making historical data less comparable.

these conditions were discarded. The procedures for collecting the benthic invertebrate samples are outlined in detail in the SOP for Benthos and Sediment Sampling (AEM, 2009).

Benthos samples were preserved in the field with a 10% buffered formalin solution and sent to Zaranko Environmental Assessment Services (ZEAS) (Nobleton, ON) for taxonomic identification and analysis. Upon arrival at ZEAS, samples were immediately logged and inspected to ensure adequate preservation to a minimum level of 10% buffered formalin and checked for correct labeling. Benthos samples were sorted at a magnification of between 7 and 10 times with the use of a stereomicroscope. To expedite sorting prior to processing, all samples were stained with a protein dye that is absorbed by aquatic organisms but not by organic material, such as detritus and algae.

Prior to sorting, samples were washed free of formalin in a 500-µm sieve. Benthos were enumerated and sorted into major taxonomic groups, (i.e., order and family), placed in glass bottles and re-preserved in 80% ethanol for more detailed taxonomic analysis by senior staff. Each bottle was labeled internally with the survey name, date, station and replicate number.

Abundance of organisms/m² was determined from the total number of organisms enumerated (see **Section 3.5**). Nematodes and ostracods were not reported, nor were they included in abundance and richness calculations because they are too small to be reliably retained on a 500-µm sieve.

The following endpoints were used for assessing benthic community structure, based on sensitivity, objectivity, ease of interpretation and cost-effectiveness:

- Taxa richness (i.e., corresponds to the number of species or taxa per sample and provides a measure of diversity).
- Total abundance (i.e., number of organisms per m²).
- Abundance and richness of all major taxa (e.g., insects, molluscs, worms).
- Simpson's Diversity index (D), calculated as follows:

$$D = \sum \frac{n_i(n_i - 1)}{N(N - 1)}$$

The benthic invertebrate dataset was tested for differences between specific area-year impacts relative to control area-years and for differences between specific longer-term impacts by area (i.e., for areas where more subtle, but prolonged, effects may have occurred). A BACI (before/after control/impact) model was used for the analysis to test for both types (i.e., single-year and multi-year) of effects.

2.7. Zooplankton

As key primary consumers in the lake food web, these planktonic organisms are important from an energy cycling perspective. Zooplankton are herbivorous, omnivorous and carnivorous water column animals that are an important food source to key life history stages of certain fish species, especially juvenile round whitefish (*Prosopium cylindraceum*) and juvenile and adult Arctic char (*Salvelinus alpinus*). The seasonal change in biomass (mg/m^3) of zooplankton is also an important indicator of lake productivity, which ultimately drives the productivity and biomass of fish in the study lakes.

Zooplankton were collected once in August 2010, using a 70 μm nitex mesh net with a 30 cm diameter mouth opening and total length of 2.2 m. Five replicate samples were collected per station in 2010 (Meadowbank lakes only). Replicate sampling stations were distributed within the wider sampling areas in order to better characterize zooplankton on a basin-wide level.

For each replicate, four independent tows were collected; two were composited to form a unique sample for biomass analysis and a two were composited for taxonomic analysis. In total, 20 tows were collected for each lake/station. Zooplankton tows were always vertical tows from 8 m depth to the surface. The procedures for collecting the zooplankton samples are outlined in detail in the SOP for Zooplankton Sampling (**Appendix C**). Zooplankton sampling locations are illustrated in **Figure 1-2**; UTM coordinates for each sample are presented in **Table 2-1**.

After collection, all samples were placed into uniquely labeled 500 mL plastic jars and preserved with a 5% buffered formalin solution. All jars were screwed tight and taped to prevent leakage. Samples were shipped to North/South Consultants, Winnipeg MB for biomass analysis and taxonomic identification. Zooplankton samples were washed through a 63- μm mesh test sieve to remove preservative and debris. For biomass determination, samples were then wet weighed and dried in an oven at 60°C until completely dry (24 – 48 hours). Samples were weighed again dry to determine dry weight. For taxonomic identification, samples were rinsed through a 63- μm mesh test sieve, transferred to 70% ethanol and identified to species level where possible.

Wet and dry biomass (mg/m^3) was determined by standardizing the wet and dry sample weights with the volume of water filtered by the net during each vertical tow (see **Section 3.6**). Total abundance (count) and presence/absence of major taxonomic groups are also discussed.

Visual comparisons were made between lakes/basins for mean total biomass per zooplankton net tow. Zooplankton community composition was also compared between stations by examining the relative proportions of major taxa that dominate species

abundance. A before/after (BA) comparison was also used to provide an initial evaluation of replicate sample numbers required to achieve different levels of statistical power. The power to detect two different effect sizes was examined: (1) 20% effect size or a 20% reduction in mean; and (2) 50% effect size.

2.8. Quality Assurance / Quality Control

The objective of quality assurance and quality control (QA/QC) is to assure that the chemical and biological data collected are representative of the material or populations being sampled, are of known quality, have sufficient laboratory precision to be highly repeatable, are properly documented, and are scientifically defensible. Data quality was assured throughout the collection and analysis of samples using specified standardized procedures, by the employment of laboratories that have been certified for all applicable methods, and by staffing the program with experienced technicians.

Laboratory QA/QC – Data Quality Objectives (DQOs) are numerically definable measures of analytical precision and completeness. Analytical precision is a measurement of the variability associated with duplicate analyses of the same sample in the laboratory. The laboratory duplicate is a new aliquot from the sample bottle/jar and is analyzed from the start in the same manner as the original aliquot taken from the bottle/jar. Also, Certified Reference Materials (CRM) are always included as part of routine laboratory QA/QC.

Field QA/QC: Water Sampling – Field QA/QC standards during water sampling were maintained for every sample. The standard QA/QC procedures included thoroughly flushing the flexible tubing and pump to prevent cross-contamination between stations and thoroughly rinsing the sample containers with site water prior to sample collection. Field QA procedures include collection and/or analysis of the following:

- **Field Duplicate Samples** – An independent collection of water samples at the same time and location as the original, as a measure of consistency in sampling methodology and heterogeneity of chemical parameters at discrete locations. The number of field duplicates taken is approximately 10% of original samples.
- **Travel Blank** – Laboratory supplied bottles of distilled water that are transported to site, carried back and forth into the field and returned to the laboratory, unopened, to test for inadvertent contamination during the transport and field sampling process.
- **Equipment Blank** – At the beginning or end of a field sampling episode, after routine rinsing of the pump and tubing, distilled water is run through the equipment and placed in sampling bottles for analysis of a wide suite of parameters (e.g., metals, nutrients, conventionals). This blank tests for possible cross-contamination of samples from the water sampling equipment.



Results from both the equipment and travel blanks are examined for detectable concentrations of any of the parameters measured; no parameter in either blank should exceed laboratory DLs.

Quality assurance results of the laboratory and field duplicates were assessed by measuring the relative percent difference (RPD) between original and duplicate measurements as measure of precision by the laboratory and the magnitude of variability between original and field duplicate samples respectively. The equation used to calculate a RPD is:

$$RPD = \frac{(A - B)}{((A + B)/2)} \times 100$$

where: A = analytical result; B = duplicate result.

The DQOs for this project were:

- Laboratory Duplicate = 25% RPD for concentrations that exceed 10x the method detection limit (MDL).
- Field Duplicate = 50% RPD for concentrations that exceed 10x the MDL.

RPD values may be either positive or negative, and ideally should provide a mix of the two, clustered around zero. Consistently positive or negative values may indicate a bias. Large variations in RPD values are often observed between duplicate samples when the concentrations of analytes are very low and approaching the detection limit. The reason for this is apparent if one considers duplicate samples with concentrations of an analyte of 0.0005 and 0.0007 mg/L. In absolute terms, the concentration difference between the two is only 0.0002 mg/L, a very tiny amount; however, the RPD value is 33.3%. This may sometimes lead to a belief that the level of precision is less than it actually is. RPDs are not calculated for cases where one of the samples (i.e., either A or B above) is below detection and the other is not.

Field QA/QC: Sediment Sampling – Field QA/QC standards during sediment sampling consisted of the following:

- Taking care between sampling areas, by rinsing and cleaning the Petite Ponar grab, stainless steel compositing bowls and spoons using site water and phosphate-free cleaning detergent, avoided the possibility of cross-contamination.
- Metals analysis of an ashless filter (QA/QC Filter) that was swiped over the pre-cleaned bowl at three stations to assess the cleaning procedures. The significance of any metal detected on this filter was evaluated by comparing this amount to the measured concentrations in the sediment samples. Where comparison were required, the concentration of metals originating from any equipment was estimated by



dividing the amount detected on the filter (weight) by: the surface area of 2 Petite Ponar grabs (assuming a thickness of 3 cm was collected from each), that was multiplied by the density of sediment (assumed to be 2 g/cm³).

- Three field duplicate samples were collected in the immediate vicinity of original samples from randomly selected locations as a test of consistency in field methodology and to characterize heterogeneity of sediment chemistry within discrete areas. The DQO for field duplicate samples is based on an RPD of 50% for concentrations that are >10x the MDL.

Field and Laboratory QA/QC: Biota Sampling – Standard procedures were used to collect biota samples. All sampling gear was thoroughly rinsed between sampling stations to ensure that there was no inadvertent introduction (i.e., cross-contamination) of biota from one station to another.

Field duplicates were collected for phytoplankton during each sampling event (i.e., monthly) in coordination with water sample duplicates and were taken in order to assess sampling variability and sample homogeneity. A RPD of 50% for density and biomass concentrations is considered acceptable.

As a measure of laboratory QA/QC on the enumeration method replicate counts were performed on 10% of the samples. Replicate samples were chosen at random and processed at different times from the original analysis to reduce biases. The laboratory replicate is a new aliquot (10 ml) from the sample jar and is counted from the start in the same manner as the original aliquot (10 ml) taken from the jar.

Field replicates (5 per station) were collected for benthos to determine natural variability and heterogeneity. Replicates were collected at least 20 m apart from one another, within the defined sampling areas, as described in **Section 2.6**.

ZEAS incorporates the following set of QA/QC procedures in all benthic projects undertaken by the company to ensure the generation of high quality and reliable data:

- Samples were logged upon arrival, inspected, and enumerated;
- Samples were checked for proper preservation;
- Samples were stained to facilitate sorting;
- Taxonomic identifications were based on the most updated and widely used keys;
- 10% of the samples were re-sorted, and re-counted, targeting >90% recovery;
- Precision and accuracy estimates were calculated;
- A voucher collection was compiled;



-
- Sorted sediments and debris were re-preserved in 10% formalin and are retained for up to three months. For samples subject to subsampling, sorted and unsorted fractions were re-preserved separately.

Field replicates (5 per station) were collected for zooplankton to test consistency in field methods and to determine natural variability and spatial heterogeneity within each basin/station. Replicate stations were spread to cover and represent the entire basin, as described in **Section 2.7**. When collection of each replicate sample was completed, the net was rinsed by holding it upside down and raising and lowering it into the water to ensure that no zooplankters were stuck inside the net.

Laboratory QA methods by North/South Consultants (NSC) included use of trained technicians familiar with procedures to perform wet and dry weight measurements, calibration of the digital scale between measurements and use of consistent personnel on the same project. The QA/QC procedure for data entry consists of technician #1 – data entry; technician #2 – checks every entry; and the senior biologist examines and finalizes the data file before delivery. Unfortunately, no quantitative QA measurements such as re-sorts, re-counts, or voucher collection were made by North/South as these are not part of their routine procedures, unless requested. By the time this shortcoming was noticed, the samples had already been discarded. This has been requested for 2011.

Completeness – Completeness for this study is defined as the percentage of valid analytical results. Results that were made uncertain due to missed hold times, improper calibration, contamination of analytical blanks, or poor calibration verification results were deemed invalid. Completeness = 95% valid data obtained.

Table 2-1. CREMP sampling location coordinates (GPS, UTM, NAD83), Meadowbank study lakes and Baker Lake, 2010.

Station ID ¹	Station Type ²	Water & Phytoplankton (monthly)			Benthos & Sediment (August)					Zooplankton (August)		
		Date	Easting	Northing	Replicate ID	Sample Type ³	Depth (m)	Easting	Northing	Replicate ID	Easting	Northing
TPE-15	NF	January	14 W 638364	7210929	TPE-1	B & C	8.3	14 W 639022	7211516	TPE-1	14 W 638182	7211763
TPE-18		February	14 W 639361	7210505	TPE-2	B & C	7.5	14 W 639108	7211564	TPE-2	14 W 638725	7210949
TPE-19		March	14 W 637886	7211427	TPE-3	B & C	6.8	14 W 639051	7211542	TPE-3	14 W 639977	7211606
TPE-22		April	14 W 639205	7210400	TPE-4	B	8.4	14 W 638982	7211520	TPE-4	14 W 638649	7210323
TPE-23		May	14 W 639595	7211592	TPE-5	B	6.5	14 W 639069	7211539	TPE-5	14 W 639357	7211373
TPE-26		July	14 W 638124	7211715								
TPE-29		August	14 W 639046	7212643								
TPE-30		September	14 W 639688	7211644								
TPN-15	NF	January	14 W 635565	7216102	TPN-1	B & C	7.5	14 W 636383	7215547	TPN-1	14 W 636166	7213214
TPN-18		February	14 W 635425	7213638	TPN-2	B & C	8.8	14 W 636406	7215529	TPN-2	14 W 634905	7214258
TPN-19		March	14 W 634765	7215733	TPN-3	B & C	9.5	14 W 636383	7215533	TPN-3	14 W 636368	7214359
TPN-22		April	14 W 636719	7213250	TPN-4	B	9.5	14 W 636513	7215442	TPN-4	14 W 635051	7215917
TPN-23		May	14 W 635670	7213586	TPN-5	B	8.4	14 W 636610	7215416	TPN-5	14 W 636270	7215311
TPN-26		July	14 W 634983	7214350								
TPN-29		August	14 W 636270	7215311								
TPN-30		September	14 W 635572	7216261								
TPS-9	Int. Ref	January	14 W 634776	7207751	TPS-1	B & C	7.2	14 W 633729	7208013	TPS-1	14 W 634868	7210306
TPS-12		February	14 W 634612	7206885	TPS-2	B & C	8.1	14 W 633679	7208008	TPS-2	14 W 634048	7208891
TPS-13		March	14 W 633785	7209039	TPS-3	B & C	8.4	14 W 633656	7208023	TPS-3	14 W 635206	7209258
TPS-16		April	14 W 634893	7208749	TPS-4	B	6.7	14 W 633703	7208026	TPS-4	14 W 633524	7207721
TPS-17		May	14 W 635885	7208497	TPS-5	B	7.6	14 W 633635	7208075	TPS-5	14 W 634651	7207017
TPS-20		July	14 W 633534	7207730								
TPS-23		August	14 W 635090	7208274								
TPS-24		September	14 W 633842	7210091								
SP-15	NF	January	14 W 640440	7213700	SP-1	B & C	8.9	14 W 640056	7214127	SP-1	14 W 640632	7213475
SP-18		February	14 W 640684	7213122	SP-2	B & C	6.8	14 W 640064	7214181	SP-2	14 W 639607	7213613
SP-19		March	14 W 639527	7213673	SP-3	B & C	8.8	14 W 640065	7214149	SP-3	14 W 640319	7212868
SP-22		April	14 W 640293	7213007	SP-4	B	7.4	14 W 640033	7214123	SP-4	14 W 640076	7214080
SP-23		May	14 W 640111	7214015	SP-5	B	8.0	14 W 640006	7214078	SP-5	14 W 640380	7212585
SP-26		July	14 W 639940	7212985								
SP-29		August	14 W 640222	7214219								
SP-30		September	14 W 640112	7212817								
TE-16	NF	January	15 W 360448	7212570	TE-1	B & C	7.7	15 W 359995	7212187	TE-1	15 W 360338	7213149
TE-18		February	15 W 361123	7212980	TE-2	B & C	9.6	15 W 360018	7212220	TE-2	15 W 359905	7212112
TE-19		March	15 W 361384	7213094	TE-3	B & C	8.2	15 W 360048	7212230	TE-3	15 W 360409	7212267
TE-22		April	15 W 360086	7212653	TE-4	B	7.5	15 W 360066	7212257	TE-4	15 W 361347	7213165
TE-23		May	15 W 360944	7212350	TE-5	B	6.9	15 W 360078	7212275	TE-5	15 W 361523	7212524
TE-26		July	15 W 360363	7212330								
TE-29		August	15 W 361530	7212662								
TE-30		September	15 W 361640	7212014								
TEFF-8	FF	July	15 W 362243	7210186	TEFF-1	B & C	7.4	15 W 361518	7210684	TEFF-1	15 W 362204	7210168
TEFF-11		August	15 W 364168	7208955	TEFF-2	B & C	7.2	15 W 361525	7210658	TEFF-2	15 W 362795	7209204
TEFF-12		September	15 W 362985	7209015	TEFF-3	B & C	7.4	15 W 361697	7210639	TEFF-3	15 W 363667	7210551
					TEFF-4	B	6.6	15 W 361849	7210750	TEFF-4	15 W 364168	7208955
					TEFF-5	B	8.0	15 W 361623	7210576	TEFF-5	15 W 362690	7209749
INUG-14	Ext. Ref	July	14 W 622457	7216196	INUG-1	B & C	6.8	14 W 622794	7216851	INUG-1	14 W 621982	7215576
INUG-17		August	14 W 621669	7214298	INUG-2	B & C	6.7	14 W 622790	7216820	INUG-2	14 W 622700	7215184
INUG-18		September	14 W 622526	7215604	INUG-3	B & C	8.0	14 W 622722	7216829	INUG-3	14 W 621669	7214298
					INUG-4	B	8.3	14 W 622715	7216805	INUG-4	14 W 622685	7216702
					INUG-5	B	8.7	14 W 622690	7216787	INUG-5	14 W 622661	7214404
WAL-8	NF	July	15 W 360628	7221238	WAL-1	B & C	9.3	15 W 360923	7220505	WAL-1	15 W 360955	7220439
WAL-11		August	15 W 361986	7221951	WAL-2	B & C	9.5	15 W 360939	7220486	WAL-2	15 W 360755	7221937
WAL-12		September	15 W 360806	7222735	WAL-3	B & C	8.0	15 W 360914	7220447	WAL-3	15 W 360973	7222162
					WAL-4	B	9.8	15 W 360937	7220444	WAL-4	15 W 361758	7222702
					WAL-5	B	7.4	15 W 360938	7220415	WAL-5	15 W 362505	7222514
PDL-8	Ext. Ref	July	14 W 632184	7224365	PDL-1	B & C	6.6	14 W 630566	7223016	PDL-1	14 W 632359	7223436
PDL-11		August	14 W 631143	7224136	PDL-2	B & C	6.9	14 W 630608	7223039	PDL-2	14 W 632437	7223921
PDL-12		September	14 W 631132	7224138	PDL-3	B & C	6.5	14 W 630724	7222732	PDL-3	14 W 632198	7224355
					PDL-4	B	6.8	14 W 630663	7223062	PDL-4	14 W 629762	7224017
					PDL-5	B	7.7	14 W 630215	7222982	PDL-5	14 W 632427	7225014

Table 2-1. CREMP sampling location coordinates (GPS, UTM, NAD83), Meadowbank study lakes and Baker Lake, 2010.

Station ID ¹	Station Type ²	Water & Phytoplankton (monthly)			Benthos & Sediment (August)					Zooplankton (August)		
		Date	Easting	Northing	Replicate ID	Sample Type ³	Depth (m)	Easting	Northing	Replicate ID	Easting	Northing
BBD-8 BBD-11 BBD-12	NF	July August September	14 W 644283 14 W 644681 14 W 644185	7135124 7135290 7135108	BBD-1 BBD-2 BBD-3 BBD-4 BBD-5	B & C B & C B & C B B	7.3 6.8 7.7 8.6 7.5	14 W 644539 14 W 644506 14 W 644417 14 W 644584 14 W 644463	7135319 7135352 7135363 7135281 7135349	NA		
BPJ-8 BPJ-11 BPJ-12	NF	July August September	15 W 356988 15 W 356734 15 W 357161	7134208 7134106 7134083	BPJ-1 BPJ-2 BPJ-3 BPJ-4 BPJ-5	B & C B & C B & C B B	7.7 7.4 8.0 7.2 6.5	15 W 357313 15 W 357201 15 W 357058 15 W 357266 15 W 357100	7134085 7134167 7134219 7134134 7134219	NA		
BAP-8 BAP-11 BAP-12	Int. Ref	July August September	15 W 363992 15 W 363440 15 W 364128	7130852 7131195 7131087	BAP-1 BAP-2 BAP-3 BAP-4 BAP-5	B & C B & C B & C B B	8.2 8.5 7.5 7.7 8.3	15 W 364149 15 W 364126 15 W 364074 15 W 364033 15 W 363962	7131079 7131144 7131169 7131187 7131216	NA		

Notes:

¹ Station IDs are as follows: TPE,TPN,TPS=Third Portage Lake - East, North, South basins; SP=Second Portage Lake; TE,TEFF=Tehek Lake - Farfield; INUG=Inuggugayualik Lake; WAL=Wally Lake; PDL=Pipedream Lake; BBD,BPJ,BAP=Baker Lake - Barge Dock, Proposed Jetty, Akilahaarjuk Point.

² Station types are as follows: NF = near-field; FF = far-field; Int. Ref.= internal reference; Ext. Ref. = external reference.

³ Sample types are as follows: B = Benthos; C = chemistry.

3. RESULTS AND DISCUSSION

3.1. QA/QC

QA/QC procedures consisted of a combination of careful field collection and sample handling, the collection of field duplicate samples and the analysis of laboratory replicates and standard reference materials. Results of the QA/QC analyses are presented in **Tables 3-1 to 3-4** for water and sediment chemistry, phytoplankton and benthos, respectively.

ALS Environmental is an analytical laboratory accredited by the Canadian Association of Environmental Analytical Laboratories. This accreditation ensures that laboratories achieve and demonstrate the highest levels of technical and management excellence for their services. Laboratory QA/QC procedures performed on the water and sediment samples met all of the laboratory's internal data quality objectives for accuracy, precision and completeness.

3.1.1. Water Chemistry

For water samples during each event (that consisted of 5–12 sample stations), one or two field duplicates, one laboratory duplicate, one travel blank and one equipment blank were each analyzed for all water parameters. As a result, a total of 10 field duplicates, and 8 laboratory duplicates, 6 travel blanks, and 10 equipment blanks were each analyzed for 24 conventional parameters as well as 29 total and 29 dissolved metals. Although there were some exceedances of the established DQOs, these exceedances represent less than 1% of the total for QA samples and parameters measured. When comparing results for a large number of parameters, many of which are near detection limits, simple odds dictate that a few parameters will exceed DQOs when in fact they do not (i.e., a false positive). There was no pattern in the nature of the exceedances that indicates a bias of specific parameters one way or another. The results of the RPD analysis for all these parameters are presented in **Table 3-1** and discussed below:

- **Field Duplicates** – Overall, these samples showed a high level of consistency with the original samples. There were only two cases (out of ~800 cases) where the RPD exceeded 50% (i.e., ammonia in January, total phosphate in February); in the case of ammonia, measured concentrations were less than 10x the MDL. In the case of total phosphate, the measured concentration of the original sample was slightly above 10x the MDL and that of the duplicate sample was below 10x the MDL.
- **Laboratory Duplicates** – These samples, conducted randomly as part of the laboratory's internal QA/QC program, showed a high degree of consistency and precision. In only one case did the RPD exceed 25% (i.e., TKN in March); however,

the measured concentration was less than 10x the MDL. Consequently, DQOs were met in all samples.

- Travel Blanks – There were two cases where a parameter was detectable (i.e., ammonia in July, conductivity in August). The ammonia concentration detected (0.0145 mg/L) was verified by repeat analysis by the lab and was determined to be a real result; however, the concentration is less than 10x the MDL (0.0050 mg/L). Conductivity was just above the DL in one instance (2.1 mg/L, compared to MDL of 2.0 mg/L).
- Equipment Blanks – Last year there were some problems with these blanks due to a low supply of deionized water available for proper flushing of the equipment. Starting in April of 2010, we implemented a change to the protocol for collecting these blanks. That is, the amount of flushing was increased to 2 minutes prior to collection (to match what is conducted in the field when collecting a sample). In order to implement this change, we acquired onsite distilled water from the Meadowbank lab. A few samples of this distilled water (excluding dissolved parameters) were also sent to ALS alongside the equipment blank samples and analyzed for the same parameters to test the quality of distilled water prepared onsite. The results (**Table 3-1**) show detectable, but low, concentrations of a variety of parameters in the supplied distilled water. Consequently, the detectable concentrations of water quality parameters found in the equipment blanks, which were all of similar magnitude to the distilled water samples, should not be construed as cross-contamination from the sampling equipment. Rather, the equipment blanks should be considered compromised after March 2010 and not usable to assess cross contamination during sample collection. Based on the excellent equipment blank results for the first three months (which were prepared with deionized water supplied by ALS) and the revised methods implemented starting April 2010 (that were put in place to improve data quality), we would not expect that cross-contamination should be an issue for water sampling at Meadowbank Mine.
- Overall – The frequency of DQO exceedances represent a small fraction of the total number of samples and parameters that were measured for QA/QC purposes (i.e., <1%). In addition, there were no apparent patterns in exceedances of parameters or sampling stations suggesting that there was no trend towards higher or lower results in replicate samples. As such, the measured concentrations are considered usable but some are flagged to be interpreted with caution as a result of detectable concentrations in equipment blanks.

3.1.2. Sediment Chemistry

Sediment QA/QC results are presented in **Table 3-2** and discussed below:



-
- Field Duplicates – Overall, these three samples showed a high level of consistency with the original samples. There were only two cases, in the same sample, where the RPD exceeded 50% (i.e., both for particle size parameters in field dup-2). In this case, the original sample had more silt content and the duplicate had more sand and clay. This difference demonstrates the heterogeneous nature of sediment particles within a spatially small area.
 - Laboratory Duplicates – None of the RPD values exceed the DQO for lab duplicate samples. This result confirms that sediments were well homogenized in the field prior to placement in jars.
 - Filter Swipes – filter swipes were analyzed for total metals in units of $\mu\text{g}/\text{filter}$. While the majority of parameters tested were below the MDL, a few were detected (aluminum, chromium, titanium, zinc). However, the incremental influence of the measured amounts was estimated to be less than 0.01% of actual measured sediment concentrations in all cases. Consequently, the potential for meaningful cross-contamination is considered negligible and DQOs were considered to be fully met.

3.1.3. Phytoplankton

For phytoplankton, during each event 1–2 field duplicates and 1 laboratory duplicate were analyzed for density and biomass (total and for each major phytoplankton group). Similar to water chemistry, the results for phytoplankton QA/QC had a number of exceedances of the established DQOs. However, where density or biomass of a particular phytoplankton group is very small (i.e., about 1% of total), small differences in that metric between the original and the duplicate can cause very large differences in the RPD. Thus, we evaluate the quality of these data based on *total* density and *total* biomass both for field and laboratory duplicates. Results of the RPD analysis for all these parameters are presented in **Table 3-3** and are discussed below:

- Field Duplicates – The phytoplankton field duplicates from Second Portage, Third Portage, Pipedream and Baker lakes displayed greater than desired variability in both density (cells/L) and biomass (mg/m^3). Within-taxa variability was quite high, which has been commonly observed in similar datasets over the years. For example, rare groups may be present in one field sample but not another. For example, Dinoflagellates were present in Second Portage Lake in the duplicate sample in January but were not present in the original sample. In such cases, where abundance or biomass is less than 1% of totals, RPD values are not calculated. Nevertheless, RPDs for *total* density and *total* biomass for most field duplicate samples were low and met the DQO (i.e., 18/20 RPDs), although some were still greater than 50% (i.e., 2/20 RPDs). This highlights an inherently high degree of natural variability for this component of the CREMP, as these samples were collected from the same location

at about the same time (likely <10 minutes apart). RPD values were always much less than 50% for number of species and Simpson's diversity. Part of the reason for exceedences of DQOs for phytoplankton, notwithstanding the very small size of phytoplankters, is the very small volume of water used to determine biomass and diversity (~2 mL). Replicate samples using small water volumes will inevitably result in exceedences of DQOs, especially for rare or poorly represented species.

- Laboratory Duplicates – Duplicate re-counts were conducted on 10% of the samples analyzed. RPDs for *total* density and *total* biomass consistently met the DQOs (i.e., <25%), with only one (of 16 RPDs) small exception (27%). Similar to field duplicates, laboratory duplicates showed high within-taxa variability.
- Overall – These results illustrate the inherently large difference in phytoplankton taxa composition because of the relatively small number of plankters enumerated relative to the very large number of plankters present in the sample. However, notwithstanding within replicate differences in taxonomic composition, total biomass did not differ in one direction or another for laboratory duplicates. The implications of this for monitoring effects is discussed further in **Section 3.4** and will be evaluated in detail as part of the CREMP design (Azimuth, 2011a *in progress*).

3.1.4. Benthic Invertebrates

Laboratory replicate counts were performed on 10% of all benthic samples. Replicate samples were chosen at random and processed at different times from the original analysis to reduce bias. Of the re-sorted samples, 1/133 (0.75%), 0/24 (0%), 1/76 (1.32%), 0/24 (0%), 1/56 (1.79%) and 0/104 (0%) of organisms were missed (**Table 3-4**), with an overall omission rate of less than 1%. These results suggest that the vast majority of animals observed in benthic samples by the taxonomist were recovered. A reference collection of benthic taxa has been compiled.

3.1.5. Zooplankton

For zooplankton, field replicates were collected to determine natural variability and heterogeneity, and will be further discussed in **Section 3.6**. The laboratory maintained routine QA checks for weighing, data entry, and taxonomic identification but these have not been quantified.

3.1.6. Completeness

Overall, >99% completeness was achieved in terms of field and sample QA planned for this monitoring study:

- Care taken in the field to ensure consistency of sample collection and methodology



-
- Thorough cleaning of equipment to avoid cross-contamination between every station
 - Equipment flushes and travel blank samples collected for every sampling event
 - Field duplicate samples collected for at least every 10 samples collected
 - Laboratory duplicates performed on 10% of samples received by the laboratory and reported for each dataset
 - All of the prescribed stations were visited and all replicates were collected
 - No stations were missed due to weather or mechanical/field equipment difficulties
 - All through-ice stations were visited except in months with dangerous ice conditions (June and October)
 - No sampling analysis parameters were missed; care was taken when completing COCs and all COCs were correctly interpreted by the laboratories
 - Only one sample was lost or broken; the January phytoplankton vial for TPN arrived at Plankton R Us broken



Table 3-1. QA/QC data for water parameters, Meadowbank study lakes and Baker Lake, 2010.

	MDLs	Second Portage Lake			Second Portage Lake			Third Portage Lake			Third Portage Lake			Second Portage Lake		
		SP-15	Jan. Dup-1	RPD	SP-18	Feb. Dup-1	RPD	TPN-20	Mar. Dup-1	RPD	TPE-22	Apr. Dup-1	RPD	SP-25	May. Dup-1	RPD
		15-Jan-10	15-Jan-10	(%)	26-Feb-10	26-Feb-10	(%)	20-Mar-10	20-Mar-10	(%)	10-Apr-10	10-Apr-10	(%)	20-May-10	20-May-10	(%)
CONVENTIONAL PARAMETERS																
Physical Tests																
Conductivity (µS/cm)	2.0	25.5	24.8	2.78	27.0	26.0	3.77	19.3	18.4	4.77	20.4	20.4	0	25.9	24.2	6.79
Hardness (mg/L)	1.1	10.1	10.3	-1.96	10.4	10.4	0	7.20	7.10	1.40	7.70	7.80	-1.29	10.3	10.5	-1.92
pH	0.10	7.31	7.31	0	6.67	6.29	5.86	6.56	6.48	1.23	6.90	6.87	0.44	6.85	6.99	-2.02
Total Suspended Solids (mg/L)	1.0	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	1.0	<1.0	NA	<1.0	<1.0	NA
Total Dissolved Solids (mg/L)	10	18	16	12	19	17	11	12	<10	NA	<10	13	NA	17	17	0
Turbidity (NTU)	0.10	0.76	0.73	4.0	1.7	1.6	10	0.17	0.16	6.1	1.8	1.7	3.4	0.87	0.74	16
Anions & Nutrients (mg/L)																
Alkalinity - Bicarbonate (as CaCO ₃)	2.0	7.1	7.6	-6.8	7.8	7.9	-1.3	5.3	5.5	-3.7	6.6	6.0	9.5	7.9	8.2	-3.7
Alkalinity - Carbonate (as CaCO ₃)	2.0	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA
Alkalinity - Hydroxide (as CaCO ₃)	2.0	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA
Alkalinity - Total (as CaCO ₃)	2.0	7.1	7.6	-6.8	7.8	7.9	-1.3	5.3	5.5	-3.7	6.6	6.0	9.5	7.9	8.2	-3.7
Ammonia (as N)	0.020	0.027	0.091	-108	<0.020	<0.020	NA	<0.020	0.021	NA	<0.020	<0.020	NA	<0.010	<0.010	NA
Bromide	0.050	<0.050	<0.050	NA	<0.050	<0.050	NA	<0.050	<0.050	NA	<0.050	<0.050	NA	<0.050	<0.050	NA
Chloride	0.50	<0.50	<0.50	NA	0.68	0.69	-1.5	0.59	0.59	0	0.60	0.61	-1.7	0.57	0.57	0
Fluoride	0.020	0.069	0.062	11	0.079	0.080	-1.3	0.074	0.071	4.1	0.078	0.077	1.3	0.067	0.067	0
Nitrate (as N)	0.0050	0.0054	<0.0050	NA	0.022	0.022	1.8	0.0075	0.0079	-5.2	0.021	0.021	-2.8	0.022	0.022	-0.46
Nitrite (as N)	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Total Kjeldahl Nitrogen	0.050	0.12	0.092	26	0.10	0.084	17	0.13	0.16	-20	<0.050	<0.050	NA	0.074	0.093	-23
Ortho Phosphate (as P)	0.0010	<0.0010	0.0015	NA	0.0084	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Total Phosphate (as P)	0.0020	<0.0020	0.0020	NA	0.043	0.0026	177	<0.0020	<0.0020	NA	0.0029	0.0024	19	<0.0020	<0.0020	NA
Silicate (as SiO ₂)	1.0	<1.0	<1.0	0	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA
Sulfate (SO ₄)	0.50	2.18	2.24	-2.71	2.36	2.37	-0.42	1.80	1.65	8.70	1.74	1.68	3.51	2.09	2.11	-0.95
ORGANIC / INORGANIC CARBON																
Dissolved Organic Carbon (mg/L)	0.50	1.67	1.67	0	1.47	1.71	-15.1	1.57	1.56	0.64	1.06	1.15	-8.14	1.25	1.28	-2.37
Total Organic Carbon (mg/L)	0.50	1.68	1.68	0	1.58	1.75	-10.21	1.60	1.56	2.53	1.07	1.20	-11.45	1.25	1.18	5.76
PLANT PIGMENTS																
Chlorophyll a (µg/L)	0.010	0.304	0.350	-14.1	0.201	0.204	-1.48	0.178	0.172	3.43	0.108	0.098	9.71	0.506	0.576	-12.9
TOTAL METALS (mg/L)																
Aluminum	0.0050	0.0320	0.0315	1.57	0.109	0.111	-1.82	0.0087	0.0082	5.92	0.107	0.106	0.94	0.0420	0.0474	-12.1
Antimony	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA
Arsenic	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA
Barium	0.020	<0.020	<0.020	NA	<0.020	<0.020	NA	<0.020	<0.020	NA	<0.020	<0.020	NA	<0.020	<0.020	NA
Beryllium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Boron	0.10	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	NA
Cadmium	0.000017	<0.000017	<0.000017	NA	<0.000017	<0.000017	NA	<0.000017	<0.000017	NA	<0.000017	<0.000017	NA	<0.000017	<0.000017	NA
Calcium	0.10	2.49	2.48	0.40	2.51	2.52	-0.40	1.58	1.58	0	1.74	1.76	-1.14	2.40	2.53	-5.27
Chromium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Cobalt	0.00030	<0.00030	<0.00030	NA	<0.00030	<0.00030	NA	<0.00030	<0.00030	NA	<0.00030	<0.00030	NA	<0.00030	<0.00030	NA
Copper	0.0010	<0.0010	<0.0010	NA	0.0013	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Iron	0.030	0.034	0.036	-5.71	0.100	0.103	-2.96	<0.030	<0.030	NA	0.098	0.091	7.41	0.042	0.046	-9.09
Lead	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA
Lithium	0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA
Magnesium	0.10	0.87	0.87	0	1.0	1.0	1.0	0.73	0.73	0	0.78	0.78	0	0.91	0.93	-2.2
Manganese	0.00030	0.00095	0.00095	0	0.0017	0.0017	0	0.00045	0.00046	-2.2	0.0016	0.0019	-17	0.00095	0.00098	-3.1
Mercury	0.000020	<0.000020	<0.000020	NA	<0.000010	<0.000010	NA	<0.000010	<0.000010	NA	<0.000010	<0.000010	NA	<0.000010	<0.000010	NA
Molybdenum	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Nickel	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Potassium	2.0	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA
Selenium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Silver	0.000020	<0.000020	<0.000020	NA	<0.000020	<0.000020	NA	<0.000020	<0.000020	NA	<0.000020	<0.000020	NA	<0.000020	<0.000020	NA
Sodium	2.0	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA
Thallium	0.00020	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA
Tin	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA
Titanium	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA	<0.010	<0.010	NA	<0.010	<0.010	NA	<0.010	<0.010	NA
Uranium	0.00020	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA
Vanadium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Zinc	0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA
DISSOLVED METALS (mg/L)																
Aluminum	0.0050	<0.0050	<0.0050	NA	0.0066	0.0057	15	<0.0050	<0.0050	NA	0.0069	0.0083	-18	<0.0050	<0.0050	NA
Antimony	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA
Arsenic	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<							

Table 3-1. QA/QC data for water parameters, Meadowbank study lakes and Baker Lake, 2010.

	MDLs	Third Portage Lake			Pipedream Lake			Second Portage Lake			Pipedream Lake			Baker Lake		
		TPN-26 17-Jul-10	Jul. Dup-1 17-Jul-10	RPD (%)	PDL-9 21-Jul-10	Jul. Dup-3 21-Jul-10	RPD (%)	SP-29 21-Aug-10	Aug. Dup-1 21-Aug-10	RPD (%)	PDL-13 22-Sep-10	Sep. Dup-2 22-Sep-10	RPD (%)	BAP-12 27-Sep-10	Sep. Dup-4 27-Sep-10	RPD (%)
CONVENTIONAL PARAMETERS																
Physical Tests																
Conductivity (µS/cm)	2.0	14.5	21.0	-36.6	19.6	18.3	6.86	23.1	23.1	0	20.1	20.0	0.50	408	413	-1.22
Hardness (mg/L)	1.1	5.75	5.69	1.05	8.06	8.02	0.50	9.77	9.72	0.51	8.43	8.42	0.12	44.7	45.4	-1.55
pH	0.10	7.44	7.20	3.28	6.77	6.72	0.74	7.11	7.11	0	7.21	7.21	0	7.21	7.18	0.42
Total Suspended Solids (mg/L)	1.0	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA
Total Dissolved Solids (mg/L)	10	12	11	8.7	16	17	-6.1	<10	12	NA	<10	14	NA	239	235	1.69
Turbidity (NTU)	0.10	0.23	0.26	-12	0.18	0.19	-5.4	0.54	0.47	14	0.22	0.21	4.7	0.17	0.20	-16
Anions & Nutrients (mg/L)																
Alkalinity - Bicarbonate (as CaCO ₃)	2.0	4.7	4.7	0	7.8	7.1	9.4	7.3	7.9	-7.9	6.1	6.3	-3.2	9.7	10	-6.0
Alkalinity - Carbonate (as CaCO ₃)	2.0	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA
Alkalinity - Hydroxide (as CaCO ₃)	2.0	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA
Alkalinity - Total (as CaCO ₃)	2.0	4.7	4.7	0	7.8	7.1	9.4	7.3	7.9	-7.9	6.1	6.3	-3.2	9.7	10	-6.0
Ammonia (as N)	0.020	<0.0050	<0.0050	NA	0.0075	0.0074	1.3	<0.0050	<0.0050	NA	0.0914	<0.0050	NA	0.0121	0.0185	-41.8
Bromide	0.050	<0.050	<0.050	NA	<0.050	0.42	NA	<0.050	<0.050	NA	<0.050	<0.050	NA	0.348	0.347	0.29
Chloride	0.50	<0.50	<0.50	NA	<0.50	<0.50	NA	<0.50	<0.50	NA	0.55	0.55	0	110	110	0
Fluoride	0.020	0.051	0.050	2.0	0.029	0.028	3.5	0.049	0.050	-2.0	0.032	0.032	0	0.061	0.062	-1.6
Nitrate (as N)	0.0050	0.018	0.017	2.8	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	0.0275	0.0280	-1.80
Nitrite (as N)	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Total Kjeldahl Nitrogen	0.050	<0.050	<0.050	NA	<0.050	0.084	NA	0.061	0.063	-3.2	0.108	0.092	16.0	0.136	0.150	-9.79
Ortho Phosphate (as P)	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Total Phosphate (as P)	0.0020	<0.0020	<0.0020	NA	<0.0020	<0.0020	NA	0.0027	0.0025	7.7	0.0029	<0.0020	NA	<0.0020	<0.0020	NA
Silicate (as SiO ₂)	1.0	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA
Sulfate (SO ₄)	0.50	1.42	1.42	0	1.31	1.31	0	1.93	1.94	-0.52	1.42	1.42	0	15.9	16.0	-0.63
ORGANIC / INORGANIC CARBON																
Dissolved Organic Carbon (mg/L)	0.50	0.90	0.89	1.12	1.10	1.16	-5.31	1.72	1.66	3.55	1.80	1.77	1.68	3.07	3.04	0.98
Total Organic Carbon (mg/L)	0.50	0.92	0.95	-3.21	1.15	1.11	3.54	1.72	1.72	0	1.70	1.77	-4.03	3.04	3.09	-1.63
PLANT PIGMENTS																
Chlorophyll a (µg/L)	0.010	0.444	0.419	5.79	0.555	0.592	-6.45	0.629	0.607	3.56	0.507	0.561	-10.1	0.935	0.951	-1.70
TOTAL METALS (mg/L)																
Aluminum	0.0050	0.0134	<0.015	NA	0.0057	0.0054	5.41	0.0241	0.0260	-7.58	<0.0050	0.0056	NA	0.0085	0.0077	10
Antimony	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA
Arsenic	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA
Barium	0.020	<0.020	<0.020	NA	<0.020	<0.020	NA	<0.020	<0.020	NA	<0.020	<0.020	NA	<0.020	<0.020	NA
Beryllium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Boron	0.10	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	NA
Cadmium	0.000017	<0.000017	<0.000017	NA	<0.000017	<0.000017	NA	<0.000017	<0.000017	NA	<0.000017	<0.000017	NA	<0.000017	<0.000017	NA
Calcium	0.10	1.36	1.32	2.99	2.13	2.11	0.94	2.47	2.48	-0.40	2.13	2.14	-0.47	4.79	4.79	0
Chromium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Cobalt	0.00030	<0.00030	<0.00030	NA	<0.00030	<0.00030	NA	<0.00030	<0.00030	NA	<0.00030	<0.00030	NA	<0.00030	<0.00030	NA
Copper	0.0010	<0.0020	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Iron	0.030	<0.030	<0.030	NA	<0.030	<0.030	NA	0.032	0.032	0	<0.030	<0.030	NA	<0.030	<0.030	NA
Lead	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA
Lithium	0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA
Magnesium	0.10	0.57	0.56	1.8	0.71	0.71	0	0.83	0.84	-1.2	0.74	0.74	0	8.38	8.34	0.48
Manganese	0.00030	0.0024	0.0023	2.1	0.0016	0.0015	7.9	0.0014	0.0014	-2.2	0.00124	0.00133	-7.00	0.00170	0.00167	1.78
Mercury	0.000020	<0.000010	<0.000010	NA	<0.000010	<0.000010	NA	<0.000010	<0.000010	NA	<0.000010	<0.000010	NA	<0.000010	<0.000010	NA
Molybdenum	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Nickel	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Potassium	2.0	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	2.7	2.7	0
Selenium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0020	<0.0020	NA
Silver	0.000020	<0.000020	<0.000020	NA	<0.000020	<0.000020	NA	<0.000020	<0.000020	NA	<0.000020	<0.000020	NA	<0.000020	<0.000020	NA
Sodium	2.0	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	61.7	61.6	0.16
Thallium	0.00020	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA
Tin	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA
Titanium	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA	<0.010	<0.010	NA	<0.010	<0.010	NA	<0.010	<0.010	NA
Uranium	0.00020	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA
Vanadium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Zinc	0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA
DISSOLVED METALS (mg/L)																
Aluminum	0.0050	0.0060	0.0075	-22	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA
Antimony	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA
Arsenic	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.000							

Table 3-1. QA/QC data for water parameters, Meadowbank study lakes and Baker Lake, 2010.

	MDLs	Various Lakes			Various Lakes			Various Lakes			Various Lakes			Various Lakes		
		Original January	Laboratory Duplicate	RPD (%)	Original February	Laboratory Duplicate	RPD (%)	Original March	Laboratory Duplicate	RPD (%)	Original April	Laboratory Duplicate	RPD (%)	Original May	Laboratory Duplicate	RPD (%)
CONVENTIONAL PARAMETERS																
Physical Tests																
Conductivity (µS/cm)	2.0	29.4	29.5	-0.34	-	-	-	20.7	20.4	1.46	26.0	26.5	-1.90	19.8	20.0	-1.01
Hardness (mg/L)	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	0.10	7.33	7.36	-0.41	5.89	5.76	2.23	-	-	-	6.93	6.94	-0.14	7.54	7.21	4.47
Total Suspended Solids (mg/L)	1.0	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	NA
Total Dissolved Solids (mg/L)	10	-	-	-	-	-	-	-	-	-	-	-	-	<10	10	NA
Turbidity (NTU)	0.10	0.88	0.89	-1.13	0.32	0.32	0	0.20	0.19	5.13	0.77	0.77	0	1.02	1.09	-6.64
Anions & Nutrients (mg/L)																
Alkalinity - Bicarbonate (as CaCO ₃)	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity - Carbonate (as CaCO ₃)	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity - Hydroxide (as CaCO ₃)	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity - Total (as CaCO ₃)	2.0	8.7	8.3	4.7	-	-	-	4.3	4.4	-2.3	5.4	5.4	0	5.0	5.4	-7.7
Ammonia (as N)	0.020	<0.020	<0.020	NA	<0.020	<0.020	NA	<0.020	0.0141	NA	-	-	-	<0.010	<0.010	NA
Bromide	0.050	<0.050	<0.050	NA	-	-	-	<0.050	<0.050	NA	<0.050	<0.050	NA	<0.050	<0.050	NA
Chloride	0.50	<0.50	<0.50	NA	-	-	-	0.58	0.58	0	0.61	0.61	0	0.5	0.5	0
Fluoride	0.020	0.081	0.081	0	-	-	-	0.070	0.071	-1.4	0.077	0.078	-1.3	0.052	0.052	0
Nitrate (as N)	0.0050	0.0145	0.0143	1.39	-	-	-	<0.0050	<0.0050	NA	0.0214	0.0207	3.33	0.0364	0.0372	-2.17
Nitrite (as N)	0.0010	<0.0010	<0.0010	NA	-	-	-	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Total Kjeldahl Nitrogen	0.050	0.12	0.13	-4.1	0.085	0.094	-10	0.12	0.081	41	<0.050	<0.050	NA	0.058	<0.050	NA
Ortho Phosphate (as P)	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	-	-	-	<0.0010	<0.0010	NA
Total Phosphate (as P)	0.0020	0.0023	<0.0020	NA	0.0024	0.0025	-4.1	<0.0020	<0.0020	NA	<0.0020	<0.0020	NA	<0.0020	<0.0020	NA
Silicate (as SiO ₂)	1.0	<1.0	<1.0	NA	-	-	-	<1.0	<1.0	NA	-	-	-	<1.0	<1.0	NA
Sulfate (SO ₄)	0.50	1.89	1.88	0.53	-	-	-	1.55	1.55	0	1.68	1.68	0	1.38	1.37	0.73
ORGANIC / INORGANIC CARBON																
Dissolved Organic Carbon (mg/L)	0.50	1.81	1.78	1.67	-	-	-	1.67	1.69	-1.19	-	-	-	-	-	-
Total Organic Carbon (mg/L)	0.50	1.80	1.84	-2.20	<0.5	0.67	NA	-	-	-	-	-	-	1.18	1.23	-4.15
PLANT PIGMENTS																
Chlorophyll a (µg/L)	0.010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL METALS (mg/L)																
Aluminum	0.0050	0.0102	0.0101	0.99	<0.010	<0.010	NA	0.0119	0.0116	2.55	0.107	0.113	-5.45	0.042	0.0414	1.44
Antimony	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA
Arsenic	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA
Barium	0.020	<0.020	<0.020	NA	<0.020	<0.020	NA	<0.020	<0.020	NA	<0.020	<0.020	NA	<0.020	<0.020	NA
Beryllium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Boron	0.10	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	NA
Cadmium	0.000017	<0.000017	<0.000010	NA	<0.000017	<0.000010	NA	<0.000017	<0.000010	NA	<0.000017	<0.000010	NA	<0.000017	<0.000010	NA
Calcium	0.10	1.75	1.74	0.57	1.48	1.52	-2.67	1.66	1.70	-2.38	1.74	1.75	-0.57	2.40	2.41	-0.42
Chromium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Cobalt	0.00030	<0.00030	<0.00030	NA	<0.00030	<0.00030	NA	<0.00030	<0.00030	NA	<0.00030	<0.00030	NA	<0.00030	<0.00030	NA
Copper	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Iron	0.030	<0.030	<0.030	NA	<0.030	<0.030	NA	<0.030	<0.030	NA	0.098	0.10	-4.0	0.042	0.041	2.4
Lead	0.00050	<0.00050	<0.00050	NA	0.00061	0.00063	-3.2	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA
Lithium	0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA
Magnesium	0.10	0.80	0.79	1.3	0.67	0.67	0	0.74	0.76	-2.7	0.78	0.79	-1.3	0.91	0.90	1.1
Manganese	0.00030	0.00061	0.00059	3.3	0.00039	0.00042	-7.4	0.00056	0.00056	0	0.0016	0.0016	-0.63	0.00095	0.00091	4.3
Mercury	0.000020	<0.000020	<0.000020	NA	<0.000010	<0.000010	NA	<0.000010	<0.000010	NA	<0.000010	<0.000010	NA	<0.000010	<0.000010	NA
Molybdenum	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Nickel	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Potassium	2.0	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA
Selenium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Silver	0.000020	<0.000020	<0.000020	NA	<0.000020	<0.000020	NA	<0.000020	<0.000020	NA	<0.000020	<0.000020	NA	<0.000020	<0.000020	NA
Sodium	2.0	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA
Thallium	0.00020	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA
Tin	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA
Titanium	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA	<0.010	<0.010	NA	<0.010	<0.010	NA	<0.010	<0.010	NA
Uranium	0.00020	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA
Vanadium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Zinc	0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA
DISSOLVED METALS (mg/L)																
Aluminum	0.0050	<0.0050	<0.0050	NA	0.0098	0.0095	3.1	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA
Antimony	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA
Arsenic	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA
Barium	0.020	<0.020	<0.020	NA	<0.020	<0.020	NA	<0.020	<0.020	NA	<0.020	<0.020	NA	<0.020	<0.020	NA
Beryllium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA
Boron	0.10	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	NA
Cadmium	0.000017	<0.000017	<0.000010	NA	<0.000017	<0.000010										

Table 3-1. QA/QC data for water parameters, Meadowbank study lakes and Baker Lake, 2010.

		Various Lakes			Various Lakes			Various Lakes			Travel Blanks					
	MDLs	Original July	Laboratory Duplicate	RPD (%)	Original August	Laboratory Duplicate	RPD (%)	Original September	Laboratory Duplicate	RPD (%)	Feb 26-Feb-10	Mar. -1 21-Mar-10	Apr. -1 10-Apr-10	Jul. -1 25-Jul-10	Aug 22-Aug-10	Sep. -1 19-Sep-10
CONVENTIONAL PARAMETERS																
Physical Tests																
Conductivity (µS/cm)	2.0	14.5	14.3	1.39	-	-	-	-	-	-	<2.0	<2.0	<2.0	<2.0	2.1	<2.0
Hardness (mg/L)	1.1	-	-	-	-	-	-	-	-	-	<1.1	-	<1.1	<0.50	<0.50	<0.50
pH	0.10	6.95	6.95	0	5.67	5.59	1.42	-	-	-	5.89	5.32	5.42	5.68	5.60	5.68
Total Suspended Solids (mg/L)	1.0	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Dissolved Solids (mg/L)	10	-	-	-	-	-	-	-	-	-	<10	<10	<10	<10	<10	<10
Turbidity (NTU)	0.10	0.51	0.51	0	0.54	0.55	-1.83	-	-	-	<0.10	<0.10	-	<0.10	<0.10	<0.10
Anions & Nutrients (mg/L)																
Alkalinity - Bicarbonate (as CaCO ₃)	2.0	-	-	-	-	-	-	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity - Carbonate (as CaCO ₃)	2.0	-	-	-	-	-	-	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity - Hydroxide (as CaCO ₃)	2.0	-	-	-	-	-	-	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity - Total (as CaCO ₃)	2.0	-	-	-	4.4	4.5	-2.2	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Ammonia (as N)	0.020	-	-	-	-	-	-	0.030	0.028	4.5	-	<0.020	<0.020	0.0145	<0.0050	-
Bromide	0.050	<0.050	<0.050	NA	-	-	-	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride	0.50	<0.50	<0.50	NA	-	-	-	-	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride	0.020	0.051	0.049	4.0	-	-	-	-	-	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Nitrate (as N)	0.0050	0.0148	0.0146	1.36	-	-	-	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	0.0010	<0.0010	<0.0010	NA	-	-	-	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	0.050	<0.050	<0.050	NA	<0.050	<0.050	NA	-	-	-	-	<0.050	<0.050	-	<0.050	-
Ortho Phosphate (as P)	0.0010	-	-	-	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Phosphate (as P)	0.0020	<0.0020	<0.0020	NA	-	-	-	<0.0020	<0.0020	NA	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Silicate (as SiO ₂)	1.0	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate (SO ₄)	0.50	1.87	1.91	-2.12	-	-	-	-	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
ORGANIC / INORGANIC CARBON																
Dissolved Organic Carbon (mg/L)	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon (mg/L)	0.50	-	-	-	-	-	-	-	-	-	<0.5	<0.50	<0.20	<0.50	<0.50	<0.50
PLANT PIGMENTS																
Chlorophyll a (µg/L)	0.010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL METALS (mg/L)																
Aluminum	0.0050	0.0891	0.0915	-2.66	<0.0050	<0.0050	NA	0.0239	0.0264	-9.94	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Antimony	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic	0.00050	0.00053	0.00054	-1.87	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Barium	0.020	<0.020	<0.020	NA	<0.020	<0.020	NA	<0.020	<0.020	NA	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Beryllium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	0.10	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Cadmium	0.000017	<0.000017	<0.000010	NA	<0.000017	<0.000010	NA	<0.000017	<0.000010	NA	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
Calcium	0.10	1.70	1.70	0	<0.10	<0.10	NA	2.43	2.51	-3.24	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chromium	0.0010	0.0010	0.0010	0	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	0.00030	<0.00030	<0.00030	NA	<0.00030	<0.00030	NA	<0.00030	<0.00030	NA	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper	0.0010	-	-	-	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Iron	0.030	0.13	0.14	-0.74	<0.030	<0.030	NA	<0.030	0.031	NA	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Lead	0.00050	<0.00050	<0.00050	NA	0.00096	0.00096	0	<0.00050	<0.00050	NA	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Lithium	0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium	0.10	0.70	0.70	0	<0.10	<0.10	NA	0.83	0.86	-3.6	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Manganese	0.00030	0.0047	0.0047	-0.42	<0.00030	<0.00030	NA	0.0015	0.0016	-4.5	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Mercury	0.000020	<0.000010	<0.000010	NA	-	-	-	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Potassium	2.0	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Selenium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Silver	0.000020	<0.000020	<0.000020	NA	<0.000020	<0.000020	NA	<0.000020	<0.000020	NA	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Sodium	2.0	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Thallium	0.00020	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Titanium	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA	<0.010	<0.010	NA	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium	0.00020	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	NA	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Vanadium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
DISSOLVED METALS (mg/L)																
Aluminum	0.0050	0.023	0.023	1.7	<0.0050	<0.0050	NA	-	-	-	-	-	-	-	-	-
Antimony	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	-	-	-	-	-	-	-	-	-
Arsenic	0.00050	<0.00050	<0.00050	NA	<0.00050	<0.00050	NA	-	-	-	-	-	-	-	-	-
Barium	0.020	<0.020	<0.020	NA	<0.020	<0.020	NA	-	-	-	-	-	-	-	-	-
Beryllium	0.0010	<0.0010	<0.0010	NA	<0.0010	<0.0010	NA	-	-	-	-	-	-	-	-	-
Boron	0.10															

Table 3-2. QA/QC data for sediment parameters, Meadowbank study lakes and Baker Lake, August 2010.

Analytes	MDLs	Second Portage Lake			Wally Lake			Baker Lake			Various Lakes			Swipe-1	Swipe-2	Swipe-3
		SP-1	Field Dup-1	RPD	WAL-2	Field Dup-2	RPD	BAP-1	Field Dup-3	RPD	Original	Laboratory Duplicate	RPD	QA/QC FILTER	QA/QC FILTER	QA/QC FILTER
		21-Aug-10	21-Aug-10	(%)	23-Aug-10	23-Aug-10	(%)	30-Aug-10	30-Aug-10	(%)	August		(%)	21-Aug-10	23-Aug-10	30-Aug-10
CONVENTIONAL PARAMETERS																
Physical & Organic Parameters																
Moisture (%)	0.1	82.1	82.0	0.12	88.7	88.9	-0.23	37.4	37.2	0.54	77.0	77.2	-0.26			
pH	0.1	5.85	5.89	-0.68	6.22	6.23	-0.16	6.06	5.95	1.83	6.14	6.20	-0.97			
Total Organic Carbon (% dw)	0.1	3.91	3.91	0	8.94	9.34	-4.38	0.33	0.30	9.52	4.21	4.06	3.63			
Particle Size																
% Gravel (>2mm)	1	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	NA			
% Sand (2.00mm - 0.063mm)	1	1.72	1.86	-7.82	0.27	2.87	-166	78.5	80.6	-2.64	13.0	13.9	-6.69			
% Silt (0.063mm - 4µm)	1	66.3	66.9	-0.90	95.2	88.7	7.07	20.2	17.3	15.5	74.4	75.2	-1.07			
% Clay (<4µm)	1	32.0	31.3	2.21	4.56	8.48	-60.1	1.30	2.11	-47.5	12.6	10.9	14.5			
AGGREGATE ORGANICS (mg/kg)																
Oil and Grease	500-1082	<1200	<1200	NA	1520	2290	-40.4	<500	<500	NA	-	-	-			
HYDROCARBONS (mg/kg)																
EPH10-19	200-480	<550	<600	NA	<820	<840	NA	<200	<200	NA	<400	<400	NA			
EPH19-32	200-480	<550	<600	NA	<820	<840	NA	<200	<200	NA	<400	<400	NA			
LEPH	200-480	<550	<600	NA	<820	<840	NA	<200	<200	NA	-	-	-			
HEPH	200-480	<550	<600	NA	<820	<840	NA	<200	<200	NA	-	-	-			
POLYCYCLIC AROMATIC HYDROCARBONS																
Acenaphthene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.0050	<0.0050	NA	<0.050	<0.050	NA			
Acenaphthylene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.0050	<0.0050	NA	<0.050	<0.050	NA			
Anthracene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.0040	<0.0040	NA	<0.050	<0.050	NA			
Benz(a)anthracene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.010	<0.010	NA	<0.050	<0.050	NA			
Benzo(a)pyrene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.010	<0.010	NA	<0.050	<0.050	NA			
Benzo(b)fluoranthene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.010	<0.010	NA	<0.050	<0.050	NA			
Benzo(g,h,i)perylene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.010	<0.010	NA	<0.050	<0.050	NA			
Benzo(k)fluoranthene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.010	<0.010	NA	<0.050	<0.050	NA			
Chrysene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.010	<0.010	NA	<0.050	<0.050	NA			
Dibenz(a,h)anthracene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.0050	<0.0050	NA	<0.050	<0.050	NA			
Fluoranthene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.010	<0.010	NA	<0.050	<0.050	NA			
Fluorene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.010	<0.010	NA	<0.050	<0.050	NA			
Indeno(1,2,3-c,d)pyrene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.010	<0.010	NA	<0.050	<0.050	NA			
2-Methylnaphthalene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.010	<0.010	NA	<0.050	<0.050	NA			
Naphthalene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.010	<0.010	NA	<0.050	<0.050	NA			
Phenanthrene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.010	<0.010	NA	<0.050	<0.050	NA			
Pyrene (mg/kg)	0.005-0.10	<0.14	<0.15	NA	<0.050	<0.050	NA	<0.010	<0.010	NA	<0.050	<0.050	NA			
d10-Acenaphthene (%)		90	102	-13	92	91	1.1	81	88	-8.3	-	-	-			
d12-Chrysene (%)		81	83	-2.4	80	68	16	83	80	3.7	-	-	-			
d8-Naphthalene (%)		95	103	-8.1	89	86	3.4	79	84	-6.1	-	-	-			
d10-Phenanthrene (%)		92	93	-1.1	89	79	12	85	86	-1.2	-	-	-			

Table 3-2. QA/QC data for sediment parameters, Meadowbank study lakes and Baker Lake, August 2010.

Analytes	Second Portage Lake			Wally Lake			Baker Lake			Various Lakes			Swipe-1	Swipe-2	Swipe-3		
	MDLs	SP-1	Field Dup-1	RPD	WAL-2	Field Dup-2	RPD	BAP-1	Field Dup-3	RPD	Original	Laboratory Duplicate	RPD	QA/QC FILTER	QA/QC FILTER	QA/QC FILTER	
		21-Aug-10	21-Aug-10	(%)	23-Aug-10	23-Aug-10	(%)	30-Aug-10	30-Aug-10	(%)	August		(%)	21-Aug-10	23-Aug-10	30-Aug-10	
TOTAL METALS (mg/kg dw)													MDLs (ug)	TOTAL METALS (ug)			
Aluminum	50	33600	33100	1.50	22700	22100	2.68	-	-	-	20100	19300	4.06	20	<20	41	<20
Antimony	10	<10	<10	NA	<10	<10	NA	<10	<10	NA	<10	<10	NA	20	<20	<20	<20
Arsenic	5.0	36.2	36.7	-1.37	29.6	29.3	1.02	<5.0	<5.0	NA	15.7	16.7	-6.17	20	<20	<20	<20
Barium	1.0	148	147	0.68	140	136	2.90	232	273	-16.2	80.2	77.1	3.94	1.0	<1.0	<1.0	<1.0
Beryllium	0.50	2.52	2.55	-1.18	1.66	1.64	1.21	<0.50	<0.50	NA	1.78	1.72	3.43	0.50	<0.50	<0.50	<0.50
Cadmium	0.50	0.72	0.74	-2.74	1.47	1.47	0	<0.50	<0.50	NA	<0.50	<0.50	NA	1.0	<1.0	<1.0	<1.0
Chromium	2.0	93.7	95.0	-1.38	62.5	61.7	1.29	15.6	15.8	-1.27	51.1	48.7	4.81	2.0	4.2	<2.0	3.6
Cobalt	2.0	17.8	17.8	0	11.5	11.4	0.87	3.8	3.8	0	8.0	8.0	0	1.0	<1.0	<1.0	<1.0
Copper	1.0	107	109	-1.85	163	158	3.12	4.5	4.6	-2.20	49.9	49.4	1.01	1.0	<1.0	<1.0	<1.0
Lead	30	<30	<30	NA	40	41	-2.47	<30	<30	NA	<30	<30	NA	5.0	<5.0	<5.0	<5.0
Mercury	0.0050	0.0326	0.0313	4.07	0.0612	0.0603	1.48	<0.0050	<0.0050	NA	0.0171	0.017	0.59	-	-	-	-
Molybdenum	4.0	7.9	8.0	-1.3	7.9	7.7	2.6	<4.0	<4.0	NA	<4.0	<4.0	NA	3.0	<3.0	<3.0	<3.0
Nickel	5.0	76.9	77.4	-0.65	55.6	54.6	1.8	7.6	7.9	-3.9	33	32	1.9	5.0	<5.0	<5.0	<5.0
Selenium	2.0	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<0.50	<0.50	NA	20	<20	<20	<20
Silver	2.0	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<2.0	NA	1.0	<1.0	<1.0	<1.0
Thallium	1.0	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	20	<20	<20	<20
Tin	5.0	<5.0	<5.0	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	<5.0	<5.0	NA	3.0	<3.0	<3.0	<3.0
Uranium (sed.) / Titanium (swipe)	0.050	25.1	25.0	0.40	17.1	18.1	-5.68	1.16	1.18	-1.71	16.0	15.4	3.82	1.0	<1.0	1.5	<1.0
Vanadium	2.0	46.6	46.2	0.86	30.9	30.5	1.30	16.7	17.7	-5.81	32.5	31.6	2.81	3.0	<3.0	<3.0	<3.0
Zinc	1.0	139	140	-0.72	158	157	0.63	19.2	19.4	-1.04	86.7	86.2	0.58	0.50 - 0.90	<0.70	1.04	<0.90

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.

Shaded RPDs exceed 25% (lab duplicates) or 50% (field duplicates).

Bolded filter swipes exceed laboratory method detection limits, but < 10 x MDL.

Each of the 'Field Dup' samples are homogenization duplicates - the original and duplicate samples were split from the same homogenized bowl of sediment.

NA = RPDs have not been calculated for cases where one of the samples is below detection and the other is not and in cases where both are below detection.

Table 3-3. QA/QC data for phytoplankton, Meadowbank study lakes and Baker Lake, 2010.

	Second Portage Lake			Second Portage Lake			Third Portage Lake			Third Portage Lake		
	SP-15-S 15-Jan-10	Jan. Field Duplicate-1	RPD (%)	SP-18-S 26-Feb-10	Feb. Field Duplicate-1	RPD (%)	TPN-20-S 20-Mar-10	Mar. Field Duplicate-1	RPD (%)	TPE-22-S 10-Apr-10	Apr. Field Duplicate-1	RPD (%)
Phytoplankton Density (cells/L)												
Cyanophyte	5746	3513	48	0	0	0	0	0	0	0	0	0
Chlorophyte	11652	37429	-105	11492	20271	-55	181159	92176	65	14365	24104	-51
Euglenophyte	0	0	0	0	0	0	0	0	0	0	0	0
Chrysophyte	758552	752726	1	295919	350586	-17	770524	572207	30	245485	271102	-10
Diatom	110374	187465	-52	0	5746	NA	5826	160	189	2873	0	NA
Cryptophyte	86764	80931	7	27544	28257	-3	44375	45415	-2	103908	86670	18
Dinoflagellate	0	160	NA	640	960	-40	480	720	-40	1440	1200	18
Total	973088	1062224	-9	335595	405820	-19	1002364	710678	34	368071	383076	-4
Phytoplankton Biomass (mg/m³)												
Cyanophyte	0.4	0.3	31	0	0	0	0	0	0	0	0	0
Chlorophyte	0.3	1.9	-137	1.1	0.8	26	1	2	-57	1	3	-119
Euglenophyte	0	0	0	0	0	0	0	0	0	0	0	0
Chrysophyte	21	21	-1	12	29	-85	22	19	11	12	14	-17
Diatom	4	6	-41	0	0.3	NA	0.3	0.2	29	0.05	0	NA
Cryptophyte	20	14	39	11	7	44	8	9	-8	14	12	16
Dinoflagellate	0	0.2	NA	1	1	-36	2	3	-40	2	1	12
Total	46	44	6	25	38	-44	33	33	0	28	30	-8
# Species	20	21	-4.9	12	16	-29	17	17	0	14	14	0
Simpsons Diversity	0.68	0.70	-3.5	0.74	0.72	1.8	0.69	0.72	-4.3	0.72	0.75	-3.9

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.

Shaded RPDs exceed 50% (field duplicates) or 25% (lab duplicates).

NA = Not Applicable for rare species.

Table 3-3. QA/QC data for phytoplankton, Meadowbank study lakes and Baker Lake, 2010.

	Second Portage Lake			Third Portage Lake			Pipedream Lake			Second Portage Lake		
	SP-25-S	May Field	RPD	TPN-26-S	July Field	RPD	PDL-9-S	July Field	RPD	SP-29-S	Aug. Field	RPD
	20-May-10	Duplicate-1	(%)	17-Jul-10	Duplicate-1	(%)	21-Jul-10	Duplicate-3	(%)	21-Aug-10	Duplicate-1	(%)
Phytoplankton Density (cells/L)												
Cyanophyte	0	0	0	2000	0	NA	0	0	0	21552	0	NA
Chlorophyte	30890	16525	61	80024	231088	-97	80224	188384	-81	690264	984608	-35
Euglenophyte	0	0	0	0	0	0	0	0	0	0	0	0
Chrysophyte	1106105	1051518	5	675696	1266584	-61	2206904	1268800	54	1187560	1258600	-6
Diatom	0	0	0	28736	22152	26	120344	113760	6	245456	246056	0
Cryptophyte	79251	64406	21	38520	51088	-28	47304	62072	-27	26568	54888	-70
Dinoflagellate	800	720	11	1400	11184	-155	2400	10384	-125	22352	7984	95
Total	1217046	1133169	7	826376	1582096	-63	2457176	1643400	40	2193752	2552136	-15
Phytoplankton Biomass (mg/m³)												
Cyanophyte	0	0	0	0	0	0	0	0	0	6.2	0	NA
Chlorophyte	0.4	0.3	20	1	3	-104	2	5	-77	13	16	-18
Euglenophyte	0	0	0	0	0	0	0	0	0	0	0	0
Chrysophyte	77	64	17	42	76	-57	186	105	56	79	71	11
Diatom	0	0	0	1	2	-37	9	7	24	7	7	-2
Cryptophyte	9	7	22	7	4	45	8	11	-33	12	7	54
Dinoflagellate	3	2	27	10	21	-67	18	24	-29	17	5	104
Total	89	74	18	62	106	-52	223	152	38	135	106	24
# Species	20	17	16	24	31	-25	35	31	12	34	33	3.0
Simpsons Diversity	0.75	0.73	2.6	0.81	0.75	7.5	0.76	0.84	-9.1	0.86	0.86	-0.1

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.

Shaded RPDs exceed 50% (field duplicates) or 25% (lab duplicates).

NA = Not Applicable for rare species.

Table 3-3. QA/QC data for phytoplankton, Meadowbank study lakes and Baker Lake, 2010.

	Pipedream Lake			Baker Lake			Tehek Lake			Third Portage Lake		
	PDL-13-S	Sept. Field	RPD	BAP-12-S	Sept. Field	RPD	TE-17-S	Lab	RPD	TPN-18-S	Lab	RPD
	22-Sep-10	Duplicate-2	(%)	27-Sep-10	Duplicate-4	(%)	16-Jan-10	Duplicate	(%)	25-Feb-10	Duplicate	(%)
Phytoplankton Density (cells/L)												
Cyanophyte	400	10584	-185	7184	7184	0	0	0	0	0	0	0
Chlorophyte	204352	160048	24	553568	223104	85	60493	74778	-21	240	160	40
Euglenophyte	0	0	0	0	0	0	0	0	0	0	0	0
Chrysophyte	1949264	2324832	-18	1099752	1027912	7	551616	522886	5	368784	271102	31
Diatom	314112	283976	10	323272	192696	51	38549	35516	8	15005	17718	-17
Cryptophyte	108960	95392	13	368184	441224	-18	72239	64580	11	98882	78851	23
Dinoflagellate	166632	11384	174	600	8184	-173	1760	1600	10	960	1360	-34
Total	2743720	2886216	-5	2352560	1900304	21	724657	699360	4	483871	369191	27
Phytoplankton Biomass (mg/m³)												
Cyanophyte	0.10	1.0	-165	0.36	0.36	0	0	0	0	0	0	0
Chlorophyte	3	4	-35	11	8	32	0.9	0.7	24	0.2	0.1	40
Euglenophyte	0	0	0	0	0	0	0	0	0	0	0	0
Chrysophyte	118	152	-25	66	73	-10	33	35	-8	10	10	-2
Diatom	22	16	33	49	20	85	2	2	-2	2	1	15
Cryptophyte	10	7	39	44	59	-28	19	20	-5	14	12	16
Dinoflagellate	56	38	38	3	5	-32	3	4	-18	1	2	-46
Total	209	218	-4	174	165	5	58	62	-7	28	26	5
# Species	38	40	-5.1	34	40	-16	21	21	0	14	13	7.4
Simpsons Diversity	0.85	0.85	-0.6	0.89	0.88	1.2	0.78	0.82	-4.2	0.64	0.71	-10.2

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.

Shaded RPDs exceed 50% (field duplicates) or 25% (lab duplicates).

NA = Not Applicable for rare species.

Table 3-3. QA/QC data for phytoplankton, Meadowbank study lakes and Baker Lake, 2010.

	Third Portage Lake			Third Portage Lake			Second Portage Lake		
	TPN-20-S 20-Mar-10	Lab Duplicate	RPD (%)	TPS-16-S 10-Apr-10	Lab Duplicate	RPD (%)	May DUP-1 20-May-10	Lab Duplicate	RPD (%)
Phytoplankton Density (cells/L)									
Cyanophyte	0	0	0	0	0	0	0	0	0
Chlorophyte	181159	126412	36	8619	5746	40	16525	42302	-88
Euglenophyte	0	0	0	0	0	0	0	0	0
Chrysophyte	770524	701652	9	337501	331915	2	1051518	1057264	-1
Diatom	5826	5826	0	0	0	0	0	0	0
Cryptophyte	44375	42062	5	81724	87150	-6	64406	49801	26
Dinoflagellate	480	240	67	1440	1440	0	720	720	0
Total	1002364	876192	13	429284	426251	1	1133169	1150087	-1
Phytoplankton Biomass (mg/m³)									
Cyanophyte	0	0	0	0	0	0	0	0	0
Chlorophyte	0.9	0.5	52	0.4	0.2	67	0.3	0.5	-41
Euglenophyte	0	0	0	0	0	0	0	0	0
Chrysophyte	22	20	8	12	13	-6	64	68	-5
Diatom	0.3	0.3	-3	0	0	0	0	0	0
Cryptophyte	8	9	-4	12	12	3	7	7	-7
Dinoflagellate	2	0.9	67	2	2	0	2	2	0
Total	33	30	8	26	26	-1	74	78	-5
# Species	17	16	6.1	13	13	0	17	17	0
Simpsons Diversity	0.69	0.68	0.4	0.67	0.68	-0.9	0.73	0.74	-2.2

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.

Shaded RPDs exceed 50% (field duplicates) or 25% (lab duplicates).

NA = Not Applicable for rare species.

Table 3-3. QA/QC data for phytoplankton, Meadowbank study lakes and Baker Lake, 2010.

	Second Portage Lake			Third Portage Lake			Third Portage Lake		
	SP-27-S 17-Jul-10	Lab Duplicate	RPD (%)	TPE-29-S 18-Aug-10	Lab Duplicate	RPD (%)	TPS-24-S 17-Sep-10	Lab Duplicate	RPD (%)
Phytoplankton Density (cells/L)									
Cyanophyte	0	0	0	7184	0	200	11384	10984	4
Chlorophyte	189584	196168	-3	136896	187384	-31	570936	591488	-4
Euglenophyte	0	0	0	0	0	0	0	0	0
Chrysophyte	1736944	1801000	-4	814192	808008	1	978624	1014744	-4
Diatom	144896	180416	-22	297344	317896	-7	311912	290760	7
Cryptophyte	91808	84624	8	75056	61488	20	61872	62472	-1
Dinoflagellate	24752	60672	-84	16968	23952	-34	800	600	29
Total	2187984	2322880	-6	1347640	1398728	-4	1935528	1971048	-2
Phytoplankton Biomass (mg/m³)									
Cyanophyte	0	0	0	0.72	0	NA	2.0	1.6	23
Chlorophyte	1	2	-36	6	7	-3	13	12	9
Euglenophyte	0	0	0	0	0	0	0	0	0
Chrysophyte	118	117	1	71	75	-5	61	65	-6
Diatom	5	7	-30	10	11	-7	27	29	-7
Cryptophyte	13	14	-2	18	17	3	9	11	-21
Dinoflagellate	29	44	-42	20	21	-5	3	3	12
Total	166	183	-10	126	131	-3	115	121	-5
# Species	33	35	-5.9	28	30	-6.9	40	40	0
Simpsons Diversity	0.69	0.74	-6.8	0.84	0.85	-2.1	0.90	0.91	-0.2

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.

Shaded RPDs exceed 50% (field duplicates) or 25% (lab duplicates).

NA = Not Applicable for rare species.

Table 3-4. Percent recovery of benthic invertebrate samples, Meadowbank study lakes and Baker Lake, August 2010.

Station	Number of Organisms Recovered	Number of Organisms in Re-sort	Percent Recovery
BBD-3	132	133	99.2%
INUG-1	24	24	100.0%
PDL-3	75	76	98.7%
SP-5	24	24	100.0%
TPN-4	55	56	98%
TPS-2	104	104	100%
<i>Average % Recovery</i>			99.4%

Notes:

All sixty samples were sorted in their entirety.

BAP-1, BAP-2, BAP-3 contained large amounts of algae.



3.2. Limnology and Water Chemistry

3.2.1. Meadowbank Study Lakes

Limnology

Throughout this discussion, the following abbreviations will be used for each lake station/basin: Third Portage Lake –East, –North, –South basins (TPE, TPN, TPS respectively); Second Portage Lake (SP); Tehek Lake and Tehek Farfield (TE, TEFF respectively); Inuggugayualik Lake (INUG); Wally Lake (WAL); and Pipedream Lake (PDL).

Vertical temperature and dissolved oxygen profiles of all lakes and seasons were isothermal with little evidence of stratification (**Figures 3-1 to 3-9**). This is consistent with observations from previous years (Azimuth, 2010a, 2009a, 2008a, 2008b). Typically, ice-off on the lakes occurs during the second week of July and water temperatures on the lakes are cold, ranging from 4–6°C. Generally, water temperatures at Meadowbank increased through the summer open water season, followed by cooling in the fall. Typically the lakes do not become stratified by more than two or three degrees for more than a few days (e.g., July at TPE, TEFF, and INUG; see **Figures 3-1, 3-6, 3-7**). However, the profile in TE in July was stratified, with a temperature difference of almost 8 degrees between the surface and 6 m deep (**Figure 3-5**). This profile was not evident several weeks later. Moderately strong and prolonged winds in this area are usually sufficient to prevent stratification except for brief periods during summer when warm, calm days occur; however, these conditions usually do not persist for more than 3-4 days. During winter, maximum ice thickness is about 2 m and there is a slight inverse stratification in temperature with temperatures around 0°C at ice-water interface, but increasing to 2–4°C depending on the lake basin (larger deeper basins are warmer – e.g., TPS, while smaller shallower basins are colder – e.g., Wally, TPE).

During the open water season, dissolved oxygen concentrations were relatively high and closely related to temperature and were always near full saturation. During winter months, lake water temperatures were much colder with correspondingly higher dissolved oxygen concentrations (see **Figures 3-1 to 3-5**). Given the moderately high oxygen concentrations even in late winter these data indicate that there is very little oxygen depletion within the lakes under ice.

Maximum water temperature varied among lakes and was primarily related to water depth and volume of water in the basin being measured. For example, water temperatures during the open water season at Meadowbank were lowest in the large, deep, south basin

of Third Portage Lake (**Figure 3-3**) in the spring ($\sim 3.5^{\circ}\text{C}$) and remained below 10°C through September in this basin. Likewise, Wally Lake being the shallowest of the Meadowbank study lakes, showed the warmest water temperatures. Wally Lake temperatures reached 13°C in spring (July) but dropped back to 10.5°C by August and then to 6°C by September (**Figure 3-8**). Maximum lake temperatures were probably missed because of the gap in sampling between mid-July at ice-off and late August when the water begins to cool. However, this is fairly typical for Wally Lake; summer maxima in previous years have ranged from 10°C in July (2009) to 15°C in July (2008) (Azimuth, 2010a, 2009a).

Water Chemistry

Conventional water quality parameters, nutrients and metals are shown in **Table 3-5** and screened against CCME guidelines (2007), as described in **Section 2.3**. Since there are no CCME guidelines for dissolved metals we have screened the dissolved metals against total metals guidelines.

The pH of open surface waters was around neutral, ranging from 6.2–7.4, with the exception of one sample in each of the Third Portage basins (pH ranged from 8.0–8.9). These are likely false measurements considering that TPE in all other months averaged $\sim \text{pH } 7$. Conductivity was lowest in TPS (14.0–19.1 $\mu\text{S}/\text{cm}$), INUG (14.2–14.6 $\mu\text{S}/\text{cm}$), and TEFF (12.6–16.6 $\mu\text{S}/\text{cm}$) and somewhat higher in SP (21.0–27.8 $\mu\text{S}/\text{cm}$), TE (18.1–29.4 $\mu\text{S}/\text{cm}$) and WAL (26.8–28.9 $\mu\text{S}/\text{cm}$) lake stations. Overall, values were low and fairly consistent within lakes, which is to be expected, except where there may have been anthropogenic influences, such as in TPE as a result of dike construction.

Total suspended solids (TSS) in surface waters were consistently near or below detection ($<1.0 \text{ mg}/\text{L}$) in all far-field and reference lake stations, which is consistent with work in previous years (Azimuth, 2010a, 2009a, 2008a). TSS in TPE was $1.9 \text{ mg}/\text{L}$ in mid-July, increased to $4.1 \text{ mg}/\text{L}$ by mid-August (also correlated with turbidity values), then decreased again in September ($1.1 \text{ mg}/\text{L}$). The elevated suspended concentrations of solids in the east basin are a result of introductions of suspended sediment due to construction of the Bay-Goose Dike. Construction of the north half of the Goose Island dike that connected the north shore and Goose Island was initiated on 27 July 2009 and completed during the fall. Despite installation of silt curtains, released some sediment to the lake. These suspended solids became dispersed by wind and were eventually transported throughout much of the east basin of Third Portage Lake and into discrete locations in Second Portage Lake in 2009 (Azimuth, 2010b).

In winter 2010, the second half of the dike connecting the south end of Goose Island to the mainland west of the island began with installation of a narrow causeway that was constructed through the ice. As discussed in **Section 1.4** this causeway was designed to act as a barrier against excessive introductions to TPE during dike construction on the

inside of the causeway during the open water season. A full description of dike construction methods and monitoring is provided in the 2010 Dike Construction Monitoring report (AEM, 2011). TSS concentrations in the east basin were much higher closer to the Bay-Goose dike. More details on the extent and magnitude of elevated TSS in Third Portage Lake, as well as the ecological significance of the sediment inputs, are discussed within the 2009 dike construction monitoring and the 2009 and 2010 EAS reports (Azimuth, 2010b, 2010c, 2011b).

Total dissolved solids (TDS) concentration were of a similar magnitude in SP (up to 19 mg/L in winter), TE (up to 23 mg/L in January), and WAL (up to 24 mg/L in September) and up to 16 mg/L in TPN. TDS concentrations were near or below detection (<10 mg/L) for the larger, deeper lake basins, namely TEFF, INUG, TPS, and PDL.

Nutrient concentrations (nitrogen, phosphorus) in the Meadowbank study lakes were low, generally close to laboratory detection limits and did not appear to differ appreciably within or among lakes and seasons but were, in a few cases, higher than those measured in 2009 (e.g., in 2009 nitrate did not exceed 0.035 mg/L). Some stations showed detectable levels of nitrogen, although did not exceed guidelines: TPE in July (nitrate up to 0.06 mg/L), and SP (nitrate up to 0.03 mg/L) and TE (nitrate up to 0.03 mg/L) during late winter. Total phosphorus concentrations exceeded guidelines for oligotrophic lakes in TPE (concentrations above detection ranged from 0.0020–0.0040 mg/L), TPN (0.0021–0.0136 mg/L), TE (0.0022–0.0044 mg/L), SP (0.0027–0.0433 mg/L), and INUG (0.0026–0.0104 mg/L). Total and dissolved organic carbon (TOC, DOC) ranged from 0.92–2.06 mg/L and 0.89–2.08 mg/L in the Meadowbank lakes, respectively.

Chlorophyll- α concentrations during through-ice events typically ranged from 0.1–0.6 $\mu\text{g/L}$. In general, chlorophyll- α concentrations increased from around 0.2 $\mu\text{g/L}$ in winter under ice to 0.4 $\mu\text{g/L}$ in July at ice-off and reaching summer maxima of between 0.6 $\mu\text{g/L}$ and 0.8 $\mu\text{g/L}$ in August (**Figure 3-13**). The two exceptions to this pattern were for (1) TPS in July (0.1 $\mu\text{g/L}$) but TPS increased to 0.6 $\mu\text{g/L}$ by August, and (2) TEFF in July (0.1 $\mu\text{g/L}$) which was still mostly covered by a thin layer of ice in July. This result is also a reflection in the natural heterogeneity of phytoplankton biomass, especially in the less productive TPS basin. Typically, oligotrophic lakes have chlorophyll- α concentrations of less than 1 $\mu\text{g/L}$ (Wetzel, 1983), so these data are consistent with very nutrient poor, low productivity lakes and are similar to ranges in chlorophyll- α seen in previous years.

Inter-annual differences in chlorophyll- α are also apparent. For example, looking at mid-July data for Second Portage and Tehek lakes each year from 2006 to 2010, chlorophyll- α concentrations in SP were 0.19 $\mu\text{g/L}$ – 0.60 $\mu\text{g/L}$ – 0.34 $\mu\text{g/L}$ – 0.77 $\mu\text{g/L}$ – 0.76 $\mu\text{g/L}$; and in TE were 0.13 $\mu\text{g/L}$ – 0.46 $\mu\text{g/L}$ – 0.31 $\mu\text{g/L}$ – 0.59 $\mu\text{g/L}$ – 0.42 $\mu\text{g/L}$. Potential changes in chlorophyll- α and nutrient concentrations will be examined in greater detail in the CREMP design (Azimuth, 2011a *in progress*).



Total and dissolved metals concentrations measured in 2010 from surface waters were consistently low among the project lakes (**Table 3-5**). Similar to previous years, most metals were below laboratory detection limits (DLs). Some metals that were detectable and occasionally above guidelines are discussed below.

The concentrations of common salts (calcium, magnesium, and manganese) exceeded DLs, but were always low in concentration. Concentrations of “total” fractions (i.e., unfiltered) were similar to the “dissolved” fractions (i.e., filtered) for these salts, which is to be expected. Dissolved concentrations of all other metals (where detectable) were always much lower than total metals concentrations, indicating that metals are bound to very fine particles in the water column.

Only a few metals (arsenic, iron, lead, nickel, mercury, titanium, uranium) exceeded DLs with some (aluminum, chromium, copper) exceeding the CCME (2007) guideline for protection of aquatic life (**Table 3-5**). Aluminum was almost always detectable and exceeded guidelines in a few lakes. Most notably, aluminum in TPE in August reached 0.21 mg/L (which is 2x the 0.10 mg/L guideline for this sample; note that aluminum guideline is pH dependent). This result is likely related to the elevated TSS concentration (4.1 mg/L) that was also measured in TPE in August, originating from sediment released into the east basin during the construction of the Bay-Goose dike. Total aluminum at some other lake stations (TPS, SP, and INUG) had concentrations just slightly above their guideline. However, last year aluminum reached >5x guideline (0.57 mg/L) in TPE in September, but did not exceed for any other lake stations (Azimuth, 2010a).

Five other metals were also only detectable in TPE, again related to the higher sediment load in this basin that was related to active construction on the Bay-Goose dike during the open-water period. Arsenic was above detection (i.e., >0.00050 mg/L) from May to September (0.00053–0.00081 mg/L), peaking in August, but about 10x below the guideline (0.0050 mg/L). The chromium guideline is equal to the laboratory detection limit (0.0010 mg/L), thus any sample which is detectable exceeds the guideline. Such was the case for TPE in July (0.0010 mg/L) and August (0.0013 mg/L). Nickel, titanium, and uranium were only detected in the August sample from TPE. Titanium (0.010 mg/L) was measured at its detection limit and both nickel (0.0012 mg/L) and uranium (0.00022 mg/L) were slightly above their DLs.

Copper was detectable in a few cases and was 10x guideline (0.0020 mg/L) on only one occasion (0.0219 mg/L from TE in April; given this is under-ice and far from the mine, this result is unexplained). Iron was detectable in TPE, SP and TE but did not exceed the 0.3 mg/L guideline in any of those cases. The highest iron concentration (0.283 mg/L) was measured in August from TPE, perhaps again related to TSS.

Lead was detectable (0.00061 mg/L) in only one sample from TPS, which appears to be a sporadic case. Oddly, mercury concentrations were detected in August samples at both

TE (11 ng/L) and INUG (14 ng/L; the DL for mercury is 10 ng/L) but still well below the CCME guideline of 26 ng/L. Mercury has never been detectable in the Meadowbank lakes since routine monitoring began in 2006 (Azimuth, 2010a, 2009a, 2008a, 2008b). In remote Arctic lakes mercury concentrations in water typically do not exceed 1.0 ng/L. The values of 11 ng/L and 14 ng/L are unusual and are likely due to contamination of the sample. This will be followed up on in 2011 monitoring.

Cadmium and zinc concentrations have exceeded guidelines sporadically in previous years (e.g., Azimuth, 2010a) but were both below detection for all stations in 2010.

Limnological data, conventional water quality parameters, chlorophyll- α and nutrient concentrations indicate that the Meadowbank study lakes are ultra-oligotrophic (i.e., clear, nutrient poor) with very low productivity. Lake waters are mainly neutral pH, soft (i.e., low hardness), and well mixed throughout the open water season with high oxygen concentration, and low turbidity which is consistent with previous work and with the remote, pristine nature of these headwater lakes. Recent development, especially dike construction has had some effects on the water quality of the lakes in close proximity to these developments (see Azimuth, 2010b, 2010c for more details).

In both 2009 and 2010, a large number of extra samples were collected to target better characterization of temporal and spatial (horizontal and vertical) variability. Statistical analyses are being conducted on these data to determine which components and how much replication are necessary in order to detect effects (i.e., power analysis). The results of these analyses will be used to make changes to the program design, helping to streamline future sampling. Any changes that are implemented will also take into consideration plans for dike construction and other mining-related activities. It has not yet been determined what changes will be made for 2011; this will be discussed in more detail in the CREMP design (Azimuth, 2011a *in progress*).

3.2.2. Baker Lake

Note that the abbreviations for each lake station/basin will be used in following results sections: Baker Lake –Barge Dock, –Proposed Jetty, –Akilahaarjuk Point (BBD, BPJ, BAP).

Generally, water temperatures in Baker Lake were warmest in spring and cooled down in August and further in September (**Figures 3-10 to 3-12**). Some stratification was observed in Baker Lake which has not been previously been documented (Azimuth, 2010a, 2009a). For example, in July at BAP temperatures dropped by 7 degrees and in August at BPJ by 5 degrees from surface to the depth of the profile (18–20 m). The dissolved oxygen concentrations were relatively similar between months and stations, ranging from about 10–14 mg/L.



The natural variability of many of the water quality parameters in Baker Lake are likely related to the influence of wind-driven vertical mixing and inflow from the Thelon River, just east of Baker Lake. Because the sampling stations are situated relatively close to shore, water from the Thelon River could be moving west along shore causing mixing.

Conventional water quality parameters, nutrients and metals are also shown for Baker Lake in **Table 3-5** and screened against CCME guidelines (2007). Many conventional water chemistry parameters from Baker Lake were clearly different from the Meadowbank study lakes. These differences are explored below.

The range of pH in Baker Lake was similar that in the Meadowbank study lakes and also showed a trend for all 3 stations between months – lowest pH in July, followed by September, and then highest pH in August. Conductivity in Baker Lake did not vary too much in July (22.9–33.6 $\mu\text{S}/\text{cm}$) or September (408–550 $\mu\text{S}/\text{cm}$), whereas in August the range was much wider (78.0–695 $\mu\text{S}/\text{cm}$). Field data show that conductivity profiles in August varied just as widely at each station from surface to depth (e.g., conductivity was measured at 38.1 $\mu\text{S}/\text{cm}$ on the water's surface at BPJ-11 and continually increased to 562 $\mu\text{S}/\text{cm}$ by 20m depth). At these locations conductivity can be significantly lowered by influence of the nearby Thelon River (low conductivity) depending on spring flow and wind direction, so variability in conductivity is to be expected.

While total suspended solids in surface waters were consistently low (<1.0 mg/L) at all stations, total dissolved solids (15–319 mg/L), chloride (1.60–146 mg/L) and sulfate (0.62–21.0 mg/L) varied substantially and were very closely related to conductivity patterns in these surface waters and were influenced by inflow from the Thelon River or by Baker Lake water that is naturally higher in these parameters.

Ammonia concentrations were low and generally close to laboratory detection limits in both July and August samples but were about 2x higher in the September samples. Interestingly, the opposite was measured for phosphate concentrations; July and August samples exceeded guidelines and September samples were below detection limits. However, nutrient levels appear to be similar to those measured in previous years for Baker Lake (Azimuth, 2010a, 2009a). Anions, chloride, and sulfate concentrations also varied among stations and seasons, and were related to hardness and conductivity. Dissolved and total organic carbon did not vary much among stations or seasons, ranging from 2.07–3.33 mg/L and 2.12–3.53 mg/L, respectively.

Chlorophyll- α concentrations in Baker Lake are typically about 3x those measured in the Meadowbank study lakes and ranged from 0.51–1.84 $\mu\text{g}/\text{L}$, which is consistent with results from previous years (Azimuth, 2010a, 2009a). Also similar to last year, chlorophyll- α concentrations peaked in July and slowly decreased through September.

Total and dissolved metals concentrations measured in Baker Lake were consistently low, and similar to previous years, most metals were below laboratory detection limits (DLs)



(**Table 3-5**). The concentrations of common salts (calcium, magnesium, manganese, potassium, and sodium) exceeded DLs, and despite being higher than those measured in the Meadowbank lakes, were still relatively low in concentration. Concentrations of “total” fractions (i.e., unfiltered) were similar to the “dissolved” fractions (i.e., filtered) for these salts, which is to be expected. Dissolved concentrations of all other metals (where detectable) were usually much lower than total metals concentrations, indicating that metals are bound to fine particles in the water column.

Aluminum was the only other detectable metal in Baker Lake but concentrations did not exceed guidelines (CCME, 2007). Aluminum concentration reached 0.022 mg/L in July at BAP, which is relatively low (i.e., 10x lower than that measure in TPE). The July BAP sample also had the only slightly detectable TSS concentration.

Table 3-5. Conventional water chemistry and total and dissolved metals (mg/L), Meadowbank study lakes and Baker Lake, 2010.

Lake & Station		East (TPE)										Third Portage Lake North (TPN)					
Station ID		TPE-15	TPE-18	TPE-19	TPE-22	TPE-23	TPE-26	TPE-29	TPE-30	TPN-15	TPN-18	TPN-19	TPN-22	TPN-23	TPN-26	TPN-29	TPN-30
Depth (m)	CCME (2007)	2.5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Date	Guideline ¹	18-Jan-10	25-Feb-10	23-Mar-10	10-Apr-10	20-May-10	16-Jul-10	18-Aug-10	19-Sep-10	19-Jan-10	24-Feb-10	20-Mar-10	10-Apr-10	22-May-10	17-Jul-10	19-Aug-10	17-Sep-10
CONVENTIONAL PARAMETERS																	
Physical Tests																	
Conductivity (µS/cm)	NG	18.2	21.7	20.0	20.4	19.8	16.8	18.9	19.2	18.3	18.4	20.7	17.3	18.4	14.5	15.3	14.4
Hardness (mg/L)	NG	6.6	8.2	7.4	7.7	8.0	7.07	7.32	7.49	6.6	6.5	7.6	6.6	6.9	5.75	5.67	5.89
pH	6.5 - 9.0	6.52	6.76	6.50	6.90	8.85	7.60	6.83	6.67	6.75	8.18	6.51	6.68	6.73	7.44	6.51	7.07
Total Suspended Solids (mg/L)	NG	<1.0	<1.0	<1.0	1.0	<1.0	1.9	4.1	1.1	<1.0	<1.0	<1.0	2.0	<1.0	<1.0	<1.0	<1.0
Total Dissolved Solids (mg/L)	NG	16	14	12	<10	<10	<10	12	15	16	11	16	<10	<10	12	<10	<10
Turbidity (NTU)	NG	1.19	1.92	0.63	1.78	1.71	1.76	4.57	1.68	0.31	0.19	0.20	0.19	0.20	0.23	0.37	0.28
Anions & Nutrients (mg/L)																	
Alkalinity - Bicarbonate (as CaCO ₃)	NG	5.0	6.6	5.4	6.6	15.0	6.0	5.6	5.5	5.3	5.0	5.5	5.4	5.0	4.7	4.3	4.6
Alkalinity - Carbonate (as CaCO ₃)	NG	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity - Hydroxide (as CaCO ₃)	NG	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity - Total (as CaCO ₃)	NG	5.0	6.6	5.4	6.6	15.0	6.0	5.6	5.5	5.3	5.0	5.5	5.4	5.0	4.7	4.3	4.6
Ammonia (as N) ²	0.274 - 81.6	<0.020	<0.020	<0.020	<0.020	<0.010	0.0117	0.0078	0.0085	<0.020	0.0310	<0.020	<0.020	<0.010	<0.0050	<0.0050	<0.0050
Bromide	NG	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride	NG	<0.50	0.63	0.61	0.60	0.50	<0.50	<0.50	<0.50	0.54	0.53	0.62	0.55	<0.50	<0.50	<0.50	<0.50
Fluoride	NG	0.068	0.075	0.072	0.078	0.054	0.057	0.057	0.065	0.048	0.061	0.077	0.067	0.054	0.051	0.048	0.054
Nitrate (as N)	2.9	0.0096	0.0196	0.0159	0.0208	0.0401	0.0558	0.0471	0.0334	0.0052	0.0131	0.0122	0.0140	0.0265	0.0179	<0.0050	<0.0050
Nitrite (as N)	0.06	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	NG	0.068	0.083	0.093	<0.050	<0.050	<0.050	<0.050	0.080	0.120	0.101	0.123	<0.050	0.058	<0.050	0.067	<0.050
Ortho Phosphate (as P)	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010
Total Phosphate (as P)	0.004	0.0022	0.0024	0.0020	0.0029	<0.0020	0.0024	0.0040	0.0023	0.0024	0.0136	<0.0020	0.0026	<0.0020	<0.0020	0.0021	<0.0020
Silicate (as SiO ₂)	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate (SO ₄)	NG	1.66	1.92	1.67	1.74	1.49	1.42	1.52	1.61	1.72	1.72	1.99	1.63	1.62	1.42	1.42	1.52
ORGANIC / INORGANIC CARBON																	
Dissolved Organic Carbon (mg/L)	NG	1.40	1.42	1.39	1.06	0.95	0.89	1.34	1.55	1.51	1.34	1.56	1.07	1.14	0.90	1.37	1.22
Total Organic Carbon (mg/L)	NG	1.75	1.54	1.42	1.07	0.93	0.92	1.27	1.52	1.57	1.47	1.61	1.24	1.19	0.92	1.36	1.49
PLANT PIGMENTS																	
Chlorophyll a - standardized (µg/L)	NG	0.200	0.252	0.178	0.108	0.237	0.411	0.415	0.846	0.108	0.136	0.246	0.305	0.422	0.444	0.453	0.700
TOTAL METALS (mg/L)																	
Aluminum ³	0.005 - 0.100	0.0814	0.1250	0.0394	0.1070	0.0927	0.0891	0.2140	0.1210	0.0094	0.0128	0.0119	0.0093	0.0139	0.0134	0.0147	0.0105
Antimony	NG	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic	0.0050	<0.00050	<0.00050	<0.00050	<0.00050	0.00061	0.00053	0.00081	0.00054	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Barium	NG	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Beryllium	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	NG	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Cadmium*	0.0000026 - 0.000021	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
Calcium	NG	1.52	1.87	1.63	1.74	1.83	1.70	1.79	1.83	1.50	1.54	1.66	1.44	1.60	1.36	1.30	1.41
Chromium ⁴	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	0.0013	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	NG	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper*	0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010
Iron	0.300	0.065	0.113	0.037	0.098	0.101	0.134	0.283	0.138	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Lead*	0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Lithium	NG	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium	NG	0.70	0.83	0.75	0.78	0.80	0.70	0.80	0.77	0.69	0.68	0.74	0.65	0.64	0.57	0.58	0.61
Manganese	NG	0.00142	0.00174	0.00087	0.00157	0.00177	0.00471	0.00642	0.00286	0.00051	0.00056	0.00056	0.00051	0.00100	0.00237	0.00174	0.00163
Mercury	0.000026	<0.000020	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum	0.073	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel*	0.025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Potassium	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Selenium	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Silver	0.00010	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Sodium	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Thallium	0.00080	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	NG	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Titanium	NG	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium	NG	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00022	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Vanadium	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	0.030	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
DISSOLVED METALS (mg/L) ⁵																	
Aluminum ³	0.005 - 0.100	0.0055	0.0098	<0.0050	0.0069	0.0052	0.0234	<0.0050	0.0068	<0.0050	<0.0050	<0.0050	<0.0050	0.0055	0.0060	<0.0050	<0.0050
Antimony	NG	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic	0.0050	<0.00050	<0.00050	<0.00050	<0.00050	0.00057	<0.00050	0.00063	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Barium	NG	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020				

Notes:

¹CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated December 2007.

²Ammonia guidelines are for 10°C and are pH dependent.

123 Shaded concentrations exceed the CCME guideline.

NG = no guideline.

⁴Chromium guideline is for Cr VI.

Italicized numbers are below detection limits.

⁵Guidelines have not yet been made for "Dissolved Metals," thus were screened against CCME guidelines for "Total Metals."

*Cadmium, copper, lead and nickel guidelines are hardness dependent.

Table 3-5. Conventional water chemistry and total and dissolved metals (mg/L), Meadowbank study lakes and Baker Lake, 2010.

Lake & Basin		Tehek Lake								Tehek Farfield			Inuggugayualik Lake		
Station ID		TE-16	TE-18	TE-19	TE-22	TE-23	TE-26	TE-29	TE-30	TEFF-8	TEFF-11	TEFF-12	INUG-14	INUG-17	INUG-18
Depth (m)	CCME (2007)	2.5	3	3	3	3	3	3	3	3	3	3	3	3	3
Date	Guideline ¹	16-Jan-10	26-Feb-10	21-Mar-10	9-Apr-10	21-May-10	20-Jul-10	28-Aug-10	21-Sep-10	20-Jul-10	28-Aug-10	21-Sep-10	22-Jul-10	25-Aug-10	23-Sep-10
CONVENTIONAL PARAMETERS															
Physical Tests															
Conductivity (µS/cm)	NG	29.4	28.1	29.4	26.0	25.0	19.5	18.1	16.1	16.6	12.6	15.1	14.2	14.6	14.2
Hardness (mg/L)	NG	11.6	11.0	11.9	11.3	10.4	8.00	6.56	6.25	6.34	5.36	5.46	5.10	5.12	5.30
pH	6.5 - 9.0	7.33	6.75	7.05	6.93	7.00	6.85	7.02	6.79	6.76	6.97	6.76	6.73	6.99	6.49
Total Suspended Solids (mg/L)	NG	<1.0	<1.0	1.1	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Dissolved Solids (mg/L)	NG	23	17	17	15	18	<10	10	<10	<10	<10	<10	13	10	<10
Turbidity (NTU)	NG	0.85	0.65	0.43	0.77	0.56	0.51	0.43	0.30	0.31	0.37	0.30	0.27	0.46	0.26
Anions & Nutrients (mg/L)															
Alkalinity - Bicarbonate (as CaCO ₃)	NG	9.2	8.4	8.9	8.9	8.1	5.5	5.3	4.7	5.0	4.4	3.7	5.1	4.4	4.0
Alkalinity - Carbonate (as CaCO ₃)	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity - Hydroxide (as CaCO ₃)	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity - Total (as CaCO ₃)	NG	9.2	8.4	8.9	8.9	8.1	5.5	5.3	4.7	5.0	4.4	3.7	5.1	4.4	4.0
Ammonia (as N) ²	0.274 - 81.6	<0.020	<0.020	<0.020	<0.020	<0.010	0.0069	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0074	<0.0050	0.1220
Bromide	NG	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride	NG	0.69	0.72	0.78	0.71	0.55	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.55	0.52	0.64
Fluoride	NG	0.062	0.074	0.086	0.085	0.065	0.048	0.049	0.052	0.045	0.045	0.049	0.045	0.042	0.054
Nitrate (as N)	2.9	0.0156	0.0127	0.0117	0.0215	0.0260	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	0.06	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	NG	0.111	0.152	0.187	<0.050	0.061	0.243	0.101	0.091	<0.050	<0.050	0.115	0.092	<0.050	0.100
Ortho Phosphate (as P)	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Phosphate (as P)	0.004	0.0022	<0.0020	0.0026	0.0022	<0.0020	0.0040	0.0044	0.0024	<0.0020	<0.0020	0.0027	0.0031	0.0104	0.0026
Silicate (as SiO ₂)	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate (SO ₄)	NG	2.72	2.75	2.78	2.67	2.13	1.62	1.63	1.68	1.50	1.53	1.64	0.72	0.63	0.76
ORGANIC / INORGANIC CARBON															
Dissolved Organic Carbon (mg/L)	NG	1.81	1.77	1.87	1.40	1.20	1.20	1.67	1.49	1.04	1.54	1.50	1.57	2.08	1.90
Total Organic Carbon (mg/L)	NG	1.80	1.78	1.92	1.51	1.23	1.18	1.68	1.56	1.05	1.60	1.53	1.69	2.06	1.88
PLANT PIGMENTS															
Chlorophyll a - standardized (µg/L)	NG	0.308	0.295	0.557	0.296	0.415	0.416	0.390	0.209	0.103	0.191	0.315	0.383	0.285	0.541
TOTAL METALS (mg/L)															
Aluminum ³	0.005 - 0.100	0.0571	0.0372	0.0321	0.0525	0.0340	0.0292	0.0112	0.0105	0.0167	0.0068	0.0075	0.0135	0.0114	0.0076
Antimony	NG	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic	0.0050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Barium	NG	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Beryllium	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	NG	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Cadmium*	0.0000026 - 0.000021	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
Calcium	NG	2.80	2.72	2.88	2.68	2.48	2.04	1.60	1.52	1.63	1.30	1.30	1.08	1.02	1.04
Chromium ⁴	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	NG	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper*	0.0020	<0.0010	<0.0010	<0.0010	0.0219	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Iron	0.300	0.053	0.036	<0.030	0.049	0.034	0.032	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Lead*	0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Lithium	NG	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium	NG	1.05	1.00	1.10	1.01	0.97	0.68	0.60	0.59	0.58	0.53	0.54	0.62	0.62	0.64
Manganese	NG	0.00121	0.00087	0.00084	0.00101	0.00087	0.00205	0.00159	0.00155	0.00228	0.00147	0.00153	0.00436	0.00204	0.00126
Mercury	0.000026	<0.000020	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000011	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000014	<0.000010
Molybdenum	0.073	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel*	0.025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Potassium	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Selenium	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Silver	0.00010	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Sodium	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Thallium	0.00080	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	NG	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Titanium	NG	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium	NG	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Vanadium	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	0.030	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
DISSOLVED METALS (mg/L) ⁵															
Aluminum ³	0.005 - 0.100	0.0091	<0.0050	<0.0050	<0.0050	<0.0050	0.0165	<0.0050	<0.0050	0.0074	<0.0050	<0.0050	0.0059	<0.0050	<0.0050
Antimony	NG	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic	0.0050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Barium	NG	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Beryllium	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	NG	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Cadmium*	0.0000026 - 0.000021	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
Calcium	NG	2.91	2.75	2.97	2.81	2.53	2.07	1.63	1.53	1.60	1.28	1.30	1.05	1.02	1.05
Chromium ⁴	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	NG	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper*	0.0020	<0.0010	<0.0010	<0.0010	<0.0										

Notes:

¹CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated December 2007.

²Ammonia guidelines are for 10°C and are pH dependent.

³Aluminum guideline is pH dependent.

⁴Chromium guideline is for Cr VI.

⁵Guidelines have not yet been made for "Dissolved Metals," thus were screened against CCME guidelines for "Total Metals."

*Cadmium, copper, lead and nickel guidelines are hardness dependent.

Each item, except the last, is followed by a blank space for the respondent to write the answer.

Figure 3-1. Temperature (°C) and dissolved oxygen (mg/L) profiles for Third Portage Lake– East Basin, 2010.

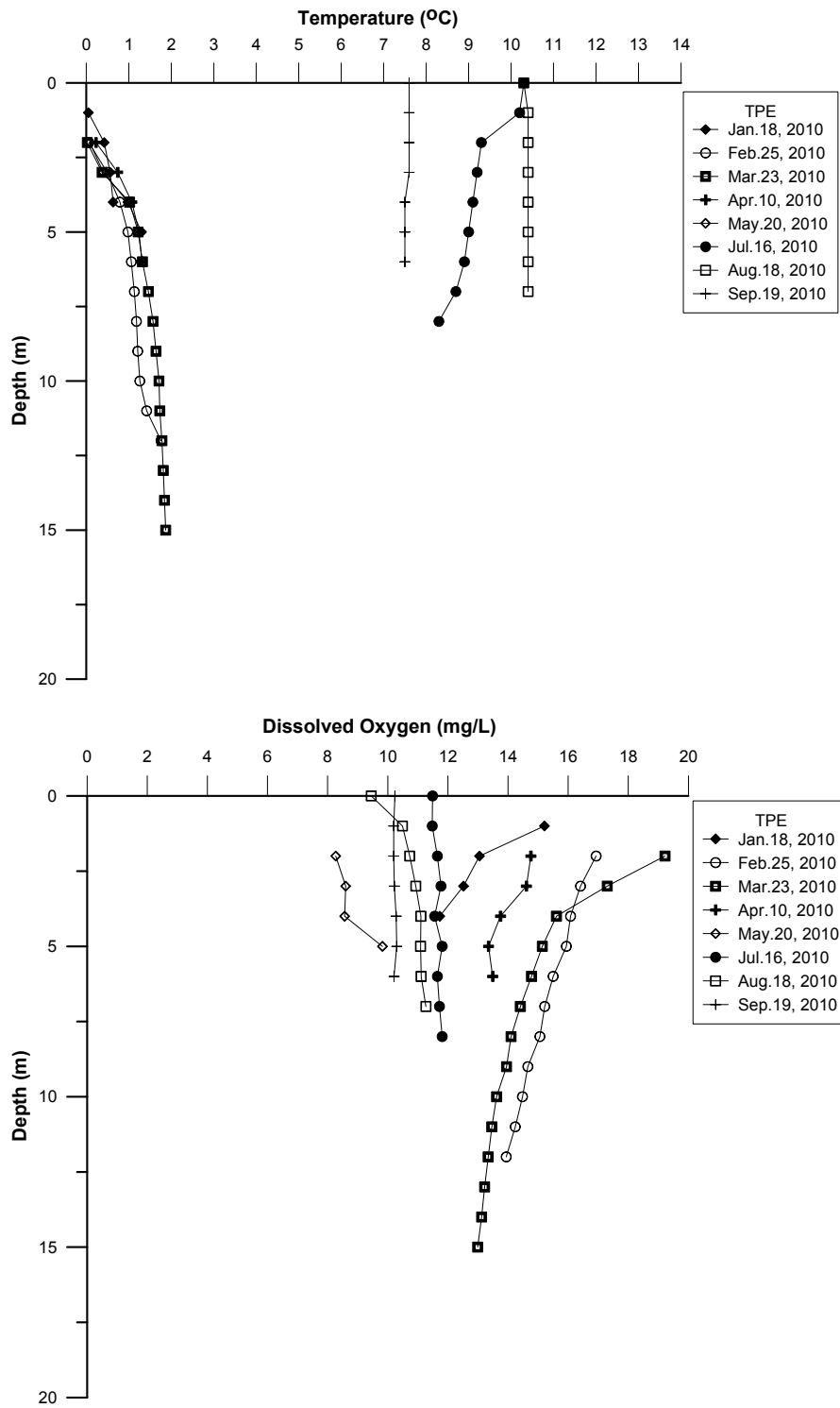


Figure 3-2. Temperature (°C) and dissolved oxygen (mg/L) profiles for Third Portage Lake– North Basin, 2010.

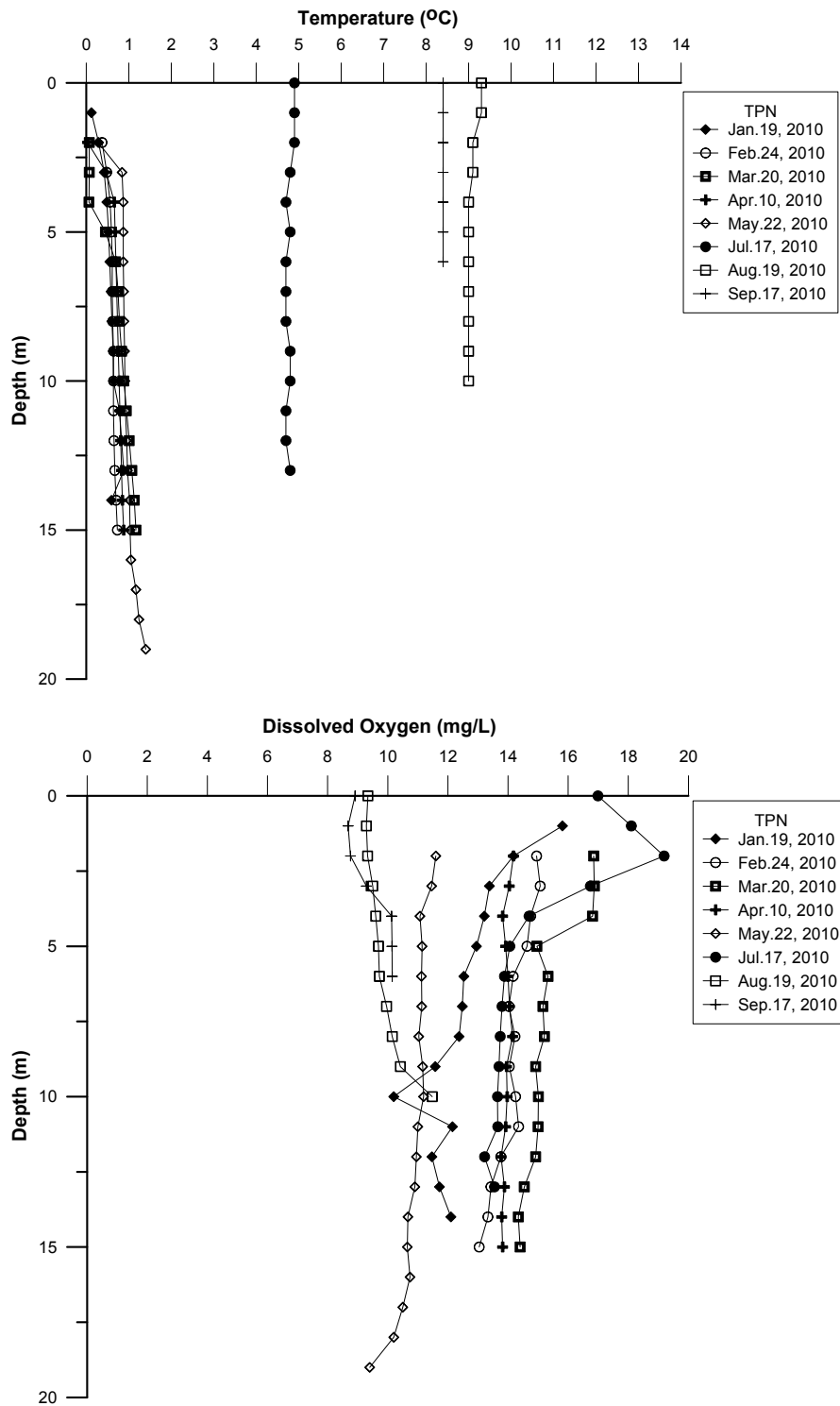


Figure 3-3. Temperature (°C) and dissolved oxygen (mg/L) profiles for Third Portage Lake– South Basin, 2010.

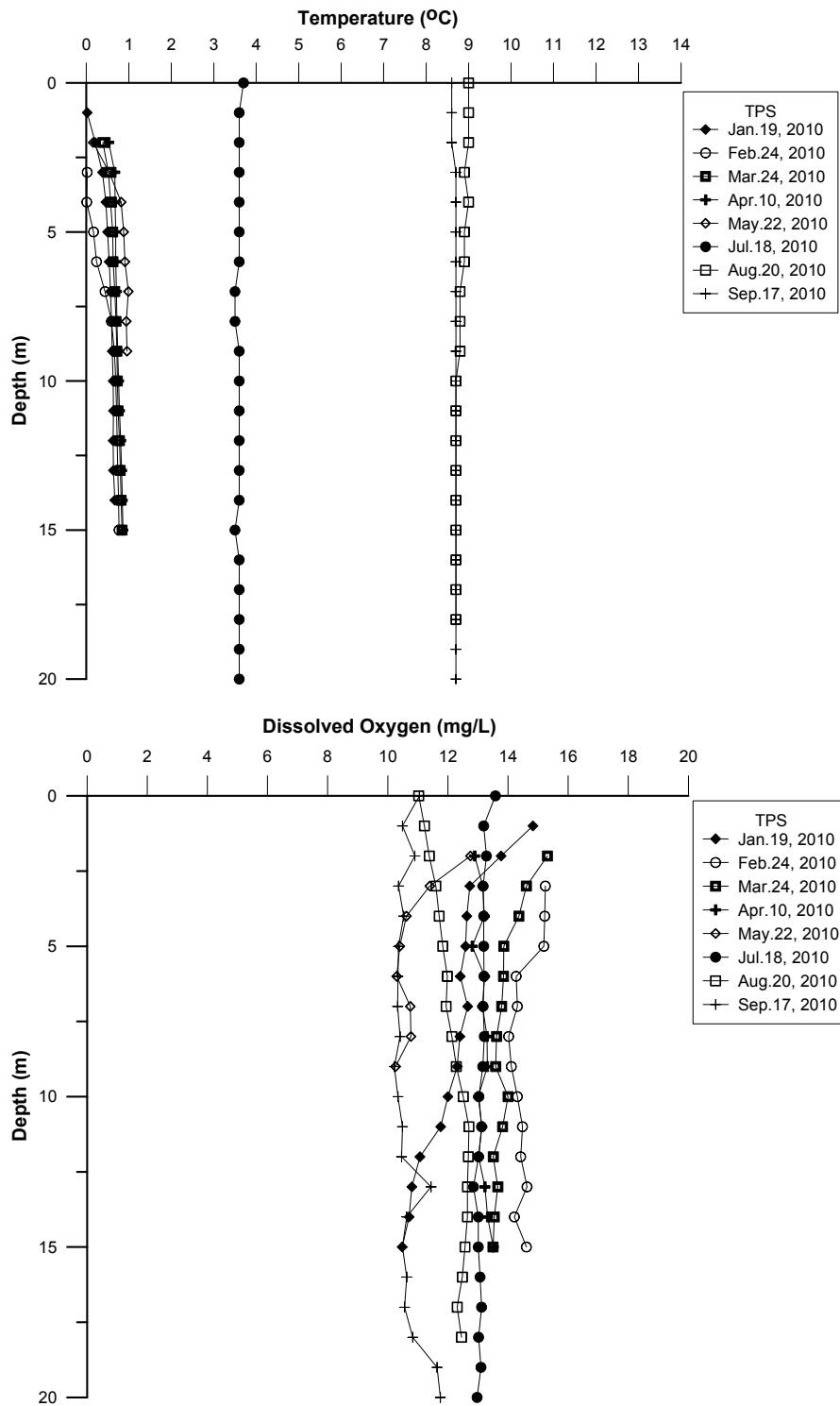


Figure 3-4. Temperature (°C) and dissolved oxygen (mg/L) profiles for Second Portage Lake, 2010.

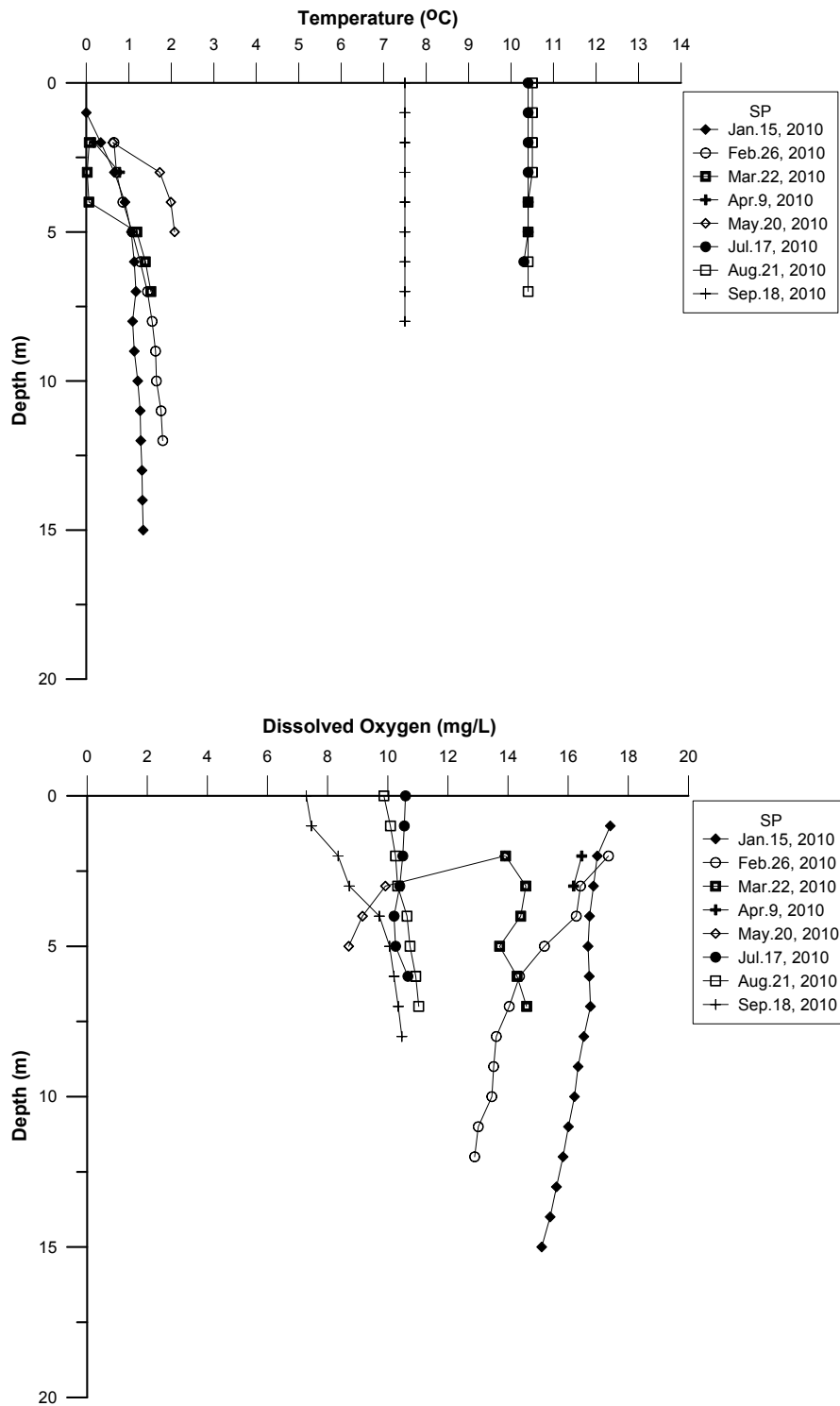


Figure 3-5. Temperature (°C) and dissolved oxygen (mg/L) profiles for Tehek Lake, 2010.

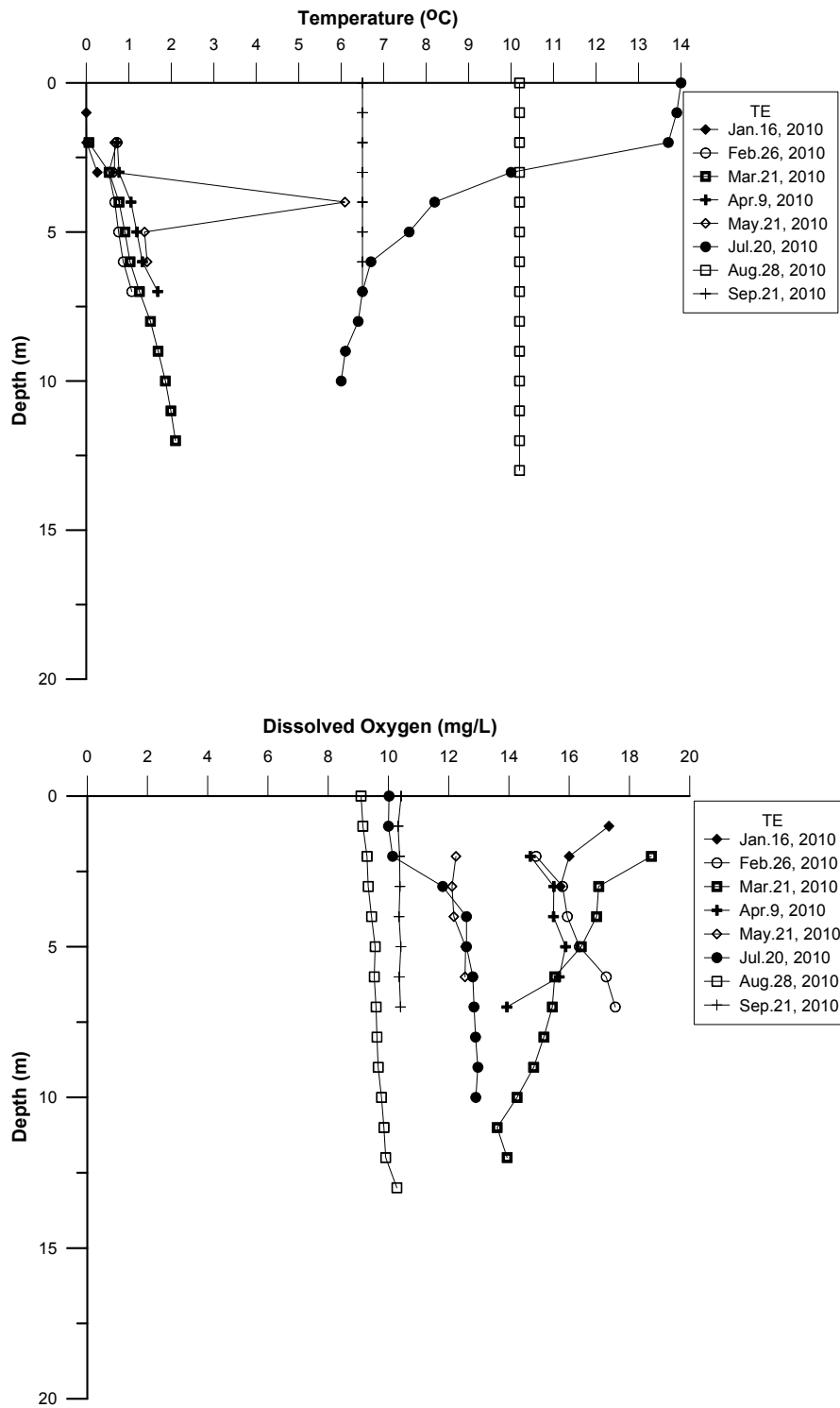


Figure 3-6. Temperature (°C) and dissolved oxygen (mg/L) profiles for Tehek Lake Farfield, 2010.

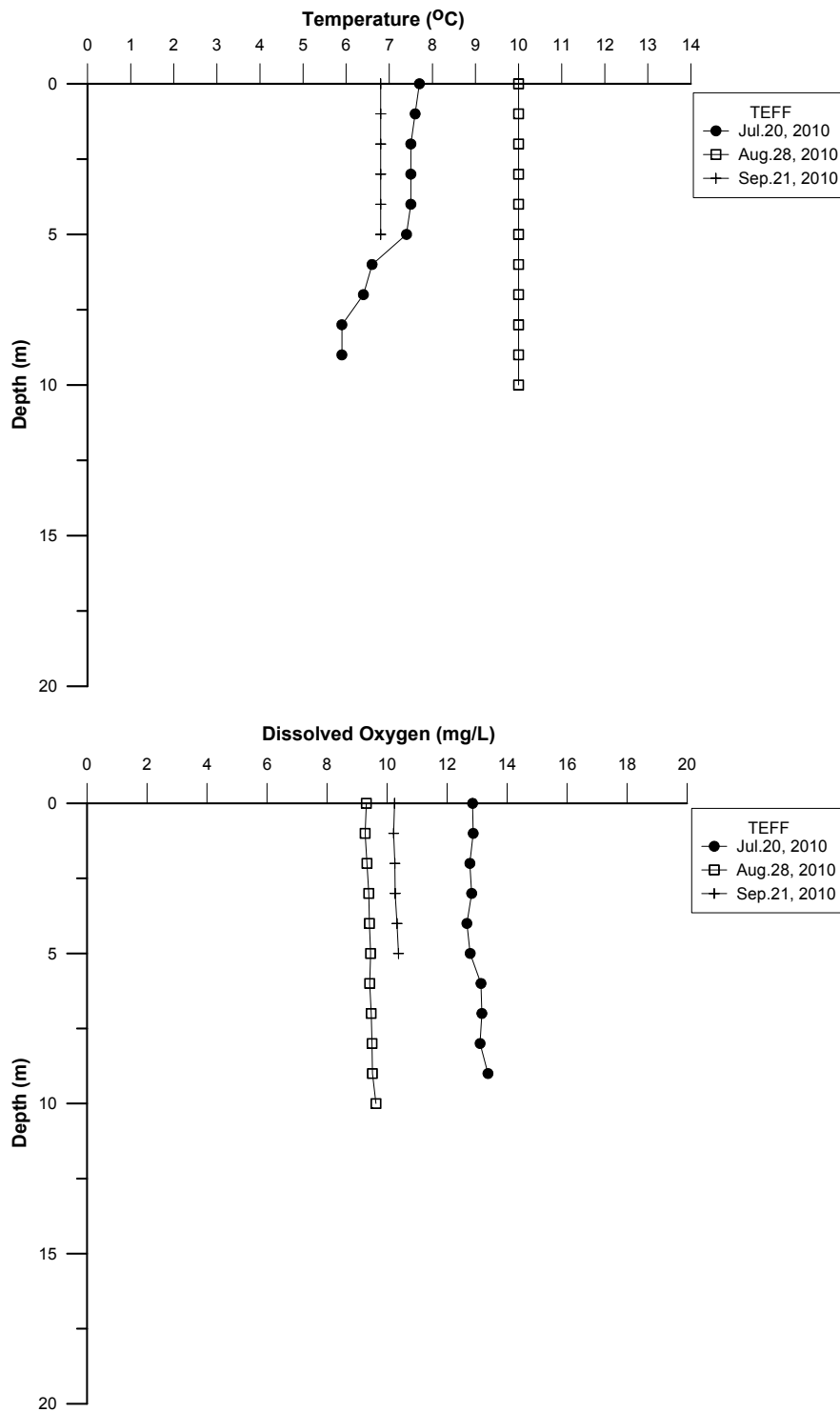


Figure 3-7. Temperature (°C) and dissolved oxygen (mg/L) profiles for Inuggugayualik Lake, 2010.

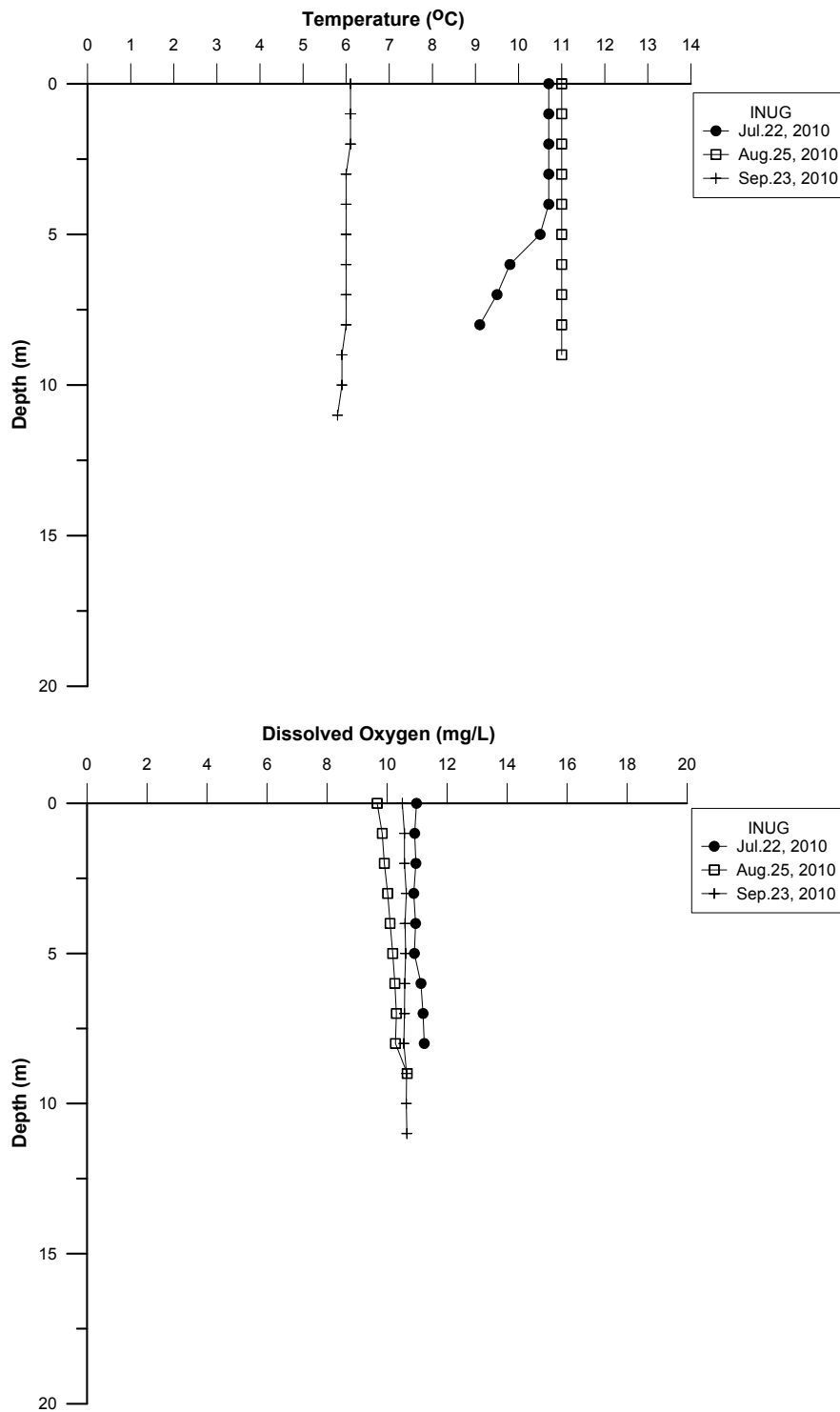


Figure 3-8. Temperature (°C) and dissolved oxygen (mg/L) profiles for Wally Lake, 2010.

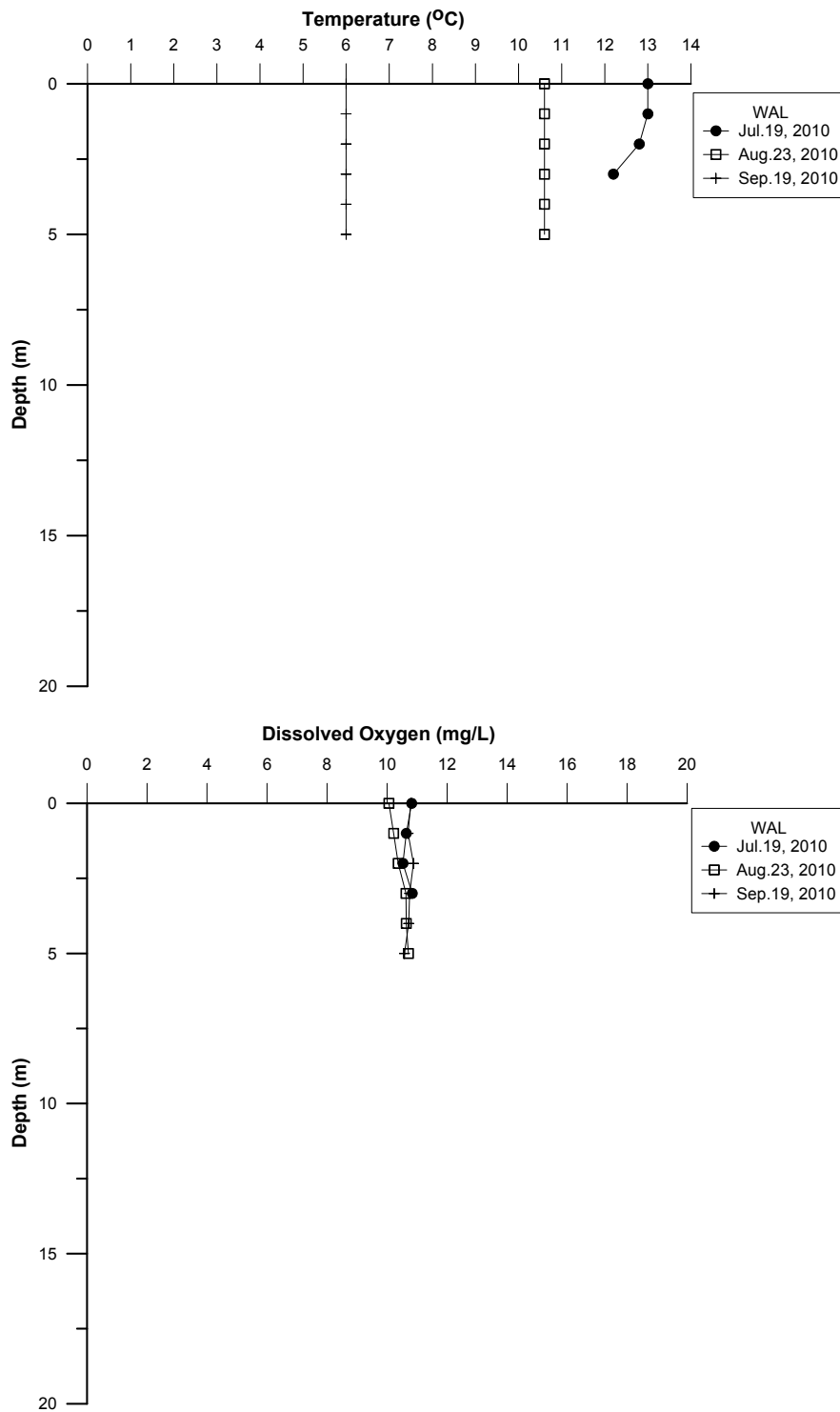


Figure 3-9. Temperature (°C) and dissolved oxygen (mg/L) profiles for Pipedream Lake, 2010.

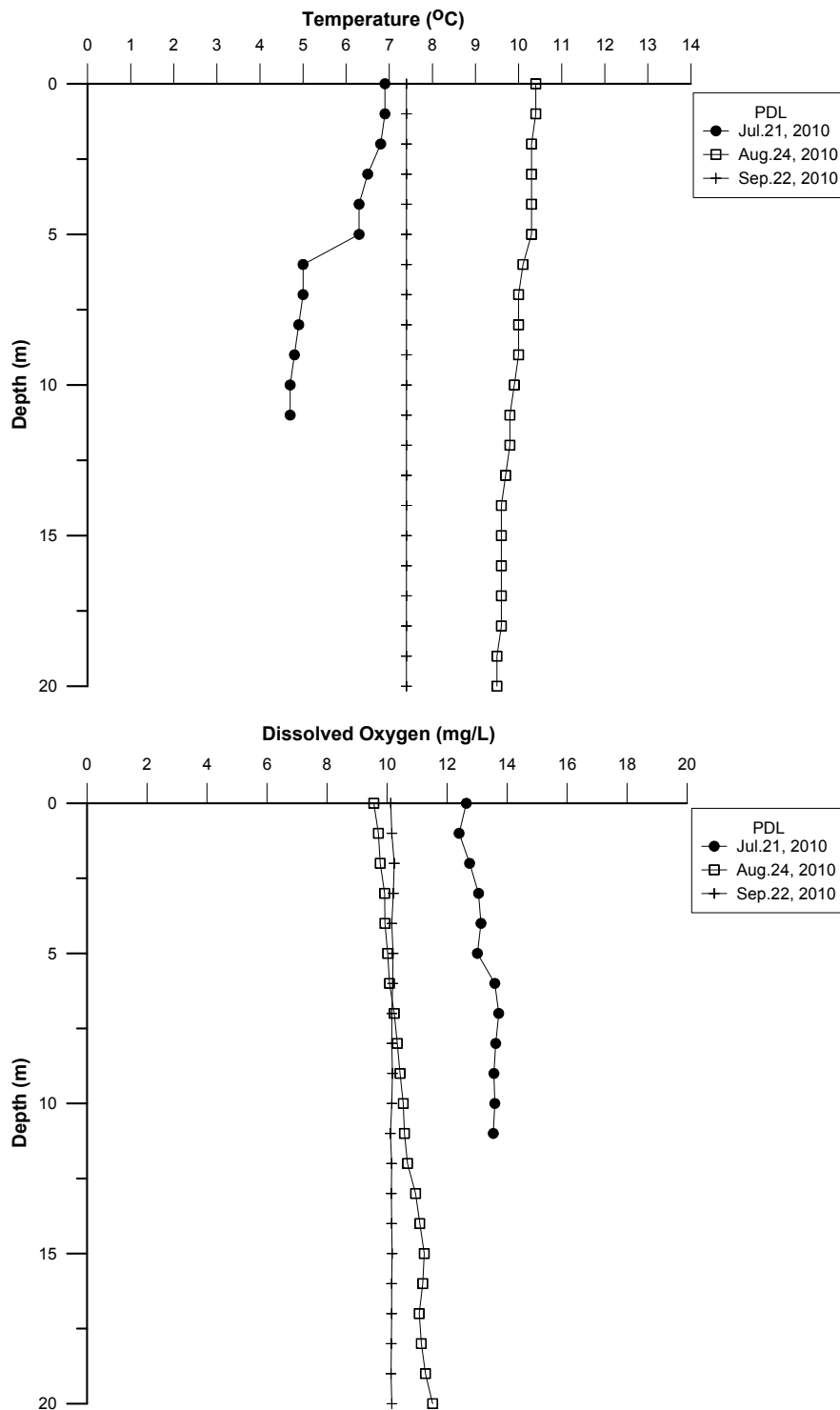


Figure 3-10. Temperature (°C) and dissolved oxygen (mg/L) profiles for Baker Lake – Barge Dock, 2010.

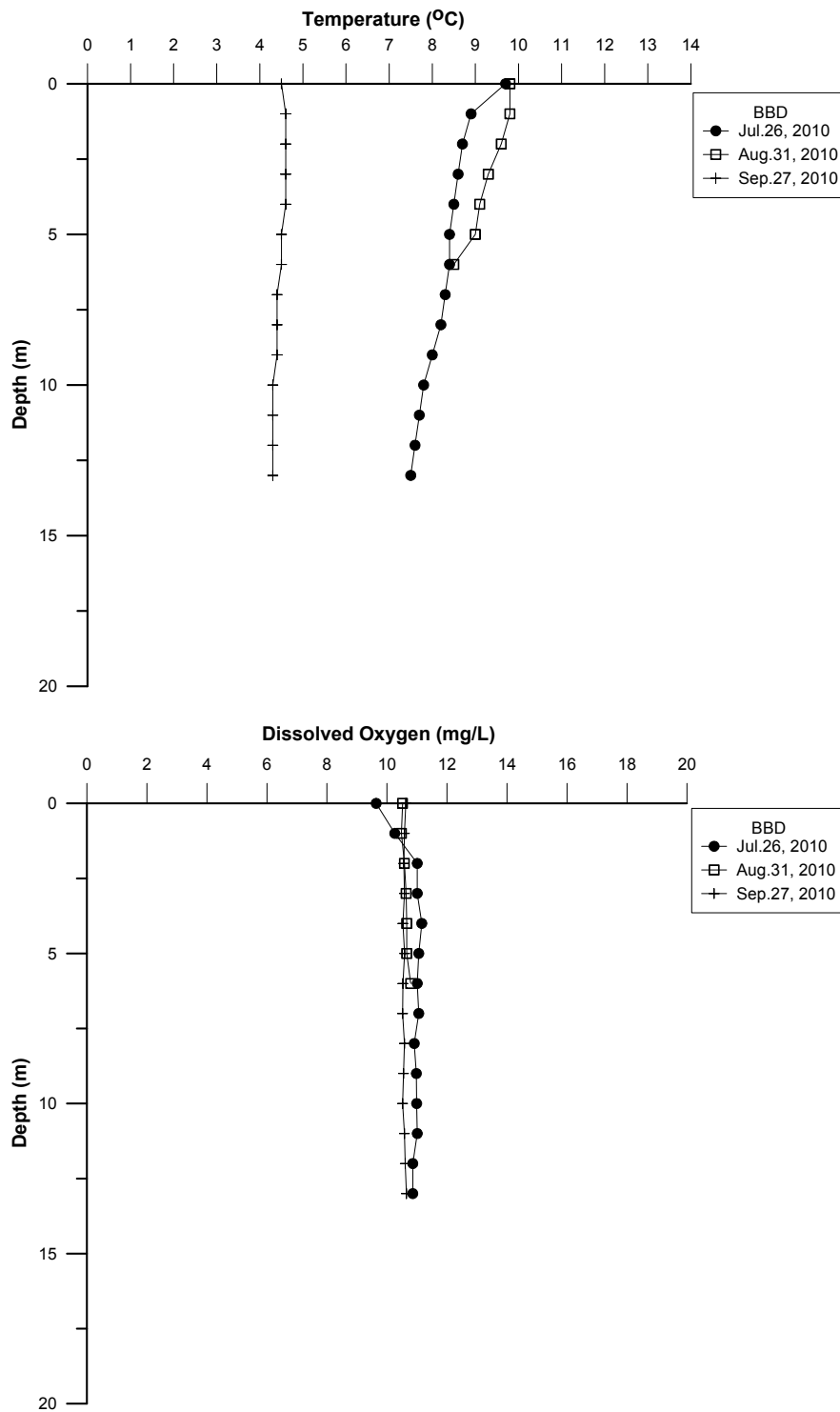


Figure 3-11. Temperature (°C) and dissolved oxygen (mg/L) profiles for Baker Lake – Proposed Jetty, 2010.

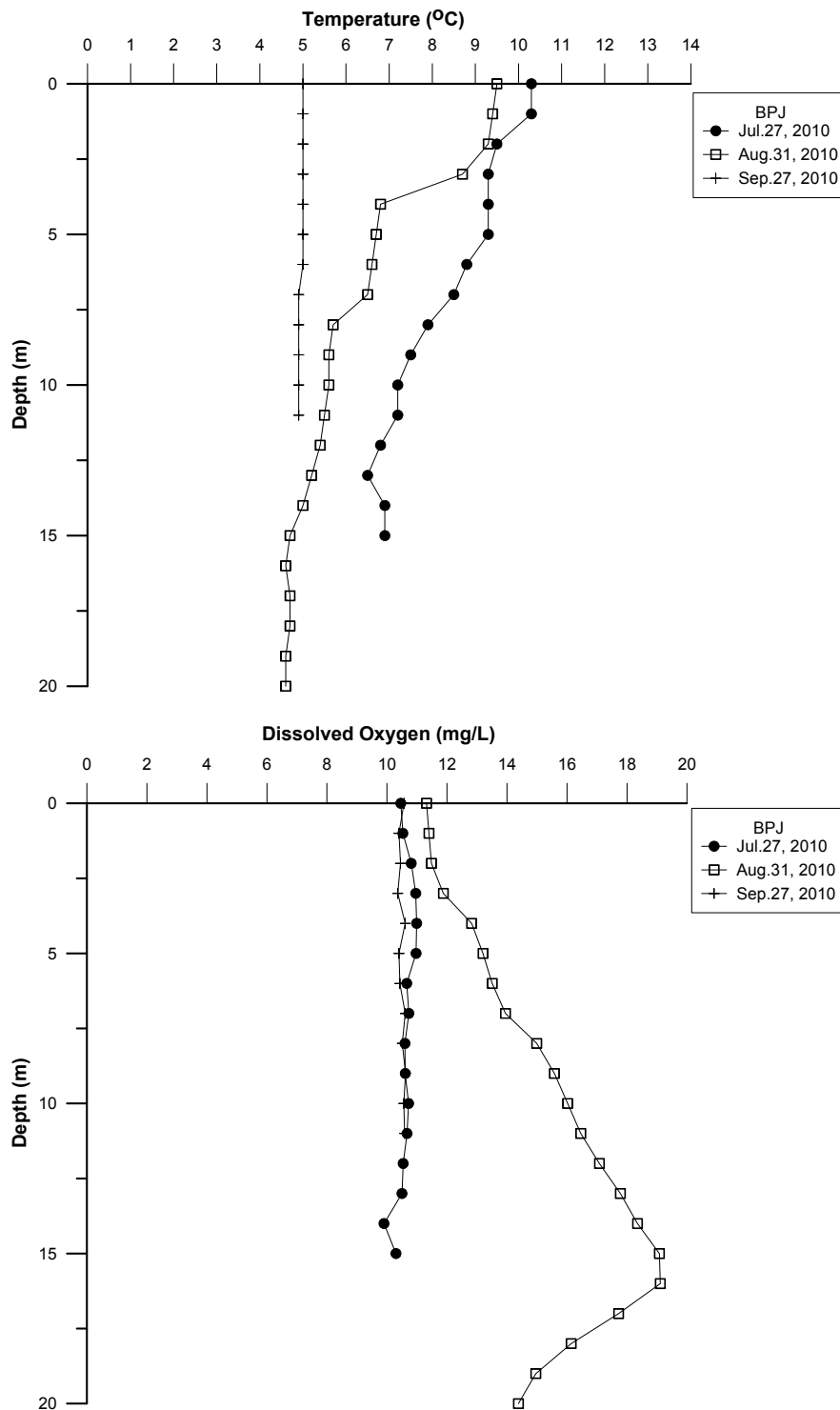


Figure 3-12. Temperature (°C) and dissolved oxygen (mg/L) profiles for Baker Lake– Akilahaarjuk Point, 2010.

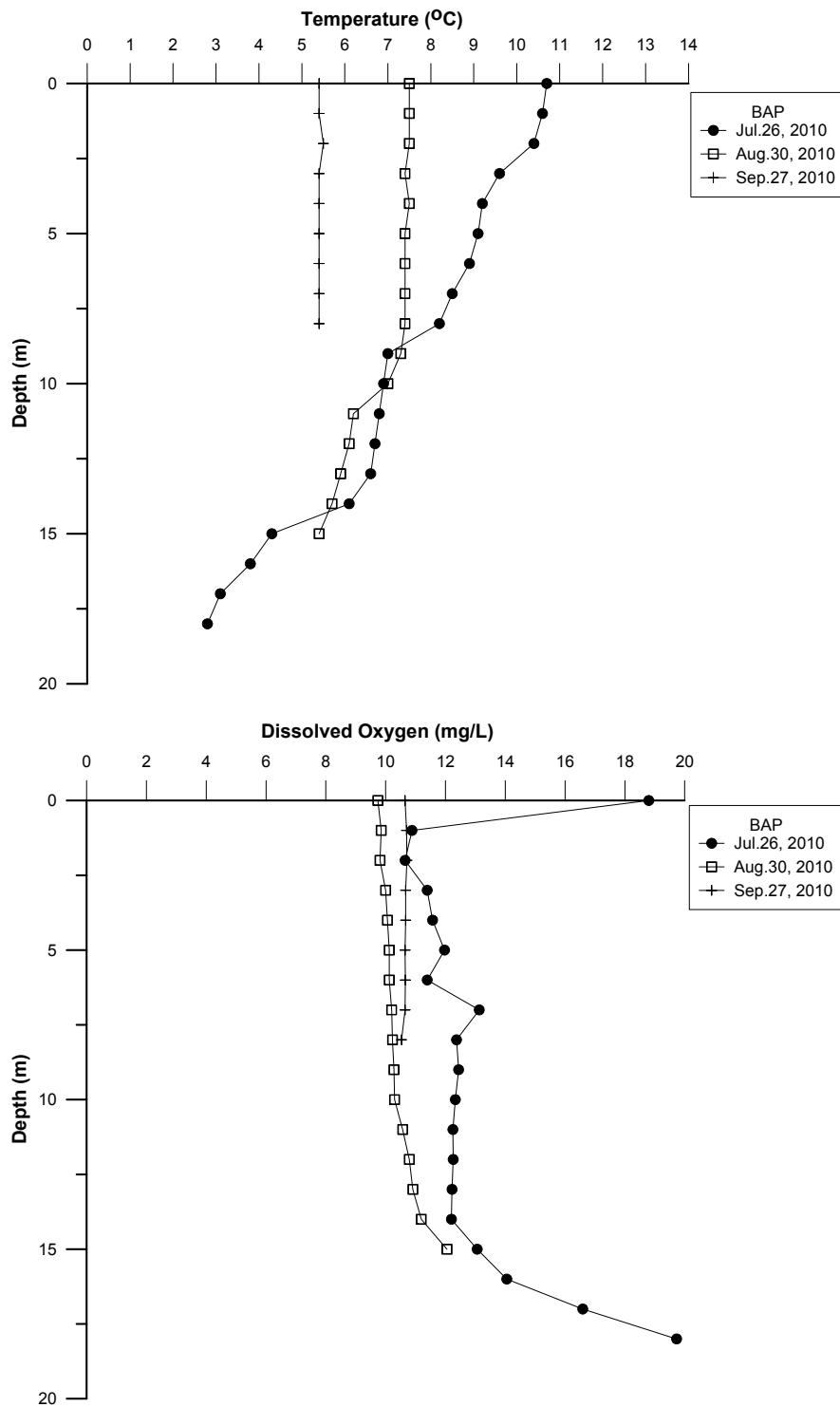
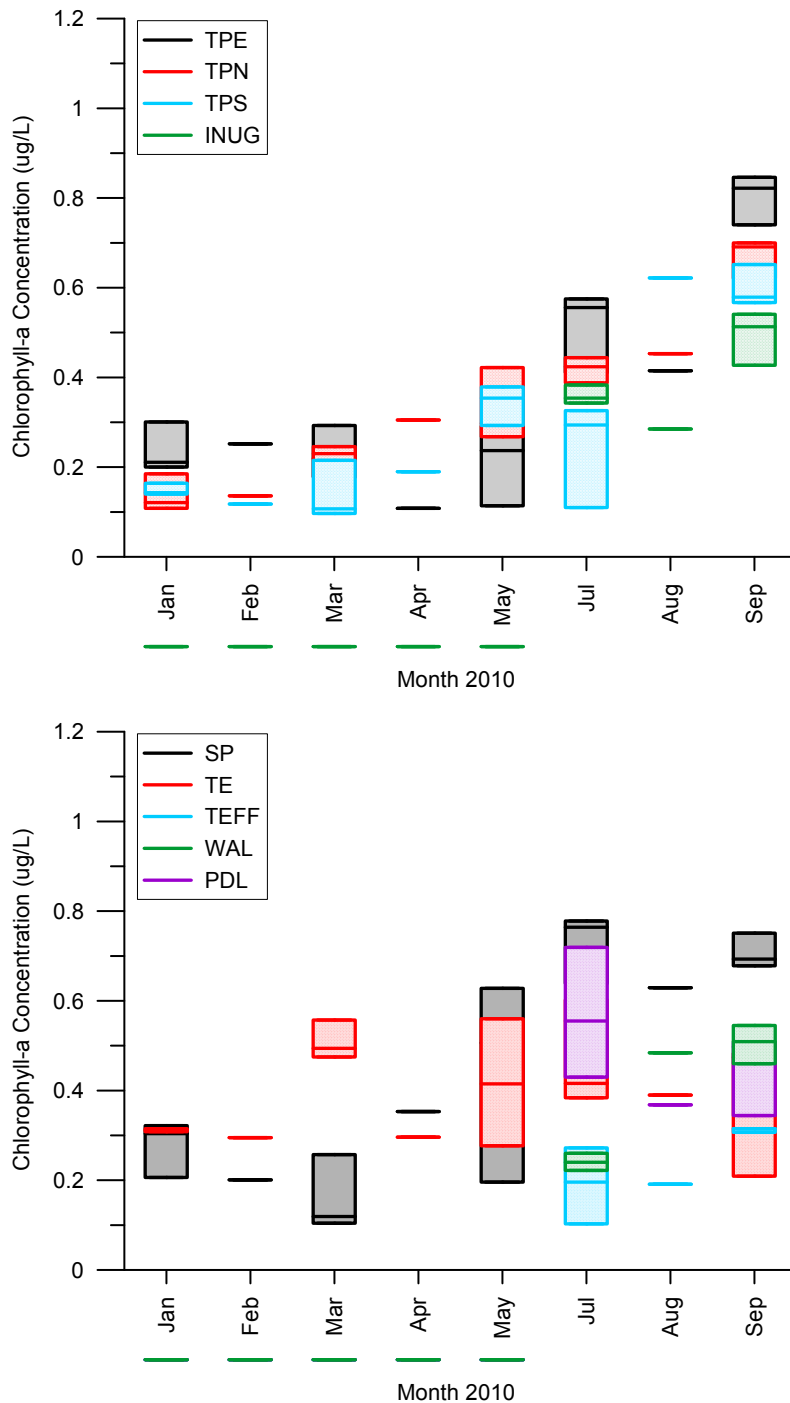


Figure 3-13. Seasonal chlorophyll- α concentration boxplots (ug/L) for Meadowbank study lakes, 2010.



Note: a green bar below a month label on the x-axis indicates that the station was not sampled in that month (i.e., INUG, TEFF, WAL, PDL from Jan-May).

3.3. Sediment Chemistry

3.3.1. Meadowbank Study Lakes

Total metals concentrations (mg/kg dry weight), PAHs, oil and grease, hydrocarbons, pH, moisture content, total organic carbon and particle size were measured in sediment from each sampling station during summer (August) sampling only (**Table 3-6**). Because the study lakes are headwater lakes, there are no significant fluvial sources of sediments; therefore sedimentation rates in the lakes are likely extremely low. Consequently, changes to sediment chemistry would be expected to occur only very slowly under natural conditions or as a result of mine-related construction and operation activities including dike construction, grouting and other activities with the potential to introduce sediment such as blasting and road construction and operation. Local geology and hydrology, therefore, would also be expected to strongly influence sediment chemistry within these lakes.

Sediment was acquired from all stations at depths ranging from 6.5–9.8 m which is consistent with previous years. To ensure consistency and provide relevant information for benthic communities, the sediment was sampled from the same depths/locations as the benthos samples, targeting sediment grain size dominated by fine sediments (74–98% silt/clay).

Total organic carbon concentrations were very similar among the study lakes, averaging 3.2% dry weight. One exception to this was sediment from Wally Lake which had a TOC of 6.0%; however, this is typical of what has been measured in previous years (8.7 % in 2009, 4.9% in 2008, 8.6% in 2007, and 8.2% in 2006), because this lake is shallower it tends to have a higher organic component (Azimuth, 2010a, 2009a, 2008a, 2008b).

Sediment metals concentrations were compared against federal (CCME, 2002) ISQG and PEL sediment quality guidelines (**Table 3-6**) for those metals for which there are SQG guidelines. Note that exceedences of these guideline values does not necessarily imply that adverse effects have occurred or are expect to occur. These values are relatively conservative and do not reflect site-specific conditions, regional geochemistry or adaptations by benthic organisms to regional characteristics.

Arsenic, chromium and copper exceeded ISQGs in all Meadowbank study lakes in 2010; this trend has been observed each year since routine monitoring began in 2006 (Azimuth, 2010a, 2009a, 2008a, 2008b) and is a reflection of background mineralization of the sediment on a broad scale.

- Arsenic exceeded the PEL (17.0 mg/kg) at TPE, SP, and WAL (up to 38 mg/kg at TPE), and despite the fact that concentrations are somewhat higher for TPE in 2010,

the PEL was exceeded at most stations in 2009, and at all stations in 2008 (Azimuth, 2010a, 2009a).

- Chromium exceeded the PEL (90.0 mg/kg) at 2/3 of the stations, and in the past has only exceeded at TPN, TPS, and INUG, the reference location.
- Cadmium slightly exceeded ISQGs at SP (0.72 mg/kg) and WAL (0.66 mg/kg), and exceeded about 3x ISQG at TEFF (1.47 mg/kg). Although cadmium has been below detection (<0.50 mg/kg) for the past 2 sampling years, in 2007 cadmium was detectable at all stations and exceeded ISQG at five of those stations (Azimuth, 2008a).
- Similar to 2009, lead marginally exceeded the ISQG (35 mg/kg) at WAL (38 mg/kg).
- Zinc also exceeded the ISQG (123 mg/kg) at SP (139 mg/kg) and WAL (132 mg/kg) in 2010, which has been the case for the past few years (Azimuth, 2010a, 2009a, 2008a, 2008b).

Overall, the concentrations in study lakes have not changed much from last year. Given that the same is true for the lakes that are removed from mining activity and the reference lakes, then the changes discussed above are most likely due to inter-annual differences attributable to spatial heterogeneity.

Polycyclic aromatic hydrocarbons (PAHs) and oil and grease were measured in sediment for the first time in 2008. These parameters were measured in order to establish a baseline prior to mine development and have been repeated this year as follow-up monitoring. Light & heavy extractable petroleum hydrocarbons (LEPHs and HEPHs) were measured in sediment in 2009 for the first time as part of the CREMP. These parameters were included in 2009 in response to elevated oil & grease concentrations detected in sediments in 2008. The laboratory had suggested that other organics, such as plant material, may have confounded the results. Since then, the laboratory discovered a calculation error and adjusted the 2008 results; such that the formerly detectable concentrations were actually below the DL. In 2009 none of the stations sampled had detectable concentrations of oil and grease, consistent with adjusted 2008 results.

In 2010 sediment samples had non-detectable concentrations of PAHs, and LEPHs and HEPHs at all stations (**Table 3-6**), consistent with 2008 and 2009 data, except TPS (1460 mg/kg) and WAL (1030 mg/kg) for oil and grease. Given the location of the two areas (i.e., well away from the site), the latter are likely due to naturally-occurring organic compounds (ALS Laboratory has informed us that the particular analysis conducted on the samples cannot distinguish between 'oil and grease' related to hydrocarbons and concentrations attributable to old organic matter in the sediment that is detected and reported as oil and grease). Thus, we recommend moving to a 'Mineral Oil and Grease'



analysis which includes an additional silica gel clean-up that removes the bulk of the naturally-occurring organic material.

3.3.2. Baker Lake

Baker Lake sediments were analyzed for the same parameters as were Meadowbank study sediments (**Table 3-6**). Sediment was acquired from the three stations at depths ranging from 6.5–8.6 m. Sediment grain size was generally dominated by silt at BBD (49%) and BPJ (62%) and sand at BAP (78.5%). Total organic carbon concentrations were low and ranged from 0.2–0.7% dry weight. This is typical for Baker Lake, in previous years TOC has ranged from 0.4–0.9% (2008) and 0.2–0.9% (2009) (Azimuth, 2009a, 2010a, respectively).

Sediment metals concentrations measured in each of the study lakes were compared against federal (CCME, 2002) ISQG and PEL sediment quality guidelines (**Table 3-6**) for those metals for which there are SQG guidelines. Similar to previous years, arsenic was the only metal that exceeded the ISQG (5.9 mg/kg) in Baker Lake and is indicative of background mineralization. Since monitoring in 2008, arsenic concentrations at BPJ have ranged from 25 mg/kg (2008), 7.6 mg/kg (2009), and 8.4 mg/kg (2010). No other metals exceeded guidelines in Baker Lake; this may be in part due to larger grain size material (e.g., sand rather than clay). The range in metals concentration among stations was relatively small, usually less than 2 times the average concentration. Concentrations of all PAHs, oil & grease, and LEPHs & HEPHs were below detection limits in sediment for the three Baker Lake stations (**Table 3-6**). These data confirm that barge activity and use in the vicinity of the BBD station has not resulted in increased metals or inputs of hydrocarbons to the local sediment.

Table 3-6. Conventional sediment chemistry, hydrocarbons, PAHs and total metals (mg/kg), Meadowbank study lakes and Baker Lake, August 2010.

Lake & Basin		Third Portage Lake			Second Portage Lake	Tehek Lake	Tehek Farfield	Inuggugayualik Lake	Wally Lake	Pipedream Lake	Baker Lake		
		East	North	South							Barge Dock	Proposed Jetty	Akilahaarjuk Point
Station ID	Sediment Quality Guidelines (CCME 2002) ¹	TPE-1	TPN-1	TPS-1	SP-1	TE-1	TEFF-1	INUG-1	WAL-1	PDL-1	BBD-1	BPJ-1	BAP-1
Date	ISQG PEL	19-Aug-10	19-Aug-10	20-Aug-10	21-Aug-10	27-Aug-10	27-Aug-10	25-Aug-10	23-Aug-10	24-Aug-10	31-Aug-10	31-Aug-10	30-Aug-10
CONVENTIONAL PARAMETERS													
Physical & Organic Parameters													
Moisture (%)	NG	NG	83.8	81.1	84.0	82.1	74.7	81.1	75.5	88.4	74.1	29.5	37.4
pH	NG	NG	5.71	6.27	6.13	5.85	6.14	5.87	5.91	6.84	5.90	6.02	6.06
Total Organic Carbon (% dw)	NG	NG	3.02	3.11	4.10	3.91	2.49	3.38	2.66	6.04	2.65	0.23	0.33
Particle Size													
% Gravel (>2mm)	NG	NG	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.39	<0.10
% Sand (2.00mm - 0.063mm)	NG	NG	3.57	22.7	13.6	1.72	26.4	5.80	13.4	2.57	11.4	41.0	78.5
% Silt (0.063mm - 4µm)	NG	NG	72.3	71.9	77.8	66.3	56.5	75.9	62.8	87.4	72.8	48.6	20.2
% Clay (<4µm)	NG	NG	24.2	5.41	8.60	32.0	17.1	18.3	23.9	10.0	15.8	10.0	1.30
AGGREGATE ORGANICS (mg/kg)													
Oil and Grease	NG	NG	<1400	<1100	1460	<1200	<500	<500	<500	1030	<500	<500	<500
HYDROCARBONS (mg/kg)													
EPH10-19	NG	NG	<540	<370	<600	<550	<400	<460	<400	<800	<360	<200	<200
EPH19-32	NG	NG	<540	<370	<600	<550	<400	<460	<400	<800	<360	<200	<200
LEPH	NG	NG	<540	<370	<600	<550	<400	<460	<400	<800	<360	<200	<200
HEPH	NG	NG	<540	<370	<600	<550	<400	<460	<400	<800	<360	<200	<200
POLYCYCLIC AROMATIC HYDROCARBONS													
Acenaphthene (mg/kg)	0.00671	0.0889	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.0050	<0.0050
Acenaphthylene (mg/kg)	0.00587	0.128	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.0050	<0.0050
Anthracene (mg/kg)	0.0469	0.245	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.0040	<0.0040
Benz(a)anthracene (mg/kg)	0.0317	0.385	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010
Benzo(a)pyrene (mg/kg)	0.0319	0.782	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010
Benzo(b)fluoranthene (mg/kg)	NG	NG	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010
Benzo(g,h,i)perylene (mg/kg)	NG	NG	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010
Benzo(k)fluoranthene (mg/kg)	NG	NG	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010
Chrysene (mg/kg)	0.0571	0.862	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010
Dibenz(a,h)anthracene (mg/kg)	0.00622	0.135	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.0050	<0.0050
Fluoranthene (mg/kg)	0.111	2.355	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010
Fluorene (mg/kg)	0.0212	0.144	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010
Indeno(1,2,3-c,d)pyrene (mg/kg)	NG	NG	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010
2-Methylnaphthalene (mg/kg)	0.0202	0.201	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010
Naphthalene (mg/kg)	0.0346	0.391	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010
Phenanthrene (mg/kg)	0.0419	0.515	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010
Pyrene (mg/kg)	0.0530	0.8750	<0.14	<0.12	<0.15	<0.14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010

Table 3-6. Conventional sediment chemistry, hydrocarbons, PAHs and total metals (mg/kg), Meadowbank study lakes and Baker Lake, August 2010.

Lake & Basin			Third Portage Lake			Second Portage Lake	Tehek Lake	Tehek Farfield	Inuggugayualik Lake	Wally Lake	Pipedream Lake	Baker Lake		
			East	North	South							Barge Dock	Proposed Jetty	Akilahaarjuk Point
Station ID	Sediment Quality Guidelines (CCME 2002) ¹		TPE-1	TPN-1	TPS-1	SP-1	TE-1	TEFF-1	INUG-1	WAL-1	PDL-1	BBD-1	BPJ-1	BAP-1
Date	ISQG	PEL	19-Aug-10	19-Aug-10	20-Aug-10	21-Aug-10	27-Aug-10	27-Aug-10	25-Aug-10	23-Aug-10	24-Aug-10	31-Aug-10	31-Aug-10	30-Aug-10
TOTAL METALS (mg/kg dw)														
Aluminum	NG	NG	25300	16900	23600	33600	20100	25500	23600	22200	20400			
Antimony	NG	NG	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Arsenic	5.9	17.0	38.1	9.8	15.8	36.2	15.7	13.1	16.8	20.6	13.0	5.1	8.4	<5.0
Barium	NG	NG	125	64.5	106	148	80.2	119	99.3	115	82.5	73.6	129	232
Beryllium	NG	NG	1.81	0.99	1.47	2.52	1.78	1.97	1.53	1.66	1.02	<0.50	<0.50	<0.50
Cadmium	0.6	3.5	0.56	<0.50	<0.50	0.72	<0.50	1.47	<0.50	0.66	<0.50	<0.50	<0.50	<0.50
Chromium	37.3	90.0	91	110	113	94	51	58	115	61	135	20	20	16
Cobalt	NG	NG	16.4	8.4	15.4	17.8	8.0	13.6	9.3	9.4	10.9	6.0	7.6	3.8
Copper	35.7	197	51.5	50.3	60.9	107	49.9	61.2	48.6	163	51.4	7.9	8.9	4.5
Lead	35.0	91.3	<30	<30	<30	<30	<30	<30	<30	38	<30	<30	<30	<30
Mercury	0.17	0.486	0.0158	0.0483	0.0250	0.0326	0.0171	0.0160	0.0154	0.0384	0.0098	0.0062	0.0099	<0.0050
Molybdenum	NG	NG	5.4	<4.0	<4.0	7.9	<4.0	4.6	<4.0	7.2	<4.0	<4.0	<4.0	<4.0
Nickel	NG	NG	64.9	54.1	75.7	76.9	32.6	35.4	67.7	57.4	81.6	9.3	11.2	7.6
Selenium	NG	NG	<2.0	<2.0	<2.0	<2.0	<0.50	<2.0	<0.50	<2.4	<2.0	<2.0	<2.0	<2.0
Silver	NG	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Thallium	NG	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tin	NG	NG	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Uranium	NG	NG	15.2	11.9	15.1	25.1	16.0	24.3	15.9	17.3	8.62	2.49	1.92	1.16
Vanadium	NG	NG	37.3	30.6	38.6	46.6	32.5	38.6	38.2	32.3	36.7	24.9	23.5	16.7
Zinc	123	315	95.9	69.3	97.3	139	86.7	109	84.7	132	80.9	30.0	36.7	19.2

Notes:

NG = no guideline.

¹CCME (Canadian Council of Ministers of the Environment) Canadian Sediment Quality Guidelines for the Protection of Aquatic Life, 1999, updated in 2002.

ISQG = Interim freshwater Sediment Quality Guideline, PEL = Probable Effect Level.

Shaded concentrations = or > ISQG.

Italicized numbers are below detection limits.

Boxed concentrations also > PEL.

3.4. Phytoplankton

3.4.1. Meadowbank Study Lakes

At least 115 phytoplankton taxa were identified from the Meadowbank study lakes, represented by six major groups: Cyanophyte (blue green algae) 11 taxa, Chlorophyte (green algae) 39 taxa, Chrysophyte (golden-brown algae) 37 taxa, diatoms 16 taxa, Cryptophyte 6 taxa and Dinoflagellate 8 taxa (**Appendix A**). Euglenophytes were absent from all stations and seasons.

Phytoplankton density (**Table 3-7**) and biomass (**Table 3-8**) results for major taxa groups show fairly similar results among stations during the open water season. Biomass-based community assemblage results across stations are shown in **Figure 3-14** with roughly similar proportional ratios between abundance (cells/L) and biomass (mg/m³).

Phytoplankton density was dominated by Chrysophytes (70% of abundance, 67% of biomass), with smaller proportions (usually <10%) of the other five major groups, which is similar to previous years (Azimuth, 2010a, 2009a, 2008a, 2008b).

The dominant Chrysophyte taxa for the Meadowbank lakes in 2010 were identical to those found in 2009 (Azimuth, 2010a): *Chrysococcus*, *Kephyrion*, *Chrysochromulina laurentiana* Kling, *Dinobryon sociale* Ehrenberg, *Chrysolkos skuja* (Nauwerck) Willen. Dominating species for the other groups were: *Ankistrodesmus spiralis* Lemmermann for chlorophytes, *Planktolyngbya limnetica* for cyanophytes, *Cyclotella michiganiana* Skvortzow for diatoms, *Rhodomonas minuta* Skuja and *Cryptomonas erosa* Ehrenberg for cryptophytes, and *Gymnodinium* for dinoflagellates.

Chrysophytes are small, usually unicellular, and are very numerous in lake water; by virtue of their very large numbers, they frequently comprise the greatest biomass as a group. Density of Chrysophytes was high, comprising 70% of the total phytoplankton density (cells/L) with Chlorophytes having the next highest density at only 16% (**Table 3-7**). Compositionally, the study lakes in 2010 had comparable assemblages to those documented from the same stations in previous years (Azimuth, 2010a, 2009a, 2008a). A chart of the phytoplankton species presence/absence at each sampling station in 2010, by season, is presented in **Appendix A**.

Phytoplankton biomass (mg/m³) is generally a more important metric ecologically than density, as this represents the amount (by weight) of food available to fish. Trends in biomass were similar to density, with Chrysophytes dominating biomass (67%) (**Table 3-8**). Cryptophytes (10%) and Dinoflagellates (9.5%) were the next most important groups (see also **Figure 3-14**). Total biomass of phytoplankton increased through the year, with low biomass (~25 mg/m³) in mid-winter (January–March) and increasing by 4–8x through spring and summer, peaking in September. Biomass was highest during the open

water months in all lake basins, ranging from 80–296 mg/m³, with the exception of TPS and TPN in July (51 and 62 mg/m³, respectively) (**Table 3-8**); however, biomass was nearly equivalent to all other stations by early September. Total biomass during the winter ranged from 15–100 mg/m³. Mean total biomass during open-water months (**Figure 3-15**) ranged from 108 mg/m³ (TPS) to 219 mg/m³ (PDL).

TPN and TPS have typically had the lowest mean total biomass over the past few years (2006, 2007). TPS is colder and less productive overall, a trend that has been seen in previous years. The two basins with the shallowest depth and warmest summer water temperatures, SP and WAL also had higher biomass than the other stations, a pattern that has also been observed in previous years. In 2008 biomass at SP decreased during East Dike construction while in 2009, biomass at TPS, TPE, SP, TE all increased (**Figure 3-16**).

At least 115 phytoplankton taxa were identified among the nine study sites in 2010, averaging 35 (22–47) taxa per station in open-water and 18 (13–28) through-ice (**Table 3-8 and Appendix A**). Taxa richness varied quite a bit between stations, even when looking at summer data independent from winter data. However, taxa diversity was relatively stable among the nine study sites, with a Simpson's diversity index averaging 0.84 in open-water and 0.70 through-ice (**Table 3-8**). Third Portage Lake East (TPE) had the lowest number of taxa in July (22) samples relative to the other stations, which again may have been due to lower biomass because of elevated TSS.

Phytoplankton results are typically quite variable and as such it is often difficult to distinguish an apparent trend in any particular season or year from natural variability. The lack of consistency of this metric is being examined in greater detail in the CREMP design report. However, **Figure 3-15** does show that mean total biomass for all stations in 2010 was relatively similar across all project lakes with the exception of slightly higher values in the warm shallow WAL and SP basins and lower in the deep cold TPS basin. In both 2009 and 2010, a large number of extra samples were collected (targeting better characterization of temporal and spatial [horizontal and vertical] variability); these will be discussed in more detail in the CREMP design (Azimuth, 2011a *in progress*).

3.4.2. Baker Lake

At least 75 phytoplankton taxa were identified in Baker Lake, represented by the same six major groups: Cyanophyte (blue green algae) 4 taxa, Chlorophyte (green algae) 21 taxa, Chrysophyte (golden-brown algae) 27 taxa, diatom 15 taxa, Cryptophyte 5 taxa and Dinoflagellate 5 taxa (**Appendix A**).

Density (**Table 3-7**) and biomass- (**Table 3-8**) based results for major taxa groups showed fairly similar results among stations during the open water season. Biomass-based community assemblage results across stations are shown in **Figure 3-14**; this figure also



suggests a fairly uniform total mean biomass in the open-water season with only small differences among stations. The phytoplankton assemblages were dominated by Chrysophytes, with smaller populations of the other five major groups.

The dominant Chrysophyte taxa at Baker Lake were very similar to those found in 2009: *Chrysococcus*, *Kephyrion*, *Dinobryon sociale* Ehrenberg, *Chrysolkos skuja* (Nauwerck) Willen, and *Chrysochromulina laurentiana* Kling.

Dominant taxa within the other groups were: *Monoraphidium komarkovae* (Nyg.) Komarkova-Legnerova and *Ankistrodesmus spiralis* Lemmermann (Chlorophyte), *Planktolyngbya limnetica* (Cyanophyte), *Cyclotella michiganiana* Skvortzow (Diatom), *Rhodomonas minuta* Skuja, *Cryptomonas erosa* Ehrenberg and *Katablepharis ovalis* Skuja (Cryptophyte), and *Gymnodinium* and *Peridinium pusillum* (Penard) Lemmermann (Dinoflagellate).

Chrysophytes comprised 70% of the total phytoplankton density (cells/L) with Cryptophytes having the next highest density at only 12% (**Table 3-7**). A chart of the phytoplankton taxa presence/absence at each of the three sampling station in 2010, by season, is presented in **Appendix A**.

Trends in biomass were similar to density, with Chrysophytes dominating biomass at 64% (**Table 3-8**). Diatoms and Cryptophytes were the next most important groups (see also **Figure 3-14**). The three sampling stations had total phytoplankton biomass ranging from 117 mg/m³ (BPJ) to 365 mg/m³ (BAP). Total biomass at Baker Lake stations has varied over the past 2 years; in 2008 BPJ (361 mg/m³) had the highest total biomass (Azimuth, 2009a), and in 2009 BBD had the highest (468 mg/m³) (Azimuth, 2010a).

Seventy-five taxa were identified for the three study sites in July, August and September 2010, averaging 37 taxa per station (**Table 3-8 and Appendix A**). Taxa richness was similar among stations and seasons, and ranged from 34–41. Taxa diversity was relatively stable among the three stations, with a Simpson's diversity index averaging 0.84 (**Table 3-8**). Taxa diversity was usually highest in September for Baker Lake stations.

Table 3-7. Seasonal density (cells/L) of major phytoplankton groups, Meadowbank study lakes and Baker Lake, 2010.

Station	Date	Phytoplankton Density (cells/L)						Total
		Cyanophyte	Chlorophyte	Chrysophyte	Diatom	Cryptophyte	Dinoflagellate	
Third Portage Lake								
TPE-15-S	18-Jan-10	80	34716	331035	20591	12699	560	399681
TPE-18-S	25-Feb-10	0	8699	164081	0	66646	160	239586
TPE-19-S	23-Mar-10	0	287540	717457	80	61300	720	1067097
TPE-22-S	10-Apr-10	0	14365	245485	2873	103908	1440	368071
TPE-23-S	20-May-10	0	57954	474045	14445	67519	0	613963
TPE-26-S	16-Jul-10	0	21552	1438000	21552	38120	7384	1526608
TPE-29-S	18-Aug-10	7184	136896	814192	297344	75056	16968	1347640
TPE-30-S	19-Sep-10	7200	554768	1258800	590088	71056	15568	2497480
TPN-15-S	19-Jan-10	NA	NA	NA	NA	NA	NA	NA
TPN-18-S	24-Feb-10	0	240	368784	15005	98882	960	483871
TPN-19-S	20-Mar-10	0	77651	722083	2953	74385	560	877632
TPN-22-S	10-Apr-10	0	8699	541244	80	62733	1200	613956
TPN-23-S	22-May-10	0	2386088	525632	172416	58872	15968	3158976
TPN-26-S	17-Jul-10	2000	80024	675696	28736	38520	1400	826376
TPN-29-S	19-Aug-10	0	273792	1215896	138296	112160	17368	1757512
TPN-30-S	17-Sep-10	3600	232288	1172792	500096	119744	16368	2044888
TPS-9-S	19-Jan-10	0	71985	268396	18678	68479	800	428338
TPS-12-S	24-Feb-10	80	480	279401	11492	28810	1680	321943
TPS-13-S	24-Mar-10	0	51954	408446	20511	32323	720	513954
TPS-16-S	10-Apr-10	0	8619	337501	0	81724	1440	429284
TPS-17-S	22-May-10	0	198237	923833	0	27137	480	1149687
TPS-20-S	18-Jul-10	0	52088	634792	44104	30736	9584	771304
TPS-23-S	20-Aug-10	0	206952	1286736	268408	90808	30936	1883840
TPS-24-S	17-Sep-10	11384	570936	978624	311912	61872	800	1935528
Second Portage Lake								
SP-15-S	15-Jan-10	5746	11652	758552	110374	86764	0	973088
SP-18-S	26-Feb-10	0	11492	295919	0	27544	640	335595
SP-19-S	22-Mar-10	0	198317	325529	8779	89230	1200	623055
SP-22-S	09-Apr-10	0	17238	367751	1600	52194	1280	440063
SP-23-S	20-May-10	0	5826	653131	25857	12932	10619	708365
SP-26-S	17-Jul-10	0	74240	2068208	47520	111960	37520	2339448
SP-29-S	21-Aug-10	21552	690264	1187560	245456	26568	22352	2193752
SP-30-S	18-Sep-10	16568	877048	2394072	348032	59288	16168	3711176
Tehek Lake								
TE-16-S	16-Jan-10	0	14445	488570	18438	117007	80	638540
TE-18-S	26-Feb-10	160	97842	880498	16205	109282	2080	1106067
TE-19-S	21-Mar-10	0	273735	954236	41262	126819	6320	1402372
TE-22-S	09-Apr-10	0	7506	440063	19158	89783	960	557470
TE-23-S	21-May-10	0	1056078	747787	102955	27537	1840	1936197
TE-26-S	20-Jul-10	0	71840	1480120	77456	71256	2400	1703072
TE-29-S	28-Aug-10	0	374768	1145656	130912	29936	22152	1703424
TE-30-S	21-Sep-10	11984	79824	1453568	153464	29536	1000	1729376
TEFF-8-S	20-Jul-10	0	30536	1731560	56688	44304	9784	1872872
TEFF-11-S	28-Aug-10	0	151864	1117120	188184	21752	800	1479720
TEFF-12-S	21-Sep-10	17168	23152	713616	162048	7584	7584	931152
Inuggugayualik Lake								
INUG-14-S	22-Jul-10	0	36920	1355192	571136	44104	1200	2008552
INUG-17-S	25-Aug-10	79024	224304	1114320	59672	57872	7984	1543176
INUG-18-S	23-Sep-10	1000	66056	1552360	95392	137096	22152	1874056
Wally Lake								
WAL-8-S	19-Jul-10	0	259424	2020120	103592	131312	1800	2516248
WAL-11-S	23-Aug-10	158048	483328	1532592	73840	87608	14968	2350384
WAL-12-S	19-Sep-10	87008	532616	1819552	318496	95792	14768	2868232
Pipedream Lake								
PDL-8-S	21-Jul-10	2400	87408	2147848	246272	12784	18368	2515080
PDL-11-S	24-Aug-10	0	65856	1245432	101776	36520	15568	1465152
PDL-12-S	22-Sep-10	21752	261224	2038272	241872	44104	25152	2632376
Relative Abundance (%)		0.6	16	70	8.5	4.6	0.6	

Table 3-7. Seasonal density (cells/L) of major phytoplankton groups, Meadowbank study lakes and Baker Lake, 2010.

Station	Date	Phytoplankton Density (cells/L)						Total
		Cyanophyte	Chlorophyte	Chrysophyte	Diatom	Cryptophyte	Dinoflagellate	
Baker Lake								
BBD-8-S	26-Jul-10	0	143680	2592640	55504	243072	9784	3044680
BBD-11-S	31-Aug-10	65056	265808	2327648	253632	197968	14968	3125080
BBD-12-S	27-Sep-10	600	208736	1034696	129824	326080	7784	1707720
BPJ-8-S	27-Jul-10	0	201152	2527584	73888	342848	3600	3149072
BPJ-11-S	31-Aug-10	29136	266208	1623400	227168	355816	28936	2530664
BPJ-12-S	27-Sep-10	200	251640	761704	192280	246256	8384	1460464
BAP-8-S	26-Jul-10	0	100776	3184528	115392	450208	5400	3856304
BAP-11-S	30-Aug-10	8784	337648	971840	262272	216720	7584	1804848
BAP-12-S	27-Sep-10	7184	553568	1099752	323272	368184	600	2352560
BAKER LAKE								
Relative Abundance (%)		0.5	10	70	7.1	12	0.4	

Table 3-8. Seasonal biomass (mg/m³) and diversity of major phytoplankton groups, Meadowbank study lakes and Baker Lake, 2010.

Station	Date	Phytoplankton Biomass (mg/m³)						Total	# Species	Simpsons Diversity
		Cyanophyte	Chlorophyte	Chrysophyte	Diatom	Cryptophyte	Dinoflagellate			
Third Portage Lake										
TPE-15-S	18-Jan-10	0	2.1	13.9	0.9	7.9	7.6	32.6	22	0.78
TPE-18-S	25-Feb-10	0	0.7	4.4	0.0	12.3	1.5	18.9	14	0.65
TPE-19-S	23-Mar-10	0	2.4	33.7	0.1	14.9	1.9	52.9	22	0.75
TPE-22-S	10-Apr-10	0	0.7	12.1	0.0	13.6	1.5	28.0	14	0.72
TPE-23-S	20-May-10	0	0.9	29.5	0.4	7.1	0.0	37.9	15	0.77
TPE-26-S	16-Jul-10	0	1.3	87.9	0.6	5.2	3.0	98.0	22	0.65
TPE-29-S	18-Aug-10	0.7	6.3	71.2	10.0	18.0	20.1	126.3	28	0.84
TPE-30-S	19-Sep-10	1.4	10.0	92.5	28.1	16.0	20.4	168.5	35	0.88
TPN-15-S	19-Jan-10	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPN-18-S	24-Feb-10	0	0.2	10.1	1.6	14.3	1.5	27.7	14	0.64
TPN-19-S	20-Mar-10	0	0.4	23.6	0.2	14.7	4.6	43.5	21	0.67
TPN-22-S	10-Apr-10	0	0.5	15.9	0.1	12.5	1.3	30.3	15	0.60
TPN-23-S	22-May-10	0	23.8	14.9	4.0	9.3	12.9	64.9	19	0.52
TPN-26-S	17-Jul-10	0.4	1.0	42.4	1.1	6.8	10.4	62.0	24	0.81
TPN-29-S	19-Aug-10	0	9.3	99.3	6.6	11.3	16.2	142.7	34	0.86
TPN-30-S	17-Sep-10	0.8	10.2	86.4	47.9	12.5	18.2	175.9	40	0.87
TPS-9-S	19-Jan-10	0	1.0	13.9	4.7	11.5	3.4	34.5	19	0.78
TPS-12-S	24-Feb-10	0	0.3	6.9	0.4	4.3	2.6	14.5	15	0.61
TPS-13-S	24-Mar-10	0	0.4	13.6	1.2	5.2	2.4	22.8	22	0.71
TPS-16-S	10-Apr-10	0	0.4	12.0	0.0	11.9	1.6	26.0	13	0.67
TPS-17-S	22-May-10	0	0.8	16.4	0.0	3.9	1.0	22.1	15	0.57
TPS-20-S	18-Jul-10	0	1.6	30.4	2.5	4.4	11.6	50.5	28	0.80
TPS-23-S	20-Aug-10	0	3.8	71.8	51.7	9.2	20.6	157.0	34	0.84
TPS-24-S	17-Sep-10	2.0	12.9	61.1	27.1	8.6	3.3	114.9	40	0.90
Second Portage Lake										
SP-15-S	15-Jan-10	0.4	0.3	21.2	4.1	20.3	0	46.4	20	0.68
SP-18-S	26-Feb-10	0	1.1	11.7	0.0	11.2	0.7	24.7	12	0.74
SP-19-S	22-Mar-10	0	0.9	11.6	0.5	16.7	3.4	33.1	20	0.77
SP-22-S	09-Apr-10	0	0.6	16.0	4.1	6.9	1.5	29.1	19	0.73
SP-23-S	20-May-10	0	0.4	28.4	0.7	3.1	16.1	48.6	15	0.71
SP-26-S	17-Jul-10	0	3.1	135.7	3.8	14.0	18.6	175.3	30	0.73
SP-29-S	21-Aug-10	6.2	13.1	78.9	6.9	12.3	17.4	134.7	34	0.86
SP-30-S	18-Sep-10	2.2	29.7	149.3	15.2	13.8	20.3	230.5	46	0.89
Tehak Lake										
TE-16-S	16-Jan-10	0	2.3	18.9	1.1	22.7	0.3	45.4	20	0.66
TE-18-S	26-Feb-10	0.2	4.0	44.3	1.1	33.3	2.5	85.4	28	0.76
TE-19-S	21-Mar-10	0	2.0	70.5	2.1	16.5	8.9	100.0	25	0.82
TE-22-S	09-Apr-10	0	0.4	20.3	0.6	12.1	2.2	35.6	21	0.68
TE-23-S	21-May-10	0	10.3	24.7	2.4	7.2	7.2	51.8	18	0.77
TE-26-S	20-Jul-10	0	1.6	142.3	7.7	11.7	15.7	179.1	32	0.76
TE-29-S	28-Aug-10	0	6.4	95.7	6.2	2.6	9.4	120.3	41	0.89
TE-30-S	21-Sep-10	1.3	3.4	94.4	10.3	3.2	13.3	125.8	41	0.82
TEFF-8-S	20-Jul-10	0.0	0.4	160.8	4.5	3.7	18.3	187.7	30	0.72
TEFF-11-S	28-Aug-10	0.0	3.8	93.0	11.2	1.4	4.9	114.3	31	0.83
TEFF-12-S	21-Sep-10	1.4	2.4	59.0	11.9	1.2	4.5	80.4	35	0.87
Inuggugayualik Lake										
INUG-14-S	22-Jul-10	0.0	1.6	118.6	38.2	3.9	3.4	165.8	34	0.86
INUG-17-S	25-Aug-10	3.0	6.6	76.5	2.7	3.8	6.7	99.3	38	0.89
INUG-18-S	23-Sep-10	0.2	2.9	130.7	10.5	6.7	10.7	161.6	35	0.85
Wally Lake										
WAL-8-S	19-Jul-10	0.0	10.3	163.6	4.8	10.4	11.5	200.6	38	0.85
WAL-11-S	23-Aug-10	5.8	14.9	149.1	4.0	8.2	11.9	193.9	44	0.90
WAL-12-S	19-Sep-10	4.5	11.9	115.2	15.7	9.6	9.9	166.7	47	0.91
Pipedream Lake										
PDL-8-S	21-Jul-10	0.4	1.0	221.5	17.9	7.6	47.1	295.6	36	0.77
PDL-11-S	24-Aug-10	0.0	2.0	106.3	5.8	1.7	14.1	129.9	31	0.84
PDL-12-S	22-Sep-10	0.2	6.7	174.6	16.6	3.3	29.9	231.3	43	0.90
MEADOWBANK LAKES										
Relative Biomass (%)		0.6	4.7	67	7.9	10	9.5			

Table 3-8. Seasonal biomass (mg/m³) and diversity of major phytoplankton groups, Meadowbank study lakes and Baker Lake, 2010.

Station	Date	Phytoplankton Biomass (mg/m ³)							# Species	Simpsons Diversity
		Cyanophyte	Chlorophyte	Chrysophyte	Diatom	Cryptophyte	Dinoflagellate	Total		
Baker Lake										
BBD-8-S	26-Jul-10	0.0	2.9	165.4	11.1	29.0	19.3	227.7	40	0.80
BBD-11-S	31-Aug-10	3.3	4.2	219.3	37.7	26.8	6.4	297.8	37	0.85
BBD-12-S	27-Sep-10	0.1	4.1	78.6	17.0	42.6	3.7	146.1	38	0.89
BPJ-8-S	27-Jul-10	0.0	4.8	194.3	24.3	34.9	25.7	284.0	39	0.78
BPJ-11-S	31-Aug-10	1.5	3.6	170.5	19.5	44.4	9.1	248.6	37	0.82
BPJ-12-S	27-Sep-10	0.2	10.1	50.4	18.4	31.4	6.3	116.9	36	0.89
BAP-8-S	26-Jul-10	0.0	2.7	261.5	19.8	42.1	39.4	365.5	41	0.78
BAP-11-S	30-Aug-10	0.8	11.6	106.4	24.2	27.5	3.8	174.3	35	0.88
BAP-12-S	27-Sep-10	0.4	10.8	65.9	49.5	44.4	3.5	174.5	34	0.89
BAKER LAKE										
Relative Biomass (%)		0.3	2.7	64	11	16	5.8			

Figure 3-14. Seasonal biomass (mg/m^3) of major phytoplankton groups, Meadowbank study lakes & Baker Lake, 2010.

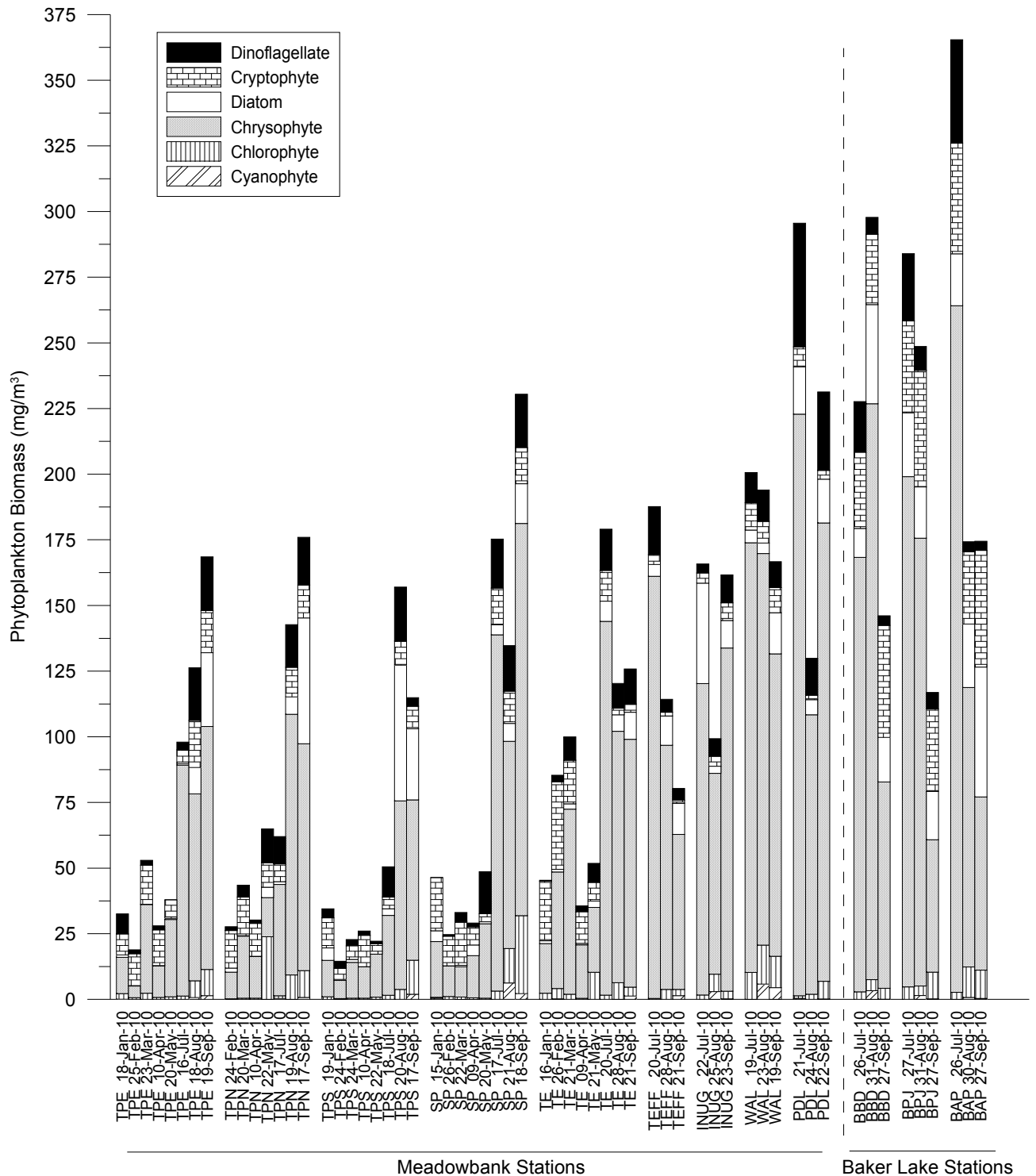


Figure 3-15. Phytoplankton mean total biomass (mg/m^3), ± 1 standard deviation, Meadowbank study lakes & Baker Lake, from July – September 2010.

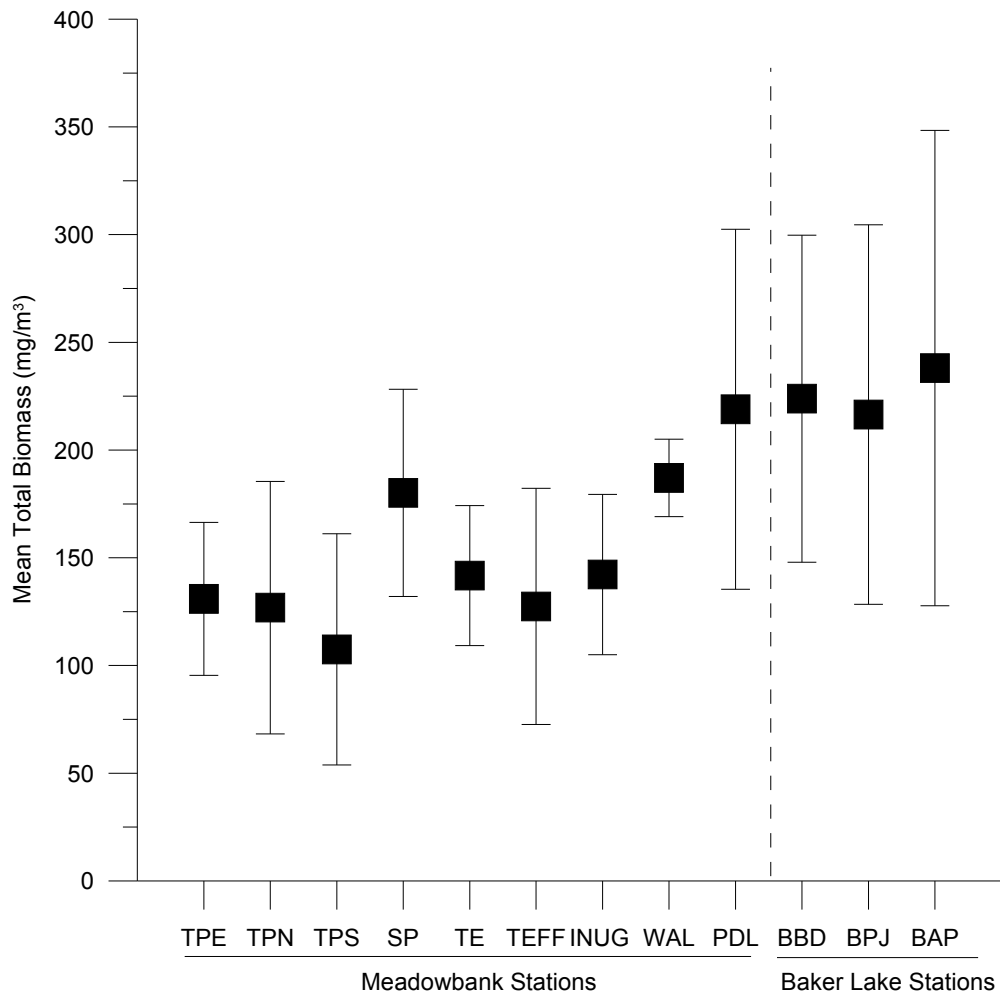
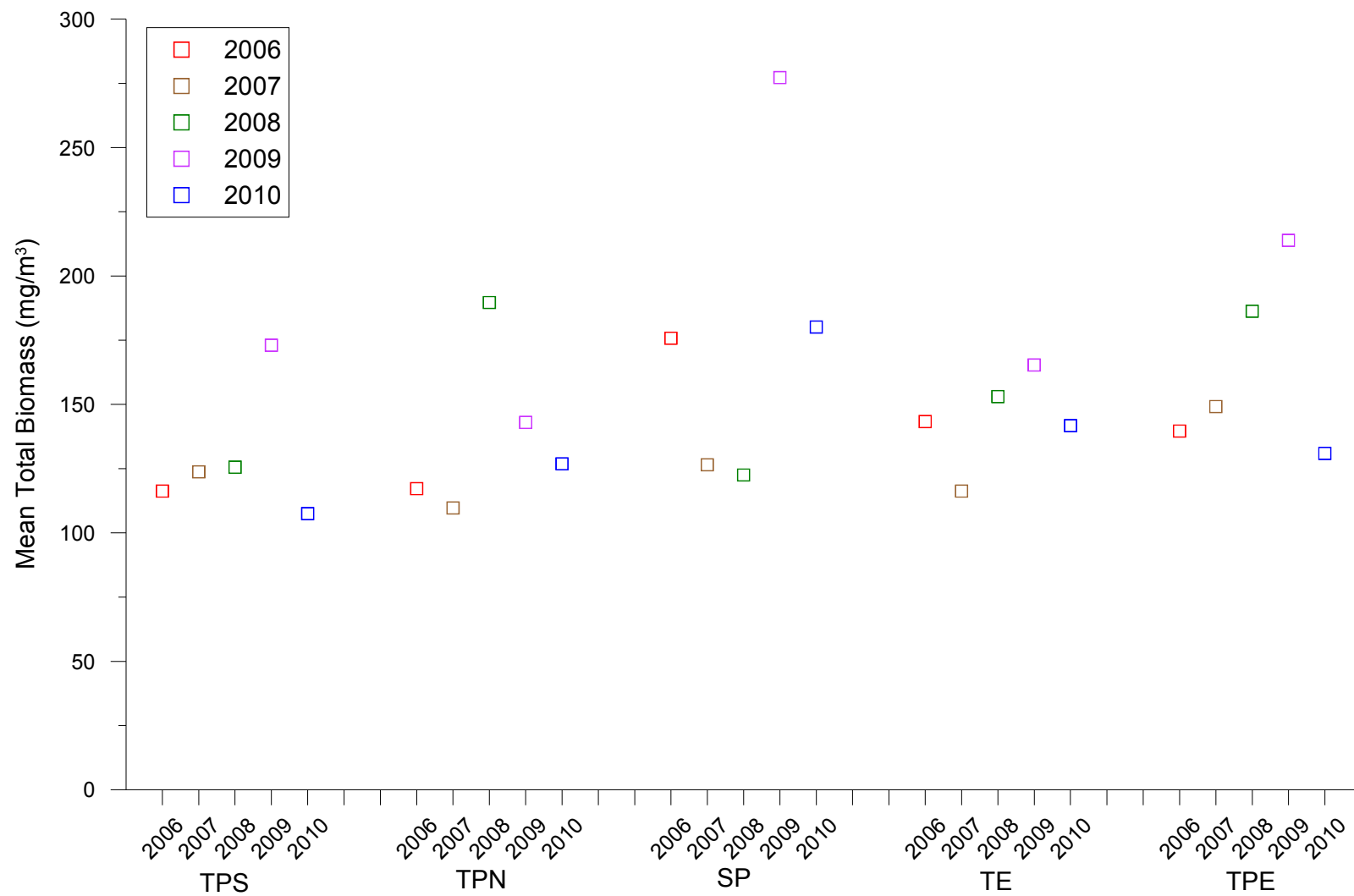


Figure 3-16. Phytoplankton mean total biomass (mg/m^3) from July–September 2006–2010.



3.5. Benthic Invertebrates

Benthic invertebrates (collectively referred to as “benthos”) are small animals that live on or in the bottom sediments and are an important food source for most fish species, especially young-of-the-year and juvenile lake trout, round whitefish, and Arctic char (Machniak, 1975; Scott and Crossman, 1979). This section gives a general description of observations made on abundance and richness of all major taxa (e.g., insects, molluscs, worms). The abundance of roundworms (Nematoda) and seed shrimp (Ostracoda) is reported (**Appendix B**), but is not included in statistical comparisons of total number of genera, abundance or richness. Because of their small size, they are not consistently retained on a 500- μm sieve, thus their presence would be confounding if they were used to quantitatively compare abundance estimates among stations. Summarized data are in **Tables 3-9 and 3-10** and raw data are in **Appendix B**.

3.5.1. Meadowbank Study Lakes

A least 40 taxa were identified and enumerated in the benthic invertebrate samples collected from the nine stations (**Appendix B**). Similar to previous years, insects, almost exclusively chironomids, dominated number of organisms enumerated at most stations and number of taxa identified at all stations (**Tables 3-9 and 3-10**). Clearly, chironomid larvae (F. Chironomidae) were the dominant taxonomic group over all stations with about 55% of all taxa identified consisting of chironomids within five subfamilies (**Appendix B**). Five genera of chironomids dominated richness.

The most commonly identified chironomid genus was *Procladius* (SF. Tanypodinae); this chironomid was found throughout all Meadowbank study lakes but was more abundant in TPE and WAL. *Stictochironomus* (SF. Chironominae) was fairly frequently detected throughout all the study lakes, and was particularly abundant in PDL. *Micropsectra* (SF. Chironominae) was very abundant in all Third Portage Lake basins, particularly TPE, rarer in the other lakes, and completely absent in SP (**Appendix B**). Given the generally depauperate invertebrate community in Second Portage Lake, it is possible that this taxa is present, but was not encountered in the grabs taken.

The next most abundant group was Mollusca (clams) especially, *Cyclocalyx* / *Neopisidium*, genera of the family Sphaeriidae (fingernail clams). Oligochaete worms were also relatively abundant in the lake sediments; generally, at least one oligochaete genus was present at all stations.

Abundance of organisms ($\#/\text{m}^2$) varied among lakes/basins (**Table 3-9 and Figure 3-17**). In Third Portage Lake abundance ranged from 1139 to 1322 organisms/ m^2 with no apparent difference among basins. Abundance in Second Portage Lake ($257/\text{m}^2$) was quite low relative to TP. Abundance at WAL ($2283/\text{m}^2$) was higher than at all other



stations which is consistent with all previous years, presumably because of its shallower depth and higher organic carbon content (8%) relative to the other lakes (3%).

- As in previous years, SP and TE have always had the two lowest abundances: 623/m² and 754/m² (2006); 913/m² and 952/m² (2007); 413/m² and 757/m² (2008); 778/m² and 770/m² (2009), respectively (Azimuth, 2008b, 2008a, 2009a, 2010a).
- Except for 2008, WAL has always had the highest abundance: 13000/m² (2006); 4700/m² (2007); 1161/m² (2008); 2265/m² (2009); 2283/m² (2010).
- Abundance at INUG (one of the reference areas) has also been fairly consistent, again with the exception of 2008: 761/m² (2006); 1022/m² (2007); 1900/m² (2008); 1191/m² (2009); 639/m² (2010).

Inter-annual variability in benthos abundance and diversity can be naturally high (as discussed in the 2009 EAS report; Azimuth, 2010c). For example, mean abundance at Third Portage Lake East varied substantially over time with values ranging between 3261/m² in 2006, 1578/m² in 2007, 5626/m² in 2008, 1713/m² in 2009, and 1139/m² in 2010. This variability is not uncommon for these lakes, can complicate the detection of actual project-related effects, and is being explored in more detail in the CREMP design (Azimuth, 2011a *in progress*) and also in the 2010 EAS (Azimuth, 2011b).

Benthic invertebrate abundance can be patchy, depending on the specific location of sampling that can differ from year to year within the sampling area, water depth, organic carbon, water temperature and development time of larvae and time of year. All of these factors contribute to variability both within and between stations and years. Several years of data are required to refine the range in abundance that might be considered to be ‘typical’ for a particular station.

As in previous years, the CREMP benthos dataset was used in the TSS EAS to determine whether elevated TSS both from East Dike construction (2008–2010) and Bay-Goose Dike construction (2009–2010) may have affected the benthic community at various stations. CREMP benthos were tested for specific area-year impacts relative to control area-years and for specific longer-term impacts by area (i.e., for areas where more subtle, but prolonged, effects may have occurred). A BACI (before/after control/impact) model was used for the analysis to test for both types (i.e., single-year and multi-year) of effects. Based on preliminary results from the EAS (for more details, see 2010 EAS report [Azimuth, 2011b]):

- *SP (2008, 2009, 2010, and 2008-2010)* – As reported for the past two years, the 2008 EAS (Azimuth, 2009c) reported a negative trend (although not statistically significant, but a fairly large effect size was observed) in total abundance at SP that did not extend to TE, which receives water from SP (and also had elevated

TSS in 2008). Abundance at SP improved in 2009 relative to baseline (i.e., 2006–2007). However, 2010 results were low and similar to 2008 results, with >50% reduction in abundance compared to what was expected. Given the single year results, it was not surprising to find a significant multi-year adverse effect for abundance at SP. There were no significant reductions in taxa richness, Simpson's Diversity or Bray Curtis distance for the short-term or long-term effects. Overall, the 2010 results for abundance at SP were unexpected and warrant further discussion after analysis of the higher-resolution East Dike EAS dataset (Azimuth, 2011b).

- *TE (2008, 2009, 2010, and 2008-2010)* – As discussed above, the negative trend in abundance observed in 2008 at SP did not extend to TE. The other single-year (2009 and 2010) and the multi-year (2008-2010) results reaffirm that there does not appear to be any significant adverse effects to benthic community structure at TE that is attributable to mining activity. Most results for TE since 2008 were within the range of baseline results.
- *TPE (2009, 2010 and 2009-2010)* – The main trends seen at this station were a decrease in benthic invertebrate abundance (not significant for 2009 or 2010 separately, but significant for the 2009-2010 multi-year effect) and an increase in Simpson's Diversity (marginal for 2010 and significant for 2009-2010). The overall results for abundance were heavily influenced by the 2008 data, where abundance and richness were anomalously elevated relative to what would be expected in that basin.
- *TPN (2009, 2010 and 2009-2010)* – As discussed in **Section 1.4**, this area was potentially exposed to elevated TSS during dewatering of the NW arm of Second Portage Lake starting in March 2009. Based on water quality from CREMP (Azimuth, 2010a and this report) and from Bay-Goose dike construction (Azimuth, 2010b) monitoring, TSS exposure in the north basin was likely low (note that discharge limits for TSS were adhered to), suggesting that adverse effects to the benthic community would be unlikely. This was confirmed by 2010 benthos results that showed no significant adverse effects. The only significant changes observed were increases for richness (2010) and Simpson's Diversity (2009-2010).

3.5.2. Baker Lake

Changing the location of the Baker Lake reference station (BAP) was considered in the 2009 CREMP report (Azimuth, 2010a). Despite large, apparently natural differences in invertebrate abundance between the reference station (higher) and the exposure stations (lower), we chose not to re-locate the reference. We reviewed the chemistry and benthic



biota data from 2008 and 2009 more carefully and determined that the reference station was not consistently different every year relative to the exposure stations, thus BAP remained as the reference station for 2010 sampling.

At least 40 taxa were identified and enumerated in the benthic invertebrate samples collected from the three stations (**Appendix B**). Insects dominated abundance at the exposure stations BBD (86%) and BPJ (79%), but not at the reference station as insects comprised only 27% of enumerated organisms (**Table 3-9**). Here (BAP) oligochaetes easily dominated abundance (60%), whereas they comprised a small fraction of abundance at the exposure stations BBD (11%) and BPJ (<5%) (**Table 3-9**). In previous years, oligochaetes have not been as abundant at BAP: <1 % in 2008; 31% in 2009. Insects have dominated abundance at all three stations for the past 2 years: 88% at BBD and BPJ (2008); 88% at BBD and 90% at BPJ (2009). We cannot explain the large abundance of oligochaetes at the reference station observed in 2010; however, taxa richness has consistently been highest for insects at all stations from 2008–2010.

In addition, some taxonomic differences were observed among the Baker Lake stations. Similar to 2009, the most abundant chironomid genera were *Stictochironomus* and *Paratanytarsus* (SF. Chironominae). *Stictochironomus* was most abundant at BBD but was detected at all stations. *Paratanytarsus* was quite abundant at BAP but rarely found at BBD and BPJ.

Cyclocalyx/Neopisidium genera of the family Sphaeriidae (fingernail clams) comprised the remainder of the taxa at Baker Lake stations (**Appendix B**); 1% at BBD, but about 10% at the other two stations.

Mean total abundance of organisms ranged from 843/m² at BPJ to 6883/m² at the reference BAP (**Table 3-9 and Figure 3-19**), nearly 10x the exposure stations. Although we acknowledge that there is natural inter-annual variability in benthos abundance and diversity we cannot explain why the differences in 2010 were so large. For example, mean abundance at BBD has varied widely between 2008 (6300/m²), 2009 (930/m²), and 2010 (1291/m²) (Azimuth, 2009a, 2010a). It is difficult to say whether this is simply natural variation or an effect as a result of exposure (although metals concentrations in sediment have not changed; see **Section 3.3.2**). Abundance at the reference station BAP was also variable over this time, but not by as much (3300/m² in 2008, 4983/m² in 2009, 6883/m² in 2010). A similar pattern is observed for mean taxa richness at Baker Lake stations (ranging from 8 taxa at BPJ to 21 taxa at BAP) despite a consistent taxa dominance of insects for all stations (**Table 3-10 and Figure 3-20**).

Table 3-9. Benthic invertebrate total abundance ($\#/m^2$), Meadowbank study lakes and Baker Lake, August 2010.

Station	Date	Depth (m)	Total Abundance (#/m ²)				Total
			Oligochaetes	Insects	Molluscs	Other Taxa	
Third Portage Lake							
TPE-1	19-Aug-10	8.3	43	413	370	22	848
TPE-2	19-Aug-10	7.5	22	435	543	152	1152
TPE-3	19-Aug-10	6.8	43	761	370	22	1196
TPE-4	19-Aug-10	8.4	109	652	326	65	1152
TPE-5	19-Aug-10	6.5	87	674	435	152	1348
		Station Mean	61	587	409	83	1139
TPN-1	19-Aug-10	7.5	87	1043	261	43	1435
TPN-2	19-Aug-10	8.8	43	1739	283	43	2109
TPN-3	19-Aug-10	9.5	87	1174	478	22	1761
TPN-4	19-Aug-10	9.5	0	913	152	43	1109
TPN-5	19-Aug-10	8.4	0	152	43	0	196
		Station Mean	43	1004	243	30	1322
TPS-1	20-Aug-10	7.2	87	1196	587	0	1870
TPS-2	20-Aug-10	8.1	43	739	978	109	1870
TPS-3	20-Aug-10	8.4	0	1326	261	0	1587
TPS-4	20-Aug-10	6.7	22	370	196	0	587
TPS-5	20-Aug-10	7.6	0	239	326	0	565
		Station Mean	30	774	470	22	1296
Second Portage Lake							
SP-1	21-Aug-10	8.9	0	109	87	22	217
SP-2	21-Aug-10	6.8	0	65	130	22	217
SP-3	21-Aug-10	8.8	0	65	109	0	174
SP-4	21-Aug-10	7.4	0	87	109	22	217
SP-5	21-Aug-10	8.0	43	152	217	43	457
		Station Mean	9	96	130	22	257
Tehok Lake							
TE-1	27-Aug-10	7.7	22	283	674	43	1022
TE-2	27-Aug-10	9.6	0	109	130	109	348
TE-3	27-Aug-10	8.2	0	65	109	43	217
TE-4	27-Aug-10	7.5	0	326	239	196	761
TE-5	27-Aug-10	6.9	43	304	239	43	630
		Station Mean	13	217	278	87	596
TEFF-1	27-Aug-10	7.4	0	370	261	22	652
TEFF-2	27-Aug-10	7.2	0	978	391	22	1391
TEFF-3	27-Aug-10	7.4	0	283	370	22	674
TEFF-4	27-Aug-10	6.6	22	609	283	43	957
TEFF-5	27-Aug-10	8.0	43	478	283	130	935
		Station Mean	13	543	317	48	922
Inuggugayualik Lake							
INUG-1	25-Aug-10	6.8	87	130	261	0	478
INUG-2	25-Aug-10	6.7	22	391	109	22	543
INUG-3	25-Aug-10	8.0	0	239	457	65	761
INUG-4	25-Aug-10	8.3	0	174	413	43	630
INUG-5	25-Aug-10	8.7	22	457	283	22	783
		Station Mean	26	278	304	30	639
Wally Lake							
WAL-1	23-Aug-10	9.3	22	370	652	22	1065
WAL-2	23-Aug-10	9.5	65	2500	370	43	2978
WAL-3	23-Aug-10	8.0	0	543	457	43	1043
WAL-4	23-Aug-10	9.8	65	4804	565	43	5478
WAL-5	23-Aug-10	7.4	0	413	413	22	848
		Station Mean	30	1726	491	35	2283
Pipedream Lake							
PDL-1	24-Aug-10	6.6	43	891	196	0	1130
PDL-2	24-Aug-10	6.9	65	696	261	22	1043
PDL-3	24-Aug-10	6.5	87	696	717	0	1500
PDL-4	24-Aug-10	6.8	22	261	152	22	457
PDL-5	24-Aug-10	7.7	0	239	109	0	348
		Station Mean	43	557	287	9	896

Table 3-9. Benthic invertebrate total abundance (#/m²), Meadowbank study lakes and Baker Lake, August 2010.

Station	Date	Depth (m)	Total Abundance (#/m ²)				Total
			Oligochaetes	Insects	Molluscs	Other Taxa	
<i>Baker Lake</i>							
BBD-1	31-Aug-10	7.3	22	370	0	22	413
BBD-2	31-Aug-10	6.8	0	435	0	22	457
BBD-3	31-Aug-10	7.7	348	1935	0	0	2283
BBD-4	31-Aug-10	8.6	217	1978	87	22	2304
BBD-5	31-Aug-10	7.5	152	848	0	0	1000
		<i>Station Mean</i>	<i>148</i>	<i>1113</i>	<i>17</i>	<i>13</i>	<i>1291</i>
BPJ-1	31-Aug-10	7.7	152	2043	348	109	2652
BPJ-2	31-Aug-10	7.4	0	22	0	0	22
BPJ-3	31-Aug-10	8.0	0	304	22	130	457
BPJ-4	31-Aug-10	7.2	43	870	22	43	978
BPJ-5	31-Aug-10	6.5	0	109	0	0	109
		<i>Station Mean</i>	<i>39</i>	<i>670</i>	<i>78</i>	<i>57</i>	<i>843</i>
BAP-1	30-Aug-10	8.2	8022	2348	1609	174	12152
BAP-2	30-Aug-10	8.5	6826	1783	65	22	8696
BAP-3	30-Aug-10	7.5	4196	2761	1043	217	8217
BAP-4	30-Aug-10	7.7	935	1109	565	217	2826
BAP-5	30-Aug-10	8.3	674	1391	217	239	2522
		<i>Station Mean</i>	<i>4130</i>	<i>1878</i>	<i>700</i>	<i>174</i>	<i>6883</i>

Table 3-10. Benthic invertebrate total richness (#taxa), Meadowbank study lakes and Baker Lake, August 2010.

Station	Date	Total Richness (#taxa)				Total
		Oligochaetes	Insects	Molluscs	Other Taxa	
Third Portage Lake						
TPE-1	19-Aug-10	2	5	1	1	9
TPE-2	19-Aug-10	1	5	1	1	8
TPE-3	19-Aug-10	1	7	1	1	10
TPE-4	19-Aug-10	2	7	1	1	11
TPE-5	19-Aug-10	2	7	1	1	11
	Station Mean	2	6	1	1	10
TPN-1	19-Aug-10	2	7	1	1	11
TPN-2	19-Aug-10	1	8	1	1	11
TPN-3	19-Aug-10	2	8	1	1	12
TPN-4	19-Aug-10	0	8	1	1	10
TPN-5	19-Aug-10	0	7	1	0	8
	Station Mean	1	8	1	1	10
TPS-1	20-Aug-10	0	8	1	0	9
TPS-2	20-Aug-10	0	9	2	1	12
TPS-3	20-Aug-10	0	8	1	0	9
TPS-4	20-Aug-10	1	3	1	0	5
TPS-5	20-Aug-10	0	5	1	0	6
	Station Mean	0	7	1	0	8
Second Portage Lake						
SP-1	21-Aug-10	0	3	1	1	5
SP-2	21-Aug-10	0	1	1	1	3
SP-3	21-Aug-10	0	1	1	0	2
SP-4	21-Aug-10	0	3	1	1	5
SP-5	21-Aug-10	1	4	1	1	7
	Station Mean	0	2	1	1	4
Tehek Lake						
TE-1	27-Aug-10	1	7	1	1	10
TE-2	27-Aug-10	0	2	1	1	4
TE-3	27-Aug-10	0	1	1	1	3
TE-4	27-Aug-10	0	5	1	1	7
TE-5	27-Aug-10	1	5	1	1	8
	Station Mean	0	4	1	1	6
TEFF-1	27-Aug-10	0	7	1	1	9
TEFF-2	27-Aug-10	0	12	1	1	14
TEFF-3	27-Aug-10	0	6	1	1	8
TEFF-4	27-Aug-10	1	9	1	1	12
TEFF-5	27-Aug-10	1	8	1	1	11
	Station Mean	0	8	1	1	11
Inuggugayualik Lake						
INUG-1	25-Aug-10	1	3	2	0	6
INUG-2	25-Aug-10	1	4	1	1	7
INUG-3	25-Aug-10	0	7	3	2	12
INUG-4	25-Aug-10	0	4	2	1	7
INUG-5	25-Aug-10	1	6	2	1	10
	Station Mean	1	5	2	1	8
Wally Lake						
WAL-1	23-Aug-10	1	7	3	1	12
WAL-2	23-Aug-10	1	7	3	1	12
WAL-3	23-Aug-10	0	8	2	1	11
WAL-4	23-Aug-10	1	6	3	1	11
WAL-5	23-Aug-10	0	3	3	1	7
	Station Mean	1	6	3	1	11
Pipedream Lake						
PDL-1	24-Aug-10	0	6	2	0	8
PDL-2	24-Aug-10	0	5	2	1	8
PDL-3	24-Aug-10	1	6	2	0	9
PDL-4	24-Aug-10	1	6	1	1	9
PDL-5	24-Aug-10	0	7	1	0	8
	Station Mean	0	6	2	0	8

Table 3-10. Benthic invertebrate total richness (#taxa), Meadowbank study lakes and Baker Lake, August 2010.

Station	Date	Total Richness (#taxa)				Total
		Oligochaetes	Insects	Molluscs	Other Taxa	
<i>Baker Lake</i>						
BBD-1	31-Aug-10	1	8	0	1	10
BBD-2	31-Aug-10	0	7	0	1	8
BBD-3	31-Aug-10	3	9	0	0	12
BBD-4	31-Aug-10	4	12	1	1	18
BBD-5	31-Aug-10	2	4	0	0	6
	<i>Station Mean</i>	2	8	0	1	11
BPJ-1	31-Aug-10	2	13	1	1	17
BPJ-2	31-Aug-10	0	1	0	0	1
BPJ-3	31-Aug-10	0	6	1	1	8
BPJ-4	31-Aug-10	1	7	1	1	10
BPJ-5	31-Aug-10	0	2	0	0	2
	<i>Station Mean</i>	1	6	1	1	8
BAP-1	30-Aug-10	5	13	2	3	23
BAP-2	30-Aug-10	5	10	2	1	18
BAP-3	30-Aug-10	5	10	1	2	18
BAP-4	30-Aug-10	5	14	2	1	22
BAP-5	30-Aug-10	2	19	1	2	24
	<i>Station Mean</i>	4	13	2	2	21

Figure 3-17. Benthic invertebrate replicates of abundance by major taxa group, Meadowbank study lakes, August 2010.

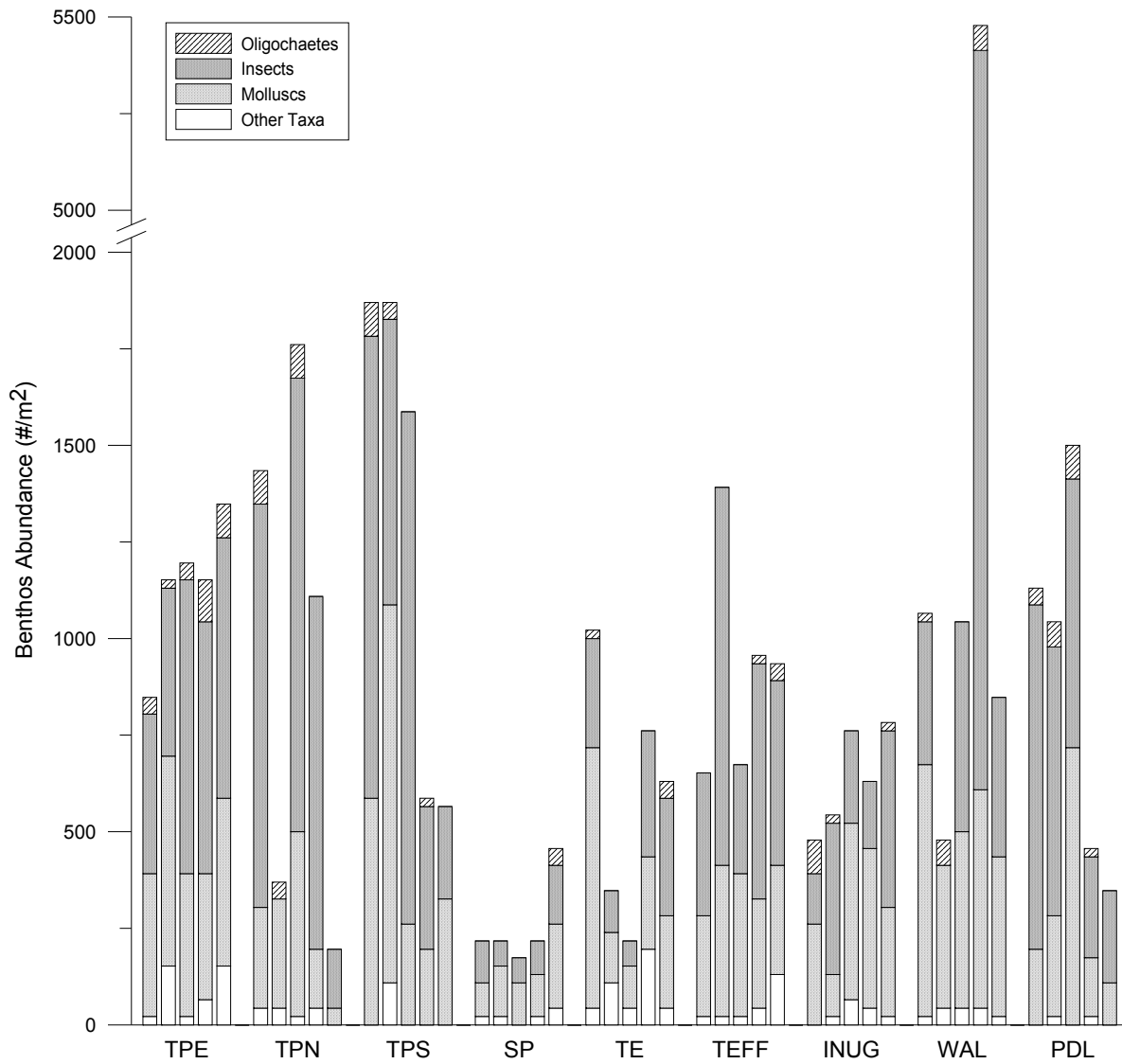


Figure 3-18. Benthic invertebrate replicates of richness by major taxa group, Meadowbank study lakes, August 2010.

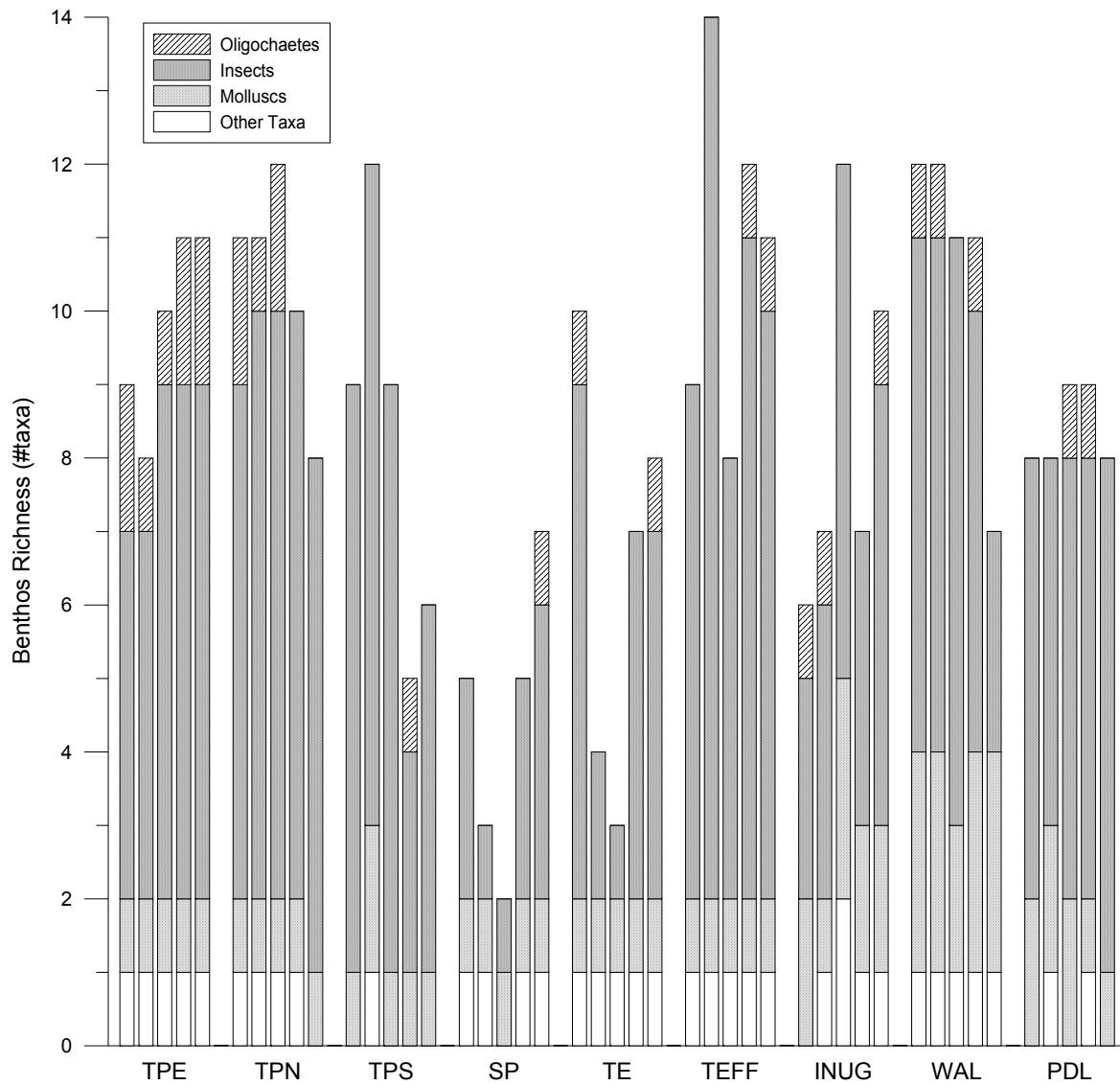


Figure 3-19. Benthic invertebrate replicates of abundance by major taxa group, Baker Lake, August 2010.

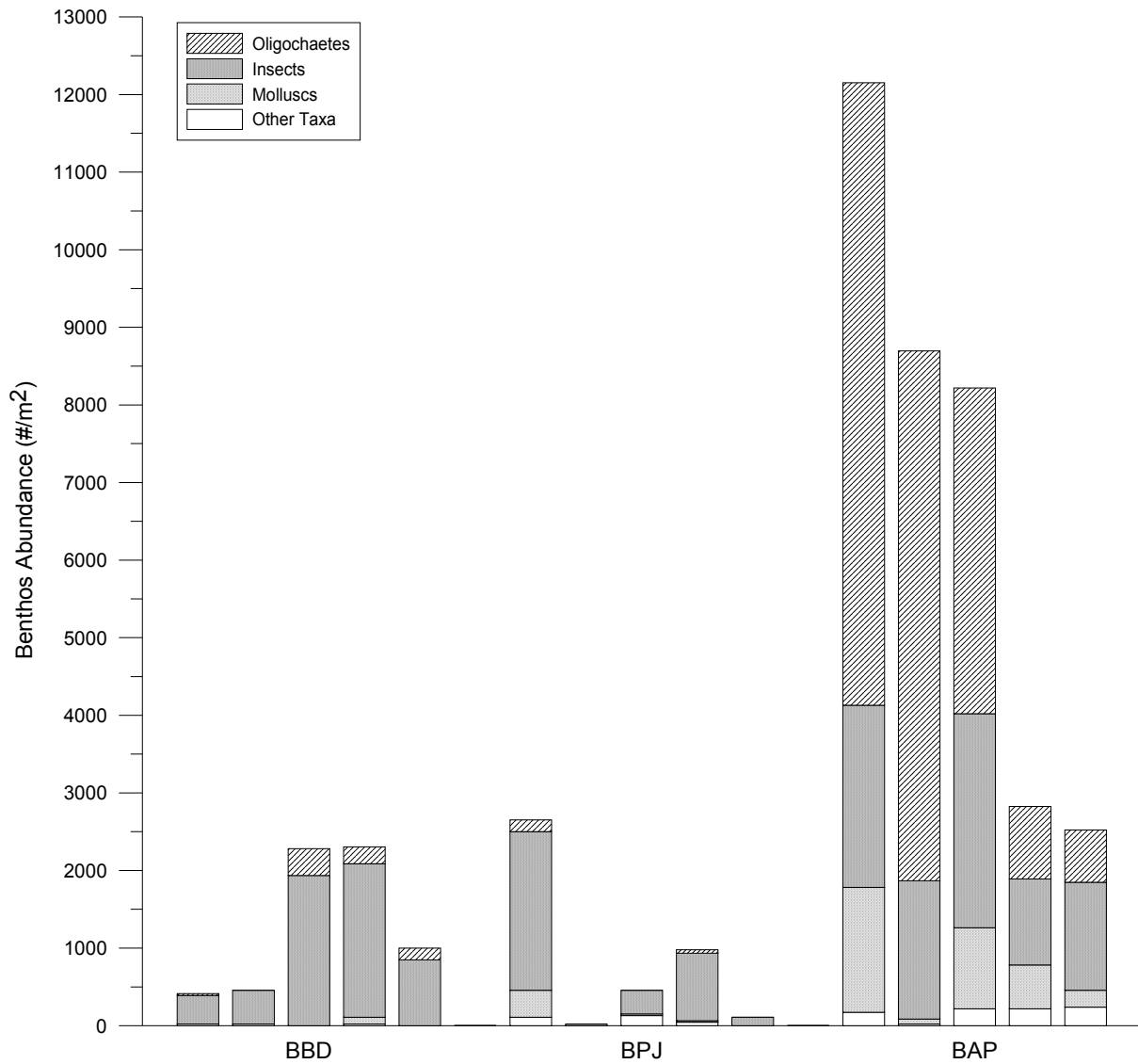
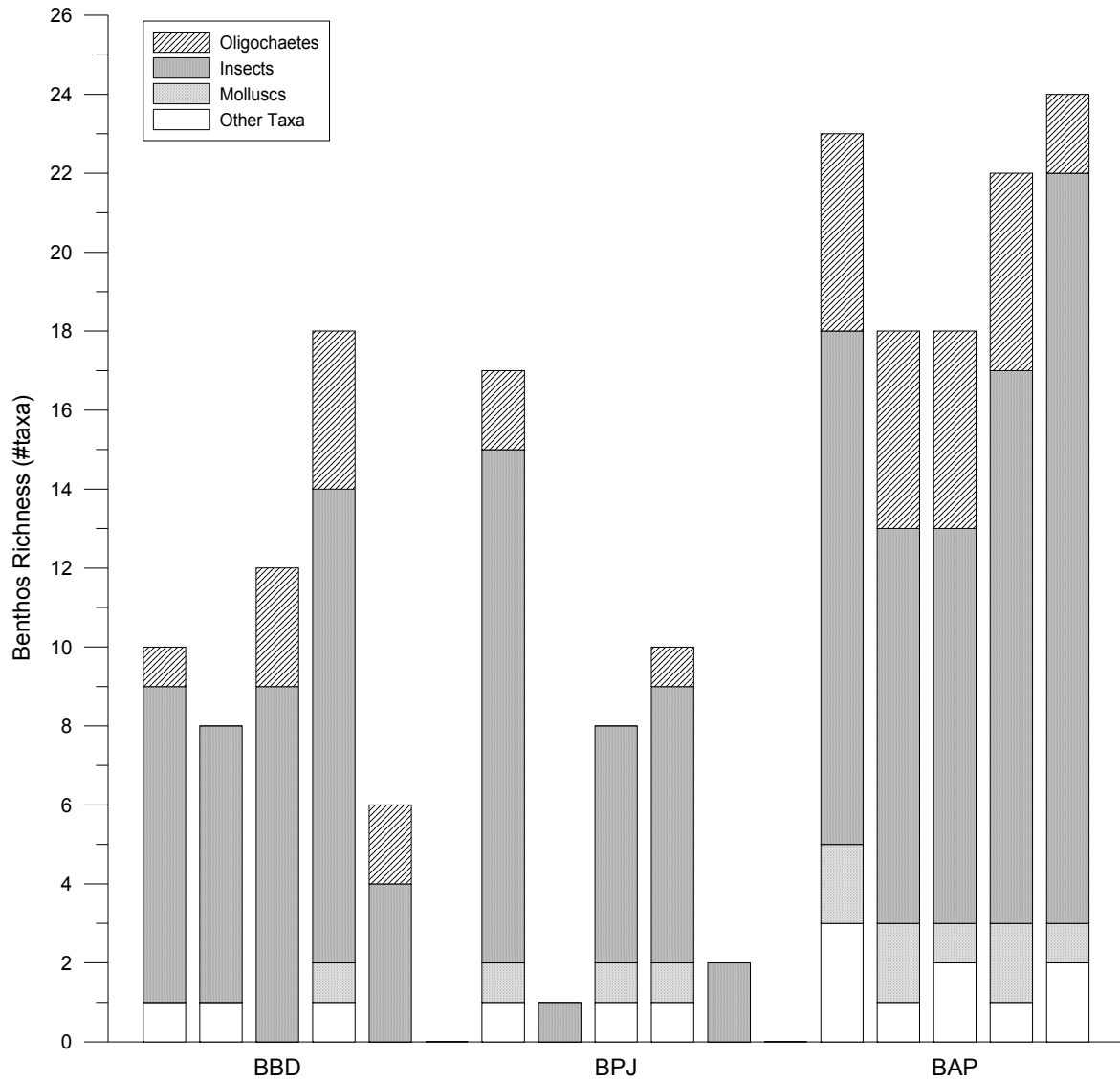


Figure 3-20. Benthic invertebrate replicates of richness by major taxa group, Baker Lake, August 2010.



3.6. Zooplankton

Zooplankton data are reported on the basis of wet and dry biomass (**Table 3-11**) in units of mg/m^3 and mean abundance of taxa identified (**Table 3-12**) in units of organisms/ m^3 . This is based on a composite of two standard vertical tows from 8m depth to surface, assuming a total filtered water volume of 1.13 m^3 . A detailed list of taxa identified are shown in **Appendix D** and raw data for biomass analyses are in **Appendix E**.

The zooplankton community was composed primarily of copepods and cladocerans (water fleas). Most stations were completely dominated by copepods (89% at TE; 91% at INUG; 93% at TPN and SP; 96% at TEFF; 97% at TPS and WAL; and 99% at TPE) and PDL had a slightly lower copepod contribution (82%) (**Table 3-12**). Copepod composition was mostly evenly split between the 2 orders: Cyclopoida (mostly *Cyclops scutifer*), and Calanoida (mostly *Diaptomus sp.* females). The remainder of the zooplankton community was made up of cladocerans, represented primarily by *Holopedium gibberum* and *Bosmina longirostris* (**Table 3-12**).

Mean total biomass ranged from about $10.4\text{--}37.5 \text{ mg}/\text{m}^3 \text{ dw}$ (**Table 3-11** and **Figure 3-21**). No obvious trends were apparent and it is difficult to distinguish differences between stations because zooplankton biomass values varied so widely even within stations (see standard deviation $\pm$ bars in **Figure 3-21**); this variability may be due to patchiness of animals in the water column. Mean total biomass ranged from about $18\text{--}21 \text{ mg}/\text{m}^3$ in Third Portage Lake basins, $22 \text{ mg}/\text{m}^3$ at SP, and $13\text{--}16$ in Tehek Lake basins.

Variability inherent in zooplankton sampling was minimized by towing from the same depth at a slow tow speed to reduce avoidance behaviour by large zooplankters. Generally, zooplankton biomass from TE, TEFF and PDL was lower than the other lakes/basins while biomass was consistently higher at INUG and WAL. The former are very large and deep lakes/basins which may explain why these lakes had a lower zooplankton biomass and the latter are generally smaller and shallower lakes and relatively high numbers of zooplankton are found in these lakes (**Figure 3-21**).

Although biomass was higher in INUG and WAL and lower in PDL, TE, and TEFF, abundance showed a somewhat different pattern. TPE had the highest abundance of zooplankton ($6707 \text{ organisms}/\text{m}^3$), followed by WAL ($6101/\text{m}^3$) and INUG ($4780/\text{m}^3$) (**Table 3-12**). Lowest abundance was observed in PDL ($1097/\text{m}^3$), followed by TPS ($1131/\text{m}^3$).

Zooplankton sampling was added to the CREMP monitoring program in 2010 to include sampling at all Meadowbank stations during the August open-water season. Statistical analyses can be performed to determine if zooplankton will be good biological indicator for detecting a significant effect for future monitoring. In addition to the benthic invertebrate community sampling, the zooplankton sampling may help to increase our

ability to detect ecological changes in project lakes that may be attributable to mine-related activities (i.e., independent from natural changes that may also be observed at both exposure and reference stations).

As discussed above, there was considerable variation among stations (which impairs our ability to discern mine-related effects) but also among replicates (see standard deviation +/- bars in **Figure 3-21**; which indicates the level of noise or sampling variability in the data). Since zooplankton data will likely exhibit natural inter-annual variation that is station-specific, a full BACI approach would be more useful in the future, because there is only one year of zooplankton data for CREMP stations, a full before/after control/impact (BACI) assessment cannot be conducted. However, a simple before/after (BA) comparison was used to provide an initial evaluation of replicate sample numbers.

Using 2010 data, we determined the power to detect two different effect sizes: (1) a 20% effect size or a 20% reduction in mean; and (2) a 50% effect size. Results of the BA comparison showed that even in low-power cases (i.e., as low as ~40% power) in order to detect a 20% effect, 15 replicates per station (or perhaps 20) would be required for a sampling event, instead of the 5 replicates that were taken in 2010. Power was considerably greater for the same number of replicates sampled in the 50% effect size scenario.

Options for increasing power with this sampling variable are either to sample more frequently (e.g., seasonal sampling), or alternatively, to increase the number of replicate samples collected for each station. The current sample design is already heavily weighted on spatial replication and not on replication over time. The BACI design is most effective for a sample design that has both spatial and time replication. Therefore, in keeping with the current design, we suggest keeping one sample event (August) and increasing the replicates from 5 to 10 per station.

One variable that was not controlled for in 2010 was net clogging in the very fine 70- μ m mesh that was used. If clogging did occur then less volume is sampled and could inadvertently affect biomass and abundance estimates on a per volume basis. To control for this in 2011 and moving forward, a flow meter will be installed at the mouth of the net to measure actual volume of water passed through the net.

The current zooplankton data will become more valuable as we continue to add yearly data that will decrease within-station variability by distinguishing natural variability from a real effect. These organisms will likely prove to be good biological indicators for change along with the benthic invertebrate community data and as such are useful additions to the CREMP monitoring program.

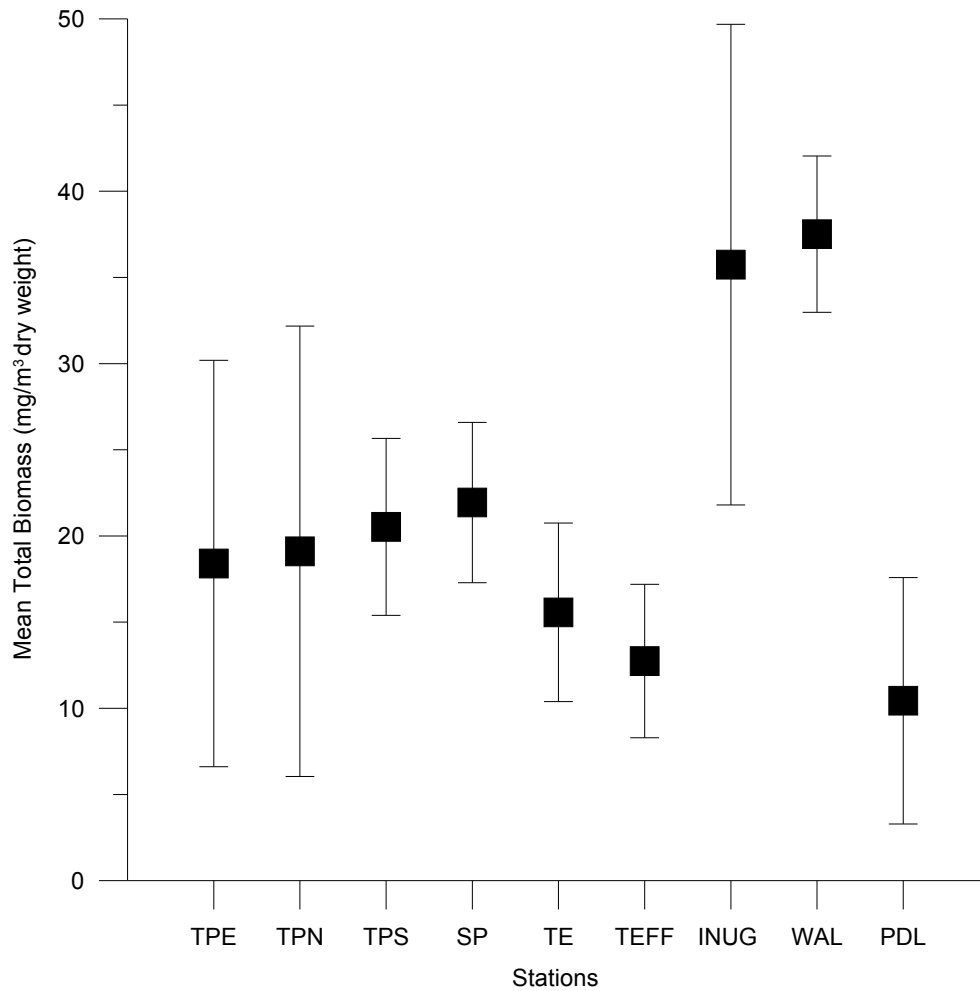
Table 3-11. Zooplankton biomass (mg/m³) (wet and dry weights), Meadowbank study lakes, 2010.

Station	Date	Water Depth (m)	Tow Depth (m)	Wet biomass (mg ww / tow)	Wet biomass (mg/m ³ ww)	Dry biomass (mg/m ³ dw)
Third Portage Lake						
TPE-1	19-Aug-10	11.0	8	200	177	10.6
TPE-2	19-Aug-10	10.5	8	414	366	23.0
TPE-3	19-Aug-10	12.4	8	219	194	11.5
TPE-4	19-Aug-10	15.8	8	814	720	37.2
TPE-5	19-Aug-10	16.6	8	188	166	9.7
Mean						18.4
TPN-1	19-Aug-10	11.5	8	407	360	12.4
TPN-2	19-Aug-10	32.2	8	190	168	30.1
TPN-3	19-Aug-10	13.0	8	577	510	15.9
TPN-4	19-Aug-10	14.9	8	367	325	34.5
TPN-5	19-Aug-10	11.3	8	75	66	2.7
Mean						19.1
TPS-1	20-Aug-10	13.9	8	173	153	27.4
TPS-2	20-Aug-10	24.2	8	238	211	21.2
TPS-3	20-Aug-10	49.8	8	240	212	15.9
TPS-4	20-Aug-10	25.4	8	220	195	23.0
TPS-5	20-Aug-10	10.7	8	371	328	15.0
Mean						20.5
Second Portage Lake						
SP-1	21-Aug-10	22.1	8	514	455	21.2
SP-2	21-Aug-10	10.4	8	917	811	27.4
SP-3	21-Aug-10	10.1	8	378	334	15.0
SP-4	21-Aug-10	12.0	8	368	326	21.2
SP-5	21-Aug-10	10.6	8	405	358	24.8
Mean						21.9
Tehek Lake						
TE-1	27-Aug-10	10.7	8	337	298	17.7
TE-2	28-Aug-10	10.6	8	240	212	11.5
TE-3	27-Aug-10	10.8	8	169	150	8.8
TE-4	27-Aug-10	14.7	8	869	769	18.6
TE-5	27-Aug-10	12.2	8	737	652	21.2
Mean						15.6
TEFF-1	28-Aug-10	10.7	8	430	380	14.2
TEFF-2	28-Aug-10	11.5	8	329	291	12.4
TEFF-3	28-Aug-10	14.0	8	342	303	8.0
TEFF-4	28-Aug-10	11.4	8	337	298	9.7
TEFF-5	28-Aug-10	11.6	8	495	438	19.5
Mean						12.7
Inuggugayualik Lake						
INUG-1	25-Aug-10	11.4	8	943	834	46.0
INUG-2	25-Aug-10	10.4	8	860	761	24.8
INUG-3	25-Aug-10	10.4	8	1394	1233	46.0
INUG-4	25-Aug-10	10.1	8	545	482	16.8
INUG-5	25-Aug-10	10.4	8	1553	1374	45.1
Mean						35.7
Wally Lake						
WAL-1	23-Aug-10	10.0	8	516	456	35.4
WAL-2	23-Aug-10	13.7	8	928	821	43.3
WAL-3	23-Aug-10	11.7	8	623	551	40.7
WAL-4	23-Aug-10	10.7	8	597	528	36.3
WAL-5	23-Aug-10	9.7	8	582	515	31.8
Mean						37.5
Pipedream Lake						
PDL-1	24-Aug-10	10.6	8	140	124	7.1
PDL-2	24-Aug-10	28.2	8	210	186	8.0
PDL-3	24-Aug-10	10.7	8	235	208	23.0
PDL-4	24-Aug-10	11.4	8	124	110	5.3
PDL-5	24-Aug-10	23.7	8	227	201	8.8
Mean						10.4

Table 3-12. Mean abundance (#/m³) per station of taxa identified, Meadowbank study lakes, 2010.

Station Date	TPE 19-Aug-10	TPN 19-Aug-10	TPS 20-Aug-10	SP 21-Aug-10	TE 27-Aug-10	TEFF 28-Aug-10	INUG 25-Aug-10	WAL 23-Aug-10	PDL 24-Aug-10
CLADOCERA									
Daphniidae									
<i>Daphnia longiremis</i> Sars	8.5	3.5	0	9.9	20	0.7	0	23	0
<i>Daphnia middendorffiana</i> Fischer	3.5	1.8	1.4	11	11	3.9	124	52	11
Bosminidae									
<i>Bosmina longirostris</i> (O.F. Muller)	1.4	5.7	3.5	18	93	30	95	37	28
Chydoridae									
<i>Chydorus</i> sp.	0.0	0	0	2.8	0	0	0	0	0
Holopedidae									
<i>Holopedium gibberum</i> Zaddach	52	102	24	121	95	49	203	97	157
% CLADOCERA:	1.0%	6.6%	2.6%	7.5%	11%	4.1%	8.8%	3.4%	18%
COPEPODA									
Calanoida									
Calanoida copepodite	71	27	15	27	27	16	45	49	33
Diaptomidae									
<i>Diaptomus ashlandi</i> Marsh	0	0	0	0	0	7.4	0	0.7	0
<i>Diaptomus minutus</i> Lilljeborg	775	139	144	416	249	523	823	1163	116
<i>Diaptomus sicilis</i> S.A. Forbes	156	67	76	12	21	3.2	13	25	2.5
<i>Diaptomus probilifensis</i> Juday and Muttkowski	215	0	0	72	0	0	18	359	8.5
<i>Diaptomus</i> spp. (unid. Females)	2670	630	615	589	598	948	1216	2042	170
Temoridae									
<i>Epischura lacustris</i> Forbes	0	0.7	0	0	17	7.1	51	1.4	47
<i>Heterocope septentrionalis</i> Juday and Muttkow	90	74	81	16	26	18	56	60	61
Cyclopoida									
Cyclopoid copepodite	218	170	58	170	138	80	272	478	76
Cyclopidae									
<i>Cyclops scutifer</i> Sars	2447	487	113	705	750	341	1865	1712	388
% COPEPODA:	99%	93%	97%	93%	89%	96%	91%	97%	82%
TOTAL ABUNDANCE / m³:	6707	1708	1131	2169	2046	2026	4780	6101	1097

Figure 3-21. Zooplankton mean total biomass (mg/m³ dry weight), +/- 1 standard deviation, Meadowbank study lakes, August 2010.



4. SUMMARY

CREMP monitoring focused on two main areas in 2010: Meadowbank study lakes (as in past years) and Baker Lake (since 2008). As in 2009, sampling in 2010 was conducted on a monthly basis throughout the year where ice conditions permitted; sampling was conducted in January through April (through-ice) and July through September (open-water). In addition, efforts to characterize spatial variability of water sampling areas were increased to include the entire basin from each of the study lakes in 2009. Also in 2010, zooplankton sampling (at all Meadowbank stations during August) was added to CREMP to provide some additional information to the CREMP design review process.

With the onset of phase 2 construction activities related to the Bay-Goose Dike, 2010 marked the third year of construction phase since the last complete baseline year in 2007. Key results for 2010 for each of the two monitoring areas are listed below.

Meadowbank Study Lakes

- Limnology results show that the lakes are generally cold, clear, isothermal, well mixed, and well oxygenated. These results are consistent among stations and seasons for 2010 and similar to historical data. The temperature profile for TE was unusually high relative to adjacent stations just after ice-off and this is likely attributable to poor instrument calibration since it was not evident several weeks later. During through-ice sampling in winter months, observed differences were colder lake water temperatures and higher dissolved oxygen concentrations, as would be expected.
- Water chemistry results show that the lakes are circum-neutral, with low and consistent conductivity, hardness and ions within and between lakes. TPE had slightly higher values related to TDS and TSS from dike construction. Total and dissolved solids concentrations are very low and typically below detection limits (see exceptions in next bullet). Carbon was also low, close to laboratory detection limits and did not differ appreciably within or among lakes and seasons. Some stations detected nitrogen above DLs and never exceeded guidelines. On a few occasions phosphorus concentrations exceeded the guideline for ultra-oligotrophic lakes in a few lakes. Total and dissolved metals concentrations were consistently low among the project lakes and similar to previous years, most metals were below laboratory detection limits (DLs). Only a few metals (iron, lead, mercury) exceeded DLs and aluminum and copper exceeded guidelines. These results are generally consistent with previous years and confirm their status as ultra-oligotrophic lakes.
- Continued construction of the Bay-Goose Dike introduced suspended sediments into TPE throughout the summer 2010. This resulted in elevated concentrations of



total suspended solids (TSS), particularly in August. Also, total phosphate, aluminum, and chromium exceeded guidelines and other metals (arsenic, nickel, titanium, and uranium) that were measured above detection limits in TPE and not in any other lake. The extent and ecological significance of the sediment introductions is assessed in greater detail in the EAS report (Azimuth, 2011b).

- Baseline sediment chemistry results showed naturally elevated metals (primarily arsenic, chromium, and copper which typically exceeded CCME guidelines) at many locations. Cadmium, lead and zinc exceeded guidelines in a few cases, at similar locations to previous years. Total organic carbon concentrations were consistent with those measured in previous years. Sediment had non-detectable concentrations of PAHs, and LEPHs and HEPHs at all stations, consistent with 2008 and 2009 data; detectable oil and grease at TPS and WAL was attributed to natural material. We recommend moving to a 'Mineral Oil and Grease' analysis which will remove the bulk of the naturally-occurring organic material. Overall, the concentrations in study lakes have not changed much from last year. Given that the same is true for the lakes that are removed from mining activity and the reference lakes, then the changes discussed above are most likely due to inter-annual differences attributable to spatial heterogeneity.
- Primary productivity was generally low, as indicated by low phytoplankton biomass and low chlorophyll- α , as expected for these ultra-oligotrophic lakes. Compositionally, the study lakes in 2010 had comparable phytoplankton assemblages to those documented from the same stations in previous years. TPN and TPS have had the lowest mean total biomass over the past few years (2006, 2007). In 2008, biomass in SP decreased during East Dike construction. In 2009 biomass in TPS, TPE, SP, TE all increased noticeably during Bay-Goose Dike construction. Phytoplankton results are quite variable and as such it is often difficult to distinguish an apparent trend in any particular season or year from natural variability. The lack of consistency of this metric is being examined in greater detail (see next bullet).
- In both 2009 and 2010, a large number of extra water, sediment, and phytoplankton samples were collected to better characterize temporal and spatial (horizontal and vertical) variability. Results of statistical analyses to determine which components and how much replication is necessary to detect effects will be discussed in more detail in the CREMP design (Azimuth, 2011a *in progress*).
- Benthic community samples were dominated by chironomid larvae in 2010, consistent with previous years. Most stations had similar results to 2009. Preliminary results, based on statistical analyses from the EAS, show a decrease in abundance at SP in 2010, despite the rebound that was observed in 2009 for

this station. These effects in SP did not extend into TE, as most results for TE since 2008 were within the range of baseline results. TPE showed a decrease in abundance for multi-year effect (2009-2010), but no significant adverse effects were observed for benthos at TPN.

- There was considerable variation among zooplankton sampling stations but also among replicates within-station. The current zooplankton data will become more valuable. At least another year of data are needed to characterize the magnitude of inter-annual variability. Consequently, this component will be continued in 2011. We suggest keeping with the current design of one sampling event (August) and increasing the replicates from 5 to 10 per station. A flow meter will be added to the mouth of the net to measure water volume filtered, rather than assuming there is no net clogging.



Baker Lake

- There is evidence of natural variability of many of the water quality parameters in Baker Lake that are likely related to the influence of wind-driven vertical mixing and inflow from the Thelon River, just east of Baker Lake. Because the sampling stations are situated relatively close to shore, water from the Thelon River could be moving west along shore resulting in changes in water quality that more resemble Thelon River than Baker Lake water. Despite some vertical differences in salinity, oxygen and temperature there was no stratification in temperature.
- Water chemistry results showed that aluminum was the only detectable metal in Baker Lake but concentrations did not exceed guidelines.
- Sediment chemistry showed lower metals concentrations than the Meadowbank study lakes, with only arsenic exceeding CCME guidelines (similar to previous years). The range in metals concentration among stations was relatively small, usually less than 2 times the average concentration. Concentrations of all PAHs, oil and grease, and LEPHs and HEPHs were below detection limits in sediment for the three stations. These data confirm that barge activity and use in the vicinity of the BBD station has not resulted in increased metals or inputs of hydrocarbons to the local sediment.
- Chlorophyll- α concentrations in Baker Lake are typically about 3x those measured in the Meadowbank study lakes which is consistent with results from previous years. Phytoplankton biomass was quite similar within and between stations in Baker Lake, with slightly more biomass at the reference station BAP this year but this has varied over the years.
- Benthic community samples in Baker Lake were dominated by insects; however, there was an unexplained large abundance of oligochaetes at the reference station BAP in 2010. Mean total abundance of organisms was nearly 10x higher at BAP relative to exposure stations. Taxa richness has consistently been highest for insects at all stations from 2008–2010.
- Consideration for changing the location of the Baker Lake reference station (BAP) was discussed in the 2009 report (Azimuth, 2010a). However, during 2010 sample planning both chemistry and benthic biota data from 2008 and 2009 were more carefully reviewed and it was clear that the reference station was not consistently different and the impact stations also varied inconsistently between the 2 years. Thus, BAP remained as the reference station for 2010 sampling. These differences do not necessarily indicate that the reference area is unsuitable as the monitoring framework targets the relative performance of each of the two

impact areas over time. Provided that the areas all respond similarly to broad-scale natural fluctuations (e.g., inter-annual variability), initial differences between control (reference) and impact areas should not preclude the detection of adverse effects. That said, if conditions do vary sufficiently that responses to regional factors (e.g., climatic) differ among areas, then a more suitable reference area may be desirable. This issue is explored in greater detail as part of the CREMP design (Azimuth, 2011a *in progress*).

5. MONITORING COMPONENTS FOR 2011

As discussed in **Section 1**, the rationale, framework, strategy, methods, and scope of receiving environment (now referred to as *Core Receiving Environment Monitoring Program* or “CREMP”) monitoring for the Meadowbank Mine were documented in the 2005 AEMP (AEMP, 2005). The CREMP has been implemented every year since 2006, with some modifications (e.g., lake station additions, parameter deletions/additions, sampling frequency and intensity) to improve the program or to comply with regulatory requirements (e.g., the NWB A License). In 2010, an update report was prepared to document changes to the program made since the 2005 AEMP and present details on sampling and analysis (Azimuth, 2010g). The CREMP design is currently being reviewed as part of AEM’s efforts to develop an integrated adaptive management framework. Based on forthcoming discussions with AEM, the NWB and regulators, as well as results from the CREMP design (Azimuth, 2011a *in progress*), changes will be made to the program and may be implemented for the 2011 open-water sampling season.

In the interim, the 2011 CREMP will be essentially the same as 2010 (unless noted), as follows:

- *Sampling Components* – limnology, water and sediment chemistry, phytoplankton, zooplankton, and benthic invertebrate community.
- *Sampling Areas* – sampling areas have been added over the years as needed, but all the initial stations have remained. Near-field stations include: TPN, TPE, SP, WAL and Baker Lake stations BBD and BPJ; far-field stations include: TE, TEFF; reference stations include: TPS, INUG, PDL and Baker Lake stations BAP.
- *Timing* – water sampling (including limnology and phytoplankton) will be conducted every month (ice conditions permitting) in 2011. The exception to this will be during periods when ice conditions are not deemed safe (e.g., likely June and October, but may vary). Sampling through-ice will take place in January, February, March, April, May, November and December months. Open-water sampling will take place in July, August and September. Sediment chemistry, benthic invertebrate, and zooplankton sampling will be conducted in August only, as it has been the previous year(s).
- *Spatial coverage* – water sampling within each lake basin area will be randomly distributed and possibly replicated to quantify the horizontal and vertical components of spatial variability (high intensity events only). The intensity (number of samples) of the events alternate between high (all areas, full reps) and low (all areas, no reps) during both open-water and through-ice sampling.

-
- *Changes from 2010* – the following are the planned changes for 2011:
 - o Addition of 5 extra spatial replicates at each station for zooplankton sampling.
 - o Analyzing sediment samples for ‘Mineral Oil and Grease’ (instead of Oil and Grease), which includes a silica gel clean-up stage that removes the bulk of naturally-occurring organic material.

6. REFERENCES

- AEM (Agnico-Eagle Mines Ltd.). 2011. Aquatic Effects Monitoring Program – Targeted Study: Dike Construction Monitoring 2010, Meadowbank Mine. Report prepared by Agnico-Eagle Mines Ltd., Baker Lake, NU.
- AEM. 2009. Aquatic Environment Management Program, March 2009.
- AEMP (Aquatic Effects Management Program). 2005. A report prepared by Azimuth Consulting Group, Vancouver for Cumberland Resources Ltd. October, 2005.
- Azimuth Consulting Group (Azimuth). 2011a. Core Receiving Environment Monitoring Program (CREMP): Design Document 2011, Meadowbank Mine. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Baker Lake, NU. *Report in progress.*
- Azimuth. 2011b. Aquatic Effects Monitoring Program – Targeted Study: Dike Construction TSS Effects Assessment Study 2010, Meadowbank Mine. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Baker Lake, NU.
- Azimuth. 2010a. Aquatic Effects Monitoring Program – Core Receiving Environment Monitoring Program 2009, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Baker Lake, NU.
- Azimuth. 2010b. Aquatic Effects Monitoring Program – Targeted Study: Dike Construction Monitoring 2009, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Baker Lake, NU.
- Azimuth. 2010c. Aquatic Effects Monitoring Program – Targeted Study: Dike Construction TSS Effects Assessment Study 2009, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Baker Lake, NU.
- Azimuth. 2010d. Aquatic Effects Monitoring Program –Habitat Compensation Monitoring 2009, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc. Vancouver BC for Agnico-Eagle Mines Ltd., Baker Lake, NU.
- Azimuth. 2010e. Aquatic Effects Monitoring Program – Addendum to the 2008 Fish-Out of the Northwest Arm of Second Portage Lake: Habitat Mapping of the Northwest Arm of Second Portage Lake 2009, Meadowbank Gold Project. Report prepared

-
- by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Baker Lake, NU.
- Azimuth. 2010f. Environmental Effects Monitoring (EEM): Cycle 1 Study Design, Meadowbank Division, Nunavut. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Environment Canada, Edmonton, AB on behalf of Agnico-Eagle Mines Ltd., Baker Lake, NU.
- Azimuth. 2010g. Core Receiving Environment Monitoring Program (CREMP) 2010 Plan Update, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Baker Lake, NU. June 2010.
- Azimuth. 2009a. Aquatic Effects Monitoring Program – Receiving Environment Monitoring 2008, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Vancouver, BC. March 2009.
- Azimuth. 2009b. Aquatic Effects Monitoring Program – Targeted Study: Dike Construction Monitoring 2008, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Vancouver, BC. March 2009.
- Azimuth. 2009c. Aquatic Effects Monitoring Program – Targeted Study: Second Portage Lake TSS Effects Assessment Study 2008, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Vancouver, BC. March 2009.
- Azimuth. 2008a. Aquatic Effects Management Program Monitoring – Meadowbank Gold Project, 2007. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Vancouver, BC. March 2008.
- Azimuth. 2008b. Aquatic Effects Management Program Monitoring – Meadowbank Gold Project, 2006. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Vancouver, BC. March 2008.
- BAER (Baseline Aquatic Ecosystem Report). 2005. A report prepared by Azimuth Consulting Group, Vancouver for Cumberland Resources Ltd. October, 2005.
- CCME (Canadian Council of Ministers of the Environment) 2007. Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life, 1999, updated December 2007.
- CCME (Canadian Council of Ministers of the Environment) 2002. Canadian Sediment Quality Guidelines for the Protection of Freshwater Aquatic Life, 1999, updated 2002.
-



-
- Elliott, J.M. 1977. Some methods for the statistical analysis of samples of benthic invertebrates. Freshwater Biological Assoc. Sci Publ. No. 25 160 pp.
- Environment Canada. 1984. Guidance document on collection and preparation of sediments for physicochemical characterization and biological testing. Environmental Protection Series. Report EPS 1/RM/29.
- EVS Environment Consultants. 1999. Fisheries evaluation of candidate reference lakes, Meadowbank Gold Project Nunavut, 1998. A report prepared for Cumberland Resources Ltd., Vancouver BC by EVS Environment Consultants, North Vancouver, April 1999. 60 pp.
- Machniak, K., 1975. The effects of hydroelectric development on the biology of northern fishes (reproduction and population dynamics) IV. Lake trout *Salvelinus namaycush* (Walabum). A literature review and bibliography. Fisheries and Marine Services Division Technical Report No. 530. 52 p.
- Nauwerck, A. 1963. Die Beziehungen zwischen Zooplankton und Phytoplankton in See Erken. Symbolae Botanicae Upsaliensis, 17: 1-163.
- Rott, E. 1981. Some results from phytoplankton counting intercalibrations. Schweiz. Z. Hydrobiologia, 43: 43-62.
- Scott, W.B. and E.J. Crossman. 1979. Freshwater fishes of Canada. Bulletin 184. Fisheries Research Board of Canada. 966 p.
- Vollenweider, R.A. 1968. Scientific fundamentals of the eutrophication of lakes and flowing waters, with particular reference to nitrogen and phosphorus as factors in eutrophication. Technical Report, Organization for Economic Cooperation and Development, Paris, 27: 1-182.
- Washington, H.G. 1984. Review: diversity, biotic and similarity indices. A review with special relevance to aquatic ecosystems. Water Res. 186: 652-694.
- Welch, H.E., J.A. Legault, and H.J. Kling. 1989. Phytoplankton, nutrients, and primary production in fertilized and natural lakes at Saqvaquac, N.W.T. Can. J. Fish. Aquat. Sci. 46: 90-107.
- Wetzel, R.G. 1983. Limnology. W.B. Saunders Co. Toronto Ont. 743 pp.

APPENDICES



APPENDIX A

PRESENCE (+) / ABSENCE (-) MATRIX OF PHYTOPLANKTON SPECIES IN MEADOWBANK STUDY LAKES AND BAKER LAKE, 2010



Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2010.

Species & Code	Third Portage Lake - East Basin								Third Portage Lake - North Basin						
	TPE-15-S	TPE-18-S	TPE-19-S	TPE-22-S	TPE-23-S	TPE-26-S	TPE-29-S	TPE-30-S	TPN-18-S	TPN-19-S	TPN-22-S	TPN-23-S	TPN-26-S	TPN-29-S	TPN-30-S
	18-Jan-10	25-Feb-10	23-Mar-10	10-Apr-10	20-May-10	16-Jul-10	18-Aug-10	19-Sep-10	24-Feb-10	20-Mar-10	10-Apr-10	22-May-10	17-Jul-10	19-Aug-10	17-Sep-10
Cyanophyte															
1007 <i>Aphanocapsa delicatissima</i> W. and G.S. West	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1008 <i>Aphanocapsa</i>	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
1012 <i>Aphanothece</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1014 <i>Chroococcus limneticus</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1026 <i>Merismopedia tenuissima</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1045 <i>Anabaena lemmermannii</i> Usacev	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1054 <i>Planktolyngbya limnetica</i>	+	-	-	-	-	-	-	+	-	-	-	-	+	-	+
1073 <i>Snowella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1077 <i>Pseudoanabaena</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1089 <i>Cyanodictyon</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1097 <i>Snowella lacustris</i> (Chodat) Komarek and Hindak	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorophyte															
2100 <i>Pyramidomonas tetrarhynchus</i> Schmarda	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2101 <i>Carteria</i>	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
2105 <i>Chlamydomonas</i>	+	-	-	-	-	-	-	+	-	-	+	+	-	+	-
2112 <i>Sphaerocystis Schroeteri</i> Chodat	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+
2115 <i>Pediastrum tetras</i> (Ehrenberg) Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2120 <i>Oocystis submarina</i> v. <i>variabilis</i> Skuja	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2121 <i>Oocystis lacustris</i> Chodat	-	-	-	-	-	-	+	+	-	-	+	+	-	+	+
2125 <i>Paulschulzia pseudovolvox</i> (Schulz and Telling) Skuja	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2126 <i>Chodatella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2127 <i>Tetradron minimum</i> (Brunow) Hansgrig	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2135 <i>Scenedesmus</i>	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2136 <i>Dictyosphaerium pulchellum</i> Wood	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2137 <i>Dictyosphaerium simplex</i> Skuja	-	-	+	-	+	-	-	+	-	+	-	+	+	-	-
2138 <i>Monoraphidium komarkovae</i> (Nyg.) Komarkova-Legnerova	-	-	+	-	-	-	-	+	-	-	-	-	-	-	+
2143 <i>Monoraphidium minutum</i> (Nag.) Komarkova-Legnerova	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+
2145 <i>Crucigenia quadrata</i> Morr.	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+
2154 <i>Coelastrum microporum</i> Naegeli	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
2157 <i>Kichnerella lunaris</i> (Kirchn.) Moeb.	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
2164 <i>Quadrigula closterioides</i> (Bohl.) Printz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2167 <i>Elakatothrix gelatinosa</i> Willen	-	-	-	-	-	-	-	+	-	-	-	-	+	+	+
2174 <i>Closterium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2178 <i>Cosmarium</i>	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+
2182 <i>Euastrum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
2185 <i>Micrasterias</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2186 <i>Xanthidium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
2187 <i>Staurodesmus extensus</i> (Andersson) Telling	+	-	+	-	-	-	-	-	-	-	+	-	+	+	+
2191 <i>Staurodesmus cuspidatus</i> (Brebisson and Ralfs) Telling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2193 <i>Staurodesmus paradoxum</i> Meyen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2199 <i>Spondylosium planum</i> (Wolle) W. and G.S. West	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2202 <i>Scourfieldia cordiformis</i> Takeda	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
2204 <i>Ankrya judai</i> (G.M. Smith) Fott	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2205 <i>Mougeotia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2206 <i>Botryococcus braunii</i> Kutzing	+	+	+	-	-	-	+	+	+	+	-	-	-	+	+
2215 <i>Tetradron caudatum</i> (Corda) Hansgrig	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-
2217 <i>Collocladion</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2222 <i>Treubaria</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2223 <i>Planktosphaeria gelatinosa</i> G.M. Smith	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2231 <i>Bulbochaete</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2235 <i>Ankistrodesmus spiralis</i> Lemmermann	+	+	+	-	+	+	+	+	-	-	-	+	+	+	+
2247 <i>Oocystis gigas</i> Archer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2252 <i>Scenedesmus acutus</i> Chodat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2512 <i>Scenedesmus acuminatus</i> Chodat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2010.

Species & Code		Third Portage Lake - East Basin								Third Portage Lake - North Basin						
		TPE-15-S 18-Jan-10	TPE-18-S 25-Feb-10	TPE-19-S 23-Mar-10	TPE-22-S 10-Apr-10	TPE-23-S 20-May-10	TPE-26-S 16-Jul-10	TPE-29-S 18-Aug-10	TPE-30-S 19-Sep-10	TPN-18-S 24-Feb-10	TPN-19-S 20-Mar-10	TPN-22-S 10-Apr-10	TPN-23-S 22-May-10	TPN-26-S 17-Jul-10	TPN-29-S 19-Aug-10	TPN-30-S 17-Sep-10
Chrysophyte																
4351	Small chrysophyceae	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4352	Large chrysophyceae	+	+	+	-	+	+	+	+	+	+	-	+	+	+	+
4354	Chromulina	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
4355	Chrysochromulina parva Lackey	-	-	-	-	-	-	+	-	-	-	-	+	+	+	+
4357	Chrysococcus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4358	Chrysostephanosphaera globulifera Scherffel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4361	Kephyrion boreale Skuja	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
4362	Kephyrion	-	-	+	+	-	+	+	+	+	-	+	+	+	+	+
4363	Spinifilomonas sirratus	-	-	+	-	+	+	-	-	-	-	-	+	+	-	+
4364	Mallomonas caudata Ivanov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4367	Mallomonas duerschmidtiae Siver, Hamer and Kling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4368	Mallomonas crassissquama (Asmund) Fott	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-
4370	Mallomonas akrokomos Asmund and Kristiansen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4372	Mallomonas tonsurata Teiling and Krieger	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-
4375	Synura sphagnicola Korschikow	-	-	+	-	-	-	-	-	+	+	-	-	-	-	+
4378	Dinobryon borgei Lemmermann	-	-	+	+	-	+	+	+	-	+	-	-	+	+	+
4381	Dinobryon mucronutum Nygaard	-	-	-	-	-	+	+	-	-	-	-	-	-	+	+
4383	Dinobryon bavaricum Imhof	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4384	Dinobryon bavaricum v vanhoeffenii (Bachmann) Krieger	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4387	Dinobryon cylindricum Imhof	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4388	Dinobryon sertularia Ehrenberg	-	-	+	-	-	+	+	-	-	-	+	+	+	+	+
4390	Dinobryon sociale Ehrenberg	-	-	-	+	-	+	+	+	-	+	+	+	+	+	+
4391	Dinobryon sociale v. stipitatum (Stein) Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4393	Dinobryon	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
4394	Epiphyxis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4396	Chrysalkos skuja (Nauwerck) Willen	-	-	-	+	+	+	+	-	-	+	+	+	+	+	-
4400	Ochromonas	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-
4401	Uroglena volvox Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4403	Chrysosphaerella longispina Lauterborn	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4411	Bitrichia chodatii (Reverdin) Chodat	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-
4413	Chrysochromulina laurentiana Kling	-	+	+	-	+	+	+	+	+	-	-	+	+	+	+
4414	Stichogloea	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+
4415	Bicoeca lacustris Clark	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4416	Bicoeca ainikkiae Jarnefelt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4418	Salpingoeca frequentissima (Zach.) Lemmermann	+	-	+	+	+	+	-	+	+	+	-	-	-	-	+
4425	Mallomonas hamata Asmund	-	+	+	-	-	-	-	+	+	-	+	-	-	-	+
4436	Dinobryon attenuatum Hill	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
4437	Pteridomonas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2010.

Species & Code		Third Portage Lake - East Basin								Third Portage Lake - North Basin						
		TPE-15-S 18-Jan-10	TPE-18-S 25-Feb-10	TPE-19-S 23-Mar-10	TPE-22-S 10-Apr-10	TPE-23-S 20-May-10	TPE-26-S 16-Jul-10	TPE-29-S 18-Aug-10	TPE-30-S 19-Sep-10	TPN-18-S 24-Feb-10	TPN-19-S 20-Mar-10	TPN-22-S 10-Apr-10	TPN-23-S 22-May-10	TPN-26-S 17-Jul-10	TPN-29-S 19-Aug-10	TPN-30-S 17-Sep-10
Diatom																
5507	<i>Cyclotella stelligera</i> Cleve and Grunow	+	-	+	-	-	-	-	+	+	+	+	-	-	+	+
5508	<i>Cyclotella pseudostelligera</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5509	<i>Cyclotella ocellata</i> Pant.	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+
5511	<i>Rhizosolenia erienne</i> H.L. Smith	+	-	-	-	-	-	+	+	-	-	-	-	+	+	+
5513	<i>Tabellaria fenestrata</i> (Lyngbye) Kutzling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5514	<i>Tabellaria flocculsa</i> (Roth) Kutzling	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
5515	<i>Fragilaria crotonensis</i> Kitton	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5518	<i>Synedra acus</i> Kutzling	+	-	-	-	+	-	+	+	-	-	-	-	-	+	-
5523	<i>Synedra ulna</i> (Nitzsch) Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5524	<i>Asterionella formosa</i> Hassall	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
5540	<i>Aulacoseira italica</i> v <i>subarctica</i> (O. Muller) Simonsen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5546	<i>Gyrosigma</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5547	<i>Frustulia rhomboides</i> (Ehrenberg) de Toni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5551	<i>Cyclotella michiganiana</i> Skvortzow	+	-	-	+	+	+	+	+	+	-	+	+	+	+	+
5720	<i>Cyclotella bodanica</i> Eulenst.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
5728	<i>Epithemia argus</i> Kutzling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5860	<i>Diatoma vulgare</i> Bory	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5906	<i>Thalassionema nitzschioides</i> Grunow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5908	<i>Diatoma tenue</i> Agardh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5916	<i>Fragilaria capucina</i> Grunow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cryptophyte																
6554	<i>Rhodomonas minuta</i> Skuja	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
6558	<i>Cryptomonas erosa</i> Ehrenberg	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
6559	<i>Cryptomonas ovata</i> Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6562	<i>Cryptomonas reflexa</i> (Marsson) Skuja	+	+	+	-	-	+	+	+	-	+	-	-	-	+	+
6565	<i>Cryptomonas rostratiformis</i> Skuja	+	+	+	-	-	+	+	+	-	+	-	-	+	+	+
6568	<i>Katablepharis ovalis</i> Skuja	-	+	+	-	+	+	-	+	+	-	+	+	+	+	+
Dinoflagellate																
7631	<i>Gymnodinium helveticum</i> Penard	+	-	-	-	-	-	-	+	-	-	-	-	-	-	+
7632	<i>Gymnodinium</i>	-	-	+	-	-	+	+	+	-	+	-	+	+	+	+
7635	<i>Peridinium willei</i> Huitfeldt-Kaas	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-
7638	<i>Peridinium inconspicuum</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7639	<i>Peridinium pusillum</i> (Penard) Lemmermann	+	+	-	+	-	+	+	-	+	+	-	+	+	+	+
7640	<i>Peridinium goslaense</i> Woloszynska	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
7641	<i>Peridinium aciculiferum</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7642	<i>Peridinium wisconsinense</i> Eddy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2010.

Species & Code	Third Portage Lake - South Basin								Second Portage Lake							
	TPS-9-S	TPS-12-S	TPS-13-S	TPS-16-S	TPS-17-S	TPS-20-S	TPS-23-S	TPS-24-S	SP-15-S	SP-18-S	SP-19-S	SP-22-S	SP-23-S	SP-26-S	SP-29-S	SP-30-S
	19-Jan-10	24-Feb-10	24-Mar-10	10-Apr-10	22-May-10	18-Jul-10	20-Aug-10	17-Sep-10	15-Jan-10	26-Feb-10	22-Mar-10	9-Apr-10	20-May-10	17-Jul-10	21-Aug-10	18-Sep-10
Cyanophyte																
1007 <i>Aphanocapsa delicatissima</i> W. and G.S. West	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1008 <i>Aphanocapsa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1012 <i>Aphanothece</i>	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+
1014 <i>Chroococcus limneticus</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1026 <i>Merismopedia tenuissima</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1045 <i>Anabaena lemmermannii</i> Usacev	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1054 <i>Planktolyngbya limnetica</i>	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	+
1073 <i>Snowella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1077 <i>Pseudoanabaena</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
1089 <i>Cyanodictyon</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1097 <i>Snowella lacustris</i> (Chodat) Komarek and Hindak	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorophyte																
2100 <i>Pyramidomonas tetrarhynchus</i> Schmarda	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
2101 <i>Carteria</i>	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
2105 <i>Chlamydomonas</i>	-	-	-	-	-	-	+	+	-	-	-	-	+	-	+	+
2112 <i>Sphaerocystis Schroeteri</i> Chodat	-	-	-	-	-	+	+	+	-	-	-	+	-	-	+	+
2115 <i>Pediastrum tetras</i> (Ehrenberg) Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2120 <i>Oocystis submarina</i> v. <i>variabilis</i> Skuja	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2121 <i>Oocystis lacustris</i> Chodat	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+	+
2125 <i>Paulschulzia pseudovolvox</i> (Schulz and Telling) Skuja	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2126 <i>Chodatella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2127 <i>Tetradron minimum</i> (Brunow) Hansgrig	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
2135 <i>Scenedesmus</i>	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2136 <i>Dictyosphaerium pulchellum</i> Wood	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
2137 <i>Dictyosphaerium simplex</i> Skuja	+	-	+	-	+	-	-	+	-	-	+	-	-	-	-	-
2138 <i>Monoraphidium komarkovae</i> (Nyg.) Komarkova-Legnerova	-	-	-	-	-	-	-	+	-	-	-	+	-	+	-	+
2143 <i>Monoraphidium minutum</i> (Nag.) Komarkova-Legnerova	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+
2145 <i>Crucigenia quadrata</i> Morr.	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-
2154 <i>Coelastrum microporum</i> Naegeli	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2157 <i>Kichnerella lunaris</i> (Kirchn.) Moeb.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2164 <i>Quadrigula closterioides</i> (Bohl.) Printz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2167 <i>Elakatothrix gelatinosa</i> Willen	-	-	-	-	-	+	+	+	-	-	-	-	-	+	-	+
2174 <i>Closterium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2178 <i>Cosmarium</i>	-	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-
2182 <i>Euastrum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2185 <i>Micrasterias</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2186 <i>Xanthidium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
2187 <i>Staurodesmus extensus</i> (Andersson) Telling	+	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-
2191 <i>Staurodesmus cuspidatus</i> (Brebisson and Ralfs) Telling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2193 <i>Staurodesmus paradoxum</i> Meyen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
2199 <i>Spondylosium planum</i> (Wolle) W. and G.S. West	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+
2202 <i>Scourfieldia cordiformis</i> Takeda	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2204 <i>Ankrya judai</i> (G.M. Smith) Fott	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2205 <i>Mougeotia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
2206 <i>Botryococcus braunii</i> Kutzing	-	+	+	-	-	-	+	+	+	-	+	-	+	-	+	+
2215 <i>Tetradron caudatum</i> (Corda) Hansgrig	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	+
2217 <i>Collocladion</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2222 <i>Treubaria</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2223 <i>Planktosphaeria gelatinosa</i> G.M. Smith	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2231 <i>Bulbochaete</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2235 <i>Ankistrodesmus spiralis</i> Lemmermann	+	-	-	-	-	+	+	+	+	+	-	-	-	+	+	+
2247 <i>Oocystis gigas</i> Archer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
2252 <i>Scenedesmus acutus</i> Chodat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2512 <i>Scenedesmus acuminatus</i> Chodat	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-

Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2010.

Species & Code	Third Portage Lake - South Basin								Second Portage Lake							
	TPS-9-S	TPS-12-S	TPS-13-S	TPS-16-S	TPS-17-S	TPS-20-S	TPS-23-S	TPS-24-S	SP-15-S	SP-18-S	SP-19-S	SP-22-S	SP-23-S	SP-26-S	SP-29-S	SP-30-S
	19-Jan-10	24-Feb-10	24-Mar-10	10-Apr-10	22-May-10	18-Jul-10	20-Aug-10	17-Sep-10	15-Jan-10	26-Feb-10	22-Mar-10	9-Apr-10	20-May-10	17-Jul-10	21-Aug-10	18-Sep-10
Chrysophyte																
4351 Small chrysophyceae	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4352 Large chrysophyceae	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+
4354 <i>Chromulina</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
4355 <i>Chrysochromulina parva</i> Lackey	-	-	-	-	-	-	+	-	-	-	-	+	-	+	-	+
4357 <i>Chrysococcus</i>	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+
4358 <i>Chrysostephanospaera globulifera</i> Scherffel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4361 <i>Kephyrion boreale</i> Skuja	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	+
4362 <i>Kephyrion</i>	-	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+
4363 <i>Spinifilimonas sirratus</i>	-	-	-	-	-	-	+	-	-	+	-	-	-	-	+	-
4364 <i>Mallomonas caudata</i> Ivanov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4367 <i>Mallomonas duerschmidtiae</i> Siver, Hamer and Kling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
4368 <i>Mallomonas crassiquama</i> (Asmund) Fott	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
4370 <i>Mallomonas akrokomos</i> Asmund and Kristiansen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4372 <i>Mallomonas tonsurata</i> Teiling and Krieger	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-
4375 <i>Synura sphagnicola</i> Korschikow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4378 <i>Dinobryon borgei</i> Lemmermann	-	-	-	-	+	+	+	+	+	+	+	-	-	+	+	+
4381 <i>Dinobryon mucronutum</i> Nygaard	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	+
4383 <i>Dinobryon bavaricum</i> Imhof	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4384 <i>Dinobryon bavaricum v. vanhoeffenii</i> (Bachmann) Krieger	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4387 <i>Dinobryon cylindricum</i> Imhof	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4388 <i>Dinobryon sertularia</i> Ehrenberg	-	-	-	-	-	+	+	+	-	-	-	+	+	+	+	-
4390 <i>Dinobryon sociale</i> Ehrenberg	-	-	+	-	+	+	+	+	+	-	+	-	-	+	+	+
4391 <i>Dinobryon sociale v. stipitatum</i> (Stein) Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4393 <i>Dinobryon</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4394 <i>Epiphyxis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
4396 <i>Chrysalkos skuja</i> (Nauwerck) Willen	-	+	+	+	+	+	-	+	-	+	+	+	+	+	+	+
4400 <i>Ochromonas</i>	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	+
4401 <i>Uroglena volvox</i> Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
4403 <i>Chrysosphaerella longispina</i> Lauterborn	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4411 <i>Bitrichia chodatii</i> (Reverdin) Chodat	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-
4413 <i>Chrysochromulina laurentiana</i> Kling	-	-	+	-	+	+	+	+	-	-	+	+	+	+	+	+
4414 <i>Stichogloea</i>	-	-	-	-	-	+	+	+	-	-	-	-	-	+	+	+
4415 <i>Bicoeca lacustris</i> Clark	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4416 <i>Bicoeca ainikkiae</i> Jamefelt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4418 <i>Salpingoeca frequentissima</i> (Zach.) Lemmermann	+	+	+	+	+	+	-	+	+	+	+	-	-	-	-	+
4425 <i>Mallomonas hamata</i> Asmund	+	+	+	-	+	+	-	-	-	-	+	-	-	-	-	+
4436 <i>Dinobryon attenuatum</i> Hill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4437 <i>Pteridomonas</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2010.

Species & Code	Third Portage Lake - South Basin								Second Portage Lake							
	TPS-9-S	TPS-12-S	TPS-13-S	TPS-16-S	TPS-17-S	TPS-20-S	TPS-23-S	TPS-24-S	SP-15-S	SP-18-S	SP-19-S	SP-22-S	SP-23-S	SP-26-S	SP-29-S	SP-30-S
	19-Jan-10	24-Feb-10	24-Mar-10	10-Apr-10	22-May-10	18-Jul-10	20-Aug-10	17-Sep-10	15-Jan-10	26-Feb-10	22-Mar-10	9-Apr-10	20-May-10	17-Jul-10	21-Aug-10	18-Sep-10
Diatom																
5507 <i>Cyclotella stelligera</i> Cleve and Grunow	+	-	+	-	-	+	+	+	+	-	+	-	-	-	-	+
5508 <i>Cyclotella pseudostelligera</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5509 <i>Cyclotella ocellata</i> Pant.	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-
5511 <i>Rhizosolenia erienne</i> H.L. Smith	-	-	+	-	-	+	+	+	-	-	-	-	-	+	+	-
5513 <i>Tabellaria fenestrata</i> (Lyngbye) Kutzing	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-
5514 <i>Tabellaria flocculsa</i> (Roth) Kutzing	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+
5515 <i>Fragilaria crotonensis</i> Kitton	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5518 <i>Synedra acus</i> Kutzing	-	-	+	-	-	+	+	+	+	-	-	+	-	+	+	+
5523 <i>Synedra ulna</i> (Nitzsch) Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5524 <i>Asterionella formosa</i> Hassall	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5540 <i>Aulacoseira italica</i> v <i>subarctica</i> (O. Muller) Simonsen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5546 <i>Gyrosigma</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
5547 <i>Frustulia rhomboides</i> (Ehrenberg) de Toni	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
5551 <i>Cyclotella michiganiana</i> Skvortzow	+	+	+	-	-	-	+	+	+	-	+	-	+	+	+	+
5720 <i>Cyclotella bodanica</i> Eulenst.	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
5728 <i>Epithemia argus</i> Kutzing	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
5860 <i>Diatoma vulgare</i> Bory	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5906 <i>Thalassionema nitzschioides</i> Grunow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5908 <i>Diatoma tenue</i> Agardh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5916 <i>Fragilaria capucina</i> Grunow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cryptophyte																
6554 <i>Rhodomonas minuta</i> Skuja	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+
6558 <i>Cryptomonas erosa</i> Ehrenberg	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+
6559 <i>Cryptomonas ovata</i> Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6562 <i>Cryptomonas reflexa</i> (Marsson) Skuja	+	+	+	-	+	+	+	+	+	-	-	-	-	+	+	+
6565 <i>Cryptomonas rostratiformis</i> Skuja	+	-	-	+	-	+	+	+	+	-	+	-	-	+	-	+
6568 <i>Katablepharis ovalis</i> Skuja	+	-	+	-	-	+	+	+	+	-	+	+	+	+	-	+
Dinoflagellate																
7631 <i>Gymnodinium helveticum</i> Penard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
7632 <i>Gymnodinium</i>	-	-	+	-	+	+	+	+	-	-	+	-	+	+	+	+
7635 <i>Peridinium willei</i> Huitfeldt-Kaas	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7638 <i>Peridinium inconspicuum</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7639 <i>Peridinium pusillum</i> (Penard) Lemmermann	+	+	+	+	-	+	+	+	-	+	+	+	-	+	-	+
7640 <i>Peridinium goslaense</i> Woloszynska	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
7641 <i>Peridinium aciculiferum</i> Lemmermann	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-
7642 <i>Peridinium wisconsinense</i> Eddy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2010.

Species & Code		Tehek Lake								Tehek Lake - Farfield			Inuggugayualik Lake		
		TE-16-S	TE-18-S	TE-19-S	TE-22-S	TE-23-INT	TE-26-S	TE-29-S	TE-30-S	TEFF-8-S	TEFF-11-S	TEFF-12-S	INUG-14-S	INUG-17-S	INUG-18-S
		16-Jan-10	26-Feb-10	21-Mar-10	9-Apr-10	21-May-10	20-Jul-10	28-Aug-10	21-Sep-10	20-Jul-10	28-Aug-10	21-Sep-10	22-Jul-10	25-Aug-10	23-Sep-10
Cyanophyte															
1007	<i>Aphanocapsa delicatissima</i> W. and G.S. West	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1008	<i>Aphanocapsa</i>	-	-	-	-	-	-	-	-	-	-	-	-	+	-
1012	<i>Aphanothece</i>	-	-	-	-	-	-	-	+	-	-	+	-	-	-
1014	<i>Chroococcus limneticus</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	+	-
1026	<i>Merismopedia tenuissima</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	+	-
1045	<i>Anabaena lemmermannii</i> Usacev	-	-	-	-	-	-	-	+	-	-	-	-	-	-
1054	<i>Planktolyngbya limnetica</i>	-	-	-	-	-	-	-	+	-	-	+	-	-	+
1073	<i>Snowella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1077	<i>Pseudoanabaena</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1089	<i>Cyanodictyon</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1097	<i>Snowella lacustris</i> (Chodat) Komarek and Hindak	-	+	-	-	-	-	-	-	-	-	-	-	-	-
Chlorophyte															
2100	<i>Pyramidomonas tetrahrhynchus</i> Schmarda	+	-	-	-	-	-	+	+	-	-	+	-	-	-
2101	<i>Carteria</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2105	<i>Chlamydomonas</i>	-	+	-	-	-	+	+	+	-	-	-	+	+	+
2112	<i>Sphaerocystis schroeteri</i> Chodat	-	-	-	-	-	-	+	-	-	+	-	-	+	-
2115	<i>Pediastrum tetras</i> (Ehrenberg) Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2120	<i>Oocystis submarina</i> v. <i>variabilis</i> Skuja	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2121	<i>Oocystis lacustris</i> Chodat	-	-	+	+	+	+	-	-	-	-	-	+	+	+
2125	<i>Paulschulzia pseudovolvox</i> (Schulz and Telling) Skuja	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2126	<i>Chodatella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2127	<i>Tetradron minimum</i> (Brunow) Hansgrig	+	-	+	-	-	+	-	-	-	-	-	-	-	-
2135	<i>Scenedesmus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2136	<i>Dictyosphaerium pulchellum</i> Wood	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2137	<i>Dictyosphaerium simplex</i> Sukja	-	+	+	-	+	-	+	+	+	-	-	-	-	-
2138	<i>Monoraphidium komarkovae</i> (Nyg.) Komarkova-Legnerov	+	-	-	-	-	-	-	-	-	-	+	-	-	-
2143	<i>Monoraphidium minutum</i> (Nag.) Komarkova-Legnerova	-	-	-	-	-	-	-	-	-	-	-	-	-	+
2145	<i>Crucigenia quadrata</i> Morr.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2154	<i>Coelastrum microporum</i> Naegeli	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2157	<i>Kichnerella lunaris</i> (Kirchn.) Moeb.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2164	<i>Quadrigula closterioides</i> (Bohl.) Printz	-	-	-	-	-	-	-	-	-	-	-	-	+	-
2167	<i>Elakatothrix gelatinosa</i> Willen	-	-	-	-	-	+	+	-	-	+	-	-	+	+
2174	<i>Closterium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2178	<i>Cosmarium</i>	-	-	-	-	-	-	+	-	-	-	-	-	+	+
2182	<i>Euastrum</i>	-	-	-	-	-	-	-	-	-	-	-	-	+	-
2185	<i>Micrasterias</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2186	<i>Xanthidium</i>	-	-	-	-	-	-	+	-	-	-	-	-	-	-
2187	<i>Staurodesmus extensus</i> (Andersson) Telling	-	+	-	+	-	-	+	-	+	+	+	-	-	-
2191	<i>Staurodesmus cuspidatus</i> (Brebisson and Ralfs) Telling	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2193	<i>Staurodesmus paradoxum</i> Meyen	-	-	-	-	-	-	-	+	-	-	-	-	-	-
2199	<i>Spondylosium planum</i> (Wolle) W. and G.S. West	-	-	-	-	-	+	+	+	-	+	+	-	+	-
2202	<i>Scourfieldia cordiformis</i> Takeda	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2204	<i>Ankrya judai</i> (G.M. Smith) Fott	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2205	<i>Mougeotia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2206	<i>Botryococcus braunii</i> Kutzing	-	-	+	+	-	-	-	+	-	-	+	+	+	+
2215	<i>Tetradron caudatum</i> (Corda) Hansgrig	-	-	-	-	+	-	+	+	+	+	-	+	-	-
2217	<i>Collocladion</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2222	<i>Treubaria</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2223	<i>Planktosphaeria gelatinosa</i> G.M. Smith	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2231	<i>Bulbochaete</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2235	<i>Ankistrodesmus spiralis</i> Lemmermann	+	+	+	+	+	-	+	+	+	+	+	-	+	-
2247	<i>Oocystis gigas</i> Archer	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2252	<i>Scenedesmus acutus</i> Chodat	-	-	-	-	-	-	-	-	-	+	-	-	-	-
2512	<i>Scenedesmus acuminatus</i> Chodat	-	+	-	-	-	-	-	-	-	-	-	-	-	-

Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2010.

Species & Code		Tehek Lake							Tehek Lake - Farfield			Inuggugayualik Lake				
		TE-16-S 16-Jan-10	TE-18-S 26-Feb-10	TE-19-S 21-Mar-10	TE-22-S 9-Apr-10	TE-23-INT 21-May-10	TE-26-S 20-Jul-10	TE-29-S 28-Aug-10	TE-30-S 21-Sep-10	TEFF-8-S 20-Jul-10	TEFF-11-S 28-Aug-10	TEFF-12-S 21-Sep-10	INUG-14-S 22-Jul-10	INUG-17-S 25-Aug-10	INUG-18-S 23-Sep-10	
Chrysophyte																
4351	Small chrysophyceae	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
4352	Large chrysophyceae	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
4354	Chromulina	-	-	+	-	-	-	-	-	-	-	-	-	-	-	
4355	Chrysochromulina parva Lackey	-	-	-	-	-	+	-	+	+	+	+	+	+	+	
4357	Chrysococcus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
4358	Chrysostephanospaera globulifera Scherffel	-	-	-	+	-	-	+	-	-	+	-	+	+	+	
4361	Kephyrion boreale Skuja	-	+	-	-	-	-	+	-	+	-	+	+	+	+	
4362	Kephyrion	+	+	+	+	+	+	+	-	+	+	+	+	+	+	
4363	Spinifilomonas sirratus	-	+	+	+	-	+	+	+	+	+	+	+	+	+	
4364	Mallomonas caudata Ivanov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4367	Mallomonas duerrschmidtiae Siver, Hamer and Kling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4368	Mallomonas crassisquama (Asmund) Fott	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4370	Mallomonas akrokomos Asmund and Kristiansen	-	-	-	-	-	-	-	-	-	-	-	+	-	+	
4372	Mallomonas tonsurata Telling and Krieger	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4375	Synura sphagnicola Korschikow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4378	Dinobryon borgei Lemmermann	-	+	-	-	+	+	+	-	+	+	+	+	-	+	
4381	Dinobryon mucronutum Nygaard	-	-	-	-	+	+	+	+	+	+	+	+	-	+	
4383	Dinobryon bavaricum Imhof	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4384	Dinobryon bavaricum v vanhoeffenii (Bachmann) Krieger	-	-	-	-	-	-	-	+	-	+	+	+	-	+	
4387	Dinobryon cylindricum Imhof	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4388	Dinobryon sertularia Ehrenberg	+	+	-	+	+	+	+	-	+	-	-	+	+	-	
4390	Dinobryon sociale Ehrenberg	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
4391	Dinobryon sociale v. stipitatum (Stein) Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4393	Dinobryon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4394	Epiphyxis	-	-	-	-	-	-	+	+	-	-	-	-	-	+	
4396	Chrysalkos skuja (Nauwerck) Willen	+	+	+	-	+	+	+	+	+	-	+	+	+	+	
4400	Ochromonas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4401	Uroglena volvox Ehrenberg	-	-	-	-	-	+	-	-	+	-	-	+	-	-	
4403	Chrysosphaerella longispina Lauterborn	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4411	Bitrichia chodatii (Reverdin) Chodat	-	-	-	-	-	-	+	-	+	-	+	+	+	-	
4413	Chrysochromulina laurentiana Kling	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
4414	Stichogloea	-	-	-	-	-	-	+	+	-	+	-	+	+	+	
4415	Bicoeca lacustris Clark	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4416	Bicoeca ainikkiae Jarnefelt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4418	Salpingoeca frequentissima (Zach.) Lemmermann	-	-	+	+	+	-	+	-	-	+	+	+	+	+	
4425	Mallomonas hamata Asmund	-	+	+	-	+	+	-	-	-	-	-	-	-	-	
4436	Dinobryon attenuatum Hill	-	-	-	-	-	-	+	-	+	-	-	-	-	-	
4437	Pteridomonas	-	-	-	-	-	-	-	+	-	-	+	-	-	-	

Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2010.

Species & Code		Tehek Lake							Tehek Lake - Farfield			Inuggugayualik Lake				
		TE-16-S 16-Jan-10	TE-18-S 26-Feb-10	TE-19-S 21-Mar-10	TE-22-S 9-Apr-10	TE-23-INT 21-May-10	TE-26-S 20-Jul-10	TE-29-S 28-Aug-10	TE-30-S 21-Sep-10	TEFF-8-S 20-Jul-10	TEFF-11-S 28-Aug-10	TEFF-12-S 21-Sep-10	INUG-14-S 22-Jul-10	INUG-17-S 25-Aug-10	INUG-18-S 23-Sep-10	
Diatom																
5507	<i>Cyclotella stelligera</i> Cleve and Grunow	-	+	+	-	-	+	+	+	+	+	+	+	+	+	
5508	<i>Cyclotella pseudostelligera</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5509	<i>Cyclotella ocellata</i> Pant.	-	-	-	-	-	-	-	+	-	-	-	-	-	+	
5511	<i>Rhizosolenia erienne</i> H.L. Smith	-	-	+	-	-	+	+	+	+	+	+	+	-	+	
5513	<i>Tabellaria fenestrata</i> (Lyngbye) Kutzing	-	-	-	-	-	-	-	-	+	-	-	-	-	-	
5514	<i>Tabellaria flocculsa</i> (Roth) Kutzing	-	-	-	-	+	+	-	+	-	-	+	-	+	-	
5515	<i>Fragilaria crotonensis</i> Kitton	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5518	<i>Synedra acus</i> Kutzing	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
5523	<i>Synedra ulna</i> (Nitzsch) Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5524	<i>Asterionella formosa</i> Hassall	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5540	<i>Aulacoseira italica</i> v <i>subarctica</i> (O. Muller) Simonsen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5546	<i>Gyrosigma</i>	-	-	-	-	-	-	+	+	-	+	+	-	-	-	
5547	<i>Frustulia rhomboides</i> (Ehrenberg) de Toni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5551	<i>Cyclotella michiganiana</i> Skvortzow	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
5720	<i>Cyclotella bodanica</i> Eulenst.	-	-	-	-	-	-	-	-	-	+	+	-	-	-	
5728	<i>Epithemia argus</i> Kutzing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5860	<i>Diatoma vulgare</i> Bory	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5906	<i>Thalassionema nitzschioides</i> Grunow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5908	<i>Diatoma tenue</i> Agardh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5916	<i>Fragilaria capucina</i> Grunow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cryptophyte																
6554	<i>Rhodomonas minuta</i> Skuja	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
6558	<i>Cryptomonas erosa</i> Ehrenberg	+	+	+	+	+	+	+	+	+	-	+	+	+	+	
6559	<i>Cryptomonas ovata</i> Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6562	<i>Cryptomonas reflexa</i> (Marsson) Skuja	+	+	-	-	-	+	+	-	+	-	+	-	-	-	
6565	<i>Cryptomonas rostratiformis</i> Skuja	+	+	-	-	-	+	+	+	+	-	+	+	+	-	
6568	<i>Katablepharis ovalis</i> Skuja	+	+	+	+	+	+	+	-	+	+	-	+	+	+	
Dinoflagellate																
7631	<i>Gymnodinium helveticum</i> Penard	-	-	-	-	-	-	-	+	-	-	-	-	-	-	
7632	<i>Gymnodinium</i>	+	+	+	+	+	+	+	+	+	+	+	-	+	+	
7635	<i>Peridinium willei</i> Huitfeldt-Kaas	-	-	-	-	+	-	-	+	-	-	-	-	-	-	
7638	<i>Peridinium inconspicuum</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7639	<i>Peridinium pusillum</i> (Penard) Lemmermann	-	+	+	+	-	+	+	-	+	-	+	+	-	+	
7640	<i>Peridinium goslawiense</i> Woloszyńska	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7641	<i>Peridinium aciculiferum</i> Lemmermann	-	-	-	-	-	+	-	-	+	-	+	-	-	-	
7642	<i>Peridinium wisconsinense</i> Eddy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2010.

Species & Code	Wally Lake			Pipedream Lake			Baker Lake - Akilahaarjuk Point			Baker Lake - Barge Dock			Baker Lake - Proposed Jetty		
	WAL-8-S	WAL-11-S	WAL-12-S	PDL-8-S	PDL-11-S	PDL-12-S	BAP-8-S	BAP-11-S	BAP-12-S	BBD-8-S	BBD-11-S	BBD-12-S	BPJ-8-S	BPJ-11-S	BPJ-12-S
	19-Jul-10	23-Aug-10	19-Sep-10	21-Jul-10	24-Aug-10	22-Sep-10	26-Jul-10	30-Aug-10	27-Sep-10	26-Jul-10	31-Aug-10	27-Sep-10	27-Jul-10	31-Aug-10	27-Sep-10
Cyanophyte															
1007 <i>Aphanocapsa delicatissima</i> W. and G.S. West	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1008 <i>Aphanocapsa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1012 <i>Aphanothece</i>	-	+	+	-	-	-	-	+	+	-	+	-	-	+	-
1014 <i>Chroococcus limneticus</i> Lemmermann	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-
1026 <i>Merismopedia tenuissima</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1045 <i>Anabaena lemmermannii</i> Usacev	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1054 <i>Planktolyngbya limnetica</i>	-	-	+	+	-	+	-	+	-	-	+	+	-	+	-
1073 <i>Snowella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
1077 <i>Pseudoanabaena</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1089 <i>Cyanodictyon</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1097 <i>Snowella lacustris</i> (Chodat) Komarek and Hindak	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorophyte															
2100 <i>Pyramidomonas tetrarhynchus</i> Schmarda	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-
2101 <i>Carteria</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2105 <i>Chlamydomonas</i>	+	+	+	-	+	-	-	+	+	+	-	+	+	+	+
2112 <i>Sphaerocystis Schroeteri</i> Chodat	-	+	+	+	-	+	-	-	+	-	-	-	-	+	-
2115 <i>Pediastrum tetras</i> (Ehrenberg) Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2120 <i>Oocystis submarina</i> v. <i>variabilis</i> Skuja	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
2121 <i>Oocystis lacustris</i> Chodat	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
2125 <i>Paulschulzia pseudovolvox</i> (Schulz and Telling) Skuja	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2126 <i>Chodatella</i>	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-
2127 <i>Tetradron minimum</i> (Brunow) Hansgrig	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2135 <i>Scenedesmus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2136 <i>Dictyosphaerium pulchellum</i> Wood	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2137 <i>Dictyosphaerium simplex</i> Skuja	-	+	+	-	-	-	+	+	+	+	+	+	+	+	+
2138 <i>Monoraphidium komarkovae</i> (Nyg.) Komarkova-Legnerova	+	-	-	-	-	+	+	+	+	+	+	+	+	+	+
2143 <i>Monoraphidium minutum</i> (Nag.) Komarkova-Legnerova	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
2145 <i>Crucigenia quadrata</i> Morr.	+	+	+	-	-	+	-	+	-	-	-	-	-	-	-
2154 <i>Coelastrum microporum</i> Naegeli	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2157 <i>Kichnerella lunaris</i> (Kirchn.) Moeb.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2164 <i>Quadrigula closterioides</i> (Bohl.) Printz	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
2167 <i>Elakatothrix gelatinosa</i> Willen	+	+	+	-	+	+	-	-	-	-	+	-	-	-	+
2174 <i>Closterium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2178 <i>Cosmarium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2182 <i>Euastrum</i>	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
2185 <i>Micrasterias</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2186 <i>Xanthidium</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
2187 <i>Staurodesmus extensus</i> (Andersson) Telling	+	+	+	+	+	+	+	-	+	-	+	-	-	+	+
2191 <i>Staurodesmus cuspidatus</i> (Brebisson and Ralfs) Telling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2193 <i>Staurodesmus paradoxum</i> Meyen	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
2199 <i>Spondylosium planum</i> (Wolle) W. and G.S. West	+	+	+	-	+	+	-	-	-	-	-	-	-	-	-
2202 <i>Scourfieldia cordiformis</i> Takeda	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2204 <i>Ankrya judai</i> (G.M. Smith) Fott	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
2205 <i>Mougeotia</i>	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
2206 <i>Botryococcus braunii</i> Kutzing	-	+	+	-	+	+	-	-	-	-	+	-	-	-	-
2215 <i>Tetradron caudatum</i> (Corda) Hansgrig	+	+	+	+	+	+	+	+	-	+	+	+	+	+	-
2217 <i>Collocladion</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
2222 <i>Treubaria</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2223 <i>Planktosphaeria gelatinosa</i> G.M. Smith	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2231 <i>Bulbochaete</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2235 <i>Ankistrodesmus spiralis</i> Lemmermann	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
2247 <i>Oocystis gigas</i> Archer	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
2252 <i>Scenedesmus acutus</i> Chodat	-	-	-	-	-	-	+	+	+	-	+	+	-	+	+
2512 <i>Scenedesmus acuminatus</i> Chodat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2010.

Species & Code	Wally Lake			Pipedream Lake			Baker Lake - Akilahaarjuk Point			Baker Lake - Barge Dock			Baker Lake - Proposed Jetty		
	WAL-8-S	WAL-11-S	WAL-12-S	PDL-8-S	PDL-11-S	PDL-12-S	BAP-8-S	BAP-11-S	BAP-12-S	BBD-8-S	BBD-11-S	BBD-12-S	BPJ-8-S	BPJ-11-S	BPJ-12-S
	19-Jul-10	23-Aug-10	19-Sep-10	21-Jul-10	24-Aug-10	22-Sep-10	26-Jul-10	30-Aug-10	27-Sep-10	26-Jul-10	31-Aug-10	27-Sep-10	27-Jul-10	31-Aug-10	27-Sep-10
Chrysophyte															
4351 Small chrysophyceae	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4352 Large chrysophyceae	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4354 <i>Chromulina</i>	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
4355 <i>Chrysochromulina parva</i> Lackey	+	+	+	+	+	+	+	-	+	+	-	+	-	-	+
4357 <i>Chrysococcus</i>	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+
4358 <i>Chrysostephanospaera globulifera</i> Scherffel	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-
4361 <i>Kephyrion boreale</i> Skuja	+	+	+	+	-	+	+	-	-	+	-	-	+	-	+
4362 <i>Kephyrion</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4363 <i>Spinifilimonas sirratus</i>	+	+	+	+	+	+	+	-	-	+	+	+	+	+	-
4364 <i>Mallomonas caudata</i> Ivanov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4367 <i>Mallomonas duerschmidtiae</i> Siver, Hamer and Kling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4368 <i>Mallomonas crassisquama</i> (Asmund) Fott	-	+	-	+	-	-	-	+	-	+	+	-	+	+	-
4370 <i>Mallomonas akrokomos</i> Asmund and Kristiansen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4372 <i>Mallomonas tonsurata</i> Teiling and Krieger	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4375 <i>Synura sphagnicola</i> Korschikow	-	-	-	-	-	-	+	-	-	+	-	-	+	-	-
4378 <i>Dinobryon borgei</i> Lemmermann	+	+	+	+	+	+	+	+	-	+	-	+	+	+	+
4381 <i>Dinobryon mucronutum</i> Nygaard	+	+	+	+	+	+	+	+	-	-	-	+	-	+	-
4383 <i>Dinobryon bavaricum</i> Imhof	-	+	-	+	-	-	+	-	-	-	-	-	+	-	-
4384 <i>Dinobryon bavaricum</i> v <i>vanhoeffenii</i> (Bachmann) Krieger	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
4387 <i>Dinobryon cylindricum</i> Imhof	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4388 <i>Dinobryon sertularia</i> Ehrenberg	+	-	+	+	+	+	+	+	-	+	+	+	+	+	-
4390 <i>Dinobryon sociale</i> Ehrenberg	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4391 <i>Dinobryon sociale</i> v. <i>stipitatum</i> (Stein) Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4393 <i>Dinobryon</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4394 <i>Epiphyxis</i>	+	-	-	+	+	+	-	-	-	-	+	+	-	-	-
4396 <i>Chrysalkos skuja</i> (Nauwerck) Willen	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4400 <i>Ochromonas</i>	-	-	-	+	-	-	-	-	+	+	+	+	-	-	+
4401 <i>Uroglena volvox</i> Ehrenberg	+	-	-	+	-	-	+	-	-	+	-	-	+	-	-
4403 <i>Chrysosphaerella longispina</i> Lauterborn	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-
4411 <i>Bitrichia chodatii</i> (Reverdin) Chodat	-	+	+	-	-	-	-	-	-	+	-	-	+	-	+
4413 <i>Chrysochromulina laurentiana</i> Kling	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4414 <i>Stichogloea</i>	-	+	+	-	-	+	-	-	-	-	-	-	-	-	-
4415 <i>Bicoeca lacustris</i> Clark	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
4416 <i>Bicoeca ainikkiae</i> Jamefelt	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
4418 <i>Salpingoeca frequentissima</i> (Zach.) Lemmermann	-	+	+	-	-	+	-	+	+	+	+	+	+	+	+
4425 <i>Mallomonas hamata</i> Asmund	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4436 <i>Dinobryon attenuatum</i> Hill	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-
4437 <i>Pteridomonas</i>	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-

Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2010.

Species & Code	Wally Lake			Pipedream Lake			Baker Lake - Akilahaarjuk Point			Baker Lake - Barge Dock			Baker Lake - Proposed Jetty		
	WAL-8-S	WAL-11-S	WAL-12-S	PDL-8-S	PDL-11-S	PDL-12-S	BAP-8-S	BAP-11-S	BAP-12-S	BBD-8-S	BBD-11-S	BBD-12-S	BPJ-8-S	BPJ-11-S	BPJ-12-S
	19-Jul-10	23-Aug-10	19-Sep-10	21-Jul-10	24-Aug-10	22-Sep-10	26-Jul-10	30-Aug-10	27-Sep-10	26-Jul-10	31-Aug-10	27-Sep-10	27-Jul-10	31-Aug-10	27-Sep-10
Diatom															
5507 <i>Cyclotella stelligera</i> Cleve and Grunow	-	+	+	+	-	+	+	+	+	+	+	+	+	+	+
5508 <i>Cyclotella pseudostelligera</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5509 <i>Cyclotella ocellata</i> Pant.	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-
5511 <i>Rhizosolenia erianse</i> H.L. Smith	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+
5513 <i>Tabellaria fenestrata</i> (Lyngbye) Kutzing	-	-	-	-	-	-	+	-	+	-	+	+	-	-	+
5514 <i>Tabellaria flocculsa</i> (Roth) Kutzing	-	-	-	-	-	-	+	-	+	+	+	+	+	-	+
5515 <i>Fragilaria crotonensis</i> Kitton	-	-	-	-	-	-	-	+	+	-	+	+	-	+	+
5518 <i>Synedra acus</i> Kutzing	+	+	+	+	+	+	+	-	-	+	-	-	+	-	-
5523 <i>Synedra ulna</i> (Nitzsch) Ehrenberg	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+
5524 <i>Asterionella formosa</i> Hassall	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+
5540 <i>Aulacoseira italica v subarctica</i> (O. Muller) Simonsen	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+
5546 <i>Gyrosigma</i>	+	-	+	-	-	+	-	-	-	-	-	-	-	-	-
5547 <i>Frustulia rhomboides</i> (Ehrenberg) de Toni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5551 <i>Cyclotella michiganiana</i> Skvortzow	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
5720 <i>Cyclotella bodanica</i> Eulenst.	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
5728 <i>Epithemia argus</i> Kutzing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5860 <i>Diatoma vulgare</i> Bory	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5906 <i>Thalassionema nitzschioides</i> Grunow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5908 <i>Diatoma tenue</i> Agardh	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
5916 <i>Fragilaria capucina</i> Grunow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cryptophyte															
6554 <i>Rhodomonas minuta</i> Skuja	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
6558 <i>Cryptomonas erosa</i> Ehrenberg	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
6559 <i>Cryptomonas ovata</i> Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6562 <i>Cryptomonas reflexa</i> (Marsson) Skuja	-	+	+	+	+	+	-	-	-	+	+	-	+	+	-
6565 <i>Cryptomonas rostratiformis</i> Skuja	+	-	+	+	-	-	+	+	-	+	-	-	+	-	-
6568 <i>Katablepharis ovalis</i> Skuja	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+
Dinoflagellate															
7631 <i>Gymnodinium helveticum</i> Penard	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-
7632 <i>Gymnodinium</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
7635 <i>Peridinium willei</i> Huitfeldt-Kaas	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-
7638 <i>Peridinium inconspicuum</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7639 <i>Peridinium pusillum</i> (Penard) Lemmermann	+	-	+	+	+	+	+	+	-	+	+	+	+	+	+
7640 <i>Peridinium goslawiense</i> Woloszyńska	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7641 <i>Peridinium aciculiferum</i> Lemmermann	+	-	-	+	-	-	+	-	-	+	-	-	+	-	-
7642 <i>Peridinium wisconsinense</i> Eddy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX B

BENTHIC INVERTEBRATE RAW DATA, MEADOWBANK STUDY LAKES AND BAKER LAKE, 2010



Appendix B. Benthic invertebrate raw data (total number of organisms in two 0.023 m² grabs), Meadowbank study lakes and Baker Lake, August 2010.

Station	BAP	BAP	BAP	BAP	BAP	BBD	BBD	BBD	BBD	BBD	BPJ	BPJ	BPJ	BPJ	BPJ	INUG	INUG	INUG	INUG	INUG
Replicate	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Depth (m)	8.2	8.5	7.5	7.7	8.3	7.3	6.8	7.7	8.6	7.5	7.7	7.4	8.0	7.2	6.5	6.8	6.7	8.0	8.3	8.7
# Grabs/sample	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mesh Size (µm)	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Date	30-Aug-10	30-Aug-10	30-Aug-10	30-Aug-10	30-Aug-10	31-Aug-10	31-Aug-10	31-Aug-10	31-Aug-10	31-Aug-10	31-Aug-10	31-Aug-10	31-Aug-10	31-Aug-10	31-Aug-10	25-Aug-10	25-Aug-10	25-Aug-10	25-Aug-10	25-Aug-10
ROUNDWORMS																				
P. Nemata	16	86	32	20	12	2	4	4	13	3	26		11	11	1			1		
FLATWORMS																				
P. Platyhelminthes																				
Cl. Turbellaria																				
indeterminate	2																	1		
ANNELIDS																				
P. Annelida																				
WORMS																				
Cl. Oligochaeta																				
F. Enchytraeidae	17	14	8	2	6				1	2	2									
F. Naididae																				
Nais barbata																				
Nais communis																				
Nais		14							2											
Slavina appendiculata																				
F. Tubificidae																				
Limnodrilus hoffmeisteri	67		8	4				1												
Rhyacodrilus coccineus	50	27	8	2				4	1											
Rhyacodrilus montana	67	82	93	29	19	1		11	4	4	5			2						
Rhyacodrilus sodalis																				
Tasserkidrilus americanus																				1
immatures with hair chaetae	101	82	51	2	4				1											
immatures without hair chaetae	50			2	2				1	1										
F. Lumbriculidae																				
Lumbriculus	17	95	25	2												4	1			
indeterminate																				
ARTHROPODS																				
P. Arthropoda																				
MITES																				
Cl. Arachnida																				
O. Acarina	4		5	10	10	1	1		1		5		6	2			1	2	2	1
HARPACTICOIDS																				
O. Harpacticoida																				
SEED SHRIMPS																				
Cl. Ostracoda	43	43	22	9	6	4	1	24	11	3	7	2		4	3	2	8	3		1
TADPOLE SHRIMP																				
O. Notostraca																				
Lepidurus arcticus																				
WATER SCUDS																				
O. Amphipoda																				
F. Gammaracanthidae																				
Gammaracanthus	2	1	5		1															
F. Hyalellidae																				
Hyalella																				
INSECTS																				
Cl. Insecta																				
BEETLES																				
O. Coleoptera																				
F. Staphylinidae																				
MAYFLIES																				
O. Ephemeroptera																				
F. Baetidae																				
indeterminate																				
CADDISFLIES																				
O. Trichoptera																				
F. Limnephilidae																				
Grammotaulius																				
Grensia praeterita	2				2														1	
pupae																				
immature																				3

Appendix B. Benthic invertebrate raw data (total number of organisms in two 0.023 m² grabs), Meadowbank study lakes and Baker Lake, August 2010.

Station	BAP	BAP	BAP	BAP	BAP	BBD	BBD	BBD	BBD	BBD	BPJ	BPJ	BPJ	BPJ	BPJ	INUG	INUG	INUG	INUG	INUG
Replicate	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Depth (m)	8.2	8.5	7.5	7.7	8.3	7.3	6.8	7.7	8.6	7.5	7.7	7.4	8.0	7.2	6.5	6.8	6.7	8.0	8.3	8.7
# Grabs/sample	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mesh Size (µm)	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Date	30-Aug-10	30-Aug-10	30-Aug-10	30-Aug-10	30-Aug-10	31-Aug-10	31-Aug-10	31-Aug-10	31-Aug-10	31-Aug-10	31-Aug-10	31-Aug-10	31-Aug-10	31-Aug-10	31-Aug-10	25-Aug-10	25-Aug-10	25-Aug-10	25-Aug-10	25-Aug-10
TRUE FLIES																				
O. Diptera																				
MIDGES																				
F. Chironomidae																				
chironomid pupae	1	3	3	2	3	1	2	6	18	3	4		2	5	3					1
S.F. Chironominae																				
Chironomus																				
Cladotanytarsus																				
Constempellina	2	2	4	3	3			6			3			2						
Corynocera																				1
Dicrotendipes																				
Microsetra	1	28	18	1		2	6	2	1	1										3
Microtendipes																1		1		1
Parachironomus																				
Paracladopelma																				
Paratanytarsus																				
Polypedium	59	29	54	15	8				1		5									
Sergentia							1	3	2	3	4	1								
Stempellinella																				
Stictochironomus	23	4	23	5	9	3		40	45	30	23		1	2			11	4		
Tanytarsus		3	3	3	7	2	2	6	2		4		1	15			1	1	1	
indeterminate																				
S.F. Diamesinae																				
Pothastia	1	1		1																
Protanytus	1		1	2	2	4	3	3	5		3			2				1		
Pseudodamesa					1	1														
S.F. Orthocladinae																				
Abiskomyia	2	6	5	3	5		2	9	6		15			4			2	1	2	1
Corynoneura																				
Cricotopus																				
Cricotopus/Orthocladus									2		3									
Heterotritissocladus	1			5	2	1	1	13	5	1	21	1	6	8	1					
Hydrobaenus									1						1					
Mesocricotopus					1															
Nanocladus																				
Paraccladius				4	6						2		2	2						
Parakiefferiella					1				1											
Psectrocladius																				
Psectrocladius (Mongopsectrocladius)																				
Psectrocladius					2															
Zalutschia					1															
indeterminate																				
S.F. Prodiamesinae																				
Monodiamesa	3			2	2		1	2	1		4					2		1		2
S.F. Tanyptodinae																				
Abiahesmyia																				
Procladius	4	4	4	1	1						3					3	1	2	4	12
Thienemannimyia complex	6	1	6	1	1															
Trissopelopia																				
indeterminate																				
F. Empididae																				
Cheiffiera/Neoplasta																				
Cheiffiera	2	1	6	3	6						3		1							
Wiedemannia					1	2														
pupae																				
MOLLUSCS																				
P. Mollusca																				
CLAMS																				
Cl. Bivalvia																				
F. Sphaeriidae																				
Cyclocalyx/Neopisidium	67	2	48	25	10				4		16		1	1		10	5	16	17	10
Cyclocalyx	7	1		1												2		2		
Cyclocalyx nitidum																				
Cyclocalyx (Pisidium)																				
Sphaerium nitidum																		3	2	3
TOTAL NUMBER OF TAXA¹																				
	23	18	18	22	24	10	8	12	18	6	17	1	8	10	2	6	7	12	7	10
TOTAL NUMBER OF ORGANISMS²																				
	559	400	378	130	116	19	21	105	106	46	122	1	21	45	5	22	25	35	29	36

Notes:
¹ Number of taxa totals exclude nematodes & ostracods, immatures & pupae (Tubificidae, Limnephilidae, Chironomidae, Empididae), and indeterminates (Lumbriculidae, Chironominae, Orthocladinae, Tanyptodinae).
² Number of organisms totals exclude nematodes (P. Nemata) & ostracods (Cl. Ostracoda).

TPE,TPN,TPS=Third Portage Lake - East, North, South basins; SP=Second Portage Lake; TE,TEFF=Tehek Lake - Fairfield;
INUG=Inuggayualik Lake; WAL=Wally Lake; PDL=Pipedream Lake;
BBD,BPJ,BAP=Baker Lake - Barge Dock, Proposed Jetty, Akilaharjuk Point.

Appendix B. Benthic invertebrate raw data (total number of organisms in two 0.023 m² grabs), Meadowbank study lakes and Baker Lake, August 2010.

Station	PDL	PDL	PDL	PDL	PDL	SP	SP	SP	SP	SP	TE	TE	TE	TE	TE	TEFF	TEFF	TEFF	TEFF	TEFF
Replicate	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Depth (m)	6.6	6.9	6.5	6.8	7.7	8.9	6.8	8.8	7.4	8.0	7.7	9.6	8.2	7.5	6.9	7.4	7.2	7.4	6.6	8.0
# Grabs/sample	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mesh Size (µm)	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Date	24-Aug-10	24-Aug-10	24-Aug-10	24-Aug-10	24-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10
ROUNDWORMS																				
P. Nematoda	3	2	1		2	1				3	1	2				2			1	1
FLATWORMS																				
P. Platyhelminthes																				
Cl. Turbellaria																				
indeterminate																				
ANNELIDS																				
P. Annelida																				
WORMS																				
Cl. Oligochaeta																				
F. Enchytraeidae																				
F. Naididae																				
Nais barbata																				
Nais communis																				
Nais																				
Slavina appendiculata																				
F. Tubificidae																				
Limnodrilus hoffmeisteri																				
Rhyacodrilus coccineus																			1	2
Rhyacodrilus montana																				
Rhyacodrilus sodalis																				
Tassaniodrilus americanus																				
immatures with hair chaetae	2	3	2							1										
immatures without hair chaetae																				
F. Lumbriculidae																				
Lumbriculus			2	1							1	1			2					
indeterminate																				
ARTHROPODS																				
P. Arthropoda																				
MITES																				
Cl. Acarida																				
O. Acarina		1		1		1	1			1	2	2	5	2	9	2	1	1	1	2
HARPACTICODS																				
O. Harpacticoida																				
SEED SHRIMPS																				
Cl. Ostracoda	10		6	1	2		5		1	2	11	6		7	5		15	13	13	6
TADPOLE SHRIMP																				
O. Notostraca																				
Lepidurus arcticus																				
WATER SCUDS																				
O. Amphipoda																				
F. Gammaracanthidae																				
Gammaracanthus																				
F. Hyalellidae																				
Hyalella																				
INSECTS																				
Cl. Insecta																				
BEETLES																				
O. Coleoptera																				
F. Staphylinidae																				
MAYFLIES																				
O. Ephemeroptera																				
F. Baetidae																				
indeterminate																				
CADDISFLIES																				
O. Trichoptera																				
F. Limnephilidae																				
Grammotaulius																				
Grensia praeterita				3													2	1	2	
pupae												1								2
immature																				

Appendix B. Benthic invertebrate raw data (total number of organisms in two 0.023 m² grabs), Meadowbank study lakes and Baker Lake, August 2010.

Station	PDL	PDL	PDL	PDL	PDL	SP	SP	SP	SP	SP	TE	TE	TE	TE	TE	TEFF	TEFF	TEFF	TEFF	TEFF
Replicate	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Depth (m)	6.6	6.9	6.5	6.8	7.7	8.9	6.8	8.8	7.4	8.0	7.7	9.6	8.2	7.5	6.9	7.4	7.2	7.4	6.6	8.0
# Grabs/sample	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mesh Size (µm)	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Date	24-Aug-10	24-Aug-10	24-Aug-10	24-Aug-10	24-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10
TRUE FLIES																				
O. Diptera																				
MIDGES																				
F. Chironomidae																				
chironomid pupae											1					1				
S.F. Chironominae																				
Chironomus																				
Cladotanytarsus						1														
Constempellina																				
Corynocera											1									
Dicrotendipes																				
Micropsectra					2										5	5	2	2	3	4
Microtendipes																				
Parachironomus																				
Paracladopelma																				
Paratanytarsus			1													2	1		3	1
Polypedium																				
Sergentia																				
Stempellinella																				
Stictochironomus	33	22	22	1		2			1	3		1		1			3		1	1
Tanytarsus	3										1			1						
indeterminate																				
S.F. Diamesinae																				
Pothastia																	1			
Protanytus			1	1	2					1				1				1		
Pseudodamesa					2											1				
S.F. Orthocladinae																				
Abiskomyia				1							1									3
Corynoneura																				
Cricotopus					1															
Cricotopus/Orthocladus																				
Heterotrissocladius	1		1							1	1		3			3	23	3	10	9
Hydrobaenus																				
Mesocricotopus															1					
Nanocladius																				
Paracladius																1	4		2	1
Parakiefferiella																	1			
Psectrocladius																				
Psectrocladius (Mongpsectrocladius)																				
Psectrocladius	1													1	1		1			
Zalutschia		1													1		1			
indeterminate																				
S.F. Prodiamesinae																				
Monodiamesa		1		1	1				1		1	4					3		2	
S.F. Tanypodinae																				
Abiahesmyia																				
Procladius	2	7	4	7	2	2	3	3	2	2	6			11	6	2	2	3	3	1
Thienemannimyia complex	1	1			1												2	2	3	
Trissopelopia																				
indeterminate																				
F. Empididae																				
Cheiffera/Neoplasta																				
Cheiffera																			1	
Wiedemannia																				
pupae																				
MOLLUSCS																				
P. Mollusca																				
CLAMS																				
Cl. Bivalvia																				
F. Sphaeriidae																				
Cyclocalyx/Neopisidium	7	9	11	7	5	4	6	5	5	10	31	6	5	11	11	12	18	17	13	13
Cyclocalyx		3	22																	
Cyclocalyx nitidum																				
Cyclocalyx (Pisidium)																				
Sphaerium nitidum	2																			
TOTAL NUMBER OF TAXA¹																				
TOTAL NUMBER OF ORGANISMS²	8	8	9	9	8	5	3	2	5	7	10	4	3	7	8	9	14	8	12	11
	52	48	69	21	16	10	10	8	10	21	47	16	10	35	29	30	64	31	44	43

Notes:
¹ Number of taxa totals exclude nematodes & ostracods, immatures & pupae (Tubificidae, Limnephilidae, Chironomidae, Empididae), and indeterminates (Lumbriculidae, Chironominae, Orthocladinae, Tanypodinae).
² Number of organisms totals exclude nematodes (P. Nemata) & ostracods (Cl. Ostracoda).

TPE,TPN,TPS=Third Portage Lake - East, North, South basins; SP=Second Portage Lake; TE,TEFF=Tehek Lake - Fairfield;
INUG=Inuggugayualik Lake; WAL=Wally Lake; PDL=Pipedream Lake;
BBD,BPJ,BAP=Baker Lake - Barge Dock, Proposed Jetty, Akilaharjuk Point.

Appendix B. Benthic invertebrate raw data (total number of organisms in two 0.023 m² grabs), Meadowbank study lakes and Baker Lake, August 2010.

Station	TPE	TPE	TPE	TPE	TPE	TPN	TPN	TPN	TPN	TPN	TPS	TPS	TPS	TPS	TPS	WAL	WAL	WAL	WAL	WAL
Replicate	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Depth (m)	8.3	7.5	6.8	8.4	6.5	7.5	8.8	9.5	9.5	8.4	7.2	8.1	8.4	6.7	7.6	9.3	9.5	8.0	9.8	7.4
# Grabs/sample	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mesh Size (µm)	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Date	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	20-Aug-10	20-Aug-10	20-Aug-10	20-Aug-10	20-Aug-10	23-Aug-10	23-Aug-10	23-Aug-10	23-Aug-10	23-Aug-10
ROUNDWORMS																				
P. Nemata	2	2	2	3	2						5	3	7		1	1				2
FLATWORMS																				
P. Platyhelminthes																				
Cl. Turbellaria																				
indeterminate																				
ANNELIDS																				
P. Annelida																				
WORMS																				
Cl. Oligochaeta																				
F. Enchytraeidae																				
F. Naididae																				
Nais barbata																				
Nais communis																				
Nais																				
Slavina appendiculata																				
F. Tubificidae																				
Limnodrilus hoffmeisteri																				
Rhyacodrilus coccineus	1	1	2	2	3	2		1												
Rhyacodrilus montana																				
Rhyacodrilus sodalis																				
Tasserkidrilus americanus																				
immatures with hair chaetae																				
immatures without hair chaetae											4	2								
F. Lumbriculidae																				
Lumbriculus	1			3	1	2	2								1	1	3		3	
indeterminate																				
ARTHROPODS																				
P. Arthropoda																				
MITES																				
Cl. Arachnida																				
O. Acarina	1	7	1	3	7	2	2	1	2			5				1	2	2	2	1
HARPACTICIDS																				
O. Harpacticoida																				
SEED SHRIMPS																				
Cl. Ostracoda																				
TADPOLE SHRIMP	23	33	27	3	28	1	4	3	5	3	26	15	22	7	15	9	8	5	9	9
O. Notostraca																				
Lepidurus arcticus																				
WATER SCUDS																				
O. Amphipoda																				
F. Gammaracanthidae																				
Gammaracanthus																				
F. Hyalellidae																				
Hyalella																				
INSECTS																				
Cl. Insecta																				
BEETLES																				
O. Coleoptera																				
F. Staphylinidae																				
MAYFLIES																				
O. Ephemeroptera																				
F. Baetidae																				
indeterminate																				
CADDISFLIES																				
O. Trichoptera																				
F. Limnephilidae																				
Grammotaulius																				
Grensia praeterita	1			1	1	1				1	1				1	1				
pupae																				
immature																				

Appendix B. Benthic invertebrate raw data (total number of organisms in two 0.023 m² grabs), Meadowbank study lakes and Baker Lake, August 2010.

Station	TPE	TPE	TPE	TPE	TPE	TPN	TPN	TPN	TPN	TPN	TPS	TPS	TPS	TPS	TPS	WAL	WAL	WAL	WAL	WAL
Replicate	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Depth (m)	8.3	7.5	6.8	8.4	6.5	7.5	8.8	9.5	9.5	8.4	7.2	8.1	8.4	6.7	7.6	9.3	9.5	8.0	9.8	7.4
# Grabs/sample	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mesh Size (µm)	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Date	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	20-Aug-10	20-Aug-10	20-Aug-10	20-Aug-10	20-Aug-10	23-Aug-10	23-Aug-10	23-Aug-10	23-Aug-10	23-Aug-10
TRUE FLIES																				
O. Diptera																				
MIDGES																				
F. Chironomidae																				
chironomid pupae			1			1	1	1	6		7	1	1	4					3	1
S.F. Chironominae																				
Chironomus																				
Cladotanytarsus																1	17		11	
Constempellina																		1		
Corynocera																3	73		189	
Dicrotendipes																		1		
Microsetra	6	7	15	14	13	35	56	33	18	1	6	5	23	10	1	1				
Microtendipes																				
Parachironomus																				
Paracladopelma																				
Paratanytarsus			3		4	1	3	1			11	10	13				10	1	2	
Polypedium																				
Sergentia												1								
Stempellinella																				
Stictochironomus		2	2	2		4	8	11			3	4				2		13		6
Tanytarsus			2	1							4	2	1				5	1	5	
indeterminate																				
S.F. Diamesinae																				
Pothastia																				
Protanytus							1						2		2					
Pseudodiamesa								1		1	2		3	1						
S.F. Orthocladinae																				
Abiskomyia	1			1	2															
Corynoneura																				
Cricotopus									1	1		2								
Cricotopus/Orthocladus																				
Heterotrissocladius			2		3		3	2	11	1	5	1	14	2	6					
Hydrobaenus							1													
Mesocricotopus																				
Nanocladius																				
Paracladius																				
Parakiefferiella																				
Psectrocladius																				
Psectrocladius (Mongopsectrocladius)																				
Psectrocladius			1						1				2			2		2	3	5
Zalutschia						1		1	1											
indeterminate																				
S.F. Prodiamesinae																				
Monodiamesa	1								1								2	1		
S.F. Tanytopodinae																				
Abiahesmyia																				
Procladius	9	6	9	10	7	2	4	1		1	2	1	2		1	7	6	5	8	7
Thienemannimyia complex	2	4		1	1	3	3	3	2	1	15	7					2			
Trissopelgia																				
indeterminate																				
F. Empididae																				
Cheiffiera/Neoplasta																				
Cheiffiera																				
Wiedemannia																				
pupae																				
MOLLUSCS																				
P. Mollusca																				
CLAMS																				
Cl. Bivalvia																				
F. Sphaeriidae																				
Cyclocalyx/Neopisidium	17	25	17	15	20	12	13	22	7	2	27	39	12	9	15	21	5	13	16	15
Cyclocalyx												6				7	11	8	9	3
Cyclocalyx nitidum																				
Cyclocalyx (Pisidium)																				
Sphaerium nitidum																2	1		1	1
TOTAL NUMBER OF TAXA¹																				
TOTAL NUMBER OF ORGANISMS²	39	53	55	53	62	66	97	81	51	9	86	86	73	27	26	49	137	48	252	39

Notes:
¹ Number of taxa totals exclude nematodes & ostracods, immatures & pupae (Tubificidae, Limnephilidae, Chironomidae, Empididae), and indeterminates (Lumbriculidae, Chironominae, Orthocladinae, Tanytopodinae).
² Number of organisms totals exclude nematodes (P. Nemata) & ostracods (Cl. Ostracoda).

TPE,TPN,TPS=Third Portage Lake - East, North, South basins; SP=Second Portage Lake; TE,TEFF=Tehek Lake - Fairfield;
INUG=Inuggugayualik Lake; WAL=Wally Lake; PDL=Pipedream Lake;
BBD,BPJ,BAP=Baker Lake - Barge Dock, Proposed Jetty, Akilaharjuk Point.

APPENDIX C

STANDARD OPERATING PROCEDURES FOR CREMP ZOOPLANKTON SAMPLING



APPENDIX C

Standard Operating Procedure Meadowbank Study Lakes CREMP Zooplankton Sampling

GENERAL:

Project Coordinator:

Maggie McConnell
Azimuth Consulting Group Inc.
218-2902 West Broadway
Vancouver, BC, V6K 2G8
Telephone: 604-730-1220
Fax: 604-739-8511
Email: mmcconnell@azimuthgroup.ca

In case of **emergency**, contact Gary Mann (Azimuth telephone number 604-730-1220 or cell phone 604-908-0601).

LOCATION AND TIMING FOR FIELD ACTIVITIES:

Nine sampling stations have been chosen for zooplankton monitoring in the Meadowbank study lakes area. These stations (with their corresponding abbreviation) are:

- Third Portage Lake – North Basin (TPN)
- Third Portage Lake – East Basin (TPE)
- Third Portage Lake – South Basin (TPS)
- Second Portage Lake (SP)
- Tehek Lake (TE)
- Wally Lake (WAL)
- Inuggugayualik Lake (INUG)
- Tehek far-field (TEFF)
- Pipedream Lake (PDL)

Field activities are scheduled for once per year, in **mid/late August**. The target **water depth** at each sampling station is 10 meters (at least > 8 m).

ZOOPLANKTON SAMPLING:

1. Gather field collection materials:

In the boat:

- Field collection data forms, waterproof paper, pencils, waterproof markers & clipboard
- GPS unit, batteries
- Depth meter, batteries
- pH meter, batteries
- Rope

- 70 micron nitex plankton net (30 cm diameter; 2.2 m long)
- Plastic squirt bottle
- Sampling gloves
- Safety glasses
- Field sample jars (per sampling station):
 - ▶ 10 – 500 mL plastic jars

In camp:

- Buffered formalin (10% Formaldehyde)
- Coolers, action packers (for storing and shipping samples)
- Address labels for coolers
- Chain-of-custody forms
- Large Ziploc bags (for sending chain-of-custody form in coolers)
- Electrical tape (for sealing zooplankton jars)
- Packing tape (for sealing coolers)

Before going into the field, **label all the lids and sampling containers** using a permanent waterproof marker. Print the following information directly onto both the jar and jar lid using a permanent waterproof marker:

- Azimuth company name
- Station abbreviation (e.g. TPE-1-B, INUG-3-B)
- Date of sample collection
- Parameters to be measured from individual jar (5 x 500 mL – Taxonomy; 5 x 500 mL – Biomass)

The following table lists the number of jars to be filled per sampling area (i.e., lake basin), naming convention to use, number of tows per replicate, analyses and preservatives required for each.

Sampling Containers / Area	Sample ID / Rep e.g.,	Tows / Rep	Analyses	Preservatives
5 x 500 mL plastic wide-mouth jar	TPE-1-B through TPE-5-B	2 tows	Biomass Analysis	5-10% Formalin
5 x 500 mL plastic wide-mouth jar	TPE-1-T through TPE-5-T	2 tows	Taxonomic Identification	5-10% Formalin

Prepare **internal labels** for each of the zooplankton containers. On a small piece of waterproof paper, write, using a lead pencil, the station abbreviation and replicate number (e.g. TPE-1). If no waterproof paper is available, use regular paper. Store the labels in their corresponding sampling container.

2. A 100% formalin solution is equivalent to a solution of 37% formaldehyde. The **target formalin concentration** in each of the sampling containers is 10% (i.e., 1/10th of the 37% solution). A neutral buffered formalin solution is achieved by adding a sufficient amount of

calcium carbonate powder or pellets to render the solution pH neutral (pH = 7.0). Borax powder may be substituted for calcium carbonate powder if necessary.

Transport Canada allows the free transport of formalin at concentrations less than 25% formaldehyde. Consequently, the formalin transported up to Meadowbank will be diluted in half (18.5% formaldehyde / 50% formalin solution).

Store at room temperature until ready to use. Only prepare the required volume of neutral buffered formalin for that sampling event. Buffered formalin will not store for long periods of time. Do not freeze the formalin solution as this renders it useless.

Follow all **safety precautions** when preparing the formalin solution. Formalin is a carcinogen and irritant. Wear sampling gloves and safety glasses when mixing the solution and prepare the solution in a well ventilated area.

3. Before and during the zooplankton sampling fill in the requested information on the **field data form**; complete one field data form in its entirety for each sampling station and sampling event. Forms are made of waterproof paper; **print** all information on the form using a **lead pencil** or write-in-the-rain pen.
4. With the aid of a GPS unit, **navigate the boat** to the sampling station using the UTM coordinates (in NAD 83) provided. Approach the station from downstream of the wind direction. In windy conditions, anchor the boat upstream of the station and drift back; it is not necessary to anchor the boat in calm conditions providing the boat remains within a 50 meter radius of the position. Do not allow the anchor to drag through the sampling station. Record the exact UTM coordinates on the field data form.
5. Measure the **water depth** at the sampling station using the 'Hawkeye' hand-held depth meter (note: place depth meter in water **before** pushing ON button). Hold the meter in the water, facing the lake bottom, until the meter measures the depth. Record this information on the field data form. Prior to sampling, make sure that the depth below the boat is at least **10 m**, to allow for a standard 8 m sampling depth, plus the length of the net (~2 m).
6. Ensure the rope is securely attached to the **Plankton Net**. Rinse the net with lake water. Lower the **Plankton Net** to 8 meters and wait for 30 seconds. Slowly tow the net towards the surface at a rate of about 0.3 m /second. It should take nearly 30 seconds to raise the net so that the mouth is above the water surface. Rinse the sidewalls of the net well by splashing water onto the outsides of the net to wash any zooplankters down towards the cod end of the net (i.e., the collecting vessel).
7. **Empty** the **sample** from the collecting vessel **into the pre-labeled** plastic sampling container (i.e. **station-1 jar**). A plastic squirt bottle filled with lake water is useful for this purpose.
8. **Repeat steps 6-7**, to acquire a second complete sample. Combine the second sample with the first sample into the same pre-labeled plastic sampling container (i.e., station-1 jar). The two tows (per replicate) are composited to increase the water volume sampled (these are for

Biomass Analyses). Collect an additional 2 tows at the same station and composite for Taxonomic ID. Note the tow depth of the water sampled at each station.

9. **Rinse the net** by, holding the net upside down and raise and lower the net and collecting vessel into the water to ensure that there are no zooplankters stuck inside the net.
10. **Repeat steps 6-9** four more times. Navigate to the four pre-determined random sample locations within the entire basin (spatial replicates). Ensure that there is sufficient depth beneath the boat. If not, move to slightly deeper water. Record the depth and GPS coordinates of each replicate station on the field data form. Put the samples from each replicate in pre-labeled station replicate jars 2 through 5. In total, 20 tows will be collected for zooplankton collection, four tows per replicate.
11. Ensure internal labels are placed in each sample container. Shake the formalin to ensure all of the calcium carbonate powder is in solution. **Add** a sufficient volume of **formalin** to each sampling container to make a corresponding formalin solution of approximately 5 - 10%. Volumes of formalin are added by 'eye' (for a 10% solution, a ratio of 4 parts water and 1 part 50% formalin solution). Overall, there must be enough liquid in the jar to cover the entire sample. Seal the sample container securely and gently roll the container to mix the sample and formalin solution. Do not shake the sample container; this will crush the organisms inside.
12. **Complete the field data form**, including sampling effort (successful tows, equipment failure, control of vertical ascent of net, tow depth) required to collect the zooplankton samples.
13. Until ready for shipping, store the zooplankton samples in a cooler or action packer at **room temperature**. Dry the zooplankton net before storing away.
14. Fill out a **chain-of-custody** form for the benthos samples being sent to **North South Consultants, Winnipeg**. Complete all of the required fields and then put the form in a sealed ziploc plastic bag in the cooler with the samples.

PACKAGING & SHIPPING SAMPLES:

1. Ensure the COC form is enclosed and then seal the cooler(s). **Label the cooler(s)** with the following address:

North South Consultants Inc.
83 Scurfield Blvd.
Winnipeg, MB, Canada
R3Y 1G4
Tel: 204-284-3366

2. Ensure **samples** are **sealed** securely. Wrap electrical tape around the edge of the lids to ensure a tight seal. **Pack** sampling containers upright in a cooler or action packer; ensure the cooler/action packer is well packed so the jars are not able to move around.
3. **Ship** the samples to North South when convenient. Coordinate shipping with the camp manager.
4. Send completed **COC forms** and **field data forms** to **Azimuth** Consulting Group Inc., attention the project coordinator – Maggie McConnell.

APPENDIX D

**ZOOPLANKTON TAXONOMIC IDENTIFICATION RAW
DATA, 2010**



Appendix D. Total abundance of taxa identified from a composite of two zooplankton tows (per replicate), Meadowbank study lakes, 2010.

Location/Sample ID	TPE-1	TPE-2	TPE-3	TPE-4	TPE-5	TPN-1	TPN-2	TPN-3	TPN-4	TPN-5	TPS-1	TPS-2	TPS-3	TPS-4	TPS-5
Date	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	20-Aug-10	20-Aug-10	20-Aug-10	20-Aug-10	20-Aug-10
Polychaeta larva		1													
Hydra															
DIPTERA															
Chironomidae larva (unid)															
CLADOCERA															
Daphniidae															
<i>Daphnia longiremis</i> Sars	8		8	24	8		12		8						
<i>Daphnia middendorffiana</i> Fischer	8	4		8			2	2	2	4		2	2	2	2
Bosminidae															
<i>Bosmina longirostris</i> (O.F. Muller)	4	4				8	16	4		4			8	4	8
Chydoridae															
<i>Chydorus</i> sp.															
Holopedidae															
<i>Holopedium gibberum</i> Zaddach	28	40	16	184	24	76	88	216	52	144	20	40	20	8	48
CLADOCERA TOTAL:	48	48	24	216	32	84	118	222	62	152	20	42	30	14	58
COPEPODA															
Calanoida															
Calanoida copepodite	44	48	64	208	40	24	28	40	32	28	10	16	16	20	24
Diaptomidae															
<i>Diaptomus ashlandi</i> Marsh															
<i>Diaptomus minutus</i> Lilljeborg	272	896	448	2272	496	144	176	68	32	368	160	176	96	272	112
<i>Diaptomus sicilis</i> S.A. Forbes	96	192	64	416	112	32	80	32	192	44	32	64	208	80	48
<i>Diaptomus probilifensis</i> Juday and Muttkowski	112	240	96	640	128										
<i>Diaptomus</i> spp. (unid. Females)	708	2576	966	8790	2056	696	944	536	992	392	214	666	992	796	808
Temoridae															
<i>Epischura lacustris</i> Forbes							4								
<i>Heterocope septentrionalis</i> Juday and Muttkowski	64	80	20	312	32	104	68	68	132	48	108	72	56	100	120
Cyclopoida															
Cyclopoid copepodite	128	96	272	608	128	220	304	190	120	128	48	60	80	80	60
Cyclopidae															
<i>Cyclops scutifer</i> Sars	1616	1296	1824	7456	1648	368	1056	240	832	256	112	112	64	96	256
Harpacticoida															
Harpacticoida (unid)													4		
COPEPODA TOTAL:	3040	5424	3754	20702	4640	1588	2660	1174	2332	1264	684	1166	1516	1444	1428
GRAND TOTAL:	3088	5473	3778	20918	4672	1672	2778	1396	2394	1416	704	1208	1546	1458	1486

Appendix D. Total abundance of taxa identified from a composite of two zooplankton tows (per replicate), Meadowbank study lakes, 2010.

Location/Sample ID	SP-1	SP-2	SP-3	SP-4	SP-5	WAL-1	WAL-2	WAL-3	WAL-4	WAL-5	PDL-1	PDL-2	PDL-3	PDL-4	PDL-5
Date	21-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	23-Aug-10	23-Aug-10	23-Aug-10	23-Aug-10	23-Aug-10	24-Aug-10	24-Aug-10	24-Aug-10	24-Aug-10	24-Aug-10
Polychaeta larva															
Hydra															
DIPTERA															
Chironomidae larva (unid)														1	
CLADOCERA															
Daphniidae															
<i>Daphnia longiremis</i> Sars		32	16		8	4	80	8		40					
<i>Daphnia middendorffiana</i> Fischer	24	12	4	4	16	16	112	56	48	64		16	24	14	8
Bosminidae															
<i>Bosmina longirostris</i> (O.F. Muller)	8	24	20	32	20	20	24	16	56	96	52	12	16	70	8
Chydoridae															
<i>Chydorus</i> sp.	4			4	8										
Holopedidae															
<i>Holopedium gibberum</i> Zaddach	120	250	92	28	192	28	266	72	96	88	68	304	144	72	300
CLADOCERA TOTAL:	156	318	132	68	244	68	482	152	200	288	120	332	184	156	316
COPEPODA															
Calanoida															
Calanoida copepodite	32	32	48	16	24	60	56	48	32	80	48	54	32	32	22
Diaptomidae															
<i>Diaptomus ashlandi</i> Marsh						4									
<i>Diaptomus minutus</i> Lilljeborg	704	224	672	128	624	1072	1120	1824	672	1888	160	208	160	48	80
<i>Diaptomus sicilis</i> S.A. Forbes	4	6	8	16	32	64	8	8	32	32			8	2	4
<i>Diaptomus probilifensis</i> Juday and Muttkowski	40	7	100	64	196	624	128	160	320	800	8	16	8	8	8
<i>Diaptomus</i> spp. (unid. Females)	1040	450	568	448	824	1748	2792	3128	1530	2350	122	410	112	144	172
Temoridae															
<i>Epischura lacustris</i> Forbes									8		72	34	52	68	40
<i>Heterocope septentrionalis</i> Juday and Muttkowski	20	36	12	12	12	28	120	40	80	72	72	72	120	46	36
Cyclopoida															
Cyclopoid copepodite	160	180	272	80	272	544	480	448	336	896	56	96	102	94	80
Cyclopidae															
<i>Cyclops scutifer</i> Sars	896	624	688	400	1376	1120	3104	1168	1728	2560	640	208	800	192	352
Harpacticoida															
Harpacticoida (unid)															
COPEPODA TOTAL:	2896	1559	2368	1164	3360	5264	7808	6824	4738	8678	1178	1098	1394	634	794
GRAND TOTAL:	3052	1877	2500	1232	3604	5332	8290	6976	4938	8966	1298	1430	1578	791	1110

Appendix D. Total abundance of taxa identified from a composite of two zooplankton tows (per replicate), Meadowbank study lakes, 2010.

Location/Sample ID Date	INUG-1 25-Aug-10	INUG-2 25-Aug-10	INUG-3 25-Aug-10	INUG-4 25-Aug-10	INUG-5 25-Aug-10	TE-1 27-Aug-10	TE-2 28-Aug-10	TE-3 27-Aug-10	TE-4 27-Aug-10	TE-5 27-Aug-10	TEFF-1 28-Aug-10	TEFF-2 28-Aug-10	TEFF-3 28-Aug-10	TEFF-4 28-Aug-10	TEFF-5 28-Aug-10
Polychaeta larva															
Hydra									1				1		
DIPTERA															
Chironomidae larva (unid)															
CLADOCERA															
Daphniidae															
<i>Daphnia longiremis</i> Sars						24	4	32	23	28	4				
<i>Daphnia middendorffiana</i> Fischer	100	104	252	16	228	5	8	16	16	20	10			4	8
Bosminidae															
<i>Bosmina longirostris</i> (O.F. Muller)	24	264	44	168	40	160	68	140	72	88	46	28	14	44	36
Chydoridae															
<i>Chydorus</i> sp.															
Holopedidae															
<i>Holopedium gibberum</i> Zaddach	312	248	220	48	320	80	112	44	240	64	16	24	8	36	192
CLADOCERA TOTAL:	436	616	516	232	588	269	192	232	351	200	76	52	22	84	236
COPEPODA															
Calanoida															
Calanoida copepodite	36	96	32	48	40	24	32	32	48	16	12	16	16	24	20
Diaptomidae															
<i>Diaptomus ashlandi</i> Marsh											10	12		4	16
<i>Diaptomus minutus</i> Lilljeborg	432	1920	1216	608	480	208	180	352	448	220	512	816	184	864	584
<i>Diaptomus sicilis</i> S.A. Forbes	12	12	8	20	20	8	36	12	32	28	6	4	4		4
<i>Diaptomus probilifensis</i> Juday and Muttkowski	20	20	12	24	24										
<i>Diaptomus</i> spp. (unid. Females)	794	2220	2080	992	792	552	496	480	1120	736	708	1360	344	1044	1902
Temoridae															
<i>Epischura lacustris</i> Forbes	60	80	72	36	40	24	32	28	1	12	4	16	16	4	
<i>Heterocope septentrionalis</i> Juday and Muttkowski	64	104	40	32	76	64	8	8	26	40	16	16	16	16	36
Cyclopoida															
Cyclopoid copepodite	112	640	192	304	288	96	128	128	368	62	64	64	68	160	96
Cyclopidae															
<i>Cyclops scutifer</i> Sars	864	5472	1984	1456	768	672	784	672	1040	1072	224	480	152	288	784
Harpacticoida															
Harpacticoida (unid)															
COPEPODA TOTAL:	2394	10564	5636	3520	2528	1648	1696	1712	3083	2186	1556	2784	800	2404	3442
GRAND TOTAL:	2830	11180	6152	3752	3116	1917	1888	1944	3435	2386	1632	2836	823	2488	3678

APPENDIX E

LABORATORY REPORTS, 2010



Type of Analysis: Zoopl BIOMASS

Project Number: AE-10-01 -- CREMP

Water Body: Nunavut mine lakes

No. of Samples: 25 (45 total)

Note: washed through a 63 micron mesh test sieve

Biomass Technicians: Nola Geard, Natalia Waldner

Data Entry: Nola Geard

QA/QC + Finalization: Ginger Gill

Location/Sample ID	TPE-1-B	TPE-2-B	TPE-3-B	TPE-4-B	TPE-5-B	TPN-1-B	TPN-2-B	TPN-3-B	TPN-4-B	TPN-5-B
Date	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10	19-Aug-10
DISH ID	N1	N2	N3	M1	M2	M3	M4	RAA1 1.00	RAA1 250	RAA1 500
Dish Wt (g)	0.786	0.813	0.809	0.805	0.804	0.833	0.804	0.792	0.802	0.792
Dish + Wet Wt (g)	0.986	1.227	1.028	1.619	0.992	1.240	0.994	1.369	1.169	0.867
Wet Wt (g)	0.200	0.414	0.219	0.814	0.188	0.407	0.190	0.577	0.367	0.075
Dish + Dry Wt (g)	0.798	0.839	0.822	0.847	0.815	0.847	0.838	0.810	0.841	0.795
Dry Wt (g)	0.012	0.026	0.013	0.042	0.011	0.014	0.034	0.018	0.039	0.003

Location/Sample ID	WAL-1-B	WAL-2-B	WAL-3-B	WAL-4-B	WAL-5-B	PDL-1-B	PDL-2-B	PDL-3-B	PDL-4-B	PDL-5-B
Date	23-Aug-10	23-Aug-10	23-Aug-10	23-Aug-10	23-Aug-10	24-Aug-10	24-Aug-10	24-Aug-10	24-Aug-10	24-Aug-10
DISH ID	RAA5 250	RAA5 500	RAB1 1.00	RAB1 250	RAB1 500	RAB2 1.00	RAB2 250	RAB2 500	BRF2 250	BRF2 500
Dish Wt (g)	0.820	0.806	0.789	0.811	0.809	0.804	0.809	0.815	0.816	0.813
Dish + Wet Wt (g)	1.336	1.734	1.412	1.408	1.391	0.944	1.019	1.050	0.940	1.040
Wet Wt (g)	0.516	0.928	0.623	0.597	0.582	0.140	0.210	0.235	0.124	0.227
Dish + Dry Wt (g)	0.860	0.855	0.835	0.852	0.845	0.812	0.818	0.841	0.822	0.823
Dry Wt (g)	0.040	0.049	0.046	0.041	0.036	0.008	0.009	0.026	0.006	0.010

Location/Sample ID	TEFF-1-B	TEFF-2-B	TEFF-3-B	TEFF-4-B	TEFF-5-B
Date	28-Aug-10	28-Aug-10	28-Aug-10	28-Aug-10	28-Aug-10
DISH ID	I1	I2	I3	I4	J1
Dish Wt (g)	0.795	0.803	0.819	0.809	0.790
Dish + Wet Wt (g)	1.225	1.132	1.161	1.146	1.285
Wet Wt (g)	0.430	0.329	0.342	0.337	0.495
Dish + Dry Wt (g)	0.811	0.817	0.828	0.820	0.812
Dry Wt (g)	0.016	0.014	0.009	0.011	0.022

Type of Analysis: Zoopl BIOMASS

Project Number: AE-10-01 -- CREMP

Water Body: Nunavut mine lakes

No. of Samples: 25 (45 total)

Note: washed through a 63 micron mesh test sieve

Biomass Technicians: Nola Geard, Natalia Waldner

Data Entry: Nola Geard

QA/QC + Finalization: Ginger Gill

Location/Sample ID	TPS-1-B	TPS-2-B	TPS-3-B	TPS-4-B	TPS-5-B	SP-1-B	SP-2-B	SP-3-B	SP-4-B	SP-5-B
Date	20-Aug-10	20-Aug-10	20-Aug-10	20-Aug-10	20-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10
DISH ID	RAA2 1.00	RAA2 250	RAA2 500	RAA3 1.00	RAA3 250	RAA3 500	RAA4 1.00	RAA4 250	RAA4 500	RAA5 1.00
Dish Wt (g)	0.788	0.813	0.820	0.815	0.811	0.818	0.823	0.812	0.810	0.825
Dish + Wet Wt (g)	0.961	1.051	1.060	1.035	1.182	1.332	1.740	1.190	1.178	1.230
Wet Wt (g)	0.173	0.238	0.240	0.220	0.371	0.514	0.917	0.378	0.368	0.405
Dish + Dry Wt (g)	0.819	0.837	0.838	0.841	0.828	0.842	0.854	0.829	0.834	0.853
Dry Wt (g)	0.031	0.024	0.018	0.026	0.017	0.024	0.031	0.017	0.024	0.028

Location/Sample ID	INUG-1-B	INUG-2-B	INUG-3-B	INUG-4-B	INUG-5-B	TE-1-B	TE-2-B	TE-3-B	TE-4-B	TE-5-B
Date	25-Aug-10	25-Aug-10	25-Aug-10	25-Aug-10	25-Aug-10	27-Aug-10	28-Aug-10	27-Aug-10	27-Aug-10	27-Aug-10
DISH ID	G1	G2	G3	G4	G5	H1	H2	H3	H4	H5
Dish Wt (g)	0.810	0.831	0.828	0.820	0.817	0.812	0.819	0.797	0.798	0.808
Dish + Wet Wt (g)	1.753	1.691	2.222	1.365	2.370	1.149	1.059	0.966	1.667	1.545
Wet Wt (g)	0.943	0.860	1.394	0.545	1.553	0.337	0.240	0.169	0.869	0.737
Dish + Dry Wt (g)	0.862	0.859	0.880	0.839	0.868	0.832	0.832	0.807	0.819	0.832
Dry Wt (g)	0.052	0.028	0.052	0.019	0.051	0.020	0.013	0.010	0.021	0.024



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: GARY MANN

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 12-FEB-10 17:06 (MT)

Version: FINAL

Lab Work Order #: L857894

Date Received: 28-JAN-10

Project P.O. #: NOT SUBMITTED

Job Reference: MEADOWBANK MINE WINTER AEMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments:

Natasha Markovic-Mirovic
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L857894-1	L857894-2	L857894-3	L857894-4	L857894-5
		15-JAN-10 13:30 SP-15-S	15-JAN-10 15:00 SP-16-S	18-JAN-10 14:15 SP-17-S	18-JAN-10 12:10 TPE-15-S	18-JAN-10 11:30 TPE-16-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	25.5	27.2	24.9	18.2	21.2
	Hardness (as CaCO3) (mg/L)	10.1	10.8	10.0	6.6	7.9
	pH (pH)	7.31	7.33	7.30	6.52	7.18
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	18	18	17	16	16
	Turbidity (NTU)	0.76	1.0	1.05	1.19	1.84
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	7.1	8.7	7.8	5.0	5.8
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	7.1	8.7	7.8	5.0	5.8
	Ammonia as N (mg/L)	0.027	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.069	0.075	0.071	0.068	0.081
	Nitrate (as N) (mg/L)	0.0054	0.0111	0.0081	0.0096	0.0145
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.119	0.134	0.170	0.068	0.154
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	0.0025	0.0021	0.0022	0.0027
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.18	2.42	2.24	1.66	1.89
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.67	1.84	1.58	1.40	1.48
	Total Organic Carbon (mg/L)	1.68	1.73	1.72	1.75	1.53
Total Metals	Aluminum (Al)-Total (mg/L)	0.0320	0.0632	0.0514	0.0814	0.113
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.49	2.69	2.55	1.52	1.73
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.034	0.060	0.053	0.065	0.102
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.87	1.00	0.92	0.70	0.79
	Manganese (Mn)-Total (mg/L)	0.00095	0.00130	0.00118	0.00142	0.00187
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L857894-6	L857894-7	L857894-8	L857894-9	L857894-10
		18-JAN-10 10:50 TPE-17-S	19-JAN-10 10:10 TPN-15-S	19-JAN-10 09:10 TPN-16-S	19-JAN-10 10:50 TPN-17-S	16-JAN-10 13:00 TE-16-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	21.6	18.3	21.6	19.1	29.4
	Hardness (as CaCO3) (mg/L)	8.0	6.6	7.5	6.7	11.6
	pH (pH)	7.20	6.75	7.20	6.72	7.33
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	19	16	18	<10	23
	Turbidity (NTU)	2.38	0.31	0.33	0.34	0.85
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	5.8	5.3	6.0	6.0	9.2
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	5.8	5.3	6.0	6.0	9.2
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.51	0.54	0.66	1.42	0.69
	Fluoride (F) (mg/L)	0.084	0.048	0.059	0.053	0.062
	Nitrate (as N) (mg/L)	0.0187	0.0052	0.0101	<0.0050	0.0156
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.125	0.120	0.119	0.104	0.111
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0032	0.0024	<0.0020	<0.0020	0.0022
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.92	1.72	2.09	1.83	2.72
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.53	1.51	1.62	1.50	1.81
	Total Organic Carbon (mg/L)	1.51	1.57	1.77	1.54	1.80
Total Metals	Aluminum (Al)-Total (mg/L)	0.135	0.0094	0.0102	0.0081	0.0571
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	0.000043	<0.000017
	Calcium (Ca)-Total (mg/L)	1.88	1.50	1.75	1.51	2.80
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.143	<0.030	<0.030	<0.030	0.053
	Lead (Pb)-Total (mg/L)	0.00070	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.85	0.69	0.80	0.70	1.05
	Manganese (Mn)-Total (mg/L)	0.00252	0.00051	0.00061	0.00052	0.00121
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L857894-11	L857894-12	L857894-13	L857894-14	L857894-15
		16-JAN-10 10:40 TE-17-S	16-JAN-10 10:45 TE-17-INT	19-JAN-10 13:30 TPS-9-S	19-JAN-10 13:35 TPS-9-INT	19-JAN-10 13:40 TPS-9-D
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	28.3	30.2	19.1	17.3	15.9
	Hardness (as CaCO ₃) (mg/L)	11.4	12.0	6.4	5.7	5.5
	pH (pH)	7.32	7.35	6.73	6.53	6.69
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	21	17	18	20	12
	Turbidity (NTU)	0.80	0.88	0.41	0.36	0.30
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO ₃) (mg/L)	8.7	9.1	5.8	4.8	4.9
	Alkalinity, Carbonate (as CaCO ₃) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO ₃) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO ₃) (mg/L)	8.7	9.1	5.8	4.8	4.9
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	0.077
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.65	0.70	0.56	<0.50	<0.50
	Fluoride (F) (mg/L)	0.057	0.064	0.054	0.047	0.050
	Nitrate (as N) (mg/L)	0.0135	0.0150	0.0062	0.0649	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.111	0.125	0.120	0.119	0.124
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0022	0.0025	<0.0020	0.0023	<0.0020
	Silicate (as SiO ₂) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO ₄) (mg/L)	2.66	2.81	1.72	1.70	1.42
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.75	4.29	1.45	1.68	1.39
	Total Organic Carbon (mg/L)	1.80	1.95 ^{RRV}	1.57	1.45	1.36
Total Metals	Aluminum (Al)-Total (mg/L)	0.0524	0.0546	0.0066	0.0094	0.0075
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.74	2.96	1.48	1.26	1.22
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.048	0.051	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	1.01	1.09	0.69	0.59	0.56
	Manganese (Mn)-Total (mg/L)	0.00122	0.00187	0.00044	0.00058	0.00051
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L857894-16	L857894-17	L857894-18	L857894-19	L857894-20
		19-JAN-10 14:40 TPS-10-S	19-JAN-10 14:45 TPS-10-INT	19-JAN-10 14:50 TPS-10-D	19-JAN-10 12:30 TPS-11-S	JAN. DUP-1
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	17.5	20.9	15.6	18.2	24.8
	Hardness (as CaCO ₃) (mg/L)	6.0	5.9	5.3	6.5	10.3
	pH (pH)	6.68	6.72	6.69	6.70	7.31
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	15	15	12	16	16
	Turbidity (NTU)	0.24	0.19	0.26	0.17	0.73
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO ₃) (mg/L)	4.9	5.0	5.3	5.1	7.6
	Alkalinity, Carbonate (as CaCO ₃) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO ₃) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO ₃) (mg/L)	4.9	5.0	5.3	5.1	7.6
	Ammonia as N (mg/L)	0.022	0.052	0.072	0.053	0.091
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.51	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.051	0.050	0.046	0.065	0.062
	Nitrate (as N) (mg/L)	<0.0050	0.0139	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.094	0.145	0.107	0.086	0.092
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	0.0016	0.0015
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	0.0020
	Silicate (as SiO ₂) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO ₄) (mg/L)	1.58	1.52	1.36	1.68	2.24
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.59	1.75	1.37	1.53	1.67
	Total Organic Carbon (mg/L)	1.46	1.73	1.37	1.51	1.68
Total Metals	Aluminum (Al)-Total (mg/L)	0.0059	0.0096	0.0067	0.0061	0.0315
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.34	1.29	1.19	1.39	2.48
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	0.036
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.62	0.59	0.56	0.65	0.87
	Manganese (Mn)-Total (mg/L)	0.00041	0.00058	0.00064	0.00042	0.00095
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L857894-21	L857894-22	L857894-23		
		JAN. DUP-2	17-JAN-10 13:35 JAN. EB-1	20-JAN-10 08:00 JAN. EB-2		
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	25.0	<2.0	<2.0		
	Hardness (as CaCO3) (mg/L)	10.2	<1.1	<1.1		
	pH (pH)	7.29	5.76	6.16		
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0		
	Total Dissolved Solids (mg/L)	21	<10	<10		
	Turbidity (NTU)	1.07				
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	7.6	<2.0	<2.0		
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		
	Alkalinity, Total (as CaCO3) (mg/L)	7.6	<2.0	<2.0		
	Ammonia as N (mg/L)	0.023	<0.020	<0.020		
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050		
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50		
	Fluoride (F) (mg/L)	0.066	<0.020	<0.020		
	Nitrate (as N) (mg/L)	0.0080	<0.0050	0.0087		
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010		
	Total Kjeldahl Nitrogen (mg/L)	0.093	<0.050	<0.050		
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010		
	Total Phosphate as P (mg/L)	0.0023	<0.0020	0.0034		
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0		
	Sulfate (SO4) (mg/L)	2.22	<0.50	<0.50		
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.65	0.51 RRV	0.86 RRV		
	Total Organic Carbon (mg/L)	1.67	0.54 RRV	<0.50		
Total Metals	Aluminum (Al)-Total (mg/L)	0.0548	<0.0050	<0.0050		
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020		
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10		
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017		
	Calcium (Ca)-Total (mg/L)	2.52	<0.10	<0.10		
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030		
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Iron (Fe)-Total (mg/L)	0.052	<0.030	<0.030		
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	0.00082		
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050		
	Magnesium (Mg)-Total (mg/L)	0.91	<0.10	<0.10		
	Manganese (Mn)-Total (mg/L)	0.00123	<0.00030	<0.00030		
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020		

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L857894-1	L857894-2	L857894-3	L857894-4	L857894-5
		15-JAN-10 13:30 SP-15-S	15-JAN-10 15:00 SP-16-S	18-JAN-10 14:15 SP-17-S	18-JAN-10 12:10 TPE-15-S	18-JAN-10 11:30 TPE-16-S
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	0.0138	0.0055	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.58	2.73	2.51	1.53	1.84
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.89	0.98	0.90	0.68	0.80
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	0.00049	0.00059	0.00030	0.00062
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.304	0.322	0.206	0.200	0.211

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L857894-6	L857894-7	L857894-8	L857894-9	L857894-10
		18-JAN-10 10:50 TPE-17-S	19-JAN-10 10:10 TPN-15-S	19-JAN-10 09:10 TPN-16-S	19-JAN-10 10:50 TPN-17-S	16-JAN-10 13:00 TE-16-S
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0172	<0.0050	<0.0050	<0.0050	0.0091
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.87	1.51	1.74	1.55	2.91
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.81	0.70	0.77	0.70	1.05
	Manganese (Mn)-Dissolved (mg/L)	0.00053	<0.00030	0.00037	<0.00030	0.00032
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.301	0.108	0.185	0.121	0.308

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L857894-11	L857894-12	L857894-13	L857894-14	L857894-15
		16-JAN-10 10:40 TE-17-S	16-JAN-10 10:45 TE-17-INT	19-JAN-10 13:30 TPS-9-S	19-JAN-10 13:35 TPS-9-INT	19-JAN-10 13:40 TPS-9-D
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	0.000021	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.86	3.02	1.46	1.30	1.25
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	0.0011	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	1.03	1.08	0.67	0.59	0.58
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	0.00033	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	0.0078	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.315	0.301	0.164	0.129	0.123

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L857894-16	L857894-17	L857894-18	L857894-19	L857894-20
		19-JAN-10 14:40 TPS-10-S	19-JAN-10 14:45 TPS-10-INT	19-JAN-10 14:50 TPS-10-D	19-JAN-10 12:30 TPS-11-S	JAN. DUP-1
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	0.0052	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.37	1.36	1.21	1.46	2.64
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.63	0.62	0.55	0.68	0.90
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	0.0060	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.140	0.147	0.137	0.143	0.350

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L857894-21	L857894-22	L857894-23		
Grouping Analyte						
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0		
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020		
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0		
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020		
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010		
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020		
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050		
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0053	<0.0050	<0.0050		
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020		
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10		
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017		
	Calcium (Ca)-Dissolved (mg/L)	2.57	<0.10	<0.10		
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030		
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030		
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050		
	Magnesium (Mg)-Dissolved (mg/L)	0.93	<0.10	<0.10		
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030		
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020		
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0		
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020		
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0		
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020		
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010		
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020		
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050		
Plant Pigments	Chlorophyll a (ug/L)	0.220				

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L857894-1 15-JAN-10 13:30 SP-15-S	L857894-2 15-JAN-10 15:00 SP-16-S	L857894-3 18-JAN-10 14:15 SP-17-S	L857894-4 18-JAN-10 12:10 TPE-15-S	L857894-5 18-JAN-10 11:30 TPE-16-S
Grouping	Analyte					
WATER						

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L857894-6	L857894-7	L857894-8	L857894-9	L857894-10
		Description					
		Sampled Date	18-JAN-10	19-JAN-10	19-JAN-10	19-JAN-10	16-JAN-10
		Sampled Time	10:50	10:10	09:10	10:50	13:00
		Client ID	TPE-17-S	TPN-15-S	TPN-16-S	TPN-17-S	TE-16-S
Grouping	Analyte						
WATER							

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L857894-11	L857894-12	L857894-13	L857894-14	L857894-15
		Description					
		Sampled Date	16-JAN-10	16-JAN-10	19-JAN-10	19-JAN-10	19-JAN-10
		Sampled Time	10:40	10:45	13:30	13:35	13:40
		Client ID	TE-17-S	TE-17-INT	TPS-9-S	TPS-9-INT	TPS-9-D
Grouping	Analyte						
WATER							

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L857894-16 19-JAN-10 14:40 TPS-10-S	L857894-17 19-JAN-10 14:45 TPS-10-INT	L857894-18 19-JAN-10 14:50 TPS-10-D	L857894-19 19-JAN-10 12:30 TPS-11-S	L857894-20 JAN. DUP-1
Grouping	Analyte					
WATER						

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L857894-21 JAN. DUP-2	L857894-22 17-JAN-10 13:35 JAN. EB-1	L857894-23 20-JAN-10 08:00 JAN. EB-2		
Grouping	Analyte						
WATER							

* 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**
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite 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". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate 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". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
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-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)".			
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)".			
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
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 is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
HG-DIS-CCME-CVAFS-VA	Water	Diss. Mercury in Water by CVAFS (CCME)	EPA 3005A/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			

Reference Information

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-CCME-CVAFS-VA Water Total Mercury in Water by CVAFS (CCME) 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-DIS-CCME-ICP-VA Water Diss. Metals in Water by ICPOES (CCME) 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-ICP-VA Water Total Metals in Water by ICPOES (CCME) 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH3-SIE-VA Water Ammonia by SIE APHA 4500 D. - NH3 NITROGEN (AMMONIA)

This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

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

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

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

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

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

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

Reference Information

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
SILICATE-COL-VA	Water	Silicate by Colourimetric analysis	APHA 4500-SiO2 D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TKN-SIE-VA	Water	Total Kjeldahl Nitrogen 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 by sample digestion at 367 celcius with analysis 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 LABORATORY GROUP - 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.

Short Holding Time

Rush Processing

ALS
ANALYTICAL
Environmental Division



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

COC #

Page 1 of 3

Report to:		Report Format / Distribution		Service Requested:	
Company: Azimuth Consulting Group Inc.		☒ Standard ☐ Other		☒ Regular Service (Default)	
Contact: Gary Mann / Maggie McConnell		☒ PDF ☐ Excel ☐ Fax		☐ Rush Service (2-3 Days)	
Address: Vancouver		Email 1: rvanengen@agnico-eagle.com		☐ Priority Service (1 Day or ASAP)	
Email 2: gmann@azimuthgroup.ca, mmccconnell@azimuthgroup.ca		Indicate Bottles: Filtered / Preserved (F/P) ->		☐ Emergency Service (<1 Day / Weekend) - Contact ALS	
Phone: 604-730-1220 Fax:		Client / Project Information:		Analysis Request	
Invoice To: ☒ Same as Report		Job #: Meadowbank Mine Winter AEMP			
Company:		PO/A/E:			
Contact:		Legal Site Description:			
Address:		Quote #: ALSEC09-077			
Sample:		ALS Contact: Natasha MM			
Phone:		Sampler (Initials):			
Fax: 6857894		Date		Time	
Lab Work Order # (lab use only)		dd-mm-yy		hh:mm	
Sample Identification (This description will appear on the report)				Sample Type (Select from drop-down list)	
SP-15-S		15-01-2010		13:30 Water	
SP-16-S		15-01-2010		15:00 Water	
SP-17-S		18-01-2010		14:15 Water	
TPE-15-S		18-01-2010		12:10 Water	
TPE-16-S		18-01-2010		11:30 Water	
TPE-17-S		18-01-2010		10:50 Water	
TPN-15-S		19-01-2010		10:10 Water	
TPN-16-S		19-01-2010		9:10 Water	
TPN-17-S		19-01-2010		10:50 Water	
TE-16-S		16-01-2010		13:00 Water	
Guidelines / Regulations		Special Instructions / Hazardous Details			
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.					
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.					
Relinquished By: Martin Theriault		Received By:		Date & Time: 2010/01/22	
Relinquished By:		Received By:		Date & Time: 2010/01/22	
Temperature		Sample Condition (lab use only)		Samples received in Good Condition? Y/N (if no provided details)	

2010/01/22

Short Holding Time

Rush Processing

ALS Labs

Environmental Division



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

COC #

Page 2 of 3

Report to:				Report Format / Distribution				Service Requested:			
Company: Azimut Consulting Group Inc.				☒ Standard ☐ Other				☒ Regular Service (Default)			
Contact: Gary Mann / Maggie McConnell				☒ PDF ☒ Excel ☐ Fax				☐ Rush Service (2-3 Days)			
Address: Vancouver				Email 1: ryanen@agnico-eagle.com				☐ Priority Service (1 Day or ASAP)			
Phone: 604-730-1220 Fax:				Email 2: gmann@azimutgroup.ca, mmccconnell@azimutgroup.ca				☐ Emergency Service (<1 Day / Weekend) - Contact ALS			
Invoice To: ☒ Same as Report				Client / Project Information:				Analysis Request			
Company:				Job #: Meadowbank Mine Winter AEMP							
Contact:				PO/A/E:							
Address:				Legal Site Description:							
Sample:				Quote #: ALSEC09-077							
Phone:				Contact: ALS Natasha MM							
Lab Work Order # (lab use only)				Sampler (initials):							
Sample Identification (This description will appear on the report)				Date dd-mm-yy		Time hh:mm		Sample Type (Select from drop-down list)			
TE-17-S				16-01-2010		10:40		Water		X	
TE-17-INT				16-01-2010		10:45		Water		X	
TPS-9-S				19-01-2010		13:30		Water		X	
TPS-9-INT				19-01-2010		13:35		Water		X	
TPS-9-D				19-01-2010		13:40		Water		X	
TPS-10-S				19-01-2010		14:40		Water		X	
TPS-10-INT				19-01-2010		14:45		Water		X	
TPS-10-D				19-01-2010		14:50		Water		X	
TPS-11-S				19-01-2010		12:30		Water		X	
Jan. Dup-1								Water		X	
Guidelines / Regulations											
Special Instructions / Hazardous Details											
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.											
Reinquired				By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.				Temperature			
By: Martin Theriault				Date & Time: January 21st				Samples Received in Good Condition Y / N (if no provided details)			
Reinquired				By: [Signature]				Date & Time: [Signature]			

10/1/20
Apr

Short Holding Time

COC #

Rush Processing

Page 3 of 3

[illegible]

0/1/28
20m



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: MAGGIE McCONNELL

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 31-MAR-10 17:23 (MT)

Version: FINAL

Lab Work Order #: L867686

Date Received: 09-MAR-10

Project P.O. #: NOT SUBMITTED

Job Reference: MEADOWBANK MINE WATER AEMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments:

23-MAR-10: ..

Natasha Markovic-Mirovic
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L867686-1	L867686-2	L867686-3	L867686-4	L867686-5
		26-FEB-10 11:00 SP-18-S	24-FEB-10 15:30 TPM-18-S	25-FEB-10 16:00 TPE-18-S	26-FEB-10 14:30 TE-18-S	26-FEB-10 15:00 TE-18-INT
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	27.0	18.4	21.7	28.1	27.0
	Hardness (as CaCO3) (mg/L)	10.4	6.5	8.2	11.0	10.5
	pH (pH)	6.67	8.18	6.76	6.75	6.80
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	19	11	14	17	16
	Turbidity (NTU)	1.74	0.19	1.92	0.65	0.67
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	7.8	5.0	6.6	8.4	7.9
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	7.8	5.0	6.6	8.4	7.9
	Ammonia as N (mg/L)	<0.020	0.031	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.68	0.53	0.63	0.72	0.73
	Fluoride (F) (mg/L)	0.079	0.061	0.075	0.074	0.071
	Nitrate (as N) (mg/L)	0.0223	0.0131	0.0196	0.0127	0.0086
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.100	0.101	0.083	0.152	0.186
	Ortho Phosphate as P (mg/L)	0.0084	<0.0010	<0.0010	<0.0010	0.0022
	Total Phosphate as P (mg/L)	0.0433	0.0136	0.0024	<0.0020	0.0047
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.36	1.72	1.92	2.75	2.72
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.47	1.34	1.42	1.77	1.86
	Total Organic Carbon (mg/L)	1.58	1.47	1.54	1.78	2.29
Total Metals	Aluminum (Al)-Total (mg/L)	0.109	0.0128	0.125	0.0372	0.0412
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.51	1.54	1.87	2.72	2.62
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	0.0013	<0.0010	<0.0010	<0.0010	0.0011
	Iron (Fe)-Total (mg/L)	0.100	<0.030	0.113	0.036	0.053
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L867686-6	L867686-7	L867686-8	L867686-9	L867686-10
		26-FEB-10 15:30 TE-18-D	24-FEB-10 17:00 TPS-12-S	24-FEB-10 17:30 TPS-12-INT	24-FEB-10 18:00 TPS-12-D	TRAVEL BLANK
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	25.9	17.9	16.7	16.8	<2.0
	Hardness (as CaCO3) (mg/L)	10.1	6.6	6.1	6.3	<1.1
	pH (pH)	6.82	7.97	7.77	7.66	5.89
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	17	<10	12	11	<10
	Turbidity (NTU)	0.40	0.20	0.32	0.19	<0.10
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	7.5	4.9	4.7	4.8	<2.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	7.5	4.9	4.7	4.8	<2.0
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.69	0.53	0.52	0.50	<0.50
	Fluoride (F) (mg/L)	0.070	0.062	0.059	0.059	<0.020
	Nitrate (as N) (mg/L)	0.0058	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.147	0.085	0.092	0.075	
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	0.0011	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.64	1.64	1.52	1.55	<0.50
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.81	1.62	1.70	1.62	
	Total Organic Carbon (mg/L)	1.90	1.73	2.02	1.64	<0.5
Total Metals	Aluminum (Al)-Total (mg/L)	0.0179	<0.010	<0.0050	0.0083	<0.0050
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.44	1.48	1.37	1.42	<0.10
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	0.0018	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	0.00061	<0.00050	<0.00050	<0.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L867686-11 FEB-DUP-1	L867686-12 FEB-EB-1		
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	26.0	<2.0			
	Hardness (as CaCO3) (mg/L)	10.4	<1.1			
	pH (pH)	6.29	5.70			
	Total Suspended Solids (mg/L)	<1.0	<1.0			
	Total Dissolved Solids (mg/L)	17	<10			
	Turbidity (NTU)	1.57				
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	7.9	<2.0			
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Total (as CaCO3) (mg/L)	7.9	<2.0			
	Ammonia as N (mg/L)	<0.020	<0.020			
	Bromide (Br) (mg/L)	<0.050	<0.050			
	Chloride (Cl) (mg/L)	0.69	<0.50			
	Fluoride (F) (mg/L)	0.080	<0.020			
	Nitrate (as N) (mg/L)	0.0219	<0.0050			
	Nitrite (as N) (mg/L)	<0.0010	<0.0010			
	Total Kjeldahl Nitrogen (mg/L)	0.084	<0.050			
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010			
	Total Phosphate as P (mg/L)	0.0026	<0.0020			
	Silicate (as SiO2) (mg/L)	<1.0	<1.0			
	Sulfate (SO4) (mg/L)	2.37	<0.50			
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.71	<0.5			
	Total Organic Carbon (mg/L)	1.75	<0.5			
Total Metals	Aluminum (Al)-Total (mg/L)	0.111	<0.0050			
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050			
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050			
	Barium (Ba)-Total (mg/L)	<0.020	<0.020			
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010			
	Boron (B)-Total (mg/L)	<0.10	<0.10			
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017			
	Calcium (Ca)-Total (mg/L)	2.52	<0.10			
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010			
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030			
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010			
	Iron (Fe)-Total (mg/L)	0.103	<0.030			
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050			

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L867686-1	L867686-2	L867686-3	L867686-4	L867686-5
		26-FEB-10 11:00 SP-18-S	24-FEB-10 15:30 TPM-18-S	25-FEB-10 16:00 TPE-18-S	26-FEB-10 14:30 TE-18-S	26-FEB-10 15:00 TE-18-INT
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	1.01	0.68	0.83	1.00	0.99
	Manganese (Mn)-Total (mg/L)	0.00166	0.00056	0.00174	0.00087	0.00129
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0066	<0.0050	0.0098	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.56	1.52	1.94	2.75	2.61
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.98	0.66	0.82	1.01	0.97
	Manganese (Mn)-Dissolved (mg/L)	0.00034	0.00034	0.00040	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	0.000013
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L867686-6	L867686-7	L867686-8	L867686-9	L867686-10
		26-FEB-10 15:30 TE-18-D	24-FEB-10 17:00 TPS-12-S	24-FEB-10 17:30 TPS-12-INT	24-FEB-10 18:00 TPS-12-D	TRAVEL BLANK
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.93	0.67	0.61	0.63	<0.10
	Manganese (Mn)-Total (mg/L)	0.00079	0.00039	0.00031	0.00061	<0.00030
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	0.0058	<0.0050	
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	
	Calcium (Ca)-Dissolved (mg/L)	2.51	1.53	1.41	1.44	
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	0.00061	<0.00050	
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	
	Magnesium (Mg)-Dissolved (mg/L)	0.94	0.68	0.62	0.65	
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	0.00044	<0.00030	
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L867686-11 FEB-DUP-1	L867686-12 FEB-EB-1		
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050			
	Magnesium (Mg)-Total (mg/L)	1.00	<0.10			
	Manganese (Mn)-Total (mg/L)	0.00166	<0.00030			
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010			
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010			
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010			
	Potassium (K)-Total (mg/L)	<2.0	<2.0			
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010			
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020			
	Sodium (Na)-Total (mg/L)	<2.0	<2.0			
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020			
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050			
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010			
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020			
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010			
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0057	<0.0050			
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050			
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050			
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020			
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010			
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10			
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017			
	Calcium (Ca)-Dissolved (mg/L)	2.57	<0.10			
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010			
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030			
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010			
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030			
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050			
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050			
	Magnesium (Mg)-Dissolved (mg/L)	0.98	<0.10			
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030			
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010			
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010			
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010			
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0			
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010			

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L867686-1	L867686-2	L867686-3	L867686-4	L867686-5
		26-FEB-10 11:00 SP-18-S	24-FEB-10 15:30 TPM-18-S	25-FEB-10 16:00 TPE-18-S	26-FEB-10 14:30 TE-18-S	26-FEB-10 15:00 TE-18-INT
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.201	0.136	0.252	0.295	0.470

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L867686-6	L867686-7	L867686-8	L867686-9	L867686-10
		26-FEB-10 15:30 TE-18-D	24-FEB-10 17:00 TPS-12-S	24-FEB-10 17:30 TPS-12-INT	24-FEB-10 18:00 TPS-12-D	TRAVEL BLANK
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	
Plant Pigments	Chlorophyll a (ug/L)	0.320	0.118	0.118	0.118	

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020			
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0			
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020			
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050			
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010			
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020			
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010			
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050			
Plant Pigments	Chlorophyll a (ug/L)	0.204				

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite 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". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate 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". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
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".			
C-DIS-ORG-LOW-CL	Water	Dissolved Organic Carbon	APHA 5310 C-Instrumental
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
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 is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
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-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/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).			

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-ICP-VA Water Total Metals in Water by ICPOES (CCME) 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH3-SIE-VA Water Ammonia by SIE APHA 4500 D. - NH3 NITROGEN (AMMONIA)

This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

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

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

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

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

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

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

SILICATE-COL-VA Water Silicate by Colourimetric analysis APHA 4500-SIO2 D.

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

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

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

TKN-SIE-VA Water Total Kjeldahl Nitrogen 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 by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

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

Reference Information

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

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

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

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

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

** 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
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - 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.

Short Holding Time

Rush Processing

Environmental Division (ALS)

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

COC #

Page 1 of 2

Report to:				Report Format / Distribution				Service Requested:			
Company: Azimuth Consulting Group Inc.				☒ Standard ☐ Other				☒ Regular Service (Default)			
Contact: Gary Mann / Maggie McConnell				☒ PDF ☒ Excel ☐ Fax				☐ Rush Service (2-3 Days)			
Address: Vancouver				Email 1: Vmanngen@agrica-eagle.com				☐ Priority Service (1 Day or ASAP)			
Phone: 604-730-1220 Fax:				Email 2: gmann@azimuthgroup.ca, mmccconnell@azimuthgroup.ca				☐ Emergency Service (<1 Day / Weekend) - Contact ALS			
Invoice To: ☒ Same as Report				Indicate Bottles Filled / Preserved (F/P) ->				Analysis Request			
Company:				Client / Project Information:							
Contact:				Job #:							
Address:				PO/A/E:							
Sample:				Legal Site Description:							
Phone:				Quote #: ALS009-077							
Lab Work Order # (lab use only)				ALS Contact: Natasha MM				Sampler (initials)			
Sample Identification (This description will appear on the report)				Date				Time			
				dd-mm-yy				hh:mm			
								(Select from drop-down list)			
SP-18-S				26-02-2010				11:00			
TPN-18-S				24-02-2010				15:30			
TPE-18-S				25-02-2010				16:00			
TE-18-S				26-02-2010				14:30			
TE-18-INT				26-02-2010				15:00			
TE-18-D				26-02-2010				15:30			
TPS-12-S				24-02-2010				17:00			
TPS-12-INT				24-02-2010				17:30			
TPS-12-D				24-02-2010				18:00			
Traveling Blanks								Water			
Guidelines / Regulations								Special Instructions / Hazardous Details			
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.											
Relinquished By:		Date & Time:		Received By:		Date & Time:		Temperature		Sample Condition (lab use only)	
Martin Theriault		01-03-2010		HD		21:17		7		Samples Received in Good Condition? Y / N (if no provided details)	

[illegible]



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: GARY MANN

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 21-APR-10 09:29 (MT)

Version: FINAL

Lab Work Order #: L874806

Date Received: 06-APR-10

Project P.O. #: NOT SUBMITTED

Job Reference: MEADOWBANK MINE WATER AEMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments:


Natasha Markovic-Mirovic
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L874806-1	L874806-2	L874806-3	L874806-4	L874806-5
		20-MAR-10 15:20 TPN-19-S	20-MAR-10 14:30 TPN-20-S	20-MAR-10 17:50 TPN-21-S	21-MAR-10 15:30 TE-19-S	21-MAR-10 15:30 TE-19-INT
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	20.7	19.3	19.0	29.4	24.8
	Hardness (as CaCO3) (mg/L)	7.6	7.2	7.1	11.9	9.8
	pH (pH)	6.51	6.56	6.55	7.05	7.07
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	1.1	<1.0
	Total Dissolved Solids (mg/L)	16	12	<10	17	18
	Turbidity (NTU)	0.20	0.17	0.19	0.43	0.33
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	5.5	5.3	5.3	8.9	7.5
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	5.5	5.3	5.3	8.9	7.5
	Ammonia-N (mg/L)	<0.020	<0.020	<0.020	<0.020	0.069
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.62	0.59	0.59	0.78	0.65
	Fluoride (F) (mg/L)	0.077	0.074	0.073	0.086	0.072
	Nitrate (as N) (mg/L)	0.0122	0.0075	0.0067	0.0117	0.0094
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.123	0.127	0.111	0.187	0.184
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	0.0026	0.0024
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.99	1.80	1.74	2.78	2.28
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.56	1.57	1.55	1.87	1.61
	Total Organic Carbon (mg/L)	1.61	1.60	1.67	1.92	1.74
Total Metals	Aluminum (Al)-Total (mg/L)	0.0119	0.0087	0.0084	0.0321	0.0221
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.66	1.58	1.58	2.88	2.40
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.00058

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L874806-6	L874806-7	L874806-8	L874806-9	L874806-10
		21-MAR-10 15:30 TE-19-D	21-MAR-10 14:30 TE-20-S	21-MAR-10 14:30 TE-20-INT	21-MAR-10 14:30 TE-20-D	21-MAR-10 16:00 TE-21-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	23.2	27.3	27.1	26.9	26.5
	Hardness (as CaCO3) (mg/L)	9.1	10.7	10.6	10.6	11.0
	pH (pH)	7.07	7.03	7.05	7.06	6.62
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	14	22	21	21	17
	Turbidity (NTU)	0.25	0.46	0.49	0.44	0.53
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	7.0	8.2	8.1	8.0	8.1
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	7.0	8.2	8.1	8.0	8.1
	Ammonia-N (mg/L)	0.022	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.58	0.75	0.76	0.74	0.70
	Fluoride (F) (mg/L)	0.067	0.080	0.079	0.079	0.079
	Nitrate (as N) (mg/L)	0.0080	0.0133	0.0095	0.0108	0.0184
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.115	0.249	0.133	0.112	0.186
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	0.0025	<0.0010
	Total Phosphate as P (mg/L)	0.0024	0.0022	0.0028	0.0020	0.0021
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.10	2.54	2.52	2.50	2.44
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.48	1.73	1.87	1.67	1.70
	Total Organic Carbon (mg/L)	1.54	1.69	1.90	1.77	1.71
Total Metals	Aluminum (Al)-Total (mg/L)	0.0130	0.0320	0.0337	0.0219	0.0405
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.22	2.61	2.51	2.56	2.63
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	0.033	<0.030	0.031
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	0.00073	<0.00050	<0.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L874806-11	L874806-12	L874806-13	L874806-14	L874806-15
		22-MAR-10 11:00 SP-19-S	22-MAR-10 10:20 SP-20-S	22-MAR-10 09:30 SP-21-S	24-MAR-10 TPS-13-S	24-MAR-10 TPS-13-INT
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	23.7	24.5	29.9	15.4	15.8
	Hardness (as CaCO3) (mg/L)	9.9	9.8	11.9	5.9	6.5
	pH (pH)	6.79	6.87	6.97	6.48	6.49
	Total Suspended Solids (mg/L)	<1.0	1.3	1.1	<1.0	<1.0
	Total Dissolved Solids (mg/L)	19	18	24	<10	12
	Turbidity (NTU)	1.18	1.14	1.31	0.16	0.23
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	7.4	7.7	9.4	4.3	4.6
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	7.4	7.7	9.4	4.3	4.6
	Ammonia-N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.66	0.67	0.83	<0.50	0.52
	Fluoride (F) (mg/L)	0.081	0.082	0.098	0.062	0.062
	Nitrate (as N) (mg/L)	0.0224	0.0227	0.0263	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.052	0.097	0.150	0.057	0.092
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0027	0.0026	0.0025	0.0022	0.0024
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.99	2.04	2.54	1.28	1.30
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.46	1.42	1.74	1.59	1.75
	Total Organic Carbon (mg/L)	1.74	1.45	1.80	1.59	1.52
Total Metals	Aluminum (Al)-Total (mg/L)	0.0997	0.0811	0.0938	0.0052	0.0195
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.26	2.25	2.75	1.27	1.37
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.079	0.071	0.084	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.00937

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L874806-16	L874806-17	L874806-18	L874806-19	L874806-20
		24-MAR-10	24-MAR-10	24-MAR-10	24-MAR-10	24-MAR-10
		TPS-13-D	TPS-14-S	TPS-14-INT	TPS-14-D	TPS-15-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	15.2	18.1	15.3	14.9	16.9
	Hardness (as CaCO3) (mg/L)	5.7	6.7	5.7	5.4	5.8
	pH (pH)	6.46	6.50	6.52	6.57	6.47
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	<10	13	15	13	<10
	Turbidity (NTU)	0.16	0.17	0.17	0.18	0.16
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.5	5.4	4.7	4.4	4.5
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.5	5.4	4.7	4.4	4.5
	Ammonia-N (mg/L)	<0.020	0.022	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	0.58	<0.50	<0.50	0.52
	Fluoride (F) (mg/L)	0.060	0.070	0.060	0.059	0.064
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.326	0.131	<0.050	<0.050	0.101
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	0.0021	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.26	1.55	1.24	1.22	1.37
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.37	1.49	1.39	1.25	1.43
	Total Organic Carbon (mg/L)	1.38	1.63	1.45	1.34	1.54
Total Metals	Aluminum (Al)-Total (mg/L)	0.0061	0.0063	0.0080	0.0073	0.0058
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.25	1.49	1.27	1.21	1.27
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L874806-21	L874806-22	L874806-23	L874806-24	L874806-25
		23-MAR-10	23-MAR-10	23-MAR-10 09:00	MAR-DUP-1	MAR-DUP-2
TPE-19-S			TPE-20-S	TPE-21-S		
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	20.0	22.7	24.6	18.4	24.7
	Hardness (as CaCO3) (mg/L)	7.4	8.5	9.6	7.1	9.8
	pH (pH)	6.50	6.59	6.81	6.48	6.93
	Total Suspended Solids (mg/L)	<1.0	1.1	1.5	<1.0	<1.0
	Total Dissolved Solids (mg/L)	12	18	16	<10	17
	Turbidity (NTU)	0.63	1.48	1.50	0.16	1.36
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	5.4	7.0	7.6	5.5	7.2
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	5.4	7.0	7.6	5.5	7.2
	Ammonia-N (mg/L)	<0.020	<0.020	0.028	0.021	0.041
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.61	0.68	0.76	0.59	0.75
	Fluoride (F) (mg/L)	0.072	0.083	0.087	0.071	0.087
	Nitrate (as N) (mg/L)	0.0159	0.0193	0.0268	0.0079	0.0261
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.093	0.105	0.121	0.155	0.209
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0020	0.0028	0.0025	<0.0020	0.0030
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.67	1.85	2.05	1.65	2.06
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.39	1.47	1.55	1.56	1.48
	Total Organic Carbon (mg/L)	1.42	1.52	1.56	1.56	1.57
Total Metals	Aluminum (Al)-Total (mg/L)	0.0394	0.109	0.107	0.0082	0.109
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.63	1.93	2.14	1.58	2.18
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.037	0.095	0.099	<0.030	0.098
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L874806-26	L874806-27	L874806-28	L874806-29	
		MAR-EB-1	MAR-EB-2	TRANSPORT BLANK1	TRANSPORT BLANK2	
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	<2.0	<2.0	<2.0	<2.0	
	Hardness (as CaCO3) (mg/L)	<1.1	<1.1			
	pH (pH)	5.52	5.45	5.32	5.48	
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	
	Total Dissolved Solids (mg/L)	<10	<10	<10	<10	
	Turbidity (NTU)			<0.10	<0.10	
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	
	Ammonia-N (mg/L)	<0.020	<0.020	<0.020	<0.020	
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	
	Fluoride (F) (mg/L)	<0.020	<0.020	<0.020	<0.020	
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050	<0.050	<0.050	
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	
	Sulfate (SO4) (mg/L)	<0.50	<0.50	<0.50	<0.50	
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	<0.50	<0.50			
	Total Organic Carbon (mg/L)	<0.50	<0.50	<0.50	<0.50	
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	
	Calcium (Ca)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L874806-1	L874806-2	L874806-3	L874806-4	L874806-5
			20-MAR-10 15:20 TPN-19-S	20-MAR-10 14:30 TPN-20-S	20-MAR-10 17:50 TPN-21-S	21-MAR-10 15:30 TE-19-S	21-MAR-10 15:30 TE-19-INT
Grouping	Analyte						
WATER							
Total Metals	Lithium (Li)-Total (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)		0.74	0.73	0.72	1.10	0.89
	Manganese (Mn)-Total (mg/L)		0.00056	0.00045	0.00049	0.00084	0.00124
	Mercury (Hg)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)		<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)		<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	0.0059
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)		<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)		1.77	1.67	1.64	2.97	2.46
	Chromium (Cr)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)		<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)		0.77	0.75	0.74	1.09	0.90
	Manganese (Mn)-Dissolved (mg/L)		0.00041	<0.00030	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L874806-6	L874806-7	L874806-8	L874806-9	L874806-10
Grouping	Analyte						
WATER							
Total Metals	Lithium (Li)-Total (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)		0.82	0.98	0.98	0.98	1.00
	Manganese (Mn)-Total (mg/L)		0.00112	0.00085	0.00105	0.00078	0.00087
	Mercury (Hg)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)		<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)		<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)		<0.0050	<0.0050	0.0052	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)		<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)		2.28	2.63	2.62	2.64	2.74
	Chromium (Cr)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)		<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)		0.83	1.00	0.99	0.98	1.00
	Manganese (Mn)-Dissolved (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L874806-11	L874806-12	L874806-13	L874806-14	L874806-15
		22-MAR-10 11:00 SP-19-S	22-MAR-10 10:20 SP-20-S	22-MAR-10 09:30 SP-21-S	24-MAR-10 TPS-13-S	24-MAR-10 TPS-13-INT
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.93	0.92	1.14	0.60	0.62
	Manganese (Mn)-Total (mg/L)	0.00142	0.00133	0.00151	0.00033	0.00080
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0071
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0053	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.43	2.39	2.88	1.33	1.49
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.93	0.93	1.14	0.62	0.67
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	0.00035	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L874806-16	L874806-17	L874806-18	L874806-19	L874806-20
		24-MAR-10	24-MAR-10	24-MAR-10	24-MAR-10	24-MAR-10
		TPS-13-D	TPS-14-S	TPS-14-INT	TPS-14-D	TPS-15-S
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.58	0.69	0.59	0.57	0.59
	Manganese (Mn)-Total (mg/L)	0.00047	0.00036	0.00046	0.00052	0.00035
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.31	1.53	1.32	1.24	1.31
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.59	0.70	0.60	0.57	0.61
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L874806-21	L874806-22	L874806-23	L874806-24	L874806-25
		23-MAR-10	23-MAR-10	23-MAR-10 09:00		
		TPE-19-S	TPE-20-S	TPE-21-S	MAR-DUP-1	MAR-DUP-2
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.75	0.89	0.99	0.73	0.99
	Manganese (Mn)-Total (mg/L)	0.00087	0.00158	0.00159	0.00046	0.00159
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	0.0053	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.71	1.97	2.25	1.63	2.29
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.75	0.86	0.96	0.74	0.98
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	0.00031	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L874806-26 MAR-EB-1	L874806-27 MAR-EB-2	L874806-28 TRANSPORT BLANK1	L874806-29 TRANSPORT BLANK2	
Grouping	Analyte						
WATER							
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050		
	Magnesium (Mg)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10		
	Manganese (Mn)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030		
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010		
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0		
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020		
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0		
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020		
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050		
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010		
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020		
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050		
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050				
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050				
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050				
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020				
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010				
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10				
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017				
	Calcium (Ca)-Dissolved (mg/L)	<0.10	<0.10				
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010				
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030				
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010				
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030				
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050				
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050				
	Magnesium (Mg)-Dissolved (mg/L)	<0.10	<0.10				
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030				
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010				
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010				
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010				
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0				
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010				

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L874806-1	L874806-2	L874806-3	L874806-4	L874806-5
		20-MAR-10 15:20 TPN-19-S	20-MAR-10 14:30 TPN-20-S	20-MAR-10 17:50 TPN-21-S	21-MAR-10 15:30 TE-19-S	21-MAR-10 15:30 TE-19-INT
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.246	0.178	0.230	0.557	0.466

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L874806-6	L874806-7	L874806-8	L874806-9	L874806-10
		21-MAR-10 15:30 TE-19-D	21-MAR-10 14:30 TE-20-S	21-MAR-10 14:30 TE-20-INT	21-MAR-10 14:30 TE-20-D	21-MAR-10 16:00 TE-21-S
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.409	0.494	0.495	0.312	0.475

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L874806-11	L874806-12	L874806-13	L874806-14	L874806-15
		Description					
		Sampled Date	22-MAR-10	22-MAR-10	22-MAR-10	24-MAR-10	24-MAR-10
		Sampled Time	11:00	10:20	09:30		
		Client ID	SP-19-S	SP-20-S	SP-21-S	TPS-13-S	TPS-13-INT
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)		<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)		<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	0.0074
Plant Pigments	Chlorophyll a (ug/L)		0.119	0.104	0.257	0.107	0.141

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L874806-16	L874806-17	L874806-18	L874806-19	L874806-20
		Description					
		Sampled Date	24-MAR-10	24-MAR-10	24-MAR-10	24-MAR-10	24-MAR-10
		Sampled Time					
		Client ID	TPS-13-D	TPS-14-S	TPS-14-INT	TPS-14-D	TPS-15-S
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.088	0.097	0.119	0.141	0.215	

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L874806-21	L874806-22	L874806-23	L874806-24	L874806-25
		Description					
		Sampled Date	23-MAR-10	23-MAR-10	23-MAR-10		
		Sampled Time			09:00		
		Client ID	TPE-19-S	TPE-20-S	TPE-21-S	MAR-DUP-1	MAR-DUP-2
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Plant Pigments	Chlorophyll a (ug/L)	0.178	0.220	0.293	0.172	0.288	

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L874806-26	L874806-27	L874806-28	L874806-29	
		MAR-EB-1	MAR-EB-2	TRANSPORT BLANK1	TRANSPORT BLANK2	
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020			
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0			
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020			
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050			
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010			
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020			
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010			
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050			
Plant Pigments	Chlorophyll a (ug/L)					

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite 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". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate 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". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
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".			
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
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
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 is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
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-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/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).			

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-ICP-VA Water Total Metals in Water by ICPOES (CCME) 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOTKJ-LOW-ED Water Total Kjeldahl Nitrogen- Low Level APHA 4500Norg C-Dig.-Auto-Colorimetry

NH4-LOW-ED Water Ammonia-N Low Level APHA 4500 NH3F-Colorimetry

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

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

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

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

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

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

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

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

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

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

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

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"

Reference Information

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

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

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

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

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

Laboratory Definition Code	Laboratory Location
ED	ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - 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 Processing

Environmental Division



www.alsglobal.com

Page 1 of 4

Report to:				Report Format / Distribution				Service Requested:			
Company: Azimuth Consulting Group Inc.				☒ Standard ☐ Other				☒ Regular Service (Default)			
Contact: Gary Mann / Maggie McConnell				☒ PDF ☐ Excel ☐ Fax				☐ Rush Service (2-3 Days)			
Address: Vancouver				Email 1: rvanengen@agnico-eagle.com				☒ Priority Service (1 Day or ASAP)			
Email 2: gmann@azimuthgroup.ca, mmcconnell@azimuthgroup.ca								☐ Emergency Service (<1 Day / Weekend) - Contact ALS			
Phone: 604-730-1220 Fax:								Analysis Request			
Invoice To: ☒ Same as Report				Indicate Bottles: Filled / Preserved (F/P) ----							
Company:				Client / Project Information:							
Contact:				Job #:				Meadowbank Mine Winter AEMP			
Address:				PO/A/E:							
Sample				Legal Site Description:							
Phone:				Quote #:				ALSEQ09-077			
				ALS Contact:				Natasha MM			
				Date				Time			
				(This description will appear on the report)				Sample Type			
				dd-mm-yy				hh:mm (Selected from drop-down list)			
TPN-19-S				20-Mar-10				15:20 Water			
TPN-20-S				20-Mar-10				14:30 Water			
TPN-21-S				20-Mar-10				17:50 Water			
TE-19-S				21-Mar-10				15:30 Water			
TE-19-INT				21-Mar-10				15:30 Water			
TE-19-D				21-Mar-10				15:30 Water			
TE-20-S				21-Mar-10				14:30 Water			
TE-20-INT				21-Mar-10				14:30 Water			
TE-20-D				21-Mar-10				14:30 Water			
TE-21-S				21-Mar-10				16:00 Water			
Guidelines / Regulations								Special Instructions / Hazardous Details			
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.											
Relinquished		Date & Time:		25-03-2010		By:		Received		Date & Time:	
By:		Martin Theriault				By:		DM		Date & Time:	
Relinquished		Date & Time:				By:		Received		Date & Time:	
By:						By:				Date & Time:	
										Temperature	
										12.0°C	
										Samples Received in Good Condition Y / N (if no provided details)	

[illegible]



Report to:				Report Format / Distribution				Service Requested:					
Company: Azimuth Consulting Group Inc.				☒ Standard ☐ Other				☒ Regular Service (Default)					
Contact: Gary Mann / Maggie McConnell				☒ PDF ☒ Excel ☐ Fax				☐ Rush Service (2-3 Days)					
Address: Vancouver				Email 1: rVanden@agnico-eagle.com				☐ Priority Service (1 Day or ASAP)					
Phone: 604-730-1220 Fax:				Email 2: gmann@azimuthgroup.ca , mmccconnell@azimuthgroup.ca				☒ Emergency Service (< 1 Day / Wkend) - Contact ALS					
Invoice To: ☒ Same as Report				Indicate Bottles: Filtered / Preserved (F/P) -->				Analysis Request					
Company:				Client / Project Information:									
Contact:				Job #:									
Address:				PO/A/E:				Meadowbank Mine Winter AEMP					
Sample				Legal Site Description:									
Phone:				Quote #: ALSEQ09-077									
				ALS Contact: Natasha MM				Sampler (Initials):					
Sample Identification (This description will appear on the report)				Date dd-mm-yy		Time hh:mm		Sample Type (Select from drop-down list)					
TPS-14-D				24-Mar-10				Water		X X X X X X X X X X			
TPS-15-S				24-Mar-10				Water		X X X X X X X X X X			
				24-Mar-10				Water		X X X X X X X X X X			
				24-Mar-10				Water		X X X X X X X X X X			
TPE-19-S				23-Mar-10		9:00		Water		X X X X X X X X X X			
TPE-20-S				23-Mar-10		10:00		Water		X X X X X X X X X X			
TPE-21-S				23-Mar-10		10:40		Water		X X X X X X X X X X			
Mar-Dup-1								Water		X X X X X X X X X X			
Mar-Dup-2								Water		X X X X X X X X X X			
Mar-EB-1								Water		X X X X X X X X X X			
Guidelines / Regulations				Special Instructions / Hazardous Details									
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.													
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.													
Relinquished		Date & Time:		25-03-2010		Received		By:		Date & Time:		Temperature	
By: Martin Theriault						By: Dan						12.0 °C	
Relinquished		Date & Time:				Received		By:		Date & Time:		Samples Received in Good Condition? Y / N (if no provided details)	
By:													

[illegible]



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: GARY MANN

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 03-MAY-10 18:46 (MT)

Version: FINAL

Lab Work Order #: L878151

Date Received: 16-APR-10

Project P.O. #: NOT SUBMITTED

Job Reference: MEADOWBANK MINE WINTER AEMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments:



Natasha Markovic-Mirovic
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L878151-1	L878151-2	L878151-3	L878151-4	L878151-5
		09-APR-10 16:10 TE-22-S	09-APR-10 16:20 TE-22-INT	09-APR-10 16:30 TE-22-D	09-APR-10 17:15 SP-22-S	10-APR-10 14:00 TPE-22-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	26.0	26.7	28.7	27.8	20.4
	Hardness (as CaCO3) (mg/L)	11.3	11.4	12.2	11.2	7.7
	pH (pH)	6.93	6.97	6.97	6.97	6.90
	Total Suspended Solids (mg/L)	1.2	<1.0	<1.0	2.2	1.0
	Total Dissolved Solids (mg/L)	15	13	15	15	<10
	Turbidity (NTU)	0.77	0.62	0.66	2.00	1.78
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	8.9	9.3	9.4	8.4	6.6
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	8.9	9.3	9.4	8.4	6.6
	Ammonia-N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.71	0.71	0.75	0.82	0.60
	Fluoride (F) (mg/L)	0.085	0.082	0.086	0.096	0.078
	Nitrate (as N) (mg/L)	0.0215	0.0131	0.0146	0.0305	0.0208
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050	0.121	<0.050	<0.050
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0022	0.0032	0.0032	0.0039	0.0029
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.67	2.70	2.82	2.55	1.74
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.40	1.49	1.51	1.42	1.06
	Total Organic Carbon (mg/L)	1.51	1.59	1.58	1.55	1.07
Total Metals	Aluminum (Al)-Total (mg/L)	0.0525	0.0398	0.0431	0.105	0.107
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.68	2.75	2.87	2.52	1.74
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	0.0219	0.0018	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.049	0.040	0.037	0.100	0.098
	Lead (Pb)-Total (mg/L)	<0.00050	0.00057	<0.00050	<0.00050	<0.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L878151-6 10-APR-10 11:25 TPN-22-S	L878151-7 10-APR-10 09:30 TPS-16-S	L878151-8 10-APR-10 09:40 TPS-16-INT	L878151-9 10-APR-10 09:50 TPS-16-D	L878151-10 APRIL-DUP-1
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	17.3	14.0	14.3	14.4	20.4
	Hardness (as CaCO3) (mg/L)	6.6	5.4	5.5	5.5	7.8
	pH (pH)	6.68	6.69	6.76	6.71	6.87
	Total Suspended Solids (mg/L)	2.0	1.4	1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	<10	<10	<10	<10	13
	Turbidity (NTU)	0.19	0.16	0.25	0.17	1.72
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	5.4	4.4	4.6	4.7	6.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	5.4	4.4	4.6	4.7	6.0
	Ammonia-N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.55	<0.50	<0.50	<0.50	0.61
	Fluoride (F) (mg/L)	0.067	0.059	0.059	0.059	0.077
	Nitrate (as N) (mg/L)	0.0140	<0.0050	<0.0050	<0.0050	0.0214
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0026	<0.0020	0.0029	<0.0020	0.0024
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.63	1.24	1.25	1.25	1.68
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.07	0.99	1.05	0.99	1.15
	Total Organic Carbon (mg/L)	1.24	1.14	1.10	1.01	1.20
Total Metals	Aluminum (Al)-Total (mg/L)	0.0093	0.0052	0.0114	0.0056	0.106
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.44	1.14	1.22	1.18	1.76
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	0.091
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L878151-11	L878151-12	L878151-13		
		APRIL-EB-1	TRAVEL BLANK-1	TRAVEL BLANK-2		
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	<2.0	<2.0	<2.0		
	Hardness (as CaCO3) (mg/L)	<1.1	<1.1	<1.1		
	pH (pH)	5.78	5.42	5.67		
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0		
	Total Dissolved Solids (mg/L)	<10	<10	<10		
	Turbidity (NTU)					
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		
	Ammonia-N (mg/L)	<0.020	<0.020	<0.020		
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050		
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50		
	Fluoride (F) (mg/L)	<0.020	<0.020	<0.020		
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050		
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010		
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050	<0.050		
	Ortho Phosphate as P (mg/L)	0.0010	<0.0010	<0.0010		
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020		
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0		
	Sulfate (SO4) (mg/L)	<0.50	<0.50	<0.50		
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	0.24				
	Total Organic Carbon (mg/L)	0.24	<0.20	<0.20		
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	<0.0050	<0.0050		
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020		
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10		
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017		
	Calcium (Ca)-Total (mg/L)	<0.10	<0.10	<0.10		
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030		
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030		
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050		

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L878151-1	L878151-2	L878151-3	L878151-4	L878151-5
		09-APR-10 16:10 TE-22-S	09-APR-10 16:20 TE-22-INT	09-APR-10 16:30 TE-22-D	09-APR-10 17:15 SP-22-S	10-APR-10 14:00 TPE-22-S
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	1.01	1.02	1.07	1.08	0.78
	Manganese (Mn)-Total (mg/L)	0.00101	0.00098	0.00104	0.00166	0.00157
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	0.0068	0.0069
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.81	2.83	3.03	2.69	1.80
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	1.04	1.04	1.12	1.10	0.78
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	0.00037	0.00031	0.00031
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L878151-6	L878151-7	L878151-8	L878151-9	L878151-10
		10-APR-10 11:25 TPN-22-S	10-APR-10 09:30 TPS-16-S	10-APR-10 09:40 TPS-16-INT	10-APR-10 09:50 TPS-16-D	APRIL-DUP-1
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.65	0.54	0.56	0.55	0.78
	Manganese (Mn)-Total (mg/L)	0.00051	0.00031	0.00055	0.00041	0.00187
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0083
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.52	1.23	1.26	1.26	1.83
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.68	0.56	0.57	0.57	0.78
	Manganese (Mn)-Dissolved (mg/L)	0.00036	<0.00030	0.00032	<0.00030	0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L878151-11 APRIL-EB-1	L878151-12 TRAVEL BLANK-1	L878151-13 TRAVEL BLANK-2		
Grouping	Analyte						
WATER							
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050			
	Magnesium (Mg)-Total (mg/L)	<0.10	<0.10	<0.10			
	Manganese (Mn)-Total (mg/L)	<0.00030	<0.00030	<0.00030			
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010			
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0			
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020			
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0			
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020			
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010			
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020			
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050					
	Antimony (Sb)-Dissolved (mg/L)	<0.00050					
	Arsenic (As)-Dissolved (mg/L)	<0.00050					
	Barium (Ba)-Dissolved (mg/L)	<0.020					
	Beryllium (Be)-Dissolved (mg/L)	<0.0010					
	Boron (B)-Dissolved (mg/L)	<0.10					
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017					
	Calcium (Ca)-Dissolved (mg/L)	<0.10					
	Chromium (Cr)-Dissolved (mg/L)	<0.0010					
	Cobalt (Co)-Dissolved (mg/L)	<0.00030					
	Copper (Cu)-Dissolved (mg/L)	<0.0010					
	Iron (Fe)-Dissolved (mg/L)	<0.030					
	Lead (Pb)-Dissolved (mg/L)	<0.00050					
	Lithium (Li)-Dissolved (mg/L)	<0.0050					
	Magnesium (Mg)-Dissolved (mg/L)	<0.10					
	Manganese (Mn)-Dissolved (mg/L)	<0.00030					
	Mercury (Hg)-Dissolved (mg/L)	<0.000010					
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010					
	Nickel (Ni)-Dissolved (mg/L)	<0.0010					
	Potassium (K)-Dissolved (mg/L)	<2.0					
	Selenium (Se)-Dissolved (mg/L)	<0.0010					

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L878151-1	L878151-2	L878151-3	L878151-4	L878151-5
		09-APR-10 16:10 TE-22-S	09-APR-10 16:20 TE-22-INT	09-APR-10 16:30 TE-22-D	09-APR-10 17:15 SP-22-S	10-APR-10 14:00 TPE-22-S
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.296	0.692	0.708	0.353	0.108

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L878151-6	L878151-7	L878151-8	L878151-9	L878151-10
		10-APR-10 11:25 TPN-22-S	10-APR-10 09:30 TPS-16-S	10-APR-10 09:40 TPS-16-INT	10-APR-10 09:50 TPS-16-D	APRIL-DUP-1
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.305	0.190	0.169	0.179	0.098

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L878151-11	L878151-12	L878151-13		
Grouping	Analyte	APRIL-EB-1	TRAVEL BLANK-1	TRAVEL BLANK-2		
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020				
	Sodium (Na)-Dissolved (mg/L)	<2.0				
	Thallium (Tl)-Dissolved (mg/L)	<0.00020				
	Tin (Sn)-Dissolved (mg/L)	<0.00050				
	Titanium (Ti)-Dissolved (mg/L)	<0.010				
	Uranium (U)-Dissolved (mg/L)	<0.00020				
	Vanadium (V)-Dissolved (mg/L)	<0.0010				
	Zinc (Zn)-Dissolved (mg/L)	<0.0050				
Plant Pigments	Chlorophyll a (ug/L)					

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite 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". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate 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". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
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".			
C-DIS-ORG-LOW-CL	Water	Dissolved Organic Carbon	APHA 5310 C-Instrumental
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
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 is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
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-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/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).			

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-ICP-VA Water Total Metals in Water by ICPOES (CCME) 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOTKJ-LOW-ED Water Total Kjeldahl Nitrogen- Low Level APHA 4500Norg C-Dig.-Auto-Colorimetry

NH4-LOW-ED Water Ammonia-N Low Level APHA 4500 NH3F-Colorimetry

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

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

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

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

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

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

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

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

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

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

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

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"

Reference Information

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

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

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

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

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

Laboratory Definition Code	Laboratory Location
ED	ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - 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.

[illegible]



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: GARY MANN

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 24-JUN-10 16:58 (MT)

Version: FINAL

Lab Work Order #: L891797

Date Received: 31-MAY-10

Project P.O. #: NOT SUBMITTED

Job Reference: MEADOWBANK MINE WATER AEMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments: ADDITIONAL 24-JUN-10 15:48
ADDITIONAL 24-JUN-10 15:48

Natasha Markovic-Mirovic
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L891797-1	L891797-2	L891797-3	L891797-4	L891797-5
		20-MAY-10 10:30 TPE-23-S	20-MAY-10 11:20 TPE-24-S	20-MAY-10 09:30 TPE-25-S	20-MAY-10 14:00 SP-23-S	20-MAY-10 13:15 SP-24-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	19.8	20.9	20.0	23.0	23.3
	Hardness (as CaCO3) (mg/L)	8.0	8.0	7.6	8.6	8.8
	pH (pH)	8.85	7.19	6.92	6.85	6.83
	Total Suspended Solids (mg/L)	<1.0	<1.0	1.0	1.6	1.8
	Total Dissolved Solids (mg/L)	<10	16	13	17	13
	Turbidity (NTU)	1.71	1.02	1.42	1.18	1.43
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	15.0	6.1	6.2	7.0	7.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	15.0	6.1	6.2	7.0	7.0
	Ammonia as N (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.50	0.50	0.50	0.58	0.58
	Fluoride (F) (mg/L)	0.054	0.052	0.052	0.065	0.069
	Nitrate (as N) (mg/L)	0.0401	0.0418	0.0364	0.0310	0.0300
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050	0.051	0.073	0.076
	Ortho Phosphate as P (mg/L)	<0.0010	0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.49	1.42	1.38	1.85	1.89
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	0.95	1.07	0.97	1.17	1.27
	Total Organic Carbon (mg/L)	0.93	1.07	0.96	1.18	1.22
Total Metals	Aluminum (Al)-Total (mg/L)	0.0927	0.0630	0.0781	0.0675	0.0642
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00061	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.83	1.81	1.74	2.03	2.01
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.101	0.062	0.078	0.098	0.081
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L891797-6	L891797-7	L891797-8	L891797-9	L891797-10
		20-MAY-10 12:15 SP-25-S	22-MAY-10 15:50 TPN-23-S	22-MAY-10 17:30 TPN-24-S	22-MAY-10 18:15 TPN-25-S	MAY-DUP-1
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	25.9	18.4	21.9	17.6	24.2
	Hardness (as CaCO3) (mg/L)	10.3	6.9	8.3	7.2	10.5
	pH (pH)	6.85	6.73	6.76	6.99	6.99
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	17	<10	14	15	17
	Turbidity (NTU)	0.87	0.20	0.13	0.20	0.74
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	7.9	5.0	6.4	5.5	8.2
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	7.9	5.0	6.4	5.5	8.2
	Ammonia as N (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.57	<0.50	0.59	0.50	0.57
	Fluoride (F) (mg/L)	0.067	0.054	0.066	0.059	0.067
	Nitrate (as N) (mg/L)	0.0219	0.0265	0.0109	0.0095	0.0220
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.074	0.058	0.081	0.061	0.093
	Ortho Phosphate as P (mg/L)	<0.0010	0.0011	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.09	1.62	1.89	1.62	2.11
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.25	1.14	1.31	1.26	1.28
	Total Organic Carbon (mg/L)	1.25	1.19	1.35	1.29	1.18
Total Metals	Aluminum (Al)-Total (mg/L)	0.0420	0.0139	0.0067	0.0064	0.0474
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.40	1.60	1.89	1.63	2.53
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.042	<0.030	<0.030	<0.030	0.046
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L891797-11	L891797-12	L891797-13	L891797-14	L891797-15
		MAY-DUP-2	21-MAY-10 11:30 TE-23-S	21-MAY-10 11:40 TE-23-D	21-MAY-10 11:50 TE-23-INT	21-MAY-10 13:00 TE-24-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	19.8	25.0	25.8	25.8	28.0
	Hardness (as CaCO3) (mg/L)	7.9	10.4	10.5	10.5	10.9
	pH (pH)	5.39	7.00	6.93	7.05	7.64
	Total Suspended Solids (mg/L)	1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	16	18	16	17	15
	Turbidity (NTU)	1.62	0.56	0.33	0.48	0.55
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	6.4	8.1	8.4	8.3	8.9
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	6.4	8.1	8.4	8.3	8.9
	Ammonia as N (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	0.55	0.63	0.62	0.60
	Fluoride (F) (mg/L)	0.061	0.065	0.067	0.068	0.068
	Nitrate (as N) (mg/L)	0.0422	0.0260	0.0070	0.0186	0.0226
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.067	0.061	0.082	0.063	0.052
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.57	2.13	2.47	2.34	2.30
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	0.91	1.20	1.39	1.39	1.36
	Total Organic Carbon (mg/L)	0.95	1.23	1.41	1.43	1.34
Total Metals	Aluminum (Al)-Total (mg/L)	0.0928	0.0340	0.0177	0.0312	0.0320
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00063	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.87	2.48	2.62	2.51	2.54
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.096	0.034	<0.030	0.031	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L891797-16	L891797-17	L891797-18	L891797-19	L891797-20
		21-MAY-10 13:10 TE-24-D	21-MAY-10 13:20 TE-24-INT	21-MAY-10 13:40 TE-25-S	21-MAY-10 09:00 MAY-EB-1	22-MAY-10 20:10 MAY-EB-2
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	27.0	27.2	25.0	<2.0	<2.0
	Hardness (as CaCO3) (mg/L)	10.7	10.7	10.1	<1.1	<1.1
	pH (pH)	7.37	7.28	7.19	5.75	5.38
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	29	26	12	<10	<10
	Turbidity (NTU)	0.34	0.45	0.67		
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	8.3	8.5	7.7	<2.0	<2.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	8.3	8.5	7.7	<2.0	<2.0
	Ammonia as N (mg/L)	<0.010	<0.010	<0.010	0.029	0.027
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.62	0.64	0.55	<0.50	<0.50
	Fluoride (F) (mg/L)	0.066	0.067	0.064	<0.020	<0.020
	Nitrate (as N) (mg/L)	0.0073	0.0137	0.0270	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.078	0.092	0.077	<0.050	<0.050
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.41	2.43	2.08	<0.50	<0.50
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.35	1.38	1.20	<0.20	<0.20
	Total Organic Carbon (mg/L)	1.46	1.41	1.34	0.43	0.23
Total Metals	Aluminum (Al)-Total (mg/L)	0.0172	0.0265	0.0391	<0.0050	<0.0050
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.55	2.58	2.40	<0.10	<0.10
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	0.0022	0.0013
	Iron (Fe)-Total (mg/L)	<0.030	0.032	0.035	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	0.00058	0.00061

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L891797-21	L891797-22	L891797-23	L891797-24	L891797-25
		22-MAY-10 11:30 TPS-17-S	22-MAY-10 11:40 TPS-17-D	22-MAY-10 11:50 TPS-17-INT	22-MAY-10 13:40 TPS-18-S	22-MAY-10 13:50 TPS-18-D
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	17.7	15.1	16.5	16.0	15.8
	Hardness (as CaCO3) (mg/L)	6.6	5.5	6.1	6.0	5.3
	pH (pH)	6.18	6.20	6.20	6.20	7.54
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	11	<10	15	12	13
	Turbidity (NTU)	0.15	0.13	0.19	0.13	0.13
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	5.4	4.1	5.1	4.9	4.1
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	5.4	4.1	5.1	4.9	4.1
	Ammonia as N (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.059	0.051	0.056	0.055	0.051
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.067	<0.050	<0.050	0.053	<0.050
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.54	1.30	1.41	1.38	1.27
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.41	1.00	1.33	1.22	0.97
	Total Organic Carbon (mg/L)	1.28	1.08	1.23	1.21	1.07
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	<0.0050	0.0066	<0.0050	0.0051
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.49	2.05	1.39	1.29	1.20
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L891797-26 22-MAY-10 14:00 TPS-INT	L891797-27 22-MAY-10 12:30 TPS-19-S		
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)		16.9	15.7		
	Hardness (as CaCO3) (mg/L)		5.5	5.2		
	pH (pH)		5.80	6.78		
	Total Suspended Solids (mg/L)		<1.0	<1.0		
	Total Dissolved Solids (mg/L)		<10	11		
	Turbidity (NTU)		0.16	0.12		
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		4.5	3.9		
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<2.0	<2.0		
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<2.0	<2.0		
	Alkalinity, Total (as CaCO3) (mg/L)		4.5	3.9		
	Ammonia as N (mg/L)		<0.010	<0.010		
	Bromide (Br) (mg/L)		<0.050	<0.050		
	Chloride (Cl) (mg/L)		<0.50	<0.50		
	Fluoride (F) (mg/L)		0.050	0.049		
	Nitrate (as N) (mg/L)		<0.0050	<0.0050		
	Nitrite (as N) (mg/L)		<0.0010	<0.0010		
	Total Kjeldahl Nitrogen (mg/L)		0.071	<0.050		
	Ortho Phosphate as P (mg/L)		<0.0010	<0.0010		
	Total Phosphate as P (mg/L)		<0.0020	<0.0020		
	Silicate (as SiO2) (mg/L)		<1.0	<1.0		
	Sulfate (SO4) (mg/L)		1.27	1.23		
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		1.04	0.98		
	Total Organic Carbon (mg/L)		1.01	0.98		
Total Metals	Aluminum (Al)-Total (mg/L)		0.0060	<0.0050		
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.00050		
	Arsenic (As)-Total (mg/L)		<0.00050	<0.00050		
	Barium (Ba)-Total (mg/L)		<0.020	<0.020		
	Beryllium (Be)-Total (mg/L)		<0.0010	<0.0010		
	Boron (B)-Total (mg/L)		<0.10	<0.10		
	Cadmium (Cd)-Total (mg/L)		<0.000017	<0.000017		
	Calcium (Ca)-Total (mg/L)		1.20	1.19		
	Chromium (Cr)-Total (mg/L)		<0.0010	<0.0010		
	Cobalt (Co)-Total (mg/L)		<0.00030	<0.00030		
	Copper (Cu)-Total (mg/L)		<0.0010	<0.0010		
	Iron (Fe)-Total (mg/L)		<0.030	<0.030		
	Lead (Pb)-Total (mg/L)		<0.00050	<0.00050		

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L891797-1	L891797-2	L891797-3	L891797-4	L891797-5
		20-MAY-10	20-MAY-10	20-MAY-10	20-MAY-10	20-MAY-10
		10:30	11:20	09:30	14:00	13:15
		TPE-23-S	TPE-24-S	TPE-25-S	SP-23-S	SP-24-S
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.80	0.81	0.77	0.89	0.84
	Manganese (Mn)-Total (mg/L)	0.00177	0.00109	0.00138	0.00221	0.00239
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0052	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	0.00057	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.89	1.87	1.77	2.04	2.10
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.81	0.82	0.77	0.85	0.87
	Manganese (Mn)-Dissolved (mg/L)	0.00042	0.00034	0.00031	0.00046	0.00044
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L891797-6	L891797-7	L891797-8	L891797-9	L891797-10
		20-MAY-10	22-MAY-10	22-MAY-10	22-MAY-10	
		12:15	15:50	17:30	18:15	
		SP-25-S	TPN-23-S	TPN-24-S	TPN-25-S	MAY-DUP-1
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.91	0.64	0.80	0.69	0.93
	Manganese (Mn)-Total (mg/L)	0.00095	0.00100	0.00047	0.00042	0.00098
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	0.0055	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.59	1.67	1.95	1.67	2.60
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.94	0.67	0.82	0.72	0.97
	Manganese (Mn)-Dissolved (mg/L)	0.00032	0.00075	0.00035	<0.00030	0.00031
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	0.0011	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L891797-11	L891797-12	L891797-13	L891797-14	L891797-15
			21-MAY-10 11:30	21-MAY-10 11:40	21-MAY-10 11:50	21-MAY-10 13:00
		MAY-DUP-2	TE-23-S	TE-23-D	TE-23-INT	TE-24-S
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.79	0.97	1.00	0.97	0.97
	Manganese (Mn)-Total (mg/L)	0.00170	0.00087	0.00064	0.00093	0.00083
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0051	<0.0050	<0.0050	<0.0050	0.0058
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	0.00057	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.84	2.53	2.60	2.57	2.69
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.80	0.98	0.99	0.99	1.01
	Manganese (Mn)-Dissolved (mg/L)	0.00042	<0.00030	<0.00030	0.00037	0.00043
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L891797-16	L891797-17	L891797-18	L891797-19	L891797-20
		21-MAY-10	21-MAY-10	21-MAY-10	21-MAY-10	22-MAY-10
		13:10	13:20	13:40	09:00	20:10
		TE-24-D	TE-24-INT	TE-25-S	MAY-EB-1	MAY-EB-2
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.94	0.99	0.91	<0.10	<0.10
	Manganese (Mn)-Total (mg/L)	0.00062	0.00105	0.00087	<0.00030	<0.00030
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	0.0072	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.65	2.63	2.49	<0.10	<0.10
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	0.0020	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	0.00057	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.98	1.00	0.93	<0.10	<0.10
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	0.00039	0.00037	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L891797-21	L891797-22	L891797-23	L891797-24	L891797-25
Grouping	Analyte						
WATER							
Total Metals	Lithium (Li)-Total (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)		0.68	0.59	0.62	0.59	0.54
	Manganese (Mn)-Total (mg/L)		0.00061	0.00036	0.00043	<0.00030	0.00051
	Mercury (Hg)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)		<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)		<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)		<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)		1.52	1.27	1.39	1.37	1.23
	Chromium (Cr)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)		<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)		0.69	0.58	0.63	0.62	0.55
	Manganese (Mn)-Dissolved (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L891797-26 22-MAY-10 14:00 TPS-INT	L891797-27 22-MAY-10 12:30 TPS-19-S			
Grouping	Analyte						
WATER							
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050				
	Magnesium (Mg)-Total (mg/L)	0.53	0.51				
	Manganese (Mn)-Total (mg/L)	0.00048	0.00030				
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010				
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010				
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010				
	Potassium (K)-Total (mg/L)	<2.0	<2.0				
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010				
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020				
	Sodium (Na)-Total (mg/L)	<2.0	<2.0				
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020				
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050				
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010				
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020				
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010				
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050				
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050				
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050				
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050				
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020				
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010				
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10				
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017				
	Calcium (Ca)-Dissolved (mg/L)	1.26	1.21				
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010				
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030				
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010				
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030				
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050				
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050				
	Magnesium (Mg)-Dissolved (mg/L)	0.56	0.53				
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030				
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010				
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010				
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010				
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0				
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010				

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L891797-1	L891797-2	L891797-3	L891797-4	L891797-5
		20-MAY-10 10:30 TPE-23-S	20-MAY-10 11:20 TPE-24-S	20-MAY-10 09:30 TPE-25-S	20-MAY-10 14:00 SP-23-S	20-MAY-10 13:15 SP-24-S
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.237	0.146	0.114	0.196	0.628

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L891797-6	L891797-7	L891797-8	L891797-9	L891797-10
		20-MAY-10 12:15 SP-25-S	22-MAY-10 15:50 TPN-23-S	22-MAY-10 17:30 TPN-24-S	22-MAY-10 18:15 TPN-25-S	MAY-DUP-1
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.506	0.422	0.298	0.268	0.576

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L891797-11	L891797-12	L891797-13	L891797-14	L891797-15
		MAY-DUP-2	21-MAY-10 11:30 TE-23-S	21-MAY-10 11:40 TE-23-D	21-MAY-10 11:50 TE-23-INT	21-MAY-10 13:00 TE-24-S
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.195	0.415	0.501	0.586	0.560

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L891797-16	L891797-17	L891797-18	L891797-19	L891797-20
Grouping Analyte						
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.542	0.671	0.277		

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L891797-21	L891797-22	L891797-23	L891797-24	L891797-25
		Description					
		Sampled Date	22-MAY-10	22-MAY-10	22-MAY-10	22-MAY-10	22-MAY-10
		Sampled Time	11:30	11:40	11:50	13:40	13:50
		Client ID	TPS-17-S	TPS-17-D	TPS-17-INT	TPS-18-S	TPS-18-D
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)		<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)		<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)		0.293	0.272	0.295	0.379	0.224

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L891797-26 22-MAY-10 14:00 TPS-INT	L891797-27 22-MAY-10 12:30 TPS-19-S			
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)		<0.000020	<0.000020			
	Sodium (Na)-Dissolved (mg/L)		<2.0	<2.0			
	Thallium (Tl)-Dissolved (mg/L)		<0.00020	<0.00020			
	Tin (Sn)-Dissolved (mg/L)		<0.00050	<0.00050			
	Titanium (Ti)-Dissolved (mg/L)		<0.010	<0.010			
	Uranium (U)-Dissolved (mg/L)		<0.00020	<0.00020			
	Vanadium (V)-Dissolved (mg/L)		<0.0010	<0.0010			
	Zinc (Zn)-Dissolved (mg/L)		<0.0050	<0.0050			
Plant Pigments	Chlorophyll a (ug)		0.333	0.354			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-MAN-VA	Water	Alkalinity (Species) by Manual 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-MAN-VA	Water	Alkalinity (Species) by Manual Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
OR			
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite 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". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate 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". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
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".			
C-DIS-ORG-LOW-CL	Water	Dissolved Organic Carbon	APHA 5310 C-Instrumental
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
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 is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
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-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B

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 acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-ICP-VA Water Total Metals in Water by ICPOES (CCME) 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

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

This analysis is carried out, on sulphuric 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.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

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

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

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

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

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

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

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

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

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

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

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

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorous". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorous". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorous". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

Reference Information

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

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

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

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

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

TKN-COL-VA Water Total Kjeldahl Nitrogen by Auto. 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.

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
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - 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 wwt milligrams per kilogram based on wet weight of sample.

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

mg/L milligrams per litre.

< - Less than.

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

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

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

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

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

Report to:				Report Format / Distribution				Service Requested:			
Company: Azimuth Consulting Group Inc.				☒ Standard Other ☒ PDF ☒ Excel Fax				☒ Regular Service (Default) Rush Service (2-3 Days) Priority Service (1 Day or ASAP) Emergency Service (<1 Day / Wkend) - Contact ALS			
Contact: Gary Mann / Maggie McConnell				Email 1: rvanengen@agnico-eagle.com							
Address: Vancouver				Email 2: gmann@azimuthgroup.ca							
Phone: 604-730-1220 Fax:											
Invoice To: ☒ Same as Report				Indicate Bottles: Filtered / Preserved (F/P) ---							
Company:				Client / Project Information:							
Contact:				Job #:				Meadowbank Mine Winter AEMP			
Address:				PO/AEE:							
Sample:				Legal Site Description:							
Phone:				Quote #: ALSEC09-077							
Lab Work Order # (lab use only)				ALS Contact: Natasha MM				Sampler (Initials):			
Sample Identification (This description will appear on the report)				Date		Time		Sample Type (Select from drop-down list)			
#				dd-mm-yy		hh:mm					
1				TPE-23-S		20-May-10		10:30		Water	
2				TPE-24-S		20-May-10		11:20		Water	
3				TPE-25-S		20-May-10		9:30		Water	
4				SP-23-S		20-May-10		14:00		Water	
5				SP-24-S		20-May-10		13:15		Water	
6				SP-25-S		20-May-10		12:15		Water	
7				TPN-23-S		22-May-10		15:50		Water	
8				TPN-24-S		22-May-10		17:30		Water	
9				TPN-25-S		22-May-10		18:15		Water	
10				May-Dup-1						Water	
Guidelines / Regulations				Special Instructions / Hazardous Details							
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.											
Relinquished By: Ryan V				Date & Time: 23-05-2010		Received By: <i>Hegman</i>		Date & Time: <i>May 31/10 10:47</i>		Temperature Condition <i>qoc</i>	
Relinquished By:				Date & Time:		Received By:		Date & Time:		Samples Received in Good Condition <i>ON</i> (if no provided details)	

Report to:				Report Format / Distribution				Service Requested:			
Company: Azimuth Consulting Group Inc.				☒ Standard Other _____ ☒ PDF ☒ Excel Fax _____				☒ Regular Service (Default) ☐ Rush Service (2-3 Days) ☐ Priority Service (1 Day or ASAP) ☐ Emergency Service (<1 Day / Wkend) - Contact ALS			
Contact: Gary Mann / Maggie McConnell				Email 1: rvanengen@agrico-eagle.com							
Address: Vancouver				Email 2: gmann@azimuthgroup.ca, mmccormell@azimuthgroup.ca							
Phone: 604-730-1220 Fax: _____				Indicate Bottles: Filtered / Preserved (F/P) -->							
Invoice To: ☒ Same as Report								Analysis Request			
Company: _____				Client / Project Information:							
Contact: _____				Job #: _____				Meadowbank Mine Winter AEMP			
Address: _____				PO/A/E: _____							
Sample: _____				Legal Site Description: _____							
Phone: _____				Quote #: ALSEQ09-077							
Lab Work Order # _____ (lab use only)				ALS Contact: Natasha MM		Sampler (Initials): _____					
Sample #		Sample Identification (This description will appear on the report)		Date		Time		Sample Type			
				dd-mm-yy		hh:mm		(Select from drop-down list)			
11	May-Dup-2			21-May-10	11:30	Water		X	X	X	X
12	TE-23-S			21-May-10	11:40	Water		X	X	X	X
13	TE-23-D			21-May-10	11:50	Water		X	X	X	X
14	TE-23-INT			21-May-10	13:00	Water		X	X	X	X
15	TE-24-S			21-May-10	13:10	Water		X	X	X	X
16	TE-24-D			21-May-10	13:20	Water		X	X	X	X
17	TE-24-INT			21-May-10	13:40	Water		X	X	X	X
18	TE-25-S			21-May-10	9:00	Water		X	X	X	X
19	May-EB-1			22-May-10	20:10	Water		X	X	X	X
20	May-EB-2							X	X	X	X
Guidelines / Regulations				Special Instructions / Hazardous Details							
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.											
Reinquisitioned		Date & Time: 23-05-2010		Received By: <i>Megan</i>		Date & Time: <i>May 31/10 10:47</i>		Temperature _____ Samples Received in Good Condition ☒ N (if no provided details)			
By: _____		Date & Time: _____		By: _____		Date & Time: _____					

Report to:				Report Format / Distribution				Service Requested:			
Company: Azimuth Consulting Group Inc.				☒ Standard ☐ Other ☒ PDF ☒ Excel ☐ Fax				☒ Regular Service (Default) ☐ Rush Service (2-3 Days) ☐ Priority Service (1 Day or ASAP) ☐ Emergency Service (<1 Day / Weekend) - Contact ALS			
Contact: Gary Mann / Maggie McConnell				Email 1: rvanengen@agnico-eagle.com				Emergency Service (<1 Day / Weekend) - Contact ALS			
Address: Vancouver				Email 2: gmann@azimuthgroup.ca, mmccconnell@azimuthgroup.ca							
Phone: 604-730-1220 Fax:											
Invoice To: ☒ Same as Report				Indicate Bottles: Filtered / Preserved (F/P) ->							
Company:				Client / Project Information:							
Contact:				Job #:							
Address:				PO/A/E:							
Sample:				Legal Site Description:							
Phone:				Quote #: ALSEQ09-077							
Lab Work Order # (lab use only)				ALS Contact: Natasha MM							
Sample #		Sample Identification (This description will appear on the report)		Date		Time		Sample Type (Select from drop-down list)		Analysis Request	
21	TPS-17-S	22-May-10	11:30	Water	X	X	X	X	X	X	X
22	TPS-17-D	22-May-10	11:40	Water	X	X	X	X	X	X	X
23	TPS-17-INT	22-May-10	11:50	Water	X	X	X	X	X	X	X
24	TPS-18-S	22-May-10	13:40	Water	X	X	X	X	X	X	X
25	TPS-18-D	22-May-10	13:50	Water	X	X	X	X	X	X	X
26	TPS-INT	22-May-10	14:00	Water	X	X	X	X	X	X	X
27	TPS-19-S	22-May-10	12:30	Water	X	X	X	X	X	X	X
Guidelines / Regulations											
Special Instructions / Hazardous Details											
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.											
Reinquired By:	Ryan V	Date & Time:	23-05-2010	Received By:	Meghan	Date & Time:	May 31/10 10:47	Temperature		9°C	
Reinquired By:		Date & Time:		Received By:		Date & Time:		Samples Received in Good Condition? (if no provided details)		Yes	



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: MAGGIE McCONNELL

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 12-AUG-10 11:22 (MT)

Version: FINAL

Lab Work Order #: L912694

Date Received: 26-JUL-10

Project P.O. #: NOT SUBMITTED

Job Reference: MEADOWBANK MINE CREMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments:



Natasha Markovic-Mirovic
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L912694-1	L912694-2	L912694-3	L912694-4	L912694-5
		16-JUL-10	16-JUL-10	16-JUL-10	17-JUL-10	17-JUL-10
		TPE-26-S	TPE-27-S	TPE-28-S	TPN-26-S	TPN-27-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	16.8	16.5	16.9	14.5	14.6
	Hardness (as CaCO3) (mg/L)	7.07	6.73	7.11	5.75	5.79
	pH (pH)	7.60	7.48	7.45	7.44	7.37
	Total Suspended Solids (mg/L)	1.9	1.0	1.4	<1.0	<1.0
	Total Dissolved Solids (mg/L)	<10	13	<10	12	<10
	Turbidity (NTU)	1.76	1.66	1.27	0.23	0.28
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	6.0	5.0	5.3	4.7	4.6
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	6.0	5.0	5.3	4.7	4.6
	Ammonia-N (mg/L)	0.0117	0.0072	0.0088	<0.0050	<0.0050
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.057	0.054	0.057	0.051	0.051
	Nitrate (as N) (mg/L)	0.0558	0.0437	0.0547	0.0179	0.0180
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	<0.050	0.079	0.282	<0.050	0.225
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0024	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.42	1.34	1.40	1.42	1.43
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	0.89	0.83	0.83	0.90	0.89
	Total Organic Carbon (mg/L)	0.92	0.89	0.84	0.92	0.99
Total Metals	Aluminum (Al)-Total (mg/L)	0.0891	0.0756	0.0783	0.0134	0.0168
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00053	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.70	1.61	1.71	1.36	1.34
	Chromium (Cr)-Total (mg/L)	0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0020	<0.0020	<0.0010
	Iron (Fe)-Total (mg/L)	0.134	0.101	0.102	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L912694-6	L912694-7	L912694-8	L912694-9	L912694-10
		Description					
		Sampled Date	17-JUL-10	17-JUL-10	17-JUL-10	17-JUL-10	17-JUL-10
		Sampled Time					
		Client ID	TPN-28-S	SP-26-S	SP-27-S	SP-28-S	JUL DUP-1
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		14.4	21.0	22.1	22.3	21.0
	Hardness (as CaCO3) (mg/L)		5.77	9.29	9.83	9.26	5.69
	pH (pH)		7.52	7.20	7.21	7.23	7.20
	Total Suspended Solids (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)		11	12	10	10	11
	Turbidity (NTU)		0.24	0.60	0.51	0.63	0.26
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		4.4	7.4	7.8	7.3	4.7
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)		4.4	7.4	7.8	7.3	4.7
	Ammonia-N (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Bromide (Br) (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)		<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)		0.053	0.051	0.048	0.051	0.050
	Nitrate (as N) (mg/L)		0.0196	0.0148	0.0075	0.0149	0.0174
	Nitrite (as N) (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)		<0.050	<0.050	0.084	<0.050	<0.050
	Ortho Phosphate as P (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)		<0.0020	<0.0020	0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)		1.48	1.87	2.02	1.88	1.42
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		1.00	1.13	1.17	1.15	0.89
	Total Organic Carbon (mg/L)		1.07	1.17	1.22	1.15	0.95
Total Metals	Aluminum (Al)-Total (mg/L)		0.0132	0.0445	<0.030	0.0352	<0.015
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)		<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)		1.35	2.38	2.50	2.32	1.32
	Chromium (Cr)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)		<0.0060	<0.0020	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)		<0.030	0.051	0.036	0.045	<0.030
	Lead (Pb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L912694-11	L912694-12		
		Description				
		Sampled Date	17-JUL-10	17-JUL-10		
		Sampled Time				
		Client ID	JUL EB-1	JUL EB-2		
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)		<2.0	<2.0		
	Hardness (as CaCO3) (mg/L)		<0.50	<0.50		
	pH (pH)		5.72	5.75		
	Total Suspended Solids (mg/L)		<1.0	<1.0		
	Total Dissolved Solids (mg/L)		<10	<10		
	Turbidity (NTU)		0.30	0.30		
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		<2.0	<2.0		
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<2.0	<2.0		
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<2.0	<2.0		
	Alkalinity, Total (as CaCO3) (mg/L)		<2.0	<2.0		
	Ammonia-N (mg/L)		0.0395 ^{RRV}	0.0397 ^{RRV}		
	Bromide (Br) (mg/L)		<0.050	<0.050		
	Chloride (Cl) (mg/L)		<0.50	<0.50		
	Fluoride (F) (mg/L)		<0.020	<0.020		
	Nitrate (as N) (mg/L)		<0.0050	<0.0050		
	Nitrite (as N) (mg/L)		<0.0010	<0.0010		
	Total Kjeldahl Nitrogen (mg/L)		<0.050	<0.050		
	Ortho Phosphate as P (mg/L)		<0.0010	<0.0010		
	Total Phosphate as P (mg/L)		<0.0020	<0.0020		
	Silicate (as SiO2) (mg/L)		<1.0	<1.0		
	Sulfate (SO4) (mg/L)		<0.50	<0.50		
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		<0.50			
	Total Organic Carbon (mg/L)		<0.50	<0.50		
Total Metals	Aluminum (Al)-Total (mg/L)		<0.0050	<0.0050		
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.00050		
	Arsenic (As)-Total (mg/L)		<0.00050	<0.00050		
	Barium (Ba)-Total (mg/L)		<0.020	<0.020		
	Beryllium (Be)-Total (mg/L)		<0.0010	<0.0010		
	Boron (B)-Total (mg/L)		<0.10	<0.10		
	Cadmium (Cd)-Total (mg/L)		<0.000017	<0.000017		
	Calcium (Ca)-Total (mg/L)		<0.10	<0.10		
	Chromium (Cr)-Total (mg/L)		<0.0010	<0.0010		
	Cobalt (Co)-Total (mg/L)		<0.00030	<0.00030		
	Copper (Cu)-Total (mg/L)		0.0011	0.0018		
	Iron (Fe)-Total (mg/L)		<0.030	<0.030		
	Lead (Pb)-Total (mg/L)		0.00061	0.00107		

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L912694-1	L912694-2	L912694-3	L912694-4	L912694-5
		16-JUL-10	16-JUL-10	16-JUL-10	17-JUL-10	17-JUL-10
		TPE-26-S	TPE-27-S	TPE-28-S	TPN-26-S	TPN-27-S
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.70	0.66	0.69	0.57	0.57
	Manganese (Mn)-Total (mg/L)	0.00471	0.00400	0.00409	0.00237	0.00209
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0234	0.0144	0.0285	0.0060	0.0067
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.72	1.63	1.72	1.35	1.37
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	0.037	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.67	0.64	0.68	0.57	0.58
	Manganese (Mn)-Dissolved (mg/L)	0.00297	0.00259	0.00295	0.00177	0.00178
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L912694-6	L912694-7	L912694-8	L912694-9	L912694-10
		17-JUL-10	17-JUL-10	17-JUL-10	17-JUL-10	17-JUL-10
		TPN-28-S	SP-26-S	SP-27-S	SP-28-S	JUL DUP-1
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.57	0.82	0.82	0.79	0.56
	Manganese (Mn)-Total (mg/L)	0.00219	0.00233	0.00203	0.00227	0.00232
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0069	0.0168	0.0202	0.0169	0.0075
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.35	2.38	2.55	2.38	1.34
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.58	0.81	0.84	0.81	0.57
	Manganese (Mn)-Dissolved (mg/L)	0.00169	0.00162	0.00158	0.00165	0.00189
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L912694-11	L912694-12		
		Description				
		Sampled Date	17-JUL-10	17-JUL-10		
		Sampled Time				
		Client ID	JUL EB-1	JUL EB-2		
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050			
	Magnesium (Mg)-Total (mg/L)	<0.10	<0.10			
	Manganese (Mn)-Total (mg/L)	<0.00030	<0.00030			
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010			
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010			
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010			
	Potassium (K)-Total (mg/L)	<2.0	<2.0			
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010			
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020			
	Sodium (Na)-Total (mg/L)	<2.0	<2.0			
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020			
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050			
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010			
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020			
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010			
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050				
	Antimony (Sb)-Dissolved (mg/L)	<0.00050				
	Arsenic (As)-Dissolved (mg/L)	<0.00050				
	Barium (Ba)-Dissolved (mg/L)	<0.020				
	Beryllium (Be)-Dissolved (mg/L)	<0.0010				
	Boron (B)-Dissolved (mg/L)	<0.10				
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017				
	Calcium (Ca)-Dissolved (mg/L)	<0.10				
	Chromium (Cr)-Dissolved (mg/L)	<0.0010				
	Cobalt (Co)-Dissolved (mg/L)	<0.00030				
	Copper (Cu)-Dissolved (mg/L)	<0.0010				
	Iron (Fe)-Dissolved (mg/L)	<0.030				
	Lead (Pb)-Dissolved (mg/L)	<0.00050				
	Lithium (Li)-Dissolved (mg/L)	<0.0050				
	Magnesium (Mg)-Dissolved (mg/L)	<0.10				
	Manganese (Mn)-Dissolved (mg/L)	<0.00030				
	Mercury (Hg)-Dissolved (mg/L)	<0.000010				
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010				
	Nickel (Ni)-Dissolved (mg/L)	<0.0010				
	Potassium (K)-Dissolved (mg/L)	<2.0				
	Selenium (Se)-Dissolved (mg/L)	<0.0010				

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L912694-1	L912694-2	L912694-3	L912694-4	L912694-5
		Description					
		Sampled Date	16-JUL-10	16-JUL-10	16-JUL-10	17-JUL-10	17-JUL-10
		Sampled Time					
		Client ID	TPE-26-S	TPE-27-S	TPE-28-S	TPN-26-S	TPN-27-S
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Plant Pigments	Chlorophyll a (ug)	0.411	0.556	0.575	0.444	0.388	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L912694-6	L912694-7	L912694-8	L912694-9	L912694-10
		Description					
		Sampled Date	17-JUL-10	17-JUL-10	17-JUL-10	17-JUL-10	17-JUL-10
		Sampled Time					
		Client ID	TPN-28-S	SP-26-S	SP-27-S	SP-28-S	JUL DUP-1
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.424	0.764	0.778	0.639	0.419	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L912694-11	L912694-12			
		Description					
		Sampled Date	17-JUL-10	17-JUL-10			
		Sampled Time					
		Client ID	JUL EB-1	JUL EB-2			
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020					
	Sodium (Na)-Dissolved (mg/L)	<2.0					
	Thallium (Tl)-Dissolved (mg/L)	<0.00020					
	Tin (Sn)-Dissolved (mg/L)	<0.00050					
	Titanium (Ti)-Dissolved (mg/L)	<0.010					
	Uranium (U)-Dissolved (mg/L)	<0.00020					
	Vanadium (V)-Dissolved (mg/L)	<0.0010					
	Zinc (Zn)-Dissolved (mg/L)	<0.0050					
Plant Pigments	Chlorophyll a (ug)						

* 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**
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite 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". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate 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". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
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".			
C-DIS-ORG-LOW-CL	Water	Dissolved Organic Carbon	APHA 5310 C-Instrumental
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
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 is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
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-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	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			

Reference Information

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

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-ICP-VA Water Total Metals in Water by ICPOES (CCME) 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOTKJ-LOW-ED Water Total Kjeldahl Nitrogen- Low Level APHA 4500Norg C-Dig.-Auto-Colorimetry

NH4-LOW-ED Water Ammonia-N Low Level APHA 4500 NH3F-Colorimetry

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

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

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

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

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

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

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

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

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

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

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

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

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

Reference Information

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



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: MAGGIE McCONNELL

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 17-AUG-10 18:53 (MT)

Version: FINAL

Lab Work Order #: L915577

Date Received: 03-AUG-10

Project P.O. #: NOT SUBMITTED

Job Reference: MEADOWBANK MINE CREMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments:



Natasha Markovic-Mirovic
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915577-1	L915577-2	L915577-3	L915577-4	L915577-5
		18-JUL-10	18-JUL-10	18-JUL-10	19-JUL-10	19-JUL-10
		TPS-20-S	TPS-21-S	TPS-22-S	WAL-8-S	WAL-9-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	15.0	14.7	14.9	26.8	27.1
	Hardness (as CaCO3) (mg/L)	5.35	5.34	5.40	11.9	12.1
	pH (pH)	6.57	6.61	6.90	7.36	7.37
	Total Suspended Solids (mg/L)	1.2	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	<10	<10	<10	16	14
	Turbidity (NTU)	0.19	0.17	0.18	0.29	0.28
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.0	4.1	3.8	8.8	9.3
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.0	4.1	3.8	8.8	9.3
	Ammonia as N (mg/L)	<0.0050	<0.0050	<0.0050	0.0068	0.0092
	Bromide (Br) (mg/L)	<0.050	<0.050	0.360	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.043	0.049	0.048	0.032	0.033
	Nitrate (as N) (mg/L)	0.0112	0.0107	0.0116	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.061	0.121	<0.050	0.152	0.100
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	0.0021	0.0030	0.0027
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.16	1.28	1.27	2.03	2.05
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	0.94	0.91	0.88	1.58	1.51
	Total Organic Carbon (mg/L)	1.07	0.93	0.92	1.63	1.60
Total Metals	Aluminum (Al)-Total (mg/L)	0.0093	0.0089	0.0092	0.0102	0.0110
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.28	1.30	1.26	3.24	3.31
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	0.0012	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915577-6	L915577-7	L915577-8	L915577-9	L915577-10
		19-JUL-10	20-JUL-10	20-JUL-10	20-JUL-10	20-JUL-10
		WAL-10-S	TE-26-S	TE-26-INT	TE-26-D	TE-27-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	27.0	19.5	20.0	19.0	19.0
	Hardness (as CaCO3) (mg/L)	11.7	8.00	7.99	7.58	7.49
	pH (pH)	7.35	6.85	7.22	6.82	6.83
	Total Suspended Solids (mg/L)	<1.0	<1.0	1.8	<1.0	<1.0
	Total Dissolved Solids (mg/L)	14	<10	10	15	14
	Turbidity (NTU)	0.30	0.51	0.51	0.52	0.47
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	9.3	5.5	5.4	5.7	6.1
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	9.3	5.5	5.4	5.7	6.1
	Ammonia as N (mg/L)	0.0149	0.0069	0.0103	0.0065	0.0053
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.032	0.048	0.048	0.047	0.048
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.135	0.243	0.174	<0.050	0.050
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0042	0.0040	0.0027	0.0075	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.04	1.62	1.67	1.61	1.60
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	0.78	1.20	1.20	1.15	1.19
	Total Organic Carbon (mg/L)	1.34	1.18	1.24	1.17	1.18
Total Metals	Aluminum (Al)-Total (mg/L)	0.0107	0.0292	0.0320	0.0265	0.0267
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	3.21	2.04	2.09	1.99	1.97
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	0.0011	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	0.032	0.037	0.033	0.033
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915577-11	L915577-12	L915577-13	L915577-14	L915577-15
		20-JUL-10	20-JUL-10	20-JUL-10	20-JUL-10	20-JUL-10
		TE-27-INT	TE-27-D	TE-28-S	TEFF-8-S	TEFF-9-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	20.0	18.5	19.5	16.6	15.0
	Hardness (as CaCO3) (mg/L)	8.15	7.32	7.82	6.34	5.65
	pH (pH)	7.20	6.80	6.82	6.76	6.69
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	12	13	19	14	11
	Turbidity (NTU)	0.48	0.44	0.52	0.31	0.28
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	5.8	5.6	5.8	5.0	4.9
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	5.8	5.6	5.8	5.0	4.9
	Ammonia as N (mg/L)	0.0080	0.0053	0.0056	<0.0050	<0.0050
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.048	0.047	0.050	0.045	0.044
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.063	0.150	0.229	<0.050	0.057
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	0.0021	0.0022	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.69	1.60	1.62	1.50	1.47
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.23	1.15	1.17	1.04	0.90
	Total Organic Carbon (mg/L)	1.19	1.19	1.40	1.05	0.97
Total Metals	Aluminum (Al)-Total (mg/L)	0.0300	0.0241	0.0306	0.0167	0.0116
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.12	1.91	2.05	1.63	1.46
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.033	<0.030	0.034	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915577-16	L915577-17	L915577-18	L915577-19	L915577-20
		20-JUL-10	21-JUL-10	21-JUL-10	21-JUL-10	22-JUL-10
		TEFF-10-S	PDL-8-S	PDL-9-S	PDL-10-S	INUG-14-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	14.6	20.3	19.6	19.9	14.2
	Hardness (as CaCO3) (mg/L)	5.23	8.06	8.06	8.23	5.10
	pH (pH)	6.63	7.11	6.77	6.80	6.73
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	11	11	16	18	13
	Turbidity (NTU)	0.23	0.18	0.18	0.18	0.27
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	3.9	7.6	7.8	6.8	5.1
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	3.9	7.6	7.8	6.8	5.1
	Ammonia as N (mg/L)	<0.0050	<0.0050	0.0075	<0.0050	0.0074
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	0.55
	Fluoride (F) (mg/L)	0.043	0.029	0.029	0.029	0.045
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.217	0.121	<0.050	0.188	0.092
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	0.0021	<0.0020	<0.0020	0.0031
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.42	1.30	1.31	1.31	0.72
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.00	1.18	1.10	0.94	1.57
	Total Organic Carbon (mg/L)	1.19	1.25	1.15	1.16	1.69
Total Metals	Aluminum (Al)-Total (mg/L)	0.0094	0.0059	0.0057	0.0070	0.0135
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.31	2.07	2.13	2.15	1.08
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.037	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915577-21	L915577-22	L915577-23	L915577-24	L915577-25
Grouping Analyte						
WATER						
Physical Tests	Conductivity (uS/cm)	14.3	14.2	14.2	14.3	14.2
	Hardness (as CaCO3) (mg/L)	5.18	5.21	5.17	5.17	5.22
	pH (pH)	6.67	6.66	6.69	6.77	6.68
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	11	13	11	<10	<10
	Turbidity (NTU)	0.31	0.29	0.29	0.28	0.28
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.9	4.6	4.4	4.9	4.9
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.9	4.6	4.4	4.9	4.9
	Ammonia as N (mg/L)	0.0087	0.0070	0.0099	0.0109	0.0052
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.56	0.55	0.56	0.56	0.55
	Fluoride (F) (mg/L)	0.046	0.045	0.045	0.045	0.045
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.189	0.131	0.150	0.053	0.089
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0025	0.0026	0.0030	0.0026	0.0023
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	0.72	0.71	0.73	0.72	0.72
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.35	1.34	1.60	1.54	1.54
	Total Organic Carbon (mg/L)	1.79	1.54	1.77	1.58	1.95
Total Metals	Aluminum (Al)-Total (mg/L)	0.0143	0.0136	0.0144	0.0142	0.0134
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.09	1.08	1.08	1.09	1.08
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.034	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915577-26	L915577-27	L915577-28	L915577-29	L915577-30
		22-JUL-10				21-JUL-10
		INUG-16-S	JULY-DUP-2	JUL-DUP-3	TRAVEL BLANK	JULY EB 3
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	14.2	25.8	18.3	<2.0	<2.0
	Hardness (as CaCO3) (mg/L)	5.18	12.0	8.02	<0.50	<0.50
	pH (pH)	6.66	7.22	6.72	5.68	5.70
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	11	21	17	<10	<10
	Turbidity (NTU)	0.33	0.31	0.19	<0.10	0.30
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	5.5	9.2	7.1	<2.0	<2.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	5.5	9.2	7.1	<2.0	<2.0
	Ammonia as N (mg/L)	0.0065	0.0136	0.0074	0.0145 ^{RRV}	0.0356
	Bromide (Br) (mg/L)	<0.050	<0.050	0.416	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.55	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.045	0.032	0.028	<0.020	<0.020
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	0.0010
	Total Kjeldahl Nitrogen (mg/L)	<0.050	0.055	0.084		<0.050
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0024	0.0039	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	0.73	2.07	1.31	<0.50	<0.50
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.44	1.68	1.16		<0.50
	Total Organic Carbon (mg/L)	1.45	1.55	1.11	<0.50	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	0.0137	0.0111	0.0054	<0.0050	<0.0050
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.09	3.28	2.11	<0.10	<0.10
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	0.0014
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.00092

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915577-1	L915577-2	L915577-3	L915577-4	L915577-5
		18-JUL-10	18-JUL-10	18-JUL-10	19-JUL-10	19-JUL-10
		TPS-20-S	TPS-21-S	TPS-22-S	WAL-8-S	WAL-9-S
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.54	0.54	0.53	0.89	0.92
	Manganese (Mn)-Total (mg/L)	0.00120	0.00127	0.00128	0.00197	0.00219
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0072
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	0.00058	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.27	1.27	1.28	3.28	3.32
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	0.0016
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.53	0.53	0.54	0.90	0.93
	Manganese (Mn)-Dissolved (mg/L)	0.00090	0.00101	0.00089	0.00151	0.00216
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915577-6	L915577-7	L915577-8	L915577-9	L915577-10
		19-JUL-10	20-JUL-10	20-JUL-10	20-JUL-10	20-JUL-10
		WAL-10-S	TE-26-S	TE-26-INT	TE-26-D	TE-27-S
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.89	0.68	0.70	0.67	0.67
	Manganese (Mn)-Total (mg/L)	0.00202	0.00205	0.00225	0.00246	0.00231
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	0.0165	0.0134	0.0146	0.0122
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	3.22	2.07	2.07	1.95	1.93
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.90	0.69	0.69	0.66	0.65
	Manganese (Mn)-Dissolved (mg/L)	0.00143	0.00181	0.00182	0.00215	0.00197
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L915577-11	L915577-12	L915577-13	L915577-14	L915577-15
		Description					
		Sampled Date	20-JUL-10	20-JUL-10	20-JUL-10	20-JUL-10	20-JUL-10
		Sampled Time					
		Client ID	TE-27-INT	TE-27-D	TE-28-S	TEFF-8-S	TEFF-9-S
Grouping	Analyte						
WATER							
Total Metals	Lithium (Li)-Total (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)		0.70	0.65	0.69	0.58	0.54
	Manganese (Mn)-Total (mg/L)		0.00213	0.00259	0.00230	0.00228	0.00235
	Mercury (Hg)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)		<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)		<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		0.0159	0.0135	0.0156	0.0074	<0.0050
	Antimony (Sb)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)		<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)		2.11	1.88	2.02	1.60	1.40
	Chromium (Cr)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)		<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)		0.70	0.64	0.67	0.57	0.52
	Manganese (Mn)-Dissolved (mg/L)		0.00183	0.00233	0.00173	0.00199	0.00226
	Mercury (Hg)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915577-16	L915577-17	L915577-18	L915577-19	L915577-20
		20-JUL-10	21-JUL-10	21-JUL-10	21-JUL-10	22-JUL-10
		TEFF-10-S	PDL-8-S	PDL-9-S	PDL-10-S	INUG-14-S
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.50	0.69	0.71	0.71	0.62
	Manganese (Mn)-Total (mg/L)	0.00259	0.00144	0.00158	0.00147	0.00436
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0059
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.28	2.09	2.08	2.13	1.05
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.49	0.69	0.69	0.71	0.60
	Manganese (Mn)-Dissolved (mg/L)	0.00225	0.00137	0.00136	0.00125	0.00297
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915577-21	L915577-22	L915577-23	L915577-24	L915577-25
		22-JUL-10	22-JUL-10	22-JUL-10	22-JUL-10	22-JUL-10
		INUG-14-INT	INUG-14-D	INUG-15-S	INUG-15-INT	INUG-15-D
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.62	0.62	0.62	0.62	0.62
	Manganese (Mn)-Total (mg/L)	0.00448	0.00437	0.00436	0.00424	0.00458
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0053	<0.0050	0.0057	0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.07	1.07	1.06	1.06	1.07
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.61	0.62	0.61	0.61	0.62
	Manganese (Mn)-Dissolved (mg/L)	0.00282	0.00275	0.00277	0.00278	0.00281
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915577-26	L915577-27	L915577-28	L915577-29	L915577-30
		22-JUL-10				21-JUL-10
		INUG-16-S	JULY-DUP-2	JUL-DUP-3	TRAVEL BLANK	JULY EB 3
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.62	0.93	0.71	<0.10	<0.10
	Manganese (Mn)-Total (mg/L)	0.00420	0.00237	0.00146	<0.00030	<0.00030
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050		<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020		<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10		<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017		<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.06	3.28	2.07		<0.10
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030		<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010		<0.0010		<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030		<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050		<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.61	0.93	0.69		<0.10
	Manganese (Mn)-Dissolved (mg/L)	0.00275	0.00166	0.00136		<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010		<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0		<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L915577-1	L915577-2	L915577-3	L915577-4	L915577-5
		Description					
		Sampled Date	18-JUL-10	18-JUL-10	18-JUL-10	19-JUL-10	19-JUL-10
		Sampled Time					
		Client ID	TPS-20-S	TPS-21-S	TPS-22-S	WAL-8-S	WAL-9-S
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.110	0.294	0.326	0.240	0.260	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L915577-6	L915577-7	L915577-8	L915577-9	L915577-10
		Description					
		Sampled Date	19-JUL-10	20-JUL-10	20-JUL-10	20-JUL-10	20-JUL-10
		Sampled Time					
		Client ID	WAL-10-S	TE-26-S	TE-26-INT	TE-26-D	TE-27-S
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.222	0.416	0.523	0.560	0.602	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L915577-11	L915577-12	L915577-13	L915577-14	L915577-15
		Description					
		Sampled Date	20-JUL-10	20-JUL-10	20-JUL-10	20-JUL-10	20-JUL-10
		Sampled Time					
		Client ID	TE-27-INT	TE-27-D	TE-28-S	TEFF-8-S	TEFF-9-S
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Plant Pigments	Chlorophyll a (ug/L)	0.487	0.497	0.384	0.103	0.196	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L915577-16	L915577-17	L915577-18	L915577-19	L915577-20
		Description					
		Sampled Date	20-JUL-10	21-JUL-10	21-JUL-10	21-JUL-10	22-JUL-10
		Sampled Time					
		Client ID	TEFF-10-S	PDL-8-S	PDL-9-S	PDL-10-S	INUG-14-S
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.272	0.430	0.555	0.719	0.383	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915577-21	L915577-22	L915577-23	L915577-24	L915577-25
		22-JUL-10	22-JUL-10	22-JUL-10	22-JUL-10	22-JUL-10
		INUG-14-INT	INUG-14-D	INUG-15-S	INUG-15-INT	INUG-15-D
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.303	0.381	0.343	0.489	0.475

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L915577-26	L915577-27	L915577-28	L915577-29	L915577-30
		Description					
		Sampled Date	22-JUL-10				21-JUL-10
		Sampled Time					
		Client ID	INUG-16-S	JULY-DUP-2	JUL-DUP-3	TRAVEL BLANK	JULY EB 3
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020			<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0			<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020			<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010			<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020			<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010			<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050			<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.354	0.369	0.592			

* 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**
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite 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". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate 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". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
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".			
C-DIS-ORG-LOW-CL	Water	Dissolved Organic Carbon	APHA 5310 C-Instrumental
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
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 is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
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-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	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			

Reference Information

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

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-ICP-VA Water Total Metals in Water by ICPOES (CCME) 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOTKJ-LOW-ED Water Total Kjeldahl Nitrogen- Low Level APHA 4500Norg C-Dig.-Auto-Colorimetry

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 "Nitrogen (Ammonia)"

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

NH3-COL-VA Water Ammonia by Colour APHA 4500-NH3 Nitrogen (Ammonia)

This analysis is carried out, on unpreserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using the phenate colourimetric method.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

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

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

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

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

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

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

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

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

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

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

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

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

Reference Information

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
SILICATE-COL-VA	Water	Silicate by Colourimetric analysis	APHA 4500-SiO2 D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
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
ED	ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - 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 wwt milligrams per kilogram based on wet weight of sample.

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

mg/L milligrams per litre.

< - Less than.

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

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

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

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

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

Report to:			Report Format / Distribution			Service Requested:		
Company: Azimuth Consulting Group Inc.			☒ Standard ☐ Other			☒ Regular Service (Default)		
Contact: Maggie McConnell			☒ PDF ☒ Excel ☐ Fax			☐ Rush Service (2-3 Days)		
Address: 218 - 2902 West Broadway, Vancouver, BC, V6K 2G8			Email 1: mmcmcconnell@azimuthgroup.ca			☐ Priority Service (1 Day or ASAP)		
Phone: 604-730-1220 Fax:			Email 2: gmann@azimuthgroup.ca			☐ Emergency Service (<1 Day / Weekend) - Contact ALS		
Invoice To: ☒ Same as Report			Indicate Bottles: Filtered / Preserved (F/P) →			Analysis Request		
Company:			Client / Project Information:					
Contact:			Job #:			Meadowbank Mine CREMP		
Address:			PO/AFE:					
Sample			Legal Site Description:					
Phone:			Quote #:			Q24230		
Lab Work Order # (lab use only)			ALS Contact:			Sampler (Initials):		
6915577			Natasha MM			mnm, MF		
Sample Identification (This description will appear on the report)			Date		Time hh:mm	Sample Type (Selected from drop-down list)		
TPS-20-S			18-Jul-10			Water		X
TPS-21-S			18-Jul-10			Water		X
TPS-22-S			18-Jul-10			Water		X
WAL-8-S			19-Jul-10			Water		X
WAL-9-S			19-Jul-10			Water		X
WAL-10-S			19-Jul-10			Water		X
TE-26-S			20-Jul-10			Water		X
TE-26-INT			20-Jul-10			Water		X
TE-26-D			20-Jul-10			Water		X
TE-27-S			20-Jul-10			Water		X
Guidelines / Regulations			Special Instructions / Hazardous Details					
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.								
Reinquired By			Date & Time		Received By		Date & Time	
Maggie			25-Jul-10		Jessica P		09:00 Aug 3	
Reinquired By			Date & Time		Received By		Date & Time	
Temperature			Sample Condition (lab use only)					
10°C			Samples Received in Good Condition? Y / N (if no provided details)					

Short Holding Time



Chain of Custody / Ana
Canada Toll Free:
www.alsglobal.com

Rush Processing

COC #

Page 2 of 3

Report to:		Report Format / Distribution		Service Requested:	
Company: Azimuth Consulting Group Inc.		☒ Standard ☐ Other		☒ Regular Service (Default)	
Contact: Maggie McConnell		☒ PDF ☒ Excel ☐ Fax		☐ Rush Service (2-3 Days)	
Address: 218 - 2902 West Broadway, Vancouver, BC, V6K 2G8		Email 1: mmcmcc@azimuthgroup.ca		☐ Priority Service (1 Day or ASAP)	
Phone: 604-730-1220 Fax:		Email 2: gmann@azimuthgroup.ca		☐ Emergency Service (<1 Day / Weekend) - Contact ALS	
Invoice To: ☒ Same as Report		Indicate Bottles Filled / Preserved (F/P) -->		Analysis Request	
Company:		Client / Project Information:			
Contact:		Job #:			
Address:		PO/A/E:			
Sample:		Legal Site Description:			
Phone:		Quote #: Q24230			
Fax:					
Lab Work Order # (lab use only) 191577		ALS		Sampler (Initials) MLM, MF	
Sample Identification (This description will appear on the report)		Date		Time	
		dd-mm-yy		hh:mm	
				Sample Type (Select from drop-down list)	
11 TE-27-INT		20-Jul-10		Water	
12 TE-27-D		20-Jul-10		Water	
13 TE-28-S		20-Jul-10		Water	
14 TEFF-8-S		20-Jul-10		Water	
15 TEFF-9-S		20-Jul-10		Water	
16 TEFF-10-S		20-Jul-10		Water	
17 PDL-8-S		21-Jul-10		Water	
18 PDL-9-S		21-Jul-10		Water	
19 PDL-10-S		21-Jul-10		Water	
20 INUG-14-S		22-Jul-10		Water	
Guidelines / Regulations		Special Instructions / Hazardous Details			
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.					
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.					
Reinquisitioned By: <i>Maggie</i>		Date & Time: 25-Jul-10		Received By:	
Reinquisitioned By: <i>Maggie</i>		Date & Time:		Received By:	
Temperature		Sample Condition (lab use only)		Samples Received in Good Condition? Y / N (if no provided details)	

www.alsglobal.com

McConnell



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: MAGGIE McCONNELL

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 18-AUG-10 11:18 (MT)

Version: FINAL

Lab Work Order #: L915089

Date Received: 30-JUL-10

Project P.O. #: NOT SUBMITTED

Job Reference: MEADOWBANK MINE CREMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments:



Natasha Markovic-Mirovic
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915089-1	L915089-2	L915089-3	L915089-4	L915089-5
		26-JUL-10	26-JUL-10	26-JUL-10	27-JUL-10	27-JUL-10
		BBD-8-S	BBD-9-S	BBD-10-S	BPJ-8-S	BPJ-9-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	22.9	27.9	28.0	26.0	24.9
	Hardness (as CaCO3) (mg/L)	9.89	10.5	10.5	10.3	10.2
	pH (pH)	6.73	6.70	6.74	6.75	6.78
	Total Suspended Solids (mg/L)	<1.0	1.0	1.0	<1.0	1.0
	Total Dissolved Solids (mg/L)	15	16	16	16	17
	Turbidity (NTU)	0.47	0.49	0.50	0.46	0.50
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	8.7	7.9	7.6	8.0	8.4
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	8.7	7.9	7.6	8.0	8.4
	Ammonia as N (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	1.60	2.80	3.00	2.39	2.04
	Fluoride (F) (mg/L)	0.048	0.047	0.047	0.047	0.048
	Nitrate (as N) (mg/L)	0.0057	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.088	<0.050	<0.050	<0.050	0.058
	Ortho Phosphate as P (mg/L)	0.0014	<0.0010	0.0012	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0047	0.0042	0.0045	0.0050	0.0046
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	0.62	0.87	0.90	0.82	0.75
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.50	2.36	2.35	2.37	2.37
	Total Organic Carbon (mg/L)	2.43 ^{RRV}	2.39	2.34 ^{RRV}	2.40	2.64
Total Metals	Aluminum (Al)-Total (mg/L)	0.0162	0.0171	0.0183	0.0168	0.0174
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.34	2.42	2.38	2.38	2.38
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L915089-6	L915089-7	L915089-8	L915089-9	L915089-10
		Description					
		Sampled Date	27-JUL-10	26-JUL-10	26-JUL-10	26-JUL-10	
		Sampled Time					
		Client ID	BPJ-10-S	BAP-8-S	BAP-9-S	BAP-10-S	JUL DUP-4
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		23.2	33.6	34.0	34.0	34.3
	Hardness (as CaCO3) (mg/L)		10.0	11.0	11.0	11.0	11.0
	pH (pH)		6.89	6.98	7.03	7.02	7.08
	Total Suspended Solids (mg/L)		<1.0	1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)		13	20	20	19	18
	Turbidity (NTU)		0.45	0.55	0.58	0.60	0.55
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		7.6	8.2	7.9	8.0	7.9
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)		7.6	8.2	7.9	8.0	7.9
	Ammonia as N (mg/L)		<0.010	<0.010	<0.010	<0.010	<0.010
	Bromide (Br) (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)		1.62	4.21	4.18	4.27	4.20
	Fluoride (F) (mg/L)		0.048	0.044	0.041	0.043	0.041
	Nitrate (as N) (mg/L)		0.0061	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)		0.071	0.083	<0.050	0.066	<0.050
	Ortho Phosphate as P (mg/L)		<0.0010	0.0011	<0.0010	0.0012	<0.0010
	Total Phosphate as P (mg/L)		0.0042	0.0045	0.0040	0.0036	0.0038
	Silicate (as SiO2) (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)		0.64	1.31	1.51	1.35	1.50
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		2.24	2.07	2.16	2.20	2.08
	Total Organic Carbon (mg/L)		2.41	2.12	2.22	2.20 ^{RRV}	2.11
Total Metals	Aluminum (Al)-Total (mg/L)		0.0181	0.0224	0.0189	0.0196	0.0194
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)		<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)		2.33	2.56	2.62	2.57	2.62
	Chromium (Cr)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)		<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
		L915089-11		L915089-12		
				27-JUL-10		
		TRAVEL BLANK		JULY EB-4		
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	<2.0	<2.0			
	Hardness (as CaCO3) (mg/L)		<0.50			
	pH (pH)	5.49	5.60			
	Total Suspended Solids (mg/L)	<1.0	<1.0			
	Total Dissolved Solids (mg/L)	<10	<10			
	Turbidity (NTU)	<0.10	0.26			
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	<2.0			
	Ammonia as N (mg/L)		0.033			
	Bromide (Br) (mg/L)	<0.050	<0.050			
	Chloride (Cl) (mg/L)	<0.50	<0.50			
	Fluoride (F) (mg/L)	<0.020	<0.020			
	Nitrate (as N) (mg/L)	<0.0050	<0.0050			
	Nitrite (as N) (mg/L)	<0.0010	<0.0010			
	Total Kjeldahl Nitrogen (mg/L)		<0.050			
	Ortho Phosphate as P (mg/L)	<0.0010	0.0011			
	Total Phosphate as P (mg/L)	<0.0020	<0.0020			
	Silicate (as SiO2) (mg/L)	<1.0	<1.0			
	Sulfate (SO4) (mg/L)	<0.50	<0.50			
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)	<0.0050	<0.0050			
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050			
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050			
	Barium (Ba)-Total (mg/L)	<0.020	<0.020			
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010			
	Boron (B)-Total (mg/L)	<0.10	<0.10			
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017			
	Calcium (Ca)-Total (mg/L)	<0.10	<0.10			
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010			
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030			
	Copper (Cu)-Total (mg/L)	<0.0010	0.0020			
	Iron (Fe)-Total (mg/L)	<0.030	<0.030			
	Lead (Pb)-Total (mg/L)	<0.00050	0.00107			

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915089-1	L915089-2	L915089-3	L915089-4	L915089-5
		26-JUL-10	26-JUL-10	26-JUL-10	27-JUL-10	27-JUL-10
		BBD-8-S	BBD-9-S	BBD-10-S	BPJ-8-S	BPJ-9-S
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	1.02	1.10	1.09	1.06	1.05
	Manganese (Mn)-Total (mg/L)	0.00425	0.00367	0.00383	0.00396	0.00435
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0058	0.0066	0.0072	0.0078	0.0069
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.31	2.41	2.39	2.39	2.36
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	1.00	1.09	1.10	1.05	1.04
	Manganese (Mn)-Dissolved (mg/L)	0.00209	0.00156	0.00175	0.00178	0.00205
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L915089-6	L915089-7	L915089-8	L915089-9	L915089-10
		Description					
		Sampled Date	27-JUL-10	26-JUL-10	26-JUL-10	26-JUL-10	
		Sampled Time					
		Client ID	BPJ-10-S	BAP-8-S	BAP-9-S	BAP-10-S	JUL DUP-4
Grouping	Analyte						
WATER							
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
	Magnesium (Mg)-Total (mg/L)	1.03	1.16	1.12	1.15	1.12	
	Manganese (Mn)-Total (mg/L)	0.00421	0.00315	0.00287	0.00313	0.00292	
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
	Sodium (Na)-Total (mg/L)	<2.0	2.5	2.4	2.5	2.3	
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0052	0.0065	0.0063	0.0059	0.0058	
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020	
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10	
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	
	Calcium (Ca)-Dissolved (mg/L)	2.32	2.53	2.58	2.53	2.58	
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Iron (Fe)-Dissolved (mg/L)	<0.030	0.040	<0.030	<0.030	<0.030	
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
	Magnesium (Mg)-Dissolved (mg/L)	1.02	1.13	1.11	1.13	1.10	
	Manganese (Mn)-Dissolved (mg/L)	0.00173	0.00107	0.00099	0.00110	0.00101	
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID			
		Description			
		Sampled Date			
		Sampled Time			
		Client ID			
		L915089-11	L915089-12		
			27-JUL-10		
		TRAVEL BLANK	JULY EB-4		
Grouping	Analyte				
WATER					
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050		
	Magnesium (Mg)-Total (mg/L)	<0.10	<0.10		
	Manganese (Mn)-Total (mg/L)	<0.00030	<0.00030		
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010		
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010		
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010		
	Potassium (K)-Total (mg/L)	<2.0	<2.0		
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010		
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020		
	Sodium (Na)-Total (mg/L)	<2.0	<2.0		
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020		
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050		
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010		
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020		
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010		
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050		
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		<0.0050		
	Antimony (Sb)-Dissolved (mg/L)		<0.00050		
	Arsenic (As)-Dissolved (mg/L)		<0.00050		
	Barium (Ba)-Dissolved (mg/L)		<0.020		
	Beryllium (Be)-Dissolved (mg/L)		<0.0010		
	Boron (B)-Dissolved (mg/L)		<0.10		
	Cadmium (Cd)-Dissolved (mg/L)		<0.000017		
	Calcium (Ca)-Dissolved (mg/L)		<0.10		
	Chromium (Cr)-Dissolved (mg/L)		<0.0010		
	Cobalt (Co)-Dissolved (mg/L)		<0.00030		
	Copper (Cu)-Dissolved (mg/L)		<0.0010		
	Iron (Fe)-Dissolved (mg/L)		<0.030		
	Lead (Pb)-Dissolved (mg/L)		<0.00050		
	Lithium (Li)-Dissolved (mg/L)		<0.0050		
	Magnesium (Mg)-Dissolved (mg/L)		<0.10		
	Manganese (Mn)-Dissolved (mg/L)		<0.00030		
	Mercury (Hg)-Dissolved (mg/L)		<0.000010		
	Molybdenum (Mo)-Dissolved (mg/L)		<0.0010		
	Nickel (Ni)-Dissolved (mg/L)		<0.0010		
	Potassium (K)-Dissolved (mg/L)		<2.0		
	Selenium (Se)-Dissolved (mg/L)		<0.0010		

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915089-1	L915089-2	L915089-3	L915089-4	L915089-5
		26-JUL-10	26-JUL-10	26-JUL-10	27-JUL-10	27-JUL-10
		BBD-8-S	BBD-9-S	BBD-10-S	BPJ-8-S	BPJ-9-S
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	1.27	1.64	1.68	1.84	0.583

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915089-6	L915089-7	L915089-8	L915089-9	L915089-10
Grouping Analyte						
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	2.6	2.3	2.4	2.2
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	1.38	1.68	1.56	1.70	1.27

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L915089-11 TRAVEL BLANK	L915089-12 27-JUL-10 JULY EB-4			
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)		<0.000020			
	Sodium (Na)-Dissolved (mg/L)		<2.0			
	Thallium (Tl)-Dissolved (mg/L)		<0.00020			
	Tin (Sn)-Dissolved (mg/L)		<0.00050			
	Titanium (Ti)-Dissolved (mg/L)		<0.010			
	Uranium (U)-Dissolved (mg/L)		<0.00020			
	Vanadium (V)-Dissolved (mg/L)		<0.0010			
	Zinc (Zn)-Dissolved (mg/L)		<0.0050			
Plant Pigments	Chlorophyll a (ug/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**
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite 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". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate 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". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
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".			
C-DIS-ORG-LOW-CL	Water	Dissolved Organic Carbon	APHA 5310 C-Instrumental
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
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 is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
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-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	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			

Reference Information

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

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-ICP-VA Water Total Metals in Water by ICPOES (CCME) 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

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

This analysis is carried out, on sulphuric 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.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

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

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

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

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

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

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

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

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

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

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

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

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total

Reference Information

phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

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

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

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

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

TKN-COL-VA Water Total Kjeldahl Nitrogen by Auto. 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.

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

CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - 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.

Short Holding Time

Rush Processing

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

COC #

Page 1 of 2

ALS
ANALYTICAL SERVICES
Environmental Division



Report to:		Report Format / Distribution		Service Requested:	
Company: Azimuth Consulting Group Inc.		☒ Standard ☐ Other		☒ Regular Service (Default)	
Contact: Maggie McConnell		☒ PDF ☒ Excel ☐ Fax		☐ Rush Service (2-3 Days)	
Address: 218 - 2902 West Broadway, Vancouver, BC, V6K 2G8		Email 1: mmcconnell@azimuthgroup.ca		☐ Priority Service (1 Day or ASAP)	
Phone: 604-730-1220 Fax:		Email 2: gmann@azimuthgroup.ca		☐ Emergency Service (<1 Day / Wkend) - Contact ALS	
Invoice To: ☒ Same as Report		Indicate Bottles Filtered / Preserved (F/P) →		Analysis Request	
Company:				P F/P P P	
Contact:		Client / Project Information:		T-PO4, ortho-PO4	
Address:		Job #: Meadowbank Mine CREMP		Anion Scan, Si, Ph, EC	
Sample		PO/AFE:		Alk (SPECIATED)	
Phone:		Legal Site Description:		TDS, TSS-low	
Fax:		Quote #: Q24230		TKN, Ammonia	
Lab Work Order # (lab use only)		ALS Contact:		TOC, DOC (F)	
Sample #		Date		D-Metals (incl. Ph) (CCME)	
BBD-8-S		26-Jul-10		T-Metals (incl. Ph) (CCME)	
BBD-9-S		26-Jul-10		Turbidity	
BBD-10-S		26-Jul-10		Chlorophyll-a	
BPJ-8-S		27-Jul-10		T-PO4, ortho-PO4	
BPJ-9-S		27-Jul-10		Anion Scan, Si, Ph, EC	
BPJ-10-S		27-Jul-10		Alk (SPECIATED)	
BAP-8-S		26-Jul-10		TDS, TSS-low	
BAP-9-S		26-Jul-10		TKN, Ammonia	
BAP-10-S		26-Jul-10		TOC, DOC (F)	
July DUP-4		26-Jul-10		D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	
				Anion Scan, Si, Ph, EC	
				Alk (SPECIATED)	
				TDS, TSS-low	
				TKN, Ammonia	
				TOC, DOC (F)	
				D-Metals (incl. Ph) (CCME)	
				T-Metals (incl. Ph) (CCME)	
				Turbidity	
				Chlorophyll-a	
				T-PO4, ortho-PO4	

[illegible]



AZIMUTH CONSULTING GROUP INC.
ATTN: MAGGIE McCONNELL
218 - 2902 WEST BROADWAY
VANCOUVER BC V6K 2G8
Phone: 604-730-1220

Date Received: 30-AUG-10
Report Date: 22-SEP-10 14:39 (MT)
Version: FINAL

Certificate of Analysis

Lab Work Order #: L925795
Project P.O. #: NOT SUBMITTED
Job Reference: MEADOWBANK MINE CREMP
Legal Site Desc:
C of C Numbers:

Natasha Markovic-Mirovic
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 LIMITED Part of the ALS Group A Campbell Brothers Limited Company

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L925795-1	L925795-2	L925795-3	L925795-4	L925795-5
		19-AUG-10	19-AUG-10	19-AUG-10	19-AUG-10	19-AUG-10
		TPE-1	TPE-2	TPE-3	TPN-1	TPN-2
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	83.8	86.4	85.1	81.1	81.9
	pH (pH)	5.71	5.85	6.09	6.27	5.86
Particle Size	% Gravel (>2mm) (%)	<0.10	<0.10	<0.10	<0.10	<0.10
	% Sand (2.0mm - 0.063mm) (%)	3.57	1.63	3.57	22.7	22.4
	% Silt (0.063mm - 4um) (%)	72.3	82.9	86.5	71.9	66.7
	% Clay (<4um) (%)	24.2	15.5	9.95	5.41	10.9
Organic / Inorganic Carbon	Total Organic Carbon (%)	3.02	3.73	3.47	3.11	3.60
Metals	Aluminum (Al) (mg/kg)	25300	27600	26000	16900	18300
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	38.1	17.6	19.4	9.8	11.8
	Barium (Ba) (mg/kg)	125	132	125	64.5	74.7
	Beryllium (Be) (mg/kg)	1.81	1.95	1.92	0.99	1.22
	Cadmium (Cd) (mg/kg)	0.56	0.55	0.70	<0.50	<0.50
	Chromium (Cr) (mg/kg)	90.7	104	98.0	110	112
	Cobalt (Co) (mg/kg)	16.4	16.5	17.6	8.4	9.7
	Copper (Cu) (mg/kg)	51.5	57.1	55.0	50.3	59.4
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Mercury (Hg) (mg/kg)	0.0158	0.0145	0.0145	0.0483	0.0151
	Molybdenum (Mo) (mg/kg)	5.4	<4.0	4.5	<4.0	<4.0
	Nickel (Ni) (mg/kg)	64.9	87.9	83.0	54.1	61.2
	Selenium (Se) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg)	15.2	16.6	16.3	11.9	15.2
	Vanadium (V) (mg/kg)	37.3	42.9	40.3	30.6	31.5
	Zinc (Zn) (mg/kg)	95.9	113	107	69.3	79.6
Aggregate Organics	Mineral Oil and Grease (mg/kg)	<1400	<1700	<1600	<1100	<1200
Hydrocarbons	EPH10-19 (mg/kg)	<540	<620	<600	<370	<480
	EPH19-32 (mg/kg)	<540	<620	<600	<370	<480
	LEPH (mg/kg)	<540	<620	<600	<370	<480
	HEPH (mg/kg)	<540	<620	<600	<370	<480
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}
	Acenaphthylene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}
	Anthracene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L925795-6 19-AUG-10 TPN-3	L925795-7 20-AUG-10 TPS-1	L925795-8 20-AUG-10 TPS-2	L925795-9 20-AUG-10 TPS-3	L925795-10 21-AUG-10 SP-1
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	86.2	84.0	83.7	82.7	82.1
	pH (pH)	5.90	6.13	5.30	6.15	5.85
Particle Size	% Gravel (>2mm) (%)	<0.10	<0.10	<0.10	<0.10	<0.10
	% Sand (2.0mm - 0.063mm) (%)	11.6	13.6	6.80	14.2	1.72
	% Silt (0.063mm - 4um) (%)	73.7	77.8	76.3	61.4	66.3
	% Clay (<4um) (%)	14.7	8.60	17.0	24.4	32.0
Organic / Inorganic Carbon	Total Organic Carbon (%)	4.92	4.10	4.21	3.10	3.91
Metals	Aluminum (Al) (mg/kg)	22400	23600	27800	24800	33600
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	15.3	15.8	25.0	14.8	36.2
	Barium (Ba) (mg/kg)	94.9	106	128	93.7	148
	Beryllium (Be) (mg/kg)	1.47	1.47	1.76	1.46	2.52
	Cadmium (Cd) (mg/kg)	0.61	<0.50	0.92	<0.50	0.72
	Chromium (Cr) (mg/kg)	134	113	132	123	93.7
	Cobalt (Co) (mg/kg)	12.1	15.4	24.0	15.5	17.8
	Copper (Cu) (mg/kg)	77.4	60.9	81.6	73.4	107
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Mercury (Hg) (mg/kg)	0.0189	0.0250	0.0180	0.0465	0.0326
	Molybdenum (Mo) (mg/kg)	<4.0	<4.0	<4.0	<4.0	7.9
	Nickel (Ni) (mg/kg)	78.5	75.7	112	73.6	76.9
	Selenium (Se) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg)	19.5	15.1	20.6	17.1	25.1
	Vanadium (V) (mg/kg)	38.0	38.6	44.5	42.7	46.6
	Zinc (Zn) (mg/kg)	96.0	97.3	120	104	139
Aggregate Organics	Mineral Oil and Grease (mg/kg)	<1600	1460	<1300	<1300	<1200
Hydrocarbons	EPH10-19 (mg/kg)	<630	<600 ^{DLHM}	<600 ^{DLHM}	<560 ^{DLHM}	<550 ^{DLHM}
	EPH19-32 (mg/kg)	<630	<600 ^{DLHM}	<600 ^{DLHM}	<560 ^{DLHM}	<550 ^{DLHM}
	LEPH (mg/kg)	<630	<600	<600	<560	<550
	HEPH (mg/kg)	<630	<600	<600	<560	<550
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}
	Acenaphthylene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}
	Anthracene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L925795-11	L925795-12	L925795-13		
		Description					
		Sampled Date	21-AUG-10	21-AUG-10	21-AUG-10		
		Sampled Time					
		Client ID	SP-2	SP-3	DUP-1		
Grouping	Analyte						
SOIL							
Physical Tests	Moisture (%)		82.5	82.4	82.0		
	pH (pH)		5.63	6.17	5.89		
Particle Size	% Gravel (>2mm) (%)		<0.10	<0.10	<0.10		
	% Sand (2.0mm - 0.063mm) (%)		1.17	2.08	1.86		
	% Silt (0.063mm - 4um) (%)		68.8	64.6	66.9		
	% Clay (<4um) (%)		30.0	33.3	31.3		
Organic / Inorganic Carbon	Total Organic Carbon (%)		3.84	3.64	3.91		
Metals	Aluminum (Al) (mg/kg)		32000	35400	33100		
	Antimony (Sb) (mg/kg)		<10	<10	<10		
	Arsenic (As) (mg/kg)		70.3	41.9	36.7		
	Barium (Ba) (mg/kg)		140	157	147		
	Beryllium (Be) (mg/kg)		2.69	2.60	2.55		
	Cadmium (Cd) (mg/kg)		0.74	0.78	0.74		
	Chromium (Cr) (mg/kg)		89.6	97.6	95.0		
	Cobalt (Co) (mg/kg)		18.0	21.1	17.8		
	Copper (Cu) (mg/kg)		104	117	109		
	Lead (Pb) (mg/kg)		<30	<30	<30		
	Mercury (Hg) (mg/kg)		0.0249	0.0242	0.0313		
	Molybdenum (Mo) (mg/kg)		13.0	8.6	8.0		
	Nickel (Ni) (mg/kg)		64.8	89.4	77.4		
	Selenium (Se) (mg/kg)		<2.0	<2.0	<2.0		
	Silver (Ag) (mg/kg)		<2.0	<2.0	<2.0		
	Thallium (Tl) (mg/kg)		<1.0	<1.0	<1.0		
	Tin (Sn) (mg/kg)		<5.0	<5.0	<5.0		
	Uranium (U) (mg/kg)		25.1	23.9	25.0		
	Vanadium (V) (mg/kg)		43.6	49.3	46.2		
	Zinc (Zn) (mg/kg)		138	141	140		
Aggregate Organics	Mineral Oil and Grease (mg/kg)		<1200	<1200	<1200		
Hydrocarbons	EPH10-19 (mg/kg)	DLHM	<500	<500	<600	DLHM	
	EPH19-32 (mg/kg)	DLHM	<500	<500	<600	DLHM	
	LEPH (mg/kg)		<500	<500	<600		
	HEPH (mg/kg)		<500	<500	<600		
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	DLHM	<0.13	<0.13	<0.15	DLHM	
	Acenaphthylene (mg/kg)	DLHM	<0.13	<0.13	<0.15	DLHM	
	Anthracene (mg/kg)	DLHM	<0.13	<0.13	<0.15	DLHM	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L925795-1	L925795-2	L925795-3	L925795-4	L925795-5
		19-AUG-10	19-AUG-10	19-AUG-10	19-AUG-10	19-AUG-10
		TPE-1	TPE-2	TPE-3	TPN-1	TPN-2
Grouping	Analyte					
SOIL						
Polycyclic Aromatic Hydrocarbons	Benz(a)anthracene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}
	Benzo(a)pyrene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}
	Benzo(b)fluoranthene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}
	Benzo(g,h,i)perylene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}
	Benzo(k)fluoranthene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}
	Chrysene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}
	Dibenz(a,h)anthracene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}
	Fluoranthene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}
	Fluorene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}
	2-Methylnaphthalene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}
	Naphthalene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}
	Phenanthrene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}
	Pyrene (mg/kg)	<0.14 ^{DLHM}	<0.16 ^{DLHM}	<0.16 ^{DLHM}	<0.12 ^{DLHM}	<0.12 ^{DLHM}
	Surrogate: d10-Acenaphthene (SS) (%)	86	87	90	95	85
	Surrogate: d12-Chrysene (SS) (%)	66	72	73	76	70
	Surrogate: d8-Naphthalene (SS) (%)	79	84	88	90	82
	Surrogate: d10-Phenanthrene (SS) (%)	73	77	78	82	74

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L925795-6 19-AUG-10 TPN-3	L925795-7 20-AUG-10 TPS-1	L925795-8 20-AUG-10 TPS-2	L925795-9 20-AUG-10 TPS-3	L925795-10 21-AUG-10 SP-1
Grouping	Analyte					
SOIL						
Polycyclic Aromatic Hydrocarbons	Benz(a)anthracene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}
	Benzo(a)pyrene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}
	Benzo(b)fluoranthene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}
	Benzo(g,h,i)perylene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}
	Benzo(k)fluoranthene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}
	Chrysene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}
	Dibenz(a,h)anthracene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}
	Fluoranthene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}
	Fluorene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}
	2-Methylnaphthalene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}
	Naphthalene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}
	Phenanthrene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}
	Pyrene (mg/kg)	<0.16 ^{DLHM}	<0.15 ^{DLHM}	<0.16 ^{DLHM}	<0.14 ^{DLHM}	<0.14 ^{DLIS}
	Surrogate: d10-Acenaphthene (SS) (%)	96	96	106	105	90
	Surrogate: d12-Chrysene (SS) (%)	78	78	86	84	81
	Surrogate: d8-Naphthalene (SS) (%)	90	69	102	103	95
	Surrogate: d10-Phenanthrene (SS) (%)	83	89	97	94	92

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L925795-11	L925795-12	L925795-13		
Grouping Analyte						
SOIL						
Polycyclic Aromatic Hydrocarbons	Benz(a)anthracene (mg/kg)	<0.13 ^{DLHM}	<0.13 ^{DLHM}	<0.15 ^{DLHM}		
	Benzo(a)pyrene (mg/kg)	<0.13 ^{DLHM}	<0.13 ^{DLHM}	<0.15 ^{DLHM}		
	Benzo(b)fluoranthene (mg/kg)	<0.13 ^{DLHM}	<0.13 ^{DLHM}	<0.15 ^{DLHM}		
	Benzo(g,h,i)perylene (mg/kg)	<0.13 ^{DLHM}	<0.13 ^{DLHM}	<0.15 ^{DLHM}		
	Benzo(k)fluoranthene (mg/kg)	<0.13 ^{DLHM}	<0.13 ^{DLHM}	<0.15 ^{DLHM}		
	Chrysene (mg/kg)	<0.13 ^{DLHM}	<0.13 ^{DLHM}	<0.15 ^{DLHM}		
	Dibenz(a,h)anthracene (mg/kg)	<0.13 ^{DLHM}	<0.13 ^{DLHM}	<0.15 ^{DLHM}		
	Fluoranthene (mg/kg)	<0.13 ^{DLHM}	<0.13 ^{DLHM}	<0.15 ^{DLHM}		
	Fluorene (mg/kg)	<0.13 ^{DLHM}	<0.13 ^{DLHM}	<0.15 ^{DLHM}		
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.13 ^{DLHM}	<0.13 ^{DLHM}	<0.15 ^{DLHM}		
	2-Methylnaphthalene (mg/kg)	<0.13 ^{DLHM}	<0.13 ^{DLHM}	<0.15 ^{DLHM}		
	Naphthalene (mg/kg)	<0.13 ^{DLHM}	<0.13 ^{DLHM}	<0.15 ^{DLHM}		
	Phenanthrene (mg/kg)	<0.13 ^{DLHM}	<0.13 ^{DLHM}	<0.15 ^{DLHM}		
	Pyrene (mg/kg)	<0.13 ^{DLHM}	<0.13 ^{DLHM}	<0.15 ^{DLHM}		
	Surrogate: d10-Acenaphthene (SS) (%)	101	103	102		
	Surrogate: d12-Chrysene (SS) (%)	80	83	83		
	Surrogate: d8-Naphthalene (SS) (%)	89	101	103		
	Surrogate: d10-Phenanthrene (SS) (%)	93	91	93		

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
SWAB						
Metals	Aluminum (Al)-Total (mg)	<0.020				
	Antimony (Sb)-Total (mg)	<0.020				
	Arsenic (As)-Total (mg)	<0.020				
	Barium (Ba)-Total (mg)	<0.0010				
	Beryllium (Be)-Total (mg)	<0.00050				
	Bismuth (Bi)-Total (mg)	<0.020				
	Cadmium (Cd)-Total (mg)	<0.0010				
	Calcium (Ca)-Total (mg)	0.0298				
	Chromium (Cr)-Total (mg)	0.0042				
	Cobalt (Co)-Total (mg)	<0.0010				
	Copper (Cu)-Total (mg)	<0.0010				
	Iron (Fe)-Total (mg)	0.0352				
	Lead (Pb)-Total (mg)	<0.0050				
	Lithium (Li)-Total (mg)	<0.0010				
	Magnesium (Mg)-Total (mg)	0.012				
	Manganese (Mn)-Total (mg)	0.00120				
	Molybdenum (Mo)-Total (mg)	<0.0030				
	Nickel (Ni)-Total (mg)	<0.0050				
	Phosphorus (P)-Total (mg)	<0.030				
	Potassium (K)-Total (mg)	<0.20				
	Selenium (Se)-Total (mg)	<0.020				
	Silver (Ag)-Total (mg)	<0.0010				
	Sodium (Na)-Total (mg)	<0.20				
	Strontium (Sr)-Total (mg)	<0.00050				
	Thallium (Tl)-Total (mg)	<0.020				
	Tin (Sn)-Total (mg)	<0.0030				
	Titanium (Ti)-Total (mg)	<0.0010				
	Vanadium (V)-Total (mg)	<0.0030				
	Zinc (Zn)-Total (mg)	<0.00070				

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L925795-15	L925795-16	L925795-17	L925795-18	L925795-19
		Description					
		Sampled Date	18-AUG-10	19-AUG-10	20-AUG-10	21-AUG-10	
		Sampled Time					
		Client ID	TPE-29-S	TPN-29-S	TPS-23-S	SP-29-S	AUG-DUP-1
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		18.9	15.3	15.2	23.1	23.1
	Hardness (as CaCO3) (mg/L)		7.32	5.67	5.62	9.77	9.72
	pH (pH)		6.83	6.51	6.53	7.11	7.11
	Total Suspended Solids (mg/L)		4.1	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)		12	<10	<10	<10	12
	Turbidity (NTU)		4.57	0.37	0.31	0.54	0.47
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		5.6	4.3	4.4	7.3	7.9
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)		5.6	4.3	4.4	7.3	7.9
	Ammonia as N (mg/L)		0.0078	<0.0050	<0.0050	<0.0050	<0.0050
	Bromide (Br) (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)		<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)		0.057	0.048	0.048	0.049	0.050
	Nitrate (as N) (mg/L)		0.0471	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)		0.058	0.067	0.051	0.061	0.063
	Ortho Phosphate as P (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)		0.0040	0.0021	0.0022	0.0027	0.0025
	Silicate (as SiO2) (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)		1.52	1.42	1.39	1.93	1.94
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		1.34	1.37	1.54	1.72	1.66
	Total Organic Carbon (mg/L)		1.27	1.36	1.54	1.72	1.72
Total Metals	Aluminum (Al)-Total (mg/L)		0.214	0.0147	0.0177	0.0241	0.0260
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)		0.00081	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)		<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)		1.79	1.30	1.28	2.47	2.48
	Chromium (Cr)-Total (mg/L)		0.0013	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)		0.283	<0.030	<0.030	0.032	0.032
	Lead (Pb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L925795-20 TRAVEL BLANK	L925795-21 21-AUG-10 AUG EB-1		
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	2.1	<2.0			
	Hardness (as CaCO3) (mg/L)	<0.50	<0.50			
	pH (pH)	5.60	5.67			
	Total Suspended Solids (mg/L)	<1.0	<1.0			
	Total Dissolved Solids (mg/L)	<10	<10			
	Turbidity (NTU)	<0.10	0.25			
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	<2.0			
	Ammonia as N (mg/L)	<0.0050	0.0246			
	Bromide (Br) (mg/L)	<0.050	<0.050			
	Chloride (Cl) (mg/L)	<0.50	<0.50			
	Fluoride (F) (mg/L)	<0.020	<0.020			
	Nitrate (as N) (mg/L)	<0.0050	<0.0050			
	Nitrite (as N) (mg/L)	<0.0010	<0.0010			
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050			
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010			
	Total Phosphate as P (mg/L)	<0.0020	<0.0020			
	Silicate (as SiO2) (mg/L)	<1.0	<1.0			
	Sulfate (SO4) (mg/L)	<0.50	<0.50			
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		0.57			
	Total Organic Carbon (mg/L)	<0.50	0.67			
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	<0.0050			
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050			
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050			
	Barium (Ba)-Total (mg/L)	<0.020	<0.020			
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010			
	Boron (B)-Total (mg/L)	<0.10	<0.10			
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017			
	Calcium (Ca)-Total (mg/L)	<0.10	<0.10			
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010			
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030			
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010			
	Iron (Fe)-Total (mg/L)	<0.030	<0.030			
	Lead (Pb)-Total (mg/L)	<0.00050	0.00096			

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L925795-15	L925795-16	L925795-17	L925795-18	L925795-19
		18-AUG-10	19-AUG-10	20-AUG-10	21-AUG-10	
		TPE-29-S	TPN-29-S	TPS-23-S	SP-29-S	AUG-DUP-1
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.80	0.58	0.56	0.83	0.84
	Manganese (Mn)-Total (mg/L)	0.00642	0.00174	0.00153	0.00136	0.00139
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	0.0012	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.00022	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	0.00063	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.78	1.32	1.32	2.53	2.52
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.70	0.57	0.57	0.83	0.83
	Manganese (Mn)-Dissolved (mg/L)	0.00123	0.00065	0.00051	<0.00030	0.00039
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L925795-20 TRAVEL BLANK	L925795-21 21-AUG-10 AUG EB-1			
Grouping	Analyte						
WATER							
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050				
	Magnesium (Mg)-Total (mg/L)	<0.10	<0.10				
	Manganese (Mn)-Total (mg/L)	<0.00030	<0.00030				
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010				
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010				
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010				
	Potassium (K)-Total (mg/L)	<2.0	<2.0				
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010				
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020				
	Sodium (Na)-Total (mg/L)	<2.0	<2.0				
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020				
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050				
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010				
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020				
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010				
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050				
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		<0.0050				
	Antimony (Sb)-Dissolved (mg/L)		<0.00050				
	Arsenic (As)-Dissolved (mg/L)		<0.00050				
	Barium (Ba)-Dissolved (mg/L)		<0.020				
	Beryllium (Be)-Dissolved (mg/L)		<0.0010				
	Boron (B)-Dissolved (mg/L)		<0.10				
	Cadmium (Cd)-Dissolved (mg/L)		<0.000017				
	Calcium (Ca)-Dissolved (mg/L)		<0.10				
	Chromium (Cr)-Dissolved (mg/L)		<0.0010				
	Cobalt (Co)-Dissolved (mg/L)		<0.00030				
	Copper (Cu)-Dissolved (mg/L)		<0.0010				
	Iron (Fe)-Dissolved (mg/L)		<0.030				
	Lead (Pb)-Dissolved (mg/L)		<0.00050				
	Lithium (Li)-Dissolved (mg/L)		<0.0050				
	Magnesium (Mg)-Dissolved (mg/L)		<0.10				
	Manganese (Mn)-Dissolved (mg/L)		<0.00030				
	Mercury (Hg)-Dissolved (mg/L)		<0.000010				
	Molybdenum (Mo)-Dissolved (mg/L)		<0.0010				
	Nickel (Ni)-Dissolved (mg/L)		<0.0010				
	Potassium (K)-Dissolved (mg/L)		<2.0				
	Selenium (Se)-Dissolved (mg/L)		<0.0010				

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L925795-15	L925795-16	L925795-17	L925795-18	L925795-19
		Description					
		Sampled Date	18-AUG-10	19-AUG-10	20-AUG-10	21-AUG-10	
		Sampled Time					
		Client ID	TPE-29-S	TPN-29-S	TPS-23-S	SP-29-S	AUG-DUP-1
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.415	0.453	0.622	0.629	0.607	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L925795-20 TRAVEL BLANK	L925795-21 21-AUG-10 AUG EB-1			
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)		<0.000020			
	Sodium (Na)-Dissolved (mg/L)		<2.0			
	Thallium (Tl)-Dissolved (mg/L)		<0.00020			
	Tin (Sn)-Dissolved (mg/L)		<0.00050			
	Titanium (Ti)-Dissolved (mg/L)		<0.010			
	Uranium (U)-Dissolved (mg/L)		<0.00020			
	Vanadium (V)-Dissolved (mg/L)		<0.0010			
	Zinc (Zn)-Dissolved (mg/L)		<0.0050			
Plant Pigments	Chlorophyll a (ug)					

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

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLHM	Detection Limit Adjusted: Sample has High Moisture Content
DLIS	Detection Limit Adjusted: Insufficient Sample

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
AL-CSR-ICP-VA	Soil	Al in Soil by ICPOES (CSR SALM)	BCMELP CSR SALM Method 8
This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B). Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite 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". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate 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". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
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".			
C-DIS-ORG-LOW-CL	Water	Dissolved Organic Carbon	APHA 5310 C-Instrumental
C-TOT-ORG-LECO-SK	Soil	Organic Carbon by combustion method	SSSA (1996) p. 973
Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK) Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight loss after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations. Reference for Total C: Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5 Reference for Inorganic C: Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5			
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0

Reference Information

Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.

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.

EPH-TUMB-FID-VA Soil EPH in Solids by Tumbler and GCFID BCMELP CSR

Extractable Hydrocarbons in Sediment/Soil

This analysis is carried out in accordance with the British Columbia Ministry of Environment, Lands and Parks (BCMELP) Analytical Method for Contaminated Sites "Extractable Petroleum Hydrocarbons in Solids by GC/FID, Version 2.1 July 1999". The procedure, based on EPA 3570, uses a rotary extraction technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene or kept in hexane/acetone and analyzed by capillary column gas chromatography with flame ionization detection (GC/FID). EPH results include Polycyclic Aromatic Hydrocarbons (PAH) and are therefore not equivalent to Light and Heavy Extractable Petroleum Hydrocarbons (LEPH/HEPH).

Accuracy target values for Reference Materials used in this method are derived from averages of long-term method performance, as certified values do not exist for the reported parameters.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-CCME-CVAFS-VA Soil CVAFS Hg in Soil (CCME) BCMELP CSR SALM METHOD 8/EPA 245.7

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic fluorescence spectrophotometry (EPA Method 7000 series).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

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).

LEPH/HEPH-CALC-VA Soil LEPHs and HEPHs BC MOE LABORATORY MANUAL (2005)

Light and Heavy Extractable Petroleum Hydrocarbons in Solids. These results are determined according to the British Columbia Ministry of Environment, Lands, and Parks Analytical Method for Contaminated Sites "Calculation of Light and Heavy Extractable Petroleum Hydrocarbons in Solids or Water". According to this method, LEPH and HEPH are calculated by subtracting selected Polycyclic Aromatic Hydrocarbon results from Extractable Petroleum Hydrocarbon results. To calculate LEPH, the individual results for Naphthalene and Phenanthrene are subtracted from EPH(C10-19). To calculate HEPH, the individual results for Benz(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Dibenzo(a,h)anthracene, Indeno(1,2,3-c,d)pyrene, and Pyrene are subtracted from EPH(C19-32). Analysis of Extractable Petroleum Hydrocarbons adheres to all prescribed elements of the BCMELP method "Extractable Petroleum Hydrocarbons in Solids by GC/FID" (Version 2.1, July 20, 1999).

MET-CSR-FULL-ICP-VA Soil Metals in Soil by ICPOES (CSR SALM) BCMELP CSR SALM METHOD 8

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

Reference Information

MET-DIS-CCME-ICP-VA Water Diss. Metals in Water by ICPOES (CCME) 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-MG-ICP-VA Swab Metals in Swab by ICPOES NIOSH 7303/EPA 6010B

This analysis is carried out using procedures adapted from Method 7303 in the NIOSH Manual of Analytical Methods (NMAM). The procedure involves a hot block digestion of the swab material, using a combination of nitric acid and hydrochloric acid. Instrumental analysis of the swab extract is by inductively coupled plasma - optical emission spectrophotometry (EPA 6010B).

MET-TOT-CCME-ICP-VA Water Total Metals in Water by ICPOES (CCME) 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MOISTURE-VA Soil Moisture content ASTM METHOD D2974-00

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

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

This analysis is carried out, on sulphuric 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-TUMB-SG-VA Soil CWS MOG with Silica Gel CCME PETROLEUM HYDROCARBONS-
GRAVIMETRIC

This analysis is carried out in accordance with the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method, Canadian Council of Ministers of the Environment, December 2000." A subsample of the sediment/soil is extracted with 1:1 hexane:acetone using a rotary extraction apparatus. The extract undergoes a silica-gel clean-up to remove polar compounds, and is analyzed gravimetrically. Mineral Oil and Grease is equivalent to fraction F4G of the Canada-wide Standard for Petroleum Hydrocarbons.

Accuracy target values for Reference Materials used in this method are derived from averages of long-term method performance, as certified values do not exist for the reported parameters.

PAH-SURR-MS-VA Soil PAH Surrogates for Soils EPA METHODS 3570, 3545A & 8270

PAH-TUMB-H/A-MS-VA Soil PAH by Tumbler HEX/ACE with GCMS EPA METHODS 3570 & 8270.

Polycyclic Aromatic Hydrocarbons in Sediment/Soil

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation.

PH-1:2-VA Soil CSR pH by 1:2 Water Leach BC WLAP METHOD: PH, ELECTROMETRIC, SOIL

This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water. The pH of the solution is then measured using a standard pH probe.

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

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

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

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

Reference Information

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

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

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

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

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

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

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

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

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PSA-PIPET+GRAVEL-SK Soil Particle size - Sieve and Pipette FORESTRY CANADA (1991) P. 46-48 MOD

Particle size analysis involves the measurement of the proportions of the various primary soil particle sizes (ie. clay < 0.004 mm, silt 0.004-0.063 mm, sand 0.063-2.0 mm and gravel > 2.0 mm). In this method, the gravel and sand portions are determined by sieving, while the clay portion is determined by sedimentation using Stokes Law, which relates the radius of the particles to the velocity of the sedimentation in water. Silt is calculated as 100% - (sand% + clay%)

Pretreatment of the soil with Calgon (sodium hexametaphosphate) is used to ensure the complete dispersion of the primary soil particles. Additional pretreatment may be necessary to remove cementing materials such as CaCO₃ and organic matter.

Reference
 Y.P. Kalra, and D.G. Maynard, 1991. Methods Manual For Forest Soil and Plant Analysis, Northwest Region. Forestry Canada (modified sand, silt and clay size ranges)

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

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

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

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

TKN-SIE-VA Water Total Kjeldahl Nitrogen 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 by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TL-CSR-MS-VA Soil ICPMS TI in Soil by CSR SALM BCMELP CSR SALM Method 8

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by either hotplate or block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma -

Reference Information

mass spectrometry (EPA Method 6020A).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

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.

U-200.2-MS-VA Soil Uranium in Soil by ICPMS EPA 200.2/6020A

This analysis is carried out using procedures from CSR Analytical Method: "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, 26 June 2009, and procedures adapted from EPA Method 200.2. The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 95 degrees Celsius for 2 hours by block digester using concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

** 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
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA
SK	ALS LABORATORY GROUP - SASKATOON, SASKATCHEWAN, 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.

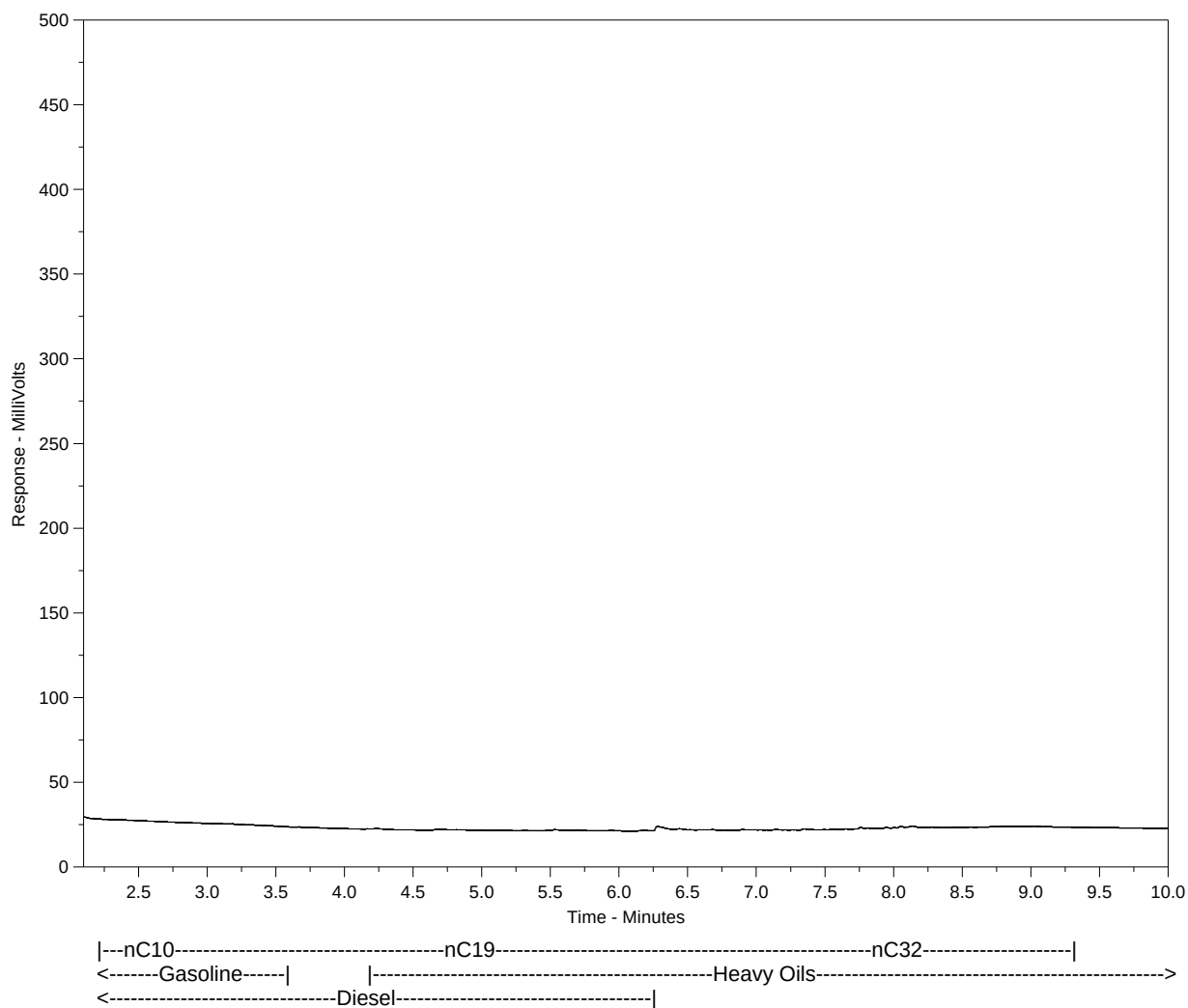
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

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

Hydrocarbon Distribution Report



ALS Sample ID: L925795-7
Client ID: TPS-1



The Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available upon request.

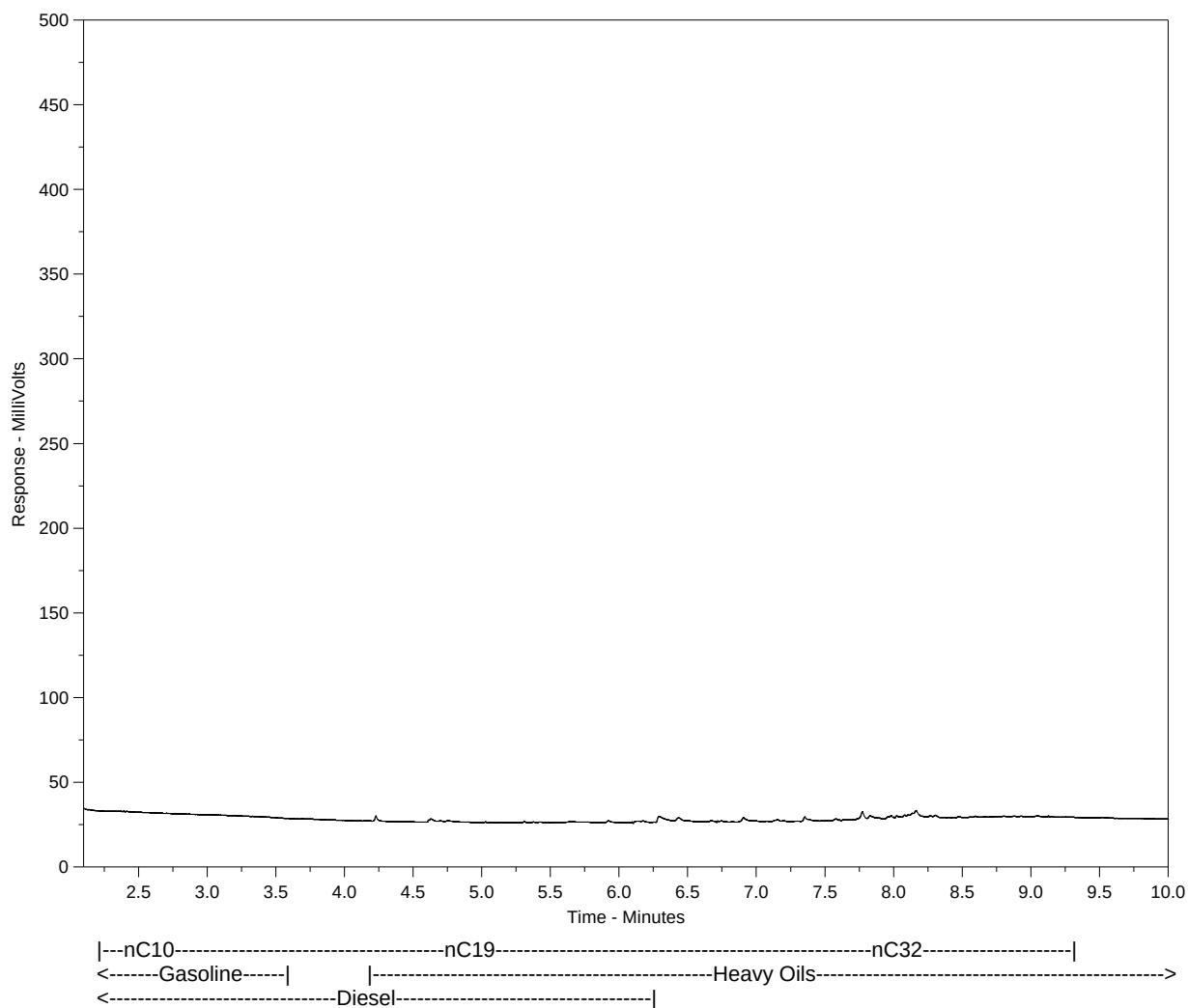
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

Hydrocarbon Distribution Report



ALS Sample ID: L925795-8
Client ID: TPS-2



The Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available upon request.

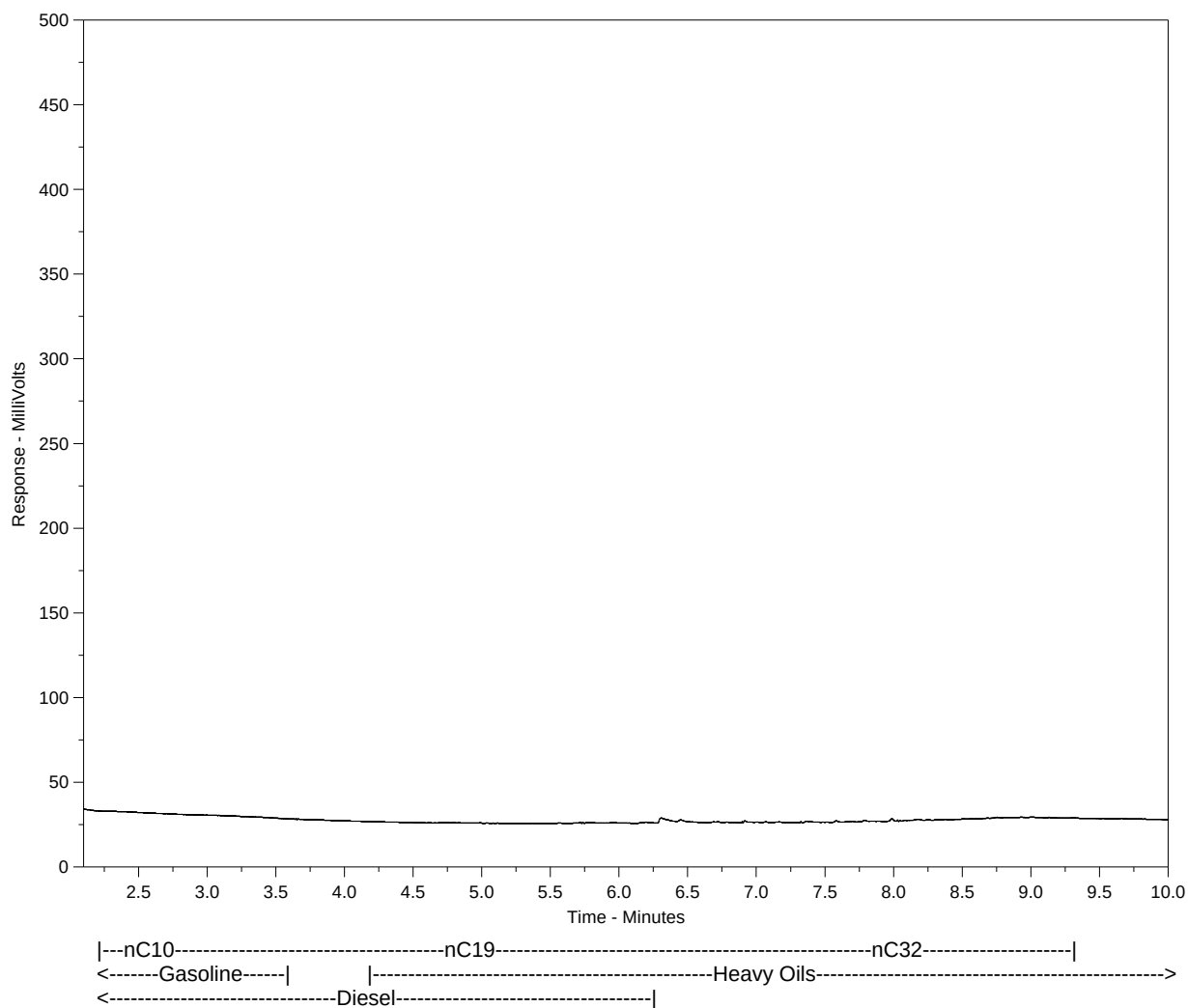
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

Hydrocarbon Distribution Report



ALS Sample ID: L925795-9
Client ID: TPS-3



The Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available upon request.

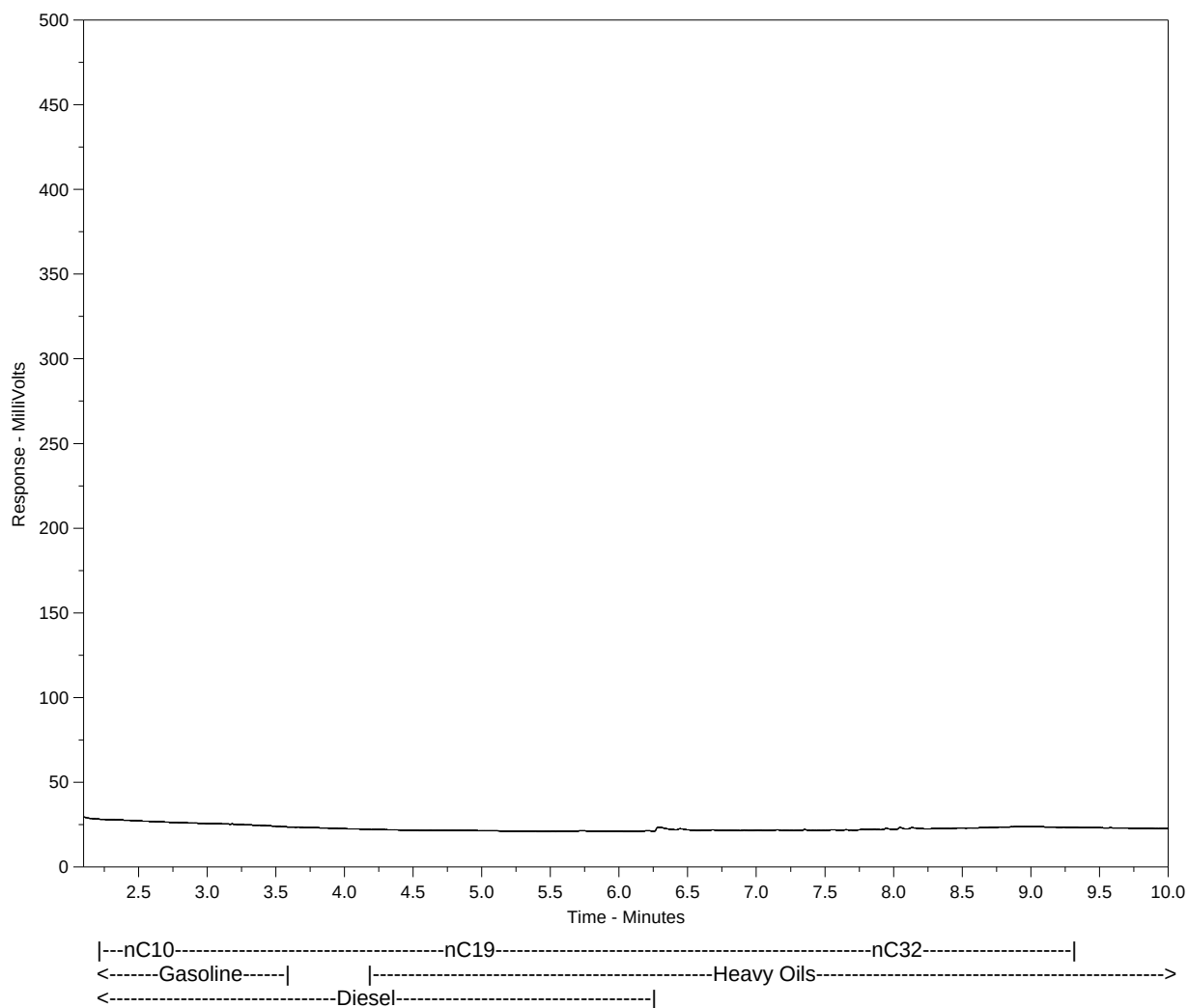
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

Hydrocarbon Distribution Report



ALS Sample ID: L925795-11
Client ID: SP-2



The Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available upon request.

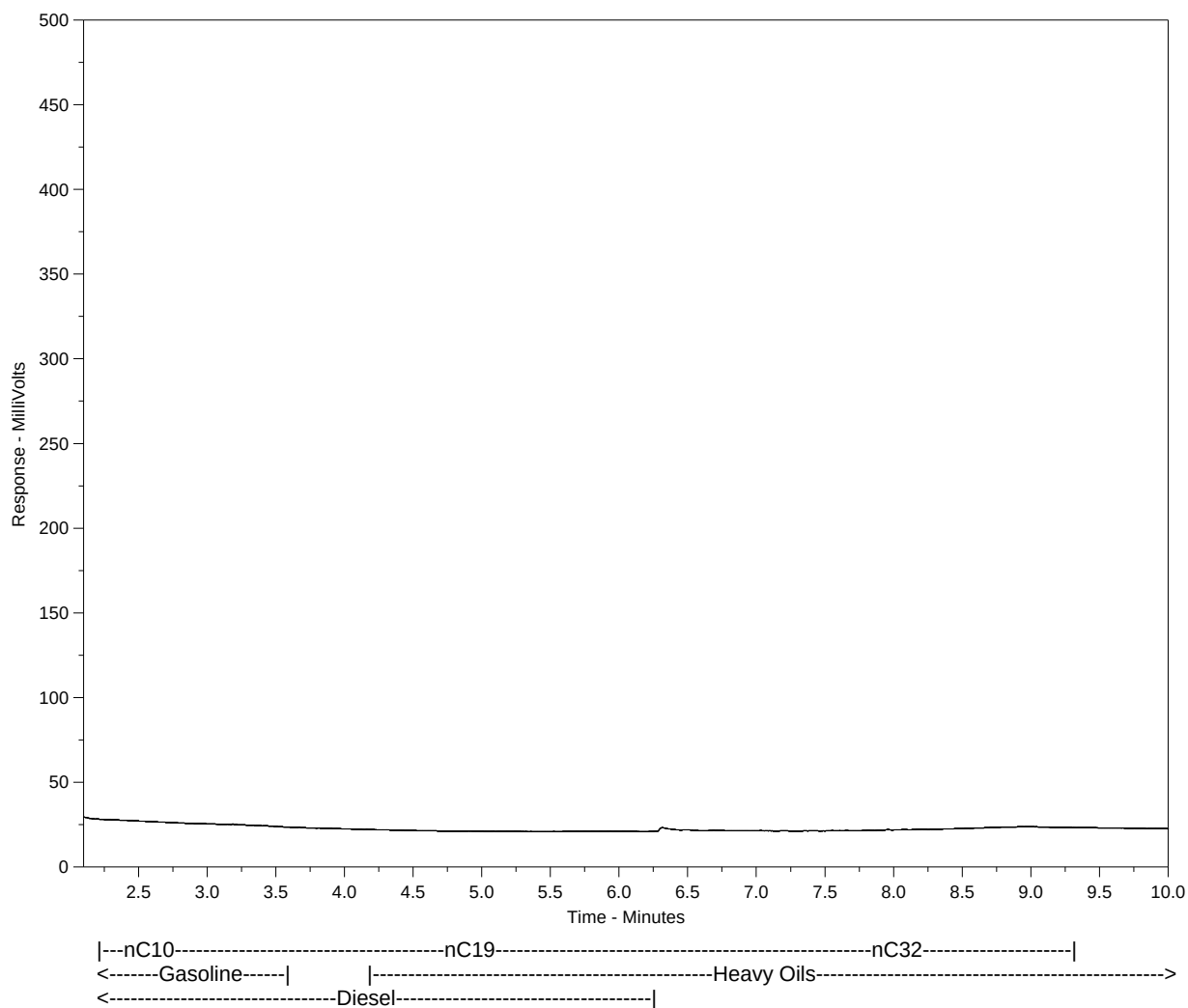
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

Hydrocarbon Distribution Report



ALS Sample ID: L925795-12
Client ID: SP-3



The Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available upon request.

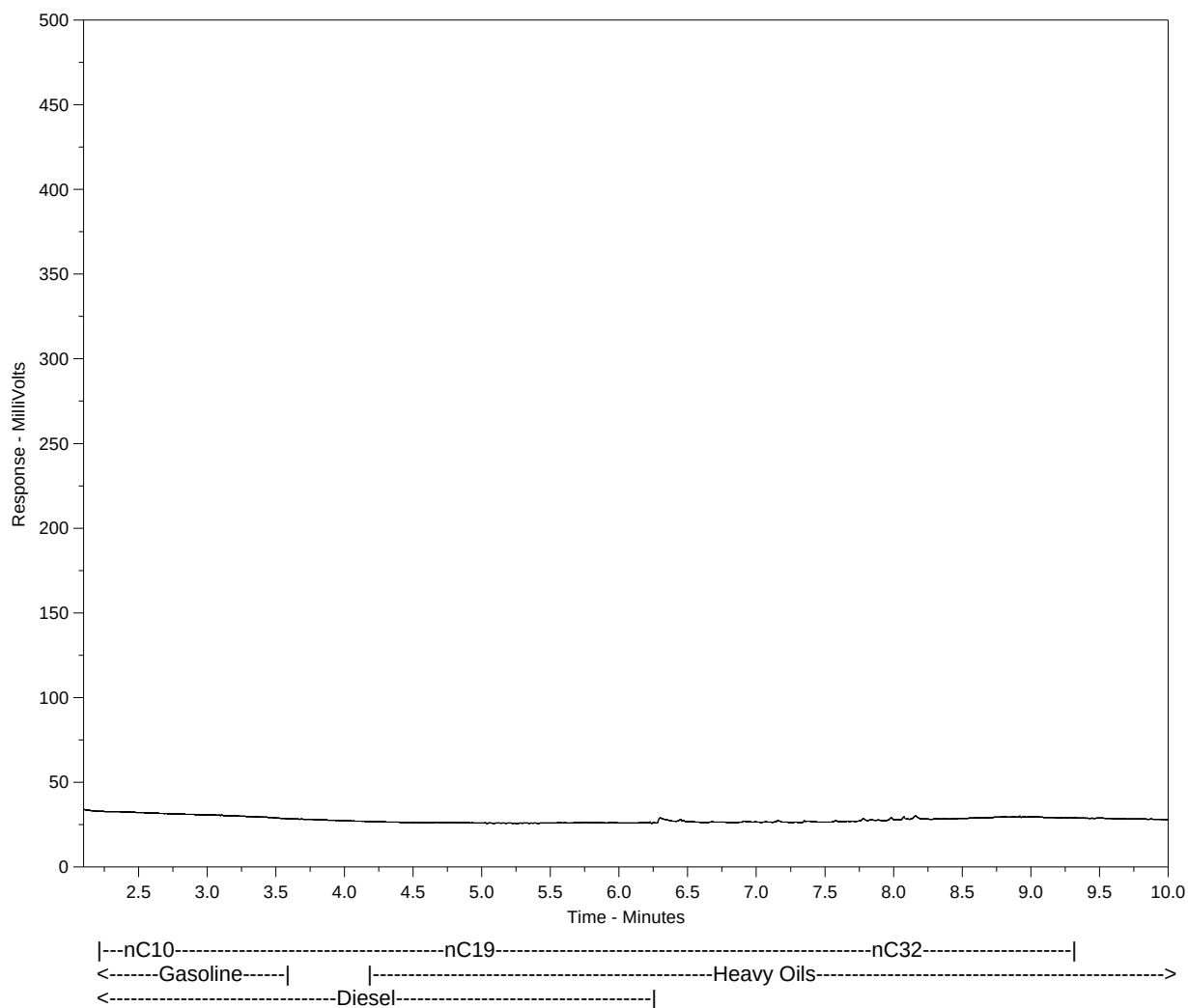
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

Hydrocarbon Distribution Report



ALS Sample ID: L925795-13
Client ID: DUP-1



The Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available upon request.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

Rush Processing



ALS Lab
4140 EXETER STREET
Environmental

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

#COC#

Page 1 of 3

Report to:		Report Format / Distribution		Service Requested:	
Company: Azimuth Consulting Group Inc.		☒ Standard ☐ Other		☒ Regular Service (Default)	
Contact: Maggie McConnell		☒ PDF ☒ Excel ☐ Fax		☐ Rush Service (2-3 Days)	
Address: 218 - 2902 West Broadway, Vancouver, BC, V6K 2G8		Email 1: mmcmconnell@azimuthgroup.ca		☐ Priority Service (1 Day or ASAP)	
		Email 2: gmam@azimuthgroup.ca		☐ Emergency Service (<1 Day / Weekend) - Contact ALS	
Phone: 604-730-1220 Fax:					
Invoice To: ☒ Same as Report		Analysis Request			
Company:		Indicate Bottles Filtered / Preserved (F/P) -->			
Contact:		Client / Project Information:			
Address:		Job #: Meadowbank Mine CREMP			
Sample		PO/AFE:			
Phone:		Legal Site Description:			
Fax:		Quote #: Q24230			
Lab Work Order # L925795		ALS Contact:		Sampler	
		Nataasha MM		(Initials)	
		Date		Time	
		dd-mm-yy		hh:mm	
		Sample Identification		Sample Type	
		(This description will appear on the report)		(Select from drop-down list)	
Sample #		Date		Time	
TPE-1		19-Aug-10		Sediment	
TPE-2		19-Aug-10		Sediment	
TPE-3		19-Aug-10		Sediment	
TPN-1		19-Aug-10		Sediment	
TPN-2		19-Aug-10		Sediment	
TPN-3		19-Aug-10		Sediment	
TPS-1		20-Aug-10		Sediment	
TPS-2		20-Aug-10		Sediment	
TPS-3		20-Aug-10		Sediment	
SP-1		21-Aug-10		Sediment	
Guidelines / Regulations		Special Instructions / Hazardous Details			
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.					
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.					
Relinquished By: <i>Maggie McConnell</i>		Date & Time: 22-Aug-10		Received By: <i>RC</i>	
Relinquished By:		Date & Time:		Date & Time: 30/08 09:30	
				Temperature 14.4	
				Sample Condition (lab use only)	
				Samples Received in Good Condition? Y / N (if no provided details)	

[illegible]



AZIMUTH CONSULTING GROUP INC.
ATTN: MAGGIE McCONNELL
218 - 2902 WEST BROADWAY
VANCOUVER BC V6K 2G8
Phone: 604-730-1220

Date Received: 03-SEP-10
Report Date: 27-SEP-10 17:10 (MT)
Version: FINAL

Certificate of Analysis

Lab Work Order #: L928158
Project P.O. #: NOT SUBMITTED
Job Reference: MEADOWBANK MINE CREMP
Legal Site Desc:
C of C Numbers:

Natasha Markovic-Mirovic
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 LIMITED Part of the ALS Group A Campbell Brothers Limited Company

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L928158-1	L928158-2	L928158-3	L928158-4	L928158-5
		23-AUG-10	23-AUG-10	23-AUG-10	24-AUG-10	24-AUG-10
		WAL-1	WAL-2	WAL-3	PDL-1	PDL-2
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	88.4	88.7	89.2	74.1	75.0
	pH (pH)	6.84	6.22	6.33	5.90	5.96
Particle Size	% Gravel (>2mm) (%)	<0.10	<0.10	<0.10	<0.10	<0.10
	% Sand (2.0mm - 0.063mm) (%)	2.57	0.27	1.49	11.4	13.0
	% Silt (0.063mm - 4um) (%)	87.4	95.2	81.9	72.8	74.4
	% Clay (<4um) (%)	10.0	4.56	16.6	15.8	12.6
Organic / Inorganic Carbon	Total Organic Carbon (%)	6.04	8.94	10.1	2.65	2.79
Metals	Aluminum (Al) (mg/kg)	22200	22700	23100	20400	21200
	Antimony (Sb) (mg/kg)	<10	<10	10	<10	<10
	Arsenic (As) (mg/kg)	20.6	29.6	60.5	13.0	12.0
	Barium (Ba) (mg/kg)	115	140	121	82.5	92.8
	Beryllium (Be) (mg/kg)	1.66	1.66	1.74	1.02	1.03
	Cadmium (Cd) (mg/kg)	0.66	1.47	1.74	<0.50	<0.50
	Chromium (Cr) (mg/kg)	61.4	62.5	63.8	135	138
	Cobalt (Co) (mg/kg)	9.4	11.5	10.0	10.9	11.5
	Copper (Cu) (mg/kg)	163	163	190	51.4	50.7
	Lead (Pb) (mg/kg)	38	40	40	<30	<30
	Mercury (Hg) (mg/kg)	0.0384	0.0612	0.0672	0.0098	0.0099
	Molybdenum (Mo) (mg/kg)	7.2	7.9	13.1	<4.0	<4.0
	Nickel (Ni) (mg/kg)	57.4	55.6	53.7	81.6	90.9
	Selenium (Se) (mg/kg)	<2.4 ^{DLHM}	<2.0	<2.0	<2.0	<2.0
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg)	17.3	17.1	19.2	8.62	8.35
	Vanadium (V) (mg/kg)	32.3	30.9	32.2	36.7	36.3
	Zinc (Zn) (mg/kg)	132	158	135	80.9	87.3
Aggregate Organics	Oil and Grease (mg/kg)	1030	1520	2030	<500	<500
Hydrocarbons	EPH10-19 (mg/kg)	<800 ^{DLHM}	<820 ^{DLHM}	<840 ^{DLHM}	<360 ^{DLHM}	<400 ^{DLHM}
	EPH19-32 (mg/kg)	<800 ^{DLHM}	<820 ^{DLHM}	<840 ^{DLHM}	<360 ^{DLHM}	<400 ^{DLHM}
	LEPH (mg/kg)	<800	<820	<840	<360	<400
	HEPH (mg/kg)	<800	<820	<840	<360	<400
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L928158-6	L928158-7	L928158-8	L928158-9	L928158-10
		Description					
		Sampled Date	24-AUG-10	25-AUG-10	25-AUG-10	25-AUG-10	27-AUG-10
		Sampled Time					
		Client ID	PDL-3	INUG-1	INUG-2	INUG-3	TE-1
Grouping	Analyte						
SOIL							
Physical Tests	Moisture (%)		68.2	75.5	47.7	82.6	74.7
	pH (pH)		5.95	5.91	6.02	5.90	6.14
Particle Size	% Gravel (>2mm) (%)		<0.10	<0.10	0.88	<0.10	<0.10
	% Sand (2.0mm - 0.063mm) (%)		20.5	13.4	16.4	3.08	26.4
	% Silt (0.063mm - 4um) (%)		70.7	62.8	52.5	79.2	56.5
	% Clay (<4um) (%)		8.78	23.9	30.3	17.8	17.1
Organic / Inorganic Carbon	Total Organic Carbon (%)		2.44	2.66	0.59	4.28	2.49
Metals	Aluminum (Al) (mg/kg)		17200	23600	24400	24200	20100
	Antimony (Sb) (mg/kg)		<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)		11.5	16.8	12.6	18.6	15.7
	Barium (Ba) (mg/kg)		60.6	99.3	101	120	80.2
	Beryllium (Be) (mg/kg)		0.80	1.53	1.04	1.56	1.78
	Cadmium (Cd) (mg/kg)		<0.50	<0.50	<0.50	<0.50	<0.50
	Chromium (Cr) (mg/kg)		115	115	111	119	51.1
	Cobalt (Co) (mg/kg)		10.7	9.3	14.3	12.1	8.0
	Copper (Cu) (mg/kg)		34.9	48.6	31.3	54.1	49.9
	Lead (Pb) (mg/kg)		<30	<30	<30	<30	<30
	Mercury (Hg) (mg/kg)		0.0112	0.0154	0.0066	0.0261	0.0171
	Molybdenum (Mo) (mg/kg)		<4.0	<4.0	4.1	4.2	<4.0
	Nickel (Ni) (mg/kg)		70.3	67.7	75.3	90.9	32.6
	Selenium (Se) (mg/kg)	DLHM	<2.2	<0.50	<0.50	<2.6	<0.50
	Silver (Ag) (mg/kg)		<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)		<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)		<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg)		5.83	15.9	11.4	17.1	16.0
	Vanadium (V) (mg/kg)		32.1	38.2	41.5	38.7	32.5
	Zinc (Zn) (mg/kg)		72.7	84.7	80.0	100	86.7
Aggregate Organics	Oil and Grease (mg/kg)		790	<500	<500	<500	<500
Hydrocarbons	EPH10-19 (mg/kg)	DLHM	<300	<400	<200	<560	<400
	EPH19-32 (mg/kg)	DLHM	<300	<400	<200	<560	<400
	LEPH (mg/kg)		<300	<400	<200	<560	<400
	HEPH (mg/kg)		<300	<400	<200	<560	<400
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Acenaphthylene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Anthracene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L928158-11	L928158-12	L928158-13	L928158-14	L928158-15
		Description					
		Sampled Date	27-AUG-10	27-AUG-10	27-AUG-10	27-AUG-10	27-AUG-10
		Sampled Time					
		Client ID	TE-2	TE-3	TEFF-1	TEFF-2	TEFF-3
Grouping	Analyte						
SOIL							
Physical Tests	Moisture (%)		76.9	76.6	81.1	78.6	77.0
	pH (pH)		5.51	5.99	5.87	5.79	5.80
Particle Size	% Gravel (>2mm) (%)		<0.10	<0.10	<0.10	<0.10	1.84
	% Sand (2.0mm - 0.063mm) (%)		10.4	7.84	5.80	9.30	6.49
	% Silt (0.063mm - 4um) (%)		67.1	71.9	75.9	71.8	55.4
	% Clay (<4um) (%)		22.6	20.3	18.3	18.9	36.2
Organic / Inorganic Carbon	Total Organic Carbon (%)		2.90	2.60	3.38	2.60	2.79
Metals	Aluminum (Al) (mg/kg)		20500	25500	25500	27700	29100
	Antimony (Sb) (mg/kg)		19	14	<10	<10	<10
	Arsenic (As) (mg/kg)		35.9	21.3	13.1	11.3	13.1
	Barium (Ba) (mg/kg)		109	126	119	124	136
	Beryllium (Be) (mg/kg)		1.79	2.08	1.97	2.04	2.15
	Cadmium (Cd) (mg/kg)		2.51	2.04	1.47	1.35	1.53
	Chromium (Cr) (mg/kg)		50.7	60.4	58.2	64.6	64.2
	Cobalt (Co) (mg/kg)		11.4	14.7	13.6	12.7	14.6
	Copper (Cu) (mg/kg)		57.6	65.4	61.2	62.3	62.2
	Lead (Pb) (mg/kg)		<30	<30	<30	<30	<30
	Mercury (Hg) (mg/kg)		0.0239	0.0187	0.0160	0.0124	0.0127
	Molybdenum (Mo) (mg/kg)		13.0	7.0	4.6	4.5	5.0
	Nickel (Ni) (mg/kg)		31.4	48.6	35.4	35.8	35.9
	Selenium (Se) (mg/kg)		<2.0	<2.0	<2.0	<2.0	<2.0
	Silver (Ag) (mg/kg)		<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)		<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)		<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg)		18.0	16.4	24.3	26.0	25.2
	Vanadium (V) (mg/kg)		30.2	37.2	38.6	41.6	43.0
	Zinc (Zn) (mg/kg)		93.6	109	109	115	117
Aggregate Organics	Oil and Grease (mg/kg)		<500	<500	<500	<500	<500
Hydrocarbons	EPH10-19 (mg/kg)	DLHM	<400	DLHM	DLHM	DLHM	DLHM
	EPH19-32 (mg/kg)	DLHM	<400	DLHM	DLHM	DLHM	DLHM
	LEPH (mg/kg)		<400	<400	<460	<400	<400
	HEPH (mg/kg)		<400	<400	<460	<400	<400
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Acenaphthylene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Anthracene (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L928158-16	L928158-29	L928158-30	L928158-31	L928158-32
		23-AUG-10	19-AUG-10	23-AUG-10	20-AUG-10	20-AUG-10
		DUP-2	14:00 TRB-2	15:36 SP-DT	08:58 SP-F1	16:50 SP-N1
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	88.9				
	pH (pH)	6.23	8.26	5.83	6.38	6.20
Particle Size	% Gravel (>2mm) (%)	<0.10	<0.10	<0.10	<0.10	0.29
	% Sand (2.0mm - 0.063mm) (%)	2.87	0.68	5.83	7.31	17.3
	% Silt (0.063mm - 4um) (%)	88.7	80.7	67.9	66.1	61.0
	% Clay (<4um) (%)	8.48	18.6	26.3	26.5	21.4
Organic / Inorganic Carbon	Total Organic Carbon (%)	9.34	0.52	4.96	4.10	2.88
Metals	Aluminum (Al) (mg/kg)	22100	28000	29400	25400	22500
	Antimony (Sb) (mg/kg)	<10	<10	17	<10	<10
	Arsenic (As) (mg/kg)	29.3	11.1	59.2	50.2	10.8
	Barium (Ba) (mg/kg)	136	149	145	98.0	102
	Beryllium (Be) (mg/kg)	1.64	0.61	2.81	2.06	1.59
	Cadmium (Cd) (mg/kg)	1.47	<0.50	2.60	<0.50	<0.50
	Chromium (Cr) (mg/kg)	61.7	156	71.5	80.5	75.2
	Cobalt (Co) (mg/kg)	11.4	21.2	12.2	13.3	9.5
	Copper (Cu) (mg/kg)	158	39.6	134	73.7	59.6
	Lead (Pb) (mg/kg)	41	<30	33	<30	<30
	Mercury (Hg) (mg/kg)	0.0603	<0.0050	0.0392	0.0270	0.0210
	Molybdenum (Mo) (mg/kg)	7.7	<4.0	13.4	9.0	<4.0
	Nickel (Ni) (mg/kg)	54.6	102	54.5	54.9	52.8
	Selenium (Se) (mg/kg)	<2.0	<2.0	<2.0	0.62	<2.0
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg)	18.1	3.12	26.2	17.6	14.5
	Vanadium (V) (mg/kg)	30.5	54.7	40.4	40.6	37.3
	Zinc (Zn) (mg/kg)	157	86.3	152	113	102
Aggregate Organics	Oil and Grease (mg/kg)	2290				
Hydrocarbons	EPH10-19 (mg/kg)	<840 ^{DLHM}				
	EPH19-32 (mg/kg)	<840 ^{DLHM}				
	LEPH (mg/kg)	<840				
	HEPH (mg/kg)	<840				
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050				
	Acenaphthylene (mg/kg)	<0.050				
	Anthracene (mg/kg)	<0.050				

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L928158-33	L928158-34	L928158-35	L928158-36	L928158-37
		20-AUG-10 11:40 SP-N2	19-AUG-10 16:00 SP-N3	25-AUG-10 14:00 TP-E1	27-AUG-10 16:45 TP-E2	25-AUG-10 15:30 TP-E3
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)					
	pH (pH)	6.40	5.78	5.88	5.50	5.86
Particle Size	% Gravel (>2mm) (%)	<0.10	<0.10	<0.10	<0.10	<0.10
	% Sand (2.0mm - 0.063mm) (%)	2.98	1.95	2.59	3.66	3.34
	% Silt (0.063mm - 4um) (%)	69.6	70.8	64.1	63.3	70.1
	% Clay (<4um) (%)	27.5	27.2	33.3	33.0	26.5
Organic / Inorganic Carbon	Total Organic Carbon (%)	4.40	4.22	2.86	3.18	3.12
Metals	Aluminum (Al) (mg/kg)	28100	27600	25400	26200	26500
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	35.5	104	23.2	32.4	24.6
	Barium (Ba) (mg/kg)	123	119	103	104	131
	Beryllium (Be) (mg/kg)	2.20	2.12	1.91	1.88	1.66
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Chromium (Cr) (mg/kg)	95.5	86.8	111	97.9	115
	Cobalt (Co) (mg/kg)	18.0	13.6	17.5	17.2	23.7
	Copper (Cu) (mg/kg)	87.1	97.5	53.7	65.5	84.4
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Mercury (Hg) (mg/kg)	0.0274	0.0244	0.0102	0.0149	0.0235
	Molybdenum (Mo) (mg/kg)	7.0	10.3	5.2	7.3	5.7
	Nickel (Ni) (mg/kg)	70.9	67.2	73.0	62.0	142
	Selenium (Se) (mg/kg)	0.73	0.88	0.70	<2.0	0.86
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg)	18.7	22.2	16.7	19.0	15.4
	Vanadium (V) (mg/kg)	44.3	43.1	42.3	42.8	43.4
	Zinc (Zn) (mg/kg)	123	131	106	109	115
Aggregate Organics	Oil and Grease (mg/kg)					
Hydrocarbons	EPH10-19 (mg/kg)					
	EPH19-32 (mg/kg)					
	LEPH (mg/kg)					
	HEPH (mg/kg)					
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)					
	Acenaphthylene (mg/kg)					
	Anthracene (mg/kg)					

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L928158-38	L928158-39	L928158-40	L928158-41	L928158-42
		24-AUG-10 13:43 HVH-4	19-AUG-10 14:00 TRB-1	23-AUG-10 15:36 TRB-3	20-AUG-10 08:58 TRB-4	20-AUG-10 16:50 SP-F2
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)					
	pH (pH)	6.00	6.58	6.38	6.01	6.40
Particle Size	% Gravel (>2mm) (%)	1.09	<0.10	<0.10	<0.10	<0.10
	% Sand (2.0mm - 0.063mm) (%)	2.89	8.79	3.06	1.75	2.73
	% Silt (0.063mm - 4um) (%)	48.4	74.9	73.3	69.0	73.5
	% Clay (<4um) (%)	47.6	16.3	23.7	29.2	23.8
Organic / Inorganic Carbon	Total Organic Carbon (%)	2.77	3.72	2.98	3.45	6.70
Metals	Aluminum (Al) (mg/kg)	36100	21100	25400	28400	29900
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	26.6	67.8	33.3	21.1	15.2
	Barium (Ba) (mg/kg)	139	169	96.4	114	163
	Beryllium (Be) (mg/kg)	2.55	1.30	1.69	2.01	2.48
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	0.80
	Chromium (Cr) (mg/kg)	119	130	183	179	91.2
	Cobalt (Co) (mg/kg)	20.1	26.5	20.7	13.8	10.6
	Copper (Cu) (mg/kg)	89.2	63.4	62.2	67.2	130
	Lead (Pb) (mg/kg)	33	<30	<30	<30	<30
	Mercury (Hg) (mg/kg)	0.0133	0.0269	0.0170	0.0138	0.0290
	Molybdenum (Mo) (mg/kg)	7.2	10.8	6.8	5.9	6.2
	Nickel (Ni) (mg/kg)	80.1	136	89.3	85.1	85.6
	Selenium (Se) (mg/kg)	<2.0	0.71	0.95	0.74	<2.0
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg)	27.9	11.9	16.3	18.4	25.9
	Vanadium (V) (mg/kg)	57.7	38.6	45.7	49.1	45.1
	Zinc (Zn) (mg/kg)	141	99.0	107	120	160
Aggregate Organics	Oil and Grease (mg/kg)					
Hydrocarbons	EPH10-19 (mg/kg)					
	EPH19-32 (mg/kg)					
	LEPH (mg/kg)					
	HEPH (mg/kg)					
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)					
	Acenaphthylene (mg/kg)					
	Anthracene (mg/kg)					

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L928158-1	L928158-2	L928158-3	L928158-4	L928158-5
		23-AUG-10	23-AUG-10	23-AUG-10	24-AUG-10	24-AUG-10
		WAL-1	WAL-2	WAL-3	PDL-1	PDL-2
Grouping	Analyte					
SOIL						
Polycyclic Aromatic Hydrocarbons	Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chrysene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Fluorene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	2-Methylnaphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Phenanthrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Surrogate: d10-Acenaphthene (SS) (%)	85	92	87	85	83
	Surrogate: d12-Chrysene (SS) (%)	78	80	76	75	80
	Surrogate: d8-Naphthalene (SS) (%)	87	89	85	83	81
	Surrogate: d10-Phenanthrene (SS) (%)	83	89	83	81	80

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L928158-6	L928158-7	L928158-8	L928158-9	L928158-10
		Description					
		Sampled Date	24-AUG-10	25-AUG-10	25-AUG-10	25-AUG-10	27-AUG-10
		Sampled Time					
		Client ID	PDL-3	INUG-1	INUG-2	INUG-3	TE-1
Grouping	Analyte						
SOIL							
Polycyclic Aromatic Hydrocarbons	Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Chrysene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Fluorene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	2-Methylnaphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Phenanthrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Surrogate: d10-Acenaphthene (SS) (%)	87	95	88	84	90	
	Surrogate: d12-Chrysene (SS) (%)	75	71	72	72	70	
	Surrogate: d8-Naphthalene (SS) (%)	83	92	82	76	90	
	Surrogate: d10-Phenanthrene (SS) (%)	82	84	81	71	82	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L928158-11	L928158-12	L928158-13	L928158-14	L928158-15
		Description					
		Sampled Date	27-AUG-10	27-AUG-10	27-AUG-10	27-AUG-10	27-AUG-10
		Sampled Time					
		Client ID	TE-2	TE-3	TEFF-1	TEFF-2	TEFF-3
Grouping	Analyte						
SOIL							
Polycyclic Aromatic Hydrocarbons	Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Chrysene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Fluorene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	2-Methylnaphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Phenanthrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Surrogate: d10-Acenaphthene (SS) (%)	82	89	94	93	92	
	Surrogate: d12-Chrysene (SS) (%)	67	70	85	74	70	
	Surrogate: d8-Naphthalene (SS) (%)	79	88	95	87	91	
	Surrogate: d10-Phenanthrene (SS) (%)	76	80	90	84	83	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L928158-16 23-AUG-10 DUP-2	L928158-29 19-AUG-10 14:00 TRB-2	L928158-30 23-AUG-10 15:36 SP-DT	L928158-31 20-AUG-10 08:58 SP-F1	L928158-32 20-AUG-10 16:50 SP-N1
Grouping	Analyte						
SOIL							
Polycyclic Aromatic Hydrocarbons	Benz(a)anthracene (mg/kg)	<0.050					
	Benzo(a)pyrene (mg/kg)	<0.050					
	Benzo(b)fluoranthene (mg/kg)	<0.050					
	Benzo(g,h,i)perylene (mg/kg)	<0.050					
	Benzo(k)fluoranthene (mg/kg)	<0.050					
	Chrysene (mg/kg)	<0.050					
	Dibenz(a,h)anthracene (mg/kg)	<0.050					
	Fluoranthene (mg/kg)	<0.050					
	Fluorene (mg/kg)	<0.050					
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050					
	2-Methylnaphthalene (mg/kg)	<0.050					
	Naphthalene (mg/kg)	<0.050					
	Phenanthrene (mg/kg)	<0.050					
	Pyrene (mg/kg)	<0.050					
	Surrogate: d10-Acenaphthene (SS) (%)	91					
	Surrogate: d12-Chrysene (SS) (%)	68					
	Surrogate: d8-Naphthalene (SS) (%)	86					
	Surrogate: d10-Phenanthrene (SS) (%)	79					

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L928158-33	L928158-34	L928158-35	L928158-36	L928158-37
		Description					
		Sampled Date	20-AUG-10	19-AUG-10	25-AUG-10	27-AUG-10	25-AUG-10
		Sampled Time	11:40	16:00	14:00	16:45	15:30
		Client ID	SP-N2	SP-N3	TP-E1	TP-E2	TP-E3
Grouping	Analyte						
SOIL							
Polycyclic Aromatic Hydrocarbons	Benz(a)anthracene (mg/kg)						
	Benzo(a)pyrene (mg/kg)						
	Benzo(b)fluoranthene (mg/kg)						
	Benzo(g,h,i)perylene (mg/kg)						
	Benzo(k)fluoranthene (mg/kg)						
	Chrysene (mg/kg)						
	Dibenz(a,h)anthracene (mg/kg)						
	Fluoranthene (mg/kg)						
	Fluorene (mg/kg)						
	Indeno(1,2,3-c,d)pyrene (mg/kg)						
	2-Methylnaphthalene (mg/kg)						
	Naphthalene (mg/kg)						
	Phenanthrene (mg/kg)						
	Pyrene (mg/kg)						
	Surrogate: d10-Acenaphthene (SS) (%)						
	Surrogate: d12-Chrysene (SS) (%)						
	Surrogate: d8-Naphthalene (SS) (%)						
	Surrogate: d10-Phenanthrene (SS) (%)						

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L928158-38	L928158-39	L928158-40	L928158-41	L928158-42
		Description					
		Sampled Date	24-AUG-10	19-AUG-10	23-AUG-10	20-AUG-10	20-AUG-10
		Sampled Time	13:43	14:00	15:36	08:58	16:50
		Client ID	HVH-4	TRB-1	TRB-3	TRB-4	SP-F2
Grouping	Analyte						
SOIL							
Polycyclic Aromatic Hydrocarbons	Benz(a)anthracene (mg/kg)						
	Benzo(a)pyrene (mg/kg)						
	Benzo(b)fluoranthene (mg/kg)						
	Benzo(g,h,i)perylene (mg/kg)						
	Benzo(k)fluoranthene (mg/kg)						
	Chrysene (mg/kg)						
	Dibenz(a,h)anthracene (mg/kg)						
	Fluoranthene (mg/kg)						
	Fluorene (mg/kg)						
	Indeno(1,2,3-c,d)pyrene (mg/kg)						
	2-Methylnaphthalene (mg/kg)						
	Naphthalene (mg/kg)						
	Phenanthrene (mg/kg)						
	Pyrene (mg/kg)						
	Surrogate: d10-Acenaphthene (SS) (%)						
	Surrogate: d12-Chrysene (SS) (%)						
	Surrogate: d8-Naphthalene (SS) (%)						
	Surrogate: d10-Phenanthrene (SS) (%)						

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
SWAB						
Metals	Aluminum (Al)-Total (ug)	41				
	Antimony (Sb)-Total (ug)	<20				
	Arsenic (As)-Total (ug)	<20				
	Barium (Ba)-Total (ug)	<1.0				
	Beryllium (Be)-Total (ug)	<0.50				
	Bismuth (Bi)-Total (ug)	<20				
	Cadmium (Cd)-Total (ug)	<1.0				
	Calcium (Ca)-Total (ug)	40.7				
	Chromium (Cr)-Total (ug)	<2.0				
	Cobalt (Co)-Total (ug)	<1.0				
	Copper (Cu)-Total (ug)	<1.0				
	Iron (Fe)-Total (ug)	46.1				
	Lead (Pb)-Total (ug)	<5.0				
	Lithium (Li)-Total (ug)	<1.0				
	Magnesium (Mg)-Total (ug)	18				
	Manganese (Mn)-Total (ug)	0.59				
	Molybdenum (Mo)-Total (ug)	<3.0				
	Nickel (Ni)-Total (ug)	<5.0				
	Phosphorus (P)-Total (ug)	<30				
	Potassium (K)-Total (ug)	<200				
	Selenium (Se)-Total (ug)	<20				
	Silver (Ag)-Total (ug)	<1.0				
	Sodium (Na)-Total (ug)	<200				
	Strontium (Sr)-Total (ug)	<0.50				
	Thallium (Tl)-Total (ug)	<20				
	Tin (Sn)-Total (ug)	<3.0				
	Titanium (Ti)-Total (ug)	1.5				
	Vanadium (V)-Total (ug)	<3.0				
	Zinc (Zn)-Total (ug)	1.04				

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L928158-18	L928158-19	L928158-20	L928158-21	L928158-22
		23-AUG-10	24-AUG-10	25-AUG-10	25-AUG-10	25-AUG-10
		WAL-11-S	PDL-11-S	INUG-17-S	INUG-17-INT	INUG-17-D
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	28.9	20.6	14.6	14.6	14.0
	Hardness (as CaCO3) (mg/L)	12.2	8.20	5.12	5.10	5.15
	pH (pH)	7.44	7.35	6.99	7.01	6.98
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	18	14	10	13	<10
	Turbidity (NTU)	0.46	0.24	0.46	0.39	0.39
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	10.2	6.9	4.4	4.6	4.5
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	10.2	6.9	4.4	4.6	4.5
	Ammonia-N (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	0.51	0.52	0.60	0.59
	Fluoride (F) (mg/L)	0.034	0.030	0.042	0.049	0.049
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050	<0.050	0.128	0.092
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0028	<0.0020	0.0104	0.0031	0.0029
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.06	1.38	0.63	0.71	0.71
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.16	1.90	2.08	2.12	2.09
	Total Organic Carbon (mg/L)	2.16	1.90	2.06	2.01	2.11
Total Metals	Aluminum (Al)-Total (mg/L)	0.0076	0.0058	0.0114	0.0126	0.0107
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	3.27	2.12	1.02	1.05	1.02
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	0.0011	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L928158-23	L928158-24	L928158-25	L928158-26	L928158-27
Grouping Analyte						
WATER						
Physical Tests	Conductivity (uS/cm)	18.1	15.9	15.0	12.6	<2.0
	Hardness (as CaCO3) (mg/L)	6.56	6.56	6.67	5.36	<0.50
	pH (pH)	7.02	7.00	7.00	6.97	5.53
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	10	11	<10	<10	<10
	Turbidity (NTU)	0.43	0.40	0.36	0.37	0.24
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	5.3	5.3	5.3	4.4	<2.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	5.3	5.3	5.3	4.4	<2.0
	Ammonia-N (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0299 ^{RRV}
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.049	0.049	0.048	0.045	<0.020
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.101	0.110	<0.050	<0.050	<0.050
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0044	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.63	1.62	1.65	1.53	<0.50
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.67	1.66	1.70	1.54	0.85
	Total Organic Carbon (mg/L)	1.68	1.65	1.63	1.60	0.81
Total Metals	Aluminum (Al)-Total (mg/L)	0.0112	0.0127	0.0109	0.0068	<0.0050
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.60	1.63	1.65	1.30	<0.10
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	0.0011
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.00085

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	<2.0				
	Hardness (as CaCO3) (mg/L)					
	pH (pH)	5.78				
	Total Suspended Solids (mg/L)	<1.0				
	Total Dissolved Solids (mg/L)	<10				
	Turbidity (NTU)	0.21				
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0				
	Ammonia-N (mg/L)	0.0214 ^{RRV}				
	Bromide (Br) (mg/L)	<0.050				
	Chloride (Cl) (mg/L)	<0.50				
	Fluoride (F) (mg/L)	<0.020				
	Nitrate (as N) (mg/L)	<0.0050				
	Nitrite (as N) (mg/L)	<0.0010				
	Total Kjeldahl Nitrogen (mg/L)	<0.050				
	Ortho Phosphate as P (mg/L)	<0.0010				
	Total Phosphate as P (mg/L)	<0.0020				
	Silicate (as SiO2) (mg/L)	<1.0				
	Sulfate (SO4) (mg/L)	<0.50				
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)					
	Total Organic Carbon (mg/L)	0.70 ^{RRV}				
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050				
	Antimony (Sb)-Total (mg/L)	<0.00050				
	Arsenic (As)-Total (mg/L)	<0.00050				
	Barium (Ba)-Total (mg/L)	<0.020				
	Beryllium (Be)-Total (mg/L)	<0.0010				
	Boron (B)-Total (mg/L)	<0.10				
	Cadmium (Cd)-Total (mg/L)	<0.000017				
	Calcium (Ca)-Total (mg/L)	<0.10				
	Chromium (Cr)-Total (mg/L)	<0.0010				
	Cobalt (Co)-Total (mg/L)	<0.00030				
	Copper (Cu)-Total (mg/L)	0.0019				
	Iron (Fe)-Total (mg/L)	<0.030				
	Lead (Pb)-Total (mg/L)	0.00135				

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L928158-18	L928158-19	L928158-20	L928158-21	L928158-22
		23-AUG-10	24-AUG-10	25-AUG-10	25-AUG-10	25-AUG-10
		WAL-11-S	PDL-11-S	INUG-17-S	INUG-17-INT	INUG-17-D
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.97	0.73	0.62	0.63	0.63
	Manganese (Mn)-Total (mg/L)	0.00182	0.00126	0.00204	0.00195	0.00193
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	0.000014	0.000013	0.000012
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	3.27	2.09	1.02	1.01	1.02
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.97	0.73	0.63	0.62	0.63
	Manganese (Mn)-Dissolved (mg/L)	0.00035	0.00038	0.00032	0.00035	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	0.000011	<0.000010	0.000017	0.000012
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L928158-23	L928158-24	L928158-25	L928158-26	L928158-27
		28-AUG-10	28-AUG-10	28-AUG-10	28-AUG-10	28-AUG-10
		TE-29-S	TE-29-INT	TE-29-D	TEFF-11-S	AUG EB-2
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.60	0.61	0.62	0.53	<0.10
	Manganese (Mn)-Total (mg/L)	0.00159	0.00167	0.00159	0.00147	<0.00030
	Mercury (Hg)-Total (mg/L)	0.000011	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.63	1.62	1.65	1.28	<0.10
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.61	0.61	0.62	0.53	<0.10
	Manganese (Mn)-Dissolved (mg/L)	0.00057	0.00062	0.00060	0.00053	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050				
	Magnesium (Mg)-Total (mg/L)	<0.10				
	Manganese (Mn)-Total (mg/L)	<0.00030				
	Mercury (Hg)-Total (mg/L)	<0.000010				
	Molybdenum (Mo)-Total (mg/L)	<0.0010				
	Nickel (Ni)-Total (mg/L)	<0.0010				
	Potassium (K)-Total (mg/L)	<2.0				
	Selenium (Se)-Total (mg/L)	<0.0010				
	Silver (Ag)-Total (mg/L)	<0.000020				
	Sodium (Na)-Total (mg/L)	<2.0				
	Thallium (Tl)-Total (mg/L)	<0.00020				
	Tin (Sn)-Total (mg/L)	<0.00050				
	Titanium (Ti)-Total (mg/L)	<0.010				
	Uranium (U)-Total (mg/L)	<0.00020				
	Vanadium (V)-Total (mg/L)	<0.0010				
	Zinc (Zn)-Total (mg/L)	<0.0050				
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)					
	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)					
	Manganese (Mn)-Dissolved (mg/L)					
	Mercury (Hg)-Dissolved (mg/L)					
	Molybdenum (Mo)-Dissolved (mg/L)					
	Nickel (Ni)-Dissolved (mg/L)					
	Potassium (K)-Dissolved (mg/L)					
	Selenium (Se)-Dissolved (mg/L)					

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L928158-18	L928158-19	L928158-20	L928158-21	L928158-22
		Description					
		Sampled Date	23-AUG-10	24-AUG-10	25-AUG-10	25-AUG-10	25-AUG-10
		Sampled Time					
		Client ID	WAL-11-S	PDL-11-S	INUG-17-S	INUG-17-INT	INUG-17-D
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.484	0.368	0.285	0.287	0.299	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L928158-23	L928158-24	L928158-25	L928158-26	L928158-27
		Description					
		Sampled Date	28-AUG-10	28-AUG-10	28-AUG-10	28-AUG-10	28-AUG-10
		Sampled Time					
		Client ID	TE-29-S	TE-29-INT	TE-29-D	TEFF-11-S	AUG EB-2
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.390	0.192	0.207	0.191		

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L928158-28				
Grouping						
Analyte						
WATER						
Dissolved Metals						
Silver (Ag)-Dissolved (mg/L)						
Sodium (Na)-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)						
Plant Pigments						
Chlorophyll a (ug)						

* 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
DLM	Detection Limit Adjusted For Sample Matrix Effects
DLHM	Detection Limit Adjusted: Sample has High Moisture Content

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
AL-CSR-ICP-VA	Soil	Al in Soil by ICPOES (CSR SALM)	BCMELP CSR SALM Method 8
This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite 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". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate 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". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
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".			
C-DIS-ORG-LOW-CL	Water	Dissolved Organic Carbon	APHA 5310 C-Instrumental
C-TOT-ORG-LECO-SK	Soil	Organic Carbon by combustion method	SSSA (1996) p. 973
Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)			
Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight loss after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.			
Reference for Total C: Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5			
Reference for Inorganic C: Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5			
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental

Reference Information

CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
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.			
EPH-TUMB-FID-VA	Soil	EPH in Solids by Tumbler and GCFID	BCMELP CSR
Extractable Hydrocarbons in Sediment/Soil This analysis is carried out in accordance with the British Columbia Ministry of Environment, Lands and Parks (BCMELP) Analytical Method for Contaminated Sites "Extractable Petroleum Hydrocarbons in Solids by GC/FID, Version 2.1 July 1999". The procedure, based on EPA 3570, uses a rotary extraction technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene or kept in hexane/acetone and analyzed by capillary column gas chromatography with flame ionization detection (GC/FID). EPH results include Polycyclic Aromatic Hydrocarbons (PAH) and are therefore not equivalent to Light and Heavy Extractable Petroleum Hydrocarbons (LEPH/HEPH).			
Accuracy target values for Reference Materials used in this method are derived from averages of long-term method performance, as certified values do not exist for the reported parameters.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
HG-CCME-CVAFS-VA	Soil	CVAFS Hg in Soil (CCME)	BCMELP CSR SALM METHOD 8/EPA 245.7
This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic fluorescence spectrophotometry (EPA Method 7000 series).			
Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.			
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).			
LEPH/HEPH-CALC-VA	Soil	LEPHs and HEPHs	BC MOE LABORATORY MANUAL (2005)
Light and Heavy Extractable Petroleum Hydrocarbons in Solids. These results are determined according to the British Columbia Ministry of Environment, Lands, and Parks Analytical Method for Contaminated Sites "Calculation of Light and Heavy Extractable Petroleum Hydrocarbons in Solids or Water". According to this method, LEPH and HEPH are calculated by subtracting selected Polycyclic Aromatic Hydrocarbon results from Extractable Petroleum Hydrocarbon results. To calculate LEPH, the individual results for Naphthalene and Phenanthrene are subtracted from EPH(C10-19). To calculate HEPH, the individual results for Benz(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-c,d)pyrene, and Pyrene are subtracted from EPH(C19-32). Analysis of Extractable Petroleum Hydrocarbons adheres to all prescribed elements of the BCMELP method "Extractable Petroleum Hydrocarbons in Solids by GC/FID" (Version 2.1, July 20, 1999).			
MET-200.2-CCMS-VA	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A
This analysis is carried out using procedures from CSR Analytical Method: "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, 26 June 2009, and procedures adapted from EPA Method 200.2. The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 95 degrees Celsius for 2 hours by block digester using concentrated nitric and hydrochloric acids. Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.			

Reference Information

MET-CSR-FULL-ICP-VA	Soil	Metals in Soil by ICPOES (CSR SALM)	BCMELP CSR SALM METHOD 8
This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.			
MET-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
MET-TOT-CCME-ICP-VA	Water	Total Metals in Water by ICPOES (CCME)	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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
MET-UG-ICP-VA	Swab	Metals in Swab by ICPOES	NIOSH 7303/EPA 6010B
This analysis is carried out using procedures adapted from Method 7303 in the NIOSH Manual of Analytical Methods (NMAM). The procedure involves a hot block digestion of the swab material, using a combination of nitric acid and hydrochloric acid. Instrumental analysis of the swab extract is by inductively coupled plasma - optical emission spectrophotometry (EPA 6010B).			
MOISTURE-VA	Soil	Moisture content	ASTM METHOD D2974-00
This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.			
N-TOTKJ-LOW-ED	Water	Total Kjeldahl Nitrogen- Low Level	APHA 4500Norg C-Dig.-Auto-Colorimetry
NH4-LOW-ED	Water	Ammonia-N Low Level	APHA 4500 NH3F-Colorimetry
OG-TMB-VA	Soil	Oil & Grease in Soils by Tumbler	NATM1100 V03 CCME PHC F2-F4G
A subsample of the sediment/soil is extracted with 1:1 hexane:acetone using a rotary extraction apparatus. The extract is analyzed gravimetrically.			
Accuracy target values for Reference Materials used in this method are derived from averages of long-term method performance, as certified values do not exist for the reported parameters.			
PAH-SURR-MS-VA	Soil	PAH Surrogates for Soils	EPA METHODS 3570, 3545A & 8270
PAH-TUMB-H/A-MS-VA	Soil	PAH by Tumbler HEX/ACE with GCMS	EPA METHODS 3570 & 8270.
Polycyclic Aromatic Hydrocarbons in Sediment/Soil This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation.			
PH-1:2-VA	Soil	CSR pH by 1:2 Water Leach	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL
This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water. The pH of the solution is then measured using a standard pH probe.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"

Reference Information

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

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

PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value

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

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

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

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

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

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

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

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

PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PSA-PIPET+GRAVEL-SK	Soil	Particle size - Sieve and Pipette	FORESTRY CANADA (1991) P. 46-48 MOD

Particle size analysis involves the measurement of the proportions of the various primary soil particle sizes (ie. clay < 0.004 mm, silt 0.004-0.063 mm, sand 0.063-2.0 mm and gravel > 2.0 mm). In this method, the gravel and sand portions are determined by sieving, while the clay portion is determined by sedimentation using Stokes Law, which relates the radius of the particles to the velocity of the sedimentation in water. Silt is calculated as 100% - (sand% + clay%)

Pretreatment of the soil with Calgon (sodium hexametaphosphate) is used to ensure the complete dispersion of the primary soil particles. Additional pretreatment may be necessary to remove cementing materials such as CaCO₃ and organic matter.

Reference
 Y.P. Kalra, and D.G. Maynard, 1991. Methods Manual For Forest Soil and Plant Analysis, Northwest Region. Forestry Canada (modified sand, silt and clay size ranges)

SILICATE-COL-VA	Water	Silicate by Colourimetric analysis	APHA 4500-SiO ₂ D.

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

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

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

TL-CSR-MS-VA	Soil	ICPMS TI in Soil by CSR SALM	BCMELP CSR SALM Method 8

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm

Reference Information

(10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by either hotplate or block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

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.

U-200.2-MS-VA Soil Uranium in Soil by ICPMS EPA 200.2/6020A

This analysis is carried out using procedures from CSR Analytical Method: "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, 26 June 2009, and procedures adapted from EPA Method 200.2. The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 95 degrees Celsius for 2 hours by block digester using concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

** 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 LABORATORY GROUP - EDMONTON, ALBERTA, CANADA
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA
SK	ALS LABORATORY GROUP - SASKATOON, SASKATCHEWAN, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

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

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

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

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

mg/L milligrams per litre.

< - Less than.

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

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

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

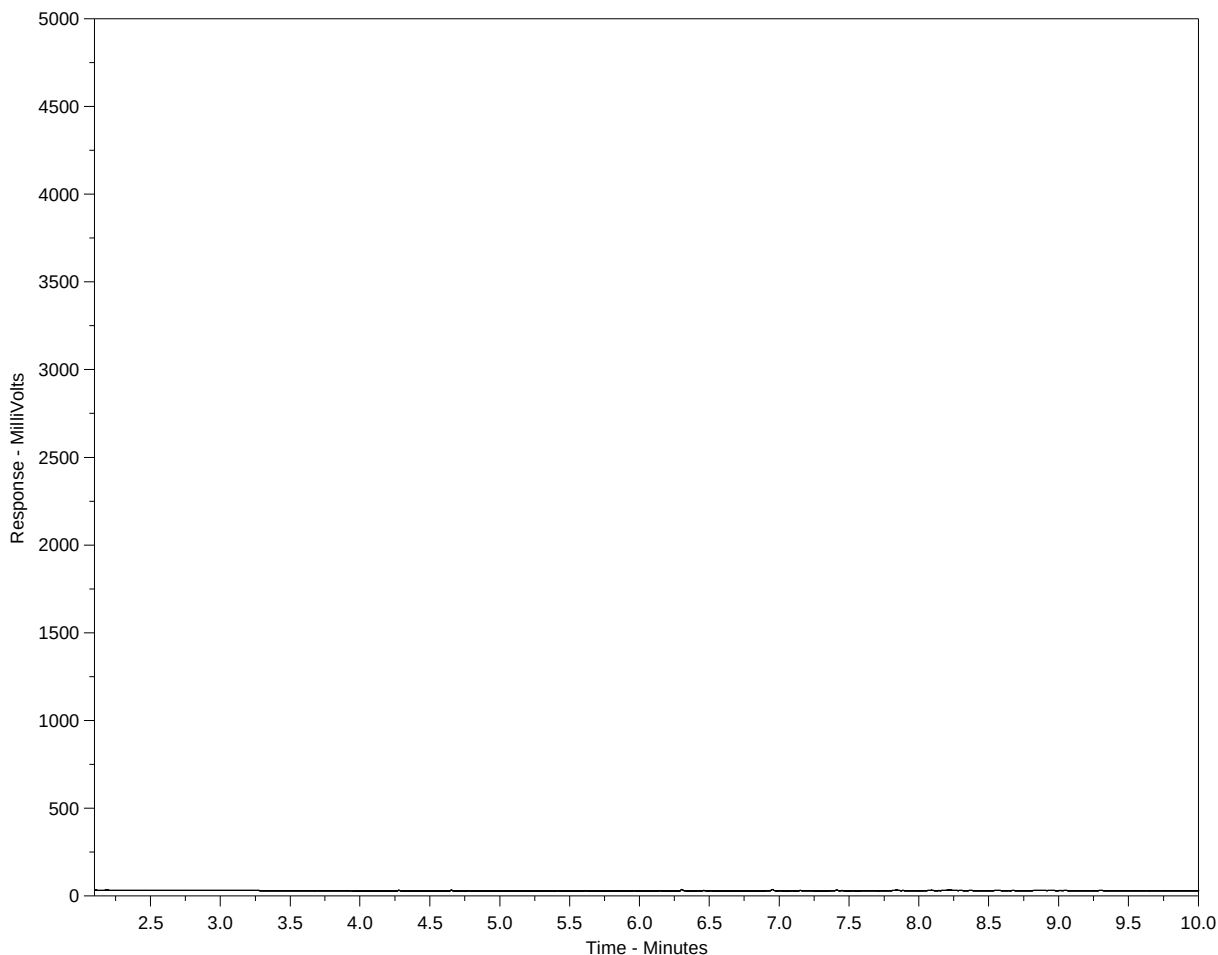
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

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

Hydrocarbon Distribution Report



ALS Sample ID: L928158-1
Client ID: WAL-1



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
345°F	626°F	873°F		972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

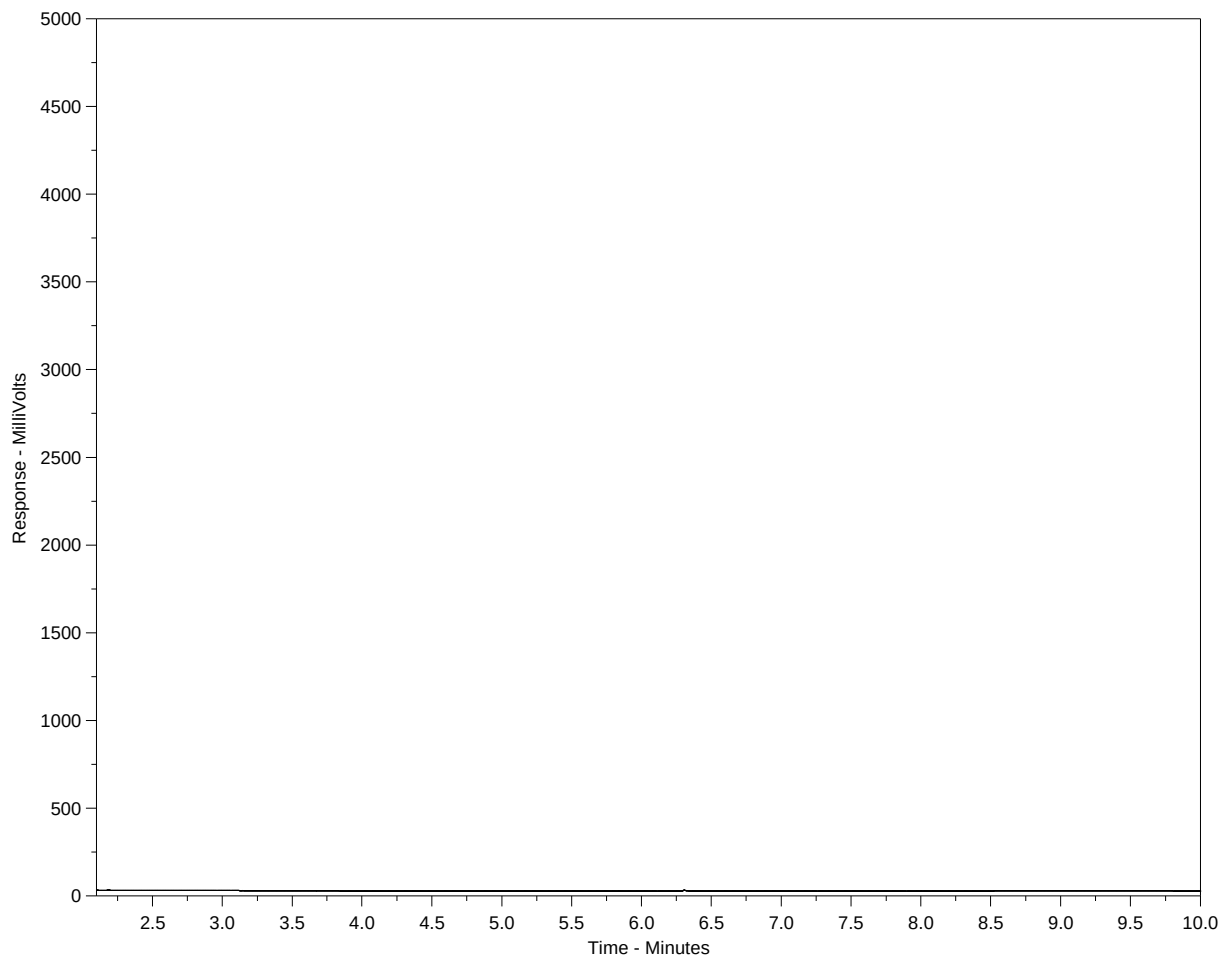
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.
Lxxxxxx-L-x denotes low level samples, Lxxxxxx-S-x denotes SG cleaned samples.

Hydrocarbon Distribution Report



ALS Sample ID: L928158-8
Client ID: INUG-2



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
345°F	626°F	873°F		972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.
Lxxxxxx-L-x denotes low level samples, Lxxxxxx-S-x denotes SG cleaned samples.



L928158

Report to:				Report Format / Distribution				Service Requested:			
Company: Azimuth Consulting Group Inc.				☒ Standard ☐ Other				☒ Regular Service (Default)			
Contact: Maggie McConnell				☒ PDF ☐ Excel ☐ Fax				☐ Rush Service (2-3 Days)			
Address: 218 - 2902 West Broadway, Vancouver, BC, V6K 2G8				Email 1: mmcmcc@azimuthgroup.ca				☐ Priority Service (1 Day or ASAP)			
Phone: 604-730-1220 Fax:				Email 2: gmann@azimuthgroup.ca				☐ Emergency Service (<1 Day / Weekend) - Contact ALS			
Invoice To: ☒ Same as Report				Indicate Bottles: Filtered / Preserved (F/P) -->				Analysis Request			
Company:				Client / Project Information:							
Contact:				Job #:				Meadowbank Mine CREMP			
Address:				PO/AFE:							
Sample:				Legal Site Description:							
Phone:				Quote #: Q24230							
Fax:				ALS Contact: Natasha MM				Sampler (Initials): M.L.M., M.F.			
Lab Work Order # (lab use only): L928158											
Sample Identification (This description will appear on the report)				Date dd-mm-yy		Time hh:mm		Sample Type (Select from drop-down list)			
1 WAL-1				23-Aug-10				Sediment		X	
2 WAL-2				23-Aug-10				Sediment		X	
3 WAL-3				23-Aug-10				Sediment		X	
4 PDL-1				24-Aug-10				Sediment		X	
5 PDL-2				24-Aug-10				Sediment		X	
6 PDL-3				24-Aug-10				Sediment		X	
7 INUG-1				25-Aug-10				Sediment		X	
8 INUG-2				25-Aug-10				Sediment		X	
9 INUG-3				25-Aug-10				Sediment		X	
10 TE-1				27-Aug-10				Sediment		X	
Guidelines / Regulations											
Special Instructions / Hazardous Details											
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.											
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.											
Relinquished By: <i>Maggie McConnell</i>		Date & Time: 29-Aug-10		Received By:		Date & Time:		Temperature		Sample Condition (lab use only)	
Relinquished By: <i>Maggie McConnell</i>		Date & Time: 29-Aug-10		Received By: <i>RC</i>		Date & Time: 03-Sep-10		15.2		Samples Received in Good Condition? Y / N (if no provided details)	

10:35am



Report to:						Report Format / Distribution							Service Requested:									
Company: Azimuth Consulting Group Inc.						☒ Standard ☐ Other ☒ PDF ☒ Excel ☐ Fax							☒ Regular Service (Default)									
Contact: Maggie McConnell													☐ Rush Service (2-3 Days)									
Address: 218 - 2902 West Broadway, Vancouver, BC, V6K 2G8						Email 1: mmcconnell@azimutgroup.ca							☐ Priority Service (1 Day or ASAP)									
Phone: 604-730-1220 Fax:						Email 2: gmann@azimutgroup.ca							☐ Emergency Service (<1 Day / Weekend) - Contact ALS									
Invoice To: [X] Same as Report						Indicate Bottles: Filtered / Preserved (F/P) →→→							Analysis Request									
Company:						Client / Project Information:																
Contact:						Job #: Meadowbank Mine CREMP																
Address:						PO/A/E:																
Sample						Legal Site Description:																
Phone:						Quote #: Q24230																
Lab Work Order # (lab use only)						ALS Contact: Natasha MM		Sampler (Initials):		MLM, MF												
Sample Identification (This description will appear on the report)						Date	Time hh:mm	Sample Type (Select from drop-down list)		T-Metals (incl. Ph) (CCME)	D-Metals (incl. Ph) (CCME)	TOC, DOC (F)	TKN, Ammonia	TDS, TSS-low	Aik (SPECIATED)	Anion Scan, Si, pH, EC	T-PO4, ortho-PO4	Chlorophyll-a	Turbidity	Hazardous?	Highly Contaminated?	Number of Containers
#	WAL-11-S				dd-mm-yy			Water	X	X	X	X	X	X	X	X	X	X	X	X	7	
18	PDL-11-S				23-Aug-10			Water	X	X	X	X	X	X	X	X	X	X	X	X	7	
19	INUG-17-S				24-Aug-10			Water	X	X	X	X	X	X	X	X	X	X	X	X	7	
20	INUG-17-INT				25-Aug-10			Water	X	X	X	X	X	X	X	X	X	X	X	X	7	
21	INUG-17-D				25-Aug-10			Water	X	X	X	X	X	X	X	X	X	X	X	X	7	
22	TE-29-S				25-Aug-10			Water	X	X	X	X	X	X	X	X	X	X	X	X	7	
23	TE-29-INT				28-Aug-10			Water	X	X	X	X	X	X	X	X	X	X	X	X	7	
24	TE-29-D				28-Aug-10			Water	X	X	X	X	X	X	X	X	X	X	X	X	7	
25	TEFF-11-S				28-Aug-10			Water	X	X	X	X	X	X	X	X	X	X	X	X	7	
Guidelines / Regulations																						
Special Instructions / Hazardous Details																						
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.																						
Relinquished By: Maggie McConnell	Date & Time: 29-Aug-10	Received By:	Date & Time:	Temperature Samples Received in Good Condition? Y / N (if no provided details)																		
Relinquished By: [Signature]	Date & Time:	Received By:	Date & Time:	[RC] 09/09/10 3:35 PM																		

[illegible]

Report to:				Report Format / Distribution				Service Requested:					
Company: Azimuth Consulting Group Inc.				☒ Standard ☐ Other				☒ Regular Service (Default)					
Contact: Maggie McConnell				☒ PDF ☒ Excel ☐ Fax				☐ Rush Service (2-3 Days)					
Address: 218 - 2902 West Broadway, Vancouver, BC, V6K 2G8				Email 1: mmccconnell@azimuthgroup.ca				☐ Priority Service (1 Day or ASAP)					
Phone: 604-730-1220 Fax:				Email 2: gmann@azimuthgroup.ca				☐ Emergency Service (<1 Day / Weekend) - Contact ALS					
Invoice To: ☒ Same as Report				Indicate Bottles: Filtered / Preserved (FFP) --				Analysis Request					
Company:				Client / Project Information:									
Contact:				Job #:									
Address:				PO/AFE:									
Sample				Legal Site Description:									
Phone:				Quote #: Q24230									
Lab Work Order #				ALS									
(lab use only)				Contact: Natasha MM									
Sample #		Sample Identification (This description will appear on the report)		Date		Time		Sample Type					
				dd-mm-yy		hh:mm		(Selected from drop-down list)					
29		TRB-2		19/08/10		14:00		Sediment		☒ T-Metals (incl. Al, Ph) (CCME)			
30		SP-DT		23/08/10		15:36		Sediment		☒ pH			
31		SP-F1		20/08/10		8:58		Sediment		☒ Moisture			
32		SP-N1		20/08/10		16:50		Sediment		☒ TOC			
33		SP-N2		20/08/10		11:40		Sediment		☒ PSA			
34		SP-N3		19/08/10		16:00		Sediment					
35		TP-E1		25/08/10		14:00		Sediment					
36		TP-E2		27/08/10		16:45		Sediment					
37		TP-E3		25/08/10		15:30		Sediment					
38		HVH-4		24/08/10		13:43		Sediment					
Guidelines / Regulations				Special Instructions / Hazardous Details									
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.													
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.													
Relinquished By:		Date & Time:		Received By:		Date & Time:		Temperature		Sample Condition (lab use only)			
Jossica Torg		August 29, 2010		RC		3/4 1035		15.2		Samples Received in Good Condition? Y / N (if no provided details)			

[illegible]



AZIMUTH CONSULTING GROUP INC.
ATTN: MAGGIE McCONNELL
218 - 2902 WEST BROADWAY
VANCOUVER BC V6K 2G8
Phone: 604-730-1220

Date Received: 13-SEP-10
Report Date: 29-SEP-10 13:53 (MT)
Version: FINAL

Certificate of Analysis

Lab Work Order #: L930620
Project P.O. #: NOT SUBMITTED
Job Reference: MEADOWBANK MINE CREMP
Legal Site Desc:
C of C Numbers:

Natasha Markovic-Mirovic
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 LIMITED Part of the ALS Group A Campbell Brothers Limited Company

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L930620-5	L930620-6	L930620-7	L930620-8	L930620-9
		Description					
		Sampled Date	31-AUG-10	31-AUG-10	31-AUG-10	31-AUG-10	31-AUG-10
		Sampled Time					
		Client ID	BBD-1	BBD-2	BBD-3	BPJ-1	BPJ-2
Grouping	Analyte						
SOIL							
Physical Tests	Moisture (%)		29.5	52.0	35.3	55.3	47.2
	pH (pH)		6.02	6.23	6.66	7.65	6.82
Particle Size	% Gravel (>2mm) (%)		0.39	<0.10	<0.10	<0.10	<0.10
	% Sand (2.0mm - 0.063mm) (%)		41.0	21.2	74.5	28.4	17.8
	% Silt (0.063mm - 4um) (%)		48.6	64.4	24.0	61.9	68.1
	% Clay (<4um) (%)		10.0	14.4	1.53	9.75	14.0
Organic / Inorganic Carbon	Total Organic Carbon (%)		0.23	0.51	0.22	0.67	0.42
Metals	Antimony (Sb) (mg/kg)		<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)		5.1	12.3	5.4	8.4	11.7
	Barium (Ba) (mg/kg)		73.6	264	66.8	129	111
	Beryllium (Be) (mg/kg)		<0.50	0.77	<0.50	<0.50	0.55
	Cadmium (Cd) (mg/kg)		<0.50	<0.50	<0.50	<0.50	<0.50
	Chromium (Cr) (mg/kg)		20.0	31.6	11.5	20.2	24.8
	Cobalt (Co) (mg/kg)		6.0	9.0	4.4	7.6	8.6
	Copper (Cu) (mg/kg)		7.9	15.7	4.9	8.9	11.4
	Lead (Pb) (mg/kg)		<30	<30	<30	<30	<30
	Mercury (Hg) (mg/kg)		0.0062	0.0089	<0.0050	0.0099	0.0064
	Molybdenum (Mo) (mg/kg)		<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)		9.3	17.2	6.2	11.2	12.6
	Selenium (Se) (mg/kg)		<2.0	<2.0	<2.0	<2.0	<2.0
	Silver (Ag) (mg/kg)		<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)		<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)		<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg)		2.49	4.23	0.891	1.92	3.39
	Vanadium (V) (mg/kg)		24.9	70.8	14.3	23.5	31.2
	Zinc (Zn) (mg/kg)		30.0	52.4	23.6	36.7	41.6
Aggregate Organics	Oil and Grease (mg/kg)		<500	<500	<500	<500	<500
Hydrocarbons	EPH10-19 (mg/kg)		<200	<200	<200	<200	<200
	EPH19-32 (mg/kg)		<200	<200	<200	<200	<200
	LEPH (mg/kg)		<200	<200	<200	<200	<200
	HEPH (mg/kg)		<200	<200	<200	<200	<200
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Acenaphthylene (mg/kg)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Anthracene (mg/kg)		<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
	Benz(a)anthracene (mg/kg)		<0.010	<0.010	<0.010	<0.010	<0.010

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L930620-10	L930620-11	L930620-12	L930620-13	L930620-14
		Description					
		Sampled Date	31-AUG-10	30-AUG-10	30-AUG-10	30-AUG-10	30-AUG-10
		Sampled Time					
		Client ID	BPJ-3	BAP-1	BAP-2	BAP-3	DUP-3
Grouping	Analyte						
SOIL							
Physical Tests	Moisture (%)		46.8	37.4	44.4	46.6	37.2
	pH (pH)		6.19	6.06	6.07	6.11	5.95
Particle Size	% Gravel (>2mm) (%)		<0.10	<0.10	<0.10	<0.10	<0.10
	% Sand (2.0mm - 0.063mm) (%)		24.4	78.5	60.6	61.4	80.6
	% Silt (0.063mm - 4um) (%)		68.0	20.2	36.1	34.9	17.3
	% Clay (<4um) (%)		7.62	1.30	3.26	3.76	2.11
Organic / Inorganic Carbon	Total Organic Carbon (%)		0.44	0.33	0.93	0.48	0.30
Metals	Antimony (Sb) (mg/kg)		<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)		60.5	<5.0	<5.0	5.1	<5.0
	Barium (Ba) (mg/kg)		155	232	329	372	273
	Beryllium (Be) (mg/kg)		<0.50	<0.50	<0.50	<0.50	<0.50
	Cadmium (Cd) (mg/kg)		<0.50	<0.50	<0.50	<0.50	<0.50
	Chromium (Cr) (mg/kg)		19.5	15.6	18.5	19.5	15.8
	Cobalt (Co) (mg/kg)		7.9	3.8	4.8	5.1	3.8
	Copper (Cu) (mg/kg)		8.4	4.5	7.7	6.9	4.6
	Lead (Pb) (mg/kg)		<30	<30	<30	<30	<30
	Mercury (Hg) (mg/kg)		0.0072	<0.0050	0.0055	0.0071	<0.0050
	Molybdenum (Mo) (mg/kg)		<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)		8.4	7.6	9.4	9.6	7.9
	Selenium (Se) (mg/kg)		<2.0	<2.0	<2.0	<2.0	<2.0
	Silver (Ag) (mg/kg)		<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)		<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)		<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg)		1.77	1.16	1.81	1.74	1.18
	Vanadium (V) (mg/kg)		22.5	16.7	23.1	23.7	17.7
	Zinc (Zn) (mg/kg)		34.2	19.2	26.2	27.4	19.4
Aggregate Organics	Oil and Grease (mg/kg)		<500	<500	<500	<500	<500
Hydrocarbons	EPH10-19 (mg/kg)		<200	<200	<200	<200	<200
	EPH19-32 (mg/kg)		<200	<200	<200	<200	<200
	LEPH (mg/kg)		<200	<200	<200	<200	<200
	HEPH (mg/kg)		<200	<200	<200	<200	<200
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Acenaphthylene (mg/kg)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Anthracene (mg/kg)		<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
	Benz(a)anthracene (mg/kg)		<0.010	<0.010	<0.010	<0.010	<0.010

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L930620-5	L930620-6	L930620-7	L930620-8	L930620-9
			31-AUG-10	31-AUG-10	31-AUG-10	31-AUG-10	31-AUG-10
			BBD-1	BBD-2	BBD-3	BPJ-1	BPJ-2
Grouping	Analyte						
SOIL							
Polycyclic Aromatic Hydrocarbons	Benzo(a)pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Benzo(b)fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Benzo(g,h,i)perylene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Benzo(k)fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Chrysene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Dibenz(a,h)anthracene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
	Fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Fluorene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	
	2-Methylnaphthalene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Naphthalene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Phenanthrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Surrogate: d10-Acenaphthene (SS) (%)	79	81	81	84	75	
	Surrogate: d12-Chrysene (SS) (%)	82	83	85	88	80	
	Surrogate: d8-Naphthalene (SS) (%)	78	78	80	81	73	
	Surrogate: d10-Phenanthrene (SS) (%)	82	83	84	89	80	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L930620-10	L930620-11	L930620-12	L930620-13	L930620-14
		Description					
		Sampled Date	31-AUG-10	30-AUG-10	30-AUG-10	30-AUG-10	30-AUG-10
		Sampled Time					
		Client ID	BPJ-3	BAP-1	BAP-2	BAP-3	DUP-3
Grouping	Analyte						
SOIL							
Polycyclic Aromatic Hydrocarbons	Benzo(a)pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Benzo(b)fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Benzo(g,h,i)perylene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Benzo(k)fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Chrysene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Dibenz(a,h)anthracene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Fluorene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	2-Methylnaphthalene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Naphthalene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Phenanthrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Surrogate: d10-Acenaphthene (SS) (%)	75	81	83	79	88	
	Surrogate: d12-Chrysene (SS) (%)	81	83	79	87	80	
	Surrogate: d8-Naphthalene (SS) (%)	72	79	79	75	84	
	Surrogate: d10-Phenanthrene (SS) (%)	79	85	85	85	86	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
SWAB						
Metals	Aluminum (Al)-Total (ug)	<20				
	Antimony (Sb)-Total (ug)	<20				
	Arsenic (As)-Total (ug)	<20				
	Barium (Ba)-Total (ug)	<1.0				
	Beryllium (Be)-Total (ug)	<0.50				
	Bismuth (Bi)-Total (ug)	<20				
	Cadmium (Cd)-Total (ug)	<1.0				
	Calcium (Ca)-Total (ug)	35.1				
	Chromium (Cr)-Total (ug)	3.6				
	Cobalt (Co)-Total (ug)	<1.0				
	Copper (Cu)-Total (ug)	<1.0				
	Iron (Fe)-Total (ug)	32.7				
	Lead (Pb)-Total (ug)	<5.0				
	Lithium (Li)-Total (ug)	<1.0				
	Magnesium (Mg)-Total (ug)	24				
	Manganese (Mn)-Total (ug)	0.54				
	Molybdenum (Mo)-Total (ug)	<3.0				
	Nickel (Ni)-Total (ug)	<5.0				
	Phosphorus (P)-Total (ug)	<30				
	Potassium (K)-Total (ug)	<200				
	Selenium (Se)-Total (ug)	<20				
	Silver (Ag)-Total (ug)	<1.0				
	Sodium (Na)-Total (ug)	<200				
	Strontium (Sr)-Total (ug)	<0.50				
	Thallium (Tl)-Total (ug)	<20				
	Tin (Sn)-Total (ug)	<3.0				
	Titanium (Ti)-Total (ug)	<1.0				
	Vanadium (V)-Total (ug)	<3.0				
	Zinc (Zn)-Total (ug)	<0.90 ^{DLB}				

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L930620-1	L930620-2	L930620-3	L930620-4	
Description							
Sampled Date			31-AUG-10	31-AUG-10	30-AUG-10		
Sampled Time							
Client ID			BBD-11-S	BPJ-11-S	BAP-11-S	AUG DUP-2	
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		78.0	448	695	321	
	Hardness (as CaCO3) (mg/L)		15.5	25.0	37.7	37.7	
	pH (pH)		7.27	8.25	8.50	7.29	
	Total Suspended Solids (mg/L)		<1.0	<1.0	<1.0	<1.0	
	Total Dissolved Solids (mg/L)		50	102	175	181	
	Turbidity (NTU)		0.30	0.31	0.24	0.30	
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		9.1	9.1	8.8	9.7	
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<2.0	<2.0	<1.0	<2.0	
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<2.0	<2.0	<1.0	<2.0	
	Alkalinity, Total (as CaCO3) (mg/L)		9.1	9.1	8.8	9.7	
	Ammonia as N (mg/L)		<0.0050	<0.0050	0.0053	0.0052	
	Bromide (Br) (mg/L)		<0.050	<0.050	0.254	0.253	
	Chloride (Cl) (mg/L)		15.3	38.3	80.0	80.1	
	Fluoride (F) (mg/L)		0.046	0.050	0.054	0.053	
	Nitrate (as N) (mg/L)		<0.0050	0.0102	0.0207	0.0225	
	Nitrite (as N) (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	
	Total Kjeldahl Nitrogen (mg/L)		0.207	0.217	0.216	0.168	
	Ortho Phosphate as P (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	
	Total Phosphate as P (mg/L)		0.0048	0.0042	0.0034	0.0038	
	Silicate (as SiO2) (mg/L)		<1.0	<1.0	<1.0	<1.0	
	Sulfate (SO4) (mg/L)		2.62	5.76	11.6	11.6	
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		3.33	3.23	3.32	3.25	
	Total Organic Carbon (mg/L)		3.26	3.53	3.24	3.30	
Total Metals	Aluminum (Al)-Total (mg/L)		0.0134	0.0091	0.0104	0.0102	
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	
	Arsenic (As)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	
	Barium (Ba)-Total (mg/L)		<0.020	<0.020	<0.020	<0.020	
	Beryllium (Be)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	
	Boron (B)-Total (mg/L)		<0.10	<0.10	<0.10	<0.10	
	Cadmium (Cd)-Total (mg/L)		<0.000017	<0.000017	<0.000017	<0.000017	
	Calcium (Ca)-Total (mg/L)		2.71	3.41	4.18	4.19	
	Chromium (Cr)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	
	Cobalt (Co)-Total (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	
	Copper (Cu)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	
	Iron (Fe)-Total (mg/L)		<0.030	<0.030	<0.030	<0.030	
	Lead (Pb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L930620-1	L930620-2	L930620-3	L930620-4	
		Description					
		Sampled Date	31-AUG-10	31-AUG-10	30-AUG-10		
		Sampled Time					
		Client ID	BBD-11-S	BPJ-11-S	BAP-11-S	AUG DUP-2	
Grouping	Analyte						
WATER							
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050		
	Magnesium (Mg)-Total (mg/L)	2.01	4.33	6.50	6.49		
	Manganese (Mn)-Total (mg/L)	0.00337	0.00338	0.00271	0.00274		
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010		
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Potassium (K)-Total (mg/L)	<2.0	<2.0	2.0	2.0		
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0015 ^{DLM}	<0.0015 ^{DLM}		
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020		
	Sodium (Na)-Total (mg/L)	8.7	28.5	46.2	45.8		
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020		
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050		
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010		
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020		
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050		
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050		
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050		
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050		
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020		
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10		
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017		
	Calcium (Ca)-Dissolved (mg/L)	2.78	3.39	4.26	4.27		
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030		
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030		
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050		
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050		
	Magnesium (Mg)-Dissolved (mg/L)	2.07	4.01	6.58	6.57		
	Manganese (Mn)-Dissolved (mg/L)	0.00041	0.00042	0.00031	0.00031		
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010		
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	2.1	2.1		
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L930620-1	L930620-2	L930620-3	L930620-4	
		Description					
		Sampled Date	31-AUG-10	31-AUG-10	30-AUG-10		
		Sampled Time					
		Client ID	BBD-11-S	BPJ-11-S	BAP-11-S	AUG DUP-2	
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)		<0.000020	<0.000020	<0.000020	<0.000020	
	Sodium (Na)-Dissolved (mg/L)		8.9	24.8	46.6	45.6	
	Thallium (Tl)-Dissolved (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	
	Tin (Sn)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	
	Titanium (Ti)-Dissolved (mg/L)		<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	
	Vanadium (V)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	
Plant Pigments	Chlorophyll a (ug)		1.20	1.22	0.847	0.678	

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

Reference Information

Qualifiers for Individual Parameters Listed:

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

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 "Alkalinity"
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-PCT-VA	Water	Alkalinity by Auto. Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite 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". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate 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". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
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".			
C-DIS-ORG-LOW-CL	Water	Dissolved Organic Carbon	APHA 5310 C-Instrumental
C-TOT-ORG-LECO-SK	Soil	Organic Carbon by combustion method	SSSA (1996) p. 973
Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)			
Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight loss after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.			
Reference for Total C: Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5			
Reference for Inorganic C: Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5			
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			

Reference Information

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.			
EPH-TUMB-FID-VA	Soil	EPH in Solids by Tumbler and GCFID	BCMELP CSR
Extractable Hydrocarbons in Sediment/Soil This analysis is carried out in accordance with the British Columbia Ministry of Environment, Lands and Parks (BCMELP) Analytical Method for Contaminated Sites "Extractable Petroleum Hydrocarbons in Solids by GC/FID, Version 2.1 July 1999". The procedure, based on EPA 3570, uses a rotary extraction technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene or kept in hexane/acetone and analyzed by capillary column gas chromatography with flame ionization detection (GC/FID). EPH results include Polycyclic Aromatic Hydrocarbons (PAH) and are therefore not equivalent to Light and Heavy Extractable Petroleum Hydrocarbons (LEPH/HEPH).			
Accuracy target values for Reference Materials used in this method are derived from averages of long-term method performance, as certified values do not exist for the reported parameters.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
HG-CCME-CVAFS-VA	Soil	CVAFS Hg in Soil (CCME)	BCMELP CSR SALM METHOD 8/EPA 245.7
This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic fluorescence spectrophotometry (EPA Method 7000 series).			
Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.			
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).			
LEPH/HEPH-CALC-VA	Soil	LEPHs and HEPHs	BC MOE LABORATORY MANUAL (2005)
Light and Heavy Extractable Petroleum Hydrocarbons in Solids. These results are determined according to the British Columbia Ministry of Environment, Lands, and Parks Analytical Method for Contaminated Sites "Calculation of Light and Heavy Extractable Petroleum Hydrocarbons in Solids or Water". According to this method, LEPH and HEPH are calculated by subtracting selected Polycyclic Aromatic Hydrocarbon results from Extractable Petroleum Hydrocarbon results. To calculate LEPH, the individual results for Naphthalene and Phenanthrene are subtracted from EPH(C10-19). To calculate HEPH, the individual results for Benz(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-c,d)pyrene, and Pyrene are subtracted from EPH(C19-32). Analysis of Extractable Petroleum Hydrocarbons adheres to all prescribed elements of the BCMELP method "Extractable Petroleum Hydrocarbons in Solids by GC/FID" (Version 2.1, July 20, 1999).			
MET-CSR-FULL-ICP-VA	Soil	Metals in Soil by ICPOES (CSR SALM)	BCMELP CSR SALM METHOD 8
This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.			
MET-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA			

Reference Information

Method 6010B).

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-ICP-VA Water Total Metals in Water by ICPOES (CCME) 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-UG-ICP-VA Swab Metals in Swab by ICPOES NIOSH 7303/EPA 6010B

This analysis is carried out using procedures adapted from Method 7303 in the NIOSH Manual of Analytical Methods (NMAM). The procedure involves a hot block digestion of the swab material, using a combination of nitric acid and hydrochloric acid. Instrumental analysis of the swab extract is by inductively coupled plasma - optical emission spectrophotometry (EPA 6010B).

MOISTURE-VA Soil Moisture content ASTM METHOD D2974-00

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

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

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

OG-TMB-VA Soil Oil & Grease in Soils by Tumbler NATM1100 V03 CCME PHC F2-F4G

A subsample of the sediment/soil is extracted with 1:1 hexane:acetone using a rotary extraction apparatus. The extract is analyzed gravimetrically.

Accuracy target values for Reference Materials used in this method are derived from averages of long-term method performance, as certified values do not exist for the reported parameters.

PAH-L-TMB-MS-VA Soil LL PAH by Rotary Extraction and GCMS EPA METHODS 3570 & 8270.

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3545 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation.

PAH-SURR-MS-VA Soil PAH Surrogates for Soils EPA METHODS 3570, 3545A & 8270

PH-1:2-VA Soil CSR pH by 1:2 Water Leach BC WLAP METHOD: PH, ELECTROMETRIC, SOIL

This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water. The pH of the solution is then measured using a standard pH probe.

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

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

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

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

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

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

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorous". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is

Reference Information

determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PSA-PIPET+GRAVEL-SK Soil Particle size - Sieve and Pipette FORESTRY CANADA (1991) P. 46-48 MOD

Particle size analysis involves the measurement of the proportions of the various primary soil particle sizes (ie. clay < 0.004 mm, silt 0.004-0.063 mm, sand 0.063-2.0 mm and gravel > 2.0 mm). In this method, the gravel and sand portions are determined by sieving, while the clay portion is determined by sedimentation using Stokes Law, which relates the radius of the particles to the velocity of the sedimentation in water. Silt is calculated as 100% - (sand% + clay%)
 Pretreatment of the soil with Calgon (sodium hexametaphosphate) is used to ensure the complete dispersion of the primary soil particles. Additional pretreatment may be necessary to remove cementing materials such as CaCO₃ and organic matter.

Reference
 Y.P. Kalra, and D.G. Maynard, 1991. Methods Manual For Forest Soil and Plant Analysis, Northwest Region. Forestry Canada (modified sand, silt and clay size ranges)

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

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

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

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

TKN-SIE-VA Water Total Kjeldahl Nitrogen 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 by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TL-CSR-MS-VA Soil ICPMS TI in Soil by CSR SALM BCMELP CSR SALM Method 8

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by either hotplate or block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

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.

U-200.2-MS-VA Soil Uranium in Soil by ICPMS EPA 200.2/6020A

This analysis is carried out using procedures from CSR Analytical Method: "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, 26 June 2009, and procedures adapted from EPA Method 200.2. The sample is manually homogenized, dried at 60 degrees Celsius,

Reference Information

sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 95 degrees Celsius for 2 hours by block digester using concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

** 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
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA
SK	ALS LABORATORY GROUP - SASKATOON, SASKATCHEWAN, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

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

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

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

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

mg/L milligrams per litre.

< - Less than.

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

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

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

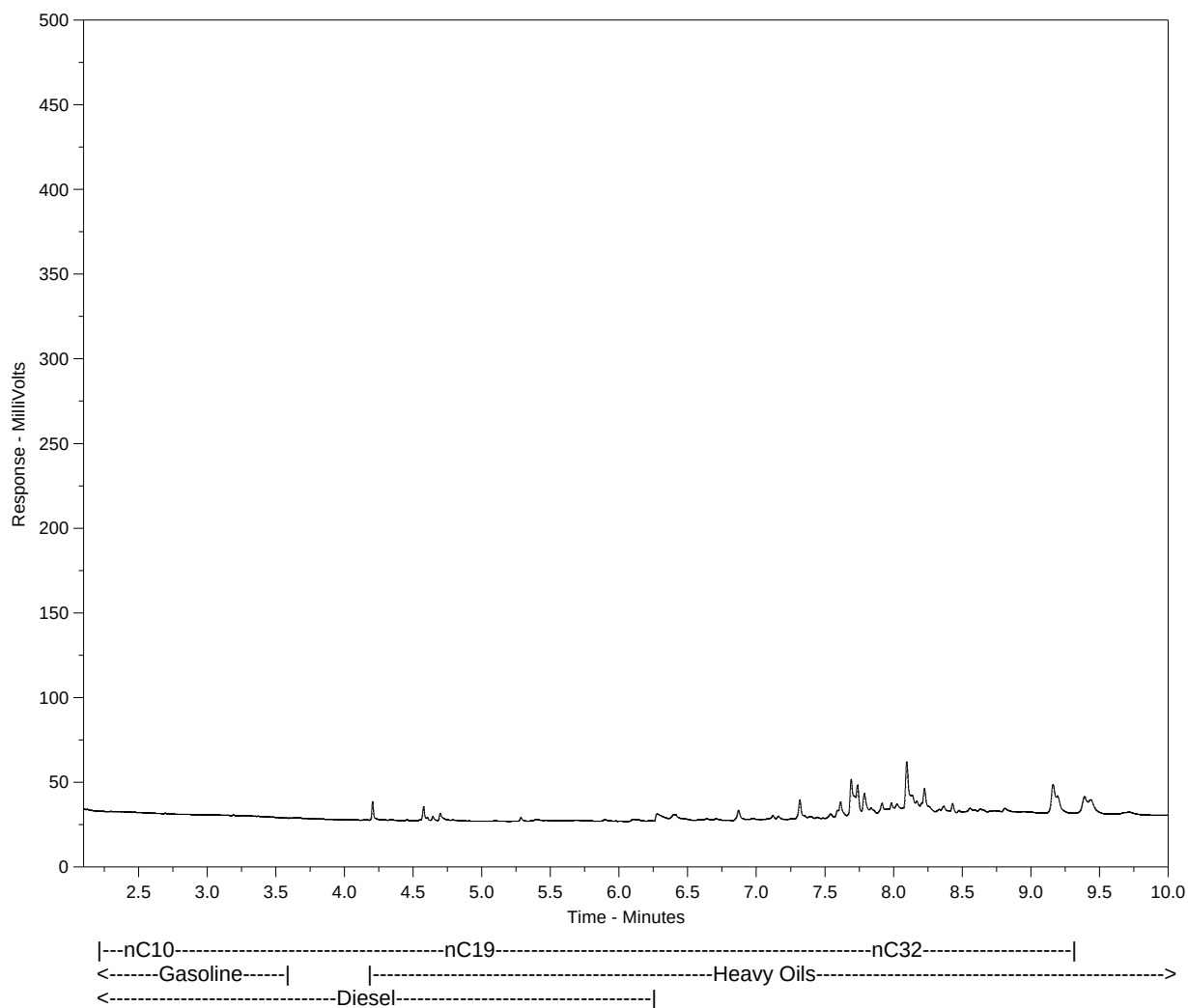
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

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

Hydrocarbon Distribution Report



ALS Sample ID: L930620-12
Client ID: BAP-2



The Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available upon request.

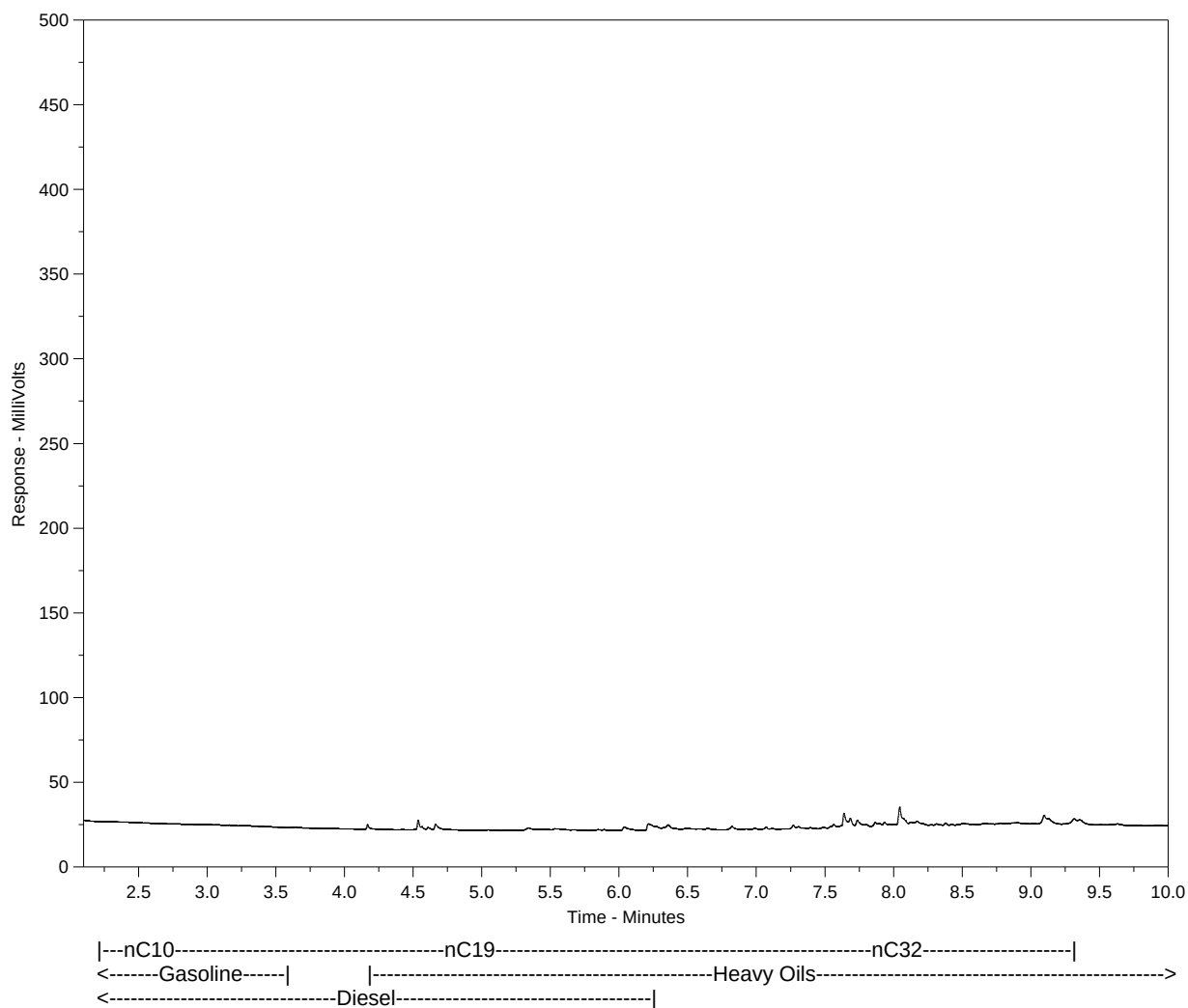
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

Hydrocarbon Distribution Report



ALS Sample ID: L930620-14
Client ID: DUP-3



The Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available upon request.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

Rush Processing

Environmental Division



www.alsqglobal.com

Page 1 of 3

N
Z
+
-
"
"
"

Short Holding Time

ALS Labora
ANALYTICAL SERVICES & TESTS
Environmental Division

Rush Processing (ALS)

At Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9678
www.alsglobal.com

COC #

Page 2 of 3

Report to:		Report Format / Distribution		Service Requested:	
Company: Azimuth Consulting Group Inc.		☒ Standard ☐ Other		☒ Regular Service (Default)	
Contact: Maggie McConnell		☒ PDF ☒ Excel ☐ Fax		☐ Rush Service (2-3 Days)	
Address: 218 - 2902 West Broadway, Vancouver, BC, V6K 2G8		Email 1: mmcmcc@azimuthgroup.ca		☐ Priority Service (1 Day or ASAP)	
Phone: 604-730-1220 Fax:		Email 2: gmann@azimuthgroup.ca		☐ Emergency Service (<1 Day / Weekend) - Contact ALS	
Invoice To: ☒ Same as Report		Indicate Bottles Filled / Preserved (F/P) -->		Analysis Request	
Company:		Client / Project Information:			
Contact:		Job #:			
Address:		PO/A/E:			
Sample:		Legal Site Description:			
Phone:		Quote #: Q24230			
Fax:					
Lab Work Order # (lab use only)		ALS Contact: Natasha MM		Sampler (Initials) ML/M, MF	
Sample Identification (This description will appear on the report)		Date dd-mm-yy		Time hh:mm	
Sample #				Sample Type (Select from drop-down list)	
BBD-1		31-Aug-10		Sediment	
BBD-2		31-Aug-10		Sediment	
BBD-3		31-Aug-10		Sediment	
BPJ-1		31-Aug-10		Sediment	
BPJ-2		31-Aug-10		Sediment	
BPJ-3		31-Aug-10		Sediment	
BAP-1		30-Aug-10		Sediment	
BAP-2		30-Aug-10		Sediment	
BAP-3		30-Aug-10		Sediment	
DUP-3		30-Aug-10		Sediment	
Guidelines / Regulations		Special Instructions / Hazardous Details			
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.					
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.					
Reinquisitioned By: <i>Maggie McConnell</i>		Date & Time: 5-Sep-10		Received By:	
Reinquisitioned By: <i>Paul</i>		Date & Time:		Received By:	
		RC		13 Sep 9am	
		Date & Time		Temperature	
				13°	
				Samples Received in Good Condition? Y / N (if no provided details)	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

---, Analytical Request Form
Canada Toll Free: 1 800 668 9878

Environmental Division

(ALS)

www.alsglobal.com

Page 3 of 3

[illegible]



AZIMUTH CONSULTING GROUP INC.
ATTN: MAGGIE McCONNELL
218 - 2902 WEST BROADWAY
VANCOUVER BC V6K 2G8
Phone: 604-730-1220

Date Received: 27-SEP-10
Report Date: 06-DEC-10 10:06 (MT)
Version: FINAL REV. 2

Certificate of Analysis

Lab Work Order #: L936353
Project P.O. #: NOT SUBMITTED
Job Reference: MEADOWBANK MINE CREMP
Legal Site Desc:
C of C Numbers:

Comments:

06-DEC-10: Please note that due to a laboratory error, Anion results for the samples identified as "TPS-26-S" and "TPN-30-S" were reported incorrectly in the original report. This revision of the report includes the corrected results.

Heather Easton
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 LIMITED Part of the ALS Group A Campbell Brothers Limited Company

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L936353-1	L936353-2	L936353-3	L936353-4	L936353-5
		Description					
		Sampled Date	17-SEP-10	17-SEP-10	17-SEP-10	17-SEP-10	17-SEP-10
		Sampled Time					
		Client ID	TPS-24-S	TPS-25-S	TPS-26-S	TPN-30-S	TPN-31-S
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		14.2	14.0	14.0	14.4	14.4
	Hardness (as CaCO3) (mg/L)		5.92	5.69	5.73	5.89	5.83
	pH (pH)		7.09	7.07	7.01	7.07	7.08
	Total Suspended Solids (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)		<10	14	<10	<10	<10
	Turbidity (NTU)		0.30	0.24	0.24	0.28	0.27
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		4.6	4.6	4.4	4.6	4.3
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)		4.6	4.6	4.4	4.6	4.3
	Ammonia-N (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Bromide (Br) (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)		<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)		0.043	0.039	0.055	0.054	0.045
	Nitrate (as N) (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)		0.153	<0.050	<0.050	<0.050	<0.050
	Ortho Phosphate as P (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)		1.27	1.13	1.46	1.52	1.40
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		1.55	1.40	1.50	1.22	1.50
	Total Organic Carbon (mg/L)		1.55	1.51	1.54	1.49	1.55
Total Metals	Aluminum (Al)-Total (mg/L)		0.0115	0.0095	0.0095	0.0105	0.0102
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)		<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)		1.39	1.35	1.32	1.41	1.42
	Chromium (Cr)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)		<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L936353-6	L936353-7	L936353-8	L936353-9	L936353-10
		Description					
		Sampled Date	17-SEP-10	17-SEP-10	18-SEP-10	18-SEP-10	
		Sampled Time					
		Client ID	TPN-32-S	SP-30-S	SP-31-S	SP-32-S	SEPT. DUP-1
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		14.4	22.0	22.3	22.3	22.2
	Hardness (as CaCO3) (mg/L)		5.82	9.85	9.95	10.1	10.3
	pH (pH)		7.07	7.32	7.31	7.31	7.31
	Total Suspended Solids (mg/L)		<1.0	<1.0	<1.0	1.1	<1.0
	Total Dissolved Solids (mg/L)		<10	10	11	15	10
	Turbidity (NTU)		0.28	0.50	0.50	0.50	0.52
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		4.7	8.0	7.8	7.8	7.7
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)		4.7	8.0	7.8	7.8	7.7
	Ammonia-N (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Bromide (Br) (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)		<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)		0.046	0.050	0.048	0.049	0.049
	Nitrate (as N) (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)		0.104	0.091	0.081	0.161	0.090
	Ortho Phosphate as P (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	0.0025
	Total Phosphate as P (mg/L)		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)		1.38	1.82	1.85	1.85	1.86
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		1.50	1.68	1.80	1.77	1.70
	Total Organic Carbon (mg/L)		1.54	1.89	1.74	1.80	2.00
Total Metals	Aluminum (Al)-Total (mg/L)		0.0105	0.0239	0.0209	0.0224	0.0210
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)		<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)		1.39	2.43	2.65	2.63	2.58
	Chromium (Cr)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)		<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L936353-11	L936353-12		
		Description				
		Sampled Date	18-SEP-10			
		Sampled Time				
		Client ID	SEPT. EB-1	TRAVEL BLANKS		
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)		<2.0	<2.0		
	Hardness (as CaCO3) (mg/L)		<0.50	<0.50		
	pH (pH)		6.09	5.68		
	Total Suspended Solids (mg/L)		<1.0	<1.0		
	Total Dissolved Solids (mg/L)		<10	<10		
	Turbidity (NTU)		0.24	<0.10		
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		<2.0	<2.0		
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<2.0	<2.0		
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<2.0	<2.0		
	Alkalinity, Total (as CaCO3) (mg/L)		<2.0	<2.0		
	Ammonia-N (mg/L)		0.0295 ^{RRV}			
	Bromide (Br) (mg/L)		<0.050	<0.050		
	Chloride (Cl) (mg/L)		<0.50	<0.50		
	Fluoride (F) (mg/L)		<0.020	<0.020		
	Nitrate (as N) (mg/L)		<0.0050	<0.0050		
	Nitrite (as N) (mg/L)		<0.0010	<0.0010		
	Total Kjeldahl Nitrogen (mg/L)		<0.050			
	Ortho Phosphate as P (mg/L)		<0.0010	<0.0010		
	Total Phosphate as P (mg/L)		<0.0020	<0.0020		
	Silicate (as SiO2) (mg/L)		<1.0	<1.0		
	Sulfate (SO4) (mg/L)		<0.50	<0.50		
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		0.65			
	Total Organic Carbon (mg/L)		0.58	<0.50		
Total Metals	Aluminum (Al)-Total (mg/L)		<0.0050	<0.0050		
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.00050		
	Arsenic (As)-Total (mg/L)		<0.00050	<0.00050		
	Barium (Ba)-Total (mg/L)		<0.020	<0.020		
	Beryllium (Be)-Total (mg/L)		<0.0010	<0.0010		
	Boron (B)-Total (mg/L)		<0.10	<0.10		
	Cadmium (Cd)-Total (mg/L)		<0.000017	<0.000017		
	Calcium (Ca)-Total (mg/L)		<0.10	<0.10		
	Chromium (Cr)-Total (mg/L)		<0.0010	<0.0010		
	Cobalt (Co)-Total (mg/L)		<0.00030	<0.00030		
	Copper (Cu)-Total (mg/L)		0.0020	<0.0010		
	Iron (Fe)-Total (mg/L)		<0.030	<0.030		
	Lead (Pb)-Total (mg/L)		0.00103	<0.00050		

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L936353-1	L936353-2	L936353-3	L936353-4	L936353-5
		17-SEP-10	17-SEP-10	17-SEP-10	17-SEP-10	17-SEP-10
		TPS-24-S	TPS-25-S	TPS-26-S	TPN-30-S	TPN-31-S
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.60	0.59	0.58	0.61	0.61
	Manganese (Mn)-Total (mg/L)	0.00140	0.00135	0.00135	0.00163	0.00162
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.38	1.32	1.33	1.38	1.36
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.60	0.58	0.58	0.60	0.59
	Manganese (Mn)-Dissolved (mg/L)	0.00030	0.00030	<0.00030	0.00057	0.00057
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L936353-6	L936353-7	L936353-8	L936353-9	L936353-10
		17-SEP-10	17-SEP-10	18-SEP-10	18-SEP-10	
		TPN-32-S	SP-30-S	SP-31-S	SP-32-S	SEPT. DUP-1
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.60	0.83	0.90	0.88	0.87
	Manganese (Mn)-Total (mg/L)	0.00150	0.00153	0.00152	0.00153	0.00153
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	0.0080	0.0054	0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.36	2.52	2.55	2.60	2.64
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.59	0.86	0.87	0.88	0.89
	Manganese (Mn)-Dissolved (mg/L)	0.00040	0.00069	0.00035	0.00037	0.00038
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L936353-11	L936353-12		
		Description				
		Sampled Date	18-SEP-10			
		Sampled Time				
		Client ID	SEPT. EB-1	TRAVEL BLANKS		
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050			
	Magnesium (Mg)-Total (mg/L)	<0.10	<0.10			
	Manganese (Mn)-Total (mg/L)	<0.00030	<0.00030			
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010			
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010			
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010			
	Potassium (K)-Total (mg/L)	<2.0	<2.0			
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010			
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020			
	Sodium (Na)-Total (mg/L)	<2.0	<2.0			
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020			
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050			
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010			
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020			
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010			
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050				
	Antimony (Sb)-Dissolved (mg/L)	<0.00050				
	Arsenic (As)-Dissolved (mg/L)	<0.00050				
	Barium (Ba)-Dissolved (mg/L)	<0.020				
	Beryllium (Be)-Dissolved (mg/L)	<0.0010				
	Boron (B)-Dissolved (mg/L)	<0.10				
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017				
	Calcium (Ca)-Dissolved (mg/L)	<0.10				
	Chromium (Cr)-Dissolved (mg/L)	<0.0010				
	Cobalt (Co)-Dissolved (mg/L)	<0.00030				
	Copper (Cu)-Dissolved (mg/L)	<0.0010				
	Iron (Fe)-Dissolved (mg/L)	<0.030				
	Lead (Pb)-Dissolved (mg/L)	<0.00050				
	Lithium (Li)-Dissolved (mg/L)	<0.0050				
	Magnesium (Mg)-Dissolved (mg/L)	<0.10				
	Manganese (Mn)-Dissolved (mg/L)	<0.00030				
	Mercury (Hg)-Dissolved (mg/L)	<0.000010				
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010				
	Nickel (Ni)-Dissolved (mg/L)	<0.0010				
	Potassium (K)-Dissolved (mg/L)	<2.0				
	Selenium (Se)-Dissolved (mg/L)	<0.0010				

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L936353-1	L936353-2	L936353-3	L936353-4	L936353-5
		Description					
		Sampled Date	17-SEP-10	17-SEP-10	17-SEP-10	17-SEP-10	17-SEP-10
		Sampled Time					
		Client ID	TPS-24-S	TPS-25-S	TPS-26-S	TPN-30-S	TPN-31-S
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.652	0.579	0.567	0.700	0.691	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L936353-6	L936353-7	L936353-8	L936353-9	L936353-10
		Description					
		Sampled Date	17-SEP-10	17-SEP-10	18-SEP-10	18-SEP-10	
		Sampled Time					
		Client ID	TPN-32-S	SP-30-S	SP-31-S	SP-32-S	SEPT. DUP-1
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	0.00572	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.621	0.693	0.751	0.678	0.756	

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L936353-11	L936353-12			
		Description					
		Sampled Date	18-SEP-10				
		Sampled Time					
		Client ID	SEPT. EB-1	TRAVEL BLANKS			
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020					
	Sodium (Na)-Dissolved (mg/L)	<2.0					
	Thallium (Tl)-Dissolved (mg/L)	<0.00020					
	Tin (Sn)-Dissolved (mg/L)	<0.00050					
	Titanium (Ti)-Dissolved (mg/L)	<0.010					
	Uranium (U)-Dissolved (mg/L)	<0.00020					
	Vanadium (V)-Dissolved (mg/L)	<0.0010					
	Zinc (Zn)-Dissolved (mg/L)	<0.0050					
Plant Pigments	Chlorophyll a (ug)						

* 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**
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite 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". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate 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". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
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".			
C-DIS-ORG-LOW-CL	Water	Dissolved Organic Carbon	APHA 5310 C-Instrumental
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
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 is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
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-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	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			

Reference Information

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

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-ICP-VA Water Total Metals in Water by ICPOES (CCME) 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOTKJ-LOW-ED Water Total Kjeldahl Nitrogen- Low Level APHA 4500Norg C-Dig.-Auto-Colorimetry

NH4-LOW-ED Water Ammonia-N Low Level APHA 4500 NH3F-Colorimetry

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

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

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

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

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

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

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

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

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

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

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

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.

Reference Information

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
ED	ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - 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 Processing



33

Page 1 of 2

Filter

[illegible]



AZIMUTH CONSULTING GROUP INC.
ATTN: MAGGIE McCONNELL
218 - 2902 WEST BROADWAY
VANCOUVER BC V6K 2G8
Phone: 604-730-1220

Date Received: 04-OCT-10
Report Date: 21-OCT-10 09:08 (MT)
Version: FINAL

Certificate of Analysis

Lab Work Order #: L938869
Project P.O. #: NOT SUBMITTED
Job Reference: MEADOWBANK MINE CREMP
Legal Site Desc:
C of C Numbers: 1, 2, 3, 4

Heather Easton
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 LIMITED Part of the ALS Group A Campbell Brothers Limited Company

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-1	L938869-2	L938869-3	L938869-4	L938869-5
		19-SEP-10	19-SEP-10	19-SEP-10	19-SEP-10	19-SEP-10
		WAL-12-S	WAL-13-S	WAL-14-S	TPE 30-S	TPE 31-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	30.9	29.0	29.2	19.2	19.2
	Hardness (as CaCO3) (mg/L)	13.6	13.1	13.0	7.49	7.50
	pH (pH)	7.44	7.37	7.36	6.67	6.75
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	1.1	1.1
	Total Dissolved Solids (mg/L)	24	19	23	15	23
	Turbidity (NTU)	0.25	0.22	0.23	1.68	1.55
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	11.0	9.7	9.9	5.5	5.3
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	11.0	9.7	9.9	5.5	5.3
	Ammonia-N (mg/L)	0.0168	<0.0050	0.0055	0.0085	<0.0050
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.039	0.041	0.039	0.065	0.065
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	0.0334	0.0339
	Nitrite (as N) (mg/L)	0.0018	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.108	0.164	0.135	0.080	0.079
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0025	0.0053	0.0025	0.0023	0.0027
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.35	2.34	2.33	1.61	1.60
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.24	2.11	2.19	1.55	1.42
	Total Organic Carbon (mg/L)	1.99	2.14	2.20	1.52	1.55
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	0.0050	0.0052	0.121	0.121
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	0.00054	0.00055
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	3.63	3.46	3.42	1.83	1.81
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	0.138	0.136
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-6	L938869-7	L938869-8	L938869-9	L938869-10
		19-SEP-10	20-SEP-10	20-SEP-10	20-SEP-10	20-SEP-10
		TPE 32-S	TE-31-S	TE-31-INT	TE-31-D	TE-32-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	19.1	17.8	18.1	17.8	17.0
	Hardness (as CaCO3) (mg/L)	7.49	6.86	6.95	6.88	6.81
	pH (pH)	6.80	6.77	6.81	6.84	6.81
	Total Suspended Solids (mg/L)	1.3	1.1	2.9	<1.0	<1.0
	Total Dissolved Solids (mg/L)	13	<10	<10	<10	<10
	Turbidity (NTU)	1.56	0.35	1.14	0.32	0.32
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	5.4	4.7	4.9	4.9	4.5
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	5.4	4.7	4.9	4.9	4.5
	Ammonia-N (mg/L)	<0.0050	0.0453	0.0168	<0.0050	<0.0050
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.064	0.054	0.055	0.054	0.054
	Nitrate (as N) (mg/L)	0.0342	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.074	0.069	0.092	0.147	0.063
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0028	0.0023	0.0075	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.60	1.72	1.71	1.72	1.71
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.52	1.53	1.62	1.54	1.57
	Total Organic Carbon (mg/L)	2.10	1.54	1.57	1.53	1.51
Total Metals	Aluminum (Al)-Total (mg/L)	0.112	0.0105	0.0822	0.0123	0.0107
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00054	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.83	1.65	1.79	1.69	1.68
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	0.0016	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.103	<0.030	0.122	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-11	L938869-12	L938869-13	L938869-14	L938869-15
		21-SEP-10	21-SEP-10	21-SEP-10	21-SEP-10	21-SEP-10
		TE-30-S	TE-30-INT	TE-30-D	TEFF-12-S	TEFF-13-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	16.1	16.6	16.8	15.1	15.1
	Hardness (as CaCO3) (mg/L)	6.25	6.29	6.47	5.46	5.48
	pH (pH)	6.79	6.75	6.74	6.76	6.74
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	<10	<10	<10	<10	<10
	Turbidity (NTU)	0.30	0.50	0.30	0.30	0.28
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.7	4.6	4.2	3.7	3.9
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.7	4.6	4.2	3.7	3.9
	Ammonia-N (mg/L)	<0.0050	<0.0050	0.109	<0.0050	0.0294
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.052	0.051	0.052	0.049	0.050
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.091	0.202	0.442	0.115	0.512
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0024	0.0021	0.0020	0.0027	0.0022
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.68	1.68	1.67	1.64	1.63
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.49	1.60	1.54	1.50	1.48
	Total Organic Carbon (mg/L)	1.56	1.66	1.61	1.53	1.54
Total Metals	Aluminum (Al)-Total (mg/L)	0.0105	0.0229	0.0099	0.0075	0.0065
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.52	1.53	1.54	1.30	1.30
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	0.033	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-16	L938869-17	L938869-18	L938869-19	L938869-20
		21-SEP-10	22-SEP-10	22-SEP-10	22-SEP-10	23-SEP-10
		TEFF-14-S	PDL-12-S	PDL-13-S	PDL-14-S	INUG-18-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	15.0	20.0	20.1	20.0	14.2
	Hardness (as CaCO3) (mg/L)	5.50	8.37	8.43	8.42	5.30
	pH (pH)	6.73	6.88	7.21	7.21	6.49
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	<10	<10	<10	10	<10
	Turbidity (NTU)	0.26	0.23	0.22	0.23	0.26
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.2	6.3	6.1	6.3	4.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.2	6.3	6.1	6.3	4.0
	Ammonia-N (mg/L)	<0.0050	<0.0050	0.0914	0.0251	0.122
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	0.56	0.55	0.55	0.64
	Fluoride (F) (mg/L)	0.049	0.033	0.032	0.032	0.054
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	0.0014	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.877	0.098	0.108	0.095	0.100
	Ortho Phosphate as P (mg/L)	0.0048	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0021	<0.0020	0.0029	0.0029	0.0026
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.62	1.43	1.42	1.42	0.76
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.49	1.74	1.80	1.79	1.90
	Total Organic Carbon (mg/L)	1.50	1.73	1.70	1.83	1.88
Total Metals	Aluminum (Al)-Total (mg/L)	0.0079	0.0062	<0.0050	0.0060	0.0076
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.31	2.12	2.13	2.15	1.04
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-21	L938869-22	L938869-23	L938869-24	L938869-25
		23-SEP-10	23-SEP-10	23-SEP-10	23-SEP-10	23-SEP-10
		INUG-18-INT	INUG-18-D	INUG-19-S	INUG-19-INT	INUG-19-D
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	14.3	14.3	14.3	14.4	14.3
	Hardness (as CaCO3) (mg/L)	5.35	5.31	5.31	5.35	5.30
	pH (pH)	6.64	6.71	6.79	6.84	6.70
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	<10	<10	<10	<10	<10
	Turbidity (NTU)	0.48	0.27	0.27	0.47	1.41
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.0	4.1	4.0	4.0	5.1
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.0	4.1	4.0	4.0	5.1
	Ammonia-N (mg/L)	0.0066	0.0056	0.0523	0.0097	0.159
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.64	0.64	0.64	0.65	0.63
	Fluoride (F) (mg/L)	0.052	0.053	0.053	0.053	0.053
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.124	0.118	0.111	0.220	0.114
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0033	0.0029	0.0028	0.0028	0.0024
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	0.77	0.78	0.77	0.77	0.77
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.87	1.90	1.92	1.98	1.91
	Total Organic Carbon (mg/L)	1.97	1.99	2.01	2.03	1.88
Total Metals	Aluminum (Al)-Total (mg/L)	0.0229	0.0085	0.0079	0.0226	0.0075
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.07	1.06	1.09	1.04	1.04
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.031	<0.030	<0.030	0.039	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L938869-26	L938869-27	L938869-28	L938869-29	L938869-30
			23-SEP-10			21-SEP-10	21-SEP-10
			INUG-20-S	SEPT-DUP2	SEPT-DUP3	SEPT-EB2	SEPT-EB3
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		14.2	20.0	14.2	10.6	10.4
	Hardness (as CaCO3) (mg/L)		5.34	8.42	5.35	3.55	3.62
	pH (pH)		6.81	7.21	6.79	6.63	6.32
	Total Suspended Solids (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)		<10	14	15	<10	<10
	Turbidity (NTU)		0.24	0.21	0.23	0.18	0.16
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		4.4	6.3	3.8	2.1	2.2
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)		4.4	6.3	3.8	2.1	2.2
	Ammonia-N (mg/L)		0.0311	<0.0050	<0.0050	0.0237	0.0208
	Bromide (Br) (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)		0.64	0.55	0.56	<0.50	<0.50
	Fluoride (F) (mg/L)		0.052	0.032	0.046	<0.020	<0.020
	Nitrate (as N) (mg/L)		<0.0050	<0.0050	<0.0050	0.0275	0.0277
	Nitrite (as N) (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)		0.100	0.092	0.109	<0.050	<0.050
	Ortho Phosphate as P (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)		0.0029	<0.0020	0.0129	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)		0.76	1.42	0.67	0.84	0.85
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		1.95	1.77	1.90	0.96	
	Total Organic Carbon (mg/L)		2.02	1.77	1.98	1.02	0.98
Total Metals	Aluminum (Al)-Total (mg/L)		0.0081	0.0056	0.0079	<0.0050	<0.0050
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)		<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)		1.05	2.14	1.08	0.96	0.96
	Chromium (Cr)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)		<0.0010	<0.0010	<0.0010	0.0038	0.0049
	Iron (Fe)-Total (mg/L)		<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	0.00123	0.00120

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-31				
TRAVEL BLANKS						
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	<2.0				
	Hardness (as CaCO3) (mg/L)	<0.50				
	pH (pH)	5.63				
	Total Suspended Solids (mg/L)	<1.0				
	Total Dissolved Solids (mg/L)	<10				
	Turbidity (NTU)	<0.10				
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0				
	Ammonia-N (mg/L)					
	Bromide (Br) (mg/L)	<0.050				
	Chloride (Cl) (mg/L)	<0.50				
	Fluoride (F) (mg/L)	<0.020				
	Nitrate (as N) (mg/L)	<0.0050				
	Nitrite (as N) (mg/L)	<0.0010				
	Total Kjeldahl Nitrogen (mg/L)					
	Ortho Phosphate as P (mg/L)	<0.0010				
	Total Phosphate as P (mg/L)	<0.0020				
	Silicate (as SiO2) (mg/L)	<1.0				
	Sulfate (SO4) (mg/L)	<0.50				
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)					
	Total Organic Carbon (mg/L)	<0.50				
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050				
	Antimony (Sb)-Total (mg/L)	<0.00050				
	Arsenic (As)-Total (mg/L)	<0.00050				
	Barium (Ba)-Total (mg/L)	<0.020				
	Beryllium (Be)-Total (mg/L)	<0.0010				
	Boron (B)-Total (mg/L)	<0.10				
	Cadmium (Cd)-Total (mg/L)	<0.000017				
	Calcium (Ca)-Total (mg/L)	<0.10				
	Chromium (Cr)-Total (mg/L)	<0.0010				
	Cobalt (Co)-Total (mg/L)	<0.00030				
	Copper (Cu)-Total (mg/L)	<0.0010				
	Iron (Fe)-Total (mg/L)	<0.030				
	Lead (Pb)-Total (mg/L)	<0.00050				

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-1	L938869-2	L938869-3	L938869-4	L938869-5
		19-SEP-10	19-SEP-10	19-SEP-10	19-SEP-10	19-SEP-10
		WAL-12-S	WAL-13-S	WAL-14-S	TPE 30-S	TPE 31-S
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	1.08	1.03	1.01	0.77	0.76
	Manganese (Mn)-Total (mg/L)	0.00137	0.00139	0.00165	0.00286	0.00277
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	0.0068	0.0083
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	3.67	3.55	3.50	1.82	1.82
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	1.08	1.03	1.03	0.72	0.72
	Manganese (Mn)-Dissolved (mg/L)	0.00032	0.00037	<0.00030	0.00039	0.00045
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-6	L938869-7	L938869-8	L938869-9	L938869-10
		19-SEP-10	20-SEP-10	20-SEP-10	20-SEP-10	20-SEP-10
		TPE 32-S	TE-31-S	TE-31-INT	TE-31-D	TE-32-S
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.75	0.62	0.71	0.64	0.64
	Manganese (Mn)-Total (mg/L)	0.00236	0.00133	0.00385	0.00162	0.00164
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0104	<0.0050	0.0058	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.82	1.70	1.72	1.70	1.69
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.72	0.64	0.64	0.64	0.63
	Manganese (Mn)-Dissolved (mg/L)	0.00046	0.00045	0.00060	0.00041	0.00053
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-11	L938869-12	L938869-13	L938869-14	L938869-15
		21-SEP-10	21-SEP-10	21-SEP-10	21-SEP-10	21-SEP-10
		TE-30-S	TE-30-INT	TE-30-D	TEFF-12-S	TEFF-13-S
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.59	0.61	0.59	0.54	0.53
	Manganese (Mn)-Total (mg/L)	0.00155	0.00201	0.00159	0.00153	0.00150
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.53	1.54	1.59	1.30	1.31
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.59	0.59	0.61	0.54	0.54
	Manganese (Mn)-Dissolved (mg/L)	0.00060	0.00063	0.00056	0.00065	0.00055
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-16	L938869-17	L938869-18	L938869-19	L938869-20
		21-SEP-10	22-SEP-10	22-SEP-10	22-SEP-10	23-SEP-10
		TEFF-14-S	PDL-12-S	PDL-13-S	PDL-14-S	INUG-18-S
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.54	0.74	0.74	0.75	0.64
	Manganese (Mn)-Total (mg/L)	0.00150	0.00116	0.00124	0.00120	0.00126
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.31	2.13	2.15	2.14	1.05
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.54	0.74	0.75	0.74	0.65
	Manganese (Mn)-Dissolved (mg/L)	0.00065	<0.00030	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	0.000030	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-21	L938869-22	L938869-23	L938869-24	L938869-25
		23-SEP-10	23-SEP-10	23-SEP-10	23-SEP-10	23-SEP-10
		INUG-18-INT	INUG-18-D	INUG-19-S	INUG-19-INT	INUG-19-D
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.66	0.65	0.66	0.64	0.63
	Manganese (Mn)-Total (mg/L)	0.00162	0.00131	0.00136	0.00161	0.00124
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.07	1.06	1.06	1.07	1.06
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.65	0.65	0.65	0.65	0.65
	Manganese (Mn)-Dissolved (mg/L)	0.00034	0.00030	0.00046	0.00057	0.00035
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-26	L938869-27	L938869-28	L938869-29	L938869-30
		23-SEP-10			21-SEP-10	21-SEP-10
		INUG-20-S	SEPT-DUP2	SEPT-DUP3	SEPT-EB2	SEPT-EB3
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.64	0.74	0.66	0.29	0.29
	Manganese (Mn)-Total (mg/L)	0.00129	0.00133	0.00136	0.00087	0.00090
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	0.000139	0.000162
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	0.00333	0.00339
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	
	Calcium (Ca)-Dissolved (mg/L)	1.07	2.15	1.07	0.95	
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	0.0021	
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	
	Magnesium (Mg)-Dissolved (mg/L)	0.65	0.74	0.65	0.29	
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	0.00031	<0.00030	0.00049	
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-31				
TRAVEL BLANKS						
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050				
	Magnesium (Mg)-Total (mg/L)	<0.10				
	Manganese (Mn)-Total (mg/L)	<0.00030				
	Mercury (Hg)-Total (mg/L)	<0.000010				
	Molybdenum (Mo)-Total (mg/L)	<0.0010				
	Nickel (Ni)-Total (mg/L)	<0.0010				
	Potassium (K)-Total (mg/L)	<2.0				
	Selenium (Se)-Total (mg/L)	<0.0010				
	Silver (Ag)-Total (mg/L)	<0.000020				
	Sodium (Na)-Total (mg/L)	<2.0				
	Thallium (Tl)-Total (mg/L)	<0.00020				
	Tin (Sn)-Total (mg/L)	<0.00050				
	Titanium (Ti)-Total (mg/L)	<0.010				
	Uranium (U)-Total (mg/L)	<0.00020				
	Vanadium (V)-Total (mg/L)	<0.0010				
	Zinc (Zn)-Total (mg/L)	<0.0050				
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)					
	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)					
	Manganese (Mn)-Dissolved (mg/L)					
	Mercury (Hg)-Dissolved (mg/L)					
	Molybdenum (Mo)-Dissolved (mg/L)					
	Nickel (Ni)-Dissolved (mg/L)					
	Potassium (K)-Dissolved (mg/L)					
	Selenium (Se)-Dissolved (mg/L)					

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-1	L938869-2	L938869-3	L938869-4	L938869-5
Grouping Analyte						
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.460	0.509	0.545	0.846	0.822

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-6	L938869-7	L938869-8	L938869-9	L938869-10
		19-SEP-10	20-SEP-10	20-SEP-10	20-SEP-10	20-SEP-10
		TPE 32-S	TE-31-S	TE-31-INT	TE-31-D	TE-32-S
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.740	0.474	0.453	0.480	0.483

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L938869-11	L938869-12	L938869-13	L938869-14	L938869-15
		Description					
		Sampled Date	21-SEP-10	21-SEP-10	21-SEP-10	21-SEP-10	21-SEP-10
		Sampled Time					
		Client ID	TE-30-S	TE-30-INT	TE-30-D	TEFF-12-S	TEFF-13-S
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Plant Pigments	Chlorophyll a (ug)	0.209	0.253	0.292	0.315	0.315	

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L938869-16	L938869-17	L938869-18	L938869-19	L938869-20
		Description					
		Sampled Date	21-SEP-10	22-SEP-10	22-SEP-10	22-SEP-10	23-SEP-10
		Sampled Time					
		Client ID	TEFF-14-S	PDL-12-S	PDL-13-S	PDL-14-S	INUG-18-S
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.307	0.497	0.507	0.344	0.541	

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L938869-21	L938869-22	L938869-23	L938869-24	L938869-25
		Description					
		Sampled Date	23-SEP-10	23-SEP-10	23-SEP-10	23-SEP-10	23-SEP-10
		Sampled Time					
		Client ID	INUG-18-INT	INUG-18-D	INUG-19-S	INUG-19-INT	INUG-19-D
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Plant Pigments	Chlorophyll a (ug)	0.531	0.570	0.427	0.581	0.490	

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-26	L938869-27	L938869-28	L938869-29	L938869-30
		23-SEP-10			21-SEP-10	21-SEP-10
		INUG-20-S	SEPT-DUP2	SEPT-DUP3	SEPT-EB2	SEPT-EB3
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	0.000038	
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	0.00125	
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	
Plant Pigments	Chlorophyll a (ug)	0.513	0.561	0.489		

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L938869-31				
TRAVEL BLANKS						
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)					
	Sodium (Na)-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)					
Plant Pigments	Chlorophyll a (ug)					

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite 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". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate 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". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
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".			
C-DIS-ORG-LOW-CL	Water	Dissolved Organic Carbon	APHA 5310 C-Instrumental
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
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 is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
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-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/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).			

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-ICP-VA Water Total Metals in Water by ICPOES (CCME) 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

NH4-LOW-ED Water Ammonia-N Low Level APHA 4500 NH3F-Colorimetry

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

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

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

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

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

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

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

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

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

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

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

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

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

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

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

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

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

Reference Information

TKN-SIE-VA	Water	Total Kjeldahl Nitrogen 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 by sample digestion at 367 celcius with analysis 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
ED	ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

1	2	3	4

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.

Short Holding Time



Rush Processing

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC #

Page 1 of 4

Environmental Division

(ALS)

Report to:			Report Format / Distribution			Service Requested:												
Company: Azimuth Consulting Group Inc.			☒ Standard ☐ Other			☒ Regular Service (Default)												
Contact: Maggie McConnell			☒ PDF ☒ Excel ☐ Fax			☐ Rush Service (2-3 Days)												
Address: 218 - 2902 West Broadway, Vancouver, BC, V6K 2G8			Email 1: mmcconnell@azimuthgroup.ca			☐ Priority Service (1 Day or ASAP)												
			Email 2: gmann@azimuthgroup.ca			☐ Emergency Service (<1 Day / Wkend) - Contact ALS												
Phone: 604-730-1220 Fax:						Analysis Request												
Invoice To: ☒ Same as Report			Indicate Bottles: Filtered / Preserved (F/P) →			P	F	P	P						P			
Company:			Client / Project Information:															
Contact:			Job #: Meadowbank Mine CREMP															
Address:			PO/AFE:															
Sample			Legal Site Description:															
Phone: Fax:			Quote #: Q24230															
Lab Work Order # (lab use only)			ALS Contact: Natasha MM			Sampler (initials): MLM, MF												
L 938869																		
Sample #	Sample Identification (This description will appear on the report)	Date dd-mmm-yy	Time hh:mm	Sample Type (Select from drop-down list)	T-Metals (incl. Ph) (CCME)	D-Metals (incl. Ph) (CCME)	TOC, DOC (F)	TKN, Ammonia	TDS, TSS-low	Alk (SPECIATED)	Anion Scan, Si, pH, EC	T-PO4, ortho-PO4	Chlorophyll-a	Turbidity	Hazardous?	Highly Contaminated?	Number of Containers	
	WAL-12-S	19-Sep-10		Water	X	X	X	X	X	X	X	X	X	X			7	
	WAL-13-S	19-Sep-10		Water	X	X	X	X	X	X	X	X	X	X			7	
	WAL-14-S	19-Sep-10		Water	X	X	X	X	X	X	X	X	X	X			7	
	TPE-30-S	19-Sep-10		Water	X	X	X	X	X	X	X	X	X	X			7	
	TPE-31-S	19-Sep-10		Water	X	X	X	X	X	X	X	X	X	X			7	
	TPE-32-S	19-Sep-10		Water	X	X	X	X	X	X	X	X	X	X			7	
	TE-31-S	20-Sep-10		Water	X	X	X	X	X	X	X	X	X	X			7	
	TE-31-INT	20-Sep-10		Water	X	X	X	X	X	X	X	X	X	X			7	
	TE-31-D	20-Sep-10		Water	X	X	X	X	X	X	X	X	X	X			7	
	TE-32-S	20-Sep-10		Water	X	X	X	X	X	X	X	X	X	X			7	
Guidelines / Regulations					Special Instructions / Hazardous Details													
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.																		
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.																		
Relinquished By:	Maggie McConnell	Date & Time:	26-Sep-10	Received By:	SH	Date & Time:	04/Oct 10:40	Sample Condition (lab use only)										
Relinquished By:		Date & Time:	26-Sep-10	Received By:		Date & Time:		Temperature	15.6	Samples Received in Good Condition? Y / N (if no provided details)								



Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC #

Page 2 of 4

Report to:			Report Format / Distribution			Service Requested:																	
Company: Azimuth Consulting Group Inc.			☒ Standard ☐ Other			☒ Regular Service (Default)																	
Contact: Maggie McConnell			☒ PDF ☒ Excel ☐ Fax			☐ Rush Service (2-3 Days)																	
Address: 218 - 2902 West Broadway, Vancouver, BC, V6K 2G8			Email 1: mmccconnell@azimuthgroup.ca			☐ Priority Service (1 Day or ASAP)																	
			Email 2: gmann@azimuthgroup.ca			☐ Emergency Service (<1 Day / Wkend) - Contact ALS																	
Phone: 604-730-1220 Fax:						Analysis Request																	
Invoice To: ☒ Same as Report			Indicate Bottles: Filtered / Preserved (F/P) →			P	F	P	P														
Company:			Client / Project Information:			Number of Containers Highly Contaminated? Hazardous? Turbidity Chlorophyll-a T-PO4, ortho-PO4 Anion Scan, Si, pH, EC Alk (SPECIATED) TDS, TSS-low TKN, Ammonia TOC, DOC (F) D-Metals (incl. Ph) (CCME) T-Metals (incl. Ph) (CCME)																	
Contact:			Job #: Meadowbank Mine CREMP																				
Address:			PO/AFE:																				
Sample			Legal Site Description:																				
Phone: Fax:			Quote #: Q24230																				
Lab Work Order # (lab use only) U938869			ALS Contact: Natasha MM		Sampler (initials): MLM, MF																		
Sample #	Sample Identification (This description will appear on the report)		Date dd-mmm-yy	Time hh:mm	Sample Type (Select from drop-down list)																		
	TE-30-S		21-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
	TE-30-INT		21-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
	TE-30-D		21-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
	TEFF-12-S		21-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
	TEFF-13-S		21-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
	TEFF-14-S		21-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
	PDL-12-S		22-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
	PDL-13-S		22-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
	PDL-14-S		22-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
	INUG-18-S		23-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
Guidelines / Regulations			Special Instructions / Hazardous Details																				
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.																							
Relinquished By:	Maggie McConnell	Date & Time:	26-Sep-10	Received By:		Date & Time:		Temperature		Sample Condition (lab use only)													
Relinquished By:	<i>[Signature]</i>	Date & Time:	26-Sep-10	Received By:		Date & Time:				Samples Received in Good Condition? Y / N (if no provided details)													

7	+	1	filter
1	+		"
2	+		"
2	+		"
7	+		"
2	+		"
1	+		"
2	+		"
7	+		"
2	+		"
1	+		"



Environmental Division



Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC #

Page 3 of 4

Report to:			Report Format / Distribution			Service Requested:														
Company: Azimuth Consulting Group Inc.			☒ Standard ☐ Other			☒ Regular Service (Default)														
Contact: Maggie McConnell			☒ PDF ☒ Excel ☐ Fax			☐ Rush Service (2-3 Days)														
Address: 218 - 2902 West Broadway, Vancouver, BC, V6K 2G8			Email 1: mmcconnell@azimuthgroup.ca			☐ Priority Service (1 Day or ASAP)														
			Email 2: gmann@azimuthgroup.ca			☐ Emergency Service (<1 Day / Wkend) - Contact ALS														
Phone: 604-730-1220 Fax:						Analysis Request														
Invoice To: ☒ Same as Report			Indicate Bottles: Filtered / Preserved (F/P) ---			P	F	P	P						P					
Company:			Client / Project Information:			T-Metals (incl. Ph) (CCME) D-Metals (incl. Ph) (CCME) TOC, DOC (F) TKN, Ammonia TDS, TSS-low Alk (SPECIATED) Anion Scan, Si, pH, EC T-PO4, ortho-PO4 Chlorophyll-a Turbidity Hazardous? Highly Contaminated? Number of Containers														
Contact:			Job #: Meadowbank Mine CREMP																	
Address:			PO/AFE:																	
Sample			Legal Site Description:																	
Phone: Fax:			Quote #: Q24230																	
Lab Work Order # (lab use only)			ALS Contact: Natasha MM			Sampler (Initial's): MLM, MF														
L938 869																				
Sample #	Sample Identification (This description will appear on the report)	Date dd-mmm-yy	Time hh:mm	Sample Type (Select from drop-down list)	X	X	X	X	X	X	X	X	X	X	X	X				
	INUG-18-INT	23-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X	X				
	INUG-18-D	23-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X	X				
	INUG-19-S	23-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X	X				
	INUG-19-INT	23-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X	X				
	INUG-19-D	23-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X	X				
	INUG-20-S	23-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X	X				
	Sept. DUP-2	--		Water	X	X	X	X	X	X	X	X	X	X	X	X				
	Sept. DUP-3	--		Water	X	X	X	X	X	X	X	X	X	X	X	X				
Guidelines / Regulations					Special Instructions / Hazardous Details															
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.																				
Reinquished By:	Maggie McConnell	Date & Time:	26-Sep-10	Received By:		Date & Time:		Sample Condition (lab use only)												
Reinquished By:		Date & Time:	26-Sep-10	Received By:		Date & Time:		Temperature		Samples Received in Good Condition? Y / N (if no provided details)										



Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC #

Page 4 of 4

Report to:				Report Format / Distribution				Service Requested:														
Company: Azimuth Consulting Group Inc.				☒ Standard ☐ Other				☒ Regular Service (Default)														
Contact: Maggie McConnell				☒ PDF ☒ Excel ☐ Fax				☐ Rush Service (2-3 Days)														
Address: 218 - 2902 West Broadway, Vancouver, BC, V6K 2G8				Email 1: mmccconnell@azimuthgroup.ca				☐ Priority Service (1 Day or ASAP)														
				Email 2: gmann@azimuthgroup.ca				☐ Emergency Service (<1 Day / Wkend) - Contact ALS														
Phone: 604-730-1220 Fax:								Analysis Request														
Invoice To: ☒ Same as Report				Indicate Bottles: Filtered / Preserved (F/P) -->				P	F	P	P					P						
Company:				Client / Project Information:				T-Metals (incl. Pb) (CCME) D-Metals (incl. Ph) (CCME) TOC, DOC (F) TKN, Ammonia TDS, TSS-low Alk (SPECIATED) Anion Scan, Si, pH, EC T-PO4, ortho-PO4 Chlorophyll-a Turbidity Hazardous? Highly Contaminated? Number of Containers														
Contact:				Job #: Meadowbank Mine CREMP																		
Address:				PO/AFE:																		
Sample:				Legal Site Description:																		
Phone: Fax:				Quote #: Q24230																		
Lab Work Order # (lab use only) L938869				ALS Contact: Natasha MM		Sampler (Initials): MLM. MF																
Sample #	Sample Identification (This description will appear on the report)			Date dd-mmm-yy	Time hh:mm	Sample Type (Select from drop-down list)																
	Sept. EB-2			21-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X					
	Sept. EB-3			21-Sep-10		Water	X		X	X	X	X	X	X	X	X	X					
	Travel Blanks			--		Water	X	X	X		X	X	X	X	X	X	X					
Guidelines / Regulations				Special Instructions / Hazardous Details																		
				"Sept. EB-2" and "Sept. EB-3" should be analysed for TSS but not TSS-low.																		
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 specified on the adjacent worksheet.																						
Relinquished By:	Maggie McConnell	Date & Time:	26-Sep-10	Received By:		Date & Time:		Sample Condition (lab use only)														
Relinquished By:	<i>[Signature]</i>	Date & Time:	26-Sep-10	Received By:		Date & Time:		Temperature	Samples Received in Good Condition? Y / N (if no provided details)													



AZIMUTH CONSULTING GROUP INC.
ATTN: MAGGIE McCONNELL
218 - 2902 WEST BROADWAY
VANCOUVER BC V6K 2G8
Phone: 604-730-1220

Date Received: 12-OCT-10
Report Date: 02-NOV-10 09:40 (MT)
Version: FINAL

Certificate of Analysis

Lab Work Order #: L942071
Project P.O. #: NOT SUBMITTED
Job Reference: MEADOWBANK MINE CREMP
Legal Site Desc:
C of C Numbers: 1, 2

Heather Easton
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 LIMITED Part of the ALS Group A Campbell Brothers Limited Company

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L942071-1	L942071-2	L942071-3	L942071-4	L942071-5
		27-SEP-10	27-SEP-10	27-SEP-10	27-SEP-10	27-SEP-10
		BBD-12-S	BBD-13-S	BBD-14-S	BPJ-12-S	BPJ-13-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	550	511	503	447	439
	Hardness (as CaCO3) (mg/L)	57.1	55.0	55.7	49.8	48.5
	pH (pH)	7.09	7.12	7.17	7.21	7.19
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	319	299	287	266	227
	Turbidity (NTU)	0.21	0.19	0.26	0.27	0.19
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	10.5	10.3	10.3	10.9	9.9
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	10.5	10.3	10.3	10.9	9.9
	Ammonia-N (mg/L)	0.0251	0.0159	0.0151	0.0132	0.0127
	Bromide (Br) (mg/L)	0.466	0.436	0.433	0.387	0.334
	Chloride (Cl) (mg/L)	146	137	137	121	114
	Fluoride (F) (mg/L)	0.063	0.064	0.064	0.062	0.058
	Nitrate (as N) (mg/L)	0.0431	0.0402	0.0403	0.0346	0.0327
	Nitrite (as N) (mg/L)	<0.0010	0.0015	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.136	0.153	0.121	0.133	0.136
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	21.0	19.6	19.7	17.5	16.5
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.99	3.13	3.03	3.05	3.14
	Total Organic Carbon (mg/L)	2.96	2.99	2.97	3.02	3.05
Total Metals	Aluminum (Al)-Total (mg/L)	0.0089	0.0135	0.0130	0.0099	0.0087
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	5.60	5.47	5.39	5.04	4.92
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L942071-6	L942071-7	L942071-8	L942071-9	L942071-10
		Description					
		Sampled Date	27-SEP-10	27-SEP-10	27-SEP-10	27-SEP-10	27-SEP-10
		Sampled Time					
		Client ID	BPJ-14-S	BAP-12-S	BAP-13-S	BAP-14-S	SEPT DUP-4
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		438	408	305	304	413
	Hardness (as CaCO3) (mg/L)		49.0	44.7	36.5	35.9	45.4
	pH (pH)		7.20	7.21	7.20	7.10	7.18
	Total Suspended Solids (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)		249	239	172	170	235
	Turbidity (NTU)		0.19	0.17	0.25	0.17	0.20
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		10.2	9.7	9.1	10.1	10.3
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)		10.2	9.7	9.1	10.1	10.3
	Ammonia-N (mg/L)		0.0133	0.0121	0.0119	0.0106	0.0185
	Bromide (Br) (mg/L)		0.372	0.348	0.252	0.241	0.347
	Chloride (Cl) (mg/L)		118	110	80.2	78.8	110
	Fluoride (F) (mg/L)		0.063	0.061	0.059	0.058	0.062
	Nitrate (as N) (mg/L)		0.0355	0.0275	0.0195	0.0198	0.0280
	Nitrite (as N) (mg/L)		0.0016	<0.0010	0.0014	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)		0.150	0.136	0.134	0.148	0.150
	Ortho Phosphate as P (mg/L)		<0.0010	<0.0010	0.0015	<0.0010	<0.0010
	Total Phosphate as P (mg/L)		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)		17.1	15.9	11.7	11.5	16.0
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)		3.09	3.07	3.05	3.09	3.04
	Total Organic Carbon (mg/L)		3.07	3.04	3.11	3.05	3.09
Total Metals	Aluminum (Al)-Total (mg/L)		0.0114	0.0085	0.0075	0.0085	0.0077
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)		<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)		4.99	4.79	4.20	4.15	4.79
	Chromium (Cr)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)		<0.030	<0.030	0.088	<0.030	<0.030
	Lead (Pb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	3.2				
	Hardness (as CaCO3) (mg/L)	1.35				
	pH (pH)	6.27				
	Total Suspended Solids (mg/L)	<1.0				
	Total Dissolved Solids (mg/L)	<10				
	Turbidity (NTU)	0.19				
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0				
	Ammonia-N (mg/L)	0.0301 ^{RRV}				
	Bromide (Br) (mg/L)	<0.050				
	Chloride (Cl) (mg/L)	<0.50				
	Fluoride (F) (mg/L)	<0.020				
	Nitrate (as N) (mg/L)	0.0123				
	Nitrite (as N) (mg/L)	<0.0010				
	Total Kjeldahl Nitrogen (mg/L)	<0.050				
	Ortho Phosphate as P (mg/L)	<0.0010				
	Total Phosphate as P (mg/L)	<0.0020				
	Silicate (as SiO2) (mg/L)	<1.0				
	Sulfate (SO4) (mg/L)	<0.50				
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	0.85				
	Total Organic Carbon (mg/L)	<0.5				
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050				
	Antimony (Sb)-Total (mg/L)	<0.00050				
	Arsenic (As)-Total (mg/L)	<0.00050				
	Barium (Ba)-Total (mg/L)	<0.020				
	Beryllium (Be)-Total (mg/L)	<0.0010				
	Boron (B)-Total (mg/L)	<0.10				
	Cadmium (Cd)-Total (mg/L)	<0.000017				
	Calcium (Ca)-Total (mg/L)	0.36				
	Chromium (Cr)-Total (mg/L)	<0.0010				
	Cobalt (Co)-Total (mg/L)	<0.00030				
	Copper (Cu)-Total (mg/L)	0.0022				
	Iron (Fe)-Total (mg/L)	<0.030				
	Lead (Pb)-Total (mg/L)	0.00118				

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L942071-1	L942071-2	L942071-3	L942071-4	L942071-5
		Description					
		Sampled Date	27-SEP-10	27-SEP-10	27-SEP-10	27-SEP-10	27-SEP-10
		Sampled Time					
		Client ID	BBD-12-S	BBD-13-S	BBD-14-S	BPJ-12-S	BPJ-13-S
Grouping	Analyte						
WATER							
Total Metals	Lithium (Li)-Total (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)		10.9	10.4	10.3	9.18	8.84
	Manganese (Mn)-Total (mg/L)		0.00218	0.00231	0.00217	0.00206	0.00195
	Mercury (Hg)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)		3.4	3.3	3.3	2.9	2.8
	Selenium (Se)-Total (mg/L)		<0.0020 ^{DLM}	<0.0020 ^{DLM}	<0.0020 ^{DLM}	<0.0020 ^{DLM}	<0.0020 ^{DLM}
	Silver (Ag)-Total (mg/L)		<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)		82.3	78.7	77.7	68.3	65.8
	Thallium (Tl)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)		<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)		<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)		5.43	5.28	5.34	4.96	4.86
	Chromium (Cr)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)		<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)		10.6	10.2	10.3	9.09	8.84
	Manganese (Mn)-Dissolved (mg/L)		0.00083	0.00068	0.00067	0.00061	0.00062
	Mercury (Hg)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)		3.3	3.2	3.2	2.9	2.8
	Selenium (Se)-Dissolved (mg/L)		<0.0020 ^{DLM}	<0.0020 ^{DLM}	<0.0020 ^{DLM}	<0.0020 ^{DLM}	<0.0020 ^{DLM}

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L942071-6	L942071-7	L942071-8	L942071-9	L942071-10
		Description					
		Sampled Date	27-SEP-10	27-SEP-10	27-SEP-10	27-SEP-10	27-SEP-10
		Sampled Time					
		Client ID	BPJ-14-S	BAP-12-S	BAP-13-S	BAP-14-S	SEPT DUP-4
Grouping	Analyte						
WATER							
Total Metals	Lithium (Li)-Total (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)		8.97	8.38	6.43	6.35	8.34
	Manganese (Mn)-Total (mg/L)		0.00194	0.00170	0.00205	0.00180	0.00167
	Mercury (Hg)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)		2.9	2.7	2.1	2.1	2.7
	Selenium (Se)-Total (mg/L)		<0.0020 ^{DLM}	<0.0020 ^{DLM}	<0.0020 ^{DLM}	<0.0020 ^{DLM}	<0.0020 ^{DLM}
	Silver (Ag)-Total (mg/L)		<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)		66.8	61.7	46.2	45.3	61.6
	Thallium (Tl)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)		<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)		<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)		4.92	4.64	4.12	4.06	4.70
	Chromium (Cr)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)		<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)		8.91	8.03	6.35	6.24	8.18
	Manganese (Mn)-Dissolved (mg/L)		0.00061	0.00046	0.00044	0.00041	0.00048
	Mercury (Hg)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)		2.8	2.6	2.1	2.0	2.6
	Selenium (Se)-Dissolved (mg/L)		<0.0020 ^{DLM}	<0.0020 ^{DLM}	<0.0010	<0.0020 ^{DLM}	<0.0020 ^{DLM}

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0050				
	Magnesium (Mg)-Total (mg/L)	0.12				
	Manganese (Mn)-Total (mg/L)	0.00069				
	Mercury (Hg)-Total (mg/L)	<0.000010				
	Molybdenum (Mo)-Total (mg/L)	<0.0010				
	Nickel (Ni)-Total (mg/L)	<0.0010				
	Potassium (K)-Total (mg/L)	<2.0				
	Selenium (Se)-Total (mg/L)	<0.0010				
	Silver (Ag)-Total (mg/L)	0.000025				
	Sodium (Na)-Total (mg/L)	<2.0				
	Thallium (Tl)-Total (mg/L)	<0.00020				
	Tin (Sn)-Total (mg/L)	0.00135				
	Titanium (Ti)-Total (mg/L)	<0.010				
	Uranium (U)-Total (mg/L)	<0.00020				
	Vanadium (V)-Total (mg/L)	<0.0010				
	Zinc (Zn)-Total (mg/L)	<0.0050				
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050				
	Antimony (Sb)-Dissolved (mg/L)	<0.00050				
	Arsenic (As)-Dissolved (mg/L)	<0.00050				
	Barium (Ba)-Dissolved (mg/L)	<0.020				
	Beryllium (Be)-Dissolved (mg/L)	<0.0010				
	Boron (B)-Dissolved (mg/L)	<0.10				
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017				
	Calcium (Ca)-Dissolved (mg/L)	0.34				
	Chromium (Cr)-Dissolved (mg/L)	<0.0010				
	Cobalt (Co)-Dissolved (mg/L)	<0.00030				
	Copper (Cu)-Dissolved (mg/L)	<0.0010				
	Iron (Fe)-Dissolved (mg/L)	<0.030				
	Lead (Pb)-Dissolved (mg/L)	<0.00050				
	Lithium (Li)-Dissolved (mg/L)	<0.0050				
	Magnesium (Mg)-Dissolved (mg/L)	0.12				
	Manganese (Mn)-Dissolved (mg/L)	0.00060				
	Mercury (Hg)-Dissolved (mg/L)	<0.000010				
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010				
	Nickel (Ni)-Dissolved (mg/L)	<0.0010				
	Potassium (K)-Dissolved (mg/L)	<2.0				
	Selenium (Se)-Dissolved (mg/L)	<0.0010				

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L942071-1	L942071-2	L942071-3	L942071-4	L942071-5
		27-SEP-10	27-SEP-10	27-SEP-10	27-SEP-10	27-SEP-10
		BBD-12-S	BBD-13-S	BBD-14-S	BPJ-12-S	BPJ-13-S
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	79.2	76.0	76.6	67.2	65.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.513	0.494	0.493	0.675	0.811

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

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L942071-6	L942071-7	L942071-8	L942071-9	L942071-10
		27-SEP-10	27-SEP-10	27-SEP-10	27-SEP-10	27-SEP-10
		BPJ-14-S	BAP-12-S	BAP-13-S	BAP-14-S	SEPT DUP-4
Grouping	Analyte					
WATER						
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	65.9	58.7	45.3	44.1	59.8
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.691	0.935	1.19	1.10	0.951

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

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L942071-11 27-SEP-10 SEPT EB-4				
Grouping	Analyte						
WATER							
Dissolved Metals	Silver (Ag)-Dissolved (mg/L)	<0.000020					
	Sodium (Na)-Dissolved (mg/L)	<2.0					
	Thallium (Tl)-Dissolved (mg/L)	<0.00020					
	Tin (Sn)-Dissolved (mg/L)	0.00069					
	Titanium (Ti)-Dissolved (mg/L)	<0.010					
	Uranium (U)-Dissolved (mg/L)	<0.00020					
	Vanadium (V)-Dissolved (mg/L)	<0.0010					
	Zinc (Zn)-Dissolved (mg/L)	<0.0050					
Plant Pigments	Chlorophyll a (ug)						

* 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
DLM	Detection Limit Adjusted For Sample Matrix Effects

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite 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". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate 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". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
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".			
C-DIS-ORG-LOW-CL	Water	Dissolved Organic Carbon	APHA 5310 C-Instrumental
C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
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 is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
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-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	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			

Reference Information

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

MET-DIS-CCME-MS-VA Water Diss. Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-ICP-VA Water Total Metals in Water by ICPOES (CCME) 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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-CCME-MS-VA Water Total Metals in Water by ICPMS (CCME) EPA SW-846 3005A/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 either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOTKJ-LOW-ED Water Total Kjeldahl Nitrogen- Low Level APHA 4500Norg C-Dig.-Auto-Colorimetry

NH4-LOW-ED Water Ammonia-N Low Level APHA 4500 NH3F-Colorimetry

PH-MAN-VA Water pH by Manual Meter APHA 4500-H "pH Value"

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

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

PH-MAN-VA Water pH by Manual Meter APHA 4500-H pH Value

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

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

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

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

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

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

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

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

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-DO-COL-VA Water Dissolved ortho Phosphate by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P "Phosphorous"

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

PO4-T-COL-VA Water Total Phosphate P by Color APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total

Reference Information

phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.

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

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

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

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

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
ED	ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

1 2

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.



Environmental Division



Rush Processing

COC #

Page 1 of 2

Report to:				Report Format / Distribution				Service Requested:													
Company: Azimuth Consulting Group Inc.				☒ Standard ☐ Other				☒ Regular Service (Default)													
Contact: Maggie McConnell				☒ PDF ☒ Excel ☐ Fax				☐ Rush Service (2-3 Days)													
Address: 218 - 2902 West Broadway, Vancouver, BC, V6K 2G8				Email 1: mmcconnell@azimuthgroup.ca				☐ Priority Service (1 Day or ASAP)													
				Email 2: gmann@azimuthgroup.ca				☐ Emergency Service (<1 Day / Wkend) - Contact ALS													
Phone: 604-730-1220 Fax:								Analysis Request													
Invoice To: ☒ Same as Report				Indicate Bottles: Filtered / Preserved (F/P) →				P	F	P	P					P					
Company:				Client / Project Information:				T-Metals (incl. Ph) (CCME) D-Metals (incl. Ph) (CCME) TOC, DOC (F) TKN, Ammonia TDS, TSS-low Alk (SPECIATED) Anion Scan, Si, pH, EC T-PO4, ortho-PO4 Chlorophyll-a Turbidity Hazardous? Highly Contaminated? Number of Containers													
Contact:				Job #: Meadowbank Mine CREMP																	
Address:				PO/AFE:																	
Sample:				Legal Site Description:																	
Phone: Fax:				Quote #: Q24230																	
Lab Work Order # (lab use only)				ALS Contact: Natasha MM		Sampler (initials): MLM, MF															
Sample #	Sample Identification (This description will appear on the report)			Date dd-mmm-yy	Time hh:mm	Sample Type (Select from drop-down list)															
	BBD-12-S			27-Sep-10		Water		X	X	X	X	X	X	X	X	X	X	X			
	BBD-13-S					Water		X	X	X	X	X	X	X	X	X	X	X			
	BBD-14-S					Water		X	X	X	X	X	X	X	X	X	X	X			
	BPJ-12-S					Water		X	X	X	X	X	X	X	X	X	X	X			
	BPJ-13-S					Water		X	X	X	X	X	X	X	X	X	X	X			
	BPJ-14-S					Water		X	X	X	X	X	X	X	X	X	X	X			
	BAP-12-S					Water		X	X	X	X	X	X	X	X	X	X	X			
	BAP-13-S					Water		X	X	X	X	X	X	X	X	X	X	X			
	BAP-14-S					Water		X	X	X	X	X	X	X	X	X	X	X			
Guidelines / Regulations				Special Instructions / Hazardous Details																	
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.																					
Relinquished By:	Maggie McConnell	Date & Time:	3-Oct-10	Received By:	SH	Date & Time:	12 Oct 13:30	Sample Condition (lab use only) Temperature: 12.6 Samples Received in Good Condition? Y / N (if no provided details)													
Relinquished By:	Maggie McConnell	Date & Time:	3-Oct-10	Received By:		Date & Time:															

Short Holding Time

Rush Processing

COC #

Page 2 of 2

Environmental Division



www.atsglobal.com

Report to:				Report Format / Distribution				Service Requested:															
Company: Azimuth Consulting Group Inc.				☒ Standard ☐ Other				☒ Regular Service (Default)															
Contact: Maggie McConnell				☒ PDF ☒ Excel ☐ Fax				☐ Rush Service (2-3 Days)															
Address: 218 - 2902 West Broadway, Vancouver, BC, V6K 2G8				Email 1: mmccconnell@azimuthgroup.ca				☐ Priority Service (1 Day or ASAP)															
				Email 2: gmann@azimuthgroup.ca				☐ Emergency Service (<1 Day / Wkend) - Contact ALS															
Phone: 604-730-1220 Fax:								Analysis Request															
Invoice To: ☒ Same as Report				Indicate Bottles: Filtered / Preserved (F/P) ----				P	F	P	P						P						
Company:				Client / Project Information:				T-Metals (incl. Ph) (CCME)	D-Metals (incl. Ph) (CCME)	TOC, DOC (F)	TKN, Ammonia	TDS, TSS-low	Alk (SPECIATED)	Anion Scan, Si, pH, EC	T-PO4, ortho-PO4	Chlorophyll-a	Turbidity	Hazardous?	Highly Contaminated?	Number of Containers			
Contact:				Job #: Meadowbank Mine CREMP																			
Address:				PO/AFE:																			
Sample				Legal Site Description:																			
Phone: Fax:				Quote #: Q24230																			
Lab Work Order # (lab use only)				ALS Contact: Natasha MM				Sampler (Initials): MLM, MF															
Sample #	Sample Identification (This description will appear on the report)			Date dd-mmm-yy	Time hh:mm	Sample Type (Select from drop-down list)																	
	Sept. DUP-4			--		Water	X	X	X	X	X	X	X	X	X	X	X	X			7		
	Sept. EB-4			27-Sep-10		Water	X	X	X	X	X	X	X	X	X	X	X				6		
Guidelines / Regulations				Special Instructions / Hazardous Details																			
				"Sept. EB-4" should be analysed for TSS but not TSS-low.																			
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 specified on the adjacent worksheet.																							
Relinquished By:	Maggie McConnell	Date & Time:	3-Oct-10	Received By:		Date & Time:		Sample Condition (lab use only)															
Relinquished By:	<i>[Signature]</i>	Date & Time:	3-Oct-10	Received By:	SH	Date & Time:	12/Oct 13:30	Temperature	12.2	Samples Received in Good Condition? Y / N (if no provided details)													