PEREGRINE
DIAMONDS LTD

2014 ENVIRONMENTAL BASELINE PROGRAM

CHIDLIAK PROJECT

BAFFIN ISLAND, NUNAVUT

DECEMBER 2014

TETRA TECH EBA

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EXECUTIVE SUMMARY

The Chidliak Project (the Project), owned and operated by Peregrine Diamonds Ltd. (Peregrine), is located on the Hall Peninsula of Baffin Island, Nunavut, approximately 120 km northeast of Iqaluit. Peregrine retained Tetra Tech EBA Inc. (Tetra Tech EBA) to conduct the 2014 baseline environmental studies to facilitate understanding of the environmental baseline conditions in the area, and to provide baseline data as a management tool for planning exploration activities to avoid or minimize impacts to the surrounding environment. Mr. Amie Nashalik (from Pangnirtung) and Mr. David Willis, Peregrine's Lands Administrator, assisted throughout the baseline studies.

In 2014, baseline environmental surveys were carried out during one field event undertaken from August 7 to 11. These surveys were conducted within a 3,083 square kilometres (km^2) 2014 study area covering a broad geographical area, and encompassing Peregrine's 546 km^2 Priority Area. It is within this Priority Area where Peregrine has focused their exploration efforts.

Baseline environmental studies within the Chidliak Project began in 2009 and have continued annually. During the August 7 to 11, 2014 field event, the following six key environmental components were studied:

1. Surface Water Quality

Since 2009, 14 water quality sampling field events (including winter water quality sampling) have been undertaken within the Chidliak Project. For consistency, the 2014 surface water quality sampling program continued at previous sampling locations and maintained the same laboratory protocols and analytical procedures as in previous years. An additional 15 new surface water quality sampling locations were added to the 2014 baseline program, and one of the previous sampling stations were omitted, resulting in 28 water quality stations within the study area.

The objective of the surface water quality sampling program was to determine baseline August water quality conditions within the surface waters of the study area by analyzing for routine parameters, nutrients, total metals, total organic carbon, and oil and grease. The laboratory analytical results indicated that all sampled parameters were within the Canadian Council of Ministers of the Environment for the Protection of Freshwater Aquatic Life (CCME FAL) guidelines at all sampling stations, except for pH and total Aluminum. However, the surface water quality data collected in 2014 are consistent with similar data collected in previous years, and are considered to be representative of natural background conditions.

2. Potable Water Quality

The objective of the 2014 camp potable water quality sampling program was to monitor compliance to the Canadian Drinking Water Quality criteria at the camp(s) in operation at the time of the field event and to ensure the camp water treatment systems were operating effectively. A total of five locations within Discovery Camp (the only operating camp at the time of the field program) were sampled for potable water quality. In 2014, the first time in five consecutive annual sampling events, the potable water originating from a water tank in Discovery Camp did not meet applicable drinking water quality criteria. Prior to this sampling event, all potable water within the camps water distribution system has consistently met the applicable criteria and the disinfecting systems used in camp were proven effective. Exceedance of the applicable health criteria was assumed to be related to misapplication of the disinfection procedures.

Subsequent to these results, Peregrine drained and cleaned the affected water tank prior to refilling, and reminded camp maintenance staff on the importance of following standard disinfection procedures.

3. Barren-ground Caribou

Since 2009, 12 aerial caribou surveys have been conducted within the Chidliak Project area. In 2014, an aerial caribou survey and a ground-based caribou vantage point survey were used to determine the distribution and relative abundance of caribou across the study area. No caribou were observed during these surveys. Results from the study area correlate with the Government of Nunavut Department of Environment (DoE) reported caribou density estimates across South Baffin Island.

Although no caribou were detected, predominant caribou trails were observed in a north-west – south-east direction surrounding Qamanialuk Lake (McKeand Lake), as well a single trail in a north-east – south-west direction from Ptarmigan Fiord (potentially connecting with Qamanialuk Lake), and paralleling the McKeand River.

4. Carnivores

Thirteen (13) aerial carnivore surveys have been conducted within the Chidliak Project area since 2009. No carnivores or their dens have been observed during these surveys; however, wolves and foxes have infrequently been observed and recorded in the wildlife sighting logs. Carnivore density within the study area is low, likely due to limited prey abundance (e.g., caribou, small mammals).

An unconfirmed observation of a potential carnivore den south of Qamanialuk Lake (McKeand Lake), approximately 20 km from the Priority Area, was recorded. Carnivores can be sensitive to disturbance during their reproductive period and it will be important that this potential carnivore den site be evaluated in the next survey year.

5. Raptors

Over the ten (10) aerial raptor and nest surveys completed to date within the study area since 2009, three known cliff-nesting sites, previously occupied by Common Ravens, Rough-legged Hawks, Peregrine Falcons, and a Gyrfalcon, have been documented and surveyed. During the August 2014 nest reconnaissance, known raptor scrapes, stick nest, and perching sites were inactive. Since raptors show nest site fidelity and are sensitive to disturbances during the nesting season, a conservative 1.5 km set back distance is recommended near known active nests from early May to mid-August.

6. Aquatic Environment

A preliminary assessment of fish and fish habitat was completed for select watercourses in the Chidliak Project area and for Sunrise Camp Lake in 2010. During the 2014 environmental baseline program, the geographic extent of aquatics studies was expanded to include three additional lakes and four sites along the McKeand River, locations that were selected based on their proximity to current and future mine development. The scope of the aquatics studies was also expanded to include analyses of primary producers (periphyton and phytoplankton) and secondary producers (zooplankton and benthic invertebrates) in lakes and the McKeand River, and analyses of metals concentrations in fish tissues. In addition, a preliminary desktop study seeking to identify barriers to fish migration in the McKeand River was performed.

Regarding primary and secondary production in the 2014 study area, there were relatively low densities and taxa richness present in the study area lakes and in the McKeand River. However, these findings are consistent with other oligotrophic Arctic habitats.

Arctic Char were the only species of fish captured during the 2014 program, and were sampled in each of the lakes and at two locations along the McKeand River within the study area. A total of 73 char were captured, 30 of which were aged and had tissues sampled for metals analysis. Ages of fish captured ranged between one and 19

years. Tissue mercury and selenium concentrations above provincial and national guidelines were observed in several fish sampled in 2014; there were six fish with tissue samples that exceeded the mercury guidelines (all of which originated from Qamaniruluk Lake), and twenty-four (24) tissue samples that exceeded selenium guidelines (twelve samples from Glacier Lake, seven samples from Qamaniruluk Lake ("Y" Lake), one from Qamanialuk Lake (McKeand Lake) and one sample from Sunshine Camp Lake). However, average concentrations were comparable to other Arctic systems.

Although there was less sampling effort at two of the lakes in the study area (Qamanialuk Lake and Sunrise Camp Lake), it is likely that each of the lakes support healthy populations of Arctic Char, and that the McKeand River provides some foraging habitat for juvenile char and acts as a corridor for dispersal. Currently, it is unknown if the McKeand River also acts as a migratory corridor and whether anadromous Arctic char are present in the study area. There is insufficient data to determine if a permanent barrier to fish migration is present in the McKeand River downstream of the study area. In order to better determine if barriers are present, key downstream sections of the river should be visited in future years to assess hydrographic features of the river, including stream gradient and discharge.

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ACRONYMS & ABBREVIATIONS

%	Percent
C	Degrees Celsius
agl	Above ground level
ALS	ALS Laboratory Group
Biologica	Biologica Environmental Services Ltd.
CCME FAL	Canadian Council of Ministers of the Environment for the Protection of Freshwater Aquatic Life
cells/mL	Number of cells per millilitre
cells/cm^2	Number of cells per square centimeter
CFIA	Canadian Food Inspection Agency
CI	Condition Indice
CPUE	Catch per unit effort
COC	Chain-of-custody form
DO	Dissolved oxygen
DoE	Government of Nunavut Department of Environment
EC	Electrical conductivity
E. coli	*Escherichia coli*, a member of the faecal pathogen coliform group
GPS	Global Positioning System
HC	Health Canada
Hrs	Hours
Hydro	Hydrology station (includes surface water quality and water discharge)
km	Kilometre
km^2	Square kilometre
km/hr	Kilometres per hour
m	Metre
m^2	Square meter
mg/L	Milligram per litre
mL	Millilitre
mm	Millimetre
Maxxam	Maxxam Analytics Inc.
NTS	National Topographic System
Peregrine	Peregrine Diamonds Ltd.
Pers. Comm.	Personal Communication
QA/QC	Quality Assurance/Quality Control
Rhithron	Rhithron Associates Inc.
RPD	Relative Percent Difference
TOC	Total organic carbon
$\mu m^3/cm^2$	Cubic Micrometres per square centimetre
UV	Ultra-Violet
WQ	Water quality (surface water)
YOY	Young-of-the-year fish

DEFINITIONS

Anadromy/ Anadromous	A fish/species that spawns in fresh water and rears in salt water for a period of their life cycle.
Benthos/ Benthic	The biogeographic region that includes the bottom, or bottom sediments, of a water body.
Chidliak Project	An area consisting of 745 mineral claims over a total area of 747,793 ha, located 120 km northeast of Iqaluit.
Fork Length	The length of a fish measured from the most anterior part of the head to the deepest point of the notch in the tail fin.
Heterotroph/ Heterotrophic	Refers to an organism that consumes other organisms to obtain carbon that is essential for growth and development, and are not capable of manufacturing food from inorganic sources.
Lentic	Relating to, or living in still, fresh water (e.g. lakes, ponds, etc.).
Littoral	Relating to, or situated along the shore of the sea or a lake.
Lotic	Relating to, or living in moving fresh waters (e.g. streams and rivers).
Microflora	The community of micro-organisms, including algae and fungi that live in or on another living organisms, or in a particular habitat.
Morphotype	Divergent groups of a species with distinct differences in body morphology, cranial-facial morphology, feeding behaviour or niche use that are recognized across many different populations.
Oligotrophic	A term used to describe very unproductive waters. Unproductive water systems occur where the soils and surrounding lands provide relatively little nutrients to the water. Common in the Arctic.
Pelagic	Relating to the upper layers of a water body.
Photic Zone	The depth of the water in a water body that is sufficiently illuminated to permit photosynthesis.
Priority Area	A 20 km diameter area, within the Chidliak Project (positioned within four 1:50,000 National Topographic System (NTS) maps (O26B01 to -02 and O26B07 to -08)) where exploration activities were focused.
Riverine	Relating to, or situated on a river or riverbank.
Study Area	An area of 3,083 km^2 inside the Chidliak Project and encompassing the Priority Area from which the 2014 baseline environmental studies were conducted.
Trophic Level	Each of several hierarchical levels in an ecosystem, comprising organisms that share the same function in the food chain and the same nutritional relationship to the primary sources of energy.
Young-of-the Year	Fish that are less than one year old and hatched during the spawning season.

LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Peregrine Diamonds Ltd. and their agents. Tetra Tech EBA Inc. (Tetra Tech EBA) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Peregrine Diamonds Ltd., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in Tetra Tech EBA's Services Agreement. Tetra Tech EBA's General Conditions are provided in Appendix A of this report.

1.0 INTRODUCTION

The Chidliak Project (the Project), owned and operated by Peregrine Diamonds Ltd. (Peregrine), is located on the Hall Peninsula of Baffin Island, Nunavut, approximately 120 km northeast of Iqaluit (Map 1, Appendix B). Peregrine retained Tetra Tech EBA Inc. (Tetra Tech EBA) to conduct the 2014 baseline environmental studies to facilitate understanding of the environmental baseline conditions in the area at the time of the field event, and to provide baseline data as a management tool for planning exploration activities appropriately to avoid or minimize impacts to the surrounding environment.

1.1 2014 Baseline Environmental Studies Objectives

On behalf of Peregrine, Tetra Tech EBA has been conducting baseline environmental studies at the Chidliak Project annually since 2009. During this time, five key environmental programs have consistently been studied:

- surface water quality;
- potable water quality at operating camps;
- Barren-ground Caribou (Rangifer tarandus groenlandicus);
- carnivores; and
- raptors.

In addition, several other environmental programs (e.g., stream flow, waterfowl, breeding birds, and fish and fish habitat) were undertaken over a one to three year period (Table 1-1).

Table 1-1: Summary of Baseline Environmental Programs Undertaken at Chidliak since 2009

Survey Type	2009	2010	2011	2012	2013	2014
Surface Water Quality	X	X	X	X	X	X
Stream Flow	X	X	X			
Habitat Analysis	X			X		X
Breeding Birds	X					
Waterfowl	X	X	X			
Raptors/Raptor Nest	X	X	X	X	X	X
Aerial Caribou	X	X	X	X	X	X
Aerial Carnivore	X	X	X	X	X	X
Meteorological		X	X	X	X	X
Camp Potable Water Quality		X	X	X	X	X
Fish & Fish Habitat		X				X

The objectives of the 2014 baseline environmental program were to continue studies related to the five primary environmental programs, in addition to undertaking:

- baseline fish and fish habitat studies;
- ecological land classification (a foundation for a detailed habitat analysis);

- intensified caribou sampling; and
- intensified surface water quality sampling to include additional sites within Peregrines' Priority Area and regionally within the study area.

To achieve these enhanced objectives, the necessary field surveys were conducted from August 7 to 11, 2014 while based out of Peregrine's Discovery Camp.

This report provides the results of the 2014 baseline environmental studies with exception of the ecological land classification, which is to be provided under separate cover.

2.0 BACKGROUND

At the time of the 2014 baseline environmental studies, Peregrines' Chidliak Project consists of 745 mineral claims over a total area of 747,793 hectares (ha). Within the Chidliak Project, exploration activities have focused on a 20 km diameter area positioned within four 1:50,000 National Topographic System (NTS) maps (O26B01 to -02 and O26B07 to -08), an area referred to as the "Priority Area" (Map 1, Appendix B).

Peregrine began systematic exploration at the Chidliak Project in the summer of 2008 following receipt of necessary permits and licences. Since this time, Peregrine has conducted ground and airborne geophysical surveys, land and lake-based drilling programs, mini-bulk (by hand and small equipment) and bulk (by blasting and trench excavation) sampling, and have operated four exploration camps (Discovery Camp erected in 2008, addition of Sunrise Camp in 2009, Aurora Camp in 2011, and CH-6 Camp in 2013) across their Project area. In the winter of 2012/2013, an overland cat-train was used to mobilize equipment and consumables from Iqaluit to the Chidliak Property (as approved under Land Use Permit #N2012C0024), and in July and August 2013, De Beers Canada Inc. ("De Beers") undertook a field mapping and geophysics program on the Chidliak Property.

3.0 2014 STUDY AREA

The environmental baseline 2014 study area (the "study area") encompasses Peregrine's Priority Area, as well as a broader geographical area within the Chidliak Project. The Priority Area is located inland, 25 km west of Popham Bay, the nearest marine environment. The study area has evolved slightly over the program years to reflect Peregrine's potential exploration activities. However, the boundaries and dimensions of the study area have consistently covered the Priority Area and, in 2014, expanded to include a total area of 3,083 km^2 (Map 1, Appendix B).

The study area is approximately 550 to 920 m in elevation with higher land to the east, which is covered by glaciers. Approximately half of the study area drains north and east into Cumberland Sound, while the remainder drains west via the McKeand River and its tributaries. Peak runoff typically occurs in June as a result of snowmelt and subsequently declines from July to October (EBA 2011).

4.0 2014 BASELINE STUDY METHODS

This was the sixth consecutive year of studies pertaining to surface water quality, potable water quality, Barren-ground Caribou, carnivores, and raptors, and the second year of the fish and fish habitat program. However in 2014, the baseline environmental studies were advanced and intensified, but the study methods remained consistent with previous program years.

In 2014, Ms. Karla Langlois, P.Biol (wildlife and water quality components) and Mr. Michael Vilimek, P.Biol (fish and fish habitat component) with Tetra Tech EBA, carried out the baseline field programs with direct field assistance from Mr. Amie Nashalik (from Pangnirtung) and Mr. David Willis, Peregrine's Lands Administrator.

4.1 Surface Water Quality Sampling

The August 2014 field program is the sixth consecutive year of baseline studies and the 14th water quality sampling field event (including winter water quality sampling).

For consistency, the 2014 surface water quality sampling program continued at previous sampling locations and maintained the same laboratory protocols and analytical procedures as in previous years. An additional 15 new surface water quality sampling locations were added to the 2014 baseline program based on potential mine infrastructure locations and regional reference sites. A single station, water quality (WQ) 14, previously sampled from 2011 to 2013, was removed from the 2014 program owing to its distance from the study area boundary (approximately 23 km north). Therefore, a total of 28 water quality sampling stations were established in 2014 (Map 2, Appendix B).

The continued objective of the surface water quality sampling program is to measure baseline August water quality conditions within the surface waters of the study area. For comparative purposes, the water quality data are evaluated against the Canadian Council of the Ministers of the Environment Freshwater Aquatic Life (CCME FAL) guidelines.

Water quality samples collected and submitted for laboratory analysis include routine parameters (e.g., pH, electrical conductivity, water hardness, total alkalinity, total suspended solids, turbidity), nutrients, total metals, total organic carbon (TOC), and oil and grease. The surface water quality sampling program follows standard grab-sampling methods that are consistent with those employed during previous baseline programs. ALS Laboratory Group (ALS) (an accredited laboratory) supplies the sample bottles, preservatives, coolers, and ice packs, and has analyzed on-site water chemistry since 2009. All sample bottles and preservatives are supplied in clean coolers and secured throughout transport.

Sampling (including the field and quality controls) are consistent with the following field sampling methods:

- Collect in situ field pH, water temperature, and electrical conductivity (EC) using a calibrated Oakton® Multi-Parameter 35 Series meter, which is allowed sufficient time to come to equilibrium before recording the field parameter;
- Use disposable, powderless, nitrile gloves during handling of all the bottles and equipment;
- Avoid touching the inner portions of the sample and preservative bottles and caps even with gloved hands;
- Approach the water quality stations along watercourses downstream of the intended water quality sampling location;
- Collect surface water quality samples into the current or wind, where possible, and plunging the sample bottle held in a horizontal position with the bottle opening held below the water surface to minimize the collection of bottom sediment and any surface material;
- Avoid disturbing the bottom sediment of the lake or watercourse;
- Preserve samples using appropriate acid concentrations provided by ALS;
- Seal together the water quality samples in a Ziploc bag to prevent any possible cross-contamination to other water quality station samples while in transportation;
- Store and transport the water quality samples in laboratory-issued portable coolers with ice packs, to ensure that the water quality samples remain below 4 °C, as much as possible;

- Ensure water quality samples remain upright inside the cooler, and the cooler is sealed with tape prior to shipping;
- Ship samples to the laboratory as quickly as possible to ensure hold times were met and to prevent the deterioration of the water quality samples, and
- Prepare and ship the water quality samples with a chain-of-custody (COC) to ALS for laboratory analysis.

4.1.1 Quality Controls

Three types of quality control samples are used in the baseline program:

1. **Trip blank**: prepared by ALS, accompanies the sample bottles to the site, left intact (e.g., unopened), and returned to the laboratory with the field water quality samples. One trip blank is submitted for analysis to test for possible contamination or parameter loss that might arise during the handling, transport, and storage of samples.
2. **Field blank**: prepared in the field using de-ionized water supplied by ALS. One field blank sample is collected and analyzed for the full suite of parameters to test for contamination arising from the sampling equipment, handling, or from ambient conditions during sampling.
3. **Duplicate samples**: collected in direct association with the field samples using source water. Duplicate samples, representing 10 % (or greater) of the source water samples, are collected to test the validity and precision of sampling procedures and laboratory methodology, and are analyzed for the full suite of parameters. Duplicate samples are compared to their respective field samples using a Relative Percent Difference (RPD) Assessment, which provides an index for the sampling and analytical precision. This RPD Assessment meets the British Columbia Field Sampling Manual (Clark 2003) methods. Field duplicates should not differ more than 20% from their field samples. Since analytical error increases near the detection limit, only the results five times greater than the detection limit are considered applicable to the RPD Assessment.

4.1.2 Field Samples

A total of 28 water quality sampling stations were included in the 2014 baseline program, representing all aquatic environments (lakes, river, and first order to third order streams) in the region (includes control stations), and down-gradient from exploration activities and potential mine infrastructure locations. The water quality stations lie within the Southern Cumberland Sound Watershed and the McKeand, Ptarmigan Fiord, Chidliak Bay, and Popham Bay sub watersheds (Table 1, Appendix C). The field water quality stations locations are listed in Table 1, Appendix C; and illustrated on Map 2, Appendix B.

The water quality data were evaluated against the CCME FAL guidelines. However, CCME has withdrawn their previously recommended total aluminum guideline level, and have yet to determine contemporary guidelines for this parameter. For comparison purposes, total aluminum data from the study area were evaluated against the CCME FAL withdrawn aluminum level.

4.2 Camp Potable Water Quality Sampling

Since 2010, this is the fifth consecutive year collecting potable water quality samples at the Chidliak Property, and the tenth sampling event. Camp potable water quality samples have been collected to monitor compliance with the Canadian Drinking Water Quality criteria (Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment 2010) and to ensure the camp water

treatment systems are operating effectively. The objective of the 2014 camp potable water quality sampling program was to determine if potable water at the camp(s) in operation at the time of the field event met the Guidelines for Canadian Drinking Water Quality and to minimize potential contamination and deterioration of the samples before analysis, to the extent possible.

In 2014, the potable water sampling program continued at previous sampling locations throughout camp(s) and maintained the same laboratory protocols and analytical procedures as in previous years. Discovery Camp was the only camp in operation at the time of the August 2014 field event (Map 1, Appendix B), and therefore, potable water quality samples were collected throughout the camp's water distribution system. Discovery Camp has two water holding tanks that are filled separately from the local water source (from the proximal stream) to distribute potable water to different camp facilities (Figure 4-1). Both water tanks are sanitized; one using ultra-violet (UV) filtration (Trojan UVMax®) and sodium hypochlorite (household bleach), and the second using the addition of household bleach only.

Potable water quality samples were collected from taps at the beginning and end of the camps' water distribution system, as well as at the raw water source (e.g., at the pump intake). The potable-water quality samples, as well as duplicate samples and field blanks were submitted to Maxxam Analytics (Maxxam) in Ottawa for analysis of total and faecal coliforms and *Escherichia Coli* (*E. coli*). Maxxam also supplied the sample bottles and associated materials used in the collection and shipment of the camp and quality control samples.

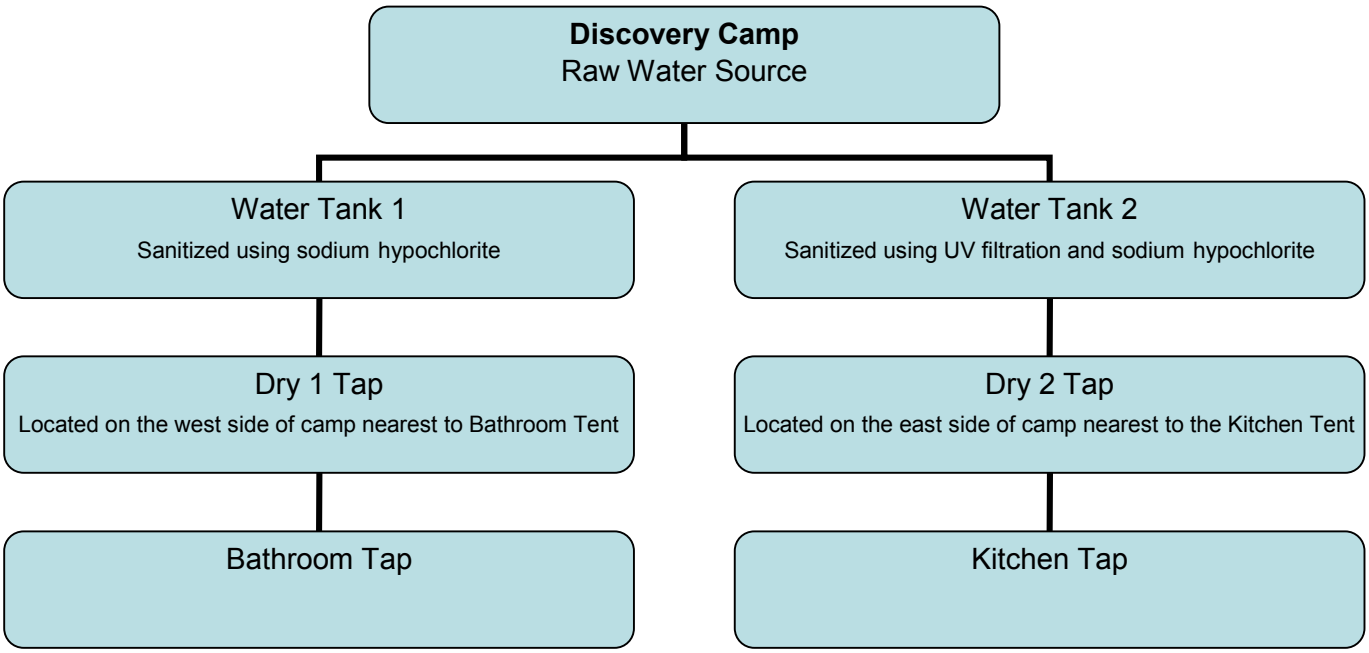

Figure 4-1: Configuration of the Discovery Camp Potable Water Distribution System

Sampling methods were consistent with previous sampling years and included:

- Purging the water distribution lines for ten minutes immediately prior to collecting the potable water quality samples;
- Using disposable, powderless, nitrile gloves when handling bottles and equipment;

- Filling sample bottles to the laboratory designated volume (appropriate headspace given) and inverted multiple times to mix the preservatives;
- Transporting sample bottles in sealed laboratory-issued portable coolers with ice packs, to ensure that the water quality samples remained below 4°C;
- Preparing a COC form and shipping with the water quality samples to the laboratory for analysis; and
- Shipping samples priority class to ensure samples meet the required 24 hour holding time.

4.3 Aerial Caribou and Vantage Point Surveys

In 2014, two survey programs: 1) an aerial caribou survey and 2) a ground-based caribou vantage point survey were used to determine the distribution and relative abundance of caribou across the study area.

4.3.1 Aerial Caribou Survey

Since 2009, this was the sixth consecutive year and the twelfth aerial caribou survey conducted within the Chidliak Project area.

The 2014 aerial caribou survey program maintained the same survey objectives, methods, and primary study area as in previous years. The objective of the 2014 aerial caribou survey was to determine the distribution and relative abundance of caribou in the study area at the time of the August field survey. However, in 2014, Peregrine concentrated their primary exploration activities near the centre of the study area (Priority Area), and additional helicopter support was available. This allowed for the aerial caribou survey transects to be intensified, and the study area to be extended further to the south and west, providing a 20 km buffer from Peregrine's Priority Area to the north, south, and west.

In 2014, a total of 13 parallel north-south transects (spaced 4 km apart), each 61 km in length, and totalling 20% of the area coverage were flown (total flying time on transect was 5.75 hours) (Map 3, Appendix B). All transects from past aerial surveys within the 2014 study area were maintained.

The Heli Carrier A-Star 350 B3 helicopter windows were calibrated immediately prior to the aerial survey to represent a 400 metre (m) boundary on each side of the helicopter when flying 150 m above ground level (agl). Calibrating the aircraft windows allowed observers to determine which caribou were inside 400 m and which ones were beyond (outside) 400 m from the flight transect. All caribou inside and outside the 400 m boundary on either side of the helicopter were counted.

Since caribou are highly mobile, the aerial survey was completed in its entirety once the survey began to reduce possible double counting. Similarly, the flight's ground speed (120 km/hr) and height above ground level (150 m agl) were maintained, to the extent possible, throughout the flight. All caribou and caribou sign observed were recorded on standardized datasheets, including the Global Positioning System (GPS) location, number of caribou observed, activity, and herd composition (if possible without disturbing the animal(s)). Following the caribou survey, caribou density estimates were calculated using Jolly's Method 1 (Jolly 1969) using equal sized sample units.

Incidental observations of caribou seen outside the caribou survey, as well as other species, including carnivores, waterfowl/water birds, and raptors, were also recorded.

4.3.2 Caribou Vantage Point Survey

To obtain additional site-specific caribou presence/absence data, a ground-based caribou vantage point survey was initiated in 2014 as a trial to provide important context to our understanding and reporting of baseline caribou conditions and to discern methods for a potential full vantage point survey in the future.

The objective of the caribou vantage point survey was to determine the presence and relative abundance of caribou in areas pre-selected by local hunters as potential lookouts. Two local Nunavummiut (Mr. Amie Nashalik and Mr. Manasie Maniapik from Pangnirtung) with appropriate caribou hunting experience selected vantage point locations from a 1:50,000 NTS contour map that showed the locations of all caribou observations since 2009. Mr. Nashalik and Mr. Maniapik were instructed to select vantage point locations within the Priority Area and beyond where they thought the best opportunity to see caribou would be (Table 4-1; Map 3, Appendix B).

Table 4-1: Caribou Vantage Point Survey Locations

Caribou Vantage Point Location	Latitude	Longitude	Proximity to the Priority Area
1	64.127060	-66.766210	Beyond 10 km from the Priority Area
2	64.085570	-66.200400	Beyond 10 km from the Priority Area
3	64.181950	-66.166370	Within 10 km of the Priority Area
4	64.197640	-66.390310	Within the Priority Area
5	64.325690	-66.294460	Within the Priority Area
6	64.361810	-66.085490	Within 10 km of the Priority Area

Once at each pre-selected site, the surveyors selected the precise vantage point location considering the existing micro-topography. Surveyors remained at each vantage point location for 20 minutes to document any caribou observed with binoculars; collected data included:

- abundance;
- approximate distance of the caribou to the vantage point station; and
- sex and age class (adult and calf).

While on station, the area from which a caribou could be detected was delineated onto a 1:50,000 NTS map. Based on this delineation, the vantage points allowed for a total area of approximately 192 km^2 to be searched during the caribou vantage point survey (Table 4-2; Map 3, Appendix B).

Table 4-2: Caribou Vantage Point Survey Areas

Caribou Vantage Point Survey Location	Survey Area (km^2)
CVP 1	80.5
CVP 2	11.8
CVP 3	22.7
CVP 4	18.0
CVP 5	45.4
CVP 6	13.8
Total	**192.2**

4.4 Aerial Carnivore Survey

The August 2014 field event was the sixth consecutive year and the 13th aerial carnivore survey (including a Polar Bear (*Ursus maritimus*) survey across Ptarmigan Fiord and Chidliak Bay) conducted within the Chidliak Project area since 2009. The 2014 aerial carnivore survey maintained the same survey objectives, methods, and primary study area as in previous years. The objective of the carnivore survey was to document the presence of carnivores and their dens (i.e., wolves (*Canis lupus manningi*), foxes (*Vulpes vulpes* and *Alopex lagopus*), Wolverine (*Gulo* gulo)) occupying terrestrial environments within the study area at the time of the August field event.

Prior to field mobilization, 1:20,000 National Topographic System (NTS) maps were reviewed for potential denning habitat for foxes and wolves. Due to the limited amount of suitable denning habitat potentially available in the study area, the carnivore and carnivore den survey was completed concurrently with the aerial caribou survey (Map 3, Appendix B). Sites that possess potential carnivore denning habitat, as encountered, were targeted.

If a den was encountered, a specific den assessment was conducted; collected data included:

- general habitat characterization;
- species use;
- GPS location;
- slope aspect;
- estimated distance to the nearest waterbody; and
- activity status (active vs. inactive).

Data collected from the 2014 surveys were used to determine species presence and sensitive carnivore areas located in direct association with the Priority Area and Peregrine's exploration activities.

4.5 Aerial Raptor Nest Reconnaissance

The August 2014 field event was the sixth consecutive year and tenth aerial raptor survey or raptor nest reconnaissance survey completed to date since 2009. In 2014, raptor nest reconnaissance surveys were completed following the same survey objectives, methods, and cliff-nesting sites identified in previous years.

Although no raptor nests are known to occur within the Priority Area, three raptor cliff-nesting sites are known to occur within the larger study area (Map 4, Appendix B). Common Ravens (*Corvus corax*), Rough-legged Hawks (*Buteo lagopus*), Peregrine Falcons (*Falco peregrinus*), and Gyrfalcons (*Falco rusticolus*) have previously occupied these raptor cliff-nesting sites. The objective of this survey is to determine occupation at these known nest sites and species use.

These known raptor nesting sites were surveyed using an A- tar 350 B3 helicopter, concurrently with the regional aerial caribou survey or while in transit to and from other survey program locales. The helicopter remained approximately 30 m from the cliff face and slowly approached in view of the specific known nest site to minimize potential disturbance to nesting raptors. Evidence of nest occupancy (e.g., seeing at least one adult bird at the nest site, two adults together, finding a nest containing eggs or young, flushing an adult from a nest) was determined by slowly passing by the cliff-nesting site. A maximum of two flight passes were performed to establish the location and occupancy of nest sites.

Data collected from the 2014 surveys were used to determine species presence, nest site occupancy, and sensitive raptor areas located in direct association with the Priority Area and Peregrine's exploration activities.

4.6 Aquatic Environment Survey

A preliminary fish and fish habitat survey was conducted in Peregrine's Priority Area in July 26 to 29, 2010. Watercourses down-gradient of known kimberlite locations were the primary focus of that preliminary study, which included seven watercourses as well as an assessment of fish presence in Sunrise Camp Lake. The fisheries and aquatics program was expanded in 2014 to include three lakes in addition to Sunrise Camp Lake, including a reference lake upstream of the future mine footprint (hereafter referred to as Glacier Lake), and surveys at four locations on the McKeand River within the study area (Map 5, Appendix B). The 2014 field program had four key objectives:

- Describe the aquatic community in the study area through the collection of periphyton, phytoplankton, zooplankton and benthic invertebrates;
- Assess the general physical habitat values of the McKeand River and lakes within the study area;
- Assess fish presence in the McKeand River and study area lakes, as well as fish community composition through ageing of fish; and
- Assess the health of fish within the study area by examining metal concentrations in tissue.

The 2014 field program initially included aquatics surveys at four lakes within the study area (see Map 5, Appendix B):

- Glacier Lake, upstream of the future mine footprint;
- Sunrise Camp Lake where historic mineral exploration has occurred; and
- Qamaniruluk Lake ("Y" Lake) and Qamanialuk Lake (McKeand Lake), both of which are located downstream of Discovery Camp and current exploration activities.

Following a malfunction of the outboard motor during the assessment at Glacier Lake on August 8, 2014 and the receipt of a replacement outboard motor only on August 10, the aquatics program needed to be reduced in scope to focus primarily on assessments at the Glacier Lake, which had no prior sampling history, and at Qamaniruluk Lake ("Y" Lake), which is the nearest lake downstream of current and proposed mine infrastructure. However, fish sampling with minnow traps was still performed at Sunrise Camp Lake and Qamanialuk Lake (McKeand Lake).

4.6.1 Fish Habitat

The baseline assessment of lentic (lake) habitat included Glacier Lake and Qamaniruluk Lake ("Y" Lake), with limited information recorded for Sunrise Camp Lake and Qamanialuk Lake (McKeand Lake) given the required change in scope following the outboard malfunction described in Section 4.6. For Glacier Lake and Qamaniruluk Lake ("Y" Lake), a commercially available fish finder (Eagle FishEasy 245 DS) was used to obtain water depths at locations where water quality was measured to determine the suitability of water quality parameters to support fish survival. Parameters measured included dissolved oxygen (DO), temperature, pH and EC.

The baseline assessment of lotic (stream) habitat included four sampling sites on the mainstem McKeand River (see Map 5, Appendix B). At each site, a channel segment of approximately 100 m was assessed to determine the general distribution, quality and suitability of fish habitat. Site cards were used to record descriptions and measurements of fish habitat and stream morphology, including the presence of habitat features related to

spawning, nursery/rearing, migration and overwintering for fish species captured. Water depth and water velocity at the time of the field program were too high to safely obtain depth measurements across the river at cross-sections where fish habitat components were evaluated. Consequently, estimates of water depth and wetted/channel widths were frequently made based on ground visual observations and aerial observations from the helicopter at each site. Water quality measurements were also taken at each river site.

All survey locations were geo-referenced using a handheld GPS unit, generally with three metre accuracy, and photo-documented with a digital camera. Aquatic habitat characteristics were assessed for each waterbody using a combination of several methods, contained in the following documents:

- Resource Inventory Committee (RIC). 2001. *Reconnaissance (1:20,000) Fish and Fish Habitat Inventory: Standards and Procedures.* BC Fisheries Information Services Branch, RIC.
- Johnston, NT and PA Slaney. 1996. *Fish Habitat Assessment Procedures.* Watershed Restoration Technical Circular No. 8. BC Ministry of Environment, Lands and Parks.

4.6.2 Aquatic Organisms (Primary and Secondary Producers)

Table 4-3 summarizes the sampling of primary and secondary producers at each of the study area waterbodies and methods for the sampling of these biota are provided in the following subsections. Maps 6 through 13 (Appendix B) identify the specific locations within each waterbody where primary and secondary producers were sampled.

Table 4-3: Primary and Secondary Producer Sampling Locations

Waterbody	Phytoplankton	Periphyton	Zooplankton	Benthic Invertebrates
Qamaniruluk ("Y") Lake	X		X	
Qamanialuk (McKeand) Lake				
Glacier Lake	X		X	
Sunrise Camp Lake				
McKeand River Site 1		X		X
McKeand River Site 2		X		X
McKeand River Site 3		X		X
McKeand River Site 4		X		X

Note: "X" denotes sampling of the primary or secondary producer.

4.6.2.1 Periphyton

Periphyton comprise a mixture of microflora (algae), bacteria and detritus that are attached to submerged surfaces in most aquatic ecosystems. They serve as an important food source for invertebrates and some fish. Periphyton can also absorb contaminants; removing them from the water column and limiting their movement through the environment. The composition and abundance of the periphyton community are important indicators of water quality because of the variable tolerance or sensitivity to environmental change of the various species that make up these assemblages.

Periphyton samples were collected from the four river sampling sites (Maps 10 to 13, Appendix B), as per standard methodologies described in British Columbia Field Sampling Manual (Clark 2003). Periphyton indices

such as diversity, richness, and composition were calculated to determine whether the periphyton community structure is generally consistent with healthy watercourses and that an adequate food supply is available to higher trophic level aquatic organisms.

At each sample site, three rocks spaced apart by a minimum of 30 m were randomly selected from within the stream channel and brought to shore. For each rock, three replicate samples were collected by placing a 11.95 cm^2 circular template over exposed flat surfaces of the rock and scraping the surface within the 11.95 cm^2 'window' with a utility knife and a toothbrush; replicate samples collected from the three rocks at each site were combined, resulting in one composite sample per river site. Photo 4-1 is of a rock that was sampled for periphyton, with the three replicate windows visible. Periphyton samples were placed into a 500 mL plastic jar and preserved with Lugol's solution (approximately 1 drop/100mL). Samples were kept in coolers or totes and shipped to Biologica Environmental Services Ltd. (Biologica) for taxonomic analysis (species identification and enumeration). COC forms describing sampling times and analytical requirements were submitted with each periphyton shipment.

Photo 4-1: Rock sampled for periphyton.

For the 2014 baseline survey, a total of four periphyton samples (plus one duplicate) were collected from the four sample sites on the McKeand River.

Laboratory Methods

Taxonomy samples were examined by Rhithron Associates Inc. (Rhithron). A description of the methods used by Rhithron is presented in Appendix E.

Data Analysis

Periphyton density (cells/cm^2) and bio-volume (($\mu m^3/cm^2$) were calculated for samples. Data were reported by taxonomic group and for the most abundant taxa at each sampling site.

Periphyton diversity was calculated for each sample using the Simpson Diversity Index (*D*), which takes into account dominance, the number of taxa present and the relative abundance of each taxon (evenness). The closer the value of *D* is to zero, the lower the diversity within a sample and with a value of 1 indicating maximum diversity.

The Simpson Diversity Index was calculated as follows:

$$D = 1 - \sum_{i=1}^{G} p_i^{\,2}$$

where,

D = the Simpson Diversity Index

p_i = the proportion of individuals of genus is relative to the total number of individuals present in a sample

G = the number of genera encountered

For the calculation of periphyton richness, taxa were grouped by genera for each sample. In instances where an organism was not identifiable to genus, they were identified to higher taxonomic levels (e.g. family or sub-family). These unidentified organisms were excluded from subsequent metrics calculations if identified lower-level taxa were encountered in the sample.

4.6.2.2 Phytoplankton

Phytoplankton are photosynthesizing microscopic organisms that inhabit the photic zone of almost all oceans and bodies of fresh water. They convert inorganic carbon, nitrogen and phosphorus into organic matter, making it available for consumers such as zooplankton and benthic invertebrates. Phytoplankton are sensitive to changes in water chemistry, and have been used as indicators of water quality since the early 1900s because of known sensitivity to changes in nutrient, Total Suspended Solids (TSS) and metal levels, which makes them useful indicators of changes related to mine operations. They also provide valuable links between water chemistry and the fish community.

Phytoplankton samples were collected at Glacier Lake and Qamaniruluk Lake ("Y" Lake) (Maps 6 and 8, Appendix B) to determine taxonomic composition and abundance. Phytoplankton samples were collected from the boat by surface grabs (Clark 2003). Phytoplankton indices such as diversity, richness, and dominance were calculated to determine whether the phytoplankton community structure is generally consistent with healthy waterbodies and that an adequate food supply is available to higher trophic-level aquatic organisms.

All samples were placed into 500 mL labeled plastic bottles, preserved with Lugol's solution (1/100mL), and shipped to Biologica for taxonomic analysis. Samples were kept in coolers or totes until arrival at the laboratory. COC forms describing sampling times and analytical requirements were submitted with each phytoplankton sample shipment.

For the 2014 field program, one surface grab sample was taken at Glacier Lake and Qamaniruluk Lake ("Y" Lake), in addition to one duplicate sample for Quality Assurance/Quality Control (QA/QC).

Laboratory Methods

Taxonomy samples were examined by Biologica. A description of the methods used by Biologica is presented in Appendix E.

Data Analysis

Phytoplankton abundance, density (cells/mL) and bio-volume (µL) were calculated for each lake sample. Data were reported by taxonomic group and for the most abundant taxa in each lake. Phytoplankton richness was calculated based on the number of genera encountered in the sample and diversity was calculated using Simpson's Diversity Index (see Section 4.6.2.3).

4.6.2.3 Zooplankton

Zooplankton are free-floating and motile, heterotrophic, microscopic organisms that inhabit almost all bodies of fresh water. Unlike phytoplankton, zooplankton cannot produce their own food, and so are consumers. Through their consumption and processing of phytoplankton and other food sources, zooplankton play a role in aquatic food webs as a resource for consumers on higher trophic levels (including fish). The smallest zooplankton can be characterized as recyclers of water-column nutrients and often are closely tied to measures of nutrient enrichment. Large zooplankton are important food for forage fish and the juvenile stages of all fish. There are three main taxonomic groups: rotifers and two subclasses of the Crustacea (Cladocera and Copepoda). Protozoans, a few coelenterates, larval trematode flatworms, gastrotrichs, mites, and the larval stages of some insects are also considered zooplankton, even if some of them only live in the water column occasionally or for a portion of their life cycles (Wetzel 2001).

Zooplankton were collected as per standard methodology provided in the British Columbia Field Sampling Manual (Clark 2003) using a 64 µm mesh size plankton net with a 40 cm diameter opening. At each lake sampled, the plankton net was deployed to depth and raised according to the vertical tow method. At the surface the net was rinsed with deionized water to wash zooplankton into the cod end of the plankton net. Samples were held in 500 ml labeled plastic bottles and preserved with 70% ethanol. Samples were submitted to Biologica to determine taxonomic composition.

For the 2014 baseline program, zooplankton were only sampled in Glacier Lake and Qamaniruluk Lake ("Y" Lake) (Maps 6 and 8, Appendix B), with one sample taken at each location and a duplicate sample taken for QA/QC. Tow height was recorded using the fish finder. These data were used to convert zooplankton abundance from a total sample count to a density (number of organisms per m^3).

Laboratory Methods

Taxonomy samples were examined by Biologica. A description of the methods used by Biologica is presented in Appendix E.

Data Analysis

Zooplankton abundance, density, richness and diversity were calculated to determine whether the zooplankton community structure is generally consistent with healthy watercourses and that an adequate food supply is available to higher trophic-level aquatic organisms.

Data were reported by taxonomic group and for the most abundant taxa at each lake. Zooplankton density was volume-corrected by using the sampling area of the plankton net mouth multiplied by the distance the net travelled through the water column. Zooplankton richness was calculated based on the number of genera encountered in a sample and zooplankton diversity was calculated using Simpson's Diversity Index (see Section 4.6.2.3).

4.6.2.4 Benthic Invertebrates

Benthic invertebrates are organisms that live within or on the bottom sediments of rivers, streams, and lakes. The benthic invertebrate community is strongly affected by its environment, including sediment composition and quality, water quality, and hydrological factors that influence the physical habitat. Because the benthic community is so dependent on its surroundings, it serves as a biological indicator that reflects the overall condition of the aquatic environment. Benthic invertebrates are an important component of both flowing and standing water habitats, as they consume smaller animals and plants, aid in decomposition of organic material, and are an important source of food for fish and other animals.

The main advantages of using benthic invertebrates for bio-monitoring are:

- they are ubiquitous, so can be affected by perturbations in many aquatic habitats;
- the many species involved offer a wide range of responses to environmental stresses;
- they are relatively sedentary, which allows for the determination of the spatial changes caused by perturbations; and
- they have long life cycles, so effects of perturbations over time can be observed.

Benthic invertebrates were collected at the four McKeand River (plus one duplicate sample) sampling sites (Maps 10 to 13, Appendix B) as per standard methodologies provided in British Columbia Field Sampling Manual (Clark 2003), using a Hess Sampler with a 500 µm mesh size, and 2,580 cm^2 bottom internal diameter. Three replicate samples were collected at each location and combined into one composite sample. The replicates at each site were sampled generally in a progressively upstream direction so as not to disturb substrates prior to sampling.

Cobble and larger gravels were first hand removed and rubbed clean. Once the coarse components (cobbles and gravel) were removed from the Hess Sampler, the remaining fine substrates were agitated with a trowel to a minimum depth of 10 cm. Composite samples were collected in labeled 500mL plastic jars, and preserved with 70% to 95% ethanol prior to shipping to Biologica for analysis. Samples were placed in clean coolers or totes until arrival along with COC forms describing sampling times and required analyses.

Laboratory Methods

Benthos samples were examined by Biologica. A description of the methods used by Biologica is presented in Appendix E.

Data Analysis

Benthic invertebrate density, richness, and diversity were calculated to determine whether the benthic invertebrate community structure is generally consistent with healthy watercourses and that an adequate food supply is available to higher trophic level aquatic organisms.

Benthic invertebrate density was area-corrected by using the Hess sampling area, and reported as number of organisms/cm^2. Benthic invertebrate richness was calculated based on the number of genera encountered in a sample and invertebrate diversity was calculated using Simpson's Diversity Index (see Section 4.6.2.3).

4.6.2.5 Aquatic Biota Sample QA/QC

The same field personnel collected all samples for the aquatics program. This ensured that sampling methods were consistent, samples were correctly collected, labeled and preserved, and equipment was properly cleaned. Detailed field notes were kept, COC forms were used, and appropriate shipping and storage methods were used.

Quality control procedures involved precautions for ensuring samples were protected from contamination and deterioration (use of clean bottles and adequate preservative). Care was taken to ensure bottles were kept in a cool, clean environment, either cooler or refrigerator, with minimal exposure to light.

Replicate samples were collected for all taxonomy (a minimum of 10% of samples for each type of primary or secondary producer); however, due to the inherent high degree of variability within biological samples, a data quality objective was not set for replicate samples. Variability between replicates was initially observed and noted. Biologica and Rhithron followed internal procedures for taxonomy: microscope calibration, counting procedures, Batch Quality Control procedures for precision, and accuracy in taxonomic identification, verification with an in-house reference collection, and external review.

4.6.3 Fish

The fish capture program for the study was carried out under the authority of DFO Animal Use Protocol # FWI-ACC-2014-044 and a DFO Licence to Fish for Scientific Purposes # S-14/15-1023-NU. Three fish capture methods were used to target a variety of species in a variety of habitats. Fish sampling methods included electrofishing, minnow trapping, and gill netting. Sampling locations within each of the waterbodies are identified in Maps 6 to 13 (Appendix B). The data were collected to identify species composition and relative abundance by waterbody. When sufficient fish were captured during gill netting (or by minnow trapping if this was the only gear type used), a maximum of ten fish of each species per lake were sacrificed in order to submit tissue samples for analysis of metal concentrations.

4.6.3.1 Assessing Fish Presence

Fish capture efforts varied depending on the waterbody (stream or lake) and method used. McKeand River sites were sampled with a combination of minnow trapping and electrofishing, while lake sites were sampled with minnow traps and/or gill nets. A summary of the gear types used at each lake and the general location of that lake is provided in Table 4-4. A summary of the gear types used at each river site and the general location of that site is provided in Table 4-5.

Table 4-4: Fish Sampling Locations By Lake

	UTM Location (19 W)		Gear Type	
Lake	**Easting**	**Northing**	**Gill Net**	**Minnow Trap**
Qamaniruluk (“Y”) Lake	605802	7132865	X	
Qamanialuk (McKeand) Lake	598263	7128000		X
Glacier Lake	644603	7118930	X	X
Sunrise Camp Lake	640068	7127519		X

Minnow traps were used in both stream and lake environments to target small-bodied fish (generally less than 15 cm in length). Typical metal, funnel-type minnow (Gee) traps were utilized and baited with a combination of canned and dry cat food. Depending upon habitat availability, trapping locations included areas with pools, boulders, bare cobbles, or bedrock areas. Minnow traps were set at each stream sample location for a period of

approximately 24 hours. Minnow traps were also set within each lake for approximately 24 hours, with the exception of Qamaniruluk Lake ("Y" Lake), where minnow trapping was not performed due to time constraints.

Table 4-5: McKeand River Fish Sampling and Habitat Assessment Locations

	UTM Location (19 W)		Fish Sampling	
Site	**Easting**	**Northing**	**Electrofishing**	**Minnow Trap**
McKeand River Site 1	642302	7119456	X	X
McKeand River Site 2	631662	7119850	X	X
McKeand River Site 3	621478	7124035	X	X
McKeand River Site 4	612145	7130084	X	X

Electrofishing was conducted at four stream locations on the McKeand River. A battery powered backpack Smith-Root Model #LR-24 was operated by one Tetra Tech EBA representative trained as an Electrofishing Crew Supervisor. A second Tetra Tech EBA representative or a Peregrine Representative, performed netting duties and collected stunned fish with a small-mesh net. All sampling personnel wore mandatory personal protective equipment, including: leak-free chest waders with belt, non-slip footwear and 15" linesman gloves rated to 5000 volts. Electrofishing effort (seconds of fishing per site) was varied and depended upon the maneuverability within the watercourse.

All fish captured were placed in totes filled with ambient water from the waterbody being fished. Fish were photographed, identified and released once fully recovered (as indicated by active swimming).

Gill netting, using multi-mesh experimental nets, was conducted on two lakes: Glacier Lake and Qamaniruluk Lake ("Y" Lake). Gill netting was also initially planned on Sunrise Camp Lake and Qamanialuk Lake (McKeand Lake); however due to issues associated with the outboard motor during the field program, gill netting did not take place at the two lakes due to time constraints and inclement weather that came in on the last day of the field program. One floating and one sinking gill net were set at each lake, for a period of approximately 2 hours. Nets in the littoral zone were set perpendicular to shore while nets in the deep location were orientated to pass through varying depths (as observed with the fish finder).

Both the floating and sinking net gang were 1.8 m deep and 60.64 m long (consisting of eight 7.58 m panels). Each panel had a different mesh size to maximize species and age classes caught as identified in Table 4-6.

Table 4-6: Gill Net Dimensions

Panel	Mesh Size
1	25 mm
2	38 mm
3	51 mm
4	64 mm
5	76 mm
6	102 mm
7	127 mm
8	152 mm

Fish captured in gill nets were collected in tubs and identified to species. Most fish were kept and euthanized for tissue sampling of metals; however, fish that were alive and not required for analysis were returned to the waterbody following measurement of fork length and weight. Due to time constraints on Qamaniruluk Lake ("Y" Lake) during the sampling event, it was not possible to take measurements of fork length and weight on all captured fish; therefore, those fish that were not retained for tissues sampling were returned to the lake following classification as "larger" (> 30 cm) or "smaller" (< 30 cm) individuals. Fish kept for tissue sampling were measured for fork length and weight and, where possible, the sex was identified during dissection.

4.6.3.2 Catch Rate Calculations

The catch per unit effort (CPUE) was calculated for minnow traps, electrofishing, and gill nets for each sampling location. For minnow traps, the CPUE was calculated as the number of fish caught per hour that the trap was set. For electrofishing, the CPUE was calculated as the number of fish caught per 100 seconds effort. For gill nets the CPUE was calculated as the number of fish caught per hour that the net was set. The CPUE data cannot be used to estimate absolute fish density but can be used in the future to compare relative abundance before and after mine development.

4.6.4 Fish Biometrics and Health

All fish processing occurred in an emergency response shack that acted as a camp laboratory. Clean tarps were placed on top tables and the floor to prevent any potential contamination of sampling tools and fish tissues with unclean surfaces, and to maintain a high level of QA/QC. Data were recorded in field books and checked again during the completion of laboratory COCs. Any incidental observations of fish parasites or maturity status were also recorded with the biometric data.

4.6.4.1 Fish Length, Weight and Condition

Fish fork lengths were measured using a measuring board marked in millimeter increments for fish smaller than 30 cm; for fish larger than 30 cm, measurements were taken with a measuring board with half-centimetre increments, and thus lengths were also taken at half-centimetre increments. Wet weight of each fish was measured with an electronic scale with 0.1 g accuracy that was able to measure a maximum of 3000 g. Metrics were recorded on sampling data forms or in a 'write-in the rain' book for fish measured in the field.

The length-weight relationship is used in the calculation of fish condition. Fish condition was calculated using the Fulton's Condition Factor (*K*) equation (Johnstone 1912):

$$K = [Weight\ (g)/Length\ (cm)^{3}] \times 100$$

According to Carlander (1944), fish with condition indices (CI) greater than 1.02 are in excellent condition. It is also recognized that seasonal variation, age, and sex are parameters that impact fish weight, which indirectly impacts a fish CI. In addition, regression analyses were also completed to examine the length-weight relationship for fish captured within each lake. Logarithmic transformations of length and weight were performed prior to calculating regression equations, which have the following form:

$$ln\ [Weight\ (g)] = ln\ (a) + b\ [Length\ (cm)]$$

where,

a is a coefficient

b is the slope of the regression.

4.6.4.2 Fish Ageing

Ageing structures (pelvic fin ray or otoliths) were collected from 10 fish from each of Glacier Lake, Qamaniruluk Lake ("Y" Lake) and Qamanialuk Lake (McKeand Lake), and from one fish from Sunrise Camp Lake. All age structures were cleaned and stored in paper coin envelopes, and hung to dry prior to packing and shipping to North/South Consultants Inc. in Winnipeg, MB for analysis. Otoliths were preferentially sampled for ageing; however, for smaller individuals (typically smaller than 20 cm) pelvic fin rays were sent in place of otoliths.

4.6.4.3 Tissue Sampling

All fish sacrificed from each lake were brought back to the camp laboratory for dissection and collection of ageing structures and tissue after each sampling event. Up to 10 fish of each species were sampled from each lake. Muscle and liver tissues were collected as per the *British Columbia Field Sampling Manual* (Clark, 2003). Fish tissues were processed from Glacier Lake, Qamaniruluk Lake ("Y" Lake), and Qamanialuk Lake (McKeand Lake).

The field fish processing laboratory was set up anew each day, and all tools were stored in a closed plastic container between uses to minimize contamination. Benches were covered in plastic and fish were dissected over aluminum paper. Aluminum paper was changed following each fish dissection and all tools used to collect tissues were washed with de-ionized water and soap between fish. Staff wore nitrile gloves when handling fish and changed gloves between fish. Care was taken not to pierce organs with any tools. Photo 4-2 is of the fish processing lab.

Photo 4-2: Arctic char being processed in the remote lab by Mr. Nashalik.

A section of muscle tissue was removed from each fish for tissue analysis. For large individuals, muscle tissue was removed from the left dorsal surface (above the lateral line), from the anterior to posterior margins of the dorsal fin. In small individuals, the muscle tissue was removed from the anterior margin of the dorsal fin to near the caudal fin. When a fish was 100 g or less, the whole fish was sent for analysis.

Following removal of muscle tissue, each fish was dissected to obtain the liver sample and to determine gender (if the fish was sufficiently mature to have evident gonads). The liver was sampled, without the gall bladder or bile duct. All tissue samples were placed into labelled, whirl bags and promptly frozen prior to sending to Maxxam Analytics for analysis of metals, which were reported on a wet tissue weight basis.

4.6.4.4 Tissue Metals

Although analysis was conducted for a full suite of metal parameters, guidelines were available for only mercury, arsenic, lead and selenium. Arsenic, lead, and mercury were compared to the Canadian Consumption Guidelines for Chemical Contaminants and Toxins in Fish and Fish Products (Canadian food Inspection Agency (CFIA 2011), and selenium was compared to the BC ambient water quality guideline (Nagpal 2001) tissue benchmark which is protective of fish and not based on human consumption. Mercury was also compared to the Health Canada (HC) tissue consumption standard (Health Canada 2011) which is the same as the CFIA guideline.

4.6.4.5 QA/QC

The field QA/QC procedures involved precautions to ensure that tissue samples were protected from contamination and deterioration. Tissue sampling equipment was cleaned with de-ionized water after each individual fish dissection, gloves were changed after each dissection, the dissection area was protected with plastic and dissections were conducted over aluminum paper which was replaced after each individual. Care was taken to ensure that internal organs were not punctured. Samples were frozen as quickly as possible following dissection, and maintained frozen until delivery to the laboratory. Sample containers were labeled with indelible ink at the time of sample collection. Replicate tissue and liver samples were collected from two fish.

4.6.5 Analysis of Potential Barriers to Fish Migration in the McKeand River

Two approaches were taken to attempt to determine if any permanent physical barriers to upstream fish migration in the McKeand River are present downstream of the study area. A permanent barrier would consist of a physical feature in the river, such as a waterfall or sections of the river with gradients greater than 20%, which would preclude anadromy (a period of the life cycle occurring in salt water) in the populations of Arctic char present within the study area.

The first approach consisted of contacting Fisheries and Oceans Canada (DFO) scientific staff that have undertaken studies in the McKeand River and in Cumberland Sound, as well as other scientists that may have worked in these areas. Tetra Tech EBA corresponded with Mr. Simon Wiley (DFO), Dr. Jean-Sebastien Moore (University of Laval), and Mr. Warren Bernhardt (North/South Consultants Inc.) regarding potential barriers in the McKeand River.

The second approach was a GIS-based analysis for the McKeand River (approximately 300.95 km long), conducted using ESRI ArcGIS software and publicly available GIS data to identify any possible barriers to fish migration. For the analysis, two different datasets were obtained and used to assess the watercourse for physical barriers. The datasets included:

- CanVec data – vector data produced by Natural Resources Canada at a scale of 1:50000; and
- Canadian Digital Elevation Data (DEM) – raster data provided by GeoBase at a scale of 1:50000.

The CanVec data contains a theme called Hydrography features. The Hydrography theme contains a representation Hydrographic Obstacles, including:

- Falls – a perpendicular or steep drop in a body of water over which water flows;
- Rapids – a fast flowing, often turbulent, section of a body of water, generally containing exposed rocks or boulders;
- Rocks – a rock or earthen formation always visible above the water surface; and

- Ford – a shallow part of a body of water suitable for crossing by people or vehicles.

These features are represented by points, lines and polygons depending on their size. Tetra Tech EBA used this information and assessed the location of any hydrographic features that may create an obstacle to fish migration.

The DEM data is a raster layer that has a spatial resolution of 15 m. This layer can be processed to show slopes in percent or degrees. In order to determine if any permanent barriers to fish migration are located in the McKeand River, the data was assessed for any areas with a slope greater than 20 degrees (a slope that would be considered a permanent barrier). The processed slope layer was reclassified to show two distinct areas, those with a slope greater than 20 degrees or those with a slope of less than 20 degrees, and this data was analyzed in conjunction with the CanVec Hydrography features.

5.0 2014 BASELINE STUDY RESULTS

Six baseline environmental components were studied using multiple survey programs over the five day period from August 7 to 11, 2014 (Table 5-1). During this time, the lakes and streams were predominantly ice-free, and snow covered approximately 3% of the eastern-most portion of the study area (near the glacier), with a gradual loss of snow further west into the remaining study area (average approximately <1% snow cover).

Table 5-1: Summary of Baseline Studies Conducted in 2014, Chidliak Property

Discipline	Environmental Component	Survey Program	2014 Survey Date(s)	Description
1	Surface Water Quality	▪ Ground-based survey	▪ August 8-9	▪ 28 surface water quality stations
2	Camp Potable Water Quality	▪ Discovery Camp water distribution system	▪ August 11	▪ Five sampling stations associated with Discovery Camp
3	Caribou	▪ Aerial Survey	▪ August 7	▪ 13 north-south aerial survey transects
		▪ Ground-based Vantage Point Survey	▪ August 9-10	▪ Six vantage point survey locations
4	Carnivores	▪ Aerial Survey	▪ August 7	▪ 13 north-south aerial survey transects
5	Raptor Nest Reconnaissance	▪ Aerial Survey	▪ August 7 and 10	▪ Three known raptor nest sites investigated
6	Aquatic Environment	▪ Primary and Secondary Producers ▪ Fish Habitat Assessment ▪ Electrofishing ▪ Minnow Trapping ▪ Gill netting	▪ August 7-11	▪ Periphyton and benthic invertebrates sampled at four McKeand River sites ▪ Phytoplankton and zooplankton sampled at two lakes ▪ Fish habitat assessments at four McKeand River sites ▪ Electrofishing and minnow trapping at four McKeand River sites ▪ Minnow trapping at four lake sites ▪ Gill netting at two lake sites

Ecological Land Classification studies also conducted. Detailed results from this study are provided under separate cover.

5.1 Surface Water Quality Sampling

5.1.1 Quality Control Samples

Water quality control samples, field and trip blanks, and duplicate samples were collected and analyzed for routine parameters, nutrients, total metals, total organic carbon, and oil and grease. The quality control sample laboratory results are provided in Tables 3, 4a to 4c (Appendix C) and the detailed laboratory reports are provided in Appendix F.

The field and trip blank sample results indicated that all of the parameters were below the applicable laboratory detection limits, with exception of TOC in the trip blank (Table 3, Appendix C). The TOC level in the trip blank (1.6 milligram per litre (mg/L)) was attributed to analytical error, as the analytical error increased near its laboratory detection limit (1.0 mg/L) (Clark 2003).

Sampling methods employed during the collection, transportation, and analyses of the 2014 surface water quality samples were satisfactory and did not lead to the introduction of potential contaminants.

Three duplicate water quality samples were collected; representing 11% of the total field samples. Blind duplicate samples were collected with Hydro 9, WQ 25, and Hydro 11 field samples, and their analytical results were compared to their respective field sample results using a RPD assessment (Tables 4a to 4c, Appendix C). Results from the RPD assessments indicated that all three duplicate samples collected during the August 2014 field event were reliable and therefore, the field sampling and analytical methods employed were acceptable.

5.1.2 Field Samples

Surface-grab water quality samples were collected from 28 stations located across the McKeand, Ptarmigan Fiord, Chidliak Bay, and Popham Bay sub watersheds. While at each station, in situ water chemistry (e.g., pH, EC, and water temperature) was measured using a handheld Oakton® Multi-Parameter probe. Surface water was clear, neutral to slightly acidic (average pH 6.4) with very low EC (average 8.42 µS/cm) and cool water temperatures (average 10.8°C). A summary of the water quality conditions is presented in Table 5-2, and the in situ water quality parameters averages, minimum, and maximum values are presented in Figure 5-1. The water quality sampling station locations are identified in Map 2, Appendix C and depicted in Photos 1 to 28, Appendix D.

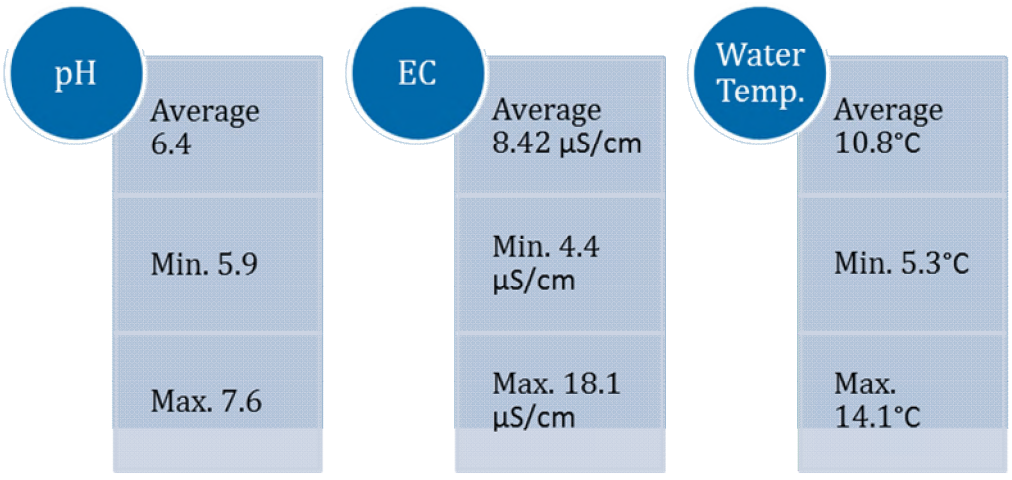

Figure 5-1: Summary of In Situ Water Quality Parameter Results, August 2014

The majority of the analyzed parameters were below their laboratory detection limits (Tables 5a and 5b, Appendix C). When comparing the field water chemistry results to the CCME FAL guidelines, pH and total aluminum levels were consistently outside criteria levels at all water quality stations including the reference stations. However, the CCME FAL guideline for total aluminum has been withdrawn, and is provided here for comparison purposes only. All other sampled parameters met applicable guideline levels.

Laboratory results for the field samples are summarized in Tables 5a and 5b (Appendix C), and the detailed laboratory report is included in Appendix E.

5.2 Camp Potable Water Sampling

Discovery Camp was the only camp in operation at the time of the August 2014 field event. This camp has been in seasonal operation since 2008; and the 2014 field event is the fifth potable-water quality sampling event at Discovery camp.

At the time of the August 2014 field event, potable-water samples were collected at the Discovery Camp raw water intake source, and from the taps located in the Kitchen, Dry 1, Dry 2, and Bathroom tents. Quality control samples, including a duplicate sample collected from the Kitchen tap and a field blank were also collected.

Laboratory analysis indicated there were detectable levels of coliforms within the Water Tank 1 distribution system (including the Bathroom and the Dry 1 taps), and therefore the potable water did not meet the Canadian Drinking Water Quality criteria (Table 6, Appendix C). This water tank is sanitized by sodium hypochlorite (household bleach). The water quality within the Water Tank 2 distribution system, sanitized by UV filtration and household bleach, met applicable criteria for potable water, as well as the quality control samples (e.g., field blank and duplicate) (Table 6, Appendix C).

Upon receiving the laboratory report, Tetra Tech EBA notified Peregrine that the water throughout the Water Tank 1 distribution system exceeded the water quality criteria. Restraint from using water within this distribution system (i.e., Dry 1 and Bathroom taps) was recommended until the water tank was drained, appropriately cleaned, and re-sanitized.

Since 2010, potable water collected within Discovery camp has consistently met the drinking water quality criteria and the disinfecting systems used in camp have been effective.

The detailed laboratory report is included in Appendix G.

5.3 Aerial Caribou and Vantage Point Surveys

During the August 7, 2014 aerial caribou survey, no caribou were observed along the 793 km long aerial caribou survey transects (which includes an effective survey area of 634 km^2). The weather at the time of the survey was partially overcast with moderate air temperatures (ranged from 9 to 15°C) and high winds (approximately 30 km/hr).

Although no caribou were seen, caribou trails were documented in seven locations, principally along the shoreline of Qamanialuk Lake (approximately 10 km from the Priority Area) as well as along the McKeand River and near Ptarmigan Fiord (Photo 5-1; Map 3, Appendix B).

Photo 5-1: Caribou trails were observed during the aerial caribou survey principally near the shoreline of Qamanialuk Lake.

Similarly, during the caribou vantage point surveys, the surveyors searched an area covering 192 km^2 with binoculars (Photo 5-2; Map 3, Appendix B), but no caribou were observed. Representative photos from each caribou vantage point station is provided in Photos 29 to 34, Appendix D.

Photo 5-2: Surveying for caribou at a designated caribou vantage point location.

On August 8, a lone male caribou was observed incidentally (Photo 5-3), and a shed caribou antler was seen along the McKeand River during the fisheries program (Map 3, Appendix B). Additional incidental caribou observations include two pellet groups and caribou hair recorded during water quality and fisheries surveys.

The overall conclusion of the 2014 caribou survey efforts suggests that caribou are only present in the study area at low densities at this time of the year.

Photo 5-3: This male caribou was observed incidentally while water quality sampling.

5.4 Aerial Carnivore Survey

A carnivore and carnivore den survey was completed in conjunction with the aerial caribou survey on August 7, 2014. Sites that were considered potential carnivore denning habitat were given particular attention, including sand deposits and gravel ridges near waterbodies or potential look-out points. During the survey, no carnivores or dens were observed throughout this 634 km^2 search area.

Surveyors recorded fox scat incidentally along the shoreline of Qamanialuk Lake (McKeand Lake) during the fisheries program and Peregrine staff reported wolf scat in the Camp Wildlife Sighting Log (summarized in Section 5.8 *Camp Wildlife Sighting Logs* and Map 15, Appendix B).

A possible carnivore den site was recorded while on the return flight to Iqaluit on August 11 at the conclusion of the field event. Based on the distance from Discovery Camp (approximately 26 km), this possible den site is present within the study area (western portion of the study area, south of Qamanialuk Lake), and consisted of a

small hummock that appeared to have multiple entrances with vegetation nearby. This observation is unconfirmed and requires further study.

5.5 Aerial Raptor Nest Reconnaissance

Three cliffs known to support nesting raptors were surveyed on August 7 and 10, 2014 (Map 4, Appendix B). These known nesting sites are located on east and southeast facing cliffs, approximately 8 to 30 m above ground level, and within 650 m to the nearest waterbody. No raptors or active nest sites were observed; however, one stick nest, at least five scrapes (or potential scrapes), and multiple perching sites were recorded (Photos 35 and 36, Appendix D). The abandoned Gyrfalcon scrape observed in 2013 that included eggs remained inactive in 2014 (Photo 5-3).

Photo 5-4: This nest, abandoned by Gyrfalcons in 2013 was inactive in 2014.

Two Rough-legged Hawks were detected incidentally near CH-06 Camp and Qamanialuk Lake (Map 4, Appendix B).

5.6 Incidental Observations of Non-Targeted Species

During the August 7-11, 2014 surveys, the surveyors also recorded observations of non-targeted wildlife species, as encountered (Table 5-3; Map 14, Appendix B). Canada geese (*Branta canadensis*), including young-of-year, were most commonly observed, and principally occupied the McKeand River and surrounding area, as well as a sedge wetland located in the northwestern portion of the study area.

Table 5-2: Summary of Non-Targeted Species Observations

Species	Category	Observation
Snow Goose (*Chen caerulescens*)	Waterfowl/Waterbird	6 x visual
Canada Goose *(Branta canadensis*)	Waterfowl/Waterbird	124 x visual
Goose species	Waterfowl/Waterbird	2 x areas with feces
Duck species	Waterfowl/Waterbird	1 x visual
Red-throated Loon (*Gavia stellate*)	Waterfowl/Waterbird	2 x visual
Pacific Loon (*Gavia pacifica*)	Waterfowl/Waterbird	2 x visual
Loon species	Waterfowl/Waterbird	3 x visual
Baird's Sandpiper (*Calidris bairdii*)	Other Bird	1 x visual
Glaucous Gull (*Larus hyperboreus)*	Waterfowl/Waterbird	4 x visual
Gull species	Waterfowl/Waterbird	1 x visual
Snow Bunting (*Plectrophenax nivalis*)	Other Bird	14 x visual
Lemming species	Small Mammal	1 x pellet grouping

5.7 Camp Wildlife Sighting Logs

Peregrine staff and contractors (e.g., pilots) record wildlife they see when carrying out their daily activities within the camp wildlife sighting logs. In 2014, wildlife sightings were recorded from March 24 to September 7, when Peregrine's Discovery Camp was in operation.

In 2014, Peregrine staff and their contractors were on site from March 13 to April 18, 2014, and again from June 30 to September 10, 2014. During this time, 125 wildlife observations were recorded, including 14 different species or species groups (e.g., gull species, loon species) (Table 5-3; Map 15, Appendix B). In summary, Peregrine staff and contractors did not observe caribou throughout this 3.5 month period. Snow Buntings were most common, and wolf and weasel were least common.

Common Raven[1] was the earliest species observed, recorded on March 24, and was also one of the last recorded species on September 7. Observations of other species began in July and continued into late August and September.

[1] Common Ravens are functional raptors, and therefore, for the purposes of this report are grouped as such.

Table 5-3: Summary of the Camp Wildlife Sightings Logs

Species/Species Group	Date		Observation(s) Highlights
	First Observation	Last Observation	
Caribou	August 13, 2014	August 14, 2014	▪ No caribou were observed ▪ Nine detections of caribou sign (e.g., tracks, trails, pellets)
Carnivores	September 1, 2014		▪ One observation of wolf sign (e.g., track)
Raptors	March 24, 2014	September 7, 2014	▪ 15 observations, totaling 20 raptors ▪ Observations include two Gyrfalcons and eighteen Common Ravens*
Waterfowl/Waterbirds	August 8, 2014	September 7, 2014	▪ 18 observations, totaling 91 waterfowl/waterbirds (e.g., geese, loons, gulls) ▪ Observations include 54 Canada geese, 21 loon species, 12 Snow geese, three gulls, and one Red-throated Loon
Other Birds	July 11, 2014	September 5, 2014	▪ 67 observations, totaling 277 other bird species (e.g., Snow Bunting, Ptarmigan) ▪ Observations include 254 Snow Buntings, 12 ptarmigan species, and 11 sandpiper species
Small Mammals	July 10, 2014	August 28, 2014	▪ Ten observations, totaling six Arctic Hare, three lemmings, and one Weasel
Fish	August 10, 2014	August 14, 2014	▪ Five observations, totaling four minnows and one "fish"

*Common Ravens are functional raptors and, therefore, for the purposes of this report are grouped as such.

Since this is an anecdotal wildlife log, the same individual animal(s) may have been observed and recorded over multiple days. Understandably, camps and other work areas of greatest use had higher wildlife sightings than areas of little use.

5.8 Aquatic Environment Survey

5.8.1 Fish Habitat

Glacier Lake and Qamaniruluk Lake ("Y" Lake) were the two lakes assessed for fish habitat during the 2014 baseline program, while some incidental observations were made regarding the nearshore areas of Sunrise Camp Lake and Qamanialuk Lake (McKeand Lake), in addition to the measurements of select water quality parameters. Table 5-4 presents a summary of the physical characteristics of each of the lakes and site overview photos included in Appendix D highlight some of these features.

Table 5-4: Summary of Lake Physical Characteristics

Lake	Nearshore Substrate	Observed Maximum Depth (m)	Secchi Depth (m)	Mean Temp (°C)	Mean DO (mg/L)	Mean EC (µS/cm)	Mean pH	Notes
Qamaniruluk ("Y") Lake	Sandy with boulder/ cobble clusters closer to the inlet, while boulder/cobble dominated moving north; the western edge had a steeper slope of bedrock closer to shore	20.20	8.00	9.22	11.92	5.82	5.89	Submergent vegetation (algae) and periphyton observed near inlet; juvenile char surfacing near inlet at time of survey
Qamanialuk (McKeand) Lake	Primarily sandy substrate near the inlet where the McKeand River joins the lake; coarser substrates (cobble/boulder) located in nearshore north of the inlet	NM	NM	NM	NM	NM	NM	
Glacier Lake	Dominated by boulders and cobble, with some bedrock outcroppings and areas with finer substrates (sand and gravels)	33.20	9.50	4.43	13.63	2.80	5.51	Heavy wave action observed due to windy conditions during survey. Brownish/yellow clay covering anchor following retrieval from aquatics station
Sunrise Camp Lake	Dominated by boulders and cobble, with more gravels farther upland	NM	NM	6.30	12.86	4.30	5.77	Rocky shoals observed north of Sunrise Camp during the aerial overview by helicopter

Note: NM indicates that the parameter was not measured during the 2014 fisheries field program. However, data for water quality parameters at Qamanialuk Lake are available in the surface water quality data.

There were four sites along the McKeand River mainstem that were assessed for fish habitat (Sites 1 to 4; Maps 10 to 13, Appendix B), located east to west across the study area.

- Site 1 was located downstream of Glacier Lake;
- Site 2 was located downstream of the confluence of the outflow from Sunrise Camp Lake and the confluence of a tributary to the McKeand River that passes adjacent to Discovery Camp;
- Site 3 was located downstream of the future airstrip as well as downstream of the confluence between the McKeand River and another tributary that flows adjacent to mine infrastructure; and
- Site 4 was located downstream of possible rock quarry, cuttings disposal and rock pile locations.

A summary of the physical assessment of fish habitat at the four McKeand River sites is presented in Table 5-5 and site overview photos included in Appendix D highlight some of these features.

Table 5-5: Summary of McKeand River Physical Characteristics

Parameter/ Characteristic	Site 1	Site 2	Site 3	Site 4
Gradient (%)	2 to 3	1	1	1
Temperature (°C)	5.3	10.6	11.9	11.9
pH	-	5.56	5.94	5.83
Conductivity (µS/m)	3.2	5.6	6	4.2
Dissolved Oxygen (mg/L)	13.42	11.30	10.83	10.67
Mean Wetted Width (m)*	85.3	71.6	162.3	277.6
Wetted Depth (m)*	Mostly between 0.3 m and 1.0 m	Mostly between 0.4m and 1.2 m, though potentially deeper in the thalweg	0.58 m at 3% channel width; undetermined in deeper areas due to water velocity and depths generally > 1m	0.52 m at 11% channel width; undetermined in deeper areas due to water velocity and depths generally > 1m
Turbidity (visual observation)	Clear	Clear	Clear	Clear
Morphology	Riffle-run with sections of rapids	Long glide sections with interspersed riffles	Deep Run	Riffle Pool
Pattern	Sinuous	Sinuous	Sinuous	Sinuous
Bank characteristics	Sloping; Dominated by boulders and cobble Bedrock present in lower section	Gradually sloping; Dominated by cobble and boulders (93%), some gravels	Gradually sloping; east bank dominated by sand and gravels with some cobble and boulders (5%), particularly near the confluence with the tributary WQ 21; west bank dominated by coarser materials (cobble and boulder), with some areas predominantly sand/gravel	Sampling location is located in a wide valley with very gradually sloping banks, composed of sand (95%), gravels (2%), boulder (1%) and cobble (1%)
Substrate	90% Boulder 10% Cobble	50% Cobble 43% Boulder 5% Gravels 2% Sand; Increasing % of boulders towards thalweg	65% Sand 30% Gravel 3% Cobble 2% Boulder	90% Sand 8% Gravel 1% Boulder 1% Cobble
Instream Cover	Boulders Turbulence Some pools > 1 m depth	Boulders Turbulence Some deeper sections where eddies present	Water depth and turbulence provided cover Few boulders interspersed throughout	Water depth and turbulence provided cover Few boulders interspersed throughout
Notes		Increased vegetated areas of banks (mosses and lichens) near confluence with tributary by minnow trap stations.	Mid-channel bars and side bars observed during aerial overview.	Mid-channel bars and side bars observed during aerial overview

*River sites could not be safely traversed by foot due to swift water velocities and/or high water depths; therefore, wetted widths and depths were estimated based on a combination of field observations, aerial views from the helicopter, and in the case of wetted widths, by taking GPS waypoints on opposite banks.

5.8.2 Aquatic Organisms (Primary and Secondary Producers)

5.8.2.1 Periphyton

Periphyton samples were collected at the four McKeand River sampling locations (Maps 10 to 13, Appendix B). Raw taxonomical data are provided in Appendix H, while Table 5-6 and Figure 5-2 present periphyton community metrics calculated for the 2014 baseline data. Representative photos of the dominant taxa are provided in Appendix L.

Table 5-6: Summary of Periphyton Metrics for the McKeand River Sites

Site	Density (# cells/cm^2)	Bio-Volume (µm^3/cm^2)	Genera Richness	Simpson's Diversity Index
Site 1	524937	170950	23	0.96
Site 2	204626	180229	20	0.92
Site 3	191661	181554	27	0.92
Site 4	36884	200386	33	0.95

Periphyton biomass (measured as bio-volume) in the McKeand River was lowest at Site 1 and highest at Site 4, displaying a spatial trend of increasing biomass further downstream in the system. Periphyton density exhibited an inverse relationship with distance downstream in the system, with the highest density at Site 1 and the lowest at Site 4.

Periphyton samples taken at the four McKeand River sites consisted of algae from four divisions (bacillariophyta, cyanobacteria, chlorophyta and chrysophyta) comprising 58 taxa, the majority of which were diatoms (from division bacillariophyta). Refer to Appendix H for a detailed breakdown of abundance and community composition.

Genera richness tended to increase moving downstream, with the exception of Site 2, which had the lowest richness of all sites. Simpson's Diversity Index was relatively similar among each of the sites, ranging between 0.92 and 0.95, indicating high diversity at each of the sites, which remained relatively consistent spatially within the river. While diversity measured with genera was relatively high, periphyton at each of the sites was dominated by diatoms, representing between 66.7% (Site 1) and 77.4% (Site 3) of the organisms within each sample. Cyanobacteria (blue-green algae) were second most abundant at each of the sites, representing between 21.8% (Site 3) and 33.3% (Site 1) of the samples. The only two other periphyton divisions encountered in the McKeand River consisted of chlorophytes (green algae) and chrysophytes (golden-brown algae), which represented only marginal proportions of the samples at Sites 3 and 4 (less than 1%), and were not encountered at the upstream sites.

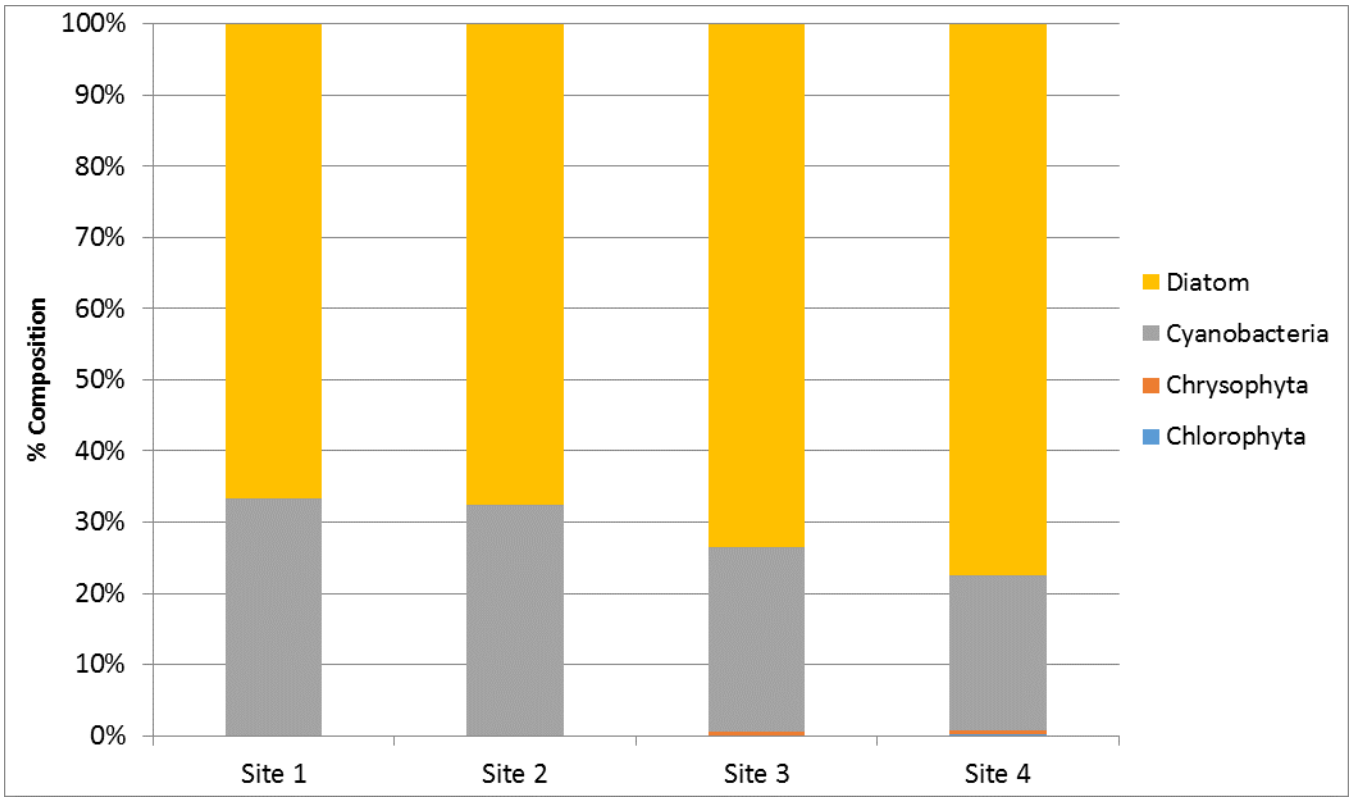

Figure 5-2: Periphyton Community Composition at the McKeand River Sampling Sites

5.8.2.2 Phytoplankton

Phytoplankton samples were collected at Glacier Lake and Qamaniruluk Lake ("Y" Lake) (Maps 6 and 8, Appendix B). Raw taxonomical data are provided in Appendix I, while Table 5-7 and Figure 5-3 present phytoplankton community metrics calculated for the 2014 baseline data at the two lakes.

Table 5-7: Summary of Phytoplankton Metrics for Glacier Lake and Qamaniruluk Lake

Lake	Density (cells/mL)	Bio-Volume (µL)	Genera Richness	Simpson's Diversity Index
Glacier Lake	91.95	0.0000987	14	0.55
Qamaniruluk Lake	194.66	0.0000987	13	0.86

Phytoplankton biomass, calculated by bio-volume, was identical in both the Glacier Lake and Qamaniruluk Lake ("Y" Lake), and can be considered very low, though phytoplankton density in Qamaniruluk Lake was more than twice that of Glacier Lake (Table 5-7).

With respect to phytoplankton diversity, Simpson's Diversity Index, which is a combined measure of genera richness and the evenness with which abundances are distributed amongst the sample's taxa, was also higher in Qamaniruluk Lake ("Y" Lake) as compared to Glacier Lake.

Phytoplankton samples taken at Glacier Lake and Qamaniruluk Lake ("Y" Lake) included eight divisions (bacillariophyta, chlorophyta, chrysophyta, cryptophyta, dinoflagelata and euglenophyta) identified to 28 different

taxonomic groups (specimens were identified to genus or species depending on the organism and condition of the specimens). Refer to Appendix I for a detailed breakdown of abundance and community composition.

The groups encountered in each of the lakes was similar, with a total of 14 and 13 genera recorded in Glacier Lake and Qamaniruluk Lake ("Y" Lake), respectively. The majority of organisms recorded in Glacier Lake consisted of golden-brown algae (70.6%), while the dominant group in Qamaniruluk Lake ("Y" Lake) consisted of green algae (61.9%) (Figure 5-3). In Glacier Lake, the chrysophyte genus *Dinobryon* was the most abundant, representing 65% of the total number of individuals in the sample, while Qamaniruluk Lake ("Y" Lake) had two equally dominant green alga, *Fusola viridis* (21%) and *Ankistrodesmus cf. falcatus* (23%).

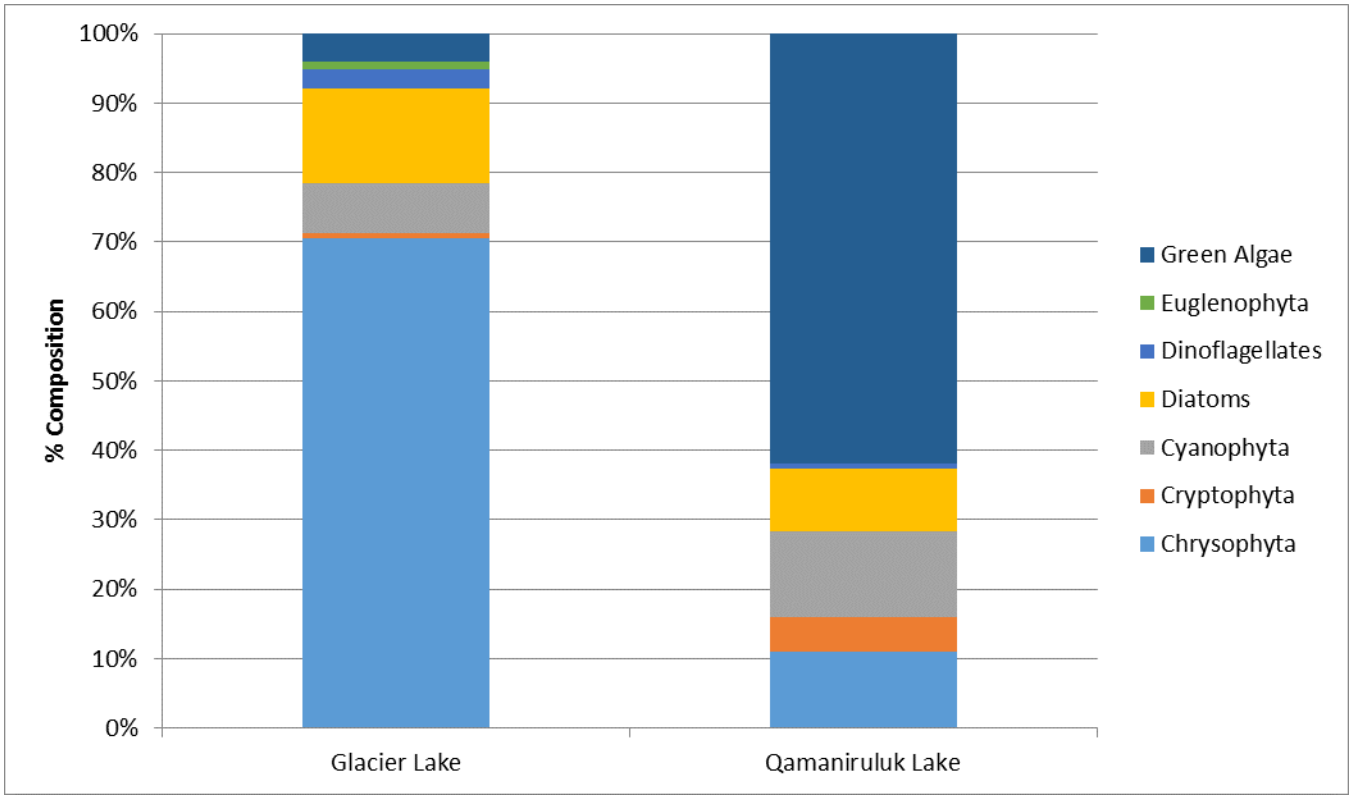

Figure 5-3: Phytoplankton Community Composition at Glacier Lake and Qamaniruluk Lake

5.8.2.3 Zooplankton

Zooplankton were collected at Glacier Lake and Qamaniruluk Lake ("Y" Lake) (Maps 6 and 8, Appendix B). Raw taxonomical data are provided in Appendix J Table 5-8 and Figure 5-4 present zooplankton community metrics calculated for the 2014 baseline data at the two lakes.

Table 5-8: Summary of Zooplankton Metrics for Glacier Lake and Qamaniruluk Lake

Lake	Density (organisms/m^3)	Genera Richness	Simpson's Diversity Index
Glacier Lake	99.87	3	0.48
Qamaniruluk ("Y") Lake	406.31	5	0.50

Zooplankton density in Qamaniruluk Lake ("Y" Lake) was more than four times that of Glacier Lake and genera richness, as well as diversity also increased at the downstream site as compared to Glacier Lake.

Zooplankton samples taken at Glacier Lake and Qamaniruluk Lake ("Y" Lake) were classified into four major groups (cladocerans, calanoid copepods, cylopoid copepods and rotifers) comprising eight different taxonomic groups (specimens were identified to genus or species for different life stages, depending on the organism and condition of the specimens). Refer to Appendix J for a detailed breakdown of abundance and community composition.

At both sampling locations, zooplankton communities were dominated by rotifers, representing nearly the entire sample at Glacier Lake (99.6%) and 80.7% of the sample at Qamaniruluk Lake ("Y" Lake). At both sites, rotifers of the genus *Kellicottia* were the most abundant. Only one calanoid copepod was present in the Glacier Lake sample while a number of cyclopoid and calanoid copepods were present at Qamaniruluk Lake ("Y" Lake), representing 12% and 7% of the sample, respectively. It is worth noting that while rotifers were by far the most dominant based on two of the samples, a duplicate sample taken at Qamaniruluk Lake ("Y" Lake) had a more even distribution among the three main groups, rotifers, cyclopoid and calanoid copepods.

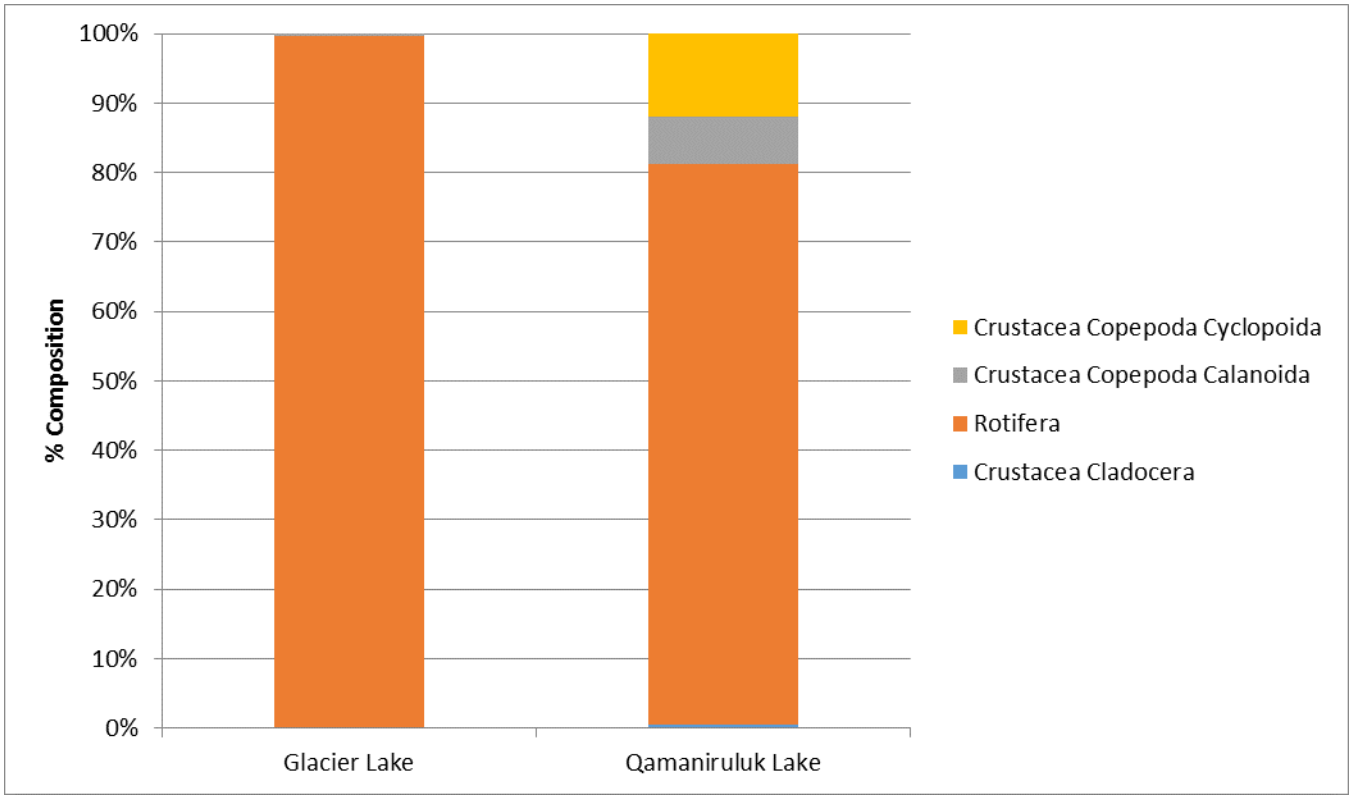

Figure 5-4: Zooplankton Community Composition at Glacier Lake and Qamaniruluk Lake

5.8.2.4 Benthic Invertebrates

Benthic invertebrates were sampled at the four McKeand River sites (Maps 10 to 13, Appendix B). Raw taxonomical data are provided in Appendix K. Table 5-9 and Figure 5-5 present benthic invertebrate community metrics calculated for the 2014 baseline data at the four sampling locations.

Table 5-9: Summary of Benthic Invertebrate Metrics for the McKeand River Sites

Site	Density (organism/m^2)	Genera Richness	Simpson's Diversity Index
Site 1	33.59	8	0.64
Site 2	165.37	13	0.84
Site 3	124.03	14	0.78
Site 4	40.05	7	0.89

Benthic invertebrate density varied at each of the McKeand River sampling sites but was generally low, ranging between 33.59 to 165.37 organisms/m^2 (Table 5-9). There was no spatial pattern in invertebrate density, with Site 2 having the highest density and Site 1 the lowest. Genera richness also varied by site, and similarly to density, Sites 2 and 3 were more similar to each other and Sites 1 and 4 were more similar to each other. There was no pattern with diversity, with Site 4 exhibiting the highest diversity (0.89) and Site 1 the lowest (0.64).

Benthic invertebrate samples taken at the four McKeand River sites were classified into eight major groups for the purpose of the 2014 baseline program analysis (acari, coleopteran, collembolan, diptera, ephemeroptera, oligochaeta, plecoptera and tricoptera), and comprised 34 taxonomic groups (most specimens were identified to genus or species, though in some cases organisms could only be identified to family due to the condition of the specimens). Refer to Appendix K for a detailed breakdown of abundance and community composition.

Benthic invertebrate community composition was dominated at each of the sites by dipterans (true flies), ranging between 54.2% at Site 3 and 88.5% at Site 1, and generally chironomids represented the majority of the dipteran groups (between 30.8% and 78.1%). At Site 1, the genus *Twinnia* (a black fly in the family Simuliidae) represented 57.7% of the sample (the majority), while at Site 3, the genus *Hygrobates* (a water mite of the family Hygrobatidae) was second most abundant at 40.6% of the sample.

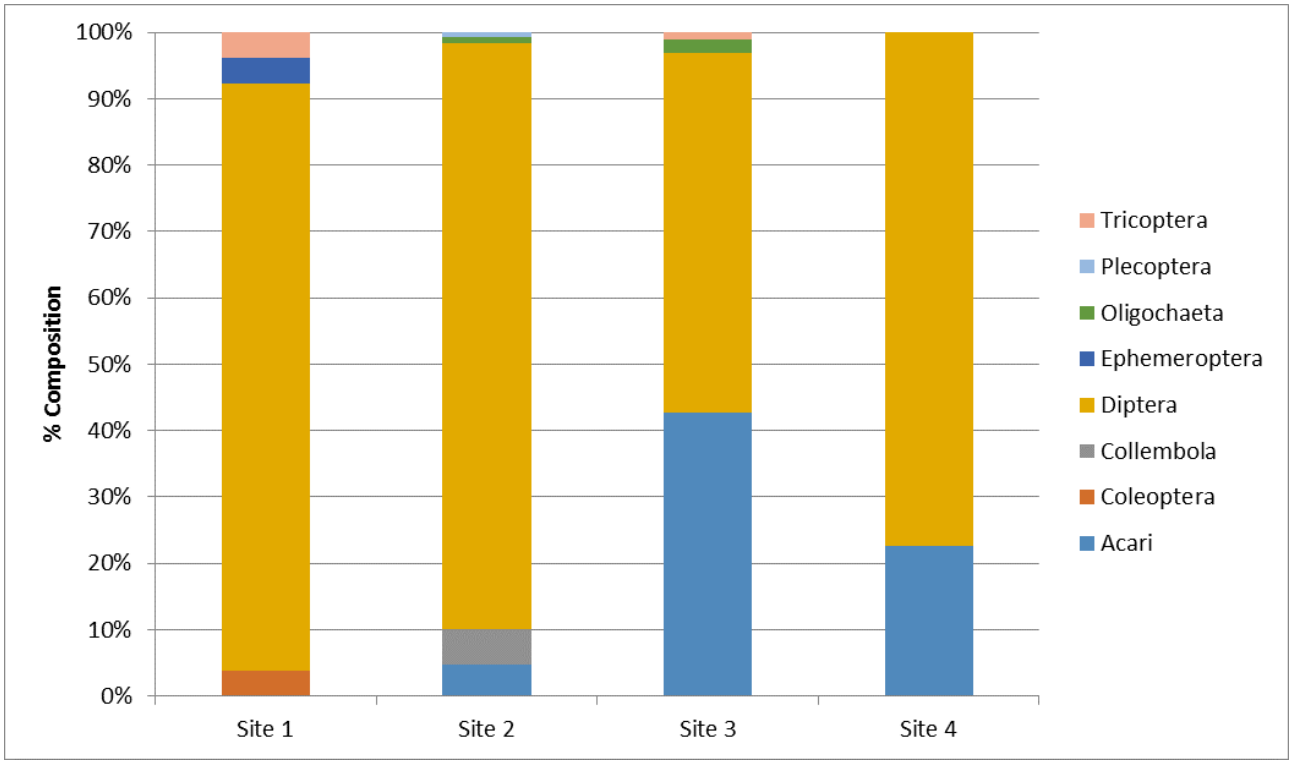

Figure 5-5: Benthic Invertebrate Community Composition at the McKeand River Sampling Sites

5.8.3 Fish

Fish were captured in each of the four lakes sampled within the study area, though fishing effort varied by lake. Of the McKeand River sites, fish were only captured at Site 1, though fish were observed during electrofishing at Sites 2 and 3; Site 4 was the only location where fish were not captured or observed. A total of 69 fish were captured during the 2014 baseline program (an additional five fish were observed but not captured) and all were Arctic Char (*Salvelinus alpinus*). The biological data for all sampled fish are presented in Appendix M. Table 5-10 summarizes the 2014 sampling program.

Table 5-10: Summary of Fish Sampling Data, Fish Ageing Data, Tissue Sample Data and Parasites for 2014 Chidliak Baseline Program

Water Body	Total Fish Sampled		Total Fish Aged		Total Tissue Samples		# Fish with Parasites
	Captured	Observed	Otolith	Fin Ray	Muscle/ Whole	Liver	
Glacier Lake	24	0	6	3	10	(1)	2
Qamanialuk (McKeand) Lake	18	0*	0	10	10	0	0
Qamaniruluk ("Y") Lake	10	15*	8	2	10	6 (1)	2
Sunrise Camp Lake	1	0	1	0	1	0	0
McKeand River Site 1	1	0	0	0	0	0	0
McKeand River Site 2	0	1	0	0	0	0	0
McKeand River Site 3	0	3	0	0	0	0	0
McKeand River Site 4	0	0	0	0	0	0	0

*Fish observed in nearshore areas, though no accurate count of number of individuals.

() Number in brackets denote a composite liver sample was analyzed.

5.8.3.1 Fish Presence in Lakes

Each of the lakes in the study area were sampled for fish, but methods by lake varied. The fish sampling gear utilized at each of the lakes is outlined in Table 4-4. Tables 5-11 and 5-12 summarize fishing effort by gill net and minnow traps respectively, including total catch and the mean catch-per-unit-effort at each lake. All gill net and minnow trap locations at each of the lakes are indicated in Maps 6 to 9 (Appendix B).

Table 5-11: Summary of Gill Net Total Effort, Catch and Mean CPUE by Lake

Lake	Number of Sets	Total Effort (hrs)	Species	Catch	Mean CPUE (# fish/hour)
Qamaniruluk ("Y") Lake	2	4.20	AC	25	6.70
Glacier Lake	2	5.25	AC	16	3.01

A total of 41 Arctic Char were captured by gill net at Glacier Lake and Qamaniruluk Lake ("Y" Lake). While the lakes could support other fish species, only Arctic Char were observed and captured. Of the two lakes sampled, Qamaniruluk Lake ("Y" Lake) had the higher CPUE of 6.7, based on two gill net sets (one shallow and one profundal set) at each lake.

Table 5-12: Summary of Minnow Trap Total Effort, Catch and Mean CPUE by Lake

Lake	Number of Traps	Total Effort (hrs)	Species	Catch	Mean CPUE (# fish/hour)
Qamanialuk (McKeand) Lake	10	220.27	AC	22	0.10
Glacier Lake	5	105.68	AC	8	0.08
Sunrise Camp Lake	7	158.05	AC	1	0.01

A total of 31 Arctic Char were captured by minnow traps set in three of the lakes within the study area. Minnow traps were the only gear type used at Qamanialuk Lake (McKeand Lake), where it was the most efficient at trapping fish (with a CPUE of 0.10), as compared to the other two lakes where minnow traps were deployed.

5.8.3.2 Fish Presence in the McKeand River

Minnow traps and backpack electrofishing were the two fish capture methods utilized at each of the McKeand River sites (Maps 10 to 13, Appendix B). The fishing effort, catch and CPUE for the two methods are summarized in Tables 5-13 and 5-14.

Table 5-13: Summary of Minnow Trap Total Effort, Catch and Mean CPUE by McKeand River Site

Site	Number of Traps	Total Effort (hrs)	Species	Catch	Mean CPUE (# fish/hour)
McKeand River Site 1	8	184.15	AC	1	0.01
McKeand River Site 2	3	64.85	NA	0	0.00
McKeand River Site 3	3	58.40	NA	0	0.00
McKeand River Site 4	3	68.47	NA	0	0.00

In the McKeand River, Arctic Char was the only fish species captured or observed. A total of three Arctic Char were captured in a total effort of 377 hours for the two gears combined. Only one Arctic Char was captured by minnow traps, and it was located at Site 1 in a deep pool.

Electrofishing resulted in the capture of one Arctic Char at Site 1. At Site 2, a juvenile Arctic Char managed to escape beneath a boulder during final retrieval with a dip net. Arctic Char were also observed by the electrofishing team at Site 3, but the fish appeared to be unaffected by the electrofisher, likely due to the greater water depth at their location and the general low EC in the river. Site 4 was the only location on the McKeand River where fish were not observed or captured.

Table 5-14: Summary of Electrofishing Total Effort, Catch and CPUE by McKeand River Site

Site	Effort (sec)	Species	Catch	CPUE (# fish/100 sec)
McKeand River Site 1	504	AC	1	0.20
McKeand River Site 2	842	AC	1 (escaped)	0.12
McKeand River Site 3	1540	NA	0	0.00
McKeand River Site 4	1125	NA	0	0.00

5.8.4 Fish Biometrics and Health

5.8.4.1 Fish Length, Weight and Condition

Biological data on captured fish were compiled for 54 of the total 73 Arctic Char that were captured during the 2014 field program (see Appendix M for the raw data collected for each fish). The lack of data for the 19 fish that were captured and released was due to time constraints during the final fish sampling events that occurred on the evening of August 10 and the morning of August 11, 2014.

The length, weight and condition of Arctic Char captured during the 2014 program are summarized in Table 5-15. The length-weight regressions for each of the lakes are provided in Figures 5-6 to 5-8.

Table 5-15: Summary of Length, Weight and Condition Index Data for Sampled Fish

			Length (cm)			Weight (g)			Condition (g/cm3)		
Lake	**Species**	**n**	**Range**	**Mean**	**SD**	**Range**	**Mean**	**SD**	**Range**	**Mean**	**SD**
Qamaniruluk ("Y") Lake	AC	10	19.3-58.8	46.6	12.97	65-2008	1139.8	693.62	0.81-1.01	0.92	0.06
Qamanialuk (McKeand) Lake	AC	18	5.4-12.8	9.55	2.19	3-19	10.06	4.56	0.77-1.80	1.13	0.29
Glacier Lake	AC	24	7.8-34.5	19.79	7.99	4-365	102.3	104.26	0.72-1.17	0.87	0.1
Sunrise Camp Lake	AC	1	-	12.3	-	-	15.0	-	-	0.81	-
McKeand River	AC	1	-	7.4	-	-	3.0	-	-	0.74	-

Arctic Char throughout the entire study area ranged in size from 5.4 cm (Qamanialuk Lake) to 58.8 cm (Qamaniruluk Lake). The majority of fish captured in Glacier Lake consisted of size classes between 11 and 15 cm (33%) followed by 26 to 30 cm (29%). The dominant size classes of Arctic Char in Qamaniruluk Lake ("Y" Lake) were between 51 to 55 cm and 56 to 60 cm, each totalling 30% of the catch. It is worth noting that 13 Arctic Char were released without being measured due to time constraints at Qamaniruluk Lake ("Y" Lake); however, these fish were of varying size classes and the proportions presented are likely still valid.

Arctic Char weights ranged between 3 g (Qamanialuk Lake) and 2008 g (Qamaniruluk Lake). Of the two lakes where gill net effort was approximately equal, Qamaniruluk Lake ("Y" Lake) and Glacier Lake, Qamaniruluk Lake ("Y" Lake) had the higher mean weight (1139.8 g) and the higher mean fish condition (0.92 g/cm^3). Char in Glacier Lake were ranked second in mean weight (102.3 g) and third in terms of fish condition (0.87 g/cm^3). While only juvenile char were captured at Qamanialuk Lake due to sampling only by minnow trap, the fish captured had the highest mean condition of all the lakes (1.13 g/cm^3).

The length-weight regression for Arctic Char in each of the three lakes where regression analysis was performed showed highly significant relationships between the two parameters ($p < 0.001$). For Qamaniruluk Lake ("Y" Lake), a lower percentage of the variation in ln (weight) was explained by the regression than for Glacier Lake and Qamanialuk Lake; however, these fish also had a higher mean condition as compared to fish in the other two lakes, which may play a role in the slightly higher unexplained variation in that relationship.

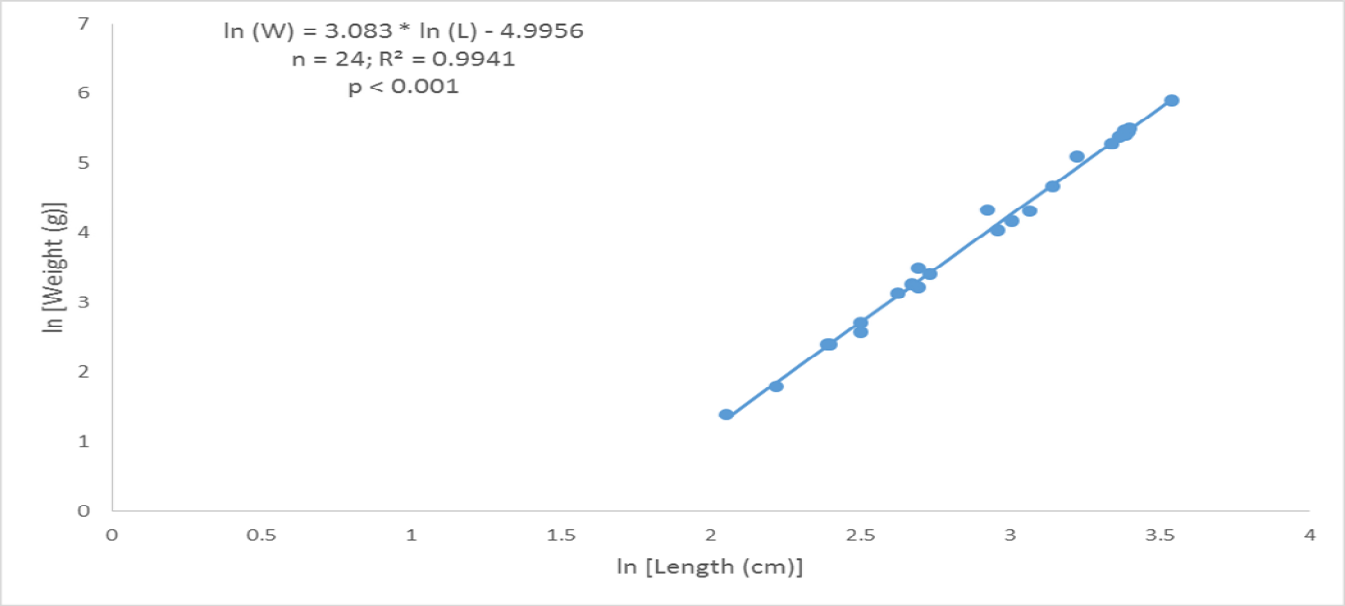

Figure 5-6: Length-Weight Regression for Glacier Lake Arctic Char

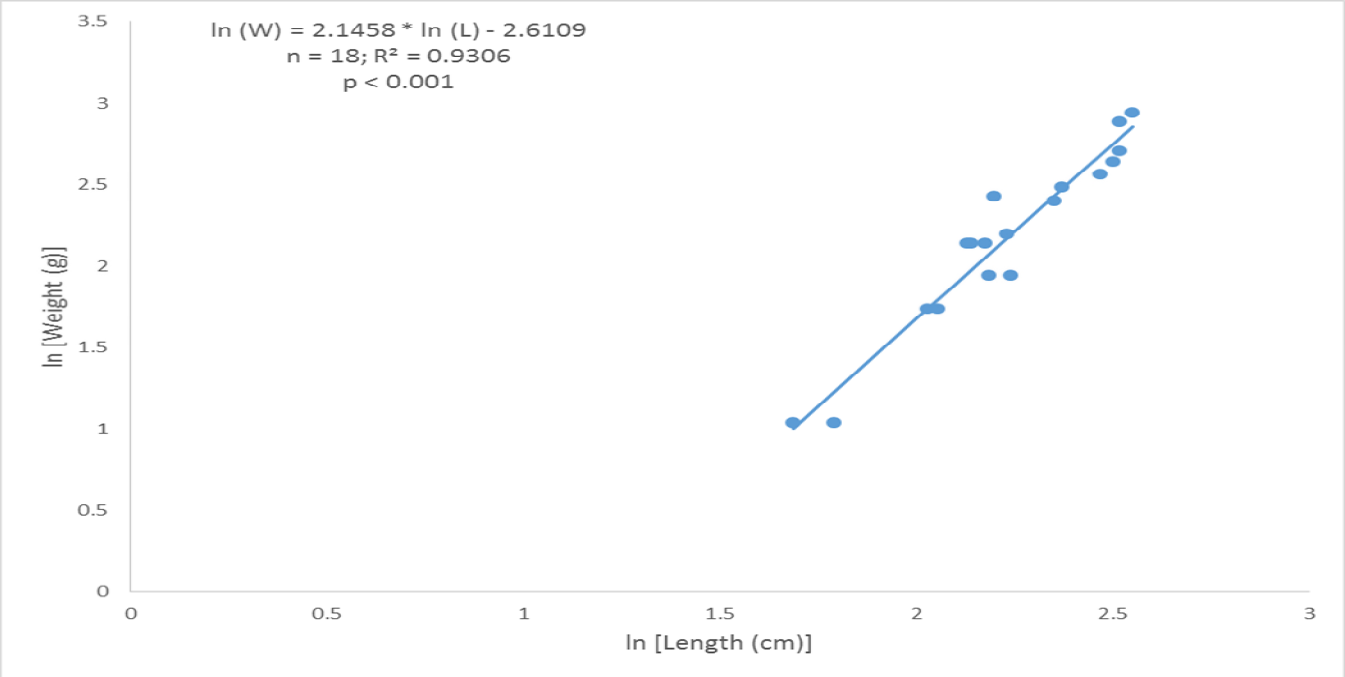

Figure 5-7: Length-Weight Regression for Qamaniruluk Lake Arctic Char

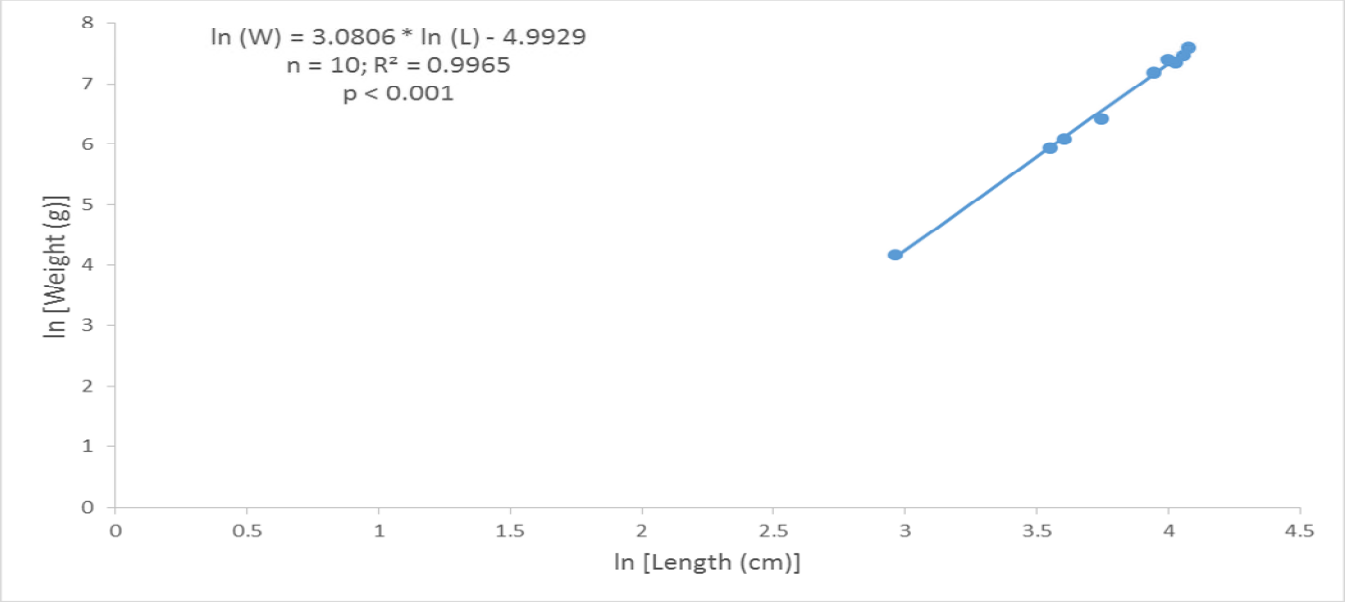

Figure 5-8: Length-Weight Regression for Qamanialuk Lake Arctic Char

Of note, there were four Arctic Char sampled during the 2014 aquatics program with parasites present; two fish were located in Glacier Lake and two fish were located in Qamaniruluk Lake ("Y" Lake). Photo 5-5 is of a char in Qamaniruluk Lake ("Y" Lake) with parasites lining organs in the body cavity.

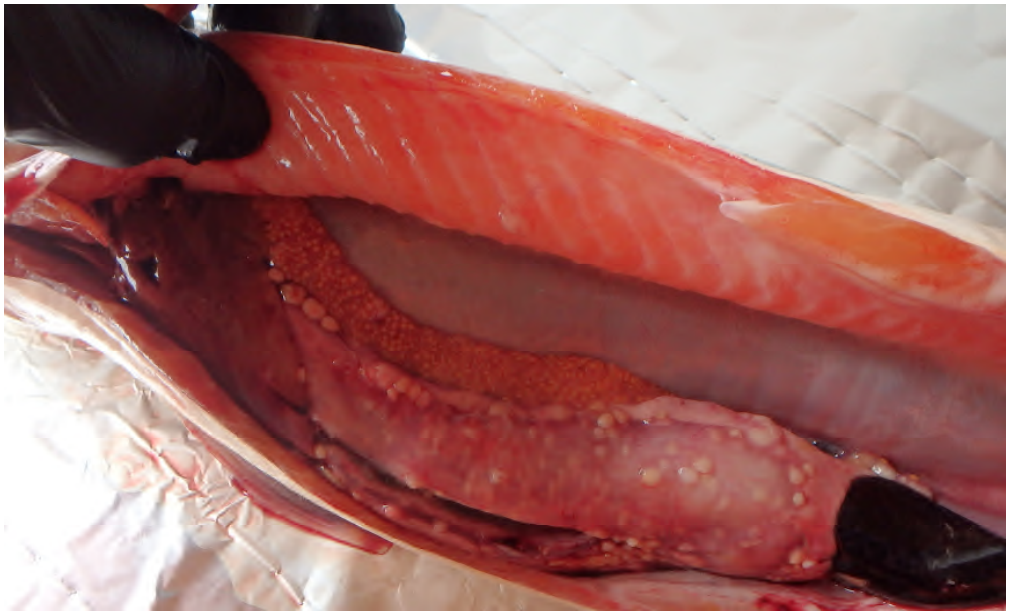

Photo 5-5: Arctic Char captured in Qamaniruluk Lake with parasites lining internal organs.

5.8.4.2 Fish Ageing

Thirty (30) Arctic Char from the four lakes in the study area were aged during the 2014 baseline program. The complete ageing results are presented in Appendix N. An Arctic char otolith sectioned and mounted on a slide for ageing is displayed in Photo 5-6.

A summary of the number of fish aged from each lake and descriptive statistics are provided in Table 5-16. Figures 5-9 to 5-11 show length-at-age of Arctic Char captured at each of the lakes (excluding Sunrise Camp Lake, where only one fish was captured and aged).

Table 5-16: Summary of Age Data by Lake

	Age (years)			
Lake	**n**	**Mean**	**Minimum**	**Maximum**
Glacier Lake	9	8	2	17
Sunshine Camp Lake	1	2	2	2
Qamaniruluk (“Y”) Lake	10	13	4	19
Qamanialuk (McKeand) Lake	10	2	1	4

Photo 5-6: Arctic Char otolith sectioned and mounted for ageing.

The oldest Arctic Char was captured in Qamaniruluk Lake (“Y” Lake) (19 years) while the youngest char was captured in Qamanialuk Lake (McKeand Lake) (1 year), where 60% of the fish were age 2 individuals. A broader distribution of ages was encountered in Glacier Lake, while Qamaniruluk Lake (“Y” Lake) had a higher proportion of fish aged between 15 and 19 years (50%). Given that minnow traps were the only sampling gear used in Qamanialuk Lake (McKeand Lake), it is not surprising to see an age distribution consisting solely of juvenile fish with a maximum age of 4 years.

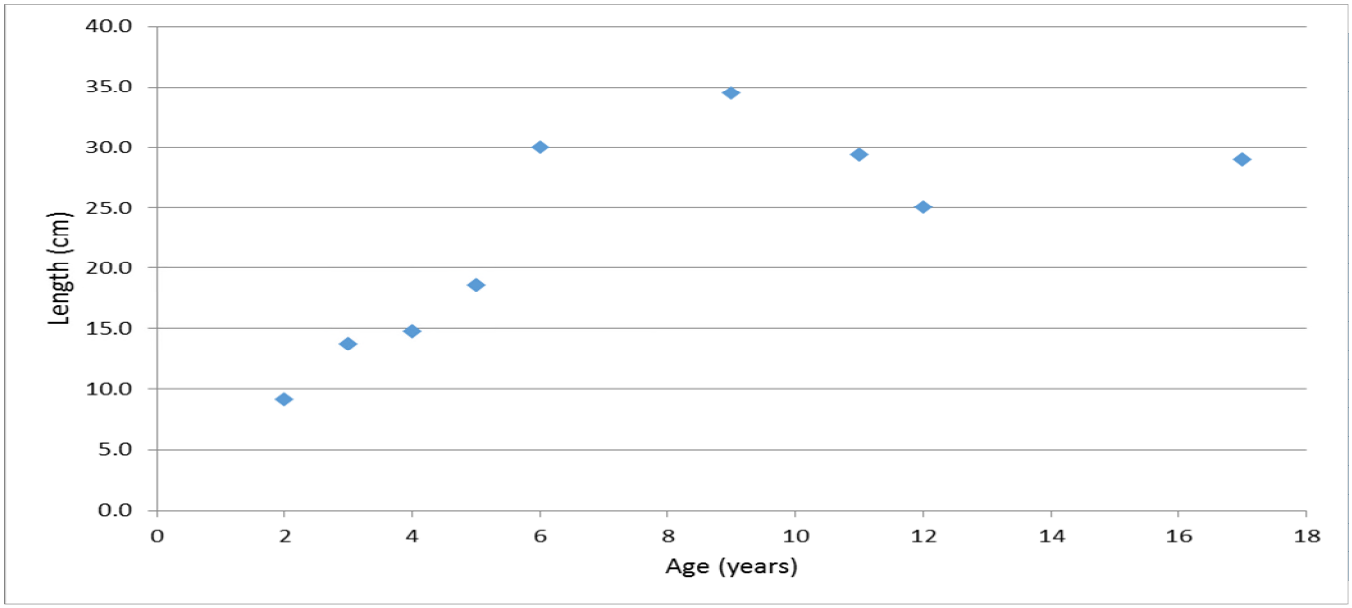

Figure 5-9: Arctic Char Length-at-Age for Glacier Lake

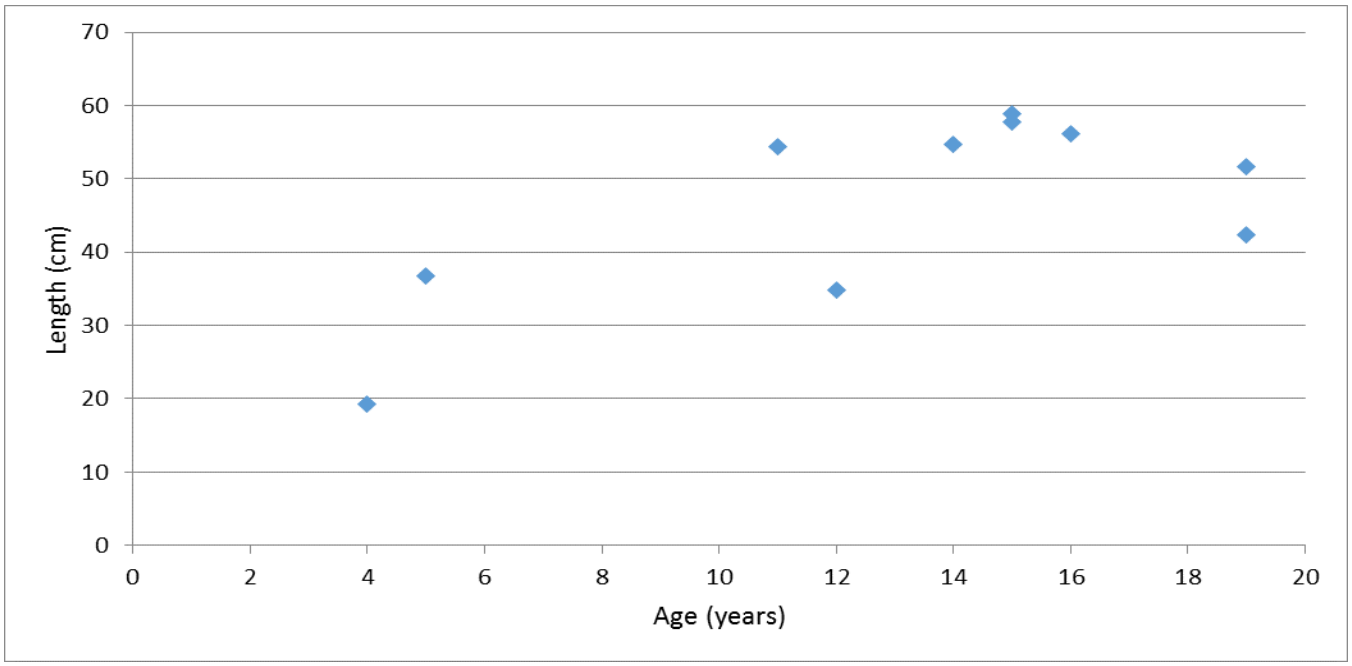

Figure 5-10: Arctic Char Length-at-Age for Qamaniruluk Lake

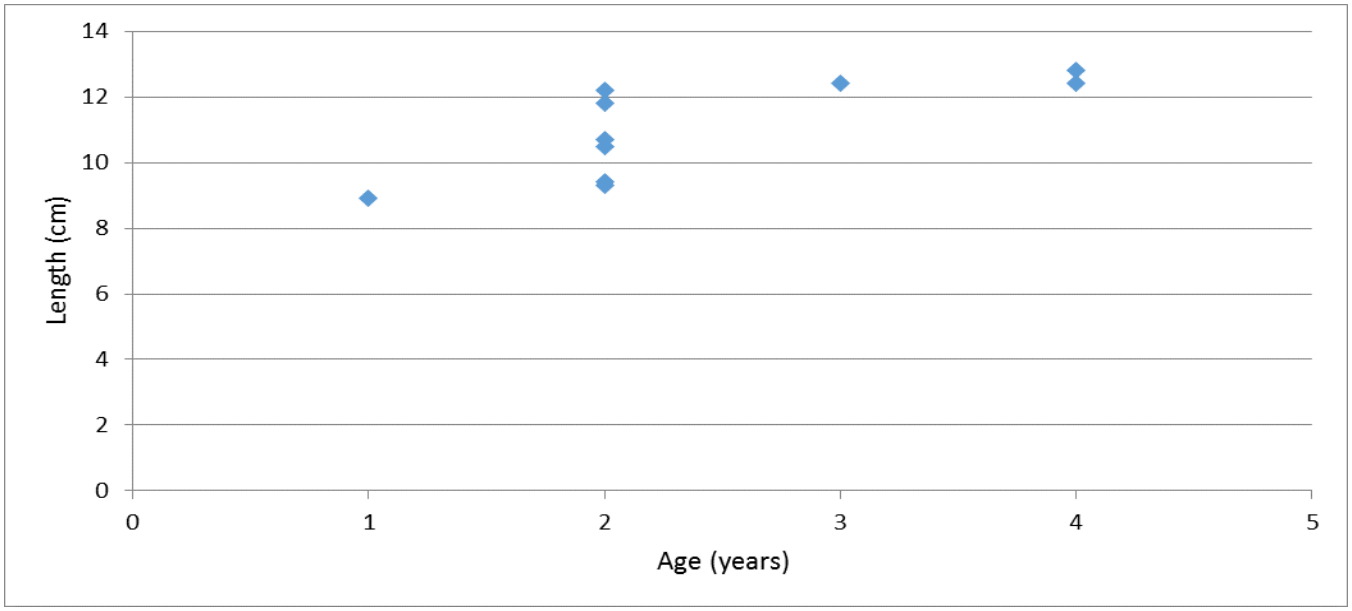

Figure 5-11: Arctic Char Length-at-Age for Qamanialuk Lake

5.8.4.3 Tissue Metals

Muscle tissue trace element concentrations were determined for 31 Arctic Char. Liver trace element concentrations were determined for 6 of those Arctic Char, plus an additional two liver samples consisted of composited tissues from three fish in Glacier Lake and four fish in Qamaniruluk Lake ("Y" Lake). Therefore, a total of 39 samples were analyzed for trace element concentrations. Raw lab data for the analysis of each sample is provided in Appendix O.

Tissue benchmarks (guidelines) were available for arsenic, lead, mercury and selenium, and comparisons with the collected tissue data were made. Of the 39 tissue samples, a total of 30 exceeded the tissue benchmarks. Mercury concentrations in 6 fish exceeded the Canadian Food Inspection Agency (CFIA) and Health Canada (HC) human consumption guidelines. Mercury concentrations exceeded benchmarks in one muscle tissue sample and in five liver samples from Qamaniruluk Lake ("Y" Lake). Selenium concentrations in 24 fish exceeded the BC guidelines. Selenium concentrations were elevated in 8 whole fish samples, three muscle tissue samples and the composite liver sample from Glacier Lake, four muscle tissue samples and 6 liver samples from Qamaniruluk Lake ("Y" Lake), one whole fish sample from Qamanialuk Lake (McKeand Lake) and one whole fish sample from Sunrise Camp Lake. None of the fish contained arsenic or lead concentrations that exceeded the CFIA guidelines. A breakdown of fish tissues exceeding the benchmarks is presented in Table 5-17.

Table 5-17: Number of Tissue Samples Exceeding Regulatory Guidelines or Standards By Lake

Analyte	Total Exceedances by Analyte	Glacier Lake		Qamaniruluk ("Y") Lake		Qamanialuk (McKeand) Lake	Sunshine Camp Lake
		Muscle[1]	Liver	Muscle[1]	Liver	Muscle[1]	Muscle[1]
Mercury	6	0	0	1	5	0	0
Arsenic	0	0	0	0	0	0	0
Lead	0	0	0	0	0	0	0
Selenium	24	11	1	4	6	1	1
Total Exceedances	**30**	**11**	**1**	**5**	**11**	**1**	**1**

[1]Whole fish samples that exceeded guidelines are included with muscle tissue sample exceedances.

5.8.5 Analysis of Potential Barriers to Fish Migration in the McKeand River

A focus of the 2014 baseline aquatics program was to attempt to determine with a desktop study if anadromous populations of Arctic char are present in the study area, as this information may influence future mine development and would be important in any habitat compensation planning. Communications with scientists that have undertaken past studies in the McKeand River system did not yield any conclusive evidence regarding a physical barrier to char migration. Mr. Wiley (DFO) and Dr. Moore (University of Laval) worked primarily near the mouth of the river into Cumberland Sound and did not observe any permanent barriers during fish tagging and monitoring work performed on Arctic Char (Moore Personal Communication {pers. Comm}; Wiley pers. comm.). Mr. Bernhardt was part of the North/South Consultants Inc. team that undertook baseline studies in the McKeand River and three other rivers on behalf of the Qulliq Energy Corporation (QEC) to assess fisheries and aquatics resources for proposed hydroelectric dam installations (Knight Piesold 2008). The baseline study had identified a section of the river downstream of the proposed dam installation site on the McKeand River with a high gradient that may pose a barrier to migration and strontium analysis of otoliths from three char upstream of the potential barrier did not indicate anadromy. Mr. Bernhardt indicated that the section of the river was likely a barrier to migration (Bernhardt pers. comm.). However, with a sample size of only three individuals for strontium analysis and without more information on the potential barrier (slope, length, discharge, presence of a drop, etc.), there is not sufficient evidence to preclude anadromy in the populations of char in the study area, and a detailed assessment of this location should be performed in future baseline studies. It should also be noted that the proposed dam on the McKeand River has not been constructed.

The analysis of the CanVec data and DEM data was inconclusive. A total of 55 smaller rapids and 77 larger rapids were identified along the length of the McKeand River based on the CanVec data. While these CanVec features were plotted along the entire length of the river, DEM data was only initially processed for a section of the river upstream and downstream of the proposed hydroelectric dam installation by the QEC. The selection of this area for an initial assessment to establish the quality of the DEM data was due to data collected during the QEC baseline aquatics program that identified a potential migration barrier downstream of the proposed dam location. As such, it was anticipated that steeper slopes associated with this feature would emerge in the data. However, this was not the case. Steep slopes that may be indicative of a migratory barrier were not encountered near the location of the proposed dam site. Additionally, the accuracy of both data sources is also questionable. This became apparent when comparing the data to satellite imagery in Google Earth. The CanVec data did not always overlay with apparent "white water" features in the imagery. For example, rapids displayed in the CanVec data, did not correspond to locations that appeared to be rapid in the Google Imagery, and vice versa; however, features did line up on much of the length of the river.

For the DEM slope data, when hydrographic features such as rapids were searched in the DEM data, areas corresponding with these rapids did not appear as sections of the river with steeper slopes as compared to upstream or downstream of the feature. This was likely a result of the combination of scale (1:50000) and spatial resolution of the DEM being too small to capture the larger scale landscape and hydrographic features this study is targeting.

Therefore, with the data providing inconclusive results for an area of the McKeand where a potential barrier was expected, further analyses along the remainder of the river with these data sources are likely to be inconclusive as well, and ground-truthing of several of the CanVec hydrographic features will likely be needed in future programs.

6.0 DISCUSSION

6.1 Surface Water Quality

The surface water quality data collected in 2014 are consistent with similar data collected in previous years, and are considered to be representative of natural background conditions. Natural water quality in the study area is oligotrophic (or relatively unproductive waters) with poor nutrient loads, low water hardness (soft water), slightly acidic, and low metal concentrations. Total aluminum and pH levels across the study area, as previously noted, were consistently outside the CCME FAL guideline levels, but are representative of natural background conditions.

The sampling station water quality results, including downstream from the exploration activities and camp sites, are comparable to station results located well beyond the likely zone-of-influence of Project activities. The reported surface water chemistry results have remained consistent throughout the 14 water quality sampling field events conducted over the past six years. This includes pH and total aluminum levels outside the CCME FAL guidelines. Naturally low pH levels are common across the Arctic. Church (1974) reported similar surface water quality conditions in eastern and central Baffin Island from 1963 to 1972. This historical report indicated stream pH levels ranging from 5.2 to 6.7, and water hardness levels were very soft (Church 1974).

The CCME FAL guideline for total aluminum has been withdrawn, but is provided herein in the interim for comparison. The total aluminum CCME FAL guideline is positively correlated to water pH; as the pH lowers, the CCME FAL guideline level for total aluminum decreases. Since the water within the study area is slightly acidic, the guideline level for total aluminum is low.

Aquatic environments with soft water (low water hardness), such as that noted within the study area, represent poorly buffered systems that are sensitive to changes in pH from both natural and human sources.

6.2 Camp Potable Water Quality

In 2014, for the first time in five consecutive sampling events, the potable water originating from Water Tank 1 (i.e., bathroom and Dry 1 taps) in Discovery Camp did not meet applicable drinking water quality criteria. Prior to 2014, all potable water within the camps water distribution system had consistently met the applicable criteria, and the disinfecting systems used in camp were proven effective.

Water stored within Water Tank 1 is disinfected by camp maintenance staff adding appropriate quantities of sodium hypochlorite; whereas, water in Water Tank 2 (i.e., kitchen and Dry 2 taps) is disinfected using both sodium hypochlorite and UV filtration. Past potable water quality sampling results from both water tanks have proven sodium hypochlorite and its combination with UV filtration are effective disinfectants. Therefore, the

potable water quality results from Water Tank 1 during the August 2014 field event were assumed to be associated with the misuse of the sodium hypochlorite disinfectant.

Immediately upon knowledge of these results, Peregrine drained, sanitized, and cleaned Water Tank 1 prior to refilling, and reminded camp maintenance staff of the importance of following standard disinfecting procedures.

6.3 Caribou

Caribou were not observed during either the aerial caribou or vantage point surveys conducted in August 2014. Similarly, Peregrine staff and their contractors did not observe caribou during the period of mid-March to early September. Based on these results, caribou appear to occur within the study area at very low densities. Since 2009, 12 aerial caribou surveys have been conducted within the Chidliak Project area. During these surveys, calculated relative densities ranged from 0 – 0.009 caribou/km^2 (or 0 to 9 caribou per 1,000 km^2) and estimated population abundances ranged from 0 – 18 (± Standard Error (SE)). Inuit Traditional Knowledge that has been shared with Peregrine during community consultations support these measured low caribou densities.

In 2012, the Government of Nunavut Department of Environment (DoE) carried out aerial caribou transect surveys across South Baffin Island, and estimated less than 5,000 caribou (95% confidence interval) one year and older occur (DoE 2013). The density of caribou across the entire South Baffin Island is “critically low” (5.3 caribou per 1,000 km^2, 95% confidence interval) (DoE 2013). In particular, eight caribou were observed across the entire Hall Peninsula Upland Ecoregion (the dominant ecoregion covering the Chidliak study area). This equates to an estimated density of 2.28 caribou per 1,000 km^2 within this ecoregion (Jenkins et al. 2012). Both Inuit Traditional Knowledge and scientific estimates of caribou densities (e.g., Government of Nunavut and the Chidliak baseline aerial caribou surveys) support the current understanding of low caribou densities within the study area.

Based on the caribou trails detected during the August 2014 field event, an apparent north-west – south-east directional corridor may exist in the most westerly portion of the study area surrounding Qamanialuk Lake (McKeand Lake). A single caribou trail also indicates a north-east – south-west direction of travel from Ptarmigan Fiord, as well as paralleling the McKeand River. Large lakes such as Qamanialuk Lake (McKeand Lake) influence the path of caribou movements. Qamanialuk Lake (McKeand Lake) may act to channel caribou along its shorelines and to suitable water crossing locations.

Few caribou calves (total of seven) have been detected across the Chidliak Project during the 12 aerial caribou surveys that have occurred since 2009. All calf observations occurred in the month of July, indicating that the study area is infrequently occupied while on their post-calving range.

Further to the south-east, approximately 40 km outside the Priority Area, Chowns and Popko (1980) delineated several suspected caribou calving areas (at the head of Smith Channel). Chowns and Popko (1980) indicated that female caribou have an affinity for large valley habitats at elevations less than 450 m, where snow melt is advanced during the peak calving season (early to mid-June). It is these areas, large valleys at lower elevations, where the suspected caribou calving areas exist. In contrast, the majority of the Chidliak study area and the entire Priority Area are situated in higher elevation upland-plateau habitat.

6.4 Carnivores

No carnivores (e.g., wolves, foxes, Wolverines) or their dens were detected during the August 2014 survey or within the camp wildlife sighting logs. Evidence of their occasional presence was confirmed by single observations of wolf and fox scat. Although wolves and foxes have infrequently been observed and recorded in the wildlife sighting logs, none have been observed during the 13 carnivore surveys completed to date across the Chidliak

Project area. Carnivore density within the study area is low, likely due to limited prey densities (e.g., caribou, small mammals).

Low carnivore densities across South Baffin Island are corroborated by DoE's aerial caribou surveys, wherein carnivore observations were recorded incidentally. Over 27,000 km of parallel transects flown, 14 foxes and 13 wolves (and their tracks) were documented (Jenkins et al. 2012).

An unconfirmed observation of a potential carnivore den south of Qamanialuk Lake (McKeand Lake), located approximately 26 km from Discovery Camp, was noted at the conclusion of the August 2014 field event. Foxes and wolves use similar denning sites, and use the same den over many years. Carnivores can be sensitive to disturbance, especially during their reproductive period.

6.5 Raptor Nests

The August nest reconnaissance surveyed known raptor scrapes, stick nest, and perching sites occurring on three known cliff sites. Although no active nests were observed, the survey was conducted at a time when nesting raptors are present and nearing the end of their nesting period.

In the Arctic, breeding raptor populations are strongly influenced by weather and prey densities, and may not successfully breed in years with poor spring weather and low prey densities.

Over the 10 aerial raptor and nest surveys completed to date, Peregrine Falcons, Rough-legged Hawks, and Common Ravens were the most common cliff-nesting raptor observed, and have been recorded nesting in the study area. A single Gyrfalcon nest was also observed.

Raptors show nest site fidelity, actively guard their nesting territories, and are sensitive to disturbances during the nesting season. A conservative 1.5 km set back distance is recommended near known active nests from early May to mid-August.

6.6 Aquatic Environment Survey

6.6.1 Primary and Secondary Producers

For the 2014 baseline program, phytoplankton and zooplankton were sampled in Glacier Lake and Qamaniruluk Lake ("Y" Lake), and periphyton and benthic invertebrates were sampled at all four McKeand River sites. This was the first year since the initiation of baseline studies that primary and secondary producers were sampled on the Chidliak Property.

Within the two lakes sampled, phytoplankton density in Qamaniruluk Lake ("Y" Lake) was more than twice that of Glacier Lake, with higher taxa diversity as well. Glacier Lake was dominated by primarily one chrysophyte (golden-brown algae) genus, *Dinobryon*, which represented 65% of the total phytoplankton community composition, whereas Qamaniruluk Lake ("Y" Lake) was dominated by green algae comprised of predominantly four genera.

Periphyton, the primary producer measured at each of the river sites, exhibited high diversity at each of the sites, but a spatial pattern in density was evident, with increasing density towards the headwaters of the system and lowest density at the most downstream site, Site 4. Taxa richness tended to follow the inverse of this spatial pattern, with richness generally increasing further downstream with the exception of Site 2 which had the lowest richness; periphyton biomass followed a similar trend to richness.

Zooplankton samples were only taken in Glacier Lake and Qamaniruluk Lake ("Y" Lake). Qamaniruluk Lake tended to exhibit higher taxa richness and diversity, and density more than four times that of Glacier Lake. At each lake, rotifers were the dominant organism in the samples.

Benthic invertebrates were only sampled at the four river sites. Benthic invertebrate density was in general moderate to high, with Site 4 having the highest diversity, though Sites 2 and 3 had the highest invertebrate densities and richness.

A study published in 2009 by Gartner et al. (2009) examining the mercury concentrations in landlocked Arctic Char of the Canadian Arctic provided a thorough review of the diet of char in the Arctic, indicating that the dominant zooplankton and invertebrate taxa occurring within the Peregrine study area are key prey items for char (e.g., cladocerans, copepods, chironomids, and some evidence for water mites).

6.6.2 Fish Presence and Fish Habitat

Arctic Char were the only species of fish encountered in the study area during the 2014 baseline field program. Char were sampled using a combination of gear types in each of the four lakes in the study area, as well as at four sites on the McKeand River. A total of 73 Arctic Char were captured/observed during the program, the majority of which were captured at Qamaniruluk Lake ("Y" Lake), Qamanialuk Lake (McKeand Lake) and Glacier Lake. Only two fish were captured as a result of fishing efforts in the McKeand River, though additional fish were observed that were not captured. In the two lakes where sampling took place by a combination of gill net and minnow traps, various age classes were sampled, and it is highly likely that Qamanialuk Lake (McKeand Lake) and Sunrise Camp Lake (which were not sampled extensively during the 2014 program) support Arctic Char populations similar in composition to those present in Glacier Lake and Qamaniruluk Lake ("Y" Lake).

The littoral zones of each of the lakes had an abundance of boulders and cobble substrates that are known to provide cover and high quality habitat for young-of-the-year (YOY) and juvenile char (Richardson et al. 2001). Each of the lakes are also of sufficient depth (i.e., > 10 m) for overwintering and to provide adequate rearing and foraging habitat for juvenile char that tend to preferentially remain near the benthos. The size of the lakes likely provide good spatial segregation between juveniles and adult char, which reside in pelagic and shallow benthic habitats in the summer for better foraging.

Each of the lakes likely support freshwater resident forms of Arctic Char and there has been some anecdotal evidence of a dwarf form of Arctic Char being present in Sunshine Camp Lake (Mr. Nashalik pers. comm.). Dwarf forms of Arctic Char have been recorded throughout its distribution and the coexistence of normal and dwarf morphotypes within the same lake have been well documented in the Canadian Arctic (Reist et al. 1995). Several morphological characters (predominantly body form and colouration) differentiate normal from dwarf forms of char, and evidence suggests that this morphological differentiation occurs as a result of habitat and food segregation (Guiguer et al. 2001). Only limited fish sampling with minnow traps occurred in Sunshine Camp Lake resulting in one fish capture, which was not likely of the dwarf form (though differentiation between morphotypes for smaller individuals is difficult). Fish sampling performed during the 2010 baseline program at Sunshine Camp Lake resulted in the capture of three adult char, none of which were identified as dwarf morphs (EBA 2011). Additionally, larger individuals captured at Glacier Lake and Qamaniruluk Lake ("Y" Lake) did not possess the morphological traits of the dwarf form. However, that does not preclude the possibility that dwarf char may be present within the study area and further fish sampling will be required to establish whether this morphotype is present.

The McKeand River mainstem was the other focus of the 2014 baseline program, with four sites along the river sampled for fish using minnow traps and backpack electrofishing. Fish sampling efforts resulted in the capture of three Arctic Char. While fish were not captured at Sites 3 or 4, Arctic Char were observed at Site 3.

Lacustrine (lake-dwelling) populations or Arctic Char are the most common, though char may be found in rivers, lakes, estuaries and marine environments throughout their life cycles. Arctic Char generally make minimal use of rivers, with anadromous populations utilizing them predominantly for annual migrations to and from lakes for feeding in the ocean during summers, and for spawning migrations (Evans et al. 2002). While some populations of Arctic Char do spawn in large rivers, and spawning has been recorded in the Hornaday River, NT (MacDonell 1996), most Arctic populations spawn in deep lakes because rivers and streams often freeze completely in the winter (Johnson 1980). Juvenile char and young-of-the-year (YOY) char are also known to invade small tributary streams for foraging on plankton and insects, and YOY have been observed congregating near the shoreline of rivers, where water velocities are slower, or in pools (Evans et al. 2002).

Based on the riverine habitat requirements of Arctic Char compiled in Evans et al. (2002), some of which are listed above, the McKeand River can provide high quality habitat for YOY and juvenile Arctic Char, as well as for spawning. Several of the sites assessed had cobble, gravel and sand substrates that are known to provide moderate to high quality spawning habitat for river-spawning Arctic Char, as well as sufficient flow to accommodate spawning. Water depths generally below 1 m, with ample cover provided by boulders and cobble, and the presence of pools provide moderate to high quality riverine habitat for YOY and juvenile char, and the majority or all of these habitat features were identified at each of the survey sites in the McKeand River.

6.6.3 Fish Health

There were four fish sampled during the 2014 aquatics program that had parasites present on internal organs. The fish were sampled from Glacier Lake and Qamaniruluk Lake (“Y” Lake). A study by Gallagher et al. (2009) examining the parasite community of Arctic Char from Lake Hazen and Craig Lake in Quttinirpaaq National Park found the prevalence of parasites in juvenile, small-form and adult char averaged 28% in Craig Lake and 88% in Lake Hazen. While parasites were only observed in adult fish sampled during the 2014 program, the study by Gallagher et al. (2009) demonstrated that variability in infection rates among age classes both within and amongst lakes can be quite high, but general trends suggest that infection is higher in larger and older fish, and that infection rates tend to be higher and more extensive in non-anadromous populations.

The majority of trace element concentrations were below lab detection limits. However, elevated concentrations of mercury above the CFIA and HC human consumption guidelines were encountered in a total of 6 tissue samples from Qamaniruluk Lake (“Y” Lake), the majority of which consisted of liver samples. In Qamaniruluk Lake (“Y” Lake), the average mercury concentration was above the CFIA and HC 0.5 µg/g guideline (average mercury concentration was 0.52 µg/g). Selenium concentrations above BC guidelines were measured in 24 samples total, 12 of which were from Glacier Lake, 10 from Qamaniruluk Lake (“Y” Lake) and 1 each from Qamanialuk Lake (McKeand Lake) and Sunshine Camp Lake. The average selenium concentration at each of the lakes was above the guideline (1 µg/g), ranging between 1.85 to 2.70 µg/g, with the exception of tissues from Qamanialuk Lake (McKeand Lake), which had an average concentration of 0.83 µg/g.

A study by Gartner et al. (2009 and 2010) that examined the total mercury concentrations in landlocked Arctic Char of the Canadian Arctic found mean concentrations of mercury in juvenile char from 18 lakes of 0.20 µg/g, and mean total mercury concentrations from 27 populations of char ranging between 0.07 and 1.31 µg/g. Therefore, the char sampled from lakes within the study area had mercury concentrations comparable to other Arctic populations.

Mercury biomagnifies within a food chain and is more likely found at elevated concentrations in predatory fish such as the Arctic Char captured within the study area. Mercury is also a “fat-loving metal”, so its accumulation in muscle tissue is expected. Selenium, like mercury, can biomagnify within a food chain and may also interact with mercury to form stable mercuric selenide, further influencing mercury accumulation in the system (Ikemoto et al. 2004).

The tissue metals data collected during the 2014 will help to establish baseline values for metals in Arctic Char within the study area and mine footprint. Sampling and the analysis of fish tissues will need to continue in future years to further establish those baseline values and monitoring benchmarks as mining activities increase.

6.6.4 Potential Barriers to Fish Migration in the McKeand River

The QEC baseline study indicated that a potential physical barrier is present in the McKeand River downstream of the proposed dam location. Mr. Bernhardt of North/South Consultants Inc. visited the site of the potential barrier and indicated that the section of the river likely prevents char migrations further upstream (Bernhardt pers. comm.). However, with a sample size of only three individuals for strontium analysis and without more information on the potential barrier (slope, length, discharge, presence of a drop, etc.), there is not sufficient evidence to preclude anadromy in the populations of char in the study area, and a detailed assessment of this location should be performed in future baseline studies.

The findings of several studies analyzing anadromy in Arctic Char seem to suggest a low likelihood of anadromous behaviour in char populations in the study area. A study on Norwegian Arctic Char populations found a negative correlation between anadromy and both the length of the outlet river and what is termed the migration barrier index, which combines migration distance and water velocity, and generally found little anadromy present for streams greater in length than 6 km and with stream velocities greater than 0.3 m/s (Kristoffersen 1994). The author suggests this may be due to the findings of Beamish (1980) that char are poor swimmers as compared to other salmonids, and that they are not well adapted for long migrations through swift water. A study by Power and Barton (1984) found that long rivers with intermediate gradients (20 to 70 m drop in elevation over 1 km) frequently lacked anadromous char, and Johnson (1980) found that most lake-dwelling anadromous char in the Canadian Arctic migrate only short distances. For migration up the McKeand River to the study area, a distance greater than 200 km would need to be travelled to reach Qamanialuk Lake (McKeand Lake), and through sections of the river with gradients above 15% based on the DEM data analysis.

7.0 CONCLUSION

The study area is considered a pristine environment. Concluding statements regarding the 2014 baseline studies are:

- Waterbodies across the study area are oligotrophic, and exhibit low metals, nutrients and pH values. The water quality sample results are considered to be representative of natural background conditions;
- Potable water treatment practices used at Discovery Camp are appropriate disinfectant systems; however, standard disinfecting procedures must be followed at all times. Laboratory results in August 2014 indicated that water stored in and within Discovery camps Water Tank 1 distribution system was compromised and did not achieve applicable health criteria. Following issuance of these results, Water Tank 1 was drained, cleaned, and properly maintained upon refilling;
- Caribou were not observed during the aerial transect and vantage point surveys or reported in the camp wildlife sighting logs from mid-March to early-September. Caribou appear to occur within the study area at very low densities. Seven locations of visible caribou trails were observed indicating a predominant north-west – south-east travel corridor along Qamanialuk Lake (McKeand Lake);
- Carnivores or their dens were not observed during the aerial survey on August 7; however, an unconfirmed observation of a carnivore den site (possibly within the study area) was noted. Carnivores are likely present at very low densities in the study area. Carnivores can be sensitive to disturbance during their reproductive period and it will be important that this potential carnivore den site be evaluated in the next survey year;

- Rough-legged Hawks were the only raptor species observed within the study area during the August 2014 field event. Common Raven (considered a functional raptor for the purposes of this report) and Gyrfalcon were also reported within the wildlife sighting logs. All three known raptor nesting sites were inactive at the time of the August field event; however, raptors are likely to reuse these nesting sites in the future. Raptors are sensitive to disturbance at their nest sites during nesting season, and a conservative 1.5 km setback distance is recommended near known active nests from early May to mid-August.
- There were relatively low densities and taxa richness of primary and secondary producers sampled in the study area lakes and in the McKeand River, which is consistent with oligotrophic Arctic habitats.
- Arctic char were the only species of fish captured during the 2014 program, and were sampled in each of the lakes and at two locations along the McKeand River within the study area. It is likely that each of the lakes support healthy populations of Arctic char, and that the McKeand River provides foraging habitat for juvenile char and acts as a corridor for dispersal. There is currently insufficient data to determine if the McKeand River is also used by char populations in the study area for annual migrations to the sea for feeding (i.e. if anadromous char are present in the study area), or if a permanent barrier to migration is present downstream of the study area. Future baseline programs should assess the area downstream of the proposed QEC dam site on the McKeand River for barriers.

8.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech EBA Inc.

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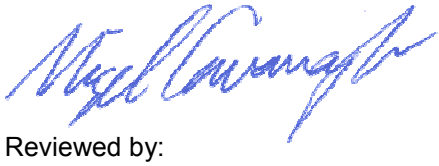

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APPENDIX A
TETRA TECH EBA'S GENERAL CONDITIONS

GENERAL CONDITIONS

GEOENVIRONMENTAL REPORT

This report incorporates and is subject to these “General Conditions”.

1.0 USE OF REPORT AND OWNERSHIP

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

This report and the assessments and recommendations contained in it are intended for the sole use of Tetra Tech EBA’s client. Tetra Tech EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than Tetra Tech EBA’s Client unless otherwise authorized in writing by Tetra Tech EBA. Any unauthorized use of the report is at the sole risk of the user.

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2.0 ALTERNATE REPORT FORMAT

Where Tetra Tech EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed Tetra Tech EBA’s instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by Tetra Tech EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of Tetra Tech EBA’s instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except Tetra Tech EBA. The Client warrants that Tetra Tech EBA’s instruments of professional service will be used only and exactly as submitted by Tetra Tech EBA.

Electronic files submitted by Tetra Tech EBA have been prepared and submitted using specific software and hardware systems. Tetra Tech EBA makes no representation about the compatibility of these files with the Client’s current or future software and hardware systems.

3.0 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by Tetra Tech EBA in its reasonably exercised discretion.

4.0 INFORMATION PROVIDED TO TETRA TECH EBA BY OTHERS

During the performance of the work and the preparation of the report, Tetra Tech EBA may rely on information provided by persons other than the Client. While Tetra Tech EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, Tetra Tech EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

APPENDIX B
MAPS

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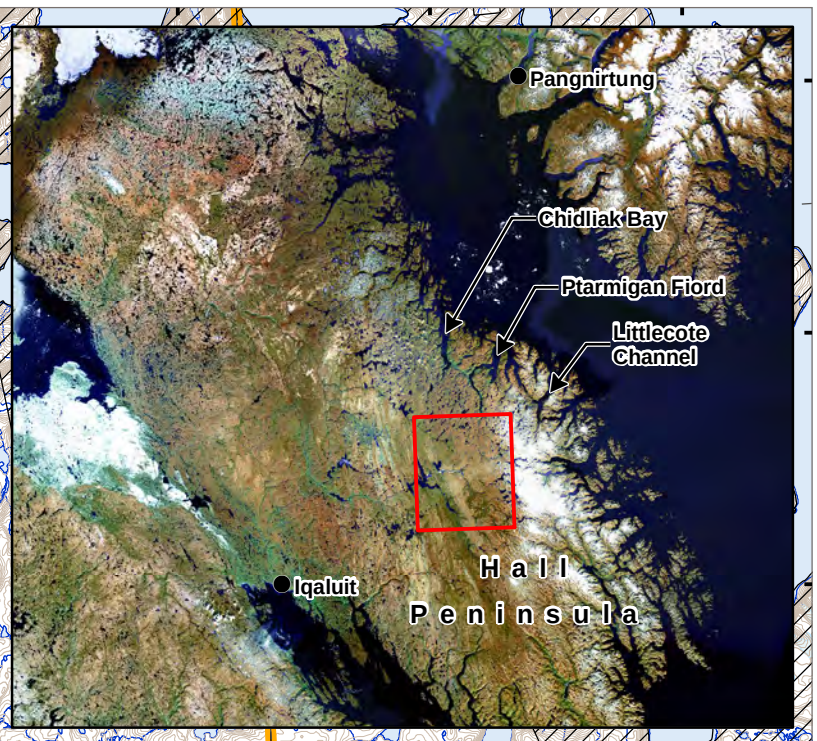

Aurora Camp
CH-06 Camp
Discovery Camp
Sunrise Camp
Zone 19
Zone 20
Qamanialuk
McKeand River
Popham Bay
Littlecote Channel
PA-22
PA-27
PA-24
PA-29
IQ-12
0 2 6 B 1 4
0 2 6 B 1 5
0 2 6 B 1 6
0 2 6 B 1 0
0 2 6 B 1 1
0 2 6 B 0 9
0 2 6 A 1 2
0 2 6 A 0 5
0 2 6 B 0 8
0 2 6 B 0 6
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0 2 6 B 0 2
0 2 6 B 0 1
0 2 6 A 0 4
0 2 5 O 1 4
0 2 5 O 1 5
0 2 5 O 1 6
0 2 5 P 1 3

LEGEND

- Camp Location
- 2014 Study Area
- Priority Area
- Inuit-Owned Lands (IOLs)
- UTM Zone Boundary
- NTS 1:50,000 Grid Line
- Index Contour (100 m)
- Intermediate Contour (20 m)
- Watercourse
- Permanent Snow and Ice
- Waterbody
- Wetland

N W E S

GRID NORTH

NOTES
Base data source: CanVec 1:50,000

STATUS
ISSUED FOR USE

CHIDLIAK BASELINE STUDIES 2014

Regional Area Map

PROJECTION	DATUM	CLIENT
UTM Zone 19	NAD83	PEREGRINE DIAMONDS LTD.

Scale: 1:300,000
5 2.5 0 5
Kilometres

TETRA TECH EBA

FILE NO. MIN03024-01_Map01_RegionalArea.mxd

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ENVMIN03024-01	SL	MEZ	KL	1

OFFICE	DATE
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Map 1

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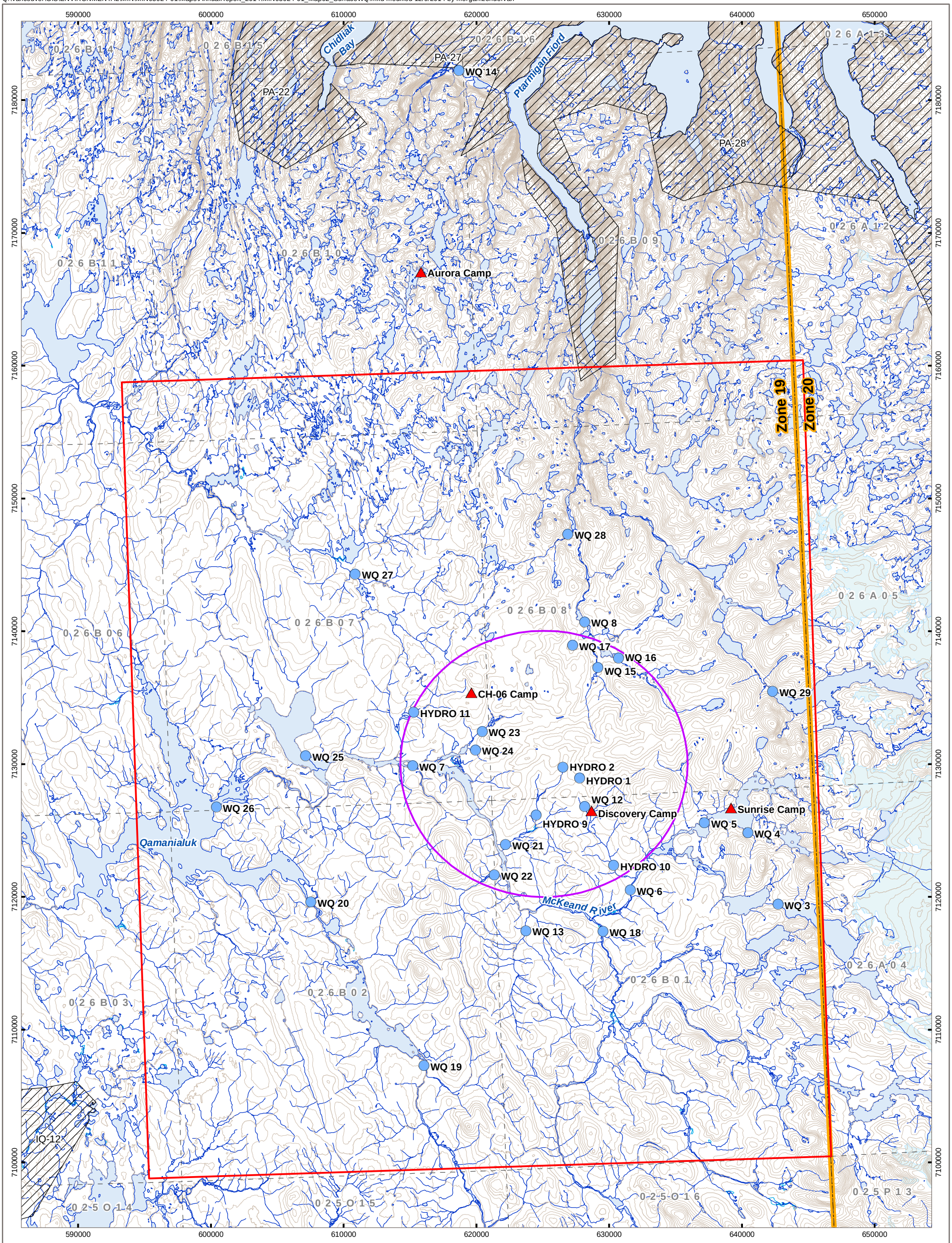

LEGEND

- Surface Water Quality Station
- Camp Location
- 2014 Study Area
- Priority Area
- Inuit-Owned Lands (IOLs)
- UTM Zone Boundary
- NTS 1:50,000 Grid Line
- Index Contour (100 m)
- Intermediate Contour (20 m)
- Watercourse
- Permanent Snow and Ice
- Waterbody
- Wetland

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NOTES
Base data source: CanVec 1:50,000

STATUS
ISSUED FOR USE

CHIDLIAK BASELINE STUDIES 2014

Surface Water Quality Stations, 2014

PROJECTION	DATUM	CLIENT
UTM Zone 19	NAD83	PEREGRINE DIAMONDS LTD.

Scale: 1:270,000
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Kilometres

FILE NO.
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PROJECT NO.	DWN	CKD	APVD	REV
ENVMIN03024-01	SL	MEZ	KL	1

OFFICE	DATE
Tt EBA-VANC	December 9, 2014

TETRA TECH EBA

Map 2

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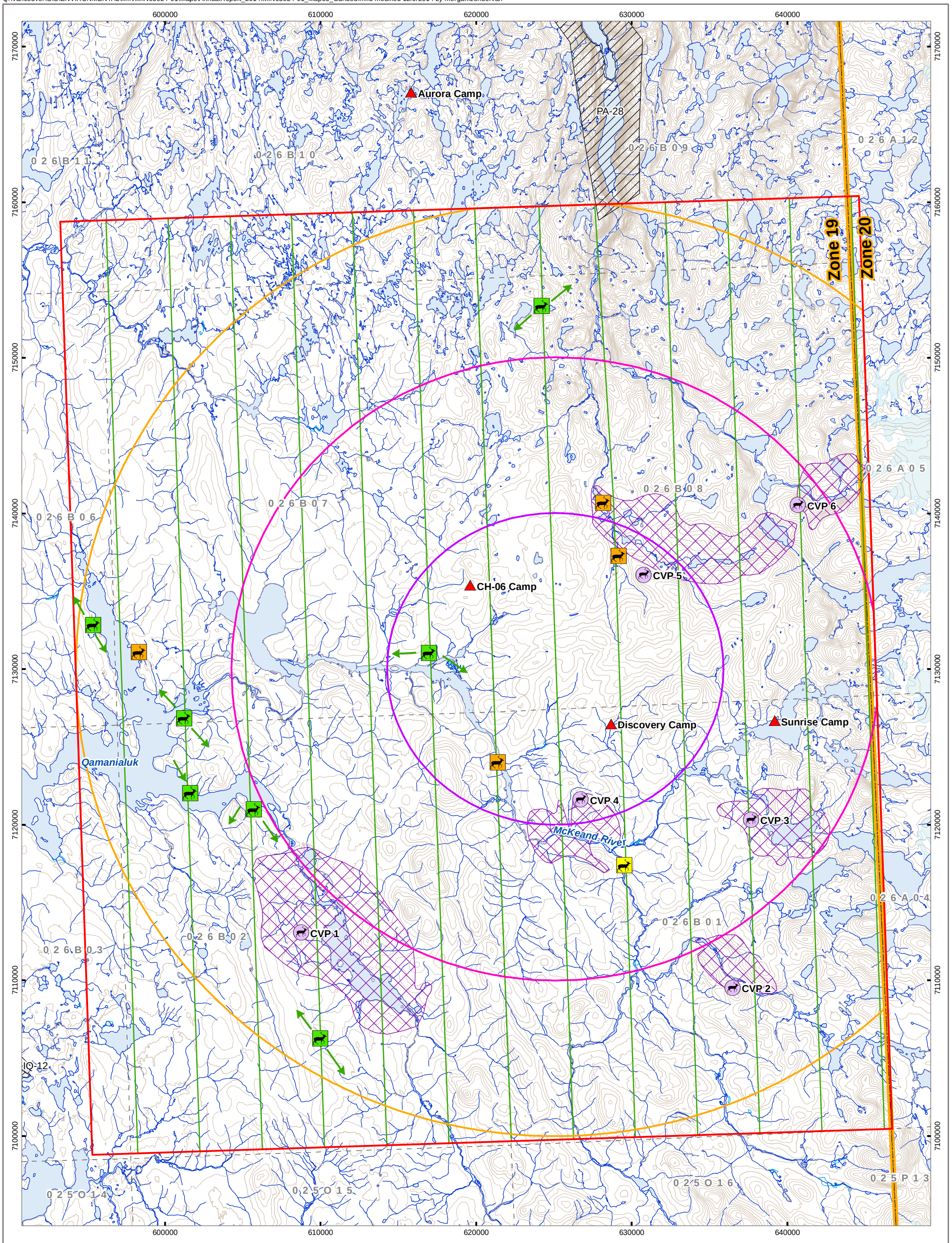

LEGEND

- 2014 Caribou Survey Transect
- Caribou Vantage Point
- Caribou Vantage Point Area
- Approximate Direction of Travel

Caribou Observations

- Caribou, Visual
- Caribou, Sign
- Caribou, Trail
- Camp Location
- 2014 Study Area
- Priority Area
- Priorty Area 10km Buffer
- Priorty Area 20km Buffer
- Inuit-Owned Lands (IOLs)
- UTM Zone Boundary
- NTS 1:50,000 Grid Line
- Index Contour (100 m)
- Intermediate Contour (20 m)
- Watercourse
- Permanent Snow and Ice
- Waterbody
- Wetland

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NOTES
Base data source: CanVec 1:50,000

STATUS
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CHIDLIAK BASELINE STUDIES 2014

Caribou Observations, 2014

PROJECTION: UTM Zone 19	DATUM: NAD83			CLIENT: Peregrine Diamonds Ltd.
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FILE NO.: MIN03024-01_Map03_Caribou.mxd				
PROJECT NO.: ENVMIN03024-01	DWN: SL	CKD: MEZ	APVD: KL	REV: 1
OFFICE: Tt EBA-VANC	DATE: December 9, 2014			Map 3

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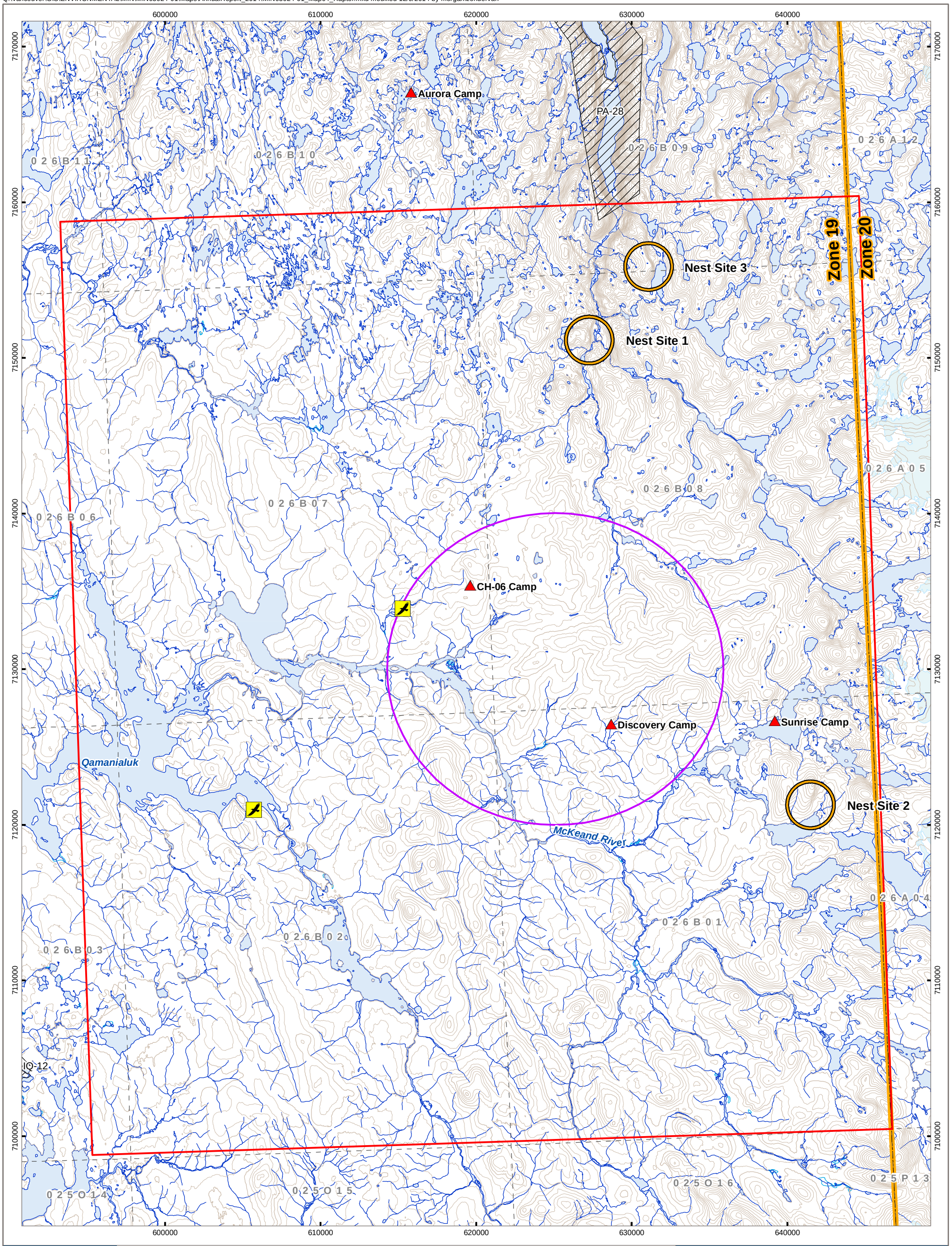

LEGEND

Raptor Observations

- Rough-legged Hawk, Visual
- Raptor Sensitive Zone
- Camp Location
- 2014 Study Area
- Priority Area
- Inuit-Owned Lands (IOLs)
- UTM Zone Boundary
- NTS 1:50,000 Grid Line
- Index Contour (100 m)
- Intermediate Contour (20 m)
- Watercourse
- Permanent Snow and Ice
- Waterbody
- Wetland

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GRID NORTH

NOTES
Base data source: CanVec 1:50,000

STATUS
ISSUED FOR USE

CHIDLIAK BASELINE STUDIES 2014

Raptor Observations, 2014

PROJECTION UTM Zone 19			**DATUM** NAD83		**CLIENT** PEREGRINE DIAMONDS LTD.
Scale: 1:230,000 — 5 2.5 0 5 Kilometres					
FILE NO. MIN03024-01_Map04_Raptor.mxd					TETRA TECH EBA
PROJECT NO. ENVMIN03024-01	**DWN** SL	**CKD** MEZ	**APVD** KL	**REV** 1	**Map 3**
OFFICE Tt EBA-VANC	**DATE** December 9, 2014				

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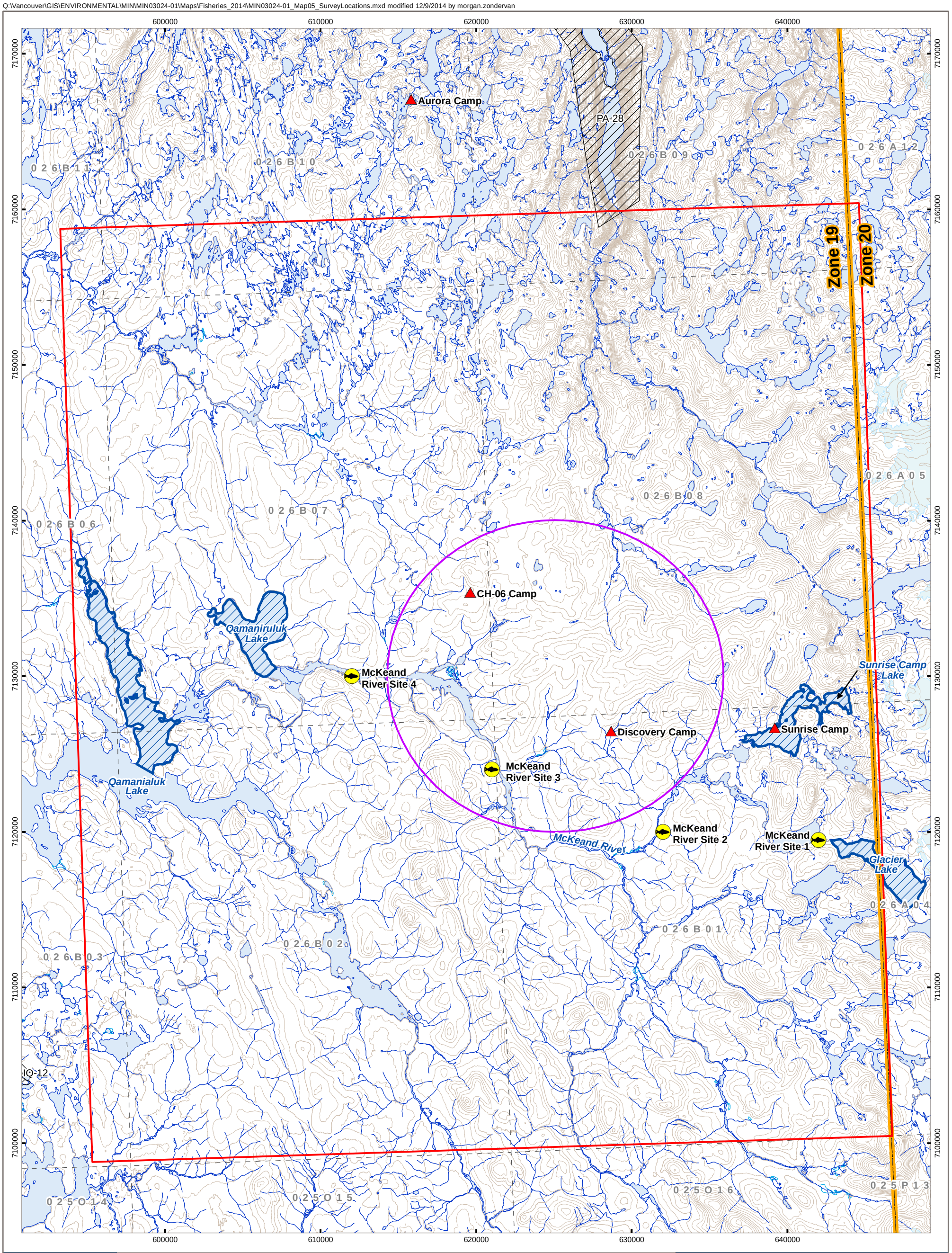

LEGEND

- 2014 Fish Survey Location
- 2014 Fish Survey Lake
- Camp Location
- 2014 Study Area
- Priority Area
- Inuit-Owned Lands (IOLs)
- UTM Zone Boundary
- NTS 1:50,000 Grid Line
- Index Contour (100 m)
- Intermediate Contour (20 m)
- Watercourse
- Permanent Snow and Ice
- Waterbody
- Wetland

N / W / E / S

GRID NORTH

NOTES
Base data source: CanVec 1:50,000

STATUS
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CHIDLIAK BASELINE STUDIES 2014

Aquatic Biota Survey Locations

PROJECTION: UTM Zone 19	DATUM: NAD83				CLIENT: PEREGRINE DIAMONDS LTD.
Scale: 1:230,000 (5 2.5 0 5 Kilometres)					TETRA TECH EBA
FILE NO.: MIN03024-01_Map05_SurveyLocations.mxd					
PROJECT NO.: ENVMIN03024-01	DWN: MEZ	CKD: BB	APVD: MV	REV: 0	Map 5
OFFICE: Tt EBA-VANC	DATE: December 9, 2014				

LEGEND

- Water Quality Station
- Phytoplankton Sampling Location
- Zooplankton Sampling Location
- Minnow Trap Location
- Gill Net

NOTES
Base data source:
Imagery supplied by
Peregrine Diamonds Ltd. (2002-2011)

STATUS
ISSUED FOR USE

CHIDLIAK BASELINE STUDIES 2014

Water Quality, Plankton Minnow Trap, and Gill Net Locations on Glacier Lake

PROJECTION	DATUM	CLIENT
UTM Zone 19	NAD83	PEREGRINE DIAMONDS LTD.

Scale: 1:6,000

100 50 0 100

Metres

FILE NO. MIN03024-01_Map06_Glacier.mxd

PROJECT NO.	DWN	CKD	APVD	REV
ENVMIN03024-01	MEZ	BB	MV	0

OFFICE Tt EBA-VANC

DATE December 9, 2014

TETRA TECH EBA

Map 6

Q:\Vancouver\GIS\ENVIRONMENTAL\MIN\MIN03024-01\Mapsl\Fisheries_2014\MIN03024-01_Map06_Glacier.mxd modified 12/9/2014 by morgan.zondervan

LEGEND

- Water Quality Station
- Minnow Trap Location

NOTES
Base data source:
Imagery supplied by
Peregrine Diamonds Ltd. (2002-2011)

STATUS
ISSUED FOR USE

CHIDLIAK BASELINE STUDIES 2014

Water Quality and Minnow Trap Locations on Sunrise Camp Lake

PROJECTION	DATUM	CLIENT
UTM Zone 19	NAD83	PEREGRINE DIAMONDS LTD.

Scale: 1:5,000

100 50 0 100

Metres

TETRA TECH EBA

FILE NO. MIN03024-01_Map07_Sunrise.mxd

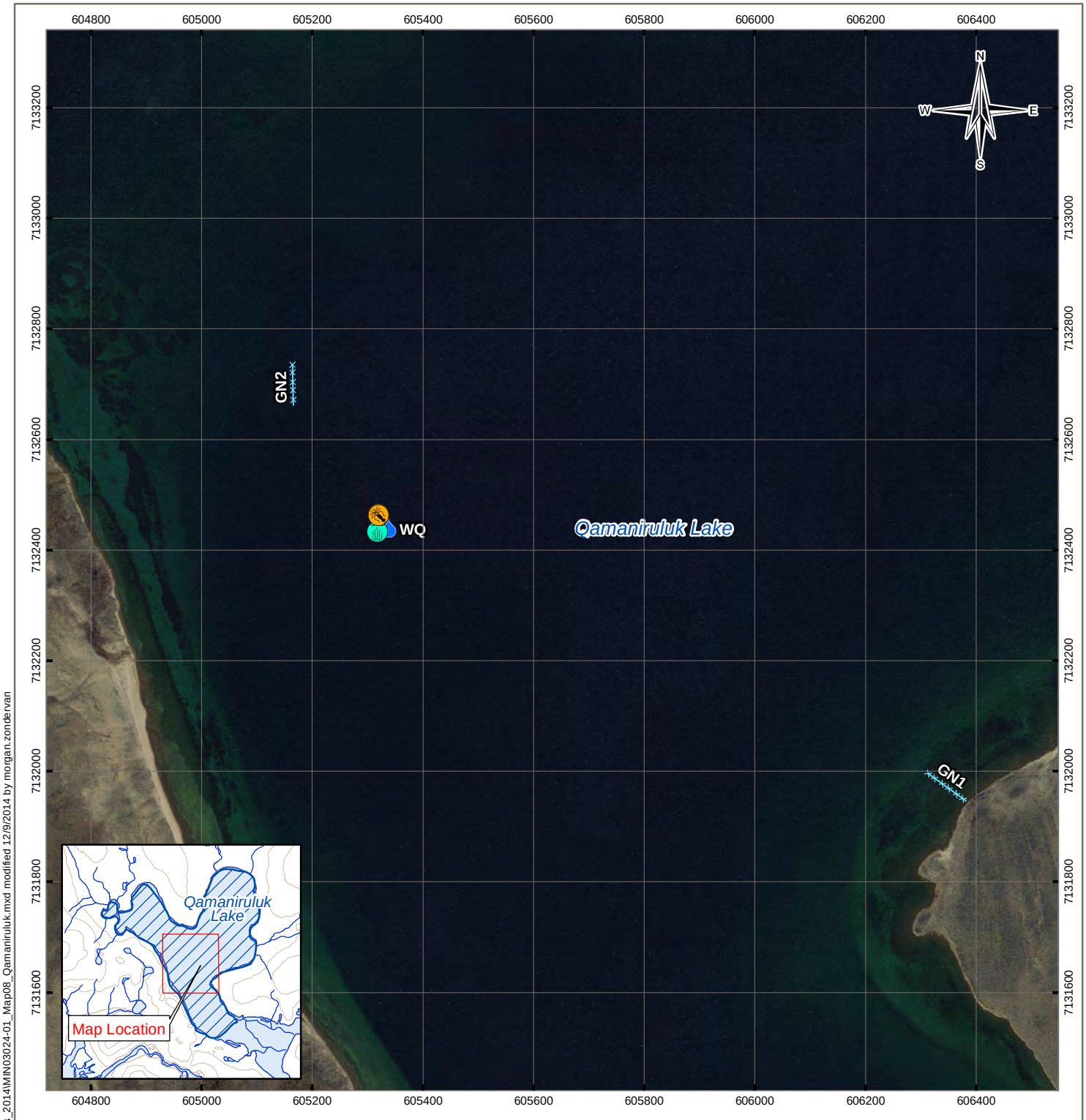
PROJECT NO.	DWN	CKD	APVD	REV
ENVMIN03024-01	MEZ	BB	MV	0

OFFICE Tt EBA-VANC

DATE December 9, 2014

Map 7

Q:\Vancouver\GIS\ENVIRONMENTAL\MIN\MIN03024-01\Maps\Fisheries_2014\MIN03024-01_Map07_Sunrise.mxd modified 12/9/2014 by morgan.zondervan



LEGEND

- Water Quality Station
- Phytoplankton Sampling Location
- Zooplankton Sampling Location
- Gill Net

NOTES
Base data source:
Imagery supplied by
Peregrine Diamonds Ltd. (2002-2011)

STATUS
ISSUED FOR USE

CHIDLIAK BASELINE STUDIES 2014

Water Quality, Plankton and Gill Net Locations on Qamaniruluk Lake

PROJECTION	DATUM	CLIENT
UTM Zone 19	NAD83	PEREGRINE DIAMONDS LTD.

Scale: 1:10,000

200 100 0 200

Metres

TETRA TECH EBA

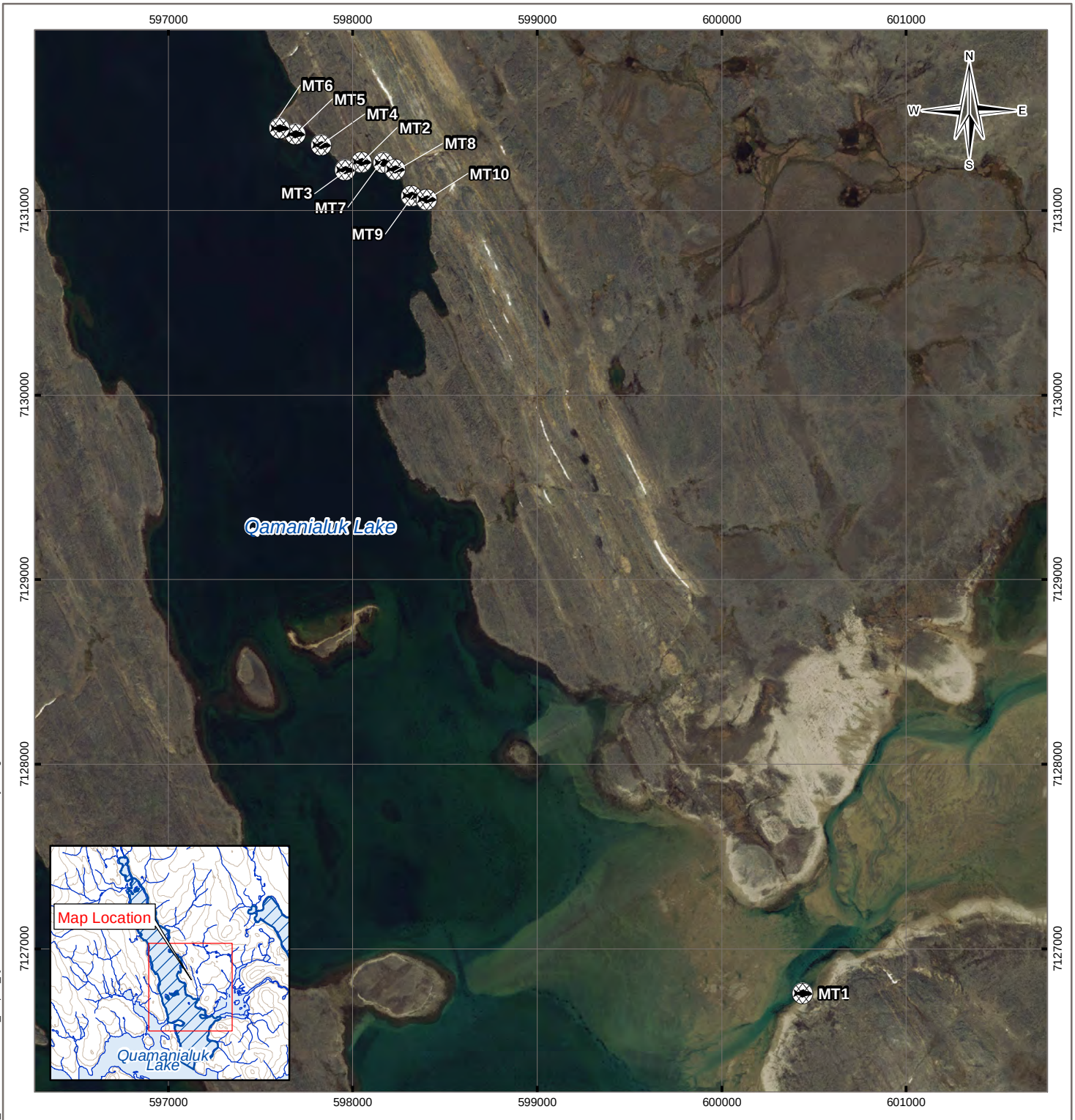
FILE NO. MIN03024-01_Map08_Qamaniruluk.mxd

PROJECT NO.	DWN	CKD	APVD	REV
ENVMIN03024-01	MEZ	BB	MV	0

OFFICE	DATE
Tt EBA-VANC	December 9, 2014

Map 8

Q:\Vancouver\GIS\ENVIRONMENTAL\MIN\MIN03024-01\Maps\Fisheries_2014\MIN03024-01_Map08_Qamaniruluk.mxd modified 12/9/2014 by morgan.zondervan



LEGEND

Minnow Trap Location

NOTES
Base data source:
Imagery supplied by
Peregrine Diamonds Ltd. (2002-2011)

STATUS
ISSUED FOR USE

CHIDLIAK BASELINE STUDIES 2014

Minnow Trap Locations on Qamanialuk Lake

PROJECTION	DATUM	CLIENT
UTM Zone 19	NAD83	PEREGRINE DIAMONDS LTD.

Scale: 1:30,000
500 250 0 500
Metres

FILE NO. MIN03024-01_Map09_Qamanialuk.mxd

PROJECT NO.	DWN	CKD	APVD	REV
ENVMIN03024-01	MEZ	BB	MV	0

OFFICE	DATE
Tt EBA-VANC	December 9, 2014

TETRA TECH EBA

Map 9

Q:\Vancouver\GIS\ENVIRONMENTAL\MIN\MIN03024-01\Maps\Fisheries_2014\MIN03024-01_Map09_Qamanialuk.mxd modified 12/9/2014 by morgan.zondervan

LEGEND

- Water Quality Station
- Benthic Invertebrate Sampling Location (each ID represents a hess sampling location)
- Electrofishing Location
- Periphyton Sampling Location (each ID represents a sampled rock)
- Minnow Trap Location

NOTES
Base data source:
Imagery supplied by
Peregrine Diamonds Ltd. (2002-2011)

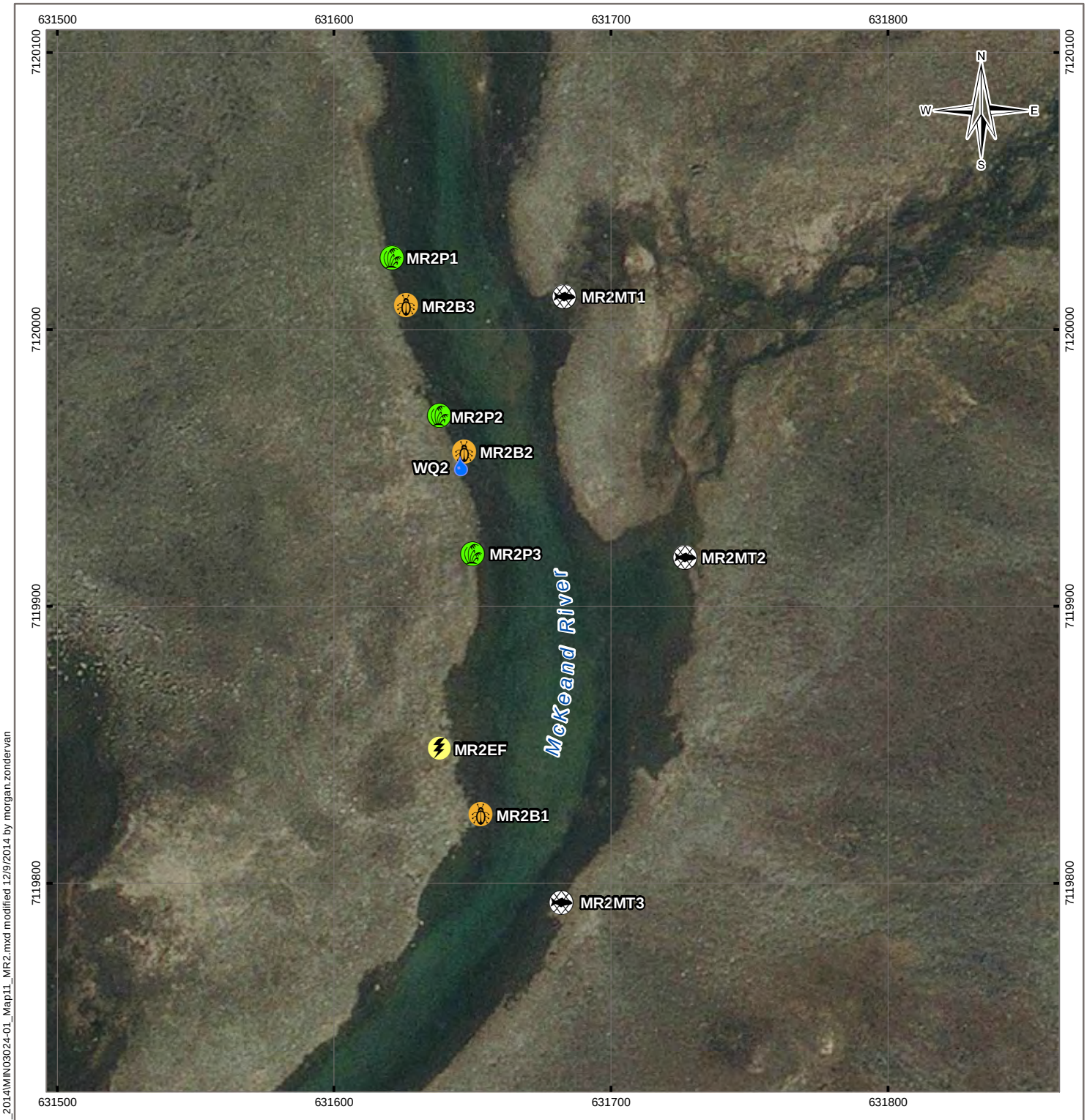
STATUS
ISSUED FOR USE

CHIDLIAK BASELINE STUDIES 2014

Water Quality, Minnow Trap, Electrofishing, Periphyton and Benthic Invertebrate Sampling Locations at McKeand River Site 1

PROJECTION UTM Zone 19			**DATUM** NAD83	**CLIENT** PEREGRINE DIAMONDS LTD.
Scale: 1:5,000 100 50 0 100 Metres				TETRA TECH EBA
FILE NO. MIN03024-01_Map10_MR1.mxd				
PROJECT NO. ENVMIN03024-01	**DWN** MEZ	**CKD** BB	**APVD** MV	**REV** 0
OFFICE Tt EBA-VANC	**DATE** December 9, 2014			**Map 10**

Q:\Vancouver\GIS\ENVIRONMENTAL\MIN\MIN03024-01\Mapsl\Fisheries_2014\MIN03024-01_Map10_MR1.mxd modified 12/9/2014 by morgan.zondervan



LEGEND

- Water Quality Station
- Benthic Invertebrate Sampling Location (each ID represents a hess sampling location)
- Electrofishing Location
- Periphyton Sampling Location (each ID represents a sampled rock)
- Minnow Trap Location

NOTES
Base data source:
Imagery supplied by
Peregrine Diamonds Ltd. (2002-2011)

STATUS
ISSUED FOR USE

CHIDLIAK BASELINE STUDIES 2014

Water Quality, Minnow Trap, Electrofishing, Periphyton and Benthic Invertebrate Sampling Locations at McKeand River Site 2

PROJECTION	DATUM	CLIENT
UTM Zone 19	NAD83	PEREGRINE DIAMONDS LTD.

Scale: 1:2,000
40 20 0 40
Metres

FILE NO. MIN03024-01_Map11_MR2.mxd

PROJECT NO.	DWN	CKD	APVD	REV
ENVMIN03024-01	MEZ	BB	MV	0

OFFICE Tt EBA-VANC
DATE December 9, 2014

TETRA TECH EBA

Map 11

Q:\Vancouver\GIS\ENVIRONMENTAL\MIN\MIN03024-01\Maps\Fisheries_2014\MIN03024-01_Map11_MR2.mxd modified 12/9/2014 by morgan.zondervan

LEGEND

- Water Quality Station
- Benthic Invertebrate Sampling Location (each ID represents a hess sampling location)
- Electrofishing Location
- Periphyton Sampling Location (each ID represents a sampled rock)
- Minnow Trap Location

NOTES
Base data source:
Imagery supplied by
Peregrine Diamonds Ltd. (2002-2011)

STATUS
ISSUED FOR USE

CHIDLIAK BASELINE STUDIES 2014

Water Quality, Minnow Trap, Electrofishing, Periphyton and Benthic Invertebrate Sampling Locations at McKeand River Site 3

PROJECTION	DATUM	CLIENT
UTM Zone 19	NAD83	PEREGRINE DIAMONDS LTD.

Scale: 1:2,000
40 20 0 40
Metres

FILE NO. MIN03024-01_Map12_MR3.mxd

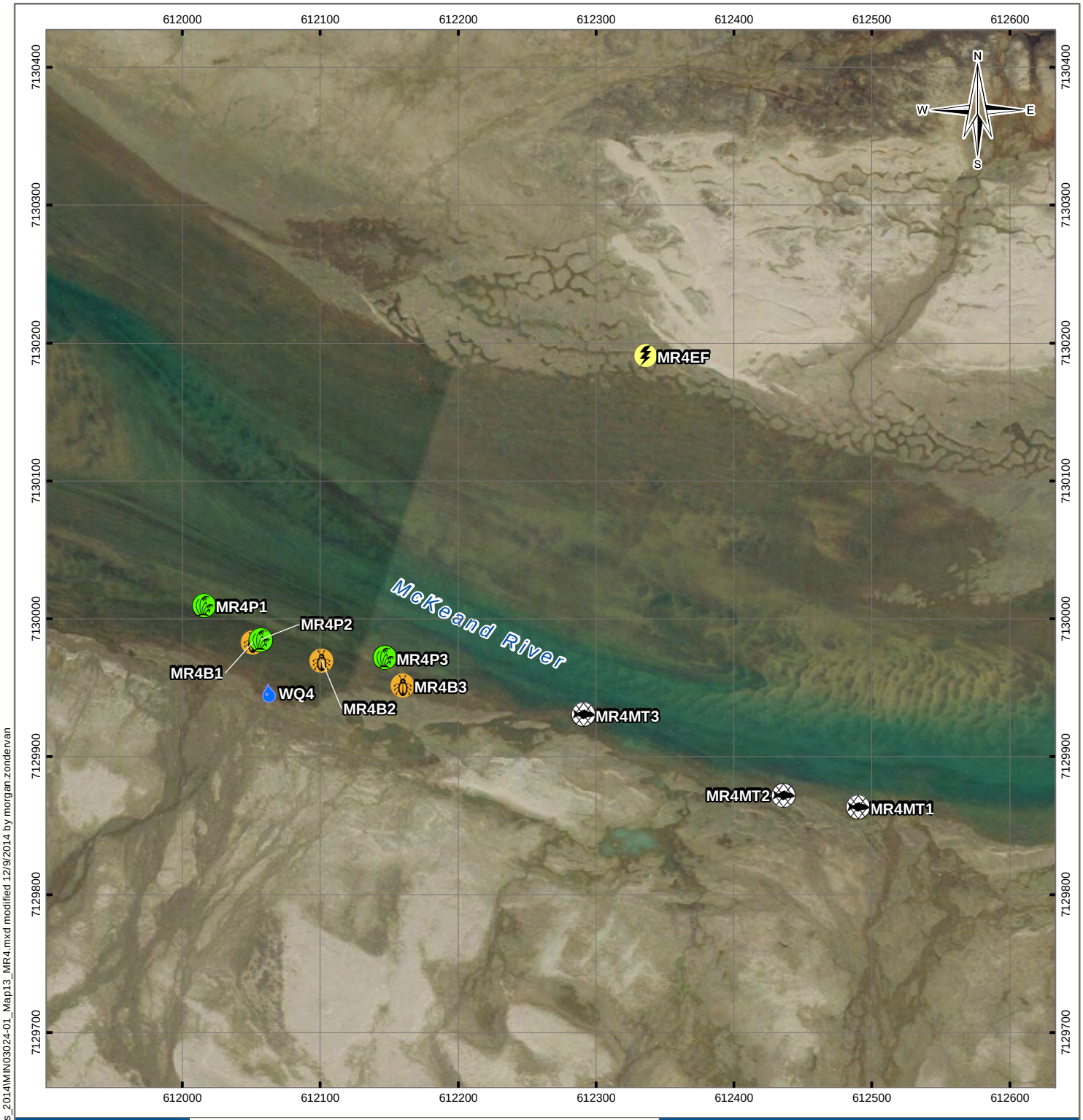
PROJECT NO.	DWN	CKD	APVD	REV
ENVMIN03024-01	MEZ	BB	MV	0

OFFICE Tt EBA-VANC
DATE December 9, 2014

TETRA TECH EBA

Map 12

Q:\Vancouver\GIS\ENVIRONMENTAL\MIN\MIN03024-01\Maps\Fisheries_2014\MIN03024-01_Map12_MR3.mxd modified 12/9/2014 by morgan.zondervan



LEGEND

- Water Quality Station
- Benthic Invertebrate Sampling Location (each ID represents a hess sampling location)
- Electrofishing Location
- Periphyton Sampling Location (each ID represents a sampled rock)
- Minnow Trap Location

NOTES
Base data source:
Imagery supplied by
Peregrine Diamonds Ltd. (2002-2011)

STATUS
ISSUED FOR USE

CHIDLIAK BASELINE STUDIES 2014

Water Quality, Minnow Trap, Electrofishing, Periphyton and Benthic Invertebrate Sampling Locations at McKeand River Site 4

PROJECTION UTM Zone 19			**DATUM** NAD83		**CLIENT** PEREGRINE DIAMONDS LTD.
Scale: 1:4,000 50 25 0 50 Metres					TETRA TECH EBA
FILE NO. MIN03024-01_Map13_MR4.mxd					
PROJECT NO. ENVMIN03024-01	**DWN** MEZ	**CKD** BB	**APVD** MV	**REV** 0	**Map 13**
OFFICE Tt EBA-VANC	**DATE** December 9, 2014				

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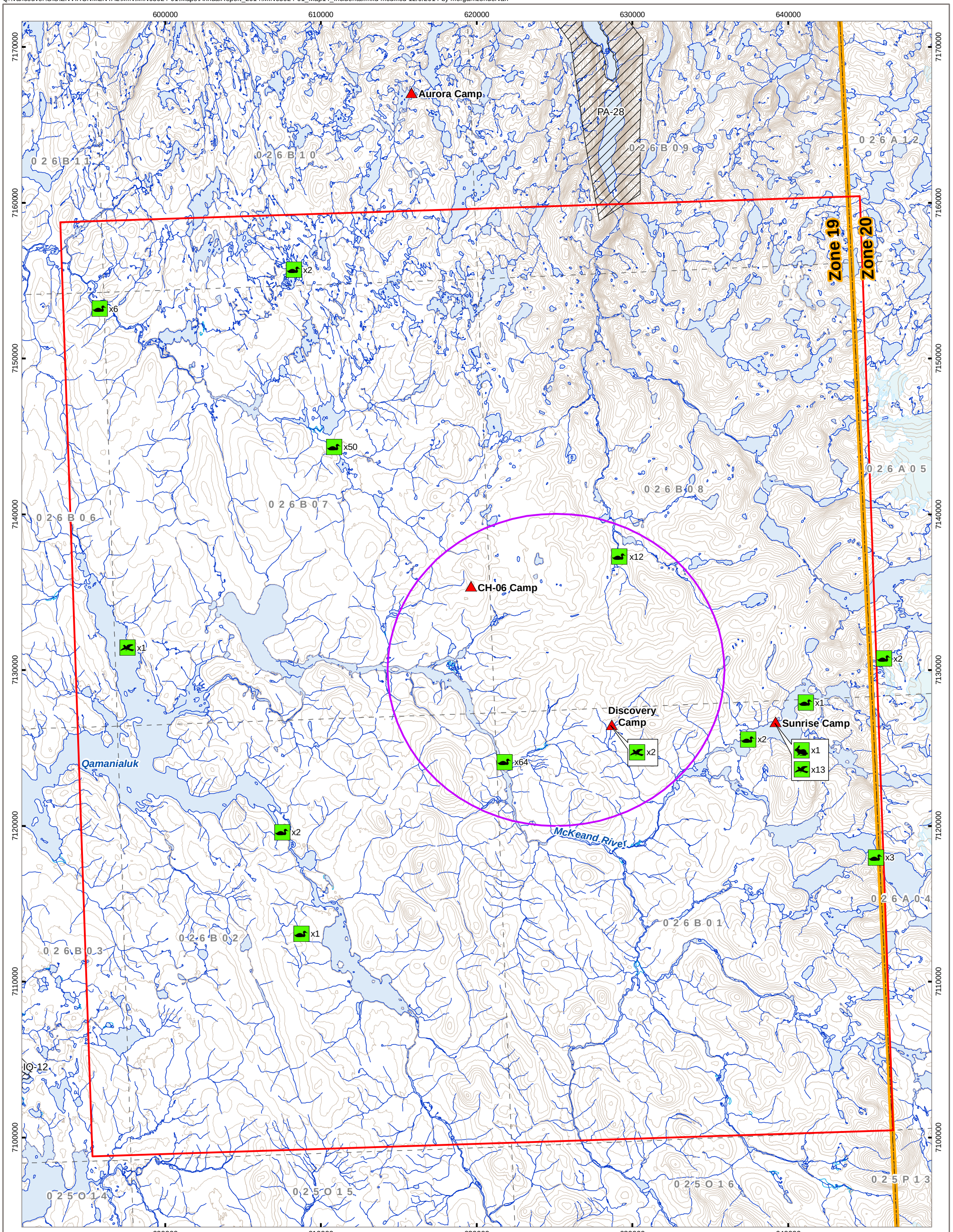
Q:\Vancouver\GIS\ENVIRONMENTAL\MIN\MIN03024-01\Maps\AnnualReport_2014\MIN03024-01_Map14_Incidental.mxd modified 12/9/2014 by morgan.zondervan



LEGEND

Species Group
- Small Mammal
- Waterfowl/Waterbird
- Other Bird

Observation Month
- August

- Camp Location
- 2014 Study Area
- Priority Area
- Inuit-Owned Lands (IOLs)
- UTM Zone Boundary
- NTS 1:50,000 Grid Line
- Index Contour (100 m)
- Intermediate Contour (20 m)
- Watercourse
- Permanent Snow and Ice
- Waterbody
- Wetland

N W E S

GRID NORTH

NOTES
Base data source: CanVec 1:50,000

STATUS
ISSUED FOR USE

CHIDLIAK BASELINE STUDIES 2014

Incidental Observations of Non-Targeted Species, 2014

PROJECTION	DATUM	CLIENT
UTM Zone 19	NAD83	PEREGRINE DIAMONDS LTD.

Scale: 1:230,000
5 2.5 0 5
Kilometres

TETRA TECH EBA

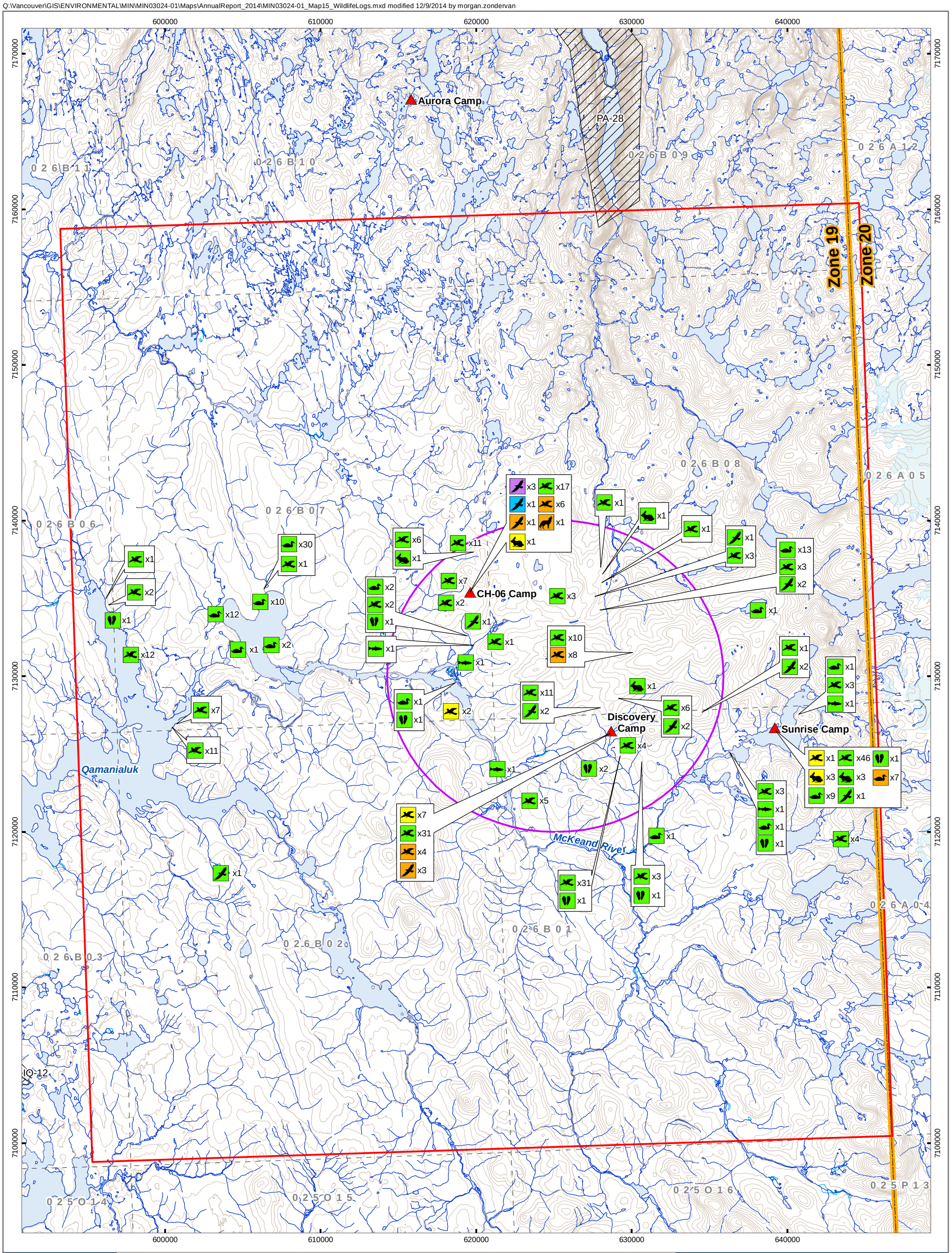
FILE NO.
MIN03024-01_Map14_Incidental.mxd

PROJECT NO.	DWN	CKD	APVD	REV
ENVMIN03024-01	SL	MEZ	KL	1

OFFICE	DATE
Tt EBA-VANC	December 9, 2014

Map 14

Q:\Vancouver\GIS\ENVIRONMENTAL\MIN\MIN03024-01\Maps\AnnualReport_2014\MIN03024-01_Map15_WildlifeLogs.mxd modified 12/9/2014 by morgan.zondervan



LEGEND

Species Group

- Small Mammal
- Caribou Sign
- Wolf
- Raptor
- Waterfowl/Waterbird
- Other Bird
- Fish

Observation Month

- March
- April
- July
- August
- September

- Camp Location
- 2014 Study Area
- Priority Area
- Inuit-Owned Lands (IOLs)
- UTM Zone Boundary
- NTS 1:50,000 Grid Line
- Index Contour (100 m)
- Intermediate Contour (20 m)
- Watercourse
- Permanent Snow and Ice
- Waterbody
- Wetland

N W E S

GRID NORTH

NOTES
Base data source: CanVec 1:50,000

STATUS
ISSUED FOR USE

CHIDLIAK BASELINE STUDIES 2014

Camp Wildlife Sighting Logs, 2014

PROJECTION	DATUM	CLIENT
UTM Zone 19	NAD83	PEREGRINE DIAMONDS LTD.

Scale: 1:230,000
5 2.5 0 5
Kilometres

TETRA TECH EBA

FILE NO. MIN03024-01_Map15_WildlifeLogs.mxd

PROJECT NO.	DWN	CKD	APVD	REV
ENVMIN03024-01	SL	MEZ	KL	1

OFFICE	DATE
Tt EBA-VANC	December 9, 2014

Map 15

APPENDIX C
TABLES

Table 1: Water Quality Sampling Station Locations

#	Sampling Station	Latitude	Longitude	Subwatershed	Description
1.	Hydro-1	64.264010	-66.354760	McKeand River	▪ First-order watercourse; down-gradient from CH-01
2.	Hydro-2	64.270990	-66.390520	McKeand River	▪ First-order watercourse
3.	WQ-3	64.169770	-66.056500	McKeand River	▪ Second-order watercourse (reference location)
4.	WQ-4	64.225480	-66.099342	McKeand River	▪ Sunrise Camp Lake (lakeshore)
5.	WQ-5	64.230090	-66.174420	McKeand River	▪ Sunrise Camp Lake outlet (McKeand River); down-gradient from Sunrise Camp
6.	WQ-6	64.185870	-66.290880	McKeand River	▪ McKeand River (third-order watercourse); down-gradient from Discovery and Sunrise camps
7.	WQ-7	64.275530	-66.620830	McKeand River	▪ McKeand River (fourth-order watercourse); down-gradient from most exploration activity
8.	WQ-8	64.368090	-66.344080	Ptarmigan Fiord	▪ Third-order watercourse; down-gradient from possible mine infrastructure
9.	Hydro-9	64.241530	-66.43222	McKeand River	▪ Second-order watercourse; down-gradient from CH-01
10.	Hydro-10	64.201930	-66.315850	McKeand River	▪ Second-order watercourse; down-gradient from Discovery Camp
11.	Hydro-11	64.311590	-66.616040	McKeand River	▪ First-order watercourse; down-gradient from CH-06
12.	WQ-12	64.245372	-66.349017	McKeand River	▪ First-order watercourse; down-gradient from CH-07
13.	WQ-13	64.161491	-66.458077	McKeand River	▪ Second-order watercourse (reference location)
14.*	WQ-15	64.337070	-66.326600	Ptarmigan Fiord	▪ Second-order watercourse; down-gradient from possible mine infrastructure
15	WQ-16	64.342720	-66.294010	Ptarmigan Fiord	▪ Second-order watercourse (reference location)
16	WQ-17	64.352660	-66.364500	Ptarmigan Fiord	▪ Second-order watercourse; down-gradient from possible mine infrastructure
17	WQ-18	64.158670	-66.335880	McKeand River	▪ Fourth-order watercourse (reference location)
18	WQ-19	64.072710	-66.620730	McKeand River	▪ Third-order watercourse (reference location)
19	WQ-20	64.185990	-66.786480	McKeand River	▪ Third-order watercourse (reference location)
20	WQ-21	64.219890	-66.481150	McKeand River	▪ Second-order watercourse; down-gradient from CH-01
21	WQ-22	64.199570	-66.500540	McKeand River	▪ Second-order watercourse (reference location)
22	WQ-23	64.297000	-66.510670	McKeand River	▪ Second-order watercourse; down-gradient from possible mine infrastructure
23	WQ-24	64.284540	-66.522180	McKeand River	▪ First-order watercourse; down-gradient from possible mine infrastructure
24	WQ-25	64.284920	-66.786520	McKeand River	▪ Second-order watercourse (reference location)
25	WQ-26	64.252370	-66.928120	McKeand River	▪ McKeand River (fourth-order watercourse); down-gradient from Priority Area
26	WQ-27	64.406550	-66.699540	Chidliak Bay	▪ Second-order watercourse (reference location)
27	WQ-28	64.427870	-66.364650	Ptarmigan Fiord	▪ Second-order watercourse (reference location)
28	WQ-29	64.315580	-66.056260	Popham Bay	▪ Second-order watercourse (reference location)

Note: Latitude and Longitudes presented in NAD 83 map datum
* Station WQ-14 (located at 64.743469N and -66.515615W) has been removed from the 2014 baseline program owing to its distance from the study area boundary (approximately 23 km north).

Table 2: Water Quality Station Site Conditions, 2014

#	Sampling Station	pH	EC (µS/cm)	Water Temp. (°C)	Station Depth (cm)	Water Clarity	Odour or Surface Sheen	Comment
1.	Hydro-1	6.2	7.2	5.6	16	Clear	No	Braided channel; channel wetted width 2 m (estimate)
2.	Hydro-2	5.9	6.8	9.5	17	Clear	No	Channel wetted width 8 m (estimate)
3.	WQ-3	6.1	4.4	5.3	32	Clear	No	Channel wetted width 30 m (estimate)
4.	WQ-4	6.3	6.1	7.4	17	Clear	No	Shallow bay with sand and boulders
5.	WQ-5	6.2	6.7	6.8	26	Clear	No	Channel wetted width 50 m (estimate)
6.	WQ-6	6.5	6.7	9.3	29	Clear	No	Channel wetted width 25 m (estimate)
7.	WQ-7	6.3	5.1	12.1	25	Clear	No	Channel wetted width 60 m (estimate)
8.	WQ-8	6.3	7.7	12.9	24	Clear	No	Channel wetted width 40 m (estimate)
9.	Hydro-9	6.0	7.6	12.3	17	Clear	No	Channel wetted width 20 m (estimate)
10.	Hydro-10	6.4	6.8	10.8	15	Clear	No	Channel wetted width 18 m (estimate)
11.	Hydro-11	6.3	18.1	12.1	14	Clear	No	Channel wetted width 15 m (estimate)
12.	WQ-12	6.5	8.9	11.2	15	Clear	No	Braided channel; channel wetted width 3 m (estimate)
13.	WQ-13	6.8	9.0	10.3	16	Clear	No	Channel wetted width 30 m (estimate)
14.*	WQ-15	5.9	10.9	14.1	19	Clear	No	Channel wetted width 55 m (estimate)
15	WQ-16	6.5	10.1	12.7	26	Clear	No	Channel wetted width 75 m through boulder field (estimate)
16	WQ-17	6.5	10.2	11.3	14	Clear	No	Channel wetted width 25 m through boulders (estimate)
17	WQ-18	6.4	5.4	11.3	40	Clear	No	Channel wetted width 35 m (estimate)
18	WQ-19	7.2	12.9	11.0	21	Clear	No	Channel wetted width 100 m (estimate)
19	WQ-20	6.7	6.2	11.9	24	Clear	No	Channel wetted width 30 m (estimate)
20	WQ-21	6.3	7.7	13.9	16	Clear	No	Channel wetted width 35 m (estimate)
21	WQ-22	7.6	8.3	9.7	13	Clear	No	Primary channel wetted width 25 m (estimate) and secondary channel wetted width 3 m
22	WQ-23	6.4	10.1	12.1	23	Clear	No	Channel wetted width 30 m (estimate)

Table 2: Water Quality Station Site Conditions, 2014

#	Sampling Station	pH	EC (µS/cm)	Water Temp. (°C)	Station Depth (cm)	Water Clarity	Odour or Surface Sheen	Comment
23	WQ-24	6.2	6.5	13.5	21	Clear	No	Braided channel; channel wetted width 50 m (estimate) through cobble/boulders
24	WQ-25	6.5	6.9	9.0	15	Clear	No	Sandy substrate; channel wetted width 35 m (estimate)
25	WQ-26	6.2	7.2	10.3	35	Clear	No	Sand and boulder substrate; confluence of McKeand River and Qamanialuk
26	WQ-27	6.8	10.0	13.5	23	Clear	No	Channel wetted width 40 m (estimate)
27	WQ-28	6.1	14.8	10.9	32	Clear	No	Flow through boulder field; few pockets of open water visible
28	WQ-29	6.1	7.1	10.5	17	Clear	No	Channel wetted width 30 m (estimate)
Ave		6.4	8.42	10.8	21.5			
Min		5.9	4.4	5.3	13			
Max		7.6	18.1	14.1	40			

* Station WQ-14 (located at 64.743469N and -66.515615W) has been removed from the 2014 baseline program owing to its distance from the study area boundary (approximately 23 km north).

Table 3: Surface Water Quality Control Results, August 2014

Parameter	August 8-9, 2014		Units	Detection Limit
	Trip Blank	Field Blank		
Major Ions, Nutrients, and Inorganics				
Calcium (Ca)-Total	<0.50	<0.50	mg/L	0.5
Magnesium (Mg)-Total	<0.10	<0.10	mg/L	0.1
Phosphorus (P), Total	<0.020	<0.020	mg/L	0.02
Potassium (K)-Total	<0.50	<0.50	mg/L	0.5
Sodium (Na)-Total	<1.0	<1.0	mg/L	1
Hardness (as CaCO3)	<1.3	<1.3	mg/L	n/a
Alkalinity, Total (as CaCO3)	<2.0	<2.0	mg/L	2
Nitrate (as N)	<0.050	<0.050	mg/L	0.05
Nitrate and Nitrite as N	<0.054	<0.054	mg/L	0.054
Nitrite (as N)	<0.020	<0.020	mg/L	0.02
Total Kjeldahl Nitrogen	<0.20	<0.20	mg/L	0.2
Nitrogen, Total	<0.21	<0.21	mg/L	0.21
Ammonia-N	<0.050	<0.050	mg/L	0.05
pH	5.4	5.37	pH	0.1
Electrical Conductivity (EC)	0.79	0.98	uS/cm	0.2
Total Organic Carbon	1.6	<1.0	mg/L	1
Total Suspended Solids	<3.0	<3.0	mg/L	3
Turbidity	<0.10	<0.10	NTU	0.1
Organics				
Oil and Grease	<1.0	<1.0	mg/L	1
Total Metals				
Aluminum (Al)	<0.0050	<0.0050	mg/L	0.005
Antimony (Sb)	<0.00040	<0.00040	mg/L	0.0004
Arsenic (As)	<0.00040	<0.00040	mg/L	0.0004
Barium (Ba)	<0.0030	<0.0030	mg/L	0.003
Beryllium (Be)	<0.0010	<0.0010	mg/L	0.001
Boron (B)	<0.050	<0.050	mg/L	0.05
Cadmium (Cd)	<0.000010	<0.000010	mg/L	0.00001
Chromium (Cr)	<0.0010	<0.0010	mg/L	0.001
Cobalt (Co)	<0.0020	<0.0020	mg/L	0.002
Copper (Cu)	<0.0010	<0.0010	mg/L	0.001
Iron (Fe)	<0.010	<0.010	mg/L	0.01
Lead (Pb)	<0.00010	<0.00010	mg/L	0.0001
Lithium (Li)	<0.010	<0.010	mg/L	0.01
Manganese (Mn)	<0.0020	<0.0020	mg/L	0.002
Mercury (Hg)	<0.0000050	<0.0000050	mg/L	0.000005
Molybdenum (Mo)	<0.0050	<0.0050	mg/L	0.005
Nickel (Ni)	<0.0020	<0.0020	mg/L	0.002
Selenium (Se)	<0.00040	<0.00040	mg/L	0.0004
Silver (Ag)	<0.000020	<0.000020	mg/L	0.00002
Strontium (Sr)	<0.00010	<0.00010	mg/L	0.0001
Thallium (Tl)	<0.00010	<0.00010	mg/L	0.0001
Tin (Sn)	<0.050	<0.050	mg/L	0.05
Titanium (Ti)	<0.0010	<0.0010	mg/L	0.001
Uranium (U)	<0.00010	<0.00010	mg/L	0.0001
Vanadium (V)	<0.0010	<0.0010	mg/L	0.001
Zinc (Zn)	<0.0040	<0.0040	mg/L	0.004

Legend

Detectable Levels

< = below the detection limit

Table 4a. August Field Event Duplicate 1 Assessment (Relative Percent Difference), 2014

Parameter	August Field Event Results		Units	Detection Limit	Duplicate Assessment			RPD[2]	Duplicate Reliable? Yes or No[3]
	HYDRO 9	Duplicate 1			HYDRO 9	Duplicate 1	Applicable? Yes or No[1]		
Major Ions, Nutrients, and Inorganics									
Calcium (Ca)-Total	<0.50	<0.50	mg/L	0.5	-	-	No	-	Yes
Magnesium (Mg)-Total	0.12	0.13	mg/L	0.5	0.24	0.26	No	-	Yes
Phosphorus (P), Total	<0.020	<0.020	mg/L	0.1	-	-	No	-	Yes
Potassium (K)-Total	<0.50	<0.50	mg/L	0.02	-	-	No	-	Yes
Sodium (Na)-Total	<1.0	<1.0	mg/L	1	-	-	No	-	Yes
Hardness (as CaCO3)	<1.3	<1.3	mg/L	1	-	-	No	-	Yes
Alkalinity, Total (as CaCO3)	<2.0	<2.0	mg/L	2	-	-	No	-	Yes
Nitrate (as N)	0.223	0.216	mg/L	0.05	4.46	4.32	No	-	Yes
Nitrate and Nitrite as N	0.223	0.216	mg/L	0.071	3.14	3.04	No	-	Yes
Nitrite (as N)	<0.020	<0.020	mg/L	0.05	-	-	No	-	Yes
Total Kjeldahl Nitrogen	<0.20	<0.20	mg/L	0.2	-	-	No	-	Yes
Nitrogen, Total	0.22	0.22	mg/L	0.21	1.05	1.05	No	-	Yes
Ammonia-N	<0.050	<0.050	mg/L	0.005	-	-	No	-	Yes
pH	5.03	5.33	pH	0.1	50.3	53.3	Yes	5.79	Yes
Electrical Conductivity (EC)	6.16	6.14	uS/cm	0.2	30.8	30.7	Yes	0.33	Yes
Total Organic Carbon	<1.0	<1.0	mg/L	1	-	-	No	-	Yes
Total Suspended Solids	<3.0	<3.0	mg/L	3	-	-	No	-	Yes
Turbidity	1.68	1.56	NTU	0.1	16.8	15.6	Yes	7.41	Yes
Organics									
Oil and Grease	<1.0	<1.0	mg/L	1	-	-	No	-	Yes
Total Metals									
Aluminum (Al)	0.0583	0.0591	mg/L	0.005	11.66	11.82	Yes	1.36	Yes
Antimony (Sb)	<0.00040	<0.00040	mg/L	0.0004	-	-	No	-	Yes
Arsenic (As)	<0.00040	<0.00040	mg/L	0.0004	-	-	No	-	Yes
Barium (Ba)	<0.0030	<0.0030	mg/L	0.003	-	-	No	-	Yes
Beryllium (Be)	<0.0010	<0.0010	mg/L	0.001	-	-	No	-	Yes
Boron (B)	<0.050	<0.050	mg/L	0.05	-	-	No	-	Yes
Cadmium (Cd)	<0.000010	<0.000010	mg/L	0.00001	-	-	No	-	Yes
Chromium (Cr)	<0.0010	<0.0010	mg/L	0.001	-	-	No	-	Yes
Cobalt (Co)	<0.0020	<0.0020	mg/L	0.002	-	-	No	-	Yes
Copper (Cu)	<0.0010	<0.0010	mg/L	0.001	-	-	No	-	Yes
Iron (Fe)	0.057	0.056	mg/L	0.01	5.7	5.6	Yes	1.77	Yes
Lead (Pb)	<0.00010	<0.00010	mg/L	0.0001	-	-	No	-	Yes
Lithium (Li)	<0.010	<0.010	mg/L	0.01	-	-	No	-	Yes
Manganese (Mn)	<0.0020	<0.0020	mg/L	0.002	-	-	No	-	Yes
Mercury (Hg)	<0.0000050	<0.0000050	mg/L	0.00002	-	-	No	-	Yes
Molybdenum (Mo)	<0.0050	<0.0050	mg/L	0.005	-	-	No	-	Yes
Nickel (Ni)	<0.0020	<0.0020	mg/L	0.002	-	-	No	-	Yes
Selenium (Se)	<0.00040	<0.00040	mg/L	0.0004	-	-	No	-	Yes
Silver (Ag)	<0.000020	<0.000020	mg/L	0.00002	-	-	No	-	Yes
Strontium (Sr)	0.00192	0.00199	mg/L	0.0001	19.2	19.9	Yes	3.58	Yes
Thallium (Tl)	<0.00010	<0.00010	mg/L	0.0001	-	-	No	-	Yes
Tin (Sn)	<0.050	<0.050	mg/L	0.05	-	-	No	-	Yes
Titanium (Ti)	0.0034	0.0038	mg/L	0.001	3.4	3.8	No	-	Yes
Uranium (U)	<0.00010	<0.00010	mg/L	0.0001	-	-	No	-	Yes
Vanadium (V)	<0.0010	<0.0010	mg/L	0.001	-	-	No	-	Yes
Zinc (Zn)	<0.0040	<0.0040	mg/L	0.004	-	-	No	-	Yes

Legend

< = below the detection limit.

1 Applicability to the Relative Percent Difference (RPD) Assessment requires that results be at least 5 x the detection limit since analytical error increases near the detection limit.
Results not applicable to the RPD assessment do not imply an unreliable duplicate.

2 Relative Percent Difference. RPD(%) = 200 x ABS(x - y)/(x + y), where ABS = Absolute difference, x = the analytical result of the original sample, y = the analytical result of the blind field duplicate sample.

3 Duplicate samples are reliable when their RPD is less than 20%.

- = not applicable to the RPD Assessment.

Table 4b: August Field Event Duplicate 2 Assessment (Relative Percent Difference), 2014

Parameter	August Field Event Results		Units	Detection Limit	Duplicate Assessment			RPD[2]	Duplicate Reliable? Yes or No[3]
	WQ25	Duplicate 2			WQ25	Duplicate 2	Applicable? Yes or No[1]		
Major Ions, Nutrients, and Inorganics									
Calcium (Ca)-Total	<0.50	<0.50	mg/L	0.5	-	-	No	-	Yes
Magnesium (Mg)-Total	0.19	0.19	mg/L	0.5	0.38	0.38	No	-	Yes
Phosphorus (P), Total	<0.020	<0.020	mg/L	0.1	-	-	No	-	Yes
Potassium (K)-Total	<0.50	<0.50	mg/L	0.02	-	-	No	-	Yes
Sodium (Na)-Total	<1.0	<1.0	mg/L	1	-	-	No	-	Yes
Hardness (as CaCO3)	<1.3	<1.3	mg/L	1	-	-	No	-	Yes
Alkalinity, Total (as CaCO3)	<2.0	<2.0	mg/L	2	-	-	No	-	Yes
Nitrate (as N)	<0.050	<0.050	mg/L	0.05	-	-	No	-	Yes
Nitrate and Nitrite as N	<0.054	<0.054	mg/L	0.071	-	-	No	-	Yes
Nitrite (as N)	<0.020	<0.020	mg/L	0.05	-	-	No	-	Yes
Total Kjeldahl Nitrogen	<0.20	<0.20	mg/L	0.2	-	-	No	-	Yes
Nitrogen, Total	<0.21	<0.21	mg/L	0.21	-	-	No	-	Yes
Ammonia-N	<0.050	<0.050	mg/L	0.005	-	-	No	-	Yes
pH	6.10	6.14	pH	0.1	61.0	61.4	Yes	0.65	Yes
Electrical Conductivity (EC)	5.42	5.18	uS/cm	0.2	27.1	25.9	Yes	4.53	Yes
Total Organic Carbon	<1.0	<1.0	mg/L	1	-	-	No	-	Yes
Total Suspended Solids	<3.0	<3.0	mg/L	3	-	-	No	-	Yes
Turbidity	0.7	0.62	NTU	0.1	7.0	6.2	Yes	12.12	Yes
Organics									
Oil and Grease	<1.0	<1.0	mg/L	1	-	-	No	-	Yes
Total Metals									
Aluminum (Al)	0.0237	0.0221	mg/L	0.005	4.74	4.42	No	-	Yes
Antimony (Sb)	<0.00040	<0.00040	mg/L	0.0004	-	-	No	-	Yes
Arsenic (As)	<0.00040	<0.00040	mg/L	0.0004	-	-	No	-	Yes
Barium (Ba)	<0.0030	<0.0030	mg/L	0.003	-	-	No	-	Yes
Beryllium (Be)	<0.0010	<0.0010	mg/L	0.001	-	-	No	-	Yes
Boron (B)	<0.050	<0.050	mg/L	0.05	-	-	No	-	Yes
Cadmium (Cd)	<0.000010	<0.000010	mg/L	0.00001	-	-	No	-	Yes
Chromium (Cr)	<0.0010	<0.0010	mg/L	0.001	-	-	No	-	Yes
Cobalt (Co)	<0.0020	<0.0020	mg/L	0.002	-	-	No	-	Yes
Copper (Cu)	<0.0010	<0.0010	mg/L	0.001	-	-	No	-	Yes
Iron (Fe)	0.024	0.022	mg/L	0.01	2.4	2.2	No	-	Yes
Lead (Pb)	<0.00010	<0.00010	mg/L	0.0001	-	-	No	-	Yes
Lithium (Li)	<0.010	<0.010	mg/L	0.01	-	-	No	-	Yes
Manganese (Mn)	0.0028	0.0029	mg/L	0.002	1.4	1.45	No	-	Yes
Mercury (Hg)	<0.0000050	<0.0000050	mg/L	0.00002	-	-	No	-	Yes
Molybdenum (Mo)	<0.0050	<0.0050	mg/L	0.005	-	-	No	-	Yes
Nickel (Ni)	<0.0020	<0.0020	mg/L	0.002	-	-	No	-	Yes
Selenium (Se)	<0.00040	<0.00040	mg/L	0.0004	-	-	No	-	Yes
Silver (Ag)	<0.000020	<0.000020	mg/L	0.00002	-	-	No	-	Yes
Strontium (Sr)	0.0025	0.00241	mg/L	0.0001	25	24.1	Yes	3.67	Yes
Thallium (Tl)	<0.00010	<0.00010	mg/L	0.0001	-	-	No	-	Yes
Tin (Sn)	<0.050	<0.050	mg/L	0.05	-	-	No	-	Yes
Titanium (Ti)	0.0013	0.0016	mg/L	0.001	1.3	1.6	No	-	Yes
Uranium (U)	<0.00010	<0.00010	mg/L	0.0001	-	-	No	-	Yes
Vanadium (V)	<0.0010	<0.0010	mg/L	0.001	-	-	No	-	Yes
Zinc (Zn)	<0.0040	<0.0040	mg/L	0.004	-	-	No	-	Yes

Legend

< = below the detection limit.

1 Applicability to the Relative Percent Difference (RPD) Assessment requires that results be at least 5 x the detection limit since analytical error increases near the detection limit.
Results not applicable to the RPD assessment do not imply an unreliable duplicate.

2 Relative Percent Difference. RPD(%) = 200 x ABS(x - y)/(x + y), where ABS = Absolute difference, x = the analytical result of the original sample, y = the analytical result of the blind field duplicate sample.

3 Duplicate samples are reliable when their RPD is less than 20%.

- = not applicable to the RPD Assessment.

Table 4c: August Field Event Duplicate 3 Assessment (Relative Percent Difference), 2014

Parameter	August Field Event Results		Units	Detection Limit	Duplicate Assessment			RPD[2]	Duplicate Reliable? Yes or No[3]
	HYDRO 11	Duplicate 3			HYDRO 11	Duplicate 3	Applicable? Yes or No[1]		
Major Ions, Nutrients, and Inorganics									
Calcium (Ca)-Total	1.03	0.94	mg/L	0.5	2.06	1.88	No	-	Yes
Magnesium (Mg)-Total	0.64	0.63	mg/L	0.5	1.28	1.26	No	-	Yes
Phosphorus (P), Total	<0.020	<0.020	mg/L	0.1	-	-	No	-	Yes
Potassium (K)-Total	<0.50	<0.50	mg/L	0.02	-	-	No	-	Yes
Sodium (Na)-Total	<1.0	<1.0	mg/L	1	-	-	No	-	Yes
Hardness (as CaCO3)	5.2	5	mg/L	1	5.2	5	Yes	3.92	Yes
Alkalinity, Total (as CaCO3)	3.7	<2.0	mg/L	2	1.85	-	No	-	Yes
Nitrate (as N)	<0.050	<0.050	mg/L	0.05	-	-	No	-	Yes
Nitrate and Nitrite as N	<0.054	<0.054	mg/L	0.071	-	-	No	-	Yes
Nitrite (as N)	<0.020	<0.020	mg/L	0.05	-	-	No	-	Yes
Total Kjeldahl Nitrogen	<0.20	<0.20	mg/L	0.2	-	-	No	-	Yes
Nitrogen, Total	<0.21	<0.21	mg/L	0.21	-	-	No	-	Yes
Ammonia-N	<0.050	<0.050	mg/L	0.005	-	-	No	-	Yes
pH	5.83	5.54	pH	0.1	58.3	55.4	Yes	5.10	Yes
Electrical Conductivity (EC)	17.7	17.6	uS/cm	0.2	88.5	88	Yes	0.57	Yes
Total Organic Carbon	<1.0	1.9	mg/L	1	-	1.9	No	-	Yes
Total Suspended Solids	<3.0	<3.0	mg/L	3	-	-	No	-	Yes
Turbidity	0.40	0.46	NTU	0.1	4.0	4.6	No	-	Yes
Organics									
Oil and Grease	<1.0	<1.0	mg/L	1	-	-	No	-	Yes
Total Metals									
Aluminum (Al)	0.0209	0.0207	mg/L	0.005	4.18	4.14	No	-	Yes
Antimony (Sb)	<0.00040	<0.00040	mg/L	0.0004	-	-	No	-	Yes
Arsenic (As)	<0.00040	<0.00040	mg/L	0.0004	-	-	No	-	Yes
Barium (Ba)	0.0037	0.0038	mg/L	0.003	1.2	1.3	No	-	Yes
Beryllium (Be)	<0.0010	<0.0010	mg/L	0.001	-	-	No	-	Yes
Boron (B)	<0.050	<0.050	mg/L	0.05	-	-	No	-	Yes
Cadmium (Cd)	0.000015	0.000011	mg/L	0.00001	1.5	1.1	No	-	Yes
Chromium (Cr)	<0.0010	<0.0010	mg/L	0.001	-	-	No	-	Yes
Cobalt (Co)	<0.0020	<0.0020	mg/L	0.002	-	-	No	-	Yes
Copper (Cu)	<0.0010	<0.0010	mg/L	0.001	-	-	No	-	Yes
Iron (Fe)	0.012	0.014	mg/L	0.01	1.2	1.4	No	-	Yes
Lead (Pb)	<0.00010	<0.00010	mg/L	0.0001	-	-	No	-	Yes
Lithium (Li)	<0.010	<0.010	mg/L	0.01	-	-	No	-	Yes
Manganese (Mn)	<0.0020	<0.0020	mg/L	0.002	-	-	No	-	Yes
Mercury (Hg)	<0.0000050	<0.0000050	mg/L	0.00002	-	-	No	-	Yes
Molybdenum (Mo)	<0.0050	<0.0050	mg/L	0.005	-	-	No	-	Yes
Nickel (Ni)	<0.0020	<0.0020	mg/L	0.002	-	-	No	-	Yes
Selenium (Se)	<0.00040	<0.00040	mg/L	0.0004	-	-	No	-	Yes
Silver (Ag)	<0.000020	<0.000020	mg/L	0.00002	-	-	No	-	Yes
Strontium (Sr)	0.00577	0.00503	mg/L	0.0001	57.7	50.3	Yes	13.70	Yes
Thallium (Tl)	<0.00010	<0.00010	mg/L	0.0001	-	-	No	-	Yes
Tin (Sn)	<0.050	<0.050	mg/L	0.05	-	-	No	-	Yes
Titanium (Ti)	<0.0010	0.0011	mg/L	0.001	-	1.1	No	-	Yes
Uranium (U)	<0.00010	<0.00010	mg/L	0.0001	-	-	No	-	Yes
Vanadium (V)	<0.0010	<0.0010	mg/L	0.001	-	-	No	-	Yes
Zinc (Zn)	<0.0040	<0.0040	mg/L	0.004	-	-	No	-	Yes
Legend									

< = below the detection limit.

1 Applicability to the Relative Percent Difference (RPD) Assessment requires that results be at least 5 x the detection limit since analytical error increases near the detection limit. Results not applicable to the RPD assessment do not imply an unreliable duplicate.

2 Relative Percent Difference. RPD(%) = 200 x ABS(x - y)/(x + y), where ABS = Absolute difference, x = the analytical result of the original sample, y = the analytical result of the blind field duplicate sample.

3 Duplicate samples are reliable when their RPD is less than 20%.

- = not applicable to the RPD Assessment.

Table 5a: Surface Water Quality Laboratory Results, August 2014

Parameter	Water Quality Station Results August 8-9, 2014														Units	Detection Limit	CCME FAL Guideline
	HYDRO1	HYDRO2	WQ3	WQ4	WQ5	WQ6	WQ7	WQ8	HYDRO9	HYDRO10	HYDRO11	WQ12	WQ13	WQ15			
Major Ions, Nutrients, and Inorganics																	
Calcium (Ca)-Total	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.03	<0.50	<0.50	<0.50	mg/L	0.5	-
Magnesium (Mg)-Total	0.15	0.12	<0.10	0.12	0.12	<0.10	<0.10	0.15	0.12	0.13	0.64	0.32	0.12	0.18	mg/L	0.1	-
Phosphorus (P), Total	<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	mg/L	0.02	-
Potassium (K)-Total	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	mg/L	0.5	-
Sodium (Na)-Total	<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	mg/L	1	-
Hardness (as CaCO3)	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	5.2	1.3	<1.3	<1.3	mg/L	n/a	-
Alkalinity, Total (as CaCO3)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	3.7	<2.0	<2.0	<2.0	mg/L	2	-
Nitrate (as N)	0.228	0.144	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.223	0.146	<0.050	0.084	<0.050	0.09	mg/L	0.05	2.935
Nitrate and Nitrite as N	0.228	0.144	<0.054	<0.054	<0.054	<0.054	<0.054	<0.054	0.223	0.146	<0.054	0.084	<0.054	0.09	mg/L	0.054	-
Nitrite (as N)	<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	mg/L	0.02	0.06
Total Kjeldahl Nitrogen	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	mg/L	0.2	-
Nitrogen, Total	0.23	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	0.22	<0.21	<0.21	<0.21	<0.21	<0.21	mg/L	0.21	-
Ammonia-N	<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	mg/L	0.05	125.8*
pH	5.70	5.31	5.35	5.31	5.38	5.21	5.30	5.42	5.03	5.29	5.83	5.79	6.11	5.46	pH	0.1	6.50 - 9.00
Electrical Conductivity (EC)	6.45	5.85	3.45	4.98	4.92	3.42	3.83	6.35	6.16	5.49	17.7	7.27	5.89	9.78	uS/cm	0.2	-
Total Organic Carbon	<1.0	3.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	mg/L	1	-
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	mg/L	3	-
Turbidity	0.89	1.32	0.29	0.32	0.23	0.43	0.6	0.68	1.68	0.55	0.4	1.61	1.09	0.34	NTU	0.1	-
Organics																	
Oil and Grease	<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	mg/L	1	-
Total Metals																	
Aluminum (Al)	0.0372	0.0419	0.0105	0.0165	0.013	0.0186	0.0232	0.0306	0.0583	0.0243	0.0209	0.0725	0.0497	0.0165	mg/L	0.005	0.005
Antimony (Sb)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	mg/L	0.0004	-
Arsenic (As)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	mg/L	0.0004	0.005
Barium (Ba)	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0037	0.0041	<0.0030	0.0043	mg/L	0.003	-
Beryllium (Be)	<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	mg/L	0.001	-
Boron (B)	<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	mg/L	0.05	1.5
Cadmium (Cd)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000015	<0.000010	<0.000010	0.000012	mg/L	0.00001	0.00011
Chromium (Cr)	<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	mg/L	0.001	0.001
Cobalt (Co)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	mg/L	0.002	-
Copper (Cu)	<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	mg/L	0.001	0.002
Iron (Fe)	0.021	0.043	<0.010	0.016	<0.010	<0.010	0.025	0.030	0.057	0.014	0.012	0.059	0.052	<0.010	mg/L	0.01	0.3
Lead (Pb)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	mg/L	0.0001	0.001
Lithium (Li)	<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	mg/L	0.01	-
Manganese (Mn)	<0.0020	0.0021	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0045	mg/L	0.002	-
Mercury (Hg)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	mg/L	0.000005	0.000026
Molybdenum (Mo)	<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	mg/L	0.005	0.073
Nickel (Ni)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	mg/L	0.002	0.025
Selenium (Se)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	mg/L	0.0004	0.001
Silver (Ag)	<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	mg/L	0.00002	0.0001
Strontium (Sr)	0.00241	0.00174	0.00138	0.00241	0.00228	0.00154	0.00168	0.00232	0.00192	0.00205	0.00577	0.00247	0.00286	0.00311	mg/L	0.0001	-
Thallium (Tl)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	mg/L	0.0001	0.0008
Tin (Sn)	<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	mg/L	0.05	-
Titanium (Ti)	0.0015	0.0024	<0.0010	<0.0010	<0.0010	<0.0010	0.0018	0.0019	0.0034	<0.0010	<0.0010	0.0034	0.0019	<0.0010	mg/L	0.001	-
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	mg/L	0.0001	0.015
Vanadium (V)	<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	mg/L	0.001	-
Zinc (Zn)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	mg/L	0.004	0.03

Legend

Note: Station WQ14 was removed from the 2014 sampling program as this station is well outside the current study area and inside a different drainage system.

< = below the detection limit

Canadian Council of Ministers of the Environment - Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (December 2007).

Outside CCME FAL Guidelines

< denotes result below detection level

--- = No CCME FAL Guideline

* = CCME guideline for Ammonia-N (Total Ammonia) is pH and water temperature dependent at each station. The calculation of the guideline assumes the water temperature is 5 °C and rounds the analyzed pH to the nearest guideline value. There is no guideline value for water with pH <6.0.

** CCME guideline for Aluminum is specific to the pH of the water at this site during this particular sampling event. Guideline for pH values < 6.5 = 0.005mg/L and ≥ 6.5 = 0.1 mg/L.

*** = CCME guideline for Cadmium is dependent on hardness of the water and is calculated using the formula: Cd guideline = 10 exp{0.86[log(hardness)]-3.2} for each sample. The value 1.3 mg/L was used for hardness concentrations <1.3 mg/L.

**** = CCME guideline dependent on hardness of the water at each station during this particular sampling event.

Table 5b: Surface Water Quality Laboratory Results, August 2014

Parameter	Water Quality Station Results August 8-9, 2014														Units	Detection Limit	CCME FAL Guideline
	WQ16	WQ17	WQ18	WQ19	WQ20	WQ21	WQ22	WQ23	WQ24	WQ25	WQ26	WQ27	WQ28	WQ29			
Major Ions, Nutrients, and Inorganics																	
Calcium (Ca)-Total	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.53	0.78	<0.50	mg/L	0.5	-
Magnesium (Mg)-Total	0.15	0.17	<0.10	0.14	0.17	0.13	0.18	0.24	0.14	0.19	0.19	0.25	0.35	0.14	mg/L	0.1	-
Phosphorus (P), Total	<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	mg/L	0.02	-
Potassium (K)-Total	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	mg/L	0.5	-
Sodium (Na)-Total	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	mg/L	1	-
Hardness (as CaCO3)	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	2.4	3.4	<1.3	mg/L	n/a	-
Alkalinity, Total (as CaCO3)	<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	mg/L	2	-
Nitrate (as N)	0.085	0.173	<0.050	<0.050	<0.050	0.197	0.155	0.081	0.123	<0.050	<0.050	<0.050	0.076	0.077	mg/L	0.05	2.935
Nitrate and Nitrite as N	0.085	0.173	<0.054	<0.054	<0.054	0.197	0.155	0.081	0.123	<0.054	<0.054	<0.054	0.076	0.077	mg/L	0.054	-
Nitrite (as N)	<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	mg/L	0.02	0.06
Total Kjeldahl Nitrogen	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	mg/L	0.2	-
Nitrogen, Total	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	mg/L	0.21	-
Ammonia-N	<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	mg/L	0.05	125.8*
pH	5.23	5.68	5.51	5.85	6.05	5.54	6.23	6.00	5.46	6.10	5.33	6.19	5.49	5.22	pH	0.1	6.50 - 9.00
Electrical Conductivity (EC)	6.25	8.17	4.17	4.36	5.08	6.16	6.44	9.31	5.61	5.42	5.54	8.78	13.2	5.43	uS/cm	0.2	-
Total Organic Carbon	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.2	<1.0	<1.0	mg/L	1	-
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	mg/L	3	-
Turbidity	0.77	3.73	0.31	0.41	0.58	1.63	2.15	1.6	1.82	0.7	0.55	1.12	0.3	0.74	NTU	0.1	-
Organics																	
Oil and Grease	<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	mg/L	1	-
Total Metals																	
Aluminum (Al)	0.0276	0.139	0.015	0.014	0.0171	0.0782	0.0984	0.0703	0.0737	0.0237	0.0533	0.0402	0.0128	0.0468	mg/L	0.005	0.005
Antimony (Sb)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	mg/L	0.0004	-
Arsenic (As)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	mg/L	0.0004	0.005
Barium (Ba)	<0.0030	0.0054	<0.0030	<0.0030	<0.0030	0.0031	<0.0030	0.0036	<0.0030	<0.0030	<0.0030	0.0068	0.0052	<0.0030	mg/L	0.003	-
Beryllium (Be)	<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	mg/L	0.001	-
Boron (B)	<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	mg/L	0.05	1.5
Cadmium (Cd)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	mg/L	0.00001	0.00011
Chromium (Cr)	<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	mg/L	0.001	0.001
Cobalt (Co)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	mg/L	0.002	-
Copper (Cu)	<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	mg/L	0.001	0.002
Iron (Fe)	0.024	0.172	0.014	0.021	0.039	0.075	0.089	0.095	0.071	0.024	0.026	0.099	<0.010	0.044	mg/L	0.01	0.3
Lead (Pb)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	mg/L	0.0001	0.001
Lithium (Li)	<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	mg/L	0.01	-
Manganese (Mn)	<0.0020	0.0025	<0.0020	<0.0020	<0.0020	<0.0020	0.0022	<0.0020	<0.0020	0.0028	0.0036	0.0021	0.0029	<0.0020	mg/L	0.002	-
Mercury (Hg)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	mg/L	0.000005	0.000026
Molybdenum (Mo)	<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	mg/L	0.005	0.073
Nickel (Ni)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0028	<0.0020	<0.0020	<0.0020	mg/L	0.002	0.025
Selenium (Se)	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	mg/L	0.0004	0.001
Silver (Ag)	<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	mg/L	0.00002	0.0001
Strontium (Sr)	0.002	0.00261	0.0017	0.00179	0.00218	0.00217	0.00274	0.00307	0.0018	0.0025	0.00223	0.00432	0.00513	0.0016	mg/L	0.0001	-
Thallium (Tl)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	mg/L	0.0001	0.0008
Tin (Sn)	<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	mg/L	0.05	-
Titanium (Ti)	0.0019	0.0131	<0.0010	<0.0010	0.0011	0.0049	0.0056	0.0051	0.0047	0.0013	0.001	0.0025	<0.0010	0.0034	mg/L	0.001	-
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	mg/L	0.0001	0.015
Vanadium (V)	<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	mg/L	0.001	-
Zinc (Zn)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	mg/L	0.004	0.03

Legend

< = below the detection limit

Canadian Council of Ministers of the Environment - Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (December 2007).

Outside CCME FAL Guidelines

< denotes result below detection level

--- = No CCME FAL Guideline

* = CCME guideline for Ammonia-N (Total Ammonia) is pH and water temperature dependent at each station. The calculation of the guideline assumes the water temperature is 5 °C and rounds the analyzed pH to the nearest guideline value. There is no guideline value for water with pH <6.0.

** CCME guideline for Aluminum is specific to the pH of the water at this site during this particular sampling event. Guideline for pH values < 6.5 = 0.005mg/L and ≥ 6.5 = 0.1 mg/L.

*** = CCME guideline for Cadmium is dependent on hardness of the water and is calculated using the formula: Cd guideline = 10 exp{0.86[log(hardness)]-3.2} for each sample. The value 1.3 mg/L was used for hardness concentrations <1.3 mg/L.

**** = CCME guideline dependent on hardness of the water at each station during this particular sampling event.

Table 6. Potable Water Quality Laboratory Results: Discovery Camp, August 2014

Parameter	Field Blank	Raw Water Source	Dry 1 Tap	Bathroom Tap	Dry 2 Tap	Duplicate	Kitchen Tap	Units	Detection Limit	Drinking Water Quality Guideline^
Faecal Coliforms	0	0	0	0	0	0	0	CFU/100 mL	0	---
Total Coliforms	0	**150**	**190**	**390**	0	0	0	CFU/100 mL	0	0
Escherichia coliforms (*E.coli*)	0	0	0	0	0	0	0	CFU/100 mL	0	0

Legend

^ Federal-Provincial-Territorial Committee on Drinking Water (2008) Guidelines for Canadian Drinking Water Quality

Outside the Canadian Drinking Water Quality Guideline

--- denotes no Canadian Drinking Water Quality Guideline

APPENDIX D
PHOTOGRAPHS

Photo 1	Water quality Station Hydro 1, a first-order watercourse, was nearly dry by the August 2014 field event.
Photo 2	Water quality Station Hydro 2, a first-order watercourse, was restricted to small interconnected pools.
Photo 3	At water quality station WQ 3, outside the exploration activities' zone of influence, looking upstream at its confluence with an unnamed lake.
Photo 4	Water quality Station WQ 4 is located in Sunrise Lake.
Photo 5	Water quality Station WQ 5 is located on the McKeand River at the outlet of Sunrise Lake and downstream from Sunrise Camp.
Photo 6	Station WQ 6, on the McKeand River (third-order watercourse), is located downstream from both Discovery and Sunrise camps.
Photo 7	Located on the McKeand River (fourth-order watercourse), water quality Station WQ 7 is downstream from most of the exploration activities.
Photo 8	Looking downstream from water quality station WQ 8, a third-order watercourse within the Ptarmigan Fiord subwatershed.
Photo 9	Water quality station Hydro 9, a second-order watercourse, is located downstream from water quality stations Hydro 1 and 2.
Photo 10	Water quality station Hydro 10 is a second-order watercourse downstream from Discovery Camp.
Photo 11	Water quality station Hydro 11, a first-order watercourse, is located down-gradient from CH-06 exploration activity site.
Photo 12	Water quality Station WQ 12, a first-order watercourse, is downstream from CH-07 exploration activity site (Discovery Camp in the background).
Photo 13	Water quality station WQ 13 is a second-order tributary of the McKeand River, and is located outside the current exploration activities' zone of influence.
Photo 14	Water quality station WQ 15 is a second-order watercourse within the Ptarmigan Fiord subwatershed.
Photo 15	Water quality Station WQ 16, a second-order watercourse within the Ptarmigan Fiord subwatershed, is located outside the current exploration activities' zone of influence.
Photo 16	Water quality Station WQ 17, a second-order watercourse within the Ptarmigan Fiord subwatershed was nearly dry at the time of the August field event (restricted flow through the boulders, as seen in the left corner of the photo).

Photo 1: Water quality Station Hydro 1, a first-order watercourse, was nearly dry by the August 2014 field event.

Photo 2: Water quality Station Hydro 2, a first-order watercourse, was restricted to small interconnected pools.

Photo 3: At water quality station WQ 3, outside the exploration activities' zone of influence, looking upstream at its confluence with an unnamed lake.

Photo 4: Water quality Station WQ 4 is located in Sunrise Lake.

Photo 5: Water quality Station WQ 5 is located on the McKeand River at the outlet of Sunrise Lake and downstream from Sunrise Camp.

Photo 6: Station WQ 6, on the McKeand River (third-order watercourse), is located downstream from both Discovery and Sunrise camps.

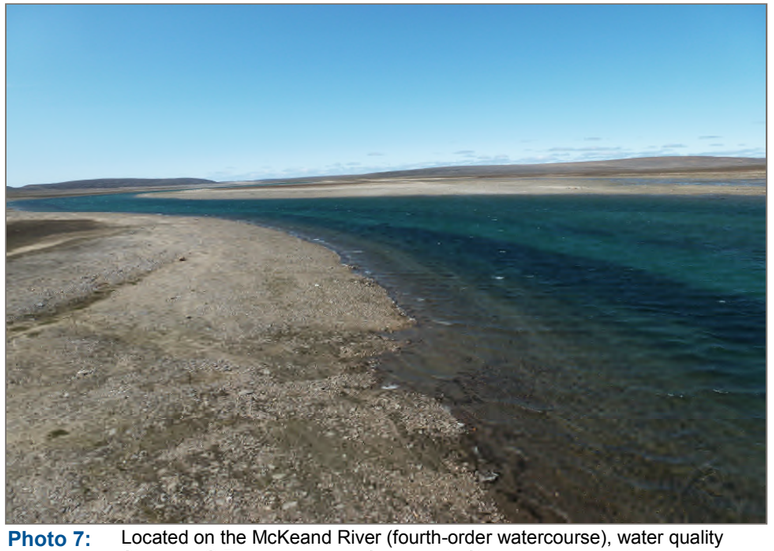


Photo 7: Located on the McKeand River (fourth-order watercourse), water quality Station WQ 7 is downstream from most of the exploration activities.

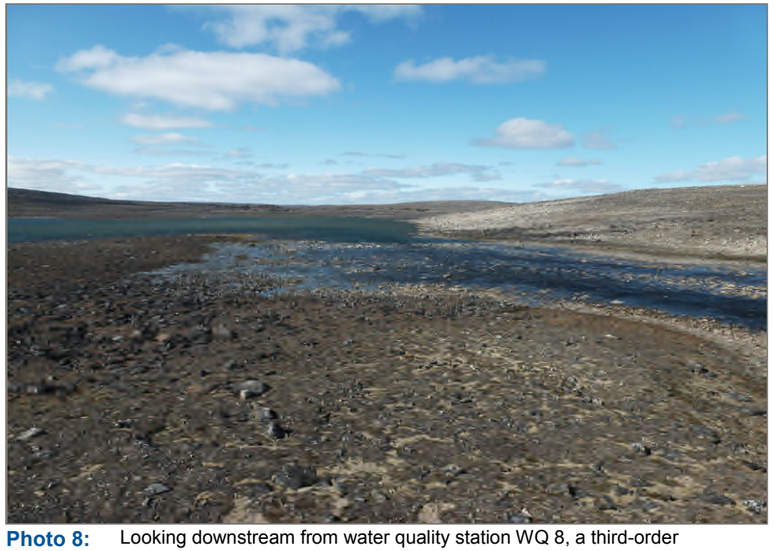


Photo 8: Looking downstream from water quality station WQ 8, a third-order watercourse within the Ptarmigan Fiord subwatershed.

Photo 9: Water quality station Hydro 9, a second-order watercourse, is located downstream from water quality stations Hydro 1 and 2.

Photo 10: Water quality station Hydro 10 is a second-order watercourse downstream from Discovery Camp.

Photo 11: Water quality station Hydro 11, a first-order watercourse, is located down-gradient from CH-06 exploration activity site.

Photo 12: Water quality Station WQ 12, a first-order watercourse, is downstream from CH-07 exploration activity site (Discovery Camp in the background).

Photo 13: Water quality station WQ 13 is a second-order tributary of the McKeand River, and is located outside the current exploration activities' zone of influence.

Photo 14: Water quality station WQ 15 is a second-order watercourse within the Ptarmigan Fiord subwatershed.

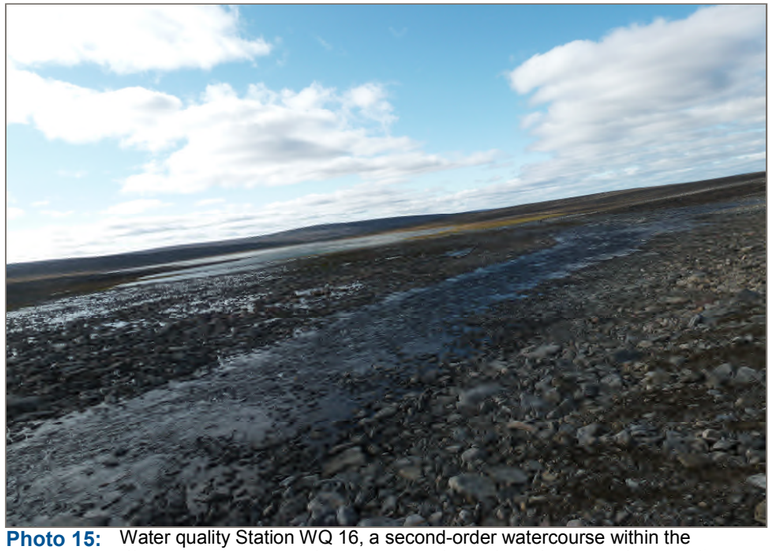


Photo 15: Water quality Station WQ 16, a second-order watercourse within the Ptarmigan Fiord subwatershed, is located outside the current exploration activities' zone of influence.

Photo 16: Water quality Station WQ 17, a second-order watercourse within the Ptarmigan Fiord subwatershed was nearly dry at the time of the August field event (restricted flow through the boulders, as seen in the left corner of the photo).

Photo 17: Water quality Station WQ 18, a third-order tributary of the McKeand River, is located outside the current exploration activities' zone of influence.

Photo 18: Water quality Station WQ 19, a third-order watercourse of the McKeand River subwatershed, is located well outside the current exploration activities' zone of influence.

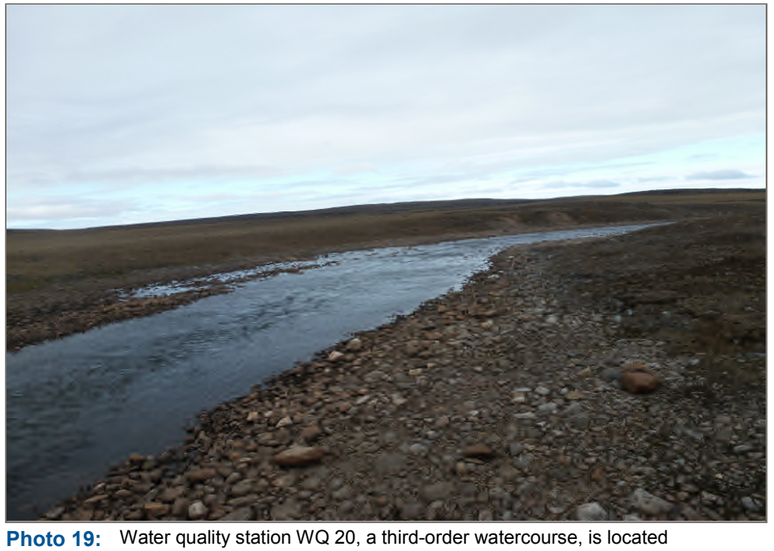


Photo 19: Water quality station WQ 20, a third-order watercourse, is located downstream from water quality station WQ 19 and near the inlet of Qamanialuk Lake (photo looking upstream away from Qamanialuk Lake).

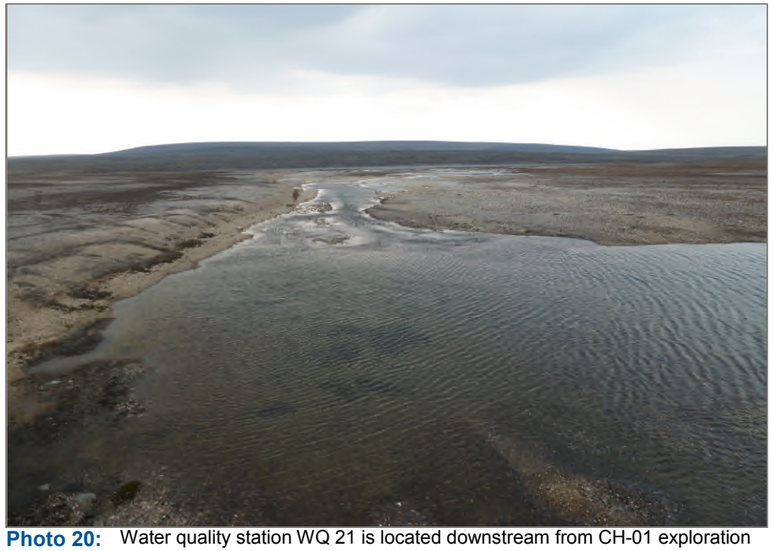


Photo 20: Water quality station WQ 21 is located downstream from CH-01 exploration activity site.

Photo 21: Water quality station WQ 22, a second-order tributary of the McKeand River, is located outside the current exploration activities' zone of influence.

Photo 22: Water quality station WQ 23, a second-order watercourse, is located within the Priority Area and downstream from proposed mine activity sites.

Photo 23: Water quality station WQ 24, a first-order watercourse, is located within the Priority Area and downstream from proposed mine activity sites.

Photo 24: Water quality station WQ 25 is located at the outflow of an unnamed Lake and outside the current exploration activities' zone of influence.

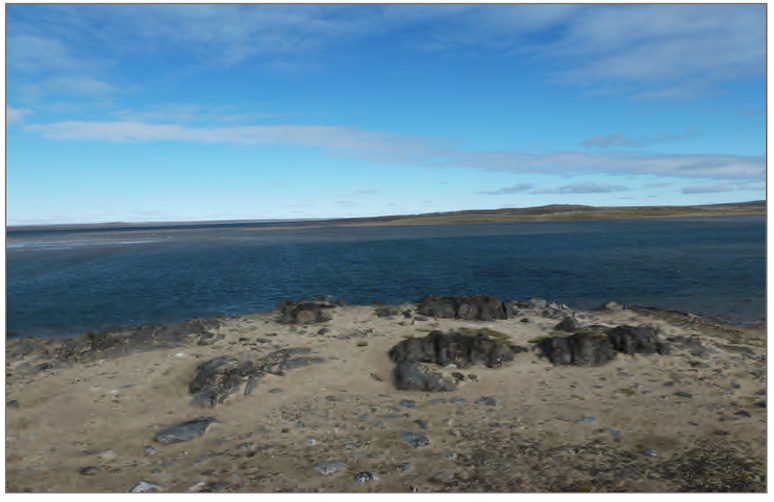


Photo 25: Water quality station WQ 26 is located on Qamanialuk Lake near the confluence with the McKeand River, and is the furthest downstream station from current exploration activities.

Photo 26: Water quality station WQ 27 is a second-order watercourse within the Chidliak Bay subwatershed and is well outside the current exploration activities' zone of influence.

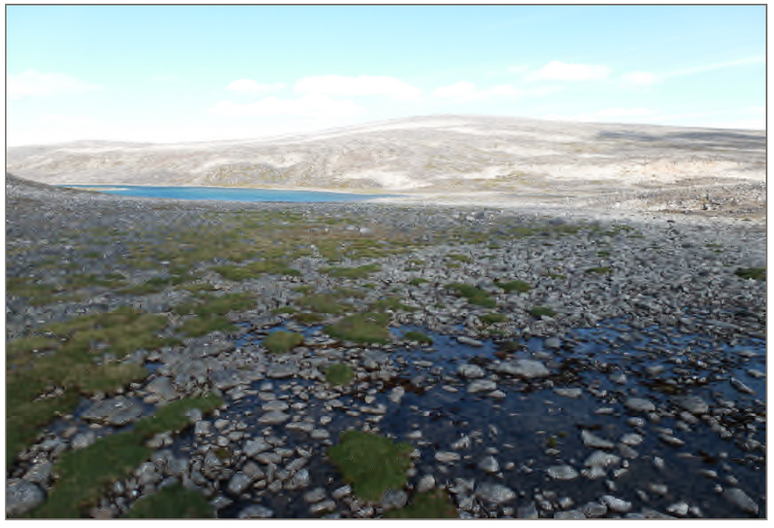


Photo 27: Water quality station WQ 28, within the Ptarmigan Fiord subwatershed, had restricted flow through boulders at the time of the August field event.

Photo 28: Water quality station WQ 29, is a second-order watercourse within the Popham Bay subwatershed, and is located immediately upstream of an unnamed lake.

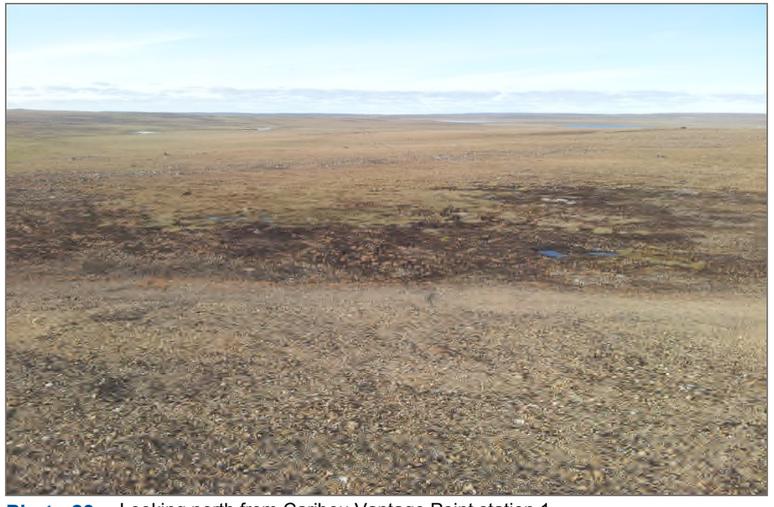


Photo 29: Looking north from Caribou Vantage Point station 1.

Photo 30: Looking north from Caribou Vantage Point station 2.

Photo 31: Looking north from Caribou Vantage Point station 3.

Photo 32: Looking north from Caribou Vantage Point station 4.

Photo 33: Looking north from Caribou Vantage Point station 5.

Photo 34: Looking north from Caribou Vantage Point station 6.

Photo 35: Within Nest Site 1, this scrape, as indicated by the arrow, was previously occupied by Peregrine Falcons.

Photo 36: This stick nest within Nest Site 2 appears to be in poor condition.

Photo 37: View northwest of the nearshore area of Glacier Lake, near minnow trap locations on the north shore. Boulder and cobble substrate of the bank and littoral zone are evident.

Photo 38: Sandy shore section at Glacier Lake near Minnow Trap 3 Location, view west.

Photo 39: View south of Sunrise Camp Lake from the north shore west of the camp, at the water quality sampling station.

Photo 40: Minnow trap being set in cover provided by boulder-dominated substrate at Sunshine Camp Lake.

Photo 41: View northwest of the Qamaniruluk Lake inlet, dominated by sandy and fine substrates.

Photo 42: Gill net 1 location at Qamaniruluk Lake, view east towards shore.

Photo 43: View north of Qamanialuk Lake by the confluence with the McKeand River. A minnow trap was placed adjacent to boulders in the foreground.

Photo 44: View west across Qamanialuk Lake from the shallow confluence with the McKeand River.

Photo 45: Minnow trap being set amongst boulders on the south bank at McKeand River Site.

Photo 46: Riffle and rapid features at McKeand Site 1 adjacent to periphyton and benthic invertebrate sampling locations, view south.

Photo 47: View upstream from the west bank at McKeand River Site 2. The substrate was dominated by cobble at this location where electrofishing of the river began.

Photo 48: View upstream from the east bank of McKeand River Site 2, downstream of the confluence with a tributary.

Photo 49: View west across the McKeand River from the east bank at Site 3.

Photo 50: View north (downstream) at McKeand Site 2 from the confluence with a tributary. The sandy substrate comprising the majority of the bank and shallow littoral is evident in the background.

Photo 51: View north across the McKeand River from the south bank of Site 4. Sand-dominated substrate with some gravels present shown in foreground.

Photo 52: View east (upstream) at McKeand River Site 4 from aquatic biota sampling location.

APPENDIX E
TAXONOMICAL METHODS

Analysis of biological samples:
Technical summary of methods
Prepared for Biologica Environmental Services Ltd.
Tara Macdonald, Project Manager
September 25, 2014

by
W. Bollman, Chief Biologist
Rhithron Associates, Inc.
Missoula, Montana

METHODS

Sample processing

Five periphyton samples were delivered to Rhithron's laboratory facility in Missoula, Montana on September 4, 2014. All samples arrived in good condition. Upon arrival, samples were unpacked and examined, and an inventory form was created. An electronic inventory spreadsheet was also created which included project code and internal laboratory identification numbers and was uploaded into the Rhithron database prior to sample processing.

Samples were thoroughly mixed by shaking. Permanent diatom slides were prepared: subsamples were taken and treated with 70% Nitric acid (HNO_3) and digested using a closed-vessel microwave digestion system (Milestone Ethos EZ), following the method developed by the Academy of Natural Sciences, Philadelphia (ANSP 2002). Samples were neutralized by rinses with distilled water, and subsample volumes were adjusted to obtain adequate densities. Small amounts of each sample were dried onto 22-mm square coverslips. Coverslips were mounted on slides using Naphrax diatom mount. To ensure a high quality mount for identification and to make replicates available for archives, 3 slide mounts were made from each sample. One of the replicates was selected from each sample batch for identification. A diamond scribe mark was made to define a transect line on the cover slip, and a minimum of 600 diatom valves were identified along the transect mark. A Leica DM 2500 compound microscope, Nomarski contrast, and 1000x magnification were used for identifications. Diatoms were identified to the lowest possible taxonomic level, generally species, following standard taxonomic references.

For soft-bodied (or non-diatom) algae samples, the raw periphyton sample was manually homogenized and emptied into a porcelain evaporating dish. A small, random sub-sample of algal material was pipetted onto a standard Palmer-Maloney microscope slide using a disposable pasture pipette. Visible (macroscopic) algae were also sub-sampled, in proportion to their estimated abundance relative to the total volume of algal material in the sample, and added to the liquid fraction on the slide. The Palmer-Maloney cell was then covered with a 22 x 30 mm coverslip.

Soft-bodied algae were identified to genus, where possible, using a Leica DM 2500 compound microscope under 200X and 400X magnification, following standard taxonomic references. Three hundred cells were counted and identified; live diatoms were included in the 300 count, allowing for the calculation of density estimates.

Data analysis

Taxa and raw counts were entered into Rhithron's customized database software. Density calculations were performed for diatoms and non-diatom algae. Diatom density estimates are expressed as number of valves per square centimeter. Non-diatom algae density estimates are expressed as number of cells per square centimeter.

Biovolume calculations were also performed for diatoms and non-diatom algae. Biovolume estimates are expressed as cubic micrometers per square centimeter.

Periphyton identifications, counts, density estimates and biovolume estimates were compiled in Microsoft Excel spreadsheets for electronic delivery to Biologica. A flat data format and a matrix format were provided.

RESULTS

Data analysis

Electronic spreadsheets were provided to the Biologica Project Manager via e-mail.

REFERENCES

ANSP. 2002. Protocols for the analysis of algal samples collected as part of the U.S. Geological Survey National Water-Quality Assessment Program. The Academy of Natural Sciences Patrick Center for Environmental Research: Report No. 02-06. May 2002.

Biologica
Environmental Services Ltd.
Marine & Freshwater Taxonomy

Methods: Freshwater Phytoplankton

Biologica's mission is to provide accurate and consistent taxonomic data to our clients.
We have rigorous quality control throughout our processing and analysis to ensure the highest possible standards of quality are met. This includes detailed attention to sample custody, analysis protocols, and high standards of precision and consistency for taxonomy and enumeration.

Upon receipt, all samples are checked against the client's chain of custody, if provided. If a client's chain of custody is unavailable, Biologica creates a sample receipt inventory with the above information. Any discrepancies are resolved before processing commences. Phytoplankton samples are immediately topped-up with fresh Lugol's solution to ensure the samples remain in good condition during the analysis period. Samples are stored in a cool (<10°C) and dark place to ensure their longevity. If they are not to be analyzed for a long period of time, these are stored in a refrigerator and fresh Lugol's solution added every 2 weeks.

Phytoplankton subsamples (usually 25-100 mL for phytoplankton) are dispensed into settling chambers and allowed to settle for a 24 hour period. Smaller or diluted volumes may be used for densely populated samples; sparsely populated samples may be centrifuged or settled to concentrate cells. Samples are examined with an inverted phase-contrast microscope calibrated for Kohler illumination.

The entire slide is scanned at increasing powers of magnification to determine which species/genera are present. These identifications are made using taxonomic keys that are reviewed bi-anually for updates and developments. Taxonomic names are that of www.algaebase.org. At least 10 random fields are counted, to obtain a total of at least 100 of the dominant species and a minimum of 300 cells counted. Randomness is assessed by comparing the counts to a Poisson distribution using a χ^2 test (Elliot 1977).

The total cell density is calculated from the total cell count by multiplication with the following microscope factor, F:

$$F = \frac{A / r^2 \pi N}{V}$$

where A= the area of the settling chamber
r= the radius of the microscope field
N= the number of microscope fields counted
V= the volume of sample settled

Subsampling accuracy is checked by repeated counts on 10% of samples. These samples are selected randomly, and a second subsample (equal to the same volume) is resettled, re-identified, and re-enumerated. In order for the batch of samples to be quantitatively acceptable duplicate analyses of subsamples, the relative standard difference should not exceed + or – 20% between the correctly identified individual taxa for internal precision control, in other words, the %Similarity must be at least

80%. Functionally internal taxonomy is kept at an agreement rate of >95% through collaboration, verification, and professional development.

Algal biovolume is calculated by measuring the dimensions of approximately 10-20 cells of each species (or restricted set thereof) enumerated (focusing on dominant and/or large taxa). Biovolume for each species is then generated by multiplying the mean dimensions of the cells by the number of cells enumerated in that sample. The total algal biovolume for the sample is a total of each calculated cell biovolume in the sample. This biomass assessment should be done independently for each batch of samples, as cell size is known to vary with nutrient level, season, and stage of the bloom.

Length and width measurements are taken for a minimum of 10-20 specimens per taxon. This is converted to biovolume using formula for volume based on the closest cell shape (e.g., cylinder, ellipsoid, sphere). Biovolume (in μm^3/cell) is converted to carbon content using one of the equations from Strathmann (1967), as recommended by Gosselaine et al. (2000):

Diatoms Log(pgC/cell): -0.422 + 0.758 (Log Biovolume (μm^3/cell))
Non-Diatom Algae Log(pgC/cell): -0.460 + 0.866 (Log Biovolume (μm^3/cell))

Methodological and Taxonomic References

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Biologica
Environmental Services Ltd.
Marine & Freshwater Taxonomy

Methods: Freshwater Zooplankton

Upon sample arrival, the samples and their numbers are double-checked against the chain of custody to ensure (1) all samples are accounted for, (2) each sample has the appropriate number of jars as indicated on the COC. Any discrepancies are reported to the client and are resolved before further sample handling. If samples arrive in formalin, these are sieved on a 63µm screen and placed in 70% denatured ethanol. At this stage, labelling is double-checked and samples are assigned unique numbers.

Freshwater zooplankton samples are analyzed in 3 fractions: (1) Organisms that are rare and/or exceed the size of 5mm are considered 'Macro' and are removed from the sample as a whole sort (2) A 'Copepod' fraction, in which a minimum count of 200-400 organisms is obtained and (3) a 'Micro' fraction, in which only the copepod nauplii and rotifers are identified. This is done processed to a minimum 100-count. Subsampling is performed with a Hensen-Stempel pipette. Generally a subsample for the Copepod fraction is 1/10 and the subsample for the Nauplii/Rotifer fraction is 1/100. If the minimum count is not reached in these subsamples, additional subsamples are taken.

The Macro and Copepod fraction are analyzed with a Bogorov tray and stereomicroscope at 10-40x magnification. All organisms are identified by taxonomic experts to the desired taxonomic level using a compound microscope (100-400x magnification), appropriate dissection tools, and standard taxonomic references. For copepods, the stage of development is also recorded (copepodites I-V) as is the sex for mature individuals (copepodite VI). The Micro fraction is analyzed using a Sedgewick-Rafter counting chamber, which holds a 1mL subsample. In this fraction, only copepod nauplii and rotifers are counted and identified. The volume and count is recorded for the whole sample or a partial sample, as soon as the 100-count is reached. If the 100-count is not obtained with a 1mL subsample, additional samples are analyzed.

Any taxa new to Biologica's reference collection are retained and sent for external verification. As an additional QA/QC measure, 10% of samples are re-analyzed in their entirety. This allows a comparison of the subsampling method as well as the taxonomic consistency.

Data are entered into an excel spreadsheet and cross-checked with bench sheets for any entry errors and delivered to the client.

If biovolume measurements are required, measurements and conversions are performed according to McCauley (1984). At least 20 individuals of each taxon for each project are measured, and their mean biomass calculated to convert abundance to biomass.

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Biologica
Environmental Services Ltd
Marine & Fresh Water Taxonomy

Methods - Freshwater Benthos

Biologica's mission is to provide accurate and consistent taxonomic data to our clients.We have rigorous quality control throughout our processing and analysis to ensure the highest possible standards are met. This includes detailed attention to sample custody, sampling protocols, high sorting efficiency (>95%), high standards of precision for subsampling, and consistent identifications that are with an >95% agreement with internal and external taxonomists.

Upon receipt, all samples were checked against the client's chain of custody and transferred into ethanol and stained with rose Bengal. Samples were sorted using a dissecting microscope. All debris in the sample/subsample is checked microscopically, including leaves, twigs, moss and other large debris. This is important as some insects are 'clingers' and are found adhering to the benthic substrate. All samples were sorted whole as they did not meet the minimum count required for subsampling (300 organisms).

Biologica's emphasis on sorting efficiency sets it apart from many other laboratories, guaranteeing 95% removal of organisms from the sample and all sample debris. This is the most important step in QA/QC procedures, as it the basis for all future analysis and interpretation. If not all organisms are guaranteed to be removed from the samples, their comparison and assessment may not be quantitatively meaningful. 25% of the debris from all samples was checked. Sorting effiency, as calucuated below, was >95%.

$$\text{Sorting efficiency} = \frac{[\text{Total count} - (\#\text{recovered on spot check})] \times 100\%}{\text{Total count}}$$

All organisms were identified using a combination of dissecting (10-40x) and compound microscopes (100-1000X) and standard taxonomic keys. All chironomids are cleared (using KOH) and slide-mounted in a permanent mounting medium. Specimens were identified by experienced (>2 years of independent taxonomy work), SFS-certified

During the identification process, both bulk identified specimens and voucher/reference specimens were placed in tightly-sealed vials with appropriate internal labeling, and organized into labeled boxes (specimens) or cornell trays (voucher/reference specimens). 1-2mL of glycerin is added to each vial to prevent complete desiccation, and topped up with clean 70-80% ethanol. Each vial is sealed with parafilm around the cap.

Biologica maintains in-house reference collections to enable our staff to assess morphological variation across large geographic regions. All taxa in this reference collection have been independently verified. New and unusual taxa are both confirmed in-house and sent

for external verification. Clients may also request external re-identification of whole samples, or to verify the identifications of randomly selected representative taxa, or new taxa for ongoing projects.

Data were entered into a spreadsheet and are completely double-checked against bench sheets for entry errors. These checked data sheets are kept filed for 10 years, along with our original bench sheets. Our electronic files are kept in duplicate in perpetuity, with backups performed every day.

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Last updated January 2014 by TM

APPENDIX F
SURFACE WATER QUALITY LABORATORY ANALYSIS

Tetra Tech EBA Inc.
ATTN: Karla Langlois
PO Box 2244 STN M
201- 4916 49 Street
Yellowknife NT X1A 2P7

Date Received: 12-AUG-14
Report Date: 21-AUG-14 14:07 (MT)
Version: FINAL

Client Phone: 867-920-2287

Certificate of Analysis

Lab Work Order #: L1500733

Project P.O. #: NOT SUBMITTED
Job Reference: ENVMIN03024
C of C Numbers: 1, 2, 3
Legal Site Desc:

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-1 HYDRO 1							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0372		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.021		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.15		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00241		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	0.0015		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921052
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.89		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.70		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	6.45		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-1 HYDRO 1							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Nitrate as N by IC							
Nitrate (as N)	0.228		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.228		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	0.23		0.21	mg/L		19-AUG-14	
L1500733-2 HYDRO 2							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		18-AUG-14	R2922386
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0419		0.0050	mg/L		18-AUG-14	R2922386
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		18-AUG-14	R2922386
Arsenic (As)-Total	<0.00040		0.00040	mg/L		18-AUG-14	R2922386
Barium (Ba)-Total	<0.0030		0.0030	mg/L		18-AUG-14	R2922386
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Boron (B)-Total	<0.050		0.050	mg/L		18-AUG-14	R2922386
Calcium (Ca)-Total	<0.50		0.50	mg/L		18-AUG-14	R2922386
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		18-AUG-14	R2922386
Copper (Cu)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Iron (Fe)-Total	0.043		0.010	mg/L		18-AUG-14	R2922386
Lead (Pb)-Total	<0.00010		0.00010	mg/L		18-AUG-14	R2922386
Lithium (Li)-Total	<0.010		0.010	mg/L		18-AUG-14	R2922386
Magnesium (Mg)-Total	0.12		0.10	mg/L		18-AUG-14	R2922386
Manganese (Mn)-Total	0.0021		0.0020	mg/L		18-AUG-14	R2922386
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		18-AUG-14	R2922386
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		18-AUG-14	R2922386
Potassium (K)-Total	<0.50		0.50	mg/L		18-AUG-14	R2922386
Selenium (Se)-Total	<0.00040		0.00040	mg/L		18-AUG-14	R2922386
Silver (Ag)-Total	<0.000020		0.000020	mg/L		18-AUG-14	R2922386
Sodium (Na)-Total	<1.0		1.0	mg/L		18-AUG-14	R2922386
Strontium (Sr)-Total	0.00174		0.00010	mg/L		18-AUG-14	R2922386
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		18-AUG-14	R2922386
Tin (Sn)-Total	<0.050		0.050	mg/L		18-AUG-14	R2922386
Titanium (Ti)-Total	0.0024		0.0010	mg/L		18-AUG-14	R2922386
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-AUG-14	R2922386
Vanadium (V)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		18-AUG-14	R2922386
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921052

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-2 HYDRO 2							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Organic Carbon	3.1		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	1.32		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.31		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	5.85		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	0.144		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.144		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-3 WQ3							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		20-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0105	RRV	0.0050	mg/L		19-AUG-14	R2923744
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	<0.10		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-3 WQ3							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00138	RRV	0.00010	mg/L		19-AUG-14	R2923744
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921052
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.29	RRV	0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.35		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	3.45		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-4 WQ4							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0165	RRV	0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-4 WQ4							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.016	RRV	0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.12	RRV	0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00241	RRV	0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921052
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.32	RRV	0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.31		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	4.98		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-5 WQ5							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-5 WQ5							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		20-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0130	RRV	0.0050	mg/L		19-AUG-14	R2923744
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.12	RRV	0.10	mg/L		19-AUG-14	R2923744
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00228	RRV	0.00010	mg/L		19-AUG-14	R2923744
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921052
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.23	RRV	0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.38		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	4.92		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-5 WQ5							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-6 WQ6							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		20-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0186	RRV	0.0050	mg/L		19-AUG-14	R2923744
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	<0.10		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00154	RRV	0.00010	mg/L		19-AUG-14	R2923744
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921052
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-6 WQ6							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.43	RRV	0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.21		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	3.42		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-7 WQ7							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		20-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0232	RRV	0.0050	mg/L		19-AUG-14	R2923744
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.025	RRV	0.010	mg/L		19-AUG-14	R2923744
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	<0.10		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-7 WQ7							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Strontium (Sr)-Total	0.00168	RRV	0.00010	mg/L		19-AUG-14	R2923744
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	0.0018	RRV	0.0010	mg/L		19-AUG-14	R2923744
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921052
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		17-AUG-14	R2922599
Turbidity	0.60	RRV	0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.30		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	3.83		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-8 WQ8							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0306		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-8 WQ8							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.030		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.15		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00232		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	0.0019		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921052
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.68		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.42		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	6.35		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-9 HYDRO 9							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-9 HYDRO 9							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		18-AUG-14	R2922386
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0583		0.0050	mg/L		18-AUG-14	R2922386
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		18-AUG-14	R2922386
Arsenic (As)-Total	<0.00040		0.00040	mg/L		18-AUG-14	R2922386
Barium (Ba)-Total	<0.0030		0.0030	mg/L		18-AUG-14	R2922386
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Boron (B)-Total	<0.050		0.050	mg/L		18-AUG-14	R2922386
Calcium (Ca)-Total	<0.50		0.50	mg/L		18-AUG-14	R2922386
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		18-AUG-14	R2922386
Copper (Cu)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Iron (Fe)-Total	0.057		0.010	mg/L		18-AUG-14	R2922386
Lead (Pb)-Total	<0.00010		0.00010	mg/L		18-AUG-14	R2922386
Lithium (Li)-Total	<0.010		0.010	mg/L		18-AUG-14	R2922386
Magnesium (Mg)-Total	0.12		0.10	mg/L		18-AUG-14	R2922386
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-AUG-14	R2922386
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		18-AUG-14	R2922386
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		18-AUG-14	R2922386
Potassium (K)-Total	<0.50		0.50	mg/L		18-AUG-14	R2922386
Selenium (Se)-Total	<0.00040		0.00040	mg/L		18-AUG-14	R2922386
Silver (Ag)-Total	<0.000020		0.000020	mg/L		18-AUG-14	R2922386
Sodium (Na)-Total	<1.0		1.0	mg/L		18-AUG-14	R2922386
Strontium (Sr)-Total	0.00192		0.00010	mg/L		18-AUG-14	R2922386
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		18-AUG-14	R2922386
Tin (Sn)-Total	<0.050		0.050	mg/L		18-AUG-14	R2922386
Titanium (Ti)-Total	0.0034		0.0010	mg/L		18-AUG-14	R2922386
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-AUG-14	R2922386
Vanadium (V)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		18-AUG-14	R2922386
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	1.68		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.03		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	6.16		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	0.223		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.223		0.054	mg/L		15-AUG-14	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-9 HYDRO 9							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	0.22		0.21	mg/L		19-AUG-14	
L1500733-10 HYDRO 10							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0243		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.014		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.13		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00205		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.55		0.10	NTU		13-AUG-14	R2917244

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-10 HYDRO 10							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
pH, Conductivity and Total Alkalinity							
pH	5.29		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	5.49		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	0.146		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.146		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-11 HYDRO 11							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	5.2			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	0.000015		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0209		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	0.0037		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	1.03		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.012		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.64		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00577		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-11 HYDRO 11							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.40		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.83		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	17.7		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	3.7		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-12 WQ12							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		18-AUG-14	R2922386
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0725		0.0050	mg/L		18-AUG-14	R2922386
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		18-AUG-14	R2922386
Arsenic (As)-Total	<0.00040		0.00040	mg/L		18-AUG-14	R2922386
Barium (Ba)-Total	0.0041		0.0030	mg/L		18-AUG-14	R2922386
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Boron (B)-Total	<0.050		0.050	mg/L		18-AUG-14	R2922386
Calcium (Ca)-Total	<0.50		0.50	mg/L		18-AUG-14	R2922386
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		18-AUG-14	R2922386
Copper (Cu)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-12 WQ12							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Iron (Fe)-Total	0.059		0.010	mg/L		18-AUG-14	R2922386
Lead (Pb)-Total	<0.00010		0.00010	mg/L		18-AUG-14	R2922386
Lithium (Li)-Total	<0.010		0.010	mg/L		18-AUG-14	R2922386
Magnesium (Mg)-Total	0.32		0.10	mg/L		18-AUG-14	R2922386
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-AUG-14	R2922386
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		18-AUG-14	R2922386
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		18-AUG-14	R2922386
Potassium (K)-Total	<0.50		0.50	mg/L		18-AUG-14	R2922386
Selenium (Se)-Total	<0.00040		0.00040	mg/L		18-AUG-14	R2922386
Silver (Ag)-Total	<0.000020		0.000020	mg/L		18-AUG-14	R2922386
Sodium (Na)-Total	<1.0		1.0	mg/L		18-AUG-14	R2922386
Strontium (Sr)-Total	0.00247		0.00010	mg/L		18-AUG-14	R2922386
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		18-AUG-14	R2922386
Tin (Sn)-Total	<0.050		0.050	mg/L		18-AUG-14	R2922386
Titanium (Ti)-Total	0.0034		0.0010	mg/L		18-AUG-14	R2922386
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-AUG-14	R2922386
Vanadium (V)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		18-AUG-14	R2922386
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	1.61		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.79		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	7.27		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	0.084		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.084		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-13 WQ13							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-13 WQ13							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0497		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.052		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.12		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00286		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	0.0019		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	1.1		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	1.09		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	6.11		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	5.89		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-13 WQ13							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-14 WQ15							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	0.000012		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0165		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	0.0043		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.18		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	0.0045		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00311		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.34		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.46		0.10	pH		13-AUG-14	R2916844

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-14 WQ15							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
pH, Conductivity and Total Alkalinity							
Conductivity (EC)	9.78		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	0.090		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.090		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-15 WQ16							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0276		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.024		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.15		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00200		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-15 WQ16							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Titanium (Ti)-Total	0.0019		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	1.1		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.77		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.23		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	6.25		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	0.085		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.085		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-16 WQ17							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		18-AUG-14	R2922386
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.139		0.0050	mg/L		18-AUG-14	R2922386
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		18-AUG-14	R2922386
Arsenic (As)-Total	<0.00040		0.00040	mg/L		18-AUG-14	R2922386
Barium (Ba)-Total	0.0054		0.0030	mg/L		18-AUG-14	R2922386
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Boron (B)-Total	<0.050		0.050	mg/L		18-AUG-14	R2922386
Calcium (Ca)-Total	<0.50		0.50	mg/L		18-AUG-14	R2922386
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		18-AUG-14	R2922386
Copper (Cu)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Iron (Fe)-Total	0.172		0.010	mg/L		18-AUG-14	R2922386

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-16 WQ17							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Lead (Pb)-Total	<0.00010		0.00010	mg/L		18-AUG-14	R2922386
Lithium (Li)-Total	<0.010		0.010	mg/L		18-AUG-14	R2922386
Magnesium (Mg)-Total	0.17		0.10	mg/L		18-AUG-14	R2922386
Manganese (Mn)-Total	0.0025		0.0020	mg/L		18-AUG-14	R2922386
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		18-AUG-14	R2922386
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		18-AUG-14	R2922386
Potassium (K)-Total	<0.50		0.50	mg/L		18-AUG-14	R2922386
Selenium (Se)-Total	<0.00040		0.00040	mg/L		18-AUG-14	R2922386
Silver (Ag)-Total	<0.000020		0.000020	mg/L		18-AUG-14	R2922386
Sodium (Na)-Total	1.1		1.0	mg/L		18-AUG-14	R2922386
Strontium (Sr)-Total	0.00261		0.00010	mg/L		18-AUG-14	R2922386
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		18-AUG-14	R2922386
Tin (Sn)-Total	<0.050		0.050	mg/L		18-AUG-14	R2922386
Titanium (Ti)-Total	0.0131		0.0010	mg/L		18-AUG-14	R2922386
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-AUG-14	R2922386
Vanadium (V)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		18-AUG-14	R2922386
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	3.73		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.68		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	8.17		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	0.173		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.173		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-17 WQ18							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		20-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-17 WQ18							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0150	RRV	0.0050	mg/L		19-AUG-14	R2923744
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.014	RRV	0.010	mg/L		19-AUG-14	R2923744
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	<0.10		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00170	RRV	0.00010	mg/L		19-AUG-14	R2923744
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.31	RRV	0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.51		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	4.17		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-17 WQ18							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-18 WQ19							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		20-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0140	RRV	0.0050	mg/L		19-AUG-14	R2923744
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.021	RRV	0.010	mg/L		19-AUG-14	R2923744
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.14	RRV	0.10	mg/L		19-AUG-14	R2923744
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00179	RRV	0.00010	mg/L		19-AUG-14	R2923744
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.41	RRV	0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.85		0.10	pH		13-AUG-14	R2916844

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-18 WQ19							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
pH, Conductivity and Total Alkalinity							
Conductivity (EC)	4.36		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-19 WQ20							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0171		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.039		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.17		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00218		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-19 WQ20							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Titanium (Ti)-Total	0.0011		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.58		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	6.05		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	5.08		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-20 WQ21							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		18-AUG-14	R2922386
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0782		0.0050	mg/L		18-AUG-14	R2922386
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		18-AUG-14	R2922386
Arsenic (As)-Total	<0.00040		0.00040	mg/L		18-AUG-14	R2922386
Barium (Ba)-Total	0.0031		0.0030	mg/L		18-AUG-14	R2922386
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Boron (B)-Total	<0.050		0.050	mg/L		18-AUG-14	R2922386
Calcium (Ca)-Total	<0.50		0.50	mg/L		18-AUG-14	R2922386
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		18-AUG-14	R2922386
Copper (Cu)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Iron (Fe)-Total	0.075		0.010	mg/L		18-AUG-14	R2922386

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-20 WQ21							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Lead (Pb)-Total	<0.00010		0.00010	mg/L		18-AUG-14	R2922386
Lithium (Li)-Total	<0.010		0.010	mg/L		18-AUG-14	R2922386
Magnesium (Mg)-Total	0.13		0.10	mg/L		18-AUG-14	R2922386
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		18-AUG-14	R2922386
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		18-AUG-14	R2922386
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		18-AUG-14	R2922386
Potassium (K)-Total	<0.50		0.50	mg/L		18-AUG-14	R2922386
Selenium (Se)-Total	<0.00040		0.00040	mg/L		18-AUG-14	R2922386
Silver (Ag)-Total	<0.000020		0.000020	mg/L		18-AUG-14	R2922386
Sodium (Na)-Total	<1.0		1.0	mg/L		18-AUG-14	R2922386
Strontium (Sr)-Total	0.00217		0.00010	mg/L		18-AUG-14	R2922386
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		18-AUG-14	R2922386
Tin (Sn)-Total	<0.050		0.050	mg/L		18-AUG-14	R2922386
Titanium (Ti)-Total	0.0049		0.0010	mg/L		18-AUG-14	R2922386
Uranium (U)-Total	<0.00010		0.00010	mg/L		18-AUG-14	R2922386
Vanadium (V)-Total	<0.0010		0.0010	mg/L		18-AUG-14	R2922386
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		18-AUG-14	R2922386
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	1.63		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.54		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	6.16		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	0.197		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.197		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-21 WQ22							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		19-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-21 WQ22							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		19-AUG-14	R2922386
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0984		0.0050	mg/L		19-AUG-14	R2922386
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Arsenic (As)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Barium (Ba)-Total	<0.0030		0.0030	mg/L		19-AUG-14	R2922386
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Boron (B)-Total	<0.050		0.050	mg/L		19-AUG-14	R2922386
Calcium (Ca)-Total	<0.50		0.50	mg/L		19-AUG-14	R2922386
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		19-AUG-14	R2922386
Copper (Cu)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Iron (Fe)-Total	0.089		0.010	mg/L		19-AUG-14	R2922386
Lead (Pb)-Total	<0.00010		0.00010	mg/L		19-AUG-14	R2922386
Lithium (Li)-Total	<0.010		0.010	mg/L		19-AUG-14	R2922386
Magnesium (Mg)-Total	0.18		0.10	mg/L		19-AUG-14	R2922386
Manganese (Mn)-Total	0.0022		0.0020	mg/L		19-AUG-14	R2922386
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		19-AUG-14	R2922386
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		19-AUG-14	R2922386
Potassium (K)-Total	<0.50		0.50	mg/L		19-AUG-14	R2922386
Selenium (Se)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Silver (Ag)-Total	<0.000020		0.000020	mg/L		19-AUG-14	R2922386
Sodium (Na)-Total	<1.0		1.0	mg/L		19-AUG-14	R2922386
Strontium (Sr)-Total	0.00274		0.00010	mg/L		19-AUG-14	R2922386
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		19-AUG-14	R2922386
Tin (Sn)-Total	<0.050		0.050	mg/L		19-AUG-14	R2922386
Titanium (Ti)-Total	0.0056		0.0010	mg/L		19-AUG-14	R2922386
Uranium (U)-Total	<0.00010		0.00010	mg/L		19-AUG-14	R2922386
Vanadium (V)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		19-AUG-14	R2922386
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	2.15		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	6.23		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	6.44		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	0.155		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.155		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-21 WQ22							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-22 WQ23							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		19-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		19-AUG-14	R2922386
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0703		0.0050	mg/L		19-AUG-14	R2922386
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Arsenic (As)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Barium (Ba)-Total	0.0036		0.0030	mg/L		19-AUG-14	R2922386
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Boron (B)-Total	<0.050		0.050	mg/L		19-AUG-14	R2922386
Calcium (Ca)-Total	<0.50		0.50	mg/L		19-AUG-14	R2922386
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		19-AUG-14	R2922386
Copper (Cu)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Iron (Fe)-Total	0.095		0.010	mg/L		19-AUG-14	R2922386
Lead (Pb)-Total	<0.00010		0.00010	mg/L		19-AUG-14	R2922386
Lithium (Li)-Total	<0.010		0.010	mg/L		19-AUG-14	R2922386
Magnesium (Mg)-Total	0.24		0.10	mg/L		19-AUG-14	R2922386
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		19-AUG-14	R2922386
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		19-AUG-14	R2922386
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		19-AUG-14	R2922386
Potassium (K)-Total	<0.50		0.50	mg/L		19-AUG-14	R2922386
Selenium (Se)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Silver (Ag)-Total	<0.000020		0.000020	mg/L		19-AUG-14	R2922386
Sodium (Na)-Total	<1.0		1.0	mg/L		19-AUG-14	R2922386
Strontium (Sr)-Total	0.00307		0.00010	mg/L		19-AUG-14	R2922386
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		19-AUG-14	R2922386
Tin (Sn)-Total	<0.050		0.050	mg/L		19-AUG-14	R2922386
Titanium (Ti)-Total	0.0051		0.0010	mg/L		19-AUG-14	R2922386
Uranium (U)-Total	<0.00010		0.00010	mg/L		19-AUG-14	R2922386
Vanadium (V)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		19-AUG-14	R2922386
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	1.60		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	6.00		0.10	pH		13-AUG-14	R2916844

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-22 WQ23							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
pH, Conductivity and Total Alkalinity							
Conductivity (EC)	9.31		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	0.081		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.081		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-23 WQ24							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		19-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		19-AUG-14	R2922386
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0737		0.0050	mg/L		19-AUG-14	R2922386
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Arsenic (As)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Barium (Ba)-Total	<0.0030		0.0030	mg/L		19-AUG-14	R2922386
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Boron (B)-Total	<0.050		0.050	mg/L		19-AUG-14	R2922386
Calcium (Ca)-Total	<0.50		0.50	mg/L		19-AUG-14	R2922386
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		19-AUG-14	R2922386
Copper (Cu)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Iron (Fe)-Total	0.071		0.010	mg/L		19-AUG-14	R2922386
Lead (Pb)-Total	<0.00010		0.00010	mg/L		19-AUG-14	R2922386
Lithium (Li)-Total	<0.010		0.010	mg/L		19-AUG-14	R2922386
Magnesium (Mg)-Total	0.14		0.10	mg/L		19-AUG-14	R2922386
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		19-AUG-14	R2922386
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		19-AUG-14	R2922386
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		19-AUG-14	R2922386
Potassium (K)-Total	<0.50		0.50	mg/L		19-AUG-14	R2922386
Selenium (Se)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Silver (Ag)-Total	<0.000020		0.000020	mg/L		19-AUG-14	R2922386
Sodium (Na)-Total	<1.0		1.0	mg/L		19-AUG-14	R2922386
Strontium (Sr)-Total	0.00180		0.00010	mg/L		19-AUG-14	R2922386
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		19-AUG-14	R2922386
Tin (Sn)-Total	<0.050		0.050	mg/L		19-AUG-14	R2922386

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-23 WQ24							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Titanium (Ti)-Total	0.0047		0.0010	mg/L		19-AUG-14	R2922386
Uranium (U)-Total	<0.00010		0.00010	mg/L		19-AUG-14	R2922386
Vanadium (V)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		19-AUG-14	R2922386
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	1.82		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.46		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	5.61		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	0.123		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.123		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-24 WQ25							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0237		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.024		0.010	mg/L		17-AUG-14	R2920902

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-24 WQ25							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.19		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	0.0028		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00250		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	0.0013		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.70		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	6.10		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	5.42		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-25 WQ26							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-25 WQ26							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0533		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.026		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.19		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	0.0036		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	0.0028		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00223		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	0.0010		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.55		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.33		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	5.54		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-25 WQ26							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-26 WQ27							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	2.4			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0402		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	0.0068		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	0.53		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.099		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.25		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	0.0021		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00432		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	0.0025		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	2.2		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	1.12		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	6.19		0.10	pH		13-AUG-14	R2916844

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-26 WQ27							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
pH, Conductivity and Total Alkalinity							
Conductivity (EC)	8.78		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-27 WQ28							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	3.4			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0128		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	0.0052		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	0.78		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.35		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	0.0029		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00513		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-27 WQ28							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.30		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.49		0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	13.2		0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	0.076		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.076		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-28 WQ29							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0468		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.044		0.010	mg/L		17-AUG-14	R2920902

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-28 WQ29							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.14		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00160		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	0.0034		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		17-AUG-14	R2921202
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.74		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.22		0.10	pH		14-AUG-14	R2916844
Conductivity (EC)	5.43		0.20	uS/cm		14-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		14-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	0.077		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.077		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	19-AUG-14	19-AUG-14	R2923514
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		19-AUG-14	
L1500733-29 CH6 TRENCH							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	4.2			mg/L		20-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-29 CH6 TRENCH							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		19-AUG-14	R2922386
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.239		0.0050	mg/L		19-AUG-14	R2922386
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Arsenic (As)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Barium (Ba)-Total	0.0064		0.0030	mg/L		19-AUG-14	R2922386
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Boron (B)-Total	<0.050		0.050	mg/L		19-AUG-14	R2922386
Calcium (Ca)-Total	0.68		0.50	mg/L		19-AUG-14	R2922386
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		19-AUG-14	R2922386
Copper (Cu)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Iron (Fe)-Total	0.308		0.010	mg/L		19-AUG-14	R2922386
Lead (Pb)-Total	0.00013		0.00010	mg/L		19-AUG-14	R2922386
Lithium (Li)-Total	<0.010		0.010	mg/L		19-AUG-14	R2922386
Magnesium (Mg)-Total	0.61		0.10	mg/L		19-AUG-14	R2922386
Manganese (Mn)-Total	0.0051		0.0020	mg/L		19-AUG-14	R2922386
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		19-AUG-14	R2922386
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		19-AUG-14	R2922386
Potassium (K)-Total	<0.50		0.50	mg/L		19-AUG-14	R2922386
Selenium (Se)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Silver (Ag)-Total	<0.000020		0.000020	mg/L		19-AUG-14	R2922386
Sodium (Na)-Total	<1.0		1.0	mg/L		19-AUG-14	R2922386
Strontium (Sr)-Total	0.00712		0.00010	mg/L		19-AUG-14	R2922386
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		19-AUG-14	R2922386
Tin (Sn)-Total	<0.050		0.050	mg/L		19-AUG-14	R2922386
Titanium (Ti)-Total	0.0187		0.0010	mg/L		19-AUG-14	R2923744
Uranium (U)-Total	<0.00010		0.00010	mg/L		19-AUG-14	R2922386
Vanadium (V)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		19-AUG-14	R2922386
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		18-AUG-14	R2922128
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	3.8		3.0	mg/L		15-AUG-14	R2921185
Turbidity	10.8		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	6.38		0.10	pH		14-AUG-14	R2916844
Conductivity (EC)	12.1		0.20	uS/cm		14-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	2.6		2.0	mg/L		14-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	0.314		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.314		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-29 CH6 TRENCH							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	20-AUG-14	20-AUG-14	R2923769
Total Nitrogen (Calculation)							
Total Nitrogen	0.31		0.21	mg/L		20-AUG-14	
L1500733-30 CH6 OUTFLOW							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	5.7			mg/L		19-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		19-AUG-14	R2922386
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.287		0.0050	mg/L		19-AUG-14	R2922386
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Arsenic (As)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Barium (Ba)-Total	0.0078		0.0030	mg/L		19-AUG-14	R2922386
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Boron (B)-Total	<0.050		0.050	mg/L		19-AUG-14	R2922386
Calcium (Ca)-Total	0.72		0.50	mg/L		19-AUG-14	R2922386
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		19-AUG-14	R2922386
Copper (Cu)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Iron (Fe)-Total	0.360		0.010	mg/L		19-AUG-14	R2922386
Lead (Pb)-Total	0.00013		0.00010	mg/L		19-AUG-14	R2922386
Lithium (Li)-Total	<0.010		0.010	mg/L		19-AUG-14	R2922386
Magnesium (Mg)-Total	0.94		0.10	mg/L		19-AUG-14	R2922386
Manganese (Mn)-Total	0.0066		0.0020	mg/L		19-AUG-14	R2922386
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		19-AUG-14	R2922386
Nickel (Ni)-Total	0.0022		0.0020	mg/L		19-AUG-14	R2922386
Potassium (K)-Total	0.56		0.50	mg/L		19-AUG-14	R2922386
Selenium (Se)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Silver (Ag)-Total	<0.000020		0.000020	mg/L		19-AUG-14	R2922386
Sodium (Na)-Total	1.1		1.0	mg/L		19-AUG-14	R2922386
Strontium (Sr)-Total	0.0103		0.00010	mg/L		19-AUG-14	R2922386
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		19-AUG-14	R2922386
Tin (Sn)-Total	<0.050		0.050	mg/L		19-AUG-14	R2922386
Titanium (Ti)-Total	0.0247		0.0010	mg/L		19-AUG-14	R2922386
Uranium (U)-Total	<0.00010		0.00010	mg/L		19-AUG-14	R2922386
Vanadium (V)-Total	0.0011		0.0010	mg/L		19-AUG-14	R2922386
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		19-AUG-14	R2922386
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		18-AUG-14	R2922128
Total Organic Carbon	1.6		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	13.3		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	6.56		0.10	pH		14-AUG-14	R2916844

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-30 CH6 OUTFLOW							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
pH, Conductivity and Total Alkalinity							
Conductivity (EC)	15.8		0.20	uS/cm		14-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	3.4		2.0	mg/L		14-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	0.363		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.363		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	20-AUG-14	20-AUG-14	R2923769
Total Nitrogen (Calculation)							
Total Nitrogen	0.36		0.21	mg/L		20-AUG-14	
L1500733-31 DUPLICATE 1							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		19-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		19-AUG-14	R2922386
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0591		0.0050	mg/L		19-AUG-14	R2922386
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Arsenic (As)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Barium (Ba)-Total	<0.0030		0.0030	mg/L		19-AUG-14	R2922386
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Boron (B)-Total	<0.050		0.050	mg/L		19-AUG-14	R2922386
Calcium (Ca)-Total	<0.50		0.50	mg/L		19-AUG-14	R2922386
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		19-AUG-14	R2922386
Copper (Cu)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Iron (Fe)-Total	0.056		0.010	mg/L		19-AUG-14	R2922386
Lead (Pb)-Total	<0.00010		0.00010	mg/L		19-AUG-14	R2922386
Lithium (Li)-Total	<0.010		0.010	mg/L		19-AUG-14	R2922386
Magnesium (Mg)-Total	0.13		0.10	mg/L		19-AUG-14	R2922386
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		19-AUG-14	R2922386
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		19-AUG-14	R2922386
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		19-AUG-14	R2922386
Potassium (K)-Total	<0.50		0.50	mg/L		19-AUG-14	R2922386
Selenium (Se)-Total	<0.00040		0.00040	mg/L		19-AUG-14	R2922386
Silver (Ag)-Total	<0.000020		0.000020	mg/L		19-AUG-14	R2922386
Sodium (Na)-Total	<1.0		1.0	mg/L		19-AUG-14	R2922386
Strontium (Sr)-Total	0.00199		0.00010	mg/L		19-AUG-14	R2922386
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		19-AUG-14	R2922386
Tin (Sn)-Total	<0.050		0.050	mg/L		19-AUG-14	R2922386

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-31 DUPLICATE 1							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Titanium (Ti)-Total	0.0038		0.0010	mg/L		19-AUG-14	R2922386
Uranium (U)-Total	<0.00010		0.00010	mg/L		19-AUG-14	R2922386
Vanadium (V)-Total	<0.0010		0.0010	mg/L		19-AUG-14	R2922386
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		19-AUG-14	R2922386
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		18-AUG-14	R2922128
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	1.56		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.33		0.10	pH		14-AUG-14	R2916844
Conductivity (EC)	6.14		0.20	uS/cm		14-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		14-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	0.216		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	0.216		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	20-AUG-14	20-AUG-14	R2923769
Total Nitrogen (Calculation)							
Total Nitrogen	0.22		0.21	mg/L		20-AUG-14	
L1500733-32 DUPLICATE 2							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0221		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.022		0.010	mg/L		17-AUG-14	R2920902

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-32 DUPLICATE 2							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.19		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	0.0029		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00241		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	0.0016		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		18-AUG-14	R2922128
Total Organic Carbon	<1.0		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.62		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	6.14		0.10	pH		14-AUG-14	R2916844
Conductivity (EC)	5.18		0.20	uS/cm		14-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		14-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	20-AUG-14	20-AUG-14	R2923769
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		20-AUG-14	
L1500733-33 DUPLICATE 3							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	5.0			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-33 DUPLICATE 3							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	0.000011		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0207		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	0.0038		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	0.94		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	0.014		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	0.63		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	0.00503		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	0.0011		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		18-AUG-14	R2922128
Total Organic Carbon	1.9		1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	0.46		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.54		0.10	pH		14-AUG-14	R2916844
Conductivity (EC)	17.6		0.20	uS/cm		14-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		14-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		14-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-33 DUPLICATE 3							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	20-AUG-14	20-AUG-14	R2923769
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		20-AUG-14	
L1500733-34 FIELD BLANK							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	<0.10		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		18-AUG-14	R2922128
Total Organic Carbon	<1.0		1.0	mg/L		20-AUG-14	R2924042
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	<0.10		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.37	RRV	0.10	pH		13-AUG-14	R2916844

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-34 FIELD BLANK							
Sampled By: KL on 09-AUG-14 @ 12:00							
Matrix: Surface Water							
pH, Conductivity and Total Alkalinity							
Conductivity (EC)	0.98	RRV	0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	20-AUG-14	20-AUG-14	R2923769
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		20-AUG-14	
L1500733-35 TRAVEL BLANK							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
TOT Metals CCME Fresh Water Aquatic Life							
Hardness (from Total Ca and Mg)							
Hardness (as CaCO3)	<1.3			mg/L		18-AUG-14	
Mercury (Hg)							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-AUG-14	R2923482
Total Cd in Water by CCMS (CCME - FAL)							
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L		17-AUG-14	R2920902
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Arsenic (As)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Barium (Ba)-Total	<0.0030		0.0030	mg/L		17-AUG-14	R2920902
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Boron (B)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902
Calcium (Ca)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Copper (Cu)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Iron (Fe)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Lead (Pb)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Lithium (Li)-Total	<0.010		0.010	mg/L		17-AUG-14	R2920902
Magnesium (Mg)-Total	<0.10		0.10	mg/L		17-AUG-14	R2920902
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		17-AUG-14	R2920902
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		17-AUG-14	R2920902
Potassium (K)-Total	<0.50		0.50	mg/L		17-AUG-14	R2920902
Selenium (Se)-Total	<0.00040		0.00040	mg/L		17-AUG-14	R2920902
Silver (Ag)-Total	<0.000020		0.000020	mg/L		17-AUG-14	R2920902
Sodium (Na)-Total	<1.0		1.0	mg/L		17-AUG-14	R2920902
Strontium (Sr)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Tin (Sn)-Total	<0.050		0.050	mg/L		17-AUG-14	R2920902

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1500733-35 TRAVEL BLANK							
Sampled By: KL on 08-AUG-14 @ 12:00							
Matrix: Surface Water							
Total Metals in Water by CRC ICPMS							
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Uranium (U)-Total	<0.00010		0.00010	mg/L		17-AUG-14	R2920902
Vanadium (V)-Total	<0.0010		0.0010	mg/L		17-AUG-14	R2920902
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		17-AUG-14	R2920902
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.050		0.050	mg/L		18-AUG-14	R2922152
Oil and Grease	<1.0		1.0	mg/L		18-AUG-14	R2922128
Total Organic Carbon	1.6	RRV	1.0	mg/L		19-AUG-14	R2922966
Phosphorus (P)-Total	<0.020		0.020	mg/L	14-AUG-14	15-AUG-14	R2920505
Total Suspended Solids	<3.0		3.0	mg/L		15-AUG-14	R2921185
Turbidity	<0.10		0.10	NTU		13-AUG-14	R2917244
pH, Conductivity and Total Alkalinity							
pH	5.40	RRV	0.10	pH		13-AUG-14	R2916844
Conductivity (EC)	0.79	RRV	0.20	uS/cm		13-AUG-14	R2916844
Bicarbonate (HCO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Carbonate (CO3)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Hydroxide (OH)	<5.0		5.0	mg/L		13-AUG-14	R2916844
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		13-AUG-14	R2916844
Total Nitrogen							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		13-AUG-14	R2917262
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.054		0.054	mg/L		15-AUG-14	
Nitrite as N by IC							
Nitrite (as N)	<0.020		0.020	mg/L		13-AUG-14	R2917262
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	20-AUG-14	20-AUG-14	R2923769
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		20-AUG-14	

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TOT-ORG-ED	Water	Total Organic Carbon	APHA 5310 B-Instrumental
CD-T-CCMS-FAL-ED	Water	Total Cd in Water by CCMS (CCME - FAL)	APHA 3030 B&E / EPA SW-846 6020A
ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
HG-T-L-CVAA-ED	Water	Mercury (Hg)	EPA 245.7 / EPA 245.1
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
N-T-CALC-ED	Water	Total Nitrogen (Calculation)	APHA 4500 N-Calculated
Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)]			
NH3-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)
This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.			
NO2+NO3-CALC-ED	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-ED	Water	Nitrite as N by IC	APHA 4110 B-ION CHROMATOGRAPHY
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
NO3-IC-ED	Water	Nitrate as N by IC	APHA 4110 B-ION CHROMATOGRAPHY
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
OGG-LLE-ED	Water	Oil and Grease-Gra	APHA 5520 B HEXANE MTBE EXT. GRAVIME
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320
All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)			
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
TKN-CFA-ED	Water	TKN in Water by Colour	APHA 4500-NORG (TKN)
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 celcius with analysis using an automated colourimetric finish.			
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer

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

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

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA

Chain of Custody Numbers:

1 2 3

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS 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 (Rush for routine analysis subject to availability)
Company:	Tetra Tech EBA Inc.	☐ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Karla Langlois	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	PO Box 2244, 4916-49 Street	Email 1: karla.langlois@tetratech.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Yellowknife, NT X1A 3X4	Email 2:	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	867.920.2287 Fax:	Email 3:	
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #: ENVMIN03024	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Peregrine Diamonds Ltd.	PO / AFE:	
Contact:	David Willis	LSD:	
Address:	Suite 201-1250 Homer Street, Vancouver, BC V6B 1C6		
Phone:	604.408.8880 Fax:	Quote #: Q46418	

Lab Work Order # (lab use only): L1500733

ALS Contact:

Sampler: KL

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals (ultra-low)	Total Mercury (low)	TSS (low)	Nutrients/TOC	Routine	Oil and Grease	Number of Containers
	Hydro 1	8/08/14		Surface Water	X	X	X	X	X	X	6
	Hydro 2	↓		↓	↓	↓	↓	↓	↓	↓	↓
	WQ3										
	WQ4										
	WQ5										
	WQ6	9/08/14									
	WQ7	9/08/14									
	WQ8	9/08/14									
	Hydro 9	8/08/14									
	Hydro 10	↓									
	Hydro 11	9/08/14									
	WQ12	8/08/14									

L1500733-COFC

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

~~See Quote~~. Change to Quote. No low level or ultra level analysis required. Only Regular analysis). please. Didn't preserve any of the oil + grease samples.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Karla Langlois	11/08/14	10:00		12-Aug-14	1210	→ °C				

Cooler Temps

1) 12.1 max 11.1 avg
2) 13.0 max 11.0 avg
3) 9.6 max 7.0 avg
4) 10.9 max 10.0 avg
5) 9.1 max 7.0 avg
6) 11.4 max 10.0 avg
7) 12.3 max 11.0 avg
8) 9.0 max 8.0 avg

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Tetra Tech EBA Inc.	☐ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Karla Langlois	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	PO Box 2244, 4916-49 Street	Email 1: karla.langlois@tetratech.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Yellowknife, NT X1A 3X4	Email 2:	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	867.920.2287 Fax:	Email 3:	
Invoice To	Same as Report ? ☐ Yes ☑ No	**Client / Project Information**	**Analysis Request**
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #: ENVMIN03024	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Peregrine Diamonds Ltd.	PO / AFE:	
Contact:	David Willis	LSD:	
Address:	Suite 201-1250 Homer Street, Vancouver, BC V6B 1C6		
Phone:	604.408.8880 Fax:	Quote #: Q46418	
Lab Work Order # (lab use only)	L1500733	**ALS Contact:**	**Sampler:** KL

Sample #	Sample Identification (This descri...)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals (ultra-low)	Total Mercury (low)	TSS (low)	Nutrients/TOC	Routine	Oil and Grease	Number of Containers
	WQ13	8/08/14		Surface Water	X	X	X	X	X	X	6
	WQ15	9/08/14		↓	↓	↓	↓	↓	↓	↓	↓
	WQ16	↓		↓							
	WQ17	8/08/14		↓							
	WQ18	↓		↓							
	WQ19	9/08/14		↓							
	WQ20	8/08/14		↓							
	WQ21	↓		↓							
	WQ22	9/08/14		↓							
	WQ23	8/08/14		↓							
	WQ24	↓		↓							
	WQ25	9/08/14		↓							

L1500733-COFC

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

~~See Quote~~ Change to Quote. No low level or ultra level analysis required. Only Regular analysis pleas
Didn't preserve any of the QTG samples.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Karla Langlois	11/08/14	10:00		12-Aug-14	1210	See page 1 °C				

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

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COC # _____

Page 3 of 3

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Tetra Tech EBA Inc.	☐ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Karla Langlois	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	PO Box 2244, 4916-49 Street	Email 1: karla.langlois@tetratech.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Yellowknife, NT X1A 3X4	Email 2:	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	867.920.2287 Fax:	Email 3:	
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☐ Yes ☑ No	Job #: ENVMIN03024	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Peregrine Diamonds Ltd.	PO / AFE:	
Contact:	David Willis	LSD:	
Address:	Suite 201-1250 Homer Street, Vancouver, BC V6B 1C6		
Phone:	604.408.8880 Fax:	Quote #: Q46418	
Lab Work Order # (lab use only)	L1500733	ALS Contact:	Sampler: KL

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals (ultra-low)	Total Mercury (low)	TSS (low)	Nutrients/TOC	Routine	Oil and Grease	Number of Containers
	WQ26	9/08/14		Surface Water	X	X	X	X	X	X	10
	WQ27	↓		↓	↓	↓	↓	↓	↓	↓	↓
	WQ28	↓		↓	↓	↓	↓	↓	↓	↓	↓
	WQ29	↓		↓	↓	↓	↓	↓	↓	↓	↓
	~~Free~~ CH6 Trench	9/08/14		↓	↓	↓	↓	↓	↓	↓	↓
	CH6 Outflow	↓		↓	↓	↓	↓	↓	↓	↓	↓
	Duplicate 1	8/08/14		↓	↓	↓	↓	↓	↓	↓	↓
	Duplicate 2	9/08/14		↓	↓	↓	↓	↓	↓	↓	↓
	Duplicate 3	↓		↓	↓	↓	↓	↓	↓	↓	↓
	Field Blank	9/08/14		↓	↓	↓	↓	↓	↓	↓	↓
	Travel Blank			↓	↓	↓	↓	↓	↓	↓	4

L1500733-COFC

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

See Quote. ~~Change to Quote~~. No low level or ultra level analyses required. Only ~~Regular~~ analysis please.
Didn't preserve any of the O&G samples

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Karla Langlois	11/08/14	10:00		12-Aug-14	12:10	Surface °C				

APPENDIX G
POTABLE WATER QUALITY LABORATORY ANALYSIS

Your Project #: ENVMIN03024
Site#: DISCOVERY CAMP
Site Location: CHIDLIAK
Your C.O.C. #: 47983601, 479836-01-01

Attention:Karla Langlois

EBA, A Terratech Company
#201 4916 49 Street
Box 2244
Yellowknife, NT
CANADA X1A 2P7

Report Date: 2014/08/14
Report #: R3121914
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B4E3591
Received: 2014/08/12, 09:45

Sample Matrix: Water
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Total Coliforms/ E. coli, CFU/100mL (1)	7	N/A	2014/08/13	CAM SOP-00551	MOE E3407
Fecal coliform, (CFU/100mL) (1)	7	N/A	2014/08/13	CAM SOP-00552	SM 9222D

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Analytics Mississauga

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Parnian Baber, Project Manager
Email: pbaber@maxxam.ca
Phone# (613) 274-0573

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B4E3591
Report Date: 2014/08/14

EBA, A Terratech Company
Client Project #: ENVMIN03024
Site Location: CHIDLIAK
Sampler Initials: KL

MICROBIOLOGY (WATER)

Maxxam ID		XB4394	XB4395	XB4396	XB4397	XB4398	XB4399	
Sampling Date		2014/08/11 08:43	2014/08/11 08:52	2014/08/11 08:55	2014/08/11 08:57	2014/08/11 09:00	2014/08/11 08:53	
COC Number		479836-01-01	479836-01-01	479836-01-01	479836-01-01	479836-01-01	479836-01-01	
	Units	RAW WATER	DRY 1	DRY 2	KITCHEN	BATHROOM	DUPLICATE 1	QC Batch
Microbiological								
Fecal coliform	CFU/100mL	0	0	0	0	0	0	3709440
Background	CFU/100mL	36	120	0	0	170	0	3709428
Total Coliforms	CFU/100mL	150	190	0	0	390	0	3709428
Escherichia coli	CFU/100mL	0	0	0	0	0	0	3709428
QC Batch = Quality Control Batch								

Maxxam ID		XB4400	
Sampling Date		2014/08/11 08:45	
COC Number		479836-01-01	
	Units	FIELD BLANK	QC Batch
Microbiological			
Fecal coliform	CFU/100mL	0	3709440
Background	CFU/100mL	0	3709428
Total Coliforms	CFU/100mL	0	3709428
Escherichia coli	CFU/100mL	0	3709428
QC Batch = Quality Control Batch			

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B4E3591
Report Date: 2014/08/14

EBA, A Terratech Company
Client Project #: ENVMIN03024
Site Location: CHIDLIAK
Sampler Initials: KL

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B4E3591
Report Date: 2014/08/14

EBA, A Terratech Company
Client Project #: ENVMIN03024
Site Location: CHIDLIAK
Sampler Initials: KL

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Vimukthi Gunawardhan

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

APPENDIX H
PERIPHYTON TAXONOMY RESULTS

EBA - Tetratech 2014 Periphyton

Prepared by Biologica Environmental Services Ltd.

Periphyton determinations by Rhithron Associates, Inc.

			BIOL14NWT001 MKR01 8/8/2014			BIOL14NWT002 MKR02 8/8/2014			BIOL14NWT003 MKR03 8/9/2014			BIOL14NWT004 MKR04 8/9/2014			BIOL14NWT005 Dup01 8/9/2014		
Portion	**Taxon**	**Total**	**Count**	**Density (#/cm2)**	**Total Biovolume (um3/cm2)**	**Count**	**Density (#/cm2)**	**Total Biovolume (um3/cm2)**	**Count**	**Density (#/cm2)**	**Total Biovolume (um3/cm2)**	**Count**	**Density (#/cm2)**	**Total Biovolume (um3/cm2)**	**Count**	**Density (#/cm2)**	**Total Biovolume (um3/cm2)**
Algae	*Calothrix*	*615*	285	497033	61634	211	143921	45631	32	20444	6920	59	7254	12759	28	3309	6055
	Cosmarium	*3*										2	246	8383	1	118	4192
	Dinobryon	*9*							4	2555	11024	4	492	11024	1	118	2756
	Geitlerinema	*75*							28	17888	869	14	1721	435	33	3900	1025
	Heteroleibleinia	*25*	7	12208	59	11	7503	92				7	861	59			
	Komvophoron	*17*													17	2009	615
	Leptolyngbya	*38*							30	19166	120	3	369	12	5	591	20
	Oscillatoria	*10*										10	1229	372			
	Phormidium	*98*	8	13952	617	27	18416	2084	41	26194	3165	16	1967	1235	6	709	463
	Pseudanabaena	*334*				40	27284	329	81	51748	665	60	7377	493	153	18083	1257
Diatoms	*Achnanthes*	*2*										2	51	16235			
	Achnanthes rechtensis	*116*				36	450	2519	26	2325	1819	38	973	2658	16	177	1119
	Achnanthes taeniata	*270*	6	17	361	28	350	1683	162	14490	9737	42	1076	2524	32	353	1923
	Achnanthidium kriegeri	*6*				4	50	39							2	22	19
	Achnanthidium minutissimum	*2*							2	179	28						
	Achnanthidium saprophila	*126*	6	17	157	36	450	942	36	3220	942	22	564	576	26	287	681
	Aulacoseira	*20*				8	100	2623	8	716	2623				4	44	1311
	Aulacoseira distans	*72*	72	209	9323												
	Chamaepinnularia	*4*										4	102	33			
	Encyonema silesiacum	*6*	6	17	833												
	Eolimna minima	*16*	12	35	252							4	102	84			
	Eunotia	*110*				12	150	3325	28	2504	7759	40	1025	11084	30	331	8313
	Eunotia bilunaris	*204*	36	105	8507	20	250	4726	26	2325	6144	50	1281	11815	72	794	17013
	Eunotia denticulata	*2*													2	22	90
	Eunotia exigua	*2*													2	22	141
	Eunotia glacialis	*8*													8	88	608
	Eunotia incisa	*2*							2	179	292						
	Eunotia intermedia	*14*							6	537	2018	8	205	2691			
	Eunotia muscicola	*62*	54	157	4795	8	100	710									
	Eunotia muscicola v. tridentula	*16*				8	100	1763	8	716	1763						
	Eunotia naegelii	*24*							6	537	2288	2	51	763	16	177	6101
	Eunotia rhomboidea	*26*	12	35	2144	4	50	715				8	205	1429	2	22	357
	Eunotia subarcuatoides	*28*				12	150	344				6	154	172	10	110	286
	Eunotia superpaludosa	*22*				12	150	940	4	358	313				6	66	470
	Eunotia tenella	*6*	6	17	1258												
	Frustulia crassinervia	*2*										2	51	641			
	Frustulia rhomboides	*88*	6	17	10480	20	250	34935	22	1968	38428	32	820	55896	8	88	13974
	Frustulia saxonica	*22*	12	35	9752							4	102	3251	6	66	4876
	Gomphonema	*4*										4	102	910			
	Gomphonema hebridense	*2*													2	22	174
	Navicula	*6*													6	66	729
	Navicula brekkaensis v. brekkaensoides	*6*	6	17	152												
	Neidium ampliatum	*20*							10	894	36600	2	51	7320	8	88	29280
	Neidium bisulcatum	*2*							2	179	123						
	Neidium hercynicum	*12*	12	35	19776												
	Nitzschia perminuta	*10*							6	537	278	2	51	93	2	22	93
	Pinnularia	*8*										8	205	8191			
	Pinnularia grunowii	*12*				8	100	1949				4	102	975			
	Pinnularia microstauron	*2*							2	179	766						
	Pinnularia obscura	*6*	6	17	1278												
	Psammothidium	*14*				8	100	126	4	358	63				2	22	31
	Psammothidium altaicum	*310*	102	296	3679							50	1281	1803	158	1743	5698
	Psammothidium bioretii	*40*	12	35	2054				4	358	685	18	461	3081	6	66	1027
	Psammothidium helveticum	*448*	42	122	7930	140	1751	26434	76	6798	14350	98	2510	18504	92	1015	17371
	Psammothidium marginulatum	*174*	42	122	800	40	500	762	30	2683	571	52	1332	990	10	110	190
	Psammothidium subatomoides	*116*	54	157	1816							44	1127	1480	18	199	605
	Stauroneis kriegeri	*10*							2	179	142	4	102	284	4	44	284
	Tabellaria flocculosa	*520*	96	279	23295	196	2451	47560	128	11449	31059	50	1281	12133	50	552	12133
	Total count	**3000**	**600**	**1744**	**108640**	**600**	**7503**	**132093**	**600**	**53665**	**158791**	**600**	**15368**	**165615**	**600**	**6619**	**124900**
	Total taxa	**51**	**23**			**20**			**27**			**33**			**34**		

APPENDIX I
PHYTOPLANKTON TAXONOMY RESULTS

EBA - Tetratech 2014 Phytoplankton

Prepared by Biologica Environmental Services Ltd.

Sample site				GL01	GL01	GL01	YL01	YL01	YL01	Dup1	Dup1	Dup1	Dup1	Dup1	Dup1
Replicate				1	1	1	1	1	1	1	1	1	QA	QA	QA
Biologica sample #				14-28-01	14-28-01	14-28-01	14-28-02	14-28-02	14-28-02	14-28-03	14-28-03	14-28-03	14-28-03	14-28-03	14-28-03
Date collected				7/25/2014	7/25/2014	7/25/2014	7/20/2014	7/20/2014	7/20/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Date analysed				9/24/2014	9/24/2014	9/24/2014	9/22/2014	9/22/2014	9/22/2014	9/25/2014	9/25/2014	9/25/2014	9/25/2014	9/25/2014	9/25/2014
Subsample Volume				100ml	100ml	100ml	100ml	100ml	100ml	100ml	100ml	100ml	100ml	100ml	100ml
Microscope Factor				0.2910	0.2910	0.2910	0.4365	0.4365	0.4365	0.2910	0.2910	0.2910	0.2910	0.2910	0.2910
Counted				30 fields	30 fields	30 fields	20 fields	20 fields	20 fields	30 fields	30 fields	30 fields	30 fields	30 fields	30 fields
units				raw count	cells/ml	biovolume (µl)	raw count	cells/ml	biovolume (µl)	raw count	cells/ml	biovolume (µl)	raw count	cells/ml	biovolume (µl)
Phylum	**Order**	**Taxon**	**Total**												
Bacillariophyta	Centrales	*Urosolenia eriensis*	70				36	15.71	0.0000320	34	9.89	0.0000202	47	13.68	0.0000279
Bacillariophyta	Pennales	*Achanthes* sp.	3							3	0.87			<0.29	
Bacillariophyta	Pennales	*Cymbella* sp.	1	1	0.29										
Bacillariophyta	Pennales	*Synedra* sp.	5				2	0.87		3	0.87		2	0.58	
Bacillariophyta	Pennales	*Tabellaria flocculosa*	58	42	12.22	0.0000846		<0.29		16	4.66	0.0000322	16	4.66	0.0000322
Bacillariophyta	Pennales	UID Pennate diatom	6				3	1.31		3	0.87		2	0.58	
Chlorophyta	Chlamydomonadales	*Fusola viridis*	197				94	41.03	0.0000009	103	29.97	0.0000007	82	23.86	0.0000005
Chlorophyta	Chlorellales	*Actinastrum hantzschii*	2							2	0.58		1	0.29	
Chlorophyta	Chlorellales	*Oocystis* sp.	3	3	0.87										
Chlorophyta	Chlorococcales	*Coelastrum* sp.	1	1	0.29										
Chlorophyta	Desmidiales	*Cosmarium* spp.	3	1	0.29			<0.29		2	0.58		1	0.29	
Chlorophyta	Desmidiales	*Euastrum* sp.	1				1	0.44							
Chlorophyta	Desmidiales	*Spondylosium* sp.	21				21	9.17					7	2.04	
Chlorophyta	Desmidiales	*Staurodesmus* sp.	212	4	1.16	0.0000016	103	44.96	0.0000608	105	30.55	0.0000414	110	32.01	0.0000433
Chlorophyta	Sphaeropleales	*Ankistrodesmus* cf. *falcatus*	32				25	10.91		7	2.04		5	1.45	
Chlorophyta	Sphaeropleales	*Crucegenia* sp.	70	4	1.16		32	13.97		34	9.89		28	8.15	
Chrysophyta	Chromulinales	*Chrysolykos* sp.	20	15	4.36			<0.29		5	1.45		6	1.75	
Chrysophyta	Chromulinales	*Dinobryon* spp.	281	206	59.94	0.0000121	40	17.46	0.0000035	35	10.18	0.0000021	34	9.89	0.0000020
Chrysophyta	Hibberdiales	*Bitrichia* sp.	27				9	3.93		18	5.24		22	6.40	
Chrysophyta		UID Chrysophyte	13	2	0.58					11	3.20		2	0.58	
Cryptophyta	Cryptomonadales	*Rhodomonas minuta*	45				14	6.11		31	9.02		26	7.57	
Cryptophyta	Cryptomonadales	UID Cryptophyte <20µm	18	2	0.58		8	3.49		8	2.33		3	0.87	
Cryptophyta	Cryptomonadales	UID Cryptophyte >20µm	1							1	0.29				
Cyanophyta	Chroococcales	*Chroococcus* spp.	82	23	6.69	0.0000004	51	22.26	0.0000014	8	2.33	0.0000001	16	4.66	0.0000003
Cyanophyta		UID Cyanophyte colony*	5				4	1.75		1	0.29		4	1.16	
Dinoflagelata		UID dinoflagellate	18	9	2.62		3	1.31		6	1.75		1	0.29	
Euglenophyta	Euglenales	*Euglena* sp.	1	1	0.29			<0.29			<0.29				
Euglenophyta	Euglenales	*Mallomonas* sp.	2	2	0.58										
		Total Count	**1198**	**316**		**0.0000987**	**446**		**0.0000987**	**436**		**0.0000966**	**415**		**0.0001063**
		Total Density (cells/mL)	**534.24**		**91.95**			**194.66**			**126.87**			**120.76**	
		Total Taxa	**23**	**14**			**13**			**16**			**16**		
MEMO		UID flagellate	9	5	1.45		2	0.87		2	0.58		4	1.16	
MEMO		*Ciliate* spp.	5	3	0.87		2	0.87			<0.29		1	0.29	
MEMO		Cyclops	5							5	0.05		4	0.04	

UID = unidentified due to lack of size and / or missing morphological characters.
cf. = confertim, possibly for species
* = 50-100 cells/colony
** = 2-50 cells/filament

Microscope Calibration Factors:
Samples were analysed using a Zeiss Televal 31 inverted phase contrast microscope at 200x magnification.
Calibration done with a micrometer slide.
Procedure:
100ml of preserved sample is settled in a Utermohl type settling chamber for >24hrs.
Chamber is scanned at increasing magnification to get a list of present species.
A minimum of 100 of the dominant cells and 300 total cells counted (20 or 30 fields).
Samples counts enumerated using the following formula:

Cells/ml = CF

$$F = \frac{A / r2\ \pi\ N}{V}$$

where:

A= the area of the settling chamber = 530930400 µm²
r= the radius of the field @ 200x = 440 µm
N= the number of fields counted 20 30
V= the volume settled 100
C= the number of cells counted

for 20 fields F = 0.436466942
for 30 fields F = 0.290977961

area of 1 field 608213.76

APPENDIX J
ZOOPLANKTON TAXONOMY RESULTS

EBA - Tetratech 2014 Zooplankton

Prepared by Biologica Environmental Services Ltd.

						GL 01						YL 01						Dup 01					
Groupcode	**Major Group**	**Family**	**Taxon**	**Stage**	**Total Number**	**Whole**	1/100 Rep 1	1/100 Rep 2	1/100 Rep 3	1/100 **Mean**	**Total**	**Whole**	1/100 Rep 1	1/100 Rep 2	1/100 Rep 3	1/100 **Mean**	**Total**	**6/10**	1/100 Rep 1	1/100 Rep 2	1/100 Rep 3	1/100 **Mean**	**Total**
CRCL	Crustacea Cladocera	Bosminidae	*Bosmina longirostris*	VIf	3							1					1	1					2
CRCL	Crustacea Cladocera	Bosminidae	*Bosmina longirostris*	J	1							1					1						
CRCL	Crustacea Cladocera	Daphniidae	*Daphnia longiremis*	VIf	10													6					10
CRCL	Crustacea Cladocera	Daphniidae	*Daphnia longiremis*	J	20							3					3	10					17
CRCO	Crustacea Copepoda Calanoida	Diaptomidae	*Leptodiaptomus tyrelli*	VIm	71							11					11	36					60
CRCO	Crustacea Copepoda Calanoida	Diaptomidae	*Leptodiaptomus tyrelli*	VIf	115							18					18	58					97
CRCO	Crustacea Copepoda Calanoida		Calanoida indet.	I-IV	8	1					1	4					4	2					3
CRCO	Crustacea Copepoda Calanoida		Calanoida indet.	V	89							27					27	37					62
CRCO	Crustacea Copepoda Cyclopoida	Cyclopidae	*Diacyclops* sp.	VIm	117							30					30	52					87
CRCO	Crustacea Copepoda Cyclopoida	Cyclopidae	*Diacyclops* sp.	VIf	72							17					17	33					55
CRCO	Crustacea Copepoda Cyclopoida		Cyclopoida indet.	I-IV	45							8					8	22					37
CRCO	Crustacea Copepoda Cyclopoida		Cyclopoida indet.	V	230							48					48	109					182
CRCO	Crustacea Copepoda Calanoida		Calanoida indet.	Nauplius	100														1	1		1	100
CRCO	Crustacea Copepoda Cyclopoida		Cyclopoida indet.	Nauplius	100															1		1	100
ROTI	Rotifera		Rotifera indet.	n/a	100									1	1	1	100						
ROTI	Rotifera	Brachionidae	*Kellicottia* sp.	n/a	1350		1		2	1.5	150		7	5	6	6	600		7	4	7	6	600
ROTI	Rotifera	Brachionidae	*Keratella* sp.	n/a	100		1			1	100												
				Total Count	**2529**	**1**	**2**		**2**	**2.5**	**251**	**168**	**7**	**6**	**7**	**7**	**868**	**366**	**8**	**6**	**7**	**8**	**1410**
				Total Taxa	**6**						**3**						**5**						**5**

Note: Due to low numbers of rotifers a mean count from three replicates was calculated.

Abreviation	**Definition**
Total Number of Taxa	Number of taxa present, not including fish eggs or higher-order taxa of which there are identified lower-level taxa (e.g. not including Calanoida indet. if *Microcalanus* sp. present).
metatrochophore	earlyt stage of annelida larva with 2-3 segments, appearing as a trochophore with segments
nectochaete	annelidan larval stage with >3 segments, appearing ready to settle (i.e. juvenile form)
cyphonautes	bryozoan larval stage
polyp	polyp stage
nectophore	medusoid locomotory structure of a siphonophore
nauplius	crustacean early larval stage
cypris	Cirripede larval stage that is ready to settle
III	Calanoid copepod stage 3; with 3 abdominal segments
IV	Calanoid copepod stage 4: with 4 abdominal segments
V	Calanoid copepod stage 5: with 5 abdominant segments
VIf	Calanoid copepod Stage 6 (reproductive, adult stage), with 6 abdominal segments. Female.
VIm	Calanoid copepod Stage 6 (reproductive, adult stage), with 6 abdominal segments. Male.
zoea	decapod larva
juv	juvenile;a non-larva without adult features
adult	Animal of reproductive size with adult features
cydippid	ctenophore larva of any stage
veliger	gastropod larval stage with shell and velar lobes
CRCL	Crustacea Cladocera
CRCO	Crustacea Copepoda
ROTI	Rotifera

APPENDIX K
BENTHIC INVERTEBRATE TAXONOMY RESULTS

EBA - Tetratech 2014 Benthos

Prepared by Biologica Environmental Services Ltd.

Phylum	Major Group	Family	Taxon	Stage	Total	MKR01 Whole	MKR02 Whole	MKR03 Whole	MKR04 Whole	Dup01 Whole
Annelida	Oligochaeta	Enchytraeidae	Enchytraeidae indet.	A	3		1	2		
Arthropoda	Acari	Hygrobatidae	*Hygrobates* sp.	A	49			39	4	6
Arthropoda	Acari	Lebertiidae	*Lebertia* sp.	A	1			1		
Arthropoda	Acari	Sperchontidae	*Sperchon* sp.	A	8		5	1	2	
Arthropoda	Acari		Hydrachnidae indet.	Deut	2		1		1	
Arthropoda	Coleoptera	Elmidae	Elmidae indet.	L	1	1				
Arthropoda	Collembola	Isotomidae	Isotomidae indet.	A	7		7			
Arthropoda	Diptera	Chironomidae	Chironomidae indet.	L	5		2		1	2
Arthropoda	Diptera	Chironomidae	Chironomidae indet.	P	23		9	10	4	
Arthropoda	Diptera	Chironomidae	Chironomini indet.	L	3			3		
Arthropoda	Diptera	Chironomidae	*Corynoneura* sp.	L	13		8	2	3	
Arthropoda	Diptera	Chironomidae	*Cricotopus/Orthocladius* sp. complex	L	74	2	46	17	4	5
Arthropoda	Diptera	Chironomidae	*Diamesa* sp.	L	3	2	1			
Arthropoda	Diptera	Chironomidae	Diamesinae indet.	L	1		1			
Arthropoda	Diptera	Chironomidae	*Eukiefferiella* sp.	L	10	3	5	2		
Arthropoda	Diptera	Chironomidae	*Hydrobaenus* sp.	L	5	1	1	3		
Arthropoda	Diptera	Chironomidae	*Micropsectra* sp.	L	3			1	1	1
Arthropoda	Diptera	Chironomidae	Orthocladiinae indet.	L	30		12	8	5	5
Arthropoda	Diptera	Chironomidae	*Paratanytarsus* sp.	L	2		2			
Arthropoda	Diptera	Chironomidae	*Phaenopsectra* sp.	L	1			1		
Arthropoda	Diptera	Chironomidae	*Procladius* sp.	L	1			1		
Arthropoda	Diptera	Chironomidae	*Psectrocladius* sp.	L	7		3	3		1
Arthropoda	Diptera	Chironomidae	Tanytarsini indet.	L	4		4			
Arthropoda	Diptera	Chironomidae	*Tanytarsus* sp.	L	1				1	
Arthropoda	Diptera	Chironomidae	*Tvetenia* sp.	L	12		6		4	2
Arthropoda	Diptera	Simuliidae	*Helodon* sp.	L	9		9			
Arthropoda	Diptera	Simuliidae	Simuliidae indet.	L	1		1			
Arthropoda	Diptera	Simuliidae	*Twinnia* sp.	L	15	15				
Arthropoda	Diptera	Tipulidae	*Dicranota* sp.	L	1			1		
Arthropoda	Diptera		Diptera indet.	P	6		3		1	2
Arthropoda	Ephemeroptera	Ephemerellidae	Ephemerellidae indet.	N	1	1				
Arthropoda	Plecoptera		Plecoptera indet.	A	1		1			
Arthropoda	Tricoptera	Leptoceridae	*Oecitis* sp.	L	1	1				
Arthropoda	Tricoptera	Limnephilidae	Limnephilidae indet.	L	1			1		
			Total count		**305**	**26**	**128**	**96**	**31**	**24**
			Total taxa		**26**	**8**	**13**	**14**	**7**	**5**
MEMO			Copepoda indet.	A	38	37	1			
MEMO			Ostracoda indet.	A	1		1			
MEMO			Nematoda indet.	A	39		14	23	1	1
MEMO			Insecta indet. Terrestrial	A	7	3		4		
MEMO			Acari indet. Terrestrial	A	6		6			
MEMO			Invertebrate indet.	egg	3		3			
MEMO			Invertebrate indet.	egg mass	3		1	2		

Abreviation	Definition
Ad	Adult
Int	Intermediate
J	Juvenile
L	Larvae
N	Nymph
P	Pupae
Deut	Deutonymph
Col	Colony
MEMO	Incidental organisms, not sampled accurately with grab samplers

APPENDIX L
DOMINANT AQUATIC ORGANISMS PHOTOS

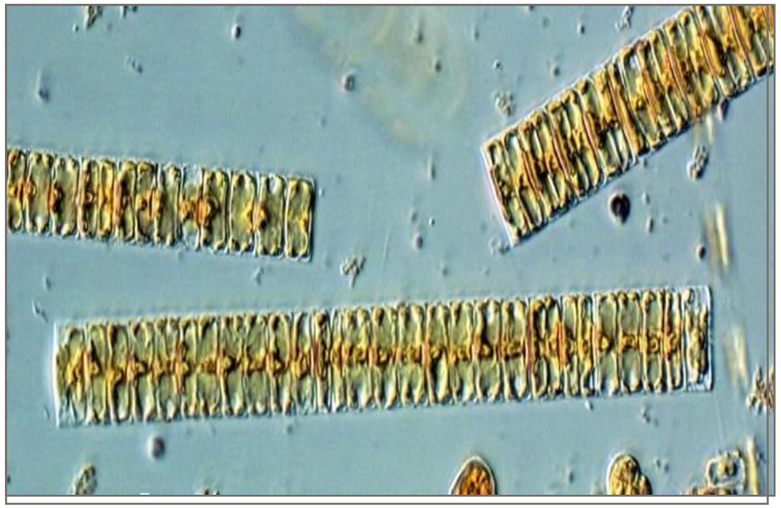

Photo 1: *Achnanthes taeniata*
This diatom was one of the more dominant diatom taxa present at each of the four McKeand River sites. Photo courtesy of Seija Hällfors.

Photo 2: *Pseudanabaena catenata*
This is an example of a cyanobacteria from the genus Pseudanabaena . Cyanobacteria comprised between 22% and 33% of all periphyton taxa at each of the McKeand River sites. Photo courtesy of Antonio Guillén.

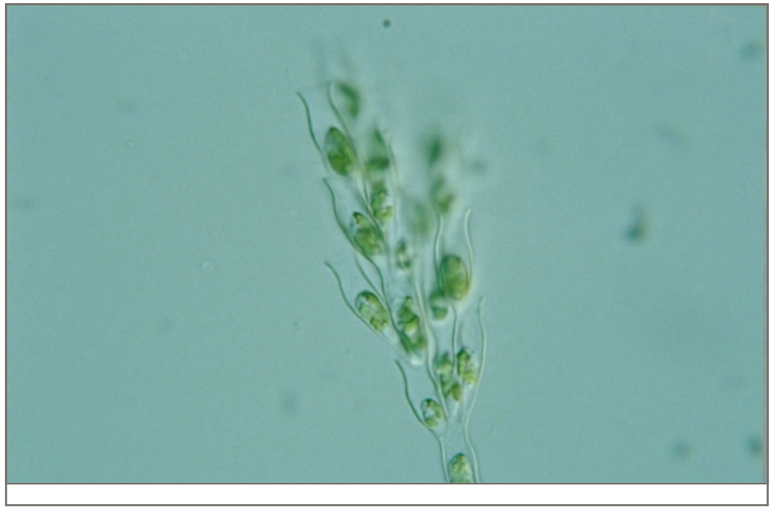

Photo 3: *Dinobryon sertularia*
Chrysophytes comprised nearly 71% of the phytoplankton sample taken at Glacier Lake, and the genus Dinobryon was the dominant group of chrysophytes. Photo courtesy of Mida-ga-hara Gassan Yamagata.

Photo 4: *Fusola viridis*
This species was the second most dominant green algae (chlorophytes) sampled in Qamaniruluk Lake. Photo courtesy of František Hindák.

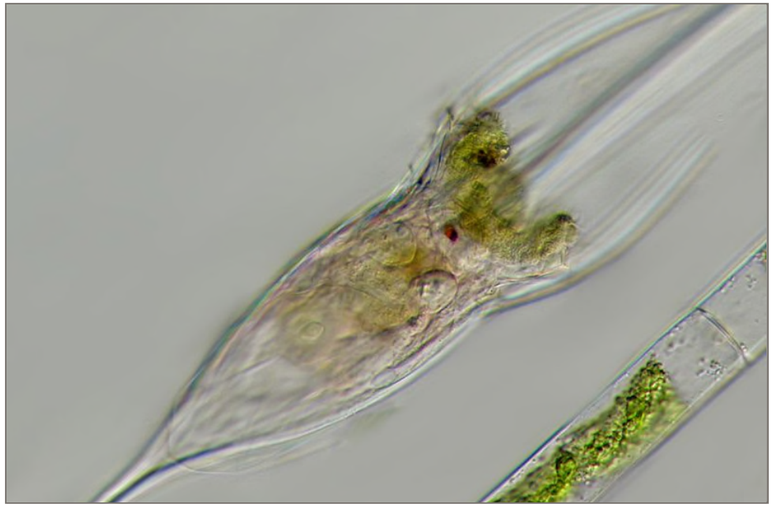

Photo 5: *Kellicottia longispina*
Rotifers of the genus Kellicottia were the dominant group in both the Glacier Lake and the Qamaniruluk Lake sample, comprising 60% and 69% respectively. Photo courtesy of Dr. R. Wagner.

Photo 6: *Diacyclops bicuspidatus odessanus*
Cyclopoid copepods from the genus Diacyclops were the most abundant identified group in the Qamaniruluk Lake sample. Photo courtesy of CFB.

Photo 7: *Cricotopus lebetis*
Dipterans of the chironomid family were generally the most abundant group at McKeand River sites, with the genus Cricotopus comprising the majority of specimens. Photo courtesy of Jerry F. Butler.

Photo 8: *Hygrobates*
Water mites (Acari) comprised between 13% and 41% of benthic invertebrate sample from McKeand River Sites 2, 3 and 4. Photo courtesy of Elora Wellington.

APPENDIX M
FISH BIOMETRIC DATA

Location	Date Sampled	Date Processed	Gear	Species	FishID	Length (cm)	Weight (g)	Condition	Sex	Age	Ageing Structures	Tissue Taken	Other Comments	Photos
Glacier Lake	8-Aug-14	9-Aug-14	GN	Arctic Char	GLAR01	25.1	164	1.04	M	12	OT	Y		
Glacier Lake	8-Aug-14	9-Aug-14	GN	Arctic Char	GLAR02	34.5	365	0.89	F	9	OT	Y		
Glacier Lake	8-Aug-14	9-Aug-14	GN	Arctic Char	GLAR03	29.8	233	0.88	F	ns	OT	Y		
Glacier Lake	8-Aug-14	9-Aug-14	GN	Arctic Char	GLAR04	18.6	75	1.17	F	5	OT	Y		
Glacier Lake	8-Aug-14	9-Aug-14	GN	Arctic Char	GLAR05	29.4	238	0.94	M	11	OT	Y		180
Glacier Lake	8-Aug-14	9-Aug-14	GN	Arctic Char	GLAR06	30.0	245	0.91	M	6	OT	Y	Parasites	196, 197
Glacier Lake	8-Aug-14	9-Aug-14	GN	Arctic Char	GLAR07	29.0	216	0.89	F	17	OT	Y		198
Glacier Lake	8-Aug-14	9-Aug-14	MT	Arctic Char	GLAR08	9.2	6	0.77	-	2	FR	Y		
Glacier Lake	8-Aug-14	9-Aug-14	MT	Arctic Char	GLAR09	14.8	33	1.02	F	4	FR	Y		130, 172
Glacier Lake	8-Aug-14	9-Aug-14	MT	Arctic Char	GLAR10	13.8	23	0.88	M	3	FR	Y		175
Glacier Lake	8-Aug-14	9-Aug-14	MT	Arctic Char	GLAR11	12.2	15	0.83	-	-	-	N		127-129, 174
Glacier Lake	8-Aug-14	9-Aug-14	MT	Arctic Char	GLAR12	12.2	13	0.72	-	-	-	N		173
Glacier Lake	8-Aug-14	9-Aug-14	MT	Arctic Char	GLAR13	11.0	11	0.83	-	-	-	N		
Glacier Lake	8-Aug-14	9-Aug-14	MT	Arctic Char	GLAR14	10.9	11	0.85	-	-	-	N		
Glacier Lake	8-Aug-14	9-Aug-14	MT	Arctic Char	GLAR15	7.8	4	0.84	-	-	-	N		176
Glacier Lake	8-Aug-14	9-Aug-14	GN	Arctic Char	GLAR16	20.2	64	0.78	-	-	-	N		
Glacier Lake	8-Aug-14	9-Aug-14	GN	Arctic Char	GLAR17	23.2	107	0.86	-	-	-	N		
Glacier Lake	8-Aug-14	9-Aug-14	GN	Arctic Char	GLAR18	21.5	74	0.74	-	-	-	N		
Glacier Lake	8-Aug-14	9-Aug-14	GN	Arctic Char	GLAR19	28.2	196	0.87	-	-	-	N		
Glacier Lake	8-Aug-14	9-Aug-14	GN	Arctic Char	GLAR20	19.3	57	0.79	-	-	-	N		
Glacier Lake	8-Aug-14	9-Aug-14	GN	Arctic Char	GLAR21	14.5	26	0.85	-	-	-	N		
Glacier Lake	8-Aug-14	9-Aug-14	GN	Arctic Char	GLAR22	14.8	25	0.77	-	-	-	N		
Glacier Lake	8-Aug-14	9-Aug-14	GN	Arctic Char	GLAR23	15.4	30	0.82	-	-	-	N		
Glacier Lake	8-Aug-14	9-Aug-14	GN	Arctic Char	GLAR24	29.6	225	0.87	-	-	-	N		
Sunrise Camp Lake	9-Aug-14	10-Aug-14	MT	Arctic Char	SLAR01	12.3	15	0.81	-	2	FR	Y		
Qamaniruluk Lake	10-Aug-14	11-Aug-14	GN	Arctic Char	YLAR01	58.8	2008	0.99	M	15	OT	Y	Duplicate 1 for fish tissue; Duplicate 2 for ageing (pelvic FR); parasites	199, 200
Qamaniruluk Lake	10-Aug-14	11-Aug-14	GN	Arctic Char	YLAR02	57.7	1745	0.91	F	15	FR	Y	Parasites	201; 202-203
Qamaniruluk Lake	10-Aug-14	11-Aug-14	GN	Arctic Char	YLAR03	56.2	1573	0.89	F	16	OT	Y		
Qamaniruluk Lake	10-Aug-14	11-Aug-14	GN	Arctic Char	YLAR04	54.7	1623	0.99	F	14	OT	Y		
Qamaniruluk Lake	10-Aug-14	11-Aug-14	GN	Arctic Char	YLAR05	54.4	1629	1.01	F	11	OT	Y		
Qamaniruluk Lake	10-Aug-14	11-Aug-14	GN	Arctic Char	YLAR06	51.6	1331	0.97	F	19	OT	Y		206
Qamaniruluk Lake	10-Aug-14	11-Aug-14	GN	Arctic Char	YLAR07	36.8	436	0.87	M	5	OT	Y	Some bile on liver	
Qamaniruluk Lake	10-Aug-14	11-Aug-14	GN	Arctic Char	YLAR08	42.3	613	0.81	F	19	OT	Y	Duplicate 2 for fish tissue	207
Qamaniruluk Lake	10-Aug-14	11-Aug-14	GN	Arctic Char	YLAR09	34.8	375	0.89	M	12	OT	Y	Duplicate 1 for aging	
Qamaniruluk Lake	10-Aug-14	11-Aug-14	GN	Arctic Char	YLAR10	19.3	65	0.90	M	4	FR	Y		
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR01	8.9	7	0.99	-	1	FR	Y	Whole fish sent to lab	
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR02	10.7	12	0.98	-	2	FR	Y	Whole fish sent to lab	
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR03	11.8	13	0.79	-	2	FR	Y	Whole fish sent to lab	
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR04	9.3	9	1.12	-	2	FR	Y	Whole fish sent to lab	
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR05	9.4	7	0.84	-	2	FR	Y	Whole fish sent to lab	
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR06	12.8	19	0.91	-	4	FR	Y	Whole fish sent to lab	
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR07	12.2	14	0.77	-	2	FR	Y	Whole fish sent to lab	
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR08	12.4	18	0.94	-	4	FR	Y	Whole fish sent to lab	
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR09	12.4	15	0.79	-	3	FR	Y	Whole fish sent to lab	
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR10	10.5	11	0.95	-	2	FR	Y	Whole fish sent to lab	
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR11	6.0	3	1.31	-	-	-	N		
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR12	8.5	9	1.38	-	-	-	N		
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR13	5.4	3	1.80	-	-	-	N		
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR14	8.8	9	1.25	-	-	-	N		
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR15	7.6	6	1.29	-	-	-	N		
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR16	8.4	9	1.43	-	-	-	N		
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR17	9.0	11	1.56	-	-	-	N		
Qamanialuk Lake	11-Aug-14	11-Aug-14	MT	Arctic Char	MLAR18	7.8	6	1.19	-	-	-	N		
McKeand River Site 1	7-Aug-14	8-Aug-14	EF	Arctic Char	MKR1AR01	7.4	3	0.74	-	-	-	N		

Note: GN = Gill Net; MT = Minnow Trap; M = Male; F = Female; OT = Otolith; FR = Pelvic Fin-Ray

APPENDIX N
FISH AGEING DATA

2014/2015

NSC Ageing ID:
Company Name: Tetra Tech EBA
Project Name or #: Chidliak 2014 Baseline Aquatics Program
Client Contact: Michael Vilimek
Phone #: 780-288-9978
Email: michael.vilimek@tetratech.com
 # & Type of Structures: 16 FR + 17 OT
Work to be Completed: 15 OT + 17 FR
Invoice:

Dave Willis | Land Administrator
PEREGRINE
DIAMONDS LTD.
201 - 1250 Homer Street
Vancouver, BC, Canada V6B1C6
Tel: 604-408-8880 **Fax:** 604-408-8881
Email: dave@pdiam.com

Location	Date	Structures (OT/FR/SC/CL)	Species	Sample/Fish #	Length	Weight	Sex	Age	Con. Index MB	QA/QC KA	Aging Comments	Other Comments	Photos
Glacier Lake	9-Aug-14	OT	Arctic Char	GLAR01	25.1	164	M	12	G				
Glacier Lake	9-Aug-14	OT	Arctic Char	GLAR02	34.5	365	F	9	F				
Glacier Lake	9-Aug-14		Arctic Char	GLAR03	29.8	233	F	ns	-		no OT in env.		
Glacier Lake	9-Aug-14	OT	Arctic Char	GLAR04	18.6	75	F	5	G				
Glacier Lake	9-Aug-14	OT	Arctic Char	GLAR05	29.4	238	M	11	G				180
Glacier Lake	9-Aug-14	OT	Arctic Char	GLAR06	30	245	M	6	P				196, 197
Glacier Lake	9-Aug-14	OT	Arctic Char	GLAR07	29	216	F	17	G				198
Glacier Lake	9-Aug-14	FR	Arctic Char	GLAR08	9.2	6	-	2	VP				
Glacier Lake	9-Aug-14	FR	Arctic Char	GLAR09	14.8	33	F	4	P				130, 172
Glacier Lake	9-Aug-14	FR	Arctic Char	GLAR10	13.8	23	M	3	VP				175
McKeand Lake	11-Aug-14	FR	Arctic Char	MLAR01	8.9	7	-	1	P				
McKeand Lake	11-Aug-14	FR	Arctic Char	MLAR02	10.7	12	-	2	P				
McKeand Lake	11-Aug-14	FR	Arctic Char	MLAR03	11.8	13	-	2	P				
McKeand Lake	11-Aug-14	FR	Arctic Char	MLAR04	9.3	9	-	2	P				
McKeand Lake	11-Aug-14	FR	Arctic Char	MLAR05	9.4	7	-	2	F				
McKeand Lake	11-Aug-14	FR	Arctic Char	MLAR06	12.8	19	-	4	F				
McKeand Lake	11-Aug-14	FR	Arctic Char	MLAR07	12.2	14	-	2	F				
McKeand Lake	11-Aug-14	FR	Arctic Char	MLAR08	12.4	18	-	4	F				
McKeand Lake	11-Aug-14	FR	Arctic Char	MLAR09	12.4	15	-	3	F				
McKeand Lake	11-Aug-14	FR	Arctic Char	MLAR10	10.5	11	-	2	P				
Qamaniruluk Lake	10-Aug-14	OT	Arctic Char	YLAR01	58.8	2008	M	15	F	15			199, 200
Qamaniruluk Lake	10-Aug-14	FR	Arctic Char	YLAR02	57.7	1745	F	15	G	15	no OT - FR aged		201; 202-203
Qamaniruluk Lake	10-Aug-14	OT	Arctic Char	YLAR03	56.2	1573	F	16	G	16	OT + FR		
Qamaniruluk Lake	10-Aug-14	OT	Arctic Char	YLAR04	54.7	1623	F	14	G	15			
Qamaniruluk Lake	10-Aug-14	OT	Arctic Char	YLAR05	54.4	1629	F	11	G				
Qamaniruluk Lake	10-Aug-14	OT	Arctic Char	YLAR06	51.6	1331	F	19	F				206
Qamaniruluk Lake	10-Aug-14	OT	Arctic Char	YLAR07	36.8	436	M	5	P				
Qamaniruluk Lake	10-Aug-14	OT	Arctic Char	YLAR08	42.3	613	F	19	F				207
Qamaniruluk Lake	10-Aug-14	OT	Arctic Char	YLAR09	34.8	375	M	12	G				
Qamaniruluk Lake	10-Aug-14	FR	Arctic Char	YLAR10	19.3	65	M	4	F				
Sunrise Lake	10-Aug-14	FR	Arctic Char	SLAR01	12.3	15	-	2	F				
-	-	OT	Arctic Char	Dup1	-	-	-	11	G				
-	-	FR	Arctic Char	Dup2	-	-	-	10	G				

2014/2015	Qualitative characteristics (pattern clarity)	Quantitative characteristics (repeatability)
Very Good (VG)	annuli are clear with no interpretation problems	Reader always gets the same age
Good (G)	annuli are clear with a few easy interpretation problems	Reader would get the same age most of the time for fish <10 years, within one year for fish 11-20 years
Fair (F)	annuli are fairly clear with some areas presenting easy and moderate interpretation problems	Reader would be within 1 year most of the time for fish<10 years and 2-3 years for fish >10 years
Poor (P)	annuli are fairly unclear presenting a number of difficult interpretation problems	Reader would be within 2-3 years most of the time for fish <10 years and 4-5 years for fish >10 years
Very Poor (VP)	annuli are very unclear presenting significant interpretation problems	Reader has little confidence in repeatability of age within 4-5 years

APPENDIX O
FISH TISSUE METALS ANALYSIS

Table O1. Glacier Lake Fish Tissue Results Compared Against Specific Benchmarks

Sample ID	Canadian Food Inspection Agency [1]	Health Canada [2]	BC MOE [3]	GLAR01	GLAR02	GLAR03	GLAR04	GLAR05-FILLET	GLAR05	GLAR06-FILLET	GLAR07-FILLET	GLAR08	GLAR09	GLAR10
Tissue Type				Whole	Whole	Whole	Whole	Muscle	Liver Composite	Muscle	Muscle	Whole	Whole	Whole
Species				AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC
Date Sampled				**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**
Total Mercury (Hg) ug/g	0.5 ppm [4]	0.5 ppm		0.049	0.098	0.06	0.072	0.065	0.087	0.12	0.08	0.023	0.035	0.027
Total Arsenic (As) ug/g	3.5 ppm [5]			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Lead (Pb) ug/g	0.5 ppm [5]			0.04	0.03	0.04	<0.03	0.11	0.07	<0.03	0.05	0.04	0.06	0.05
Total Selenium (Se) ug/g			1 ug/g	2.1	2.5	3.3	1.4	2.4	9.4	2.1	3	1.3	1.1	1.1

Notes:
1. Canadian Guidelines for Chemical Contaminants and Toxins in Fish and Fish Products. Available at: http://www.inspection.gc.ca/english/fssa/fispoi/man/samnem/app3e.shtml
2. Canadian Standards (Maximum Levels) for Various Chemical Contaminants in Food. Available at: http://www.hc-sc.gc.ca/fn-an/securit/chem-chim/contaminants-guidelines-directives-eng.php
3. Nagpal, NK. 2001. Ambient Water Quality Guidelines for Selenium, Overview Report. Prepared for BC Ministry of Environment, Lands and Parks pursuant to Section 2(e) of the Environment Mangement Act 1981.
4. Guideline applicable to all fish products.
5. Guideline applicable to fish protein concentrate
6. Species code AC indicates Arctic char.
7. Shaded values for an analyte indicate an exceedence of the relevant guideline.

Table O2. Qamaniruluk Lake Fish Tissue Results Compared Against Specific Benchmarks

Sample ID	Canadian Food Inspection	Health Canada [2]	BC MOE [3]	YLAR01-FILLET	YLAR01-LIVER	YLAR02-FILLET	YLAR02-LIVER	YLAR03-FILLET	YLAR03-LIVER	YLAR04-FILLET	YLAR04-LIVER	YLAR05-FILLET	YLAR05-FILLET DUP 1
Tissue Type				Muscle	Liver	Muscle	Liver	Muscle	Liver	Muscle	Liver	Muscle	Muscle
Species				AC	AC	AC	AC	AC	AC	AC	AC	AC	AC
Date Sampled				**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**
Total Mercury (Hg) ug/g	0.5 ppm [4]	0.5 ppm		0.4	0.94	0.43	1.3	0.37	0.65	0.42	0.43	0.56	0.55
Total Arsenic (As) ug/g	3.5 ppm [5]			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Lead (Pb) ug/g	0.5 ppm [5]			<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Total Selenium (Se) ug/g			1 ug/g	1.1	4.6	1.1	4.4	1	5.3	1	2	0.9	0.8

Sample ID	Canadian Food Inspection Agency [1]	Health Canada [2]	BC MOE [3]	YLAR05-LIVER	YLAR06-FILLET	YLAR06-LIVER	YLAR07-FILLET	YLAR07-FILLET DUP 1	YLAR07-8-9	YLAR08-FILLET	YLAR09-FILLET	YLAR10-FILLET
Tissue Type				Liver	Muscle	Liver	Muscle	Muscle	Liver Composite	Muscle	Muscle	Muscle
Species				AC	AC	AC	AC	AC	AC	AC	AC	AC
Date Sampled				**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**
Total Mercury (Hg) ug/g	0.5 ppm [4]	0.5 ppm		1.6	0.49	0.69	0.097	0.1	0.13	0.099	0.17	0.06+E42:W42
Total Arsenic (As) ug/g	3.5 ppm [5]			<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1
Total Lead (Pb) ug/g	0.5 ppm [5]			0.04	<0.03	<0.03	<0.03	-	<0.03	<0.03	<0.03	<0.03
Total Selenium (Se) ug/g			1 ug/g	5.9	1.1	4.4	1	-	3.4	1.4	0.8	0.7

Notes:
1. Canadian Guidelines for Chemical Contaminants and Toxins in Fish and Fish Products. Available at: http://www.inspection.gc.ca/english/fssa/fispoi/man/samnem/app3e.shtml
2. Canadian Standards (Maximum Levels) for Various Chemical Contaminants in Food. Available at: http://www.hc-sc.gc.ca/fn-an/securit/chem-chim/contaminants-guidelines-directives-eng.php
3. Nagpal, NK. 2001. Ambient Water Quality Guidelines for Selenium, Overview Report. Prepared for BC Ministry of Environment, Lands and Parks pursuant to Section 2(e) of the Environment Mangement Act 1981.
4. Guideline applicable to all fish products.
5. Guideline applicable to fish protein concentrate.
6. Species code AC indicates Arctic char.
7. Shaded values for an analyte indicate an exceedence of the relevant guideline.

Table O3. Qamanialuk Lake Fish Tissue Results Compared Against Specific Benchmarks

Sample ID	Canadian Food Inspection	Health Canada [2]	BC MOE [3]	MLAR01	MLAR02	MLAR03	MLAR04	MLAR05	MLAR06	MLAR07	MLAR08	MLAR09	MLAR10
Tissue Type				Whole	Whole	Whole	Whole	Whole	Whole	Whole	Whole	Whole	Whole
Species				AC	AC	AC	AC	AC	AC	AC	AC	AC	AC
Date Sampled				11-August-2014	11-August-2014	1-August-201	11-August-2014	11-August-2014	11-August-2014	11-August-2014	-August-20	11-August-2014	-August-2014
Total Mercury (Hg) ug/g	0.5 ppm [4]	0.5 ppm		0.049	0.036	0.048	0.038	0.042	0.04	0.046	0.059	0.045	0.052
Total Arsenic (As) ug/g	3.5 ppm [5]			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Lead (Pb) ug/g	0.5 ppm [5]			<0.03	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	0.22	<0.03	<0.03
Total Selenium (Se) ug/g			1 ug/g	0.7	1	0.9	0.7	0.8	1.1	0.5	0.9	0.8	0.9

Notes:

1. Canadian Guidelines for Chemical Contaminants and Toxins in Fish and Fish Products. Available at: http://www.inspection.gc.ca/english/fssa/fispoi/man/samnem/app3e.shtml
2. Canadian Standards (Maximum Levels) for Various Chemical Contaminants in Food. Available at: http://www.hc-sc.gc.ca/fn-an/securit/chem-chim/contaminants-guidelines-directives-eng.php
3. Nagpal, NK. 2001. Ambient Water Quality Guidelines for Selenium, Overview Report. Prepared for BC Ministry of Environment, Lands and Parks pursuant to Section 2(e) of the Environment Mangement Act 1981.
4. Guideline applicable to all fish products.
5. Guideline applicable to fish protein concentrate.
6. Species code AC indicates Arctic char.
7. Shaded values for an analyte indicate an exceedence of the relevant guideline.

Table O4. Sunshine Camp Lake Fish Tissue Results Compared Against Specific Benchmarks

Sample ID	Canadian Food Inspection	Health Canada [2]	BC MOE [3]	SLAR01
Tissue Type				Whole
Species				AC
Date Sampled				**11-August-2014**
Total Mercury (Hg) ug/g	0.5 ppm [4]	0.5 ppm		0.029
Total Arsenic (As) ug/g	3.5 ppm [5]			<0.1
Total Lead (Pb) ug/g	0.5 ppm [5]			0.03
Total Selenium (Se) ug/g			1 ug/g	2.5

Notes:

1. Canadian Guidelines for Chemical Contaminants and Toxins in Fish and Fish Products. Available at: http://www.inspection.gc.ca/english/fssa/fispoi/man/samnem/app3e.shtml
2. Canadian Standards (Maximum Levels) for Various Chemical Contaminants in Food. Available at: http://www.hc-sc.gc.ca/fn-an/securit/chem-chim/contaminants-guidelines-directives-eng.php
3. Nagpal, NK. 2001. Ambient Water Quality Guidelines for Selenium, Overview Report. Prepared for BC Ministry of Environment, Lands and Parks pursuant to Section 2(e) of the Environment Mangement Act 1981.
4. Guideline applicable to all fish products.
5. Guideline applicable to fish protein concentrate.
6. Species code AC indicates Arctic char.
7. Shaded values for an analyte indicate an exceedence of the relevant guideline.

Table O5. Duplicate Fish Tissue Results Compared Against Specific Benchmarks

Sample ID	Canadian Food Inspection Agency [1]	Health Canada [2]	BC MOE [3]	DUP1-FILLET	DUP1-FILLET DUP 1	DUP1-2 Composite Liver	DUP2-FILLET
Tissue Type				Muscle	Muscle	Liver Composite	Muscle
Species				AC	AC	AC	AC
Date Sampled				**11-August-2014**	**11-August-2014**	**11-August-2014**	**11-August-2014**
Total Mercury (Hg) ug/g	0.5 ppm [4]	0.5 ppm		0.4	0.39	0.53	0.091
Total Arsenic (As) ug/g	3.5 ppm [5]			<0.1	<0.1	<0.1	<0.1
Total Lead (Pb) ug/g	0.5 ppm [5]			0.03	0.04	<0.03	0.1
Total Selenium (Se) ug/g			1 ug/g	1.1	1.1	3.9	1.3

Notes:

1. Canadian Guidelines for Chemical Contaminants and Toxins in Fish and Fish Products. Available at: http://www.inspection.gc.ca/english/fssa/fispoi/man/samnem/app3e.shtml
2. Canadian Standards (Maximum Levels) for Various Chemical Contaminants in Food. Available at: http://www.hc-sc.gc.ca/fn-an/securit/chem-chim/contaminants-guidelines-directives-eng.php
3. Nagpal, NK. 2001. Ambient Water Quality Guidelines for Selenium, Overview Report. Prepared for BC Ministry of Environment, Lands and Parks pursuant to Section 2(e) of the Environment Mangement Act 1981.
4. Guideline applicable to all fish products.
5. Guideline applicable to fish protein concentrate.
6. Species code AC indicates Arctic char.
7. Shaded values for an analyte indicate an exceedence of the relevant guideline.

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