Keeyask Generation Project

Aquatic Effects Monitoring Plan

Water Quality Monitoring Report

AEMP-2020-07

KEEYASK

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KEEYASK GENERATION PROJECT

AQUATIC EFFECTS MONITORING PLAN

REPORT #AEMP-2020-07

RESULTS OF WATER QUALITY MONITORING IN THE NELSON RIVER, 2019: YEAR 6 CONSTRUCTION

Prepared for

Manitoba Hydro

By

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June 2020

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SUMMARY

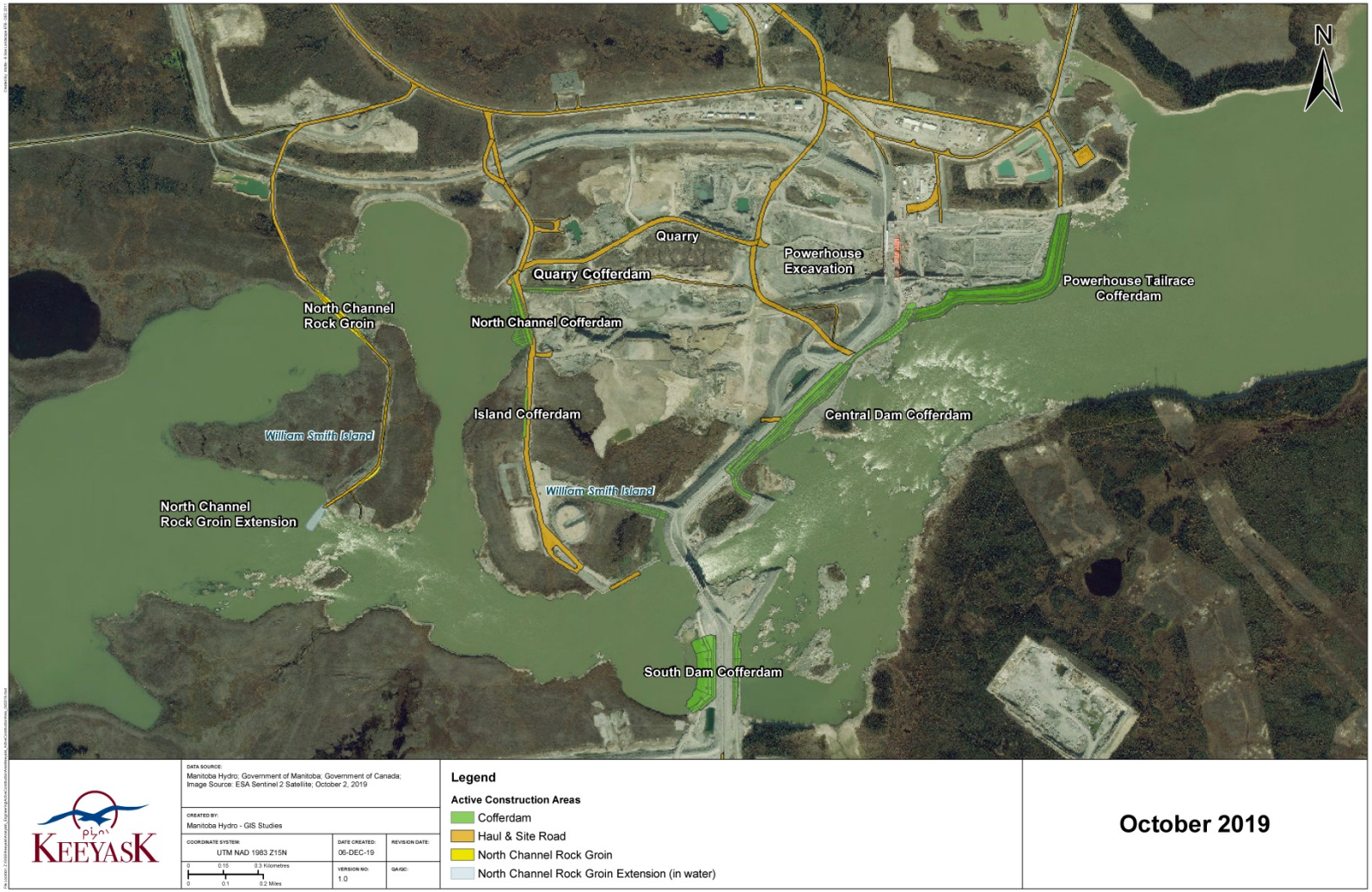
Background

The Keeyask Hydropower Limited Partnership (KHLP) was required to prepare a plan to monitor the effects of construction and operation of the Keeyask Generating Station (GS) on the environment. Besides measuring the accuracy of the predictions made and actual effects of the GS on the environment, monitoring results will provide information on how construction and operation of the GS will affect the environment and if more needs to be done to reduce harmful effects.

Construction of the Keeyask GS began in mid-July 2014 with the construction of cofferdams that blocked flow in the north and central channels of Gull Rapids (see instream structures map below). During the winter of 2015/2016 the Spillway Cofferdam, which partially blocks the south channel, was constructed. Beginning late in 2016 and continuing in 2017, the Tailrace Cofferdam was constructed. Work was completed in fall 2017 with the exception of an opening that was left to allow fish movement into and out of the cofferdam over the 2017/18 winter. This opening was closed in spring 2018, and the area was dewatered. The spillway was commissioned in August 2018. The South Dam Cofferdam was completed in fall 2018, blocking the channel and forcing the entire flow of the river through the spillway. Almost all work in 2019 was in the dry. The construction activities included the excavation of the tailrace, construction of the tailrace spawning shoal, and completion of the dams and dykes.

Water quality is a key part of the monitoring program because it determines whether water is suitable to support aquatic life, including fish. The partner First Nations have expressed concern about changes to water quality on the Nelson River from historical hydroelectric developments, so tracking water quality during the Keeyask Project is important because human activities, including the construction and operation of the GS, can negatively affect it.

This report describes the results of water quality monitoring conducted during the sixth year of construction at Gull Rapids. Samples were collected at sites in Clark or Split lakes (*i.e.*, upstream of the high water effects observed in 2014), the Nelson River upstream of construction, and at sites in Stephens Lake downstream of construction (the “local study area”) to see whether the water quality changed as it passed the construction site. Monitoring included parameters such as suspended solids (such as sand and clay, *etc.*) and turbidity (*i.e.*, “muddiness of the water”) that are expected to increase during construction. The program also measured other substances that are not expected to increase, but are measured just in case.



Satellite Imagery - October, 2019

Map illustrating instream structures at the Keeyask Generating Station site, October 2019.

Why is the study being done?

The monitoring is being done to address one main question:

Are construction activities changing water quality near Gull Rapids and in Stephens Lake to the point that fish and other aquatic life may be harmed?

The main effect of constructing the GS is that it can lead to more sand, silt, clay, and other "suspended solids" entering the Nelson River, which may impair water quality. This can be caused by building structures such as cofferdams in the river, or loss of soils and other material from the land caused by clearing vegetation or flooding shorelines. Construction may also result in the release of other potentially harmful substances, such as fuels and oils used in construction equipment (hydrocarbons), to the river. Water quality monitoring will determine whether construction is causing changes to water quality that could harm aquatic life and determine if additional measures are required to prevent effects from occurring in the future.

Suspended solids concentrations in the water are measured continuously downstream during construction and the results are relayed to the work site so that construction activities can be adjusted if the suspended solids become too high. These results are reported annually under the *Keeyask Generation Project Sediment Management Plan for In-Stream Construction* (SMP).

The water quality monitoring described in this report is much broader than what is done for the SMP. It examines water quality over a much larger area and measures other aspects of water quality besides suspended solids, such as nutrients (which are necessary for aquatic life), metals, and oil and gas (*i.e.*, hydrocarbons).

What was done?

In 2019, water quality sampling was conducted five times in the local study area in Clark or Split lakes, upstream of Gull Rapids, and in Stephens Lake in late March/early April (ice-cover period), and late June, July, August, and September (open-water period). Samples were collected to measure a number of substances in the water, including:

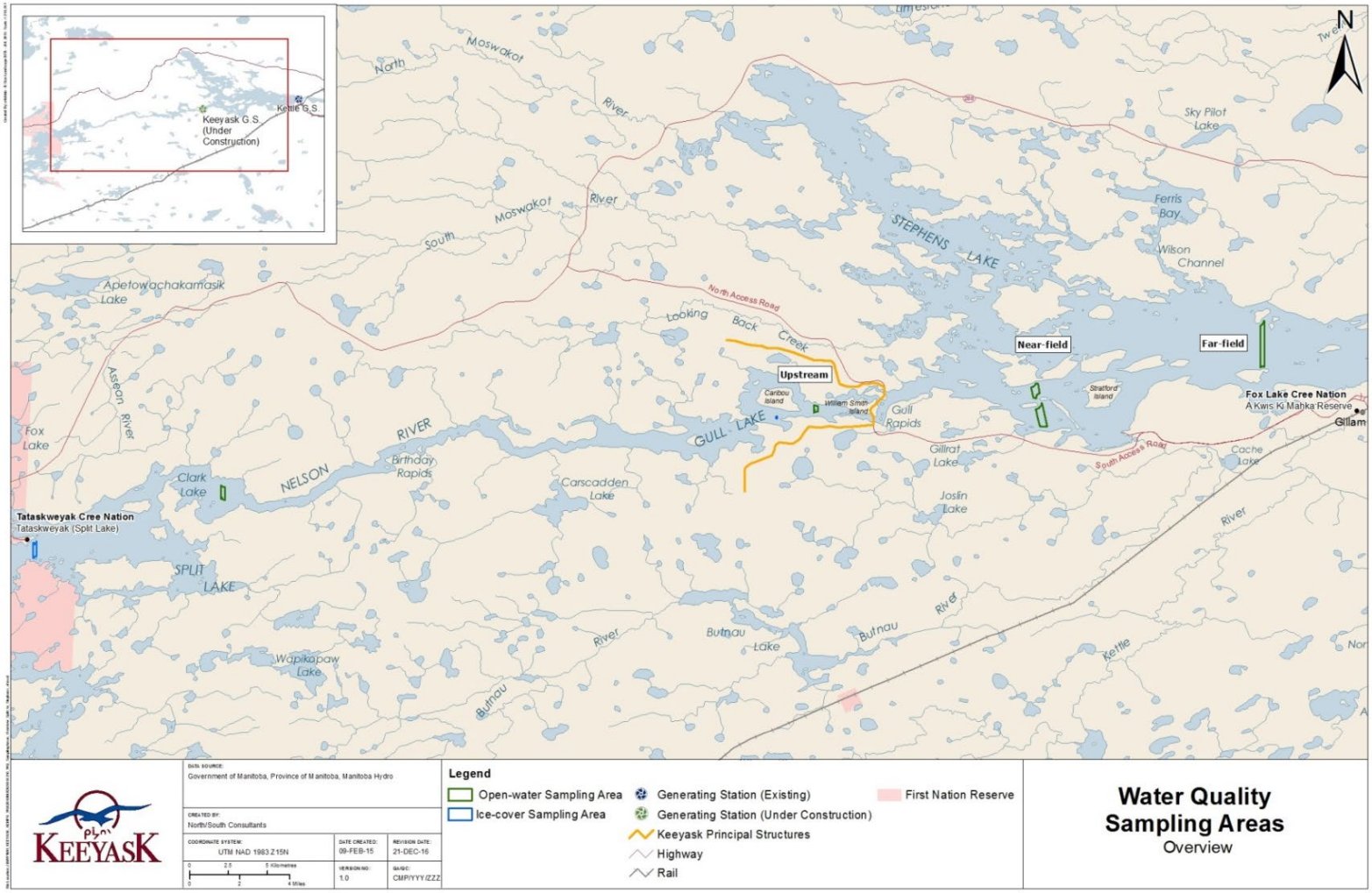
- total suspended solids and turbidity (affects sunlight penetration through the water, which can slow plant growth and the ability of aquatic life to see food; affects breathing; can smother eggs when it settles and can affect predators/prey);
- pH (should be neutral);
- oxygen (needs to be high enough for aquatic organisms to breathe);
- nutrients (compounds that may increase the amount of algae present);
- chlorophyll *a* (representing the amount of algae);
- metals and major ions (some of which are essential to aquatic life but some may also be harmful to aquatic life); and

- hydrocarbons (toxic to aquatic life in high enough concentrations).

Filling water quality sample bottles.

During monitoring in the local study area, samples were collected at four areas: Split/Clark lakes, the Nelson River, and two areas in Stephens Lake. One area at Gull Rapids ("upstream area") was intended to serve as a reference for conditions in the Nelson River upstream of construction, but high water levels in 2014 prompted the addition of sites further upstream in Split Lake (during winter) and Clark Lake (during summer) (see local study area map below). Clark Lake is the preferred reference area but does not always become ice-covered in winter so Split Lake was included as the alternate winter sampling location. The third area sampled was in Stephens Lake approximately 9 km downstream of the construction activities ("near-field area"). This represents an area where some effects on water quality from construction are expected. The fourth area was also in Stephens Lake, approximately 25 km downstream of the construction site ("far-field area"). This area was used to determine whether effects observed at the near-field area extended farther downstream.

Five sites were sampled in each of the Split/Clark Lake, upstream, near-field, and far-field areas to make sure enough samples were taken so the results would give an accurate account of what was happening at a given location.



Water quality monitoring areas during the ice-cover and open-water seasons, 2019. Green areas show areas sampled in open-water periods and blue areas show winter sampling locations. Sampling areas in the near-field and far-field of Stephens Lake were the same in open-water and ice-cover seasons. Five sites were sampled in each area.

What was found?

Water quality was generally similar upstream and downstream of the construction activities and along the length of the Nelson River, indicating there was minimal effect of construction on water quality and its suitability for aquatic life.

What does it mean?

The information collected so far during the Project indicates that construction activities have had a minimal effect on water quality and its suitability to support aquatic life.

What will be done next?

Impoundment is scheduled for fall 2020. Water quality monitoring will continue in 2020.

ACKNOWLEDGEMENTS

We would like to thank Manitoba Hydro for the opportunity and resources to conduct this study.

The following members of Tataskweyak Cree Nation (TCN) and Fox Lake Cree Nation (FLCN) are thanked for their local expertise and assistance in conducting the field work: Saul Mayham of TCN, and John Henderson and Jimmy Lockhart Jr. of FLCN. We would also like to thank Terry Kitchekeesik of TCN and Ray Mayham of FLCN for arranging logistic support and personnel needed to conduct the fieldwork.

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1.0 INTRODUCTION

The Keeyask Generation Project (the Project) is a 695-megawatt (MW) hydroelectric generating station at Gull (Keeyask) Rapids on the lower Nelson River in northern Manitoba. The Project is approximately 725 kilometres (km) northeast of Winnipeg, 35 km upstream of the existing Kettle Generating Station, where Gull Lake flows into Stephens Lake, 60 km east of the community of Split Lake, 180 km east-northeast of Thompson and 30 km west of Gillam (Map 1). Construction of the Project began in July 2014.

The *Keeyask Generation Project: Response to EIS Guidelines*, completed in June 2012, provides a summary of predicted effects and planned mitigation for the Project. Technical supporting information for the aquatic environment, including a description of the environmental setting, effects and mitigation, and a summary of proposed monitoring and follow-up programs is provided in the *Keeyask Generation Project Environmental Impact Statement: Aquatic Environment Supporting Volume* (AE SV). As part of the licensing process for the Project, an Aquatic Effects Monitoring Plan (AEMP) was developed detailing the monitoring activities of various components of the aquatic environment including the focus of this report, water quality, for the construction and operation phases of the Project.

During the construction phase, the primary effect of the Project on water quality was predicted to be related to increases in total suspended solids (TSS), notably in relation to river management and cofferdam placement/removal. The primary mechanism for monitoring effects of construction activities on TSS/turbidity in the Nelson River was through monitoring that is being conducted under the *Keeyask Generation Project Sediment Management Plan for In-Stream Construction* (SMP) and the *Keeyask Generation Project Physical Environment Monitoring Plan* (PEMP), which included monitoring of TSS and turbidity in the Nelson River. TSS data collected under the SMP and PEMP were reported in the annual reports associated with those plans. Other pathways of effects (*i.e.*, discharge of point sources) were expected to result in highly localized and negligible to small effects on water quality, including TSS (*e.g.*, discharge of concrete batch plant effluent). The water quality monitoring program implemented during construction was intended to monitor effects on a broader array of water quality parameters in addition to TSS. This program, therefore, provided the means to monitor for potential unforeseen effects.

The study area for the water quality component of the AEMP during the construction period was composed of a local study area (LSA), which included Split Lake (ice-cover season) or Clark Lake (open-water season)[1], the reach of the Nelson River upstream of Gull Rapids, and the southern area of Stephens Lake, as well as a regional study area (RSA) which included the lower Nelson River downstream of Stephens Lake (Map 1). The 2019 (Year 6 construction)

[1] Clark Lake is the preferred reference area but does not become ice-covered in winter so Split Lake was included as the alternate winter sampling location.

water quality monitoring program included monitoring in the LSA only. As described in Table 2-6 of the AEMP, monitoring in the RSA was to be conducted during periods when TSS was predicted to be elevated due to certain in-stream construction activities; none of these activities occurred in 2019.

Key questions presented in the AEMP to be answered about water quality during construction of the Keeyask GS were:

- Has the Project resulted in exceedances of water quality objectives or guidelines for the protection of aquatic life?
- What are the magnitude and spatial extent of effects of construction on water quality?

The objectives of monitoring during the construction period were to: determine if the Project caused or contributed to exceedances of benchmarks; determine the spatial and temporal extent of effects; confirm predictions presented in the AE SV; and monitor for unforeseen effects. The overall objective of construction monitoring was to record the net effect of various construction activities on a suite of water quality parameters along the mainstem of the Nelson River.

The AEMP identified key indicators and benchmarks for the water quality monitoring program to focus the program and provide an adaptive management framework (AMF). Key indicators were identified as those most likely to be affected by the Project, for which there is the greatest risk for direct effects on aquatic life, and for which there are objectives or guidelines for the protection of aquatic life (PAL). Benchmarks were identified based on baseline water quality conditions, Manitoba Water Quality Standards, Objectives, and Guidelines (MWQSOGs) for PAL (MWS 2011), and the Canadian Council of Ministers of the Environment (CCME) phosphorus guidance framework for freshwater systems (CCME 1999; updated to 2014[2]). Monitoring was also designed to include measurement of additional parameters for which no benchmarks were developed.

The construction monitoring program was designed to facilitate comparisons of water quality spatially (*i.e.*, upstream versus downstream of construction activities) to delineate Project-related effects. Specifically, the program was designed to facilitate statistical comparisons of water quality in an upstream reference area to water quality monitored downstream of construction activities. The reference area is an area located upstream of Project activities in the lower Nelson River. The Nelson River upstream of Gull Rapids served as the reference during years 1 and 2 of the program; however, sites further upstream (*i.e.,* in Split or Clark lakes) were added after high water levels in 2014 caused backwater effects within the Nelson River upstream of Gull Rapids.

An AMF was developed for the water quality monitoring program, as presented in the AEMP. In brief, the framework entails initially comparing monitoring results to pre-established benchmarks

[2] All guidelines were those current at that time of AEMP development.

(Step 1). If a benchmark is not exceeded, the assessment proceeds to Response Level 1 – trend analysis. If a benchmark is exceeded, the assessment proceeds to Step 2 – determination of whether there is a statistical difference between upstream and downstream areas (*i.e.*, control-impact). If a statistical difference is not observed, the assessment proceeds to Response Level 1. Where statistical differences are identified for key indicators, the assessment proceeds to Step 3, in which a determination of cause (*i.e.*, is the difference Project-related) would be undertaken (see Figure 1).

The following report presents the results of water quality monitoring completed in the ice-cover and open-water seasons of 2019 during Year 6 of construction. Results are assessed using the adaptive management framework as summarized above and detailed in the AEMP.

2.0 STUDY SETTING

The study area encompasses an approximately 236 km long reach of the Nelson River from Split Lake to the estuary (Map 1). This section of river offers a diversity of physical habitat conditions, including a variety of substrate types, and variable water depths (ranging from 0 to 30 m) and velocities.

Split Lake is located at the confluence of the Burntwood and Nelson rivers (Map 1). Due to the large inflows from the Nelson and Burntwood rivers, the lake has detectable current in several locations. Split Lake has maximum and mean depths of 28.0 m and 3.9 m, respectively, at a water surface elevation of 167.0 m above sea level (ASL; Lawrence *et al.* 1999). The surface area of Split Lake was determined to be 26,100 ha (excluding islands), with a total shoreline length, including islands, of 940.0 km (Lawrence *et al.* 1999). The numerous islands in Split Lake represent 411.6 km of the total shoreline.

Clark Lake is located immediately downstream of Split Lake, and approximately 42 km upstream of Gull Rapids (Maps 1 and 3). Current is restricted to the main section of the lake, with off-current bays outside the main channel. The Assean River is the only major tributary to Clark Lake, and flows into the north side. Downstream from the outlet of Clark Lake, the Nelson River narrows and water velocity increases for a 3 km stretch, known as Long Rapids. For the next 7 km, the river widens, and water velocity decreases.

Birthday Rapids is located approximately 10 km downstream of Clark Lake and 30 km upstream of Gull Rapids (Maps 1 and 3). The drop in elevation from the upstream to downstream side of Birthday Rapids is approximately 2 m. The 14 km reach of the Nelson River between Birthday Rapids and Gull Lake is characterized as a large, somewhat uniform channel with medium to high water velocities. There are a few large bays with reduced water velocity and a number of small tributaries that drain into the Nelson River.

Gull Lake is a section of the Nelson River where the river widens, with moderate to low water velocity. Gull Lake is herein defined as the reach of the Nelson River beginning approximately 17 km upstream of Gull Rapids and 14 km downstream of Birthday Rapids (*i.e.*, where the river widens to the north into a bay around a large point of land; Maps 1 and 3), and extending to the downstream end of Caribou Island, approximately 3 km upstream of Gull Rapids. Gull Lake has three distinct basins, the first extending from the upstream end of the lake downstream approximately 6 km to a large island; the second extending from the large island to Morris Point (a constriction in the river immediately upstream of Caribou Island); and the third extending from Morris Point to the downstream end of Caribou Island.

Gull Rapids is located approximately 3 km downstream of Caribou Island on the Nelson River (Maps 1 and 3). The rapids are approximately 2 km in length, and the river elevation drops approximately 11 m over this distance. Two large islands and several small islands occur within the rapids, prior to the river narrowing; these features are within the Project footprint and have

been substantially altered during construction (Map 2). A summary of construction activities at Gull Rapids is provided in Section 2.1.

Just below Gull Rapids, the Nelson River enters Stephens Lake (Maps 1 and 3). Stephens Lake was formed in 1971 by construction of the Kettle GS. Between Gull Rapids and Stephens Lake there is an approximately 6 km long reach of the Nelson River that, although affected by water regulation at the Kettle GS, remains riverine habitat with moderate velocity. In August 2018, flow was further constricted when the spillway was commissioned (see Section 2.1).

Construction of the Kettle GS flooded Moose Nose Lake (north arm) and several other small lakes that previously drained into the Nelson River, as well as the old channels of the Nelson River that now lie within the southern portion of the lake. Major tributaries to Stephens Lake include the North and South Moswakot rivers that enter the north arm of the lake. Looking Back Creek is a second order stream that drains into the north arm of Stephens Lake (Map 1). Kettle GS is located approximately 40 km downstream of Gull Rapids.

Long Spruce Reservoir was formed in 1979 by the construction of the Long Spruce GS. It is a 16 km reach of the Nelson River extending from Long Spruce GS upstream to Kettle GS (Manitoba Hydro Public Affairs 1999). Kettle River and Boots Creek are the only major tributaries flowing into Long Spruce Reservoir, with both tributaries entering the Reservoir on the south shore.

The Limestone Reservoir was formed in 1990 by the construction of the Limestone GS. It is a 23 km reach of the Nelson River extending from the Limestone GS upstream to Long Spruce GS. Four tributaries of the Nelson River enter the Reservoir; Wilson Creek and Brooks Creek enter from the south, and Sky Pilot Creek and Leslie Creek enter from the north. Aquatic habitat within the Reservoir ranges from a riverine environment in the upper reach, to more lacustrine conditions just upstream of the Limestone GS.

Similar to the section of the Nelson River between Split Lake and Stephens Lake, the Nelson River below the Limestone GS is also characterized by narrow sections with swiftly flowing water and wider more lacustrine sections created by the reservoir of the Long Spruce and Limestone GSs (Map 1). The Nelson River below the Limestone GS is extensively affected by discharge regulation, with diurnal fluctuations in discharge and stage changes varying on the order of 1 m (Manitoba Hydro 1994).

2.1 CONSTRUCTION SUMMARY

Construction of the Keeyask GS began in mid-July 2014 with the construction of cofferdams in the north and central channels of Gull Rapids (Map 2). These cofferdams resulted in the dewatering of the north and central channels and the diversion of all flow to the south channel. Construction of the Spillway Cofferdam (SWCD), which extends into the south channel of Gull Rapids, was completed in 2015. The rock placement for the inner and outer groins of the

Tailrace Cofferdam (TRCD) started in late 2016 and the impervious fill placement was completed in fall 2017. An opening was created to allow fish to move freely over the winter of 2017–2018. The opening was closed in spring 2018 and dewatering of the TRCD occurred in July, at which time a fish salvage was completed. In preparation for commissioning of the spillway, the SWCD was watered-up on both sides of the structure in June 2018. Removal of the SWCD started in early July and continued into August. The spillway was commissioned between August 3 and 7, 2018. Closing the south channel with the upstream South Dam Cofferdam (SDCD) commenced at the beginning of August and river closure was achieved on August 16. This closure and the work that continued to seal the cofferdam forced the entire river flow through the spillway. The downstream SDCD was completed in September and the area between the two cofferdams was dewatered, allowing for fish salvage to be completed by late September 2018. Work continued on the upstream SDCD until it was complete in late fall 2018. Almost all work in 2019 was in the dry. The construction activities included the excavation of the tailrace, construction of the tailrace spawning shoal, and completion of the dams and dykes.

2.2 FLOWS AND WATER LEVELS

From October 2018 to October 2019, calculated Split Lake outflows ranged from about 2,600 to 3,700 m^3/s. However, over most of the period, outflows ranged from approximately 3,000 to 3,500 m^3/s and were near the historical annual median flow of approximately 3,300 m^3/s. Outflow increased from about 2,600 to 3,600 m^3/s from October to December 2018, and then was variable through the remainder of the winter period. Between June and September 2019, the flow generally ranged from 3,300 to 3,500 m^3/s. Flows dropped to about 2,900 m^3/s in early October 2019 before rising again to almost 3,700 m^3/s by the end of the month. Water levels varied in conjunction with flows, ranging from about 153.2–155.0 m ASL on Gull Lake.

3.0 METHODS

The following provides a description of the study design, sampling sites, sampling methods, and data analysis methods employed during the 2019 monitoring program.

3.1 STUDY DESIGN

The construction monitoring program is designed to facilitate comparisons of water quality spatially (*i.e.*, upstream and downstream of construction activities) to delineate Project-related effects. Specifically, the program is designed to facilitate statistical comparisons of water quality in an upstream reference area to water quality monitored downstream of construction activities (*i.e.*, areas that are predicted to be most affected by the Project); this area is defined as the local study area. Sampling in the LSA includes monitoring at replicate sites upstream and downstream of construction activities and is to be conducted annually during the construction period.

The objective of monitoring during the construction period is to determine if the Project caused or contributed to exceedances of benchmarks and to confirm predictions in the AE SV.

3.2 SAMPLING SITES

The construction water quality monitoring program incorporated monitoring at replicate sampling sites upstream and downstream of construction activities within the LSA (Maps 3 and 4) as follows:

- Split Lake/Clark Lake (Maps 5 to 7): Split and Clark lakes are situated upstream of the construction site and are not affected by water level increases related to the Project. Clark Lake is the preferred reference area but does not become ice-covered in winter so Split Lake was included as the alternate winter sampling location;
- Nelson River Upstream Area (Map 8): the Nelson River upstream of Gull Rapids. This area served as the reference area in 2014 and 2015. However, high flows in combination with river management beginning in July 2014 raised water levels to above the 95th percentile at various points between 2014 and 2019;
- Near-Field Area (Map 9): this area is located approximately 9 km downstream of all construction activities in Stephens Lake; and
- Far-Field Area (Map 10): this area is located approximately 25 km downstream of construction activities in Stephens Lake.

Five replicate sites were sampled in each of the sampling areas (*i.e.*, sampling polygons) during the open-water and ice-cover seasons (Maps 6–10). During the ice-cover season, sites were relocated to areas with sufficient ice formation to facilitate safe access. Universal Transverse Mercator (UTM) coordinates for the water quality sites are provided in Table 1.

The locations of the replicate stations were defined differently for the upstream areas (*i.e.*, Nelson River upstream of Gull Rapids and Split and Clark lakes) and the downstream near-field and far-field areas due to the lack of detailed bathymetric information for Stephens Lake. As there are detailed bathymetry data for the areas upstream of Gull Rapids up to and including Split Lake, the polygon boundary was defined based on open-water depths (> 5 m in depth at the 50th percentile water level), distance from shore (*i.e.*, > 100 m from shore), and length (*i.e.*, 250 m in length) (Maps 6–8).

Due to the lack of detailed bathymetry for the two downstream sampling areas in Stephens Lake, these polygons were defined based on distance from shorelines. Specifically, the polygons were located 250 m from shorelines (including islands) and were 250 m in length (Maps 9–10).

These boundaries were identified to ensure sites were located in relatively deep areas even under low water levels and to avoid nearshore areas where localized differences in water quality may occur (*e.g.*, localized shoreline erosion), while also being sufficiently large to accommodate five sampling sites with sufficient separation (*i.e.*, minimum of 20 m separation between sites). Two exceptions to the minimum sampling distance occurred in 2019: once in winter and again in August. In winter, two sites in the Nelson River upstream sampling area (sites US-9 and US-10) were located 6 m apart. In August, site FF-3 in the far-field area was not sampled but a location 6 m from site FF-2 was visited; the site is identified as site FF-6 on Map 10.

3.3 SAMPLING METHODS

Sampling in the LSA was conducted during the ice-cover season on March 31 – April 5 and four times during the open-water season in 2019: June 24–26, July 21–23, August 25–31, and September 15–18. Sites were accessed by boat during the open-water season and by snowmobile or helicopter and on foot during winter.

UTMs were recorded at each site using a hand-held Global Positioning System (GPS) unit and total water depth was measured using a HawkEye H22PX handheld depth sounder. General information recorded at each site included:

- Date and time of sample collection;
- Cloud cover, wind, air temperature, and precipitation, including the occurrence of precipitation prior to sampling where possible;
- Sampling equipment used;

- Site conditions and/or observations relevant to the sampling program;
- Any deviations from field sampling protocols; and,
- Snow and ice thickness (ice-cover season only).

Sampling consisted of collection of *in situ* water quality measurements and collection of grab samples for laboratory analysis, as described below.

3.3.1 *IN SITU* MEASUREMENTS

Secchi disk depth was measured during the open-water season at each LSA site. Secchi disk depth was measured from the shady side of the boat by lowering the disk until it was no longer visible; the disk was then lowered approximately 1 m deeper than the previous reading and raised until it was visible again. The Secchi disk depth was recorded as the average of the two readings.

In situ measurements of dissolved oxygen (DO), turbidity, pH, specific conductance and temperature were collected at each sampling site in each season using a YSI EXO2 water quality multi-meter. *In situ* parameters were measured at 1.0 m or 0.5 m intervals (for sites > 5.0 m and < 5.0 m, respectively) at each site beginning with a near surface measurement (*i.e.*, 0.3 m).

3.3.2 SAMPLING FOR LABORATORY ANALYSES

At each site, grab samples of surface water were collected for laboratory analysis. Laboratory parameters included “routine” parameters (*e.g.*, nutrients, TSS, and pH), total metals, and total mercury at all LSA sites. Benzene, toluene, ethylbenzene, and xylene (BTEX), and F1-F4 hydrocarbons were also measured in the upstream and near-field areas (Map 3) to monitor for potential hydrocarbon contamination downstream of construction activities.

With the exception of sample collection for ultra-trace mercury, sampling during the open-water season was conducted by wearing gloves and submerging each sample bottle (provided by the analytical laboratory) to elbow depth (*i.e.*, approximately 0.3 m depth) then uncapping, filling, recapping, retrieving the bottle to the surface, then adding preservatives as required. For sample bottles pre-charged with preservative by the analytical laboratory, extra care was taken to ensure preservative was not lost during sampling. During the ice-cover season, near-surface water was collected using a Kemmerer water sampler deployed approximately 0.3 m below the ice; the sampler was retrieved to the surface and sample bottles were filled. Samples were then preserved as instructed by the analytical laboratory while wearing nitrile gloves. During all seasons, samples for ultra-trace mercury were collected using the “clean hands-dirty hands” protocol (U.S. Environmental Protection Agency 1996).

All sample bottles were filled with minimal headspace, except where instructed, to prevent chemical alteration and loss of compounds. Samples were subsequently kept cool (but not frozen) and in the dark until submission to a Canadian Association for Laboratory Accreditation (CALA) accredited laboratory (ALS Laboratories, Winnipeg, MB).

3.4 QUALITY ASSURANCE/QUALITY CONTROL

The quality control/quality assurance (QA/QC) program included application of standard procedures to limit sample contamination in the field, submission of QA/QC samples to the analytical laboratory, and QA/QC verifications of the water quality meter.

3.4.1 GENERAL QA/QC

Standard procedures for the control of sample contamination were adhered to throughout the sampling program, including:

- Use of gloves during sampling;
- Collecting samples facing in an upstream direction to minimize sample contamination. Where possible, sites were also approached moving in an upstream direction to avoid site disturbance and contamination;
- Avoiding contact with the insides of sample bottles, including lids;
- Limiting exposure of the insides of sample bottles to the atmosphere;
- Regular cleaning, calibration, inspection, and accuracy verification of field meters and equipment; and
- Adherence to sampling protocols wherever possible.

3.4.2 TRIPLICATE SAMPLES

The sampling program incorporated the collection of one triplicate sample at a randomly selected sampling site during each sample collection period. The triplicates were collected at the same location and as close in time as practically feasible. Triplicate samples were identified with the Site ID followed by “A”, “B”, or “C”.

3.4.3 FIELD BLANKS

One field blank was submitted to the analytical laboratory (ALS Laboratories) during each sampling period. Field blanks were prepared by filling one set of sample bottles (provided by the

analytical laboratory) with deionized water (also provided by the analytical laboratory) in the field and treating the blanks in exactly the same manner as environmental samples.

Bottles were blindly labeled, stored, and transported according to sampling and handling protocols, and submitted along with environmental samples.

3.4.4 TRIP BLANKS

One trip blank was also submitted to the analytical laboratory (ALS Laboratories) during each sampling period. Trip blanks were prepared by the analytical laboratory by filling one set of sample bottles with deionized water and adding preservatives where appropriate.

The trip blank samples were transported to the field site, using the same handling and transport protocols as for environmental samples, and submitted along with environmental samples to the analytical laboratory for analysis. Trip blanks were treated similarly to field blanks, but the bottles were not opened at any point in the field and thus were not exposed to the environment. Trip blanks were also blindly labelled.

3.4.5 WATER QUALITY METER QA/QC

The water quality meter was calibrated and inspected prior to departure for the field for each sampling trip. In the field, the functioning and accuracy of the meter was also assessed at the end of each sampling day by verifying meter measurements in standards of known values for turbidity, pH, and specific conductance. Any discrepancies from the standard values were documented in the field notes.

3.5 DATA ANALYSIS

Prior to analysis, all environmental data were evaluated qualitatively for potential outliers and transcription or analytical errors. Suspect results were noted and requests were made to the analytical laboratory to verify the values.

QA/QC samples were assessed according to standard criteria to evaluate precision and identify potential sample contamination issues (BCMELP 1998). Field and trip blank results were evaluated for evidence of sample contamination. Blank results that exceeded five times the analytical detection limit (DL) were considered to be indicative of sample contamination and/or laboratory error. Percent relative standard deviation (PRSD) was calculated for triplicate samples as follows:

PRSD = Standard deviation of the triplicate values/Mean of the triplicate values x 100.

Precision of the QA/QC samples was evaluated using the "rule of thumb" criteria for precision of 18% for triplicate samples (BCMELP 1998). Where one or more of the measurements being compared was less than five times the analytical DL, an analysis of precision was not undertaken, in accordance with guidance provided in BCMELP (1998).

Mean and standard error (SE) were also calculated for all five sampling sites within each sampling area during each sampling period. Results that were reported below the analytical DL were assigned a value of one half the DL for all statistical and graphical analyses.

As summarized in Section 1.0, and detailed in the AEMP, results of the water quality monitoring program are subject to the steps identified within the AMF (Figure 1). This framework prescribes data analysis methods and other tasks to be undertaken based on results of the monitoring program. Step 1 of the AMF entails comparison of the mean values of replicate samples for key indicators measured during a single sampling period to the benchmarks identified in the AEMP. If a benchmark is not exceeded, the assessment proceeds to Response Level 1 – trend analysis. If a benchmark is exceeded, the assessment proceeds to Step 2 – determination of whether there is a statistical difference between upstream and downstream areas (*i.e.*, control-impact) and/or relative to baseline conditions (before-after). If a statistical difference is not observed, the assessment proceeds to Response Level 1. Where statistical differences are identified for key indicators, the assessment proceeds to Step 3, in which a determination of cause (*i.e.*, is the difference Project-related) would be undertaken.

For data collected in 2019, means for key indicators were first compared to benchmarks (Table 2). For each key indicator that exceeded a benchmark, a statistical comparison between upstream and downstream sampling areas was undertaken during the respective sampling period. Data subject to statistical analyses, as per the AMF, were analysed in XLStat 2014, version 3.01 by a non-parametric Kruskal-Wallis test ($\alpha = 0.05$).

Hydrocarbon data were screened upon receipt of results from the analytical laboratory to identify if there was any indication of potential contamination; results were evaluated for occurrence of detections and comparisons to MWQSOGs for PAL (MWS 2011; Table A1-4), where available.

In addition to the key water quality indicators, monitoring results for other water quality parameters (*e.g.,* parameters for which there are no PAL objectives or guidelines but may be indicative of general changes in water quality, such as conductivity) were also summarized to provide supporting information regarding potential effects of construction and to assist with development of trend monitoring over the long-term.

4.0 RESULTS

Results of the water quality monitoring program for the 2019 ice-cover and open-water seasons are summarized below, and presented in Tables 2 and 3, and Figures 2–38. Raw data are provided in Appendix 1 and results of the QA/QC samples are presented in Appendix 2.

Anomalous *in situ* pH measurements were noted in the field in August (*e.g.*, 13.41 pH units; Table A1-1) and September (particularly at depth; *e.g.,* 4.62 pH units at 5.0 m depth) at some sites. Comparison of the surface *in situ* pH measurements to laboratory results indicated that *in situ* measurements from August in Clark Lake were erroneous and the results were discarded. *In situ* measurements from one site in the Nelson River upstream area (US-4) in August (surface = 9.29 pH units) were also marked as suspect (*i.e.,* results were higher than those recorded at these sites throughout the AEMP program conducted since 2014). Anomalous *in situ* measurements recorded at depth in September were marked as suspect when there was a notable change across 1 m; surface *in situ* measurements were confirmed against the laboratory results and were therefore retained.

4.1 KEY INDICATORS

4.1.1 NUTRIENTS

Mean ammonia, nitrate/nitrite, and total phosphorus (TP) concentrations measured in Split Lake/Clark Lake, the Nelson River upstream of Gull Rapids, and the near-field and far-field areas of the LSA were within the benchmark values during each of the sampling events in March/April (winter), June, July, August, and September (Table 2; Figures 2–4).

4.1.2 CHLOROPHYLL *a*

Mean chlorophyll *a* concentrations measured in Split Lake/Clark Lake, the Nelson River upstream area, and the near-field and far-field areas of the LSA were below the benchmark of 10.00 µg/L in March/April, June, July, August, and September (Table 2; Figure 5).

4.1.3 TOTAL SUSPENDED SOLIDS

Mean TSS concentrations measured in Split Lake/Clark Lake, the Nelson River upstream area, and the near-field and far-field areas of the LSA in March/April, June, July, and August, and September were within the chronic benchmark values, defined as a 5 mg/L increase above

background (calculated from measurements collected at Split or Clark lakes during each sampling period) (Table 2; Figure 6).

The mean concentration in August in the near-field area (8.7 mg/L) was within the chronic benchmark (12.7 mg/L), although one of the five samples (site NF-1; 16.3 mg/L; Table A1-2) exceeded the benchmark. The mean TSS concentration in the near-field area in August was not significantly different from that measured in either of the upstream reference areas (Clark Lake or Nelson River upstream area; means = 7.7 and 8.3 mg/L, respectively; Figure 6), indicating that the overall conditions downstream of construction were similar to background.

4.1.4 DISSOLVED OXYGEN

Mean DO concentrations measured in all sampling areas in the LSA were within the benchmark values during each of the sampling events in March/April, June, July, August, and September (Table 2; Figure 7). Although slight variations in DO concentrations were observed across water depth during some sampling periods, all sites in the study area were well-oxygenated with DO saturation exceeding 85%. All measurements collected across the water column at every site and sampling time exceeded the DO benchmarks.

4.1.5 pH

Mean laboratory and *in situ* pH measurements collected in Split Lake/Clark Lake, the Nelson River upstream of Gull Rapids, and the near-field and far-field areas of the LSA were within the benchmark values during each of the sampling events in March/April, June, July, August, and September (Table 2; Figure 8). As previously discussed, erroneous *in situ* measurements from Clark Lake in August were removed from the analysis (Table A1-1). *In situ* results from one site in the upstream area in August (site US-4; 9.29 and 9.01 at depths of 0.3 and 1.0 m, respectively) exceeded the upper benchmark (9.0 pH units); however, these measurements are considered suspect for several reasons:

- issues with the water quality meter were noted in the field;
- values exceeded those measured historically across all sites and times sampling has occurred under the AEMP program (range: 7.70-8.82 pH units, across all sites, seasons, and depths; Wyn and Cooley 2015, 2016; Martens and Cooley 2017; Wyn and Cooley 2018; Wyn 2019), and they were higher than those measured at the three other replicate stations (range 7.49-8.78 pH units); and
- measurements from all other sites in the upstream area differed (i.e., were lower and similar to other sites and the range of conditions measured in previous years) from those collected at site US-4.

4.1.6 METALS

Mean concentrations of total metals measured in each of the LSA sampling areas were within the benchmark values during each sampling event, including: aluminum, arsenic, boron, cadmium, chromium, copper, iron, lead, mercury, molybdenum, nickel, selenium, silver, thallium, uranium, and zinc (Table 2; Figures 9–24).

Copper in one sample (site US-9; 0.0357 mg/L; the results was confirmed by reanalysis at the laboratory) from the upstream area exceeded the benchmark (0.0119 mg/L) in winter, though the mean concentration for the area (0.00948 mg/L) remained below the benchmark (Table 2; Figure 14). The sampling area is upstream of construction activities and, as such, the exceedance is not considered to be related to the Project.

Although all results remained below the benchmarks, an anomalous molybdenum concentration was also measured in the upstream area in September (Figure 18). One of the replicate samples (from site US-2) had a molybdenum concentration approximately 100 times higher than the other results (0.0412 mg/L compared to 0.000513 and 0.000544 mg/L); the result was confirmed by reanalysis at the analytical laboratory and was therefore retained in the analysis. The mean concentration for the upstream area (0.00322 mg/L) remained well below the benchmark (0.073 mg/L) even with this result included.

4.1.7 HYDROCARBONS AND BTEX

F1-F4 hydrocarbons and BTEX were below the analytical detection limits in all samples collected in the LSA in 2019 (Table A1-4). As results for all seasons were below detection and the DLs were lower than PAL guidelines, all measurements were also within the PAL guidelines.

Some samples from August and September were submitted with headspace and the laboratory stated the results may be artificially low; however, the results are comparable to all other sites, seasons, and years of sampling. The laboratory also noted that samples from the near-field area in September contained visible sediment and that results may be biased on the high end. The detection limit was raised for xylene due to the presence of sediments.

4.2 ADDITIONAL PARAMETERS

Results for parameters measured in the LSA that are not key indicators (Table 3) are presented as follows: dissolved phosphorus (Figure 25), total nitrogen (Figure 26), dissolved organic carbon (Figure 27), true colour (Figure 28), *in situ* and laboratory turbidity (Figure 29), *in situ* and laboratory specific conductance (Figure 30), total dissolved solids (Figure 31), hardness (Figure 32), and major ions (chloride, sulfate, calcium, magnesium, potassium, and sodium;

Figures 33–38). Turbidity and a number of metals decreased in the downstream direction during most seasons.

5.0 DISCUSSION

The mean concentrations of all key indicators measured in the LSA were within benchmarks during the March/April, June, July, August, and September sampling events in 2019. As per Step 1 of the AMF, no further analysis was therefore required.

During the August sampling period, TSS was below the benchmark of 12.7 mg/L in the Stephens Lake near-field area (mean = 8.7 mg/L) and, therefore, further analyses were not triggered under the AMF. However, data were explored further due to an exceedance observed in one of the five replicate samples. Concentrations of TSS were not statistically different between the near-field and upstream reference areas (Clark Lake or Nelson River upstream area; means = 7.7 and 8.3 mg/L respectively), indicating that the overall conditions downstream of construction were similar to background. Collectively, the information illustrates that there was no indication of a Project-related effect on TSS in the downstream environment.

F1-F4 hydrocarbons and BTEX were below the analytical detection limits, and within the MWQSOGs for PAL, in all samples collected from the lower Nelson River upstream of the construction site and the downstream near-field area during each of the sampling events.

6.0 SUMMARY AND CONCLUSIONS

Key questions presented in the AEMP to be answered about water quality during construction of the Keeyask GS are:

- *Has the Project resulted in exceedances of water quality objectives or guidelines for the protection of aquatic life?*
- *What are the magnitude and spatial extent of effects of construction on water quality?*

Water quality measured in the local study area along the lower Nelson River indicated that conditions measured during the ice-cover and open-water seasons of 2019 were generally similar upstream and downstream of the construction activities. Any upstream to downstream differences in water quality were consistent with spatial trends observed during baseline studies.

Overall, information collected thus far indicates that construction activities have not affected water quality and its suitability to support aquatic life.

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TABLES

Table 1: Coordinates of water quality monitoring sites sampled in the local study area in 2019.

Region	Site ID	Zone	Easting	Northing
Split Lake	SPL-10	14V	680830	6236761
	SPL-11	14V	680887	6236610
	SPL-12	14V	680919	6236898
	SPL-13	14V	680741	6236671
	SPL-14	14V	680987	6236489
Clark Lake	CL-1	15V	321208	6240797
	CL-2	15V	321109	6240831
	CL-3	15V	321176	6240608
	CL-4	15V	321221	6240972
	CL-5	15V	321182	6240991
Nelson River Upstream of Gull Rapids	US-1	15V	359578	6246174
	US-2	15V	359501	6246182
	US-3	15V	359364	6246145
	US-4	15V	359389	6246190
	US-5	15V	359438	6246070
	US-6	15V	356921	6245418
	US-7	15V	356922	6245502
	US-8	15V	356918	6245438
	US-9	15V	356856	6245498
	US-10	15V	356861	6245494
Stephens Lake Near-field	NF-1	15V	373744	6247187
	NF-2	15V	373907	6245447
	NF-3	15V	373840	6247144
	NF-4	15V	374305	6245234
	NF-5	15V	373826	6247488
Stephens Lake Far-field	FF-1	15V	388137	6250849
	FF-2	15V	388245	6249831
	FF-3	15V	388371	6249139
	FF-4	15V	388174	6249632
	FF-5	15V	388386	6250446
	FF-6	15V	388238	6249844

Table 2: Benchmark and mean values of key water quality parameters measured during the water quality monitoring program, 2019.

Indicator	Unit	Benchmark[1]	March/April			
			Split Lake	Upstream	Near-Field	Far-Field
Ammonia	(mg N/L)	1.24	0.011	0.019	0.010	0.013
Nitrate/ Nitrite	(mg N/L)	2.93	0.0635	0.0628	0.0627	0.0632
Total Phosphorus	(mg/L)	0.058	0.0237	0.0254	0.0240	0.0252
Chlorophyll *a*	(µg/L)	10.0	1.54	1.67	2.18	3.43
Total Suspended Solids	(mg/L)	9.3/29.3[2]	4.3	7.8	6.8	5.7
Laboratory pH	-	6.5/9.0	7.98	7.82	7.91	7.95
Dissolved Oxygen	(mg/L)	6.5/9.5[3]	14.81	14.60	14.80	14.69
Aluminum	(mg/L)	1.98	0.328	0.381	0.368	0.320
Arsenic	(mg/L)	0.150	0.00105	0.00117	0.00120	0.00117
Boron	(mg/L)	1.5	0.013	0.017	0.016	0.015
Cadmium	(mg/L)	0.000278	<0.0000050	0.0000059	0.0000115	0.0000097
Chromium	(mg/L)	0.0887	0.00079	0.00070	0.00068	0.00065
Copper	(mg/L)	0.00962	0.00301	0.00948[4]	0.00327	0.00190
Iron	(mg/L)	1.45	0.394	0.410	0.395	0.367
Lead	(mg/L)	0.00333	0.000182	0.000212	0.000183	0.000177
Mercury	(mg/L)	0.000026	0.00000070	0.00000076	0.00000068	0.00000125
Molybdenum	(mg/L)	0.073	0.000504	0.000597	0.000620	0.000606
Nickel	(mg/L)	0.0537	0.00133	0.00137	0.00130	0.00130
Selenium	(mg/L)	0.0010	0.000113	0.000127	0.000121	0.000118
Silver	(mg/L)	0.0001	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	(mg/L)	0.0008	<0.000010	<0.000010	<0.000010	<0.000010
Uranium	(mg/L)	0.0330	0.000564	0.000677	0.000685	0.000680
Zinc	(mg/L)	0.123	<0.0030	0.0031	<0.0030	<0.0030

1. Benchmark values are based on the most stringent calculation measured from the 2019 monitoring program.
2. Lower value represents chronic benchmark; higher value represents short-term benchmark. Values calculated based on the mean TSS measured at Split/Clark Lake during each sampling period.
3. 6.5 mg/L represents the benchmark for the open-water season; 9.5 mg/L is the benchmark for the ice-cover season.
4. Mean includes one anomalously high copper measurement from the Nelson River upstream area in March (0.0357 mg/L). The monthly mean is reduced to 0.00298 mg/L when the result is excluded.

Table 2: Benchmark and mean values of key water quality parameters measured during the water quality monitoring program, 2019 (continued).

Indicator	Unit	Benchmark[1]	June			
			Clark Lake	Upstream	Near-Field	Far-Field
Ammonia	(mg N/L)	1.24	<0.010	0.011	0.029	0.013
Nitrate/ Nitrite	(mg N/L)	2.93	<0.0051	<0.0051	<0.0051	<0.0051
Total Phosphorus	(mg/L)	0.058	0.0303	0.0312	0.0294	0.0256
Chlorophyll *a*	(µg/L)	10.0	4.87	5.02	5.74	4.96
Total Suspended Solids	(mg/L)	12.4/32.4[2]	7.4	8.1	7.3	5.7
Laboratory pH	-	6.5/9.0	8.19	8.17	8.06	8.09
Dissolved Oxygen	(mg/L)	6.5/9.5[3]	9.79	9.62	9.88	9.74
Aluminum	(mg/L)	1.98	0.487	0.581	0.532	0.446
Arsenic	(mg/L)	0.150	0.00100	0.00099	0.00103	0.00091
Boron	(mg/L)	1.5	0.022	0.022	0.017	0.018
Cadmium	(mg/L)	0.000278	0.0000071	0.0000054	0.0000090	<0.0000050
Chromium	(mg/L)	0.0887	0.00098	0.00108	0.00112	0.00090
Copper	(mg/L)	0.00962	0.00168	0.00162	0.00168	0.00154
Iron	(mg/L)	1.45	0.516	0.604	0.571	0.478
Lead	(mg/L)	0.00333	0.000286	0.000274	0.000303	0.000235
Mercury	(mg/L)	0.000026	0.00000079	0.00000087	0.00000083	0.00000075
Molybdenum	(mg/L)	0.073	0.000481	0.000514	0.000521	0.000524
Nickel	(mg/L)	0.0537	0.00147	0.00155	0.00153	0.00133
Selenium	(mg/L)	0.0010	0.000096	0.000097	0.000104	0.000105
Silver	(mg/L)	0.0001	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	(mg/L)	0.0008	<0.000010	<0.000010	<0.000010	<0.000010
Uranium	(mg/L)	0.0330	0.000555	0.000526	0.000565	0.000514
Zinc	(mg/L)	0.123	0.0039	<0.0030	0.0041	<0.0030

Table 2: Benchmark and mean values of key water quality parameters measured during the water quality monitoring program, 2019 (continued).

Indicator	Unit	Benchmark[1]	July			
			Clark Lake	Upstream	Near-Field	Far-Field
Ammonia	(mg N/L)	1.24	0.013	0.013	0.015	0.010
Nitrate/ Nitrite	(mg N/L)	2.93	0.0060	<0.0051	<0.0051	<0.0051
Total Phosphorus	(mg/L)	0.058	0.0348	0.0363	0.0299	0.0296
Chlorophyll *a*	(µg/L)	10.0	5.49	5.60	4.81	5.59
Total Suspended Solids	(mg/L)	15.2/35.2[2]	10.2	9.8	7.6	4.3
Laboratory pH	-	6.5/9.0	8.22	8.24	8.20	8.19
Dissolved Oxygen	(mg/L)	6.5/9.5[3]	9.02	9.05	9.65	9.29
Aluminum	(mg/L)	1.98	0.699	0.522	0.470	0.480
Arsenic	(mg/L)	0.150	0.00118	0.00115	0.00111	0.00105
Boron	(mg/L)	1.5	0.014	0.015	0.025	0.024
Cadmium	(mg/L)	0.000278	0.0000086	0.0000063	0.0000074	0.0000059
Chromium	(mg/L)	0.0887	0.00138	0.00107	0.00096	0.00090
Copper	(mg/L)	0.00962	0.00182	0.00172	0.00176	0.00181
Iron	(mg/L)	1.45	0.740	0.606	0.507	0.475
Lead	(mg/L)	0.00333	0.000343	0.000299	0.000250	0.000216
Mercury	(mg/L)	0.000026	0.00000086	0.00000080	0.00000073	0.00000067
Molybdenum	(mg/L)	0.073	0.000569	0.000538	0.000513	0.000529
Nickel	(mg/L)	0.0537	0.00180	0.00157	0.00148	0.00137
Selenium	(mg/L)	0.0010	0.000108	0.000108	0.000100	0.000096
Silver	(mg/L)	0.0001	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	(mg/L)	0.0008	0.000012	<0.000010	<0.000010	<0.000010
Uranium	(mg/L)	0.0330	0.000577	0.000592	0.000549	0.000532
Zinc	(mg/L)	0.123	<0.0030	<0.0030	<0.0030	<0.0030

Table 2: Benchmark and mean values of key water quality parameters measured during the water quality monitoring program, 2019 (continued).

Indicator	Unit	Benchmark[1]	August			
			Clark Lake	Upstream	Near-Field	Far-Field
Ammonia	(mg N/L)	1.24	0.014	0.021	0.023	0.029
Nitrate/ Nitrite	(mg N/L)	2.93	<0.0051	0.0178	0.0263	0.0260
Total Phosphorus	(mg/L)	0.058	0.0361	0.0396	0.0395	0.0384
Chlorophyll *a*	(µg/L)	10.0	5.76	4.69	4.99	4.40
Total Suspended Solids	(mg/L)	12.7/32.7[2]	7.7	8.3	8.7	6.5
Laboratory pH	-	6.5/9.0	8.24	8.19	8.17	8.16
Dissolved Oxygen	(mg/L)	6.5/9.5[3]	9.36	9.44	10.65	9.97
Aluminum	(mg/L)	1.98	0.657	0.644	0.541	0.556
Arsenic	(mg/L)	0.150	0.00138	0.00140	0.00142	0.00134
Boron	(mg/L)	1.5	0.016	0.018	0.025	0.024
Cadmium	(mg/L)	0.000278	<0.0000050	0.0000074	<0.0000050	0.0000067
Chromium	(mg/L)	0.0887	0.00125	0.00134	0.00148	0.00249
Copper	(mg/L)	0.00962	0.00177	0.00186	0.00175	0.00178
Iron	(mg/L)	1.45	0.677	0.703	0.585	0.589
Lead	(mg/L)	0.00333	0.000325	0.000351	0.000282	0.000288
Mercury	(mg/L)	0.000026	0.00000069	0.00000075	<0.00000050	0.00000055
Molybdenum	(mg/L)	0.073	0.000568	0.000584	0.000630	0.000702
Nickel	(mg/L)	0.0537	0.00161	0.00187	0.00243	0.00298
Selenium	(mg/L)	0.0010	0.000108	0.000119	0.000105	0.000097
Silver	(mg/L)	0.0001	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	(mg/L)	0.0008	0.000012	0.000011	<0.000010	<0.000010
Uranium	(mg/L)	0.0330	0.000562	0.000561	0.000599	0.000564
Zinc	(mg/L)	0.123	<0.0030	<0.0030	<0.0030	<0.0030

Table 2: Benchmark and mean values of key water quality parameters measured during the water quality monitoring program, 2019 (continued).

Indicator	Unit	Benchmark[1]	September			
			Clark Lake	Upstream	Near-Field	Far-Field
Ammonia	(mg N/L)	1.24	0.0216	0.0203	<0.010	0.0248
Nitrate/ Nitrite	(mg N/L)	2.93	0.0070	<0.0051	0.0203	0.0058
Total Phosphorus	(mg/L)	0.058	0.0344	0.0344	0.0339	0.0259
Chlorophyll *a*	(µg/L)	10.0	6.09	6.12	6.61	6.78
Total Suspended Solids	(mg/L)	13.0/33.0[2]	8.0	7.1	5.9	4.0
Laboratory pH	-	6.5/9.0	8.08	8.10	8.10	8.17
Dissolved Oxygen	(mg/L)	6.5/9.5[3]	10.24	10.20	10.48	10.31
Aluminum	(mg/L)	1.98	0.613	0.562	0.445	0.235
Arsenic	(mg/L)	0.150	0.00116	0.00108	0.00105	0.00108
Boron	(mg/L)	1.5	0.022	0.020	0.021	0.020
Cadmium	(mg/L)	0.000278	<0.0000050	0.0000074	0.0000059	<0.0000050
Chromium	(mg/L)	0.0887	0.00121	0.00119	0.00099	0.00062
Copper	(mg/L)	0.00962	0.00173	0.00159	0.00150	0.00146
Iron	(mg/L)	1.45	0.666	0.565	0.452	0.291
Lead	(mg/L)	0.00333	0.000292	0.000273	0.000234	0.000211
Mercury	(mg/L)	0.000026	0.00000056	0.00000057	0.00000061	0.00000055
Molybdenum	(mg/L)	0.073	0.000496	0.00322[5]	0.000763	0.000633
Nickel	(mg/L)	0.0537	0.00158	0.00161	0.00143	0.00140
Selenium	(mg/L)	0.0010	0.000121	0.000053	0.000059	0.000074
Silver	(mg/L)	0.0001	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	(mg/L)	0.0008	<0.000010	<0.000010	<0.000010	<0.000010
Uranium	(mg/L)	0.0330	0.000499	0.000517	0.000499	0.000567
Zinc	(mg/L)	0.123	<0.0030	<0.0030	<0.0030	<0.0030

5. Includes an anomalously high he molybdenum value for one replicate from the Nelson River upstream area in September (0.0412 mg/L) which was confirmed through reanalysis at the laboratory. The monthly mean is reduced to 0.000529 mg/L and the open-water mean is reduced to 0.000536 mg/L when this value is excluded.

Table 2: Benchmark and mean values of key water quality parameters measured during the water quality monitoring program, 2019 (continued).

Indicator	Unit	Benchmark[1]	Open-water Season			
			Clark Lake	Upstream	Near-Field	Far-Field
Ammonia	(mg N/L)	1.24	0.014	0.016	0.019	0.019
Nitrate/ Nitrite	(mg N/L)	2.93	0.0054	0.0069	0.0129	0.0092
Total Phosphorus	(mg/L)	0.058	0.0339	0.0354	0.0332	0.0299
Chlorophyll *a*	(µg/L)	10.0	5.55	5.36	5.54	5.43
Total Suspended Solids	(mg/L)	13.3/33.3[2]	8.3	8.3	7.4	5.1
Laboratory pH	-	6.5/9.0	8.18	8.18	8.13	8.15
Dissolved Oxygen	(mg/L)	6.5/9.5[3]	9.60	9.58	10.17	9.83
Aluminum	(mg/L)	1.98	0.614	0.577	0.497	0.429
Arsenic	(mg/L)	0.150	0.00118	0.00116	0.00115	0.00109
Boron	(mg/L)	1.5	0.018	0.019	0.022	0.021
Cadmium	(mg/L)	0.000278	0.0000056	0.0000066	0.0000068	0.0000052
Chromium	(mg/L)	0.0887	0.00120	0.00117	0.00114	0.00123
Copper	(mg/L)	0.00962	0.00175	0.00170	0.00167	0.00165
Iron	(mg/L)	1.45	0.650	0.619	0.528	0.458
Lead	(mg/L)	0.00333	0.000312	0.000299	0.000267	0.000237
Mercury	(mg/L)	0.000026	0.00000073	0.00000075	0.00000066	0.00000063
Molybdenum	(mg/L)	0.073	0.000529	0.00121[5]	0.000607	0.000597
Nickel	(mg/L)	0.0537	0.00162	0.00165	0.00172	0.00177
Selenium	(mg/L)	0.0010	0.000108	0.000094	0.000092	0.000093
Silver	(mg/L)	0.0001	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	(mg/L)	0.0008	<0.000010	<0.000010	<0.000010	<0.000010
Uranium	(mg/L)	0.0330	0.000548	0.000549	0.000553	0.000544
Zinc	(mg/L)	0.123	<0.0030	<0.0030	<0.0030	<0.0030

Table 3: Mean values of additional parameters measured during the water quality monitoring program, 2019.

Indicator	Unit	March/April				June			
		Split Lake	Upstream	Near-Field	Far-Field	Clark Lake	Upstream	Near-Field	Far-Field
Dissolved Phosphorus	(mg/L)	0.0123	0.0144	0.0128	0.0134	0.0111	0.0094	0.0145	0.0101
Total Nitrogen	(mg/L)	0.45	0.50	0.42	0.44	0.40	0.29	0.37	0.36
Dissolved Organic Carbon	(mg/L)	8.56	9.98	9.61	8.75	8.22	7.95	7.41	7.37
In situ Turbidity	(NTU)	10.48	8.96	9.04	9.23	16.1	16.6	15.7	13.4
Laboratory Turbidity	(NTU)	11.3	10.3	10.7	11.3	17.5	18.3	16.3	14.0
In situ Specific Conductance	(µS/cm)	274	178	311	316	274	275	277	276
Laboratory Specific Conductance	(µmhos/cm)	275	316	312	312	260	256	258	260
Total Dissolved Solids	(mg/L)	194	185	198	183	172	178	169	166
True Color	(TCU)	16.1	15.2	15.9	14.6	17.2	16.6	9.8	11.9
In situ pH	-	7.80	8.01	7.85	7.89	7.95	7.99	8.08	8.06
Hardness as $CaCO_3$	(mg/L)	113	131	126	126	112	119	124	104
Chloride	(mg/L)	13.9	17.4	17.1	17.0	12.9	12.7	13.1	12.7
Sulfate	(mg/L)	27.7	34.4	34.2	33.5	26.4	25.6	26.8	25.5
Calcium	(mg/L)	25.4	28.5	27.6	27.6	25.7	27.0	30.7	25.5
Magnesium	(mg/L)	12.0	14.5	13.8	13.7	11.6	12.4	11.4	9.7
Potassium	(mg/L)	2.37	2.77	2.70	2.58	2.35	2.30	2.35	2.26
Sodium	(mg/L)	14.4	17.6	17.0	17.2	13.4	13.9	13.5	12.1

Table 3: Mean values of additional parameters measured during the water quality monitoring program, 2019 (continued).

Indicator	Unit	July				August			
		Clark Lake	Upstream	Near-Field	Far-Field	Clark Lake	Upstream	Near-Field	Far-Field
Dissolved Phosphorus [1]	(mg/L)	0.0142	0.0147	0.0150	0.0143	0.0174	0.0196	0.0199	0.0205
Total Nitrogen	(mg/L)	0.38	0.39	0.41	0.37	0.43	0.37	0.41	0.41
Dissolved Organic Carbon	(mg/L)	8.35	10.11	9.87	8.37	8.55	7.89	7.92	7.83
In situ Turbidity	(NTU)	19.6	19.9	17.6	13.7	17.9	19.1	17.1	17.8
Laboratory Turbidity	(NTU)	19.9	19.7	17.7	14.1	19.4	19.0	18.2	19.3
In situ Specific Conductance	(µS/cm)	256	262	265	257	254	255	268	255
Laboratory Specific Conductance	(µmhos/cm)	278	288	290	284	283	280	296	277
Total Dissolved Solids	(mg/L)	189	190	177	176	190	198	197	197
True Color	(TCU)	15.5	13.3	13.2	13.2	12.6	12.2	13.0	11.2
In situ pH	-	8.68	8.78	8.74	8.75	[1]	8.63 [2]	8.35	8.47
Hardness as $CaCO_3$	(mg/L)	122	120	122	118	121	129	131	125
Chloride	(mg/L)	13.9	14.4	14.8	14.1	12.5	12.5	13.1	12.4
Sulphate	(mg/L)	28.8	29.1	30.2	28.7	28.5	27.8	29.5	27.2
Calcium	(mg/L)	28.4	27.4	27.8	27.5	27.9	30.0	30.5	29.4
Magnesium	(mg/L)	12.5	12.4	12.7	12.0	12.5	13.3	13.3	12.5
Potassium	(mg/L)	2.50	2.59	2.49	2.33	2.42	2.37	2.45	2.39
Sodium	(mg/L)	14.6	14.7	14.7	13.9	14.4	14.3	15.0	14.1

1. *In situ* pH for Clark Lake in August (>11 pH units) was considered erroneous and removed from the analysis.
2. *In situ* pH measured at US-4 in August (9.29) was considered suspect and removed from the analysis.

Table 3: Mean values of additional parameters measured during the water quality monitoring program, 2019 (continued).

Indicator	Unit	September				Open-water Season			
		Clark Lake	Upstream	Near-Field	Far-Field	Clark Lake	Upstream	Near-Field	Far-Field
Dissolved Phosphorus [1]	(mg/L)	0.0129	0.0121	0.0141	0.0135	0.0139	0.0140	0.0159	0.0146
Total Nitrogen	(mg/L)	0.42	0.43	0.44	0.41	0.41	0.37	0.41	0.39
Dissolved Organic Carbon	(mg/L)	7.65	7.83	7.63	7.56	8.19	8.44	8.21	7.78
In situ Turbidity	(NTU)	15.4	15.4	15.2	12.6	17.2	17.7	16.4	14.4
Laboratory Turbidity	(NTU)	17.1	16.1	14.9	13.3	18.5	18.3	16.8	15.2
In situ Specific Conductance	(µS/cm)	238	241	242	247	255	258	263	259
Laboratory Specific Conductance	(µmhos/cm)	260	272	272	284	270	274	279	276
Total Dissolved Solids	(mg/L)	173	185	207	184	181	188	187	181
True Color	(TCU)	13.8	12.0	11.6	11.5	14.8	13.5	11.9	12.0
In situ pH	-	8.13	8.13	8.21	8.13	8.25	8.37	8.35	8.35
Hardness as $CaCO_3$	(mg/L)	120	118	119	120	119	121	124	117
Chloride	(mg/L)	10.1	11.9	11.9	11.0	12.3	12.9	13.2	12.5
Sulphate	(mg/L)	24.0	29.6	29.2	27.2	26.9	28.0	29.0	27.2
Calcium	(mg/L)	28.2	28.5	29.2	30.1	27.5	28.2	29.6	28.1
Magnesium	(mg/L)	12.0	11.2	11.2	10.9	12.2	12.3	12.1	11.3
Potassium	(mg/L)	2.27	2.33	2.32	2.26	2.39	2.40	2.40	2.31
Sodium	(mg/L)	12.8	12.5	12.5	12.6	13.8	13.9	13.9	13.2

FIGURES

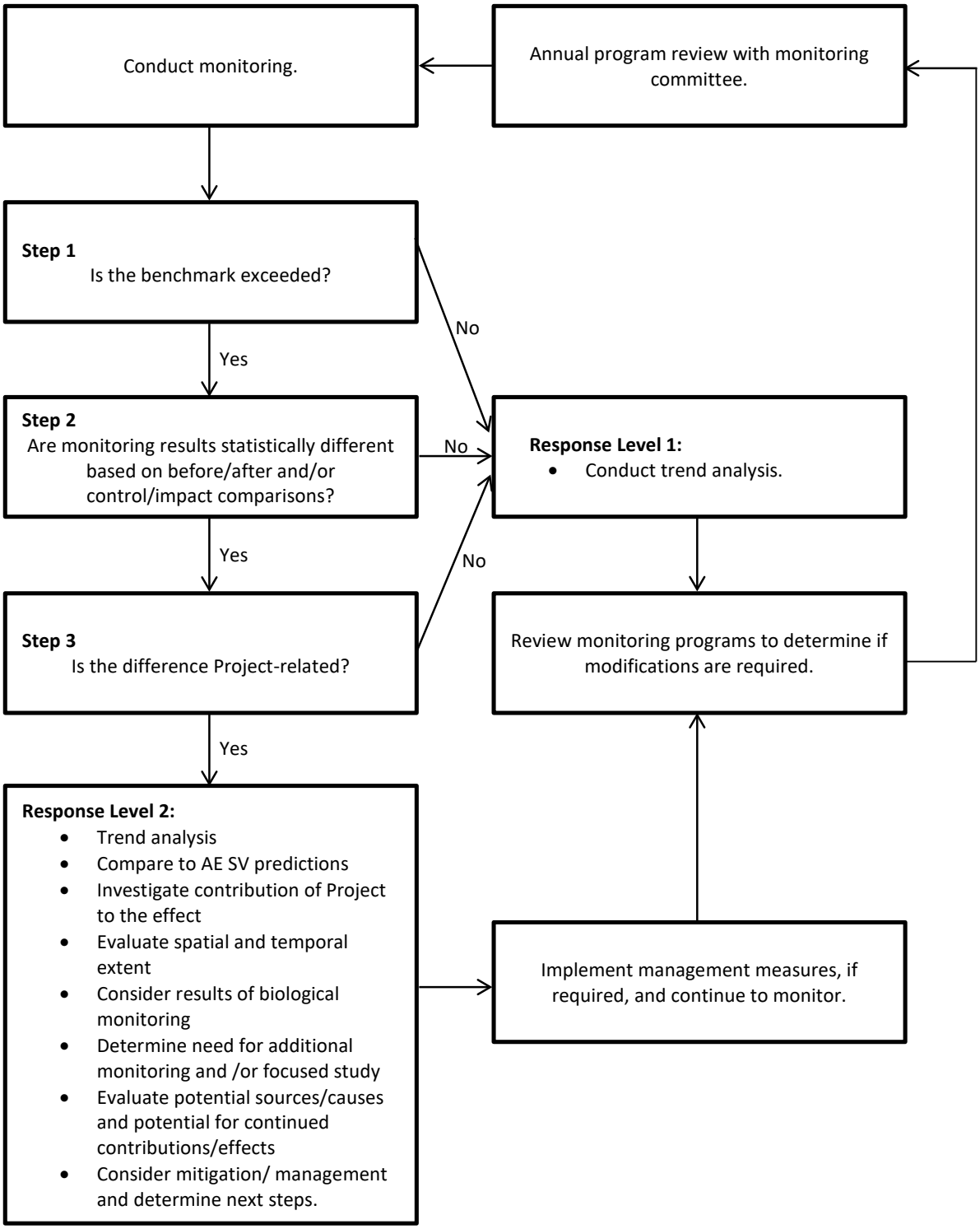


Figure 1: Water quality assessment management framework (AMF).

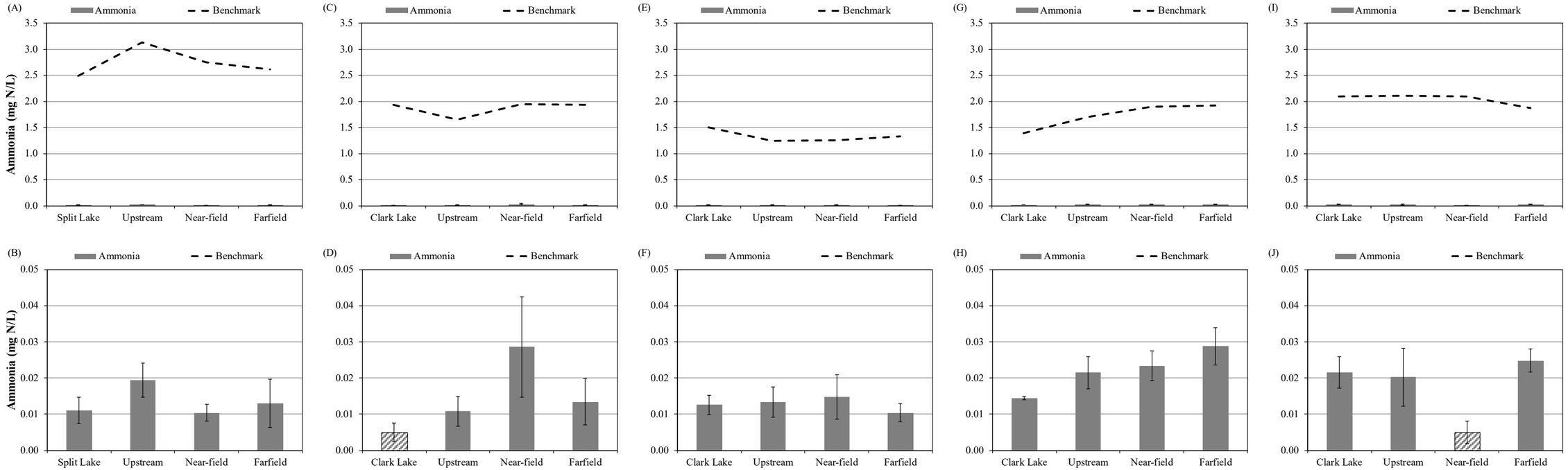


Figure 2: **Mean (± SE) ammonia concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A,B), June 24–26 (C,D), July 21–23 (E,F), August 25–31 (G,H), and September 15–18 (I,J), 2019. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom. Hashed bars represent results below the analytical detection limit.**

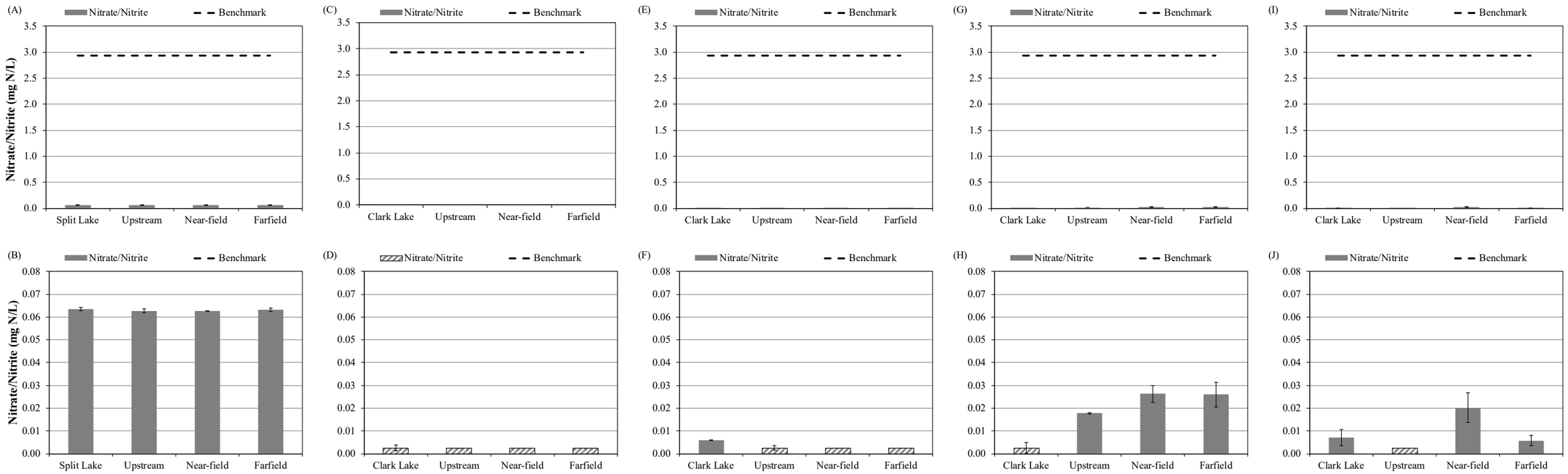


Figure 3: **Mean (± SE) nitrate/nitrite concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A,B), June 24–26 (C,D), July 21–23 (E,F), August 25–31 (G,H), and September 15–18 (I,J), 2019. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom. Hashed bars represent results below the analytical detection limit.**

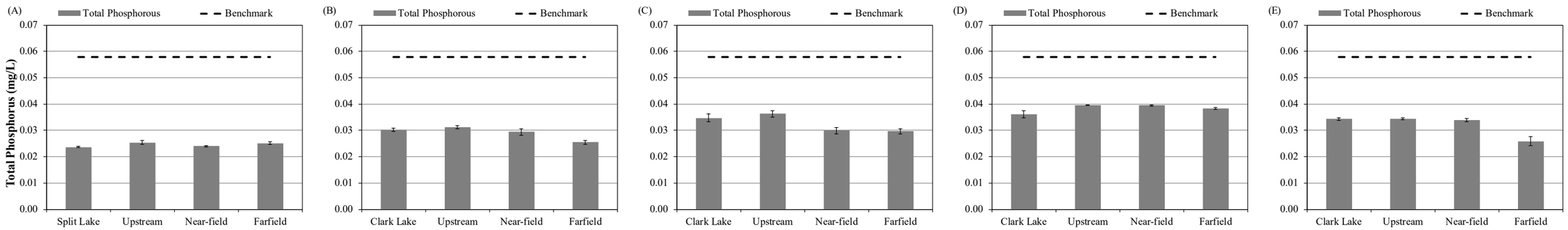


Figure 4: **Mean (± SE) concentrations of total phosphorus measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019**

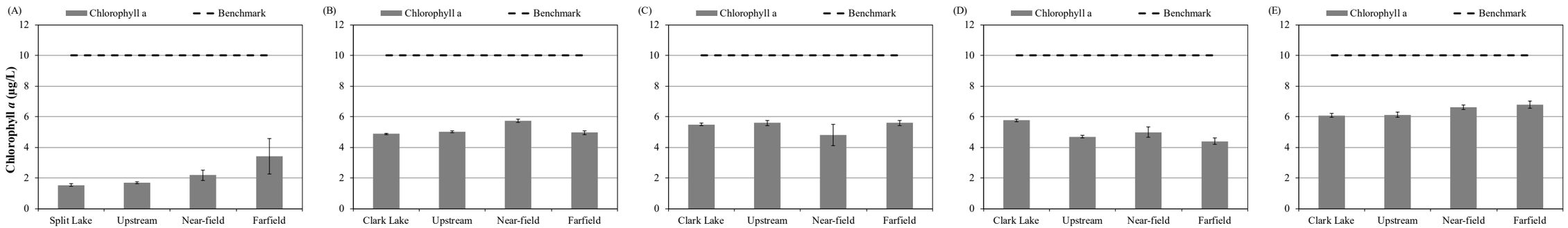


Figure 5: **Mean (± SE) chlorophyll *a* concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.**

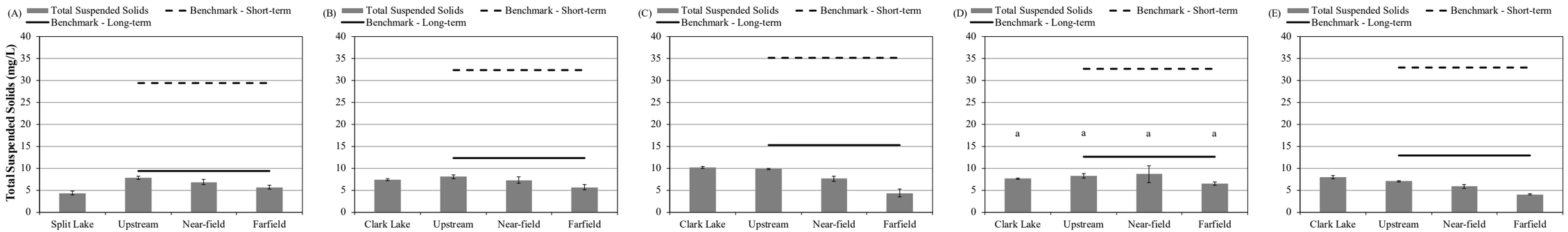


Figure 6: **Mean (± SE) concentration of total suspended solids measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019. Letters in (D) indicate significantly (α = 0.05) different results between sampling areas.**

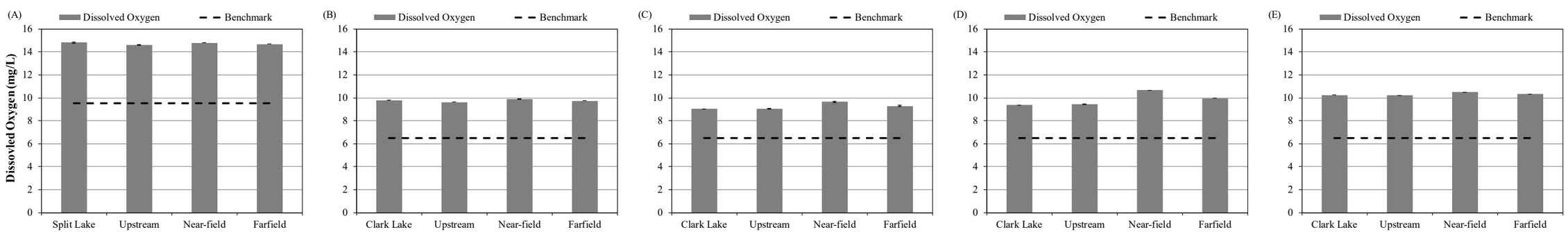
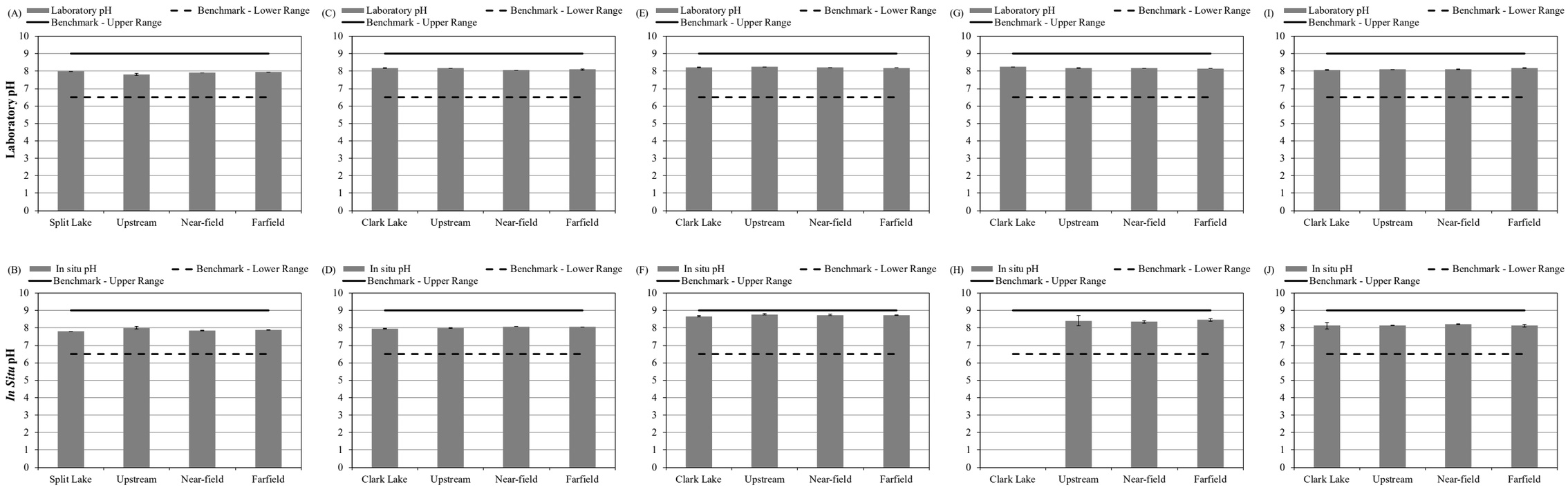


Figure 7: **Mean (± SE) dissolved oxygen concentrations measured near the surface in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.**



In situ pH for Clark Lake in August (>11 pH units) was considered erroneous and removed from the analysis; results from US-4 (9.29) were also considered suspect and removed from the analysis. See Tables A1-1 and A1-2 for additional information.

Figure 8: Mean (± SE) laboratory (top) and *in situ* (bottom) pH measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A,B), June 24–26 (C,D), July 21–23 (E,F), August 25–31 (G,H), and September 15–18 (I,J), 2019.

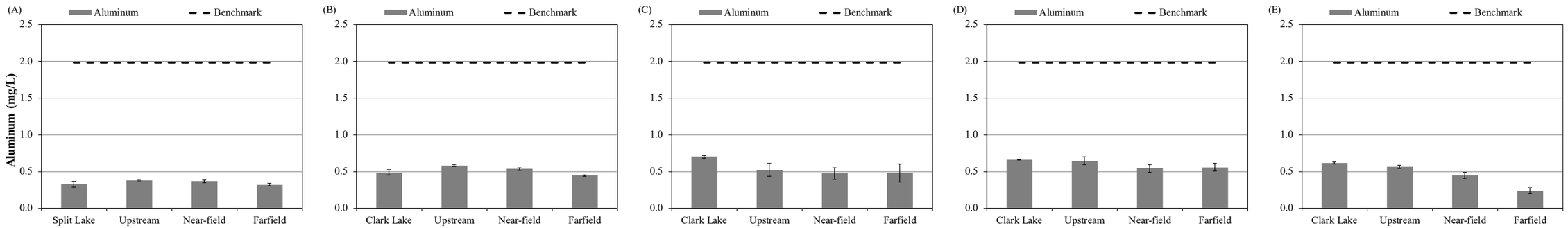


Figure 9: Mean (± SE) aluminum concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.

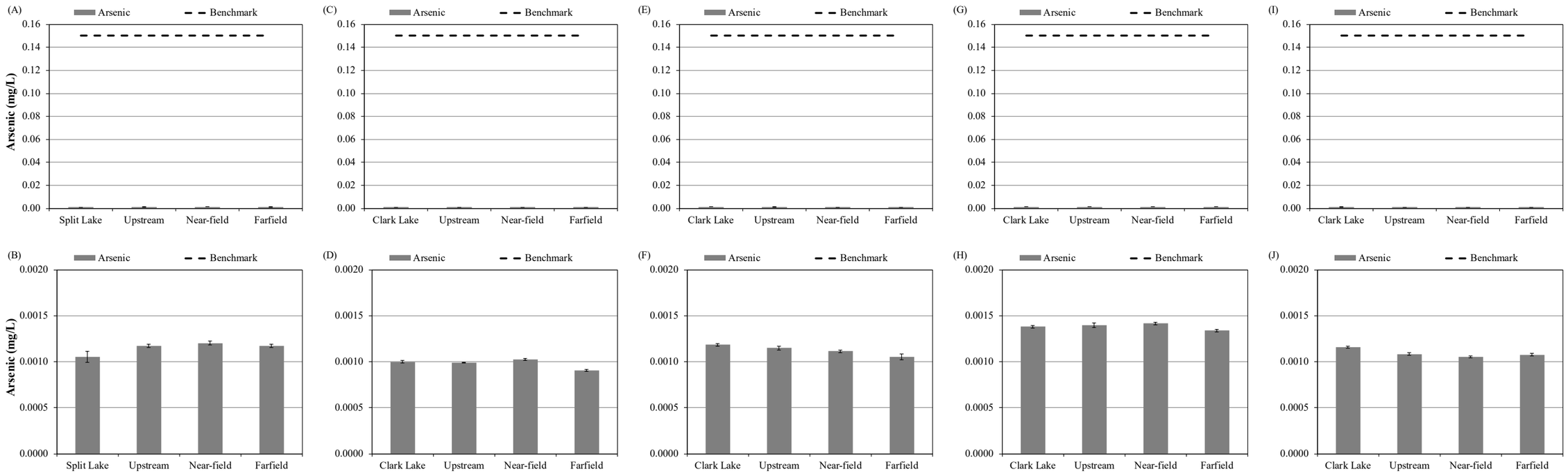


Figure 10: **Mean (± SE) arsenic concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A,B), June 24–26 (C,D), July 21–23 (E,F), August 25–31 (G,H), and September 15–18 (I,J), 2019. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**

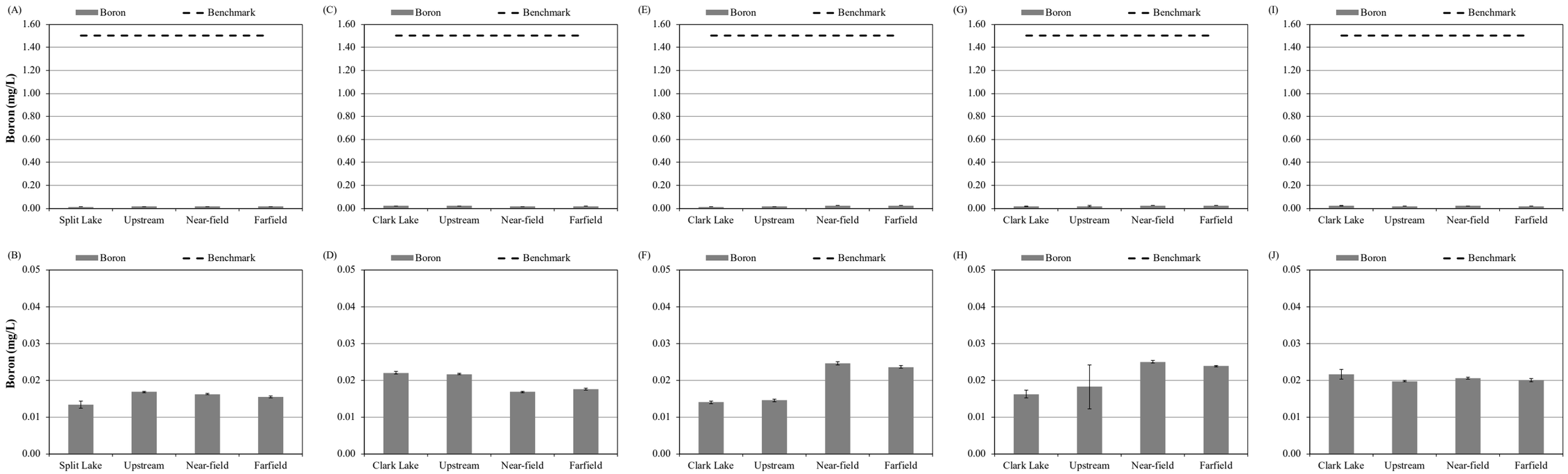


Figure 11: **Mean (± SE) boron concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A,B), June 24–26 (C,D), July 21–23 (E,F), August 25–31 (G,H), and September 15–18 (I,J), 2019. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**

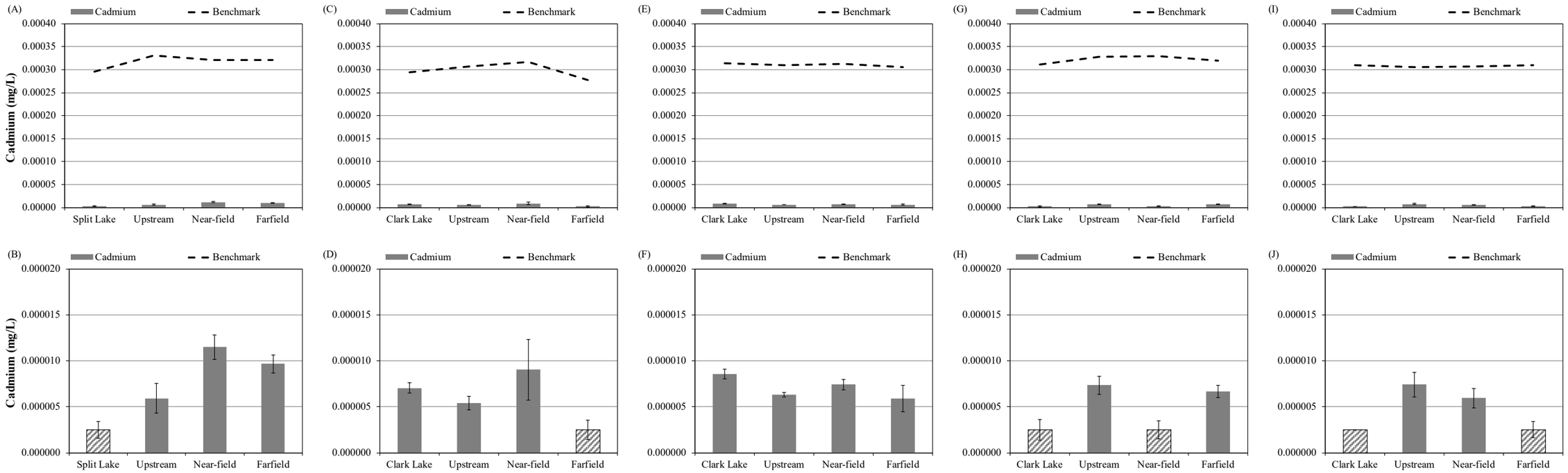


Figure 12: **Mean (± SE) cadmium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A,B), June 24–26 (C,D), July 21–23 (E,F), August 25–31 (G,H), and September 15–18 (I,J), 2019. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom. Hashed bars represent results below the analytical detection limit.**

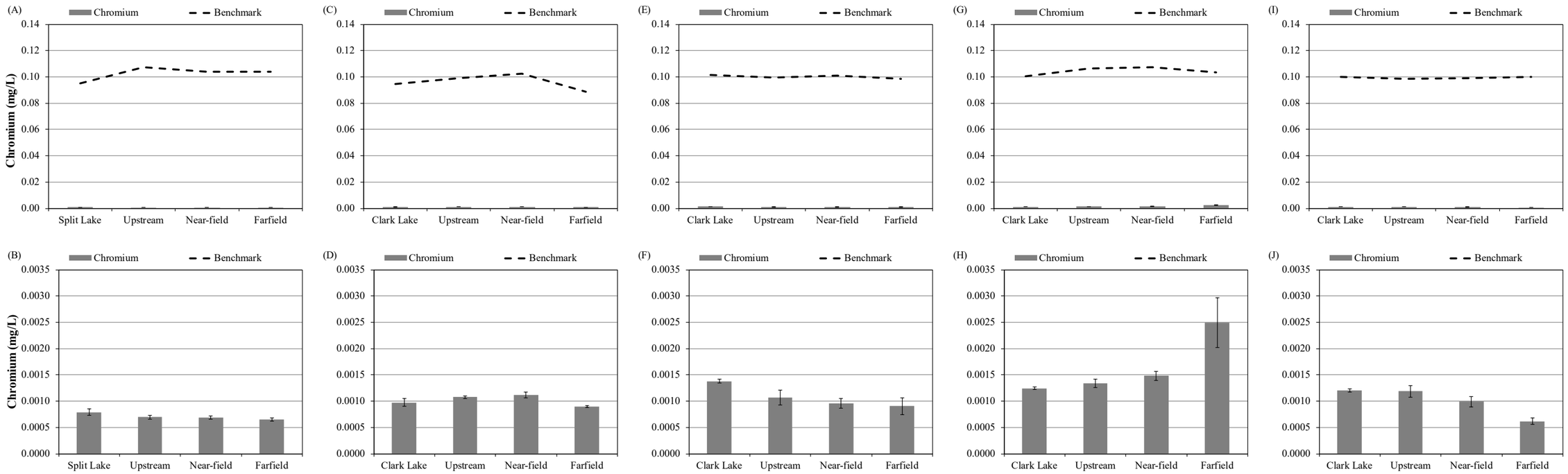
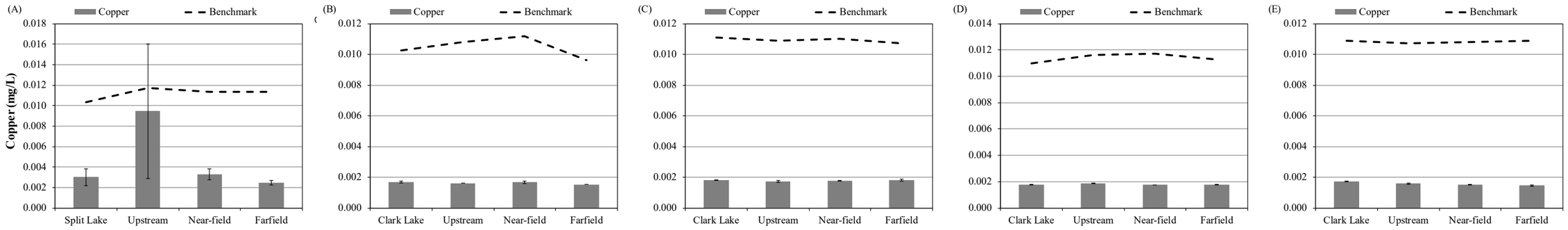


Figure 13: **Mean (± SE) chromium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A,B), June 24–26 (C,D), July 21–23 (E,F), August 25–31 (G,H), and September 15–18 (I,J), 2019. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**



One copper result from the Nelson River upstream area in March (0.0357 mg/L) could not be rerun but the analytical QAQC confirmed; therefore, the result was included in the analysis. If the value is removed, then the mean and SE concentrations (0.00298 ±0.0010 mg/L) are both within the MWQSOG. See Table A1-2 for additional information.

Figure 14: Mean (± SE) copper concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.

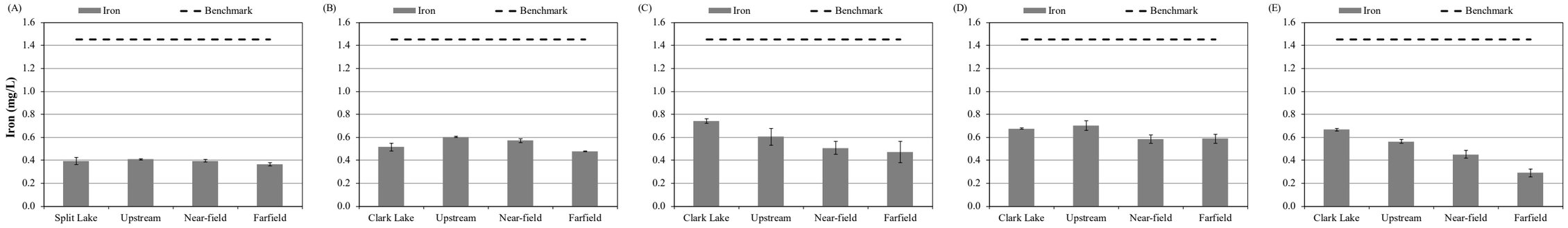


Figure 15: Mean (± SE) iron concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.

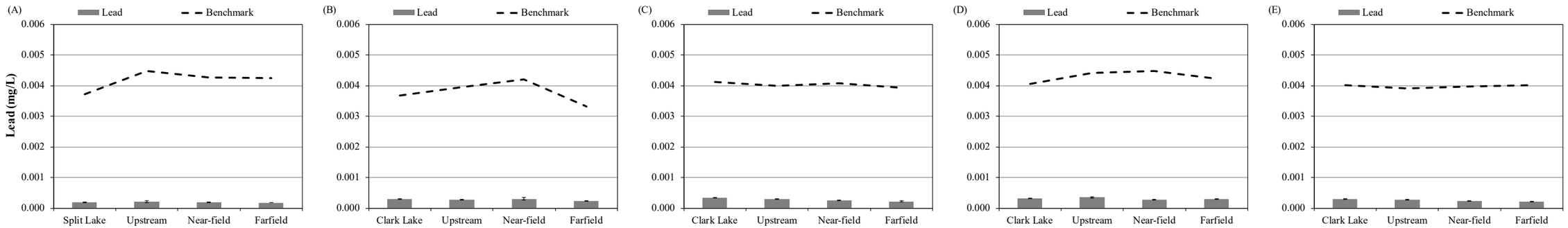


Figure 16: Mean (± SE) lead concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.

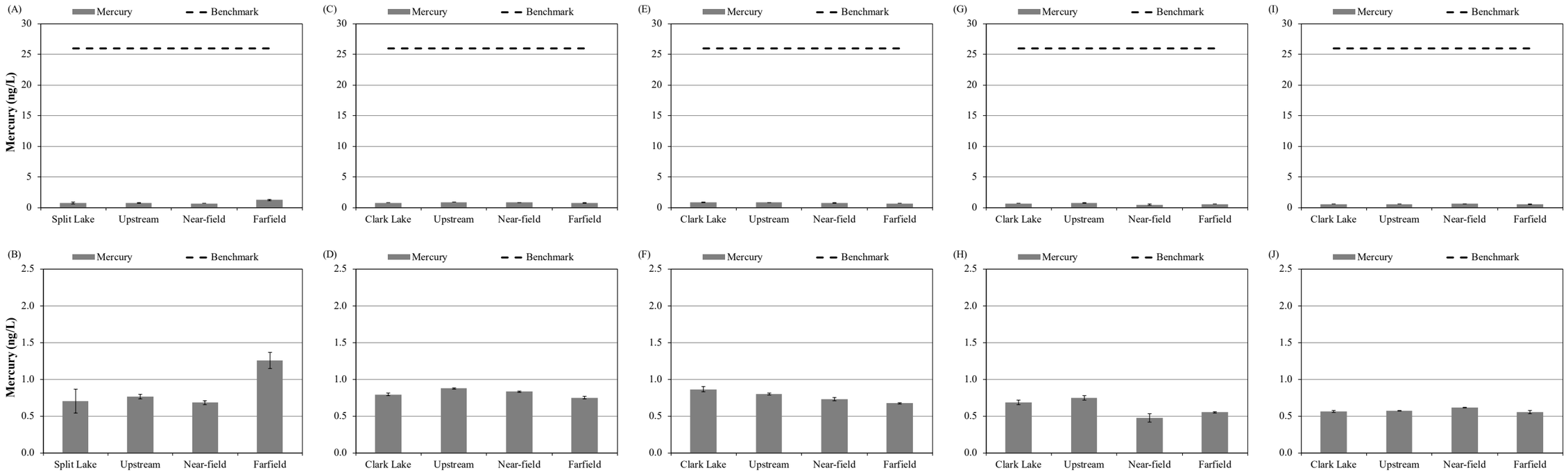
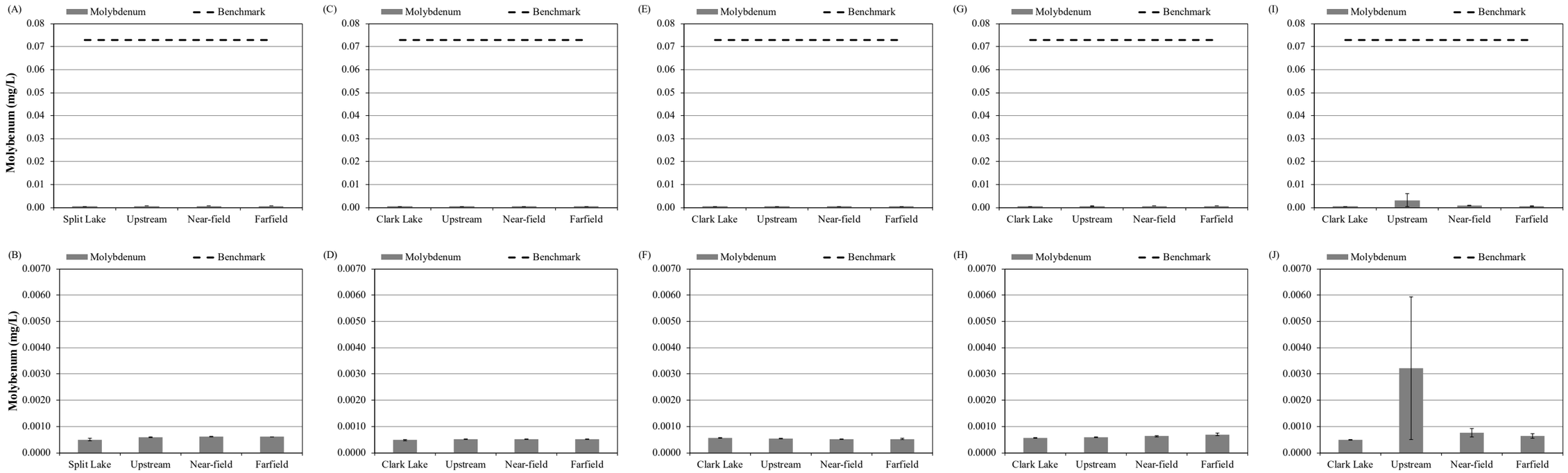


Figure 17: **Mean (± SE) mercury concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A,B), June 24–26 (C,D), July 21–23 (E,F), August 25–31 (G,H), and September 15–18 (I,J), 2019. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**



The molybdenum result for one replicate from the Nelson River upstream area in September (0.0412 mg/L) was 100 times higher than the other triplicate results but was confirmed through reanalysis at the laboratory; therefore, the result was included in the analysis. If the value is removed, then the mean and SE concentrations fall to 0.000529 ±0.000013 mg/L. See Table A2-2 for additional information.

Figure 18: Mean (± SE) molybdenum concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A,B), June 24–26 (C,D), July 21–23 (E,F), August 25–31 (G,H), and September 15–18 (I,J), 2019. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.

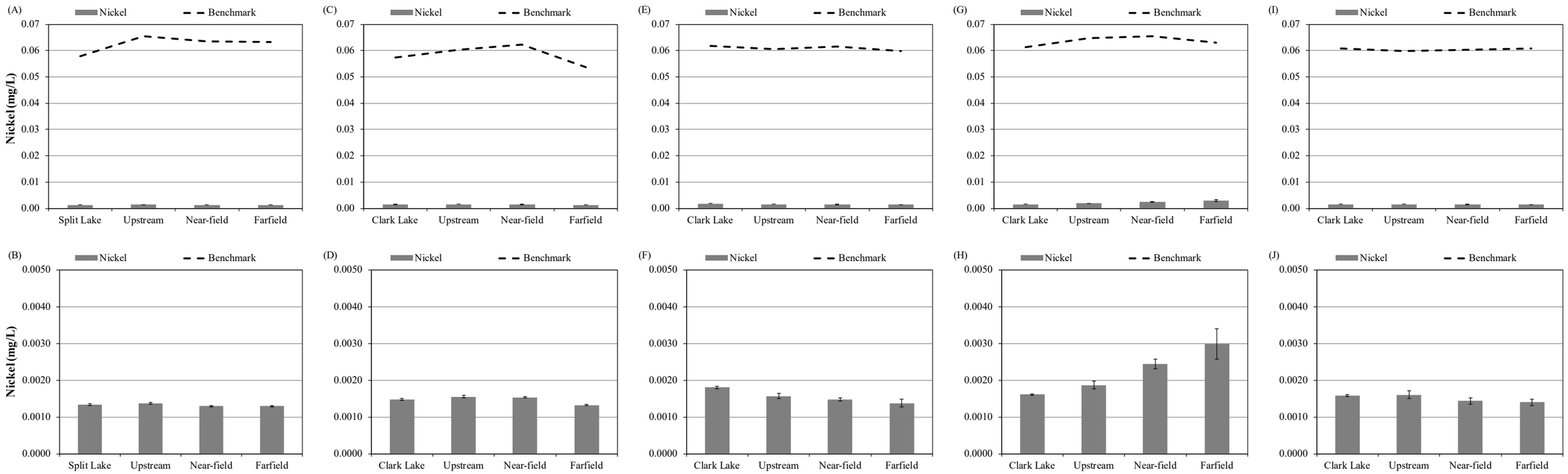


Figure 19: **Mean (± SE) nickel concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A,B), June 24–26 (C,D), July 21–23 (E,F), August 25–31 (G,H), and September 15–18 (I,J), 2019. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**

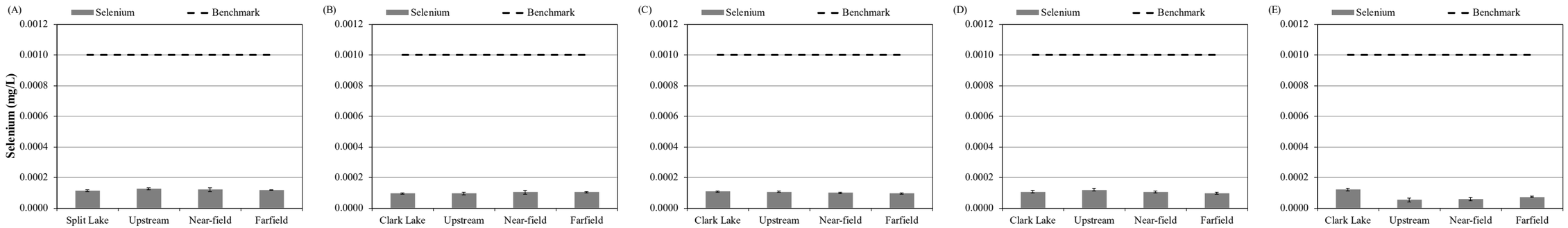


Figure 20: Mean (± SE) selenium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.

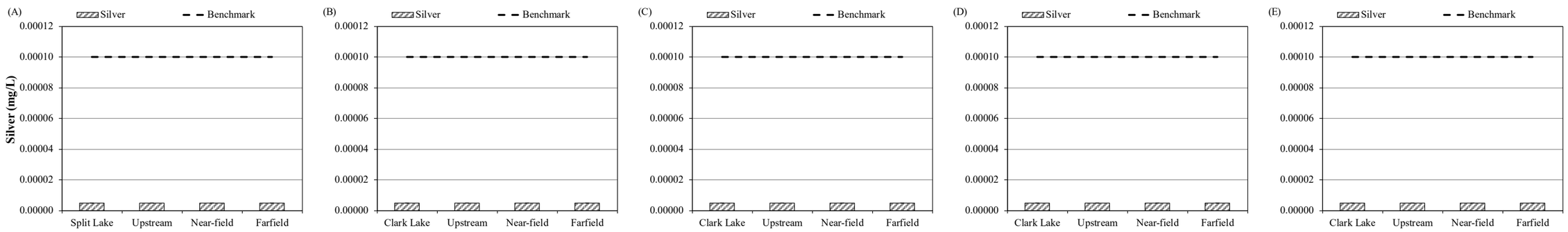


Figure 21: Mean (± SE) silver concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019. Hashed bars represent results below the analytical detection limit.

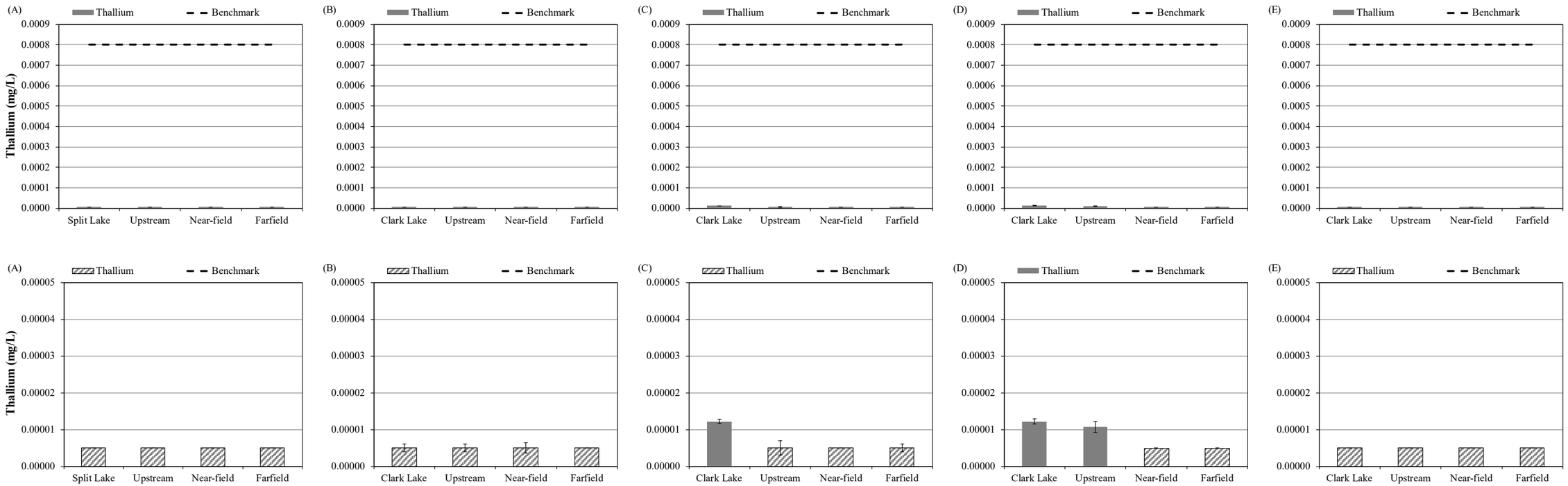


Figure 22: Mean (± SE) thallium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A,B), June 24–26 (C,D), July 21–23 (E,F), August 25–31 (G,H), and September 15–18 (I,J), 2019. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom. Hashed bars represent results below the analytical detection limit.

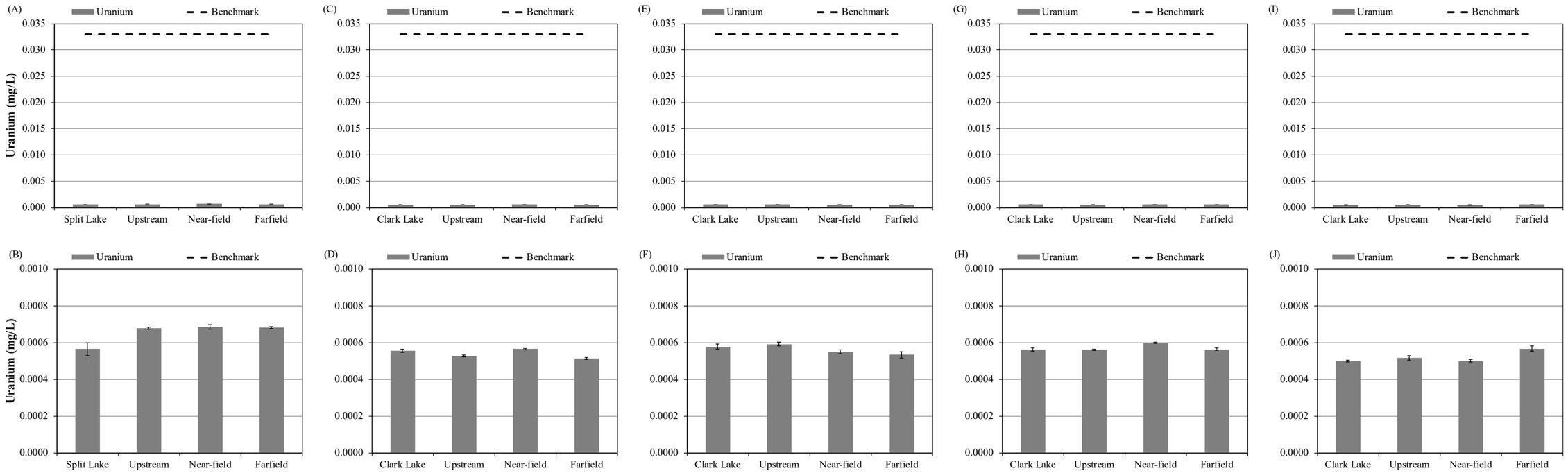


Figure 23: **Mean (± SE) uranium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A,B), June 24–26 (C,D), July 21–23 (E,F), August 25–31 (G,H), and September 15–18 (I,J), 2019. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**

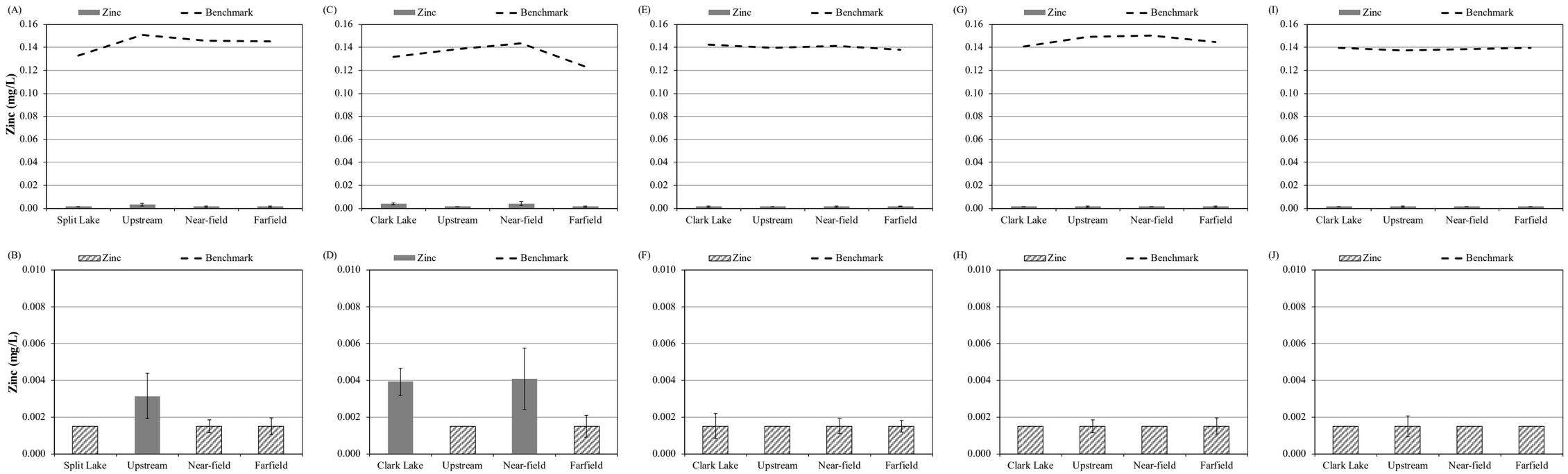


Figure 24: **Mean (± SE) zinc concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A,B), June 24–26 (C,D), July 21–23 (E,F), August 25–31 (G,H), and September 15–18 (I,J), 2019. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom. Hashed bars represent results below the analytical detection limit.**

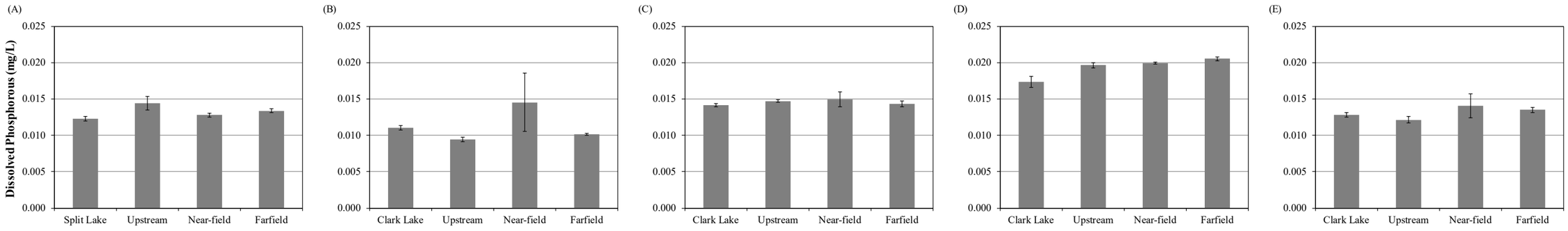


Figure 25: Mean (± SE) dissolved phosphorus concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.

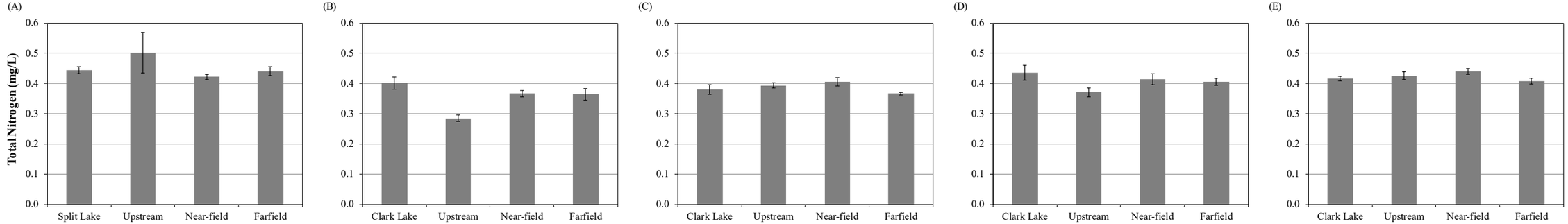


Figure 26: Mean (± SE) concentrations of total nitrogen measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.

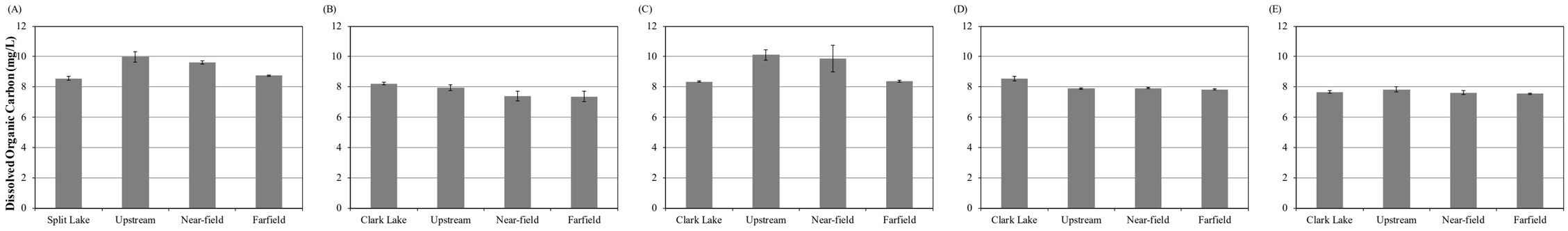


Figure 27: **Mean (± SE) dissolved organic carbon concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.**

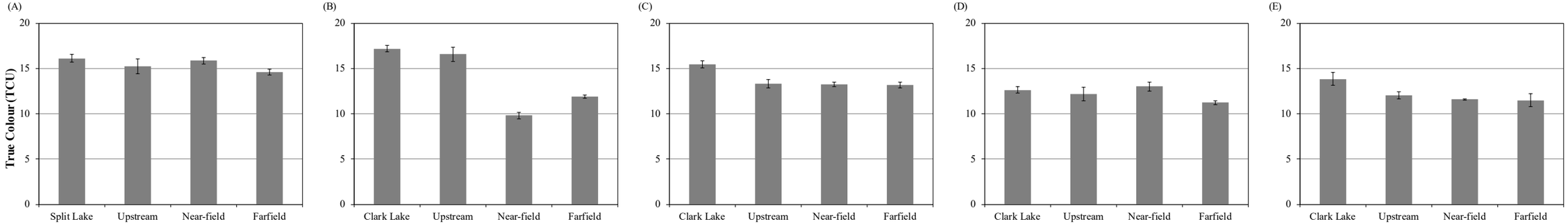


Figure 28: **Mean (± SE) colour measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.**

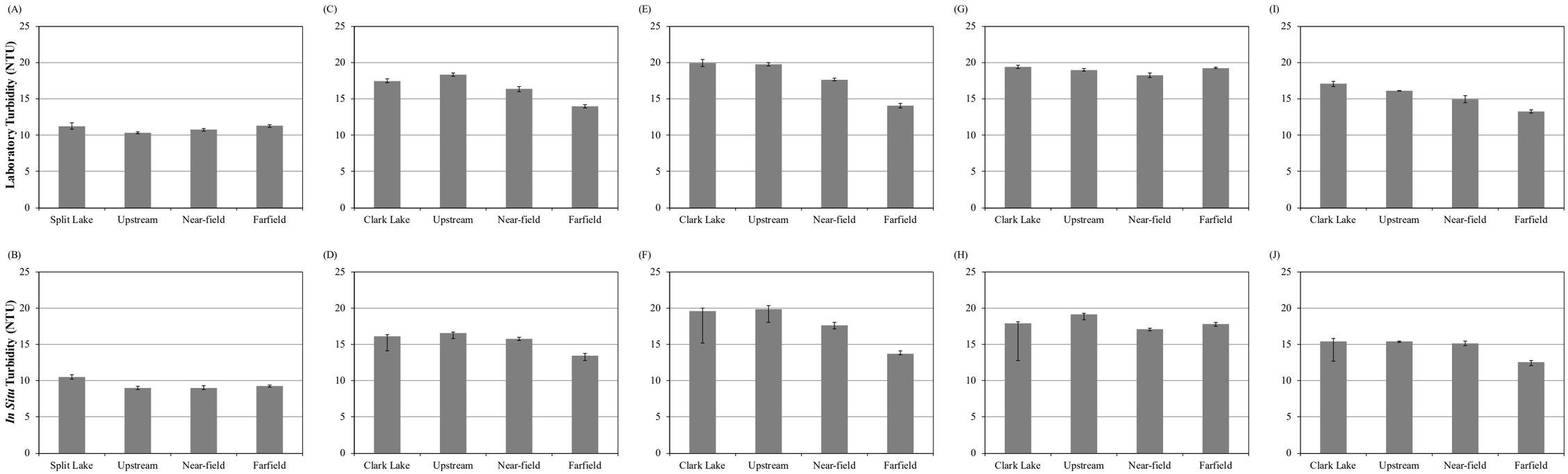


Figure 29: **Mean (± SE) laboratory (top) and *in situ* (bottom) turbidity measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A,B), June 24–26 (C,D), July 21–23 (E,F), August 25–31 (G,H), and September 15–18 (I,J), 2019. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**

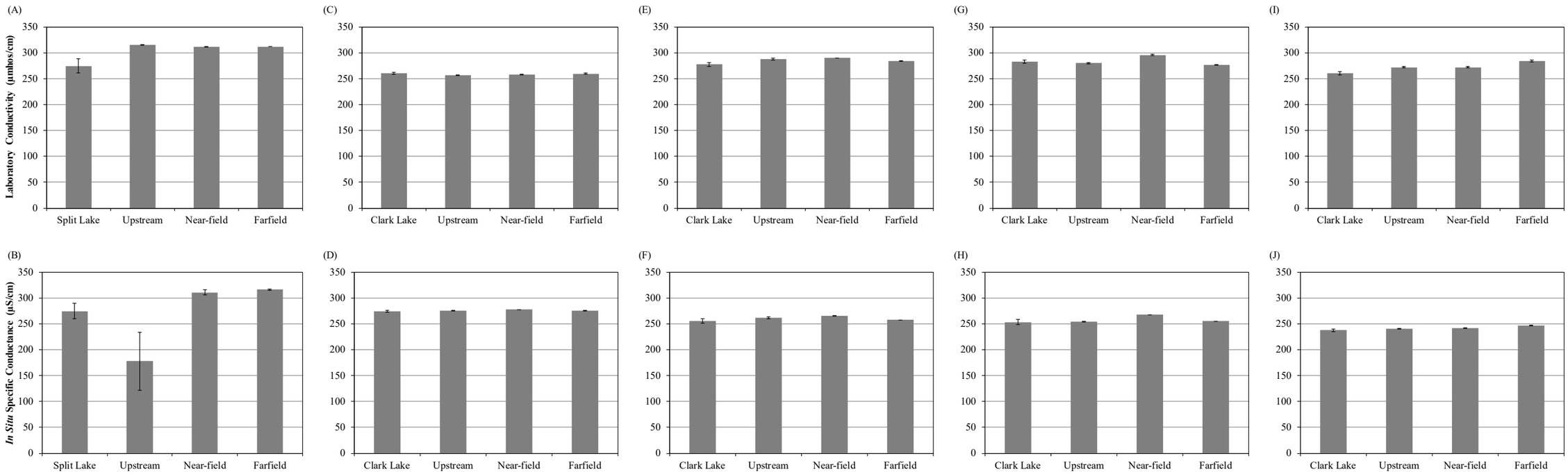


Figure 30: **Mean (± SE) laboratory (top) and *in situ* (bottom) specific conductance measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A,B), June 24–26 (C,D), July 21–23 (E,F), August 25–31 (G,H), and September 15–18 (I,J), 2019. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**

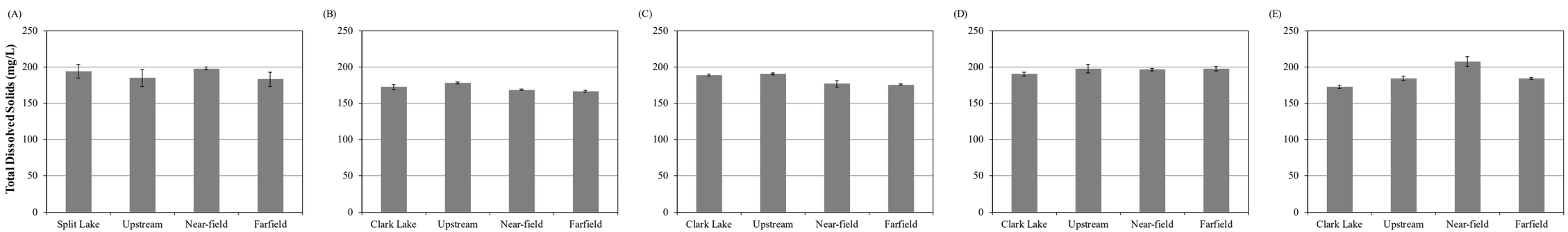


Figure 31: **Mean (± SE) concentrations of total dissolved solids measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.**

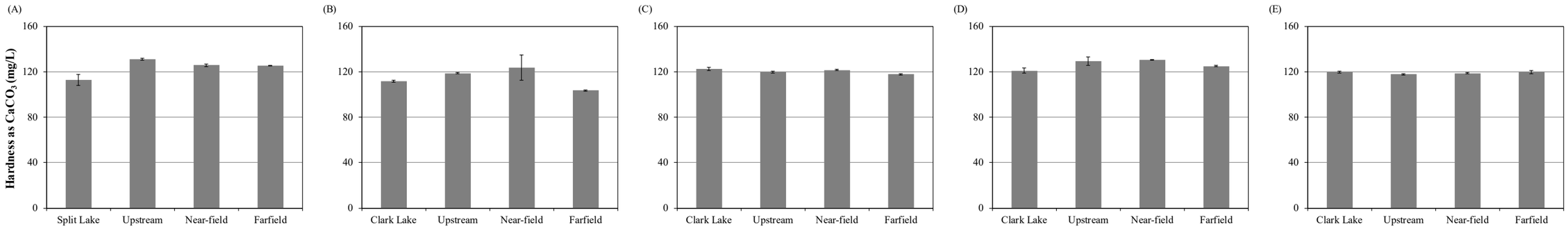


Figure 32: Mean (± SE) hardness measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.

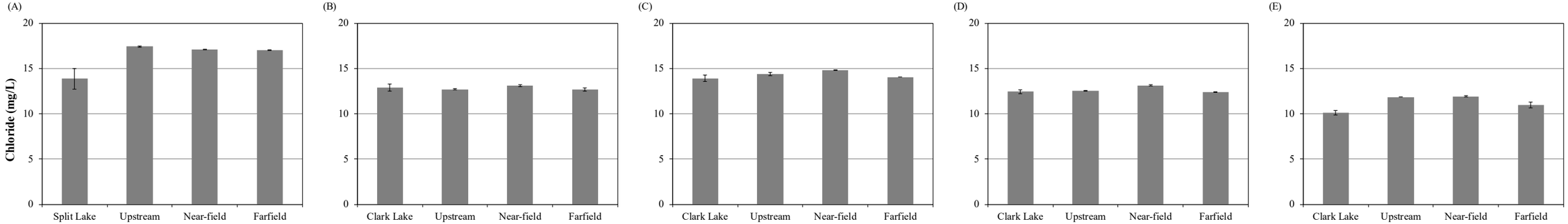


Figure 33: Mean (± SE) chloride concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.

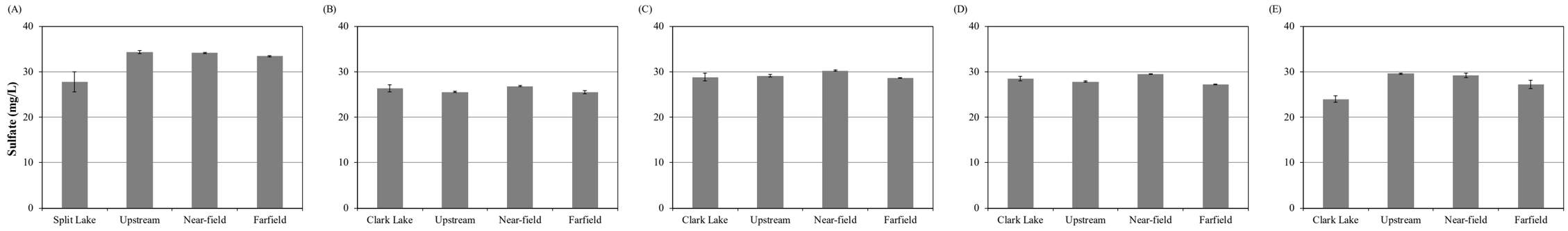


Figure 34: Mean (± SE) sulfate concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.

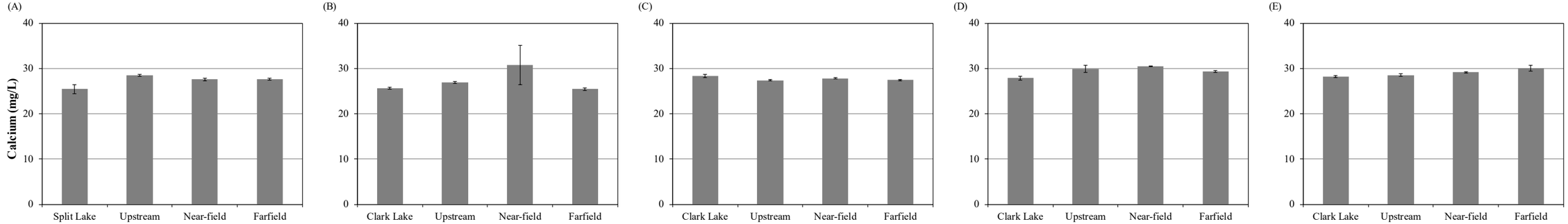


Figure 35: Mean (± SE) calcium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.

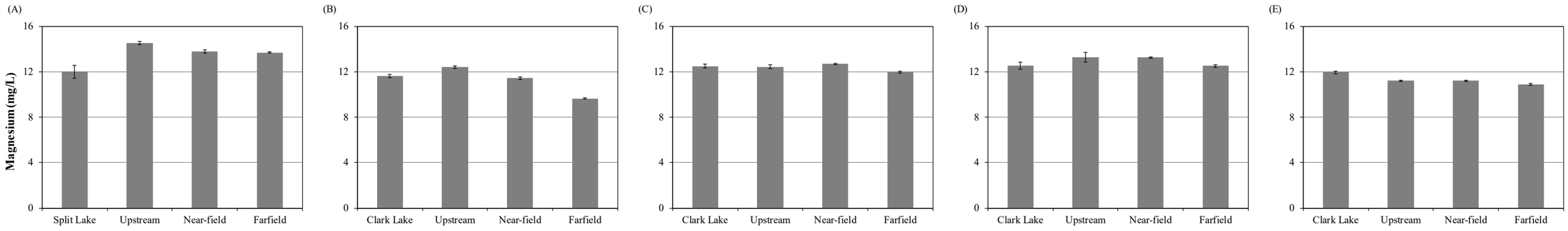


Figure 36: Mean (± SE) magnesium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.

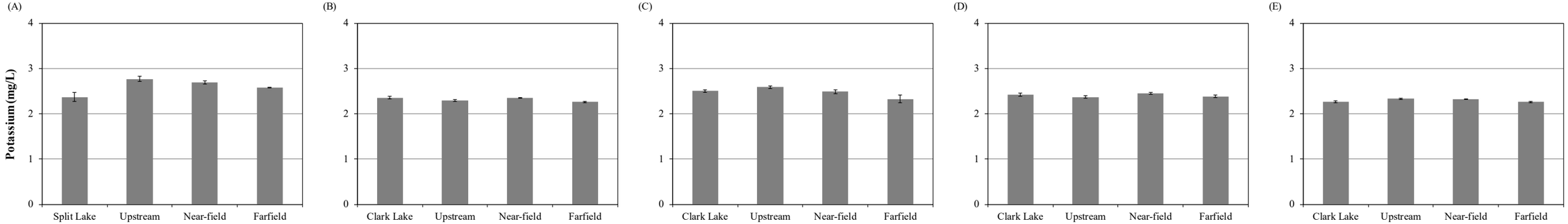


Figure 37: Mean (± SE) potassium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.

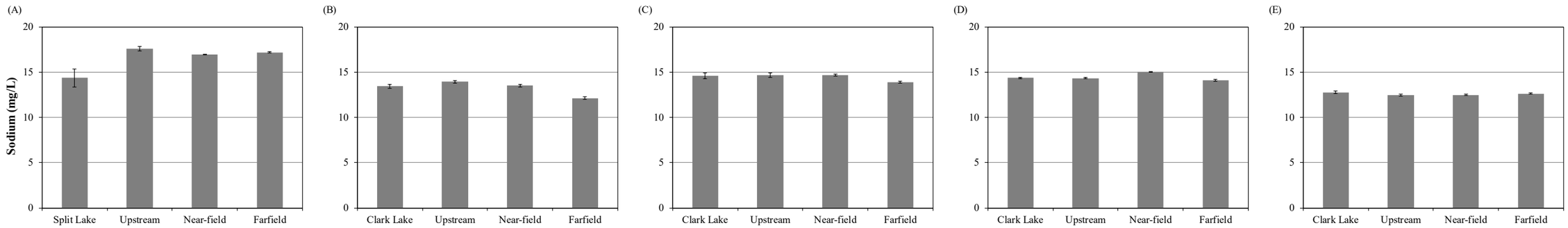
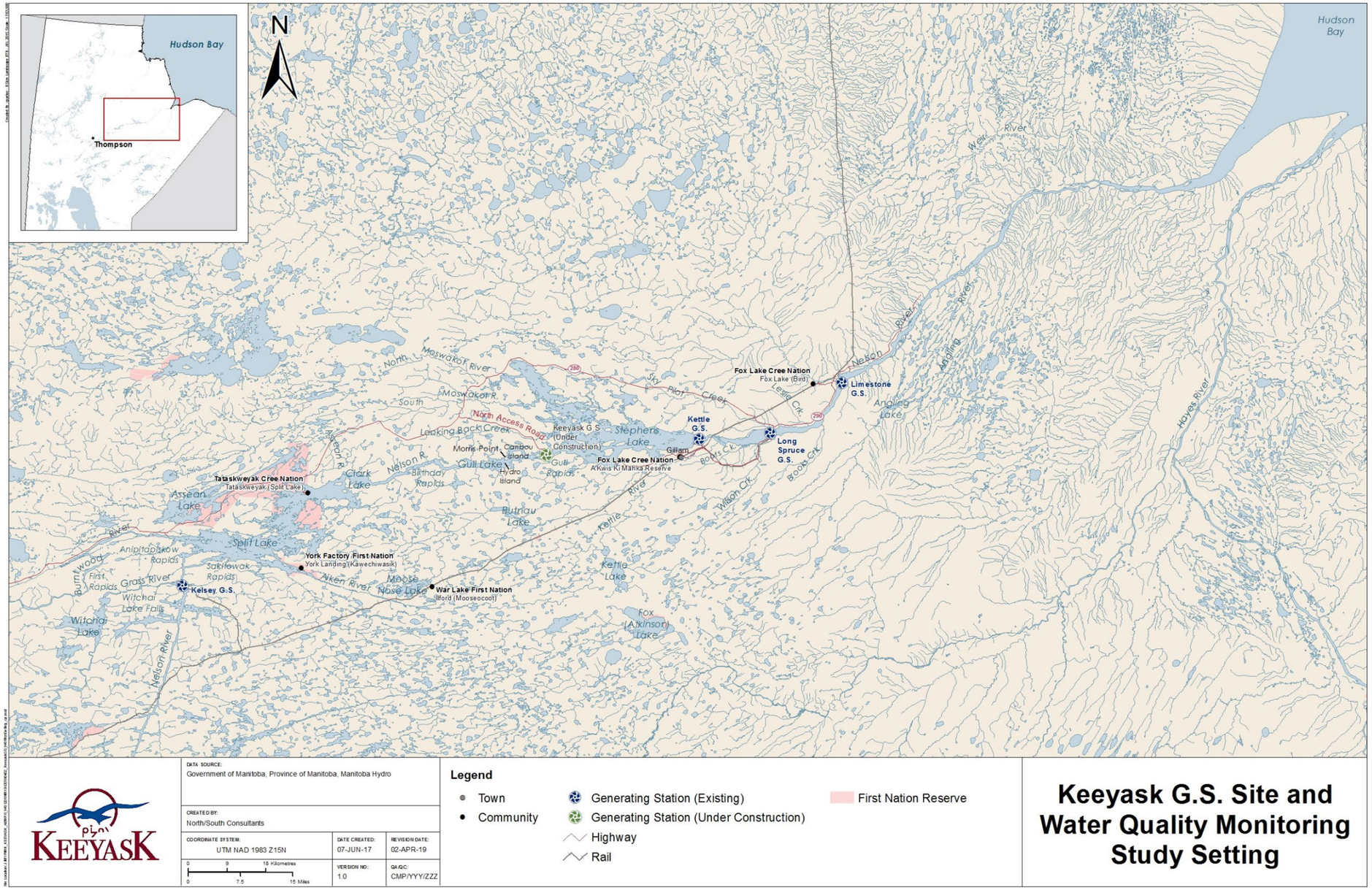
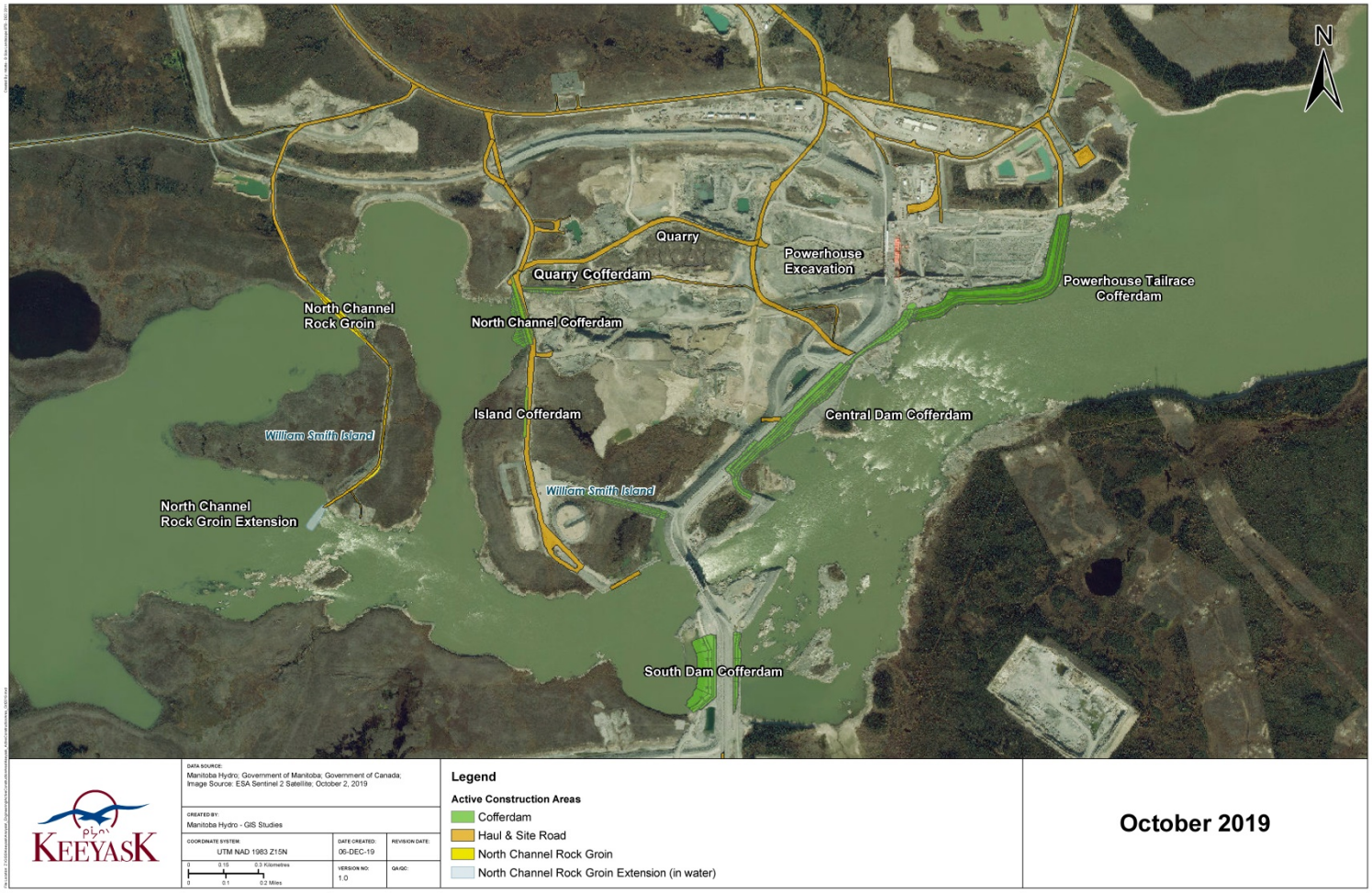


Figure 38: Mean (± SE) sodium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on March 31–April 5 (A), June 24–26 (B), July 21–23 (C), August 25–31 (D), and September 15–18 (E), 2019.

MAPS

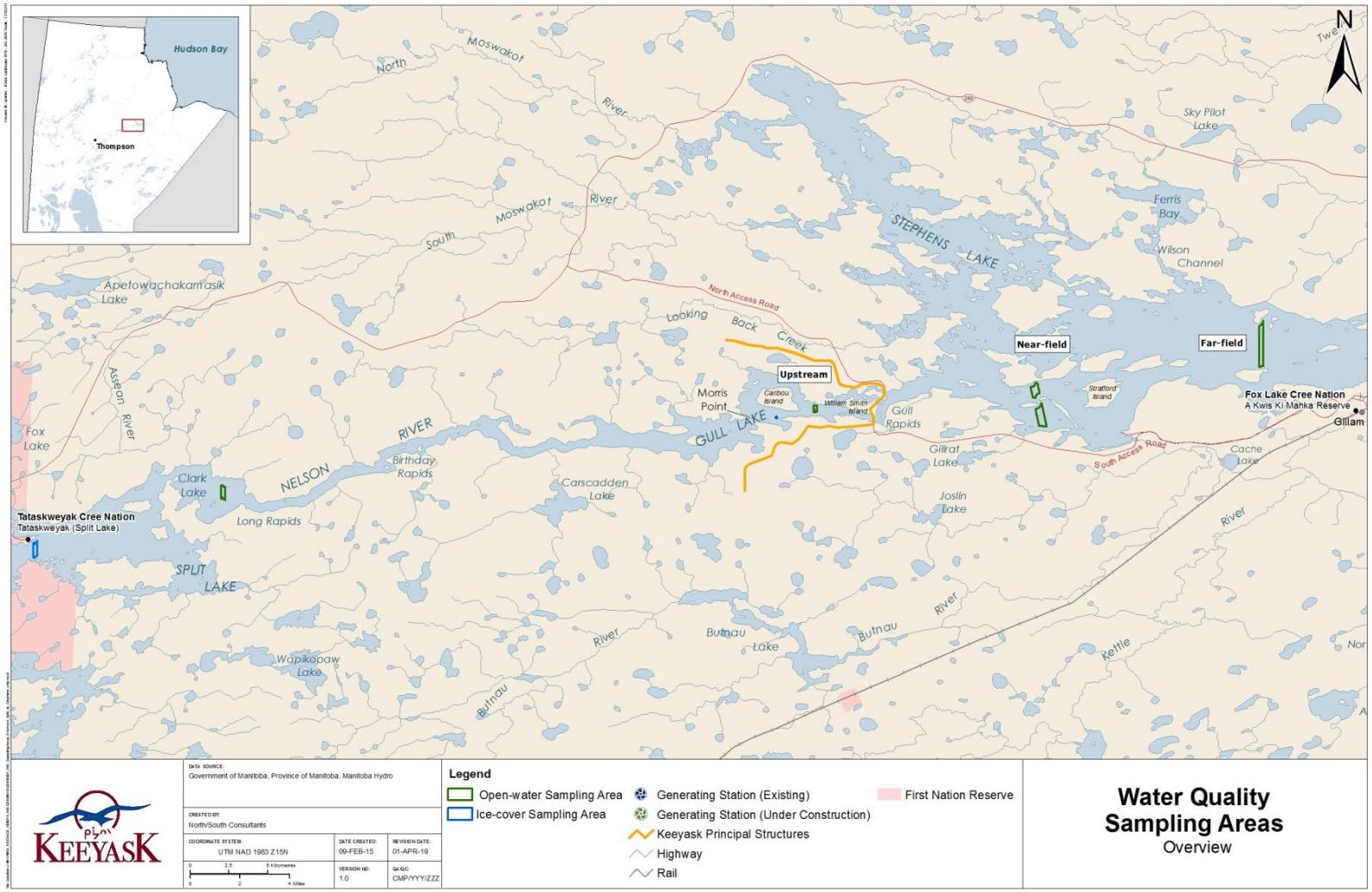


Map 1: Map of the Nelson River showing the site of the Keeyask Generating Station and the water quality monitoring study setting.

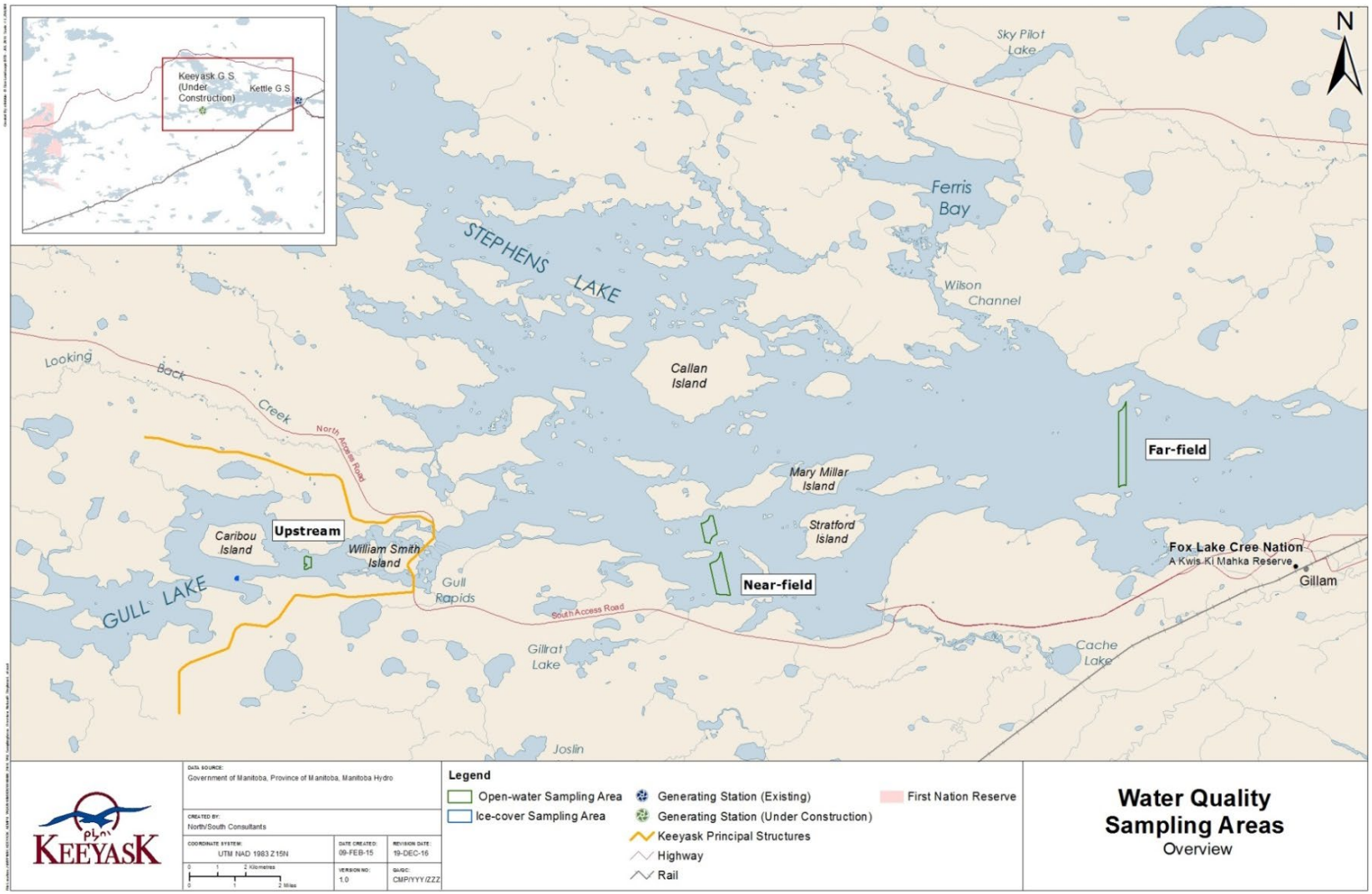


Satellite Imagery - October, 2019

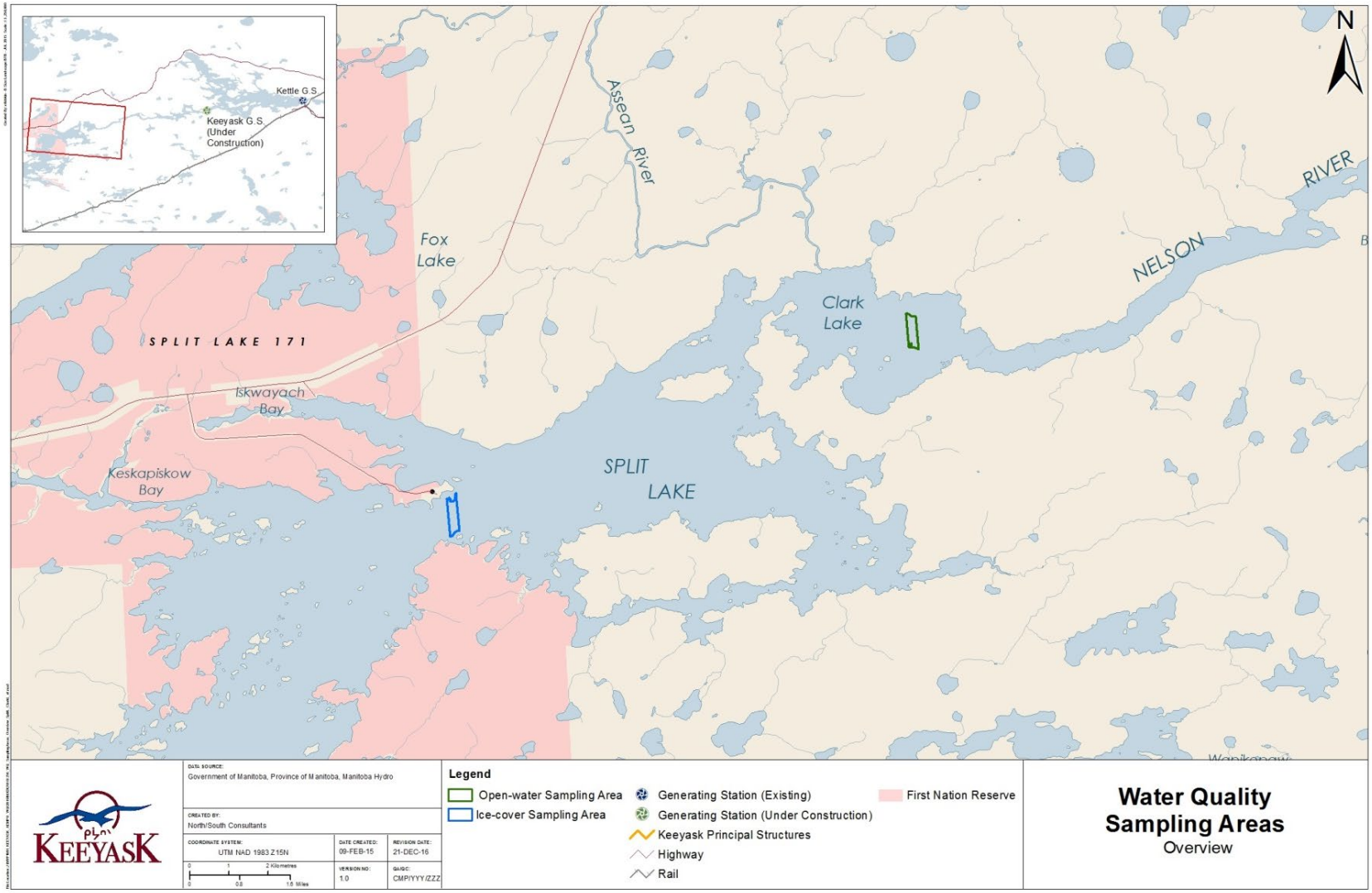
Map 2: Map of instream structures at the Keeyask Generating Station site, October 2019.



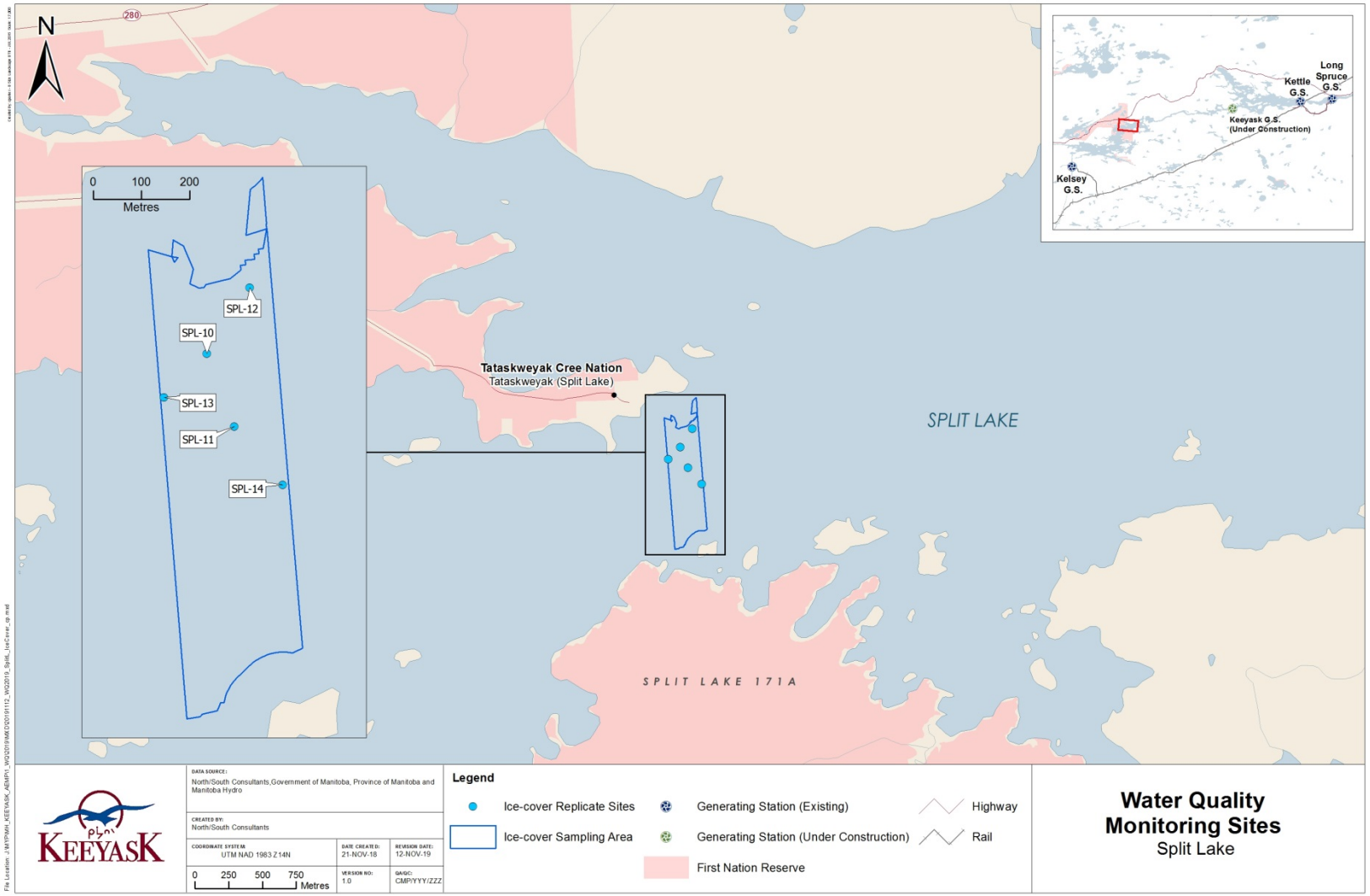
Map 3: Overview of water quality monitoring areas in the Keeyask local study area during the ice-cover and open-water seasons, 2019. Sampling areas in the near-field and far-field of Stephens Lake were the same in open-water and ice-cover seasons.



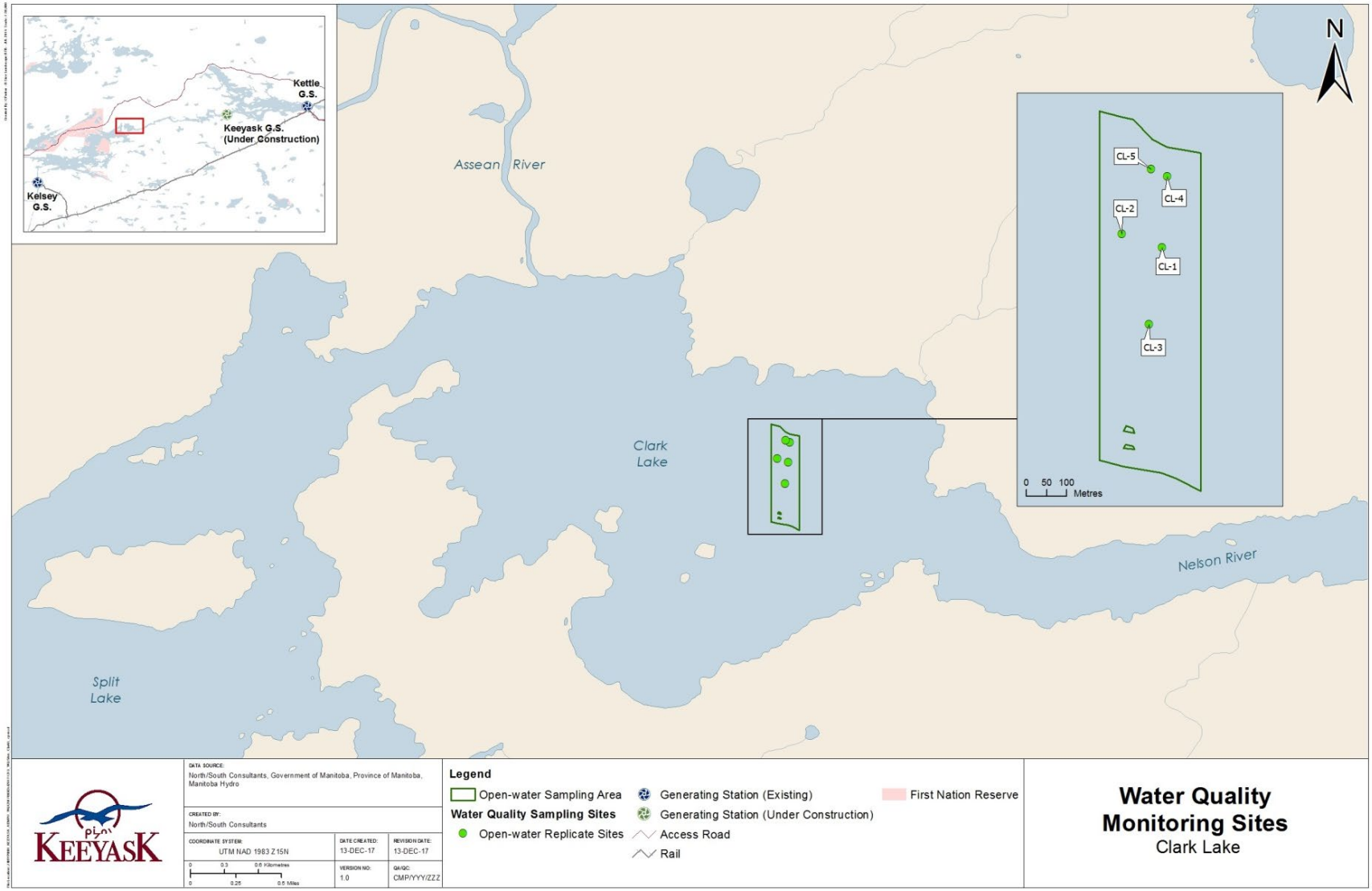
Map 4: Overview of the Nelson River upstream of Gull Rapids and Stephens Lake water quality monitoring areas during the ice-cover and open-water seasons, 2019.



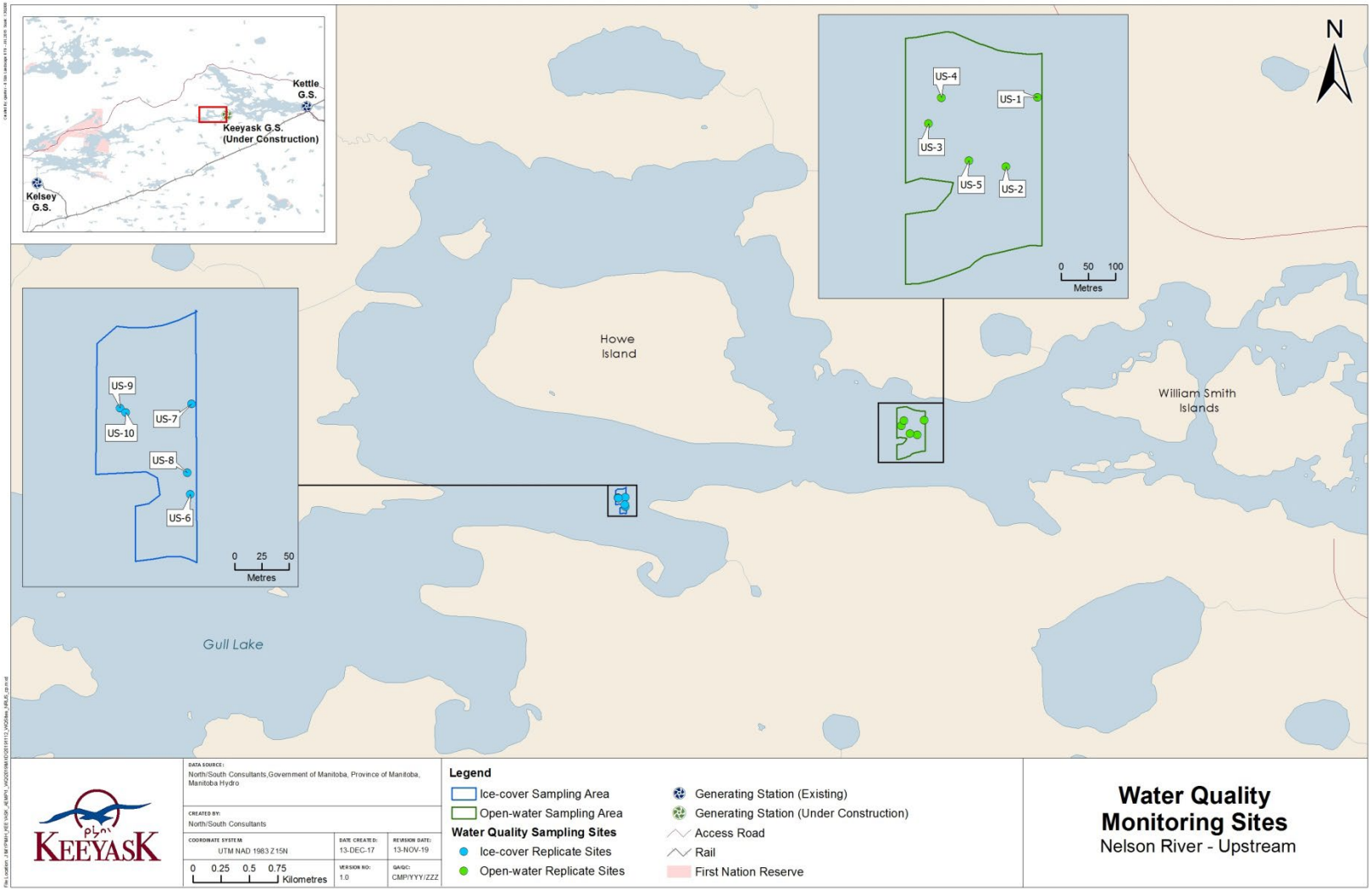
Map 5: Overview of furthest upstream reference water quality monitoring areas during the ice-cover (Split Lake) and open-water seasons (Clark Lake), 2019.



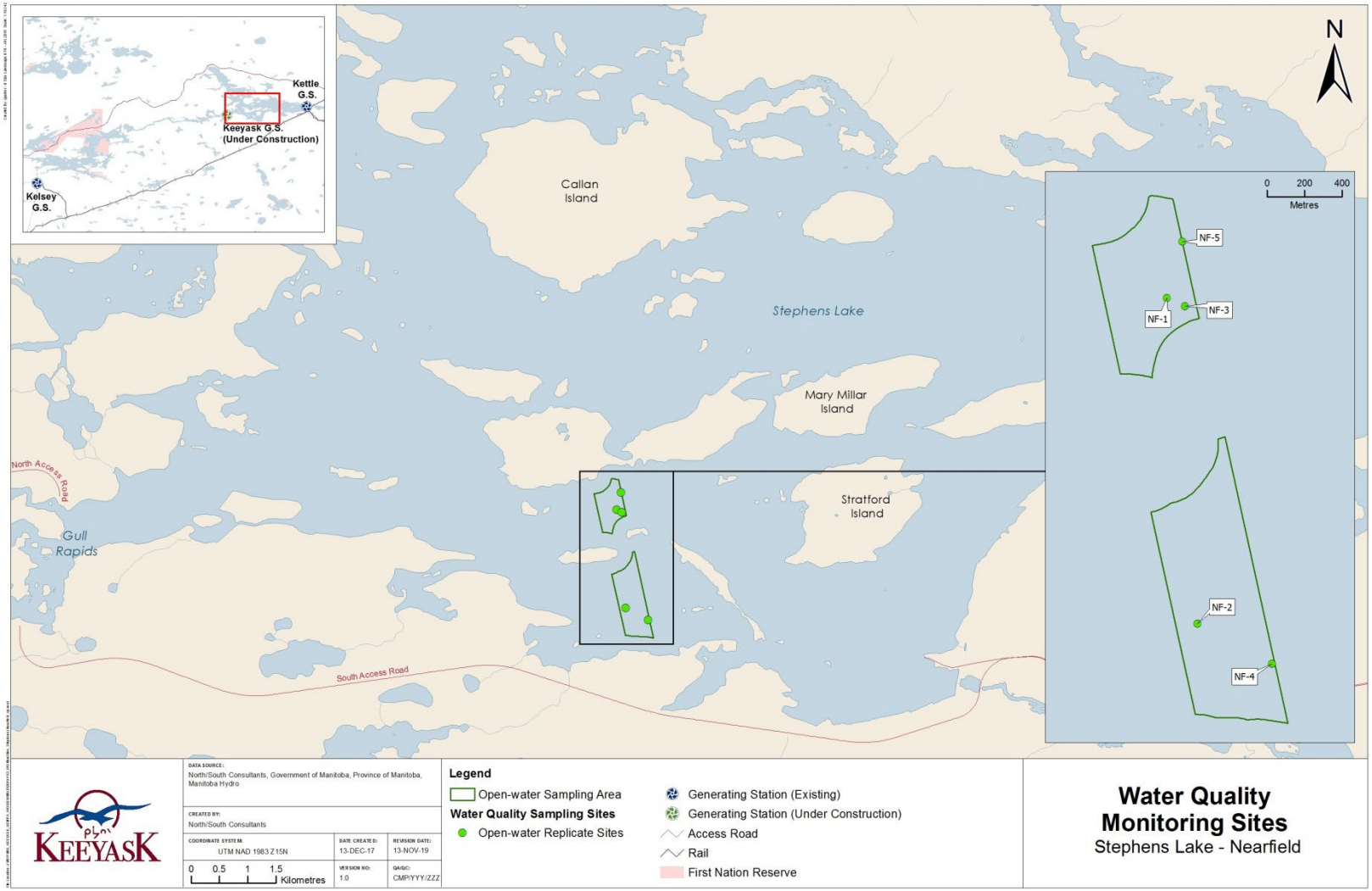
Map 6: Water quality sampling locations in Split Lake during the ice-cover season, 2019.



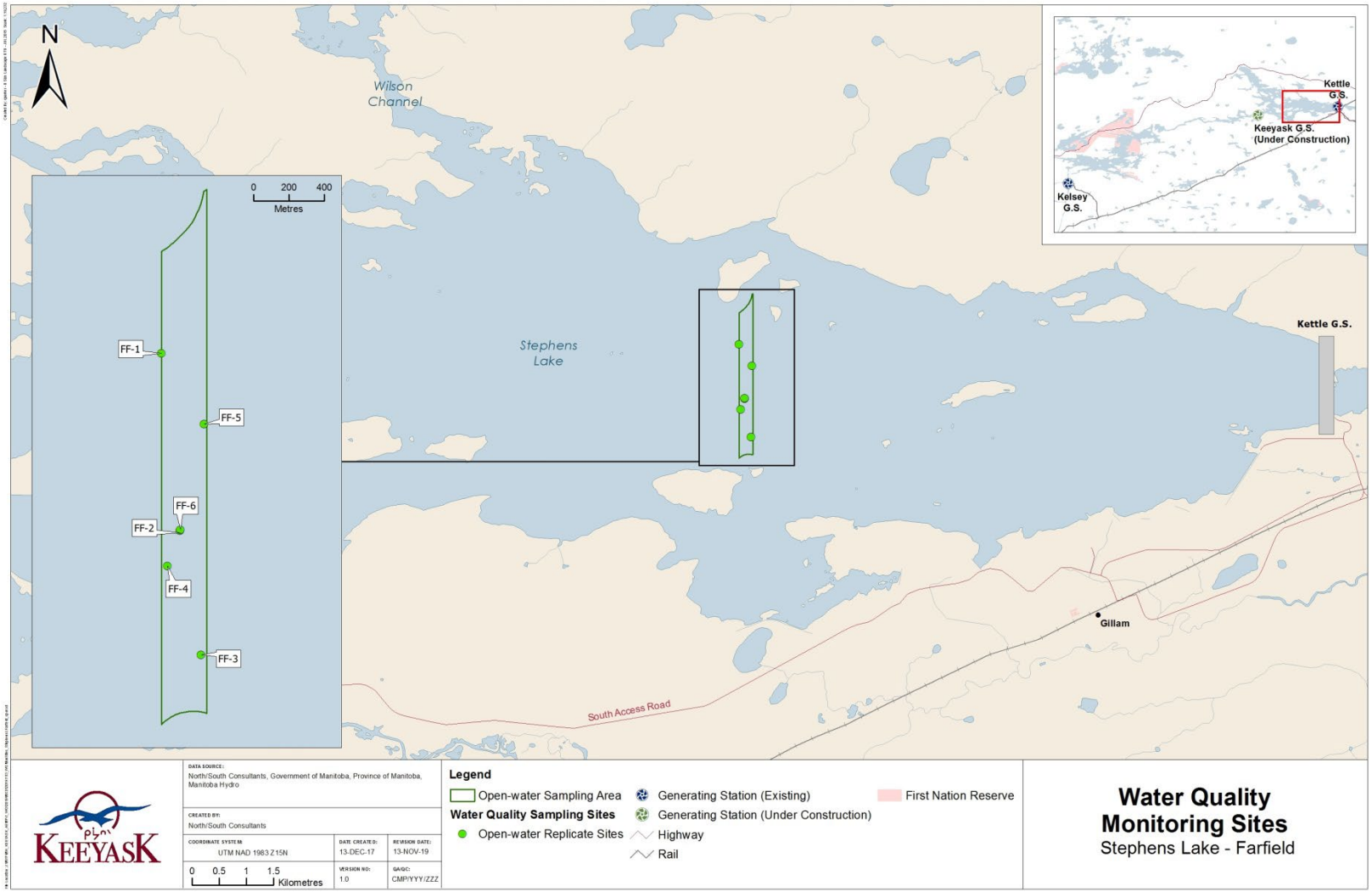
Map 7: Water quality sampling locations in Clark Lake during the open-water season, 2019.



Map 8: Water quality sampling locations in the Nelson River upstream of Gull Rapids during the ice-cover and open-water seasons, 2019.



Map 9: Water quality sampling locations in the near-field sampling area of Stephens Lake during the ice-cover and open-water seasons, 2019.



Map 10: Water quality sampling locations in the far-field sampling area of Stephens Lake during the ice-cover and open-water seasons, 2019.

APPENDICES

APPENDIX 1:
RESULTS OF WATER QUALITY MONITORING, 2019

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Split Lake #10	SPL-10	31-Mar-19	10:29	19.0	0.20	0.58	0.3	0.01	7.83	14.91	102.1	255.7	11.40	N/A
							1.9	0.02	7.81	14.89	102.0	254.2	10.86	
							2.9	0.02	7.80	14.88	101.9	254.8	10.36	
							3.9	0.02	7.79	14.87	101.8	253.9	10.92	
							4.9	0.02	7.78	14.83	101.5	261.1	10.82	
							5.9	0.01	7.77	14.79	101.3	276.1	11.34	
							6.9	0.02	7.76	14.77	101.2	271.3	11.12	
							7.9	0.01	7.76	14.74	100.9	282.3	10.41	
							8.9	0.02	7.75	14.75	101.0	261.2	10.03	
							9.9	0.00	7.74	14.66	100.3	295.5	10.24	
							10.9	0.00	7.74	14.64	100.2	294.1	9.57	
							11.9	0.00	7.74	14.57	99.6	304.1	9.27	
							12.9	0.00	7.74	14.55	99.6	304.7	9.48	
							13.9	0.00	7.75	14.55	99.6	304.6	9.12	
							14.9	0.00	7.74	14.53	99.5	305.4	9.22	
							15.9	0.00	7.75	14.51	99.3	307.4	9.11	
							16.9	0.00	7.75	14.48	99.1	309.4	9.13	
							17.9	0.00	7.75	14.47	99.1	308.3	9.64	
							18.9	0.00	7.75	14.46	99.0	308.2	10.45	
Split Lake #11	SPL-11	31-Mar-19	11:15	17.0	0.18	0.70	0.3	-0.01	7.78	14.91	102.0	242.3	10.39	N/A
							1.7	0.01	7.75	14.89	101.9	246.4	10.12	
							2.7	0.01	7.74	14.89	101.9	247.3	10.45	
							3.7	0.01	7.73	14.87	101.8	252.9	10.81	
							4.7	0.01	7.73	14.84	101.6	256.9	10.10	
							5.7	0.01	7.73	14.83	101.6	259.9	10.43	
							6.7	0.01	7.72	14.80	101.4	264.9	10.36	
							7.7	0.00	7.72	14.77	101.2	274.4	10.36	
							8.7	0.00	7.71	14.68	100.5	285.9	9.48	
							9.7	0.00	7.73	14.58	99.8	311.6	9.17	
							10.7	0.00	7.74	14.55	99.6	312.9	8.89	
							11.7	0.00	7.74	14.52	99.4	316.1	8.64	
							12.7	0.00	7.75	14.47	99.1	322.0	8.69	
							13.7	0.00	7.75	14.45	99.0	323.1	8.59	
							14.7	0.00	7.76	14.43	98.8	325.6	9.13	
							15.7	0.00	7.76	14.41	98.7	325.9	8.98	
							16.7	0.00	7.76	14.40	98.6	325.8	9.02	
Split Lake #12	SPL-12	31-Mar-19	13:30	7.0	0.22	0.52	0.3	0.01	7.81	14.72	100.8	293.5	11.01	N/A
							1.5	0.01	7.80	14.41	100.7	296.3	9.15	
							2.5	0.01	7.80	14.70	100.6	295.3	9.93	
							3.5	0.01	7.80	14.68	100.5	298.5	9.59	
							4.5	0.01	7.80	14.67	100.4	298.6	10.18	
							5.5	0.01	7.80	14.67	100.4	292.7	8.82	
							6.5	0.01	7.80	14.65	100.3	296.7	10.06	

1. Result does not meet QAQC criteria when compared to lab pH.

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Split Lake #13	SPL-13	31-Mar-19	12:45	19.6	0.18	0.62	0.3	0.01	7.80	14.90	102.0	256.3	9.79	N/A
							1.6	0.01	7.79	14.89	101.9	257.4	10.18	
							2.6	0.01	7.78	14.88	101.9	258.5	10.34	
							3.6	0.01	7.77	14.86	101.8	259.7	11.58	
							4.6	0.01	7.77	14.85	101.7	259.9	11.26	
							5.6	0.01	7.77	14.83	101.5	262.7	10.54	
							6.6	0.01	7.76	14.80	101.3	264.6	11.33	
							7.6	0.01	7.76	14.77	101.1	268.6	10.44	
							8.6	0.00	7.76	14.72	100.7	282.0	10.03	
							9.6	0.01	7.76	14.70	100.6	282.9	9.89	
							10.6	0.00	7.77	14.68	100.5	283.8	9.41	
							11.6	0.00	7.78	14.63	100.1	290.3	9.22	
							12.6	0.00	7.78	14.60	99.9	297.3	9.55	
							13.6	0.00	7.78	14.59	99.9	295.7	9.06	
							14.6	0.00	7.79	14.54	99.5	299.6	9.29	
							15.6	0.00	7.79	14.54	99.6	300.3	8.94	
							16.6	0.00	7.78	14.51	99.4	307.1	9.04	
							17.6	0.00	7.79	14.46	99.0	315.5	9.29	
							18.6	0.00	7.79	14.43	98.8	317.1	9.67	
Split Lake #14	SPL-14	31-Mar-19	12:10	17.3	0.15	1.03	0.3	0.00	7.80	14.60	100.0	323.8	9.80	N/A
							2.0	0.00	7.79	14.59	99.9	324.6	9.11	
							3.0	0.00	7.79	14.57	99.8	325.2	8.00	
							4.0	0.00	7.79	14.56	99.7	325.4	8.27	
							5.0	0.00	7.79	14.54	99.6	326.3	8.70	
							6.0	0.00	7.79	14.53	99.4	327.0	8.59	
							7.0	0.00	7.79	14.50	99.3	329.4	8.38	
							8.0	0.00	7.79	14.49	99.2	330.1	8.53	
							9.0	0.00	7.79	14.47	99.0	330.8	8.52	
							10.0	0.00	7.79	14.46	99.0	329.6	8.55	
							11.0	0.00	7.79	14.45	98.9	330.4	8.46	
							12.0	0.00	7.79	14.43	98.8	331.2	8.29	
							13.0	0.00	7.79	14.42	98.7	330.1	8.42	
							14.0	0.00	7.79	14.39	98.6	332.2	8.84	
							15.0	0.00	7.80	14.37	98.4	331.9	8.40	
							16.0	0.00	7.80	14.36	98.3	335.4	9.10	
Nelson River Upstream #6	US-6	3-Apr-19	12:10	2.0	0.15	1.02	0.3	-0.02	7.84	14.60	99.9	273.2	8.55	N/A
							1.5	-0.02	7.84	14.60	99.9	273.9	8.90	
							2.0	-0.02	7.84	14.59	99.8	273.5	9.04	
Nelson River Upstream #7	US-7	3-Apr-19	10:45	2.7	0.22	1	0.3	-0.04	8.20	14.60	99.9	*54.6*	9.82	N/A
							2.0	-0.02	8.16	14.58	99.7	*60.7*	9.52	
							2.5	-0.02	8.15	14.57	99.6	*66.4*	9.17	
							3.0	-0.02	8.13	14.56	99.6	*67.9*	9.88	
Nelson River Upstream #8	US-8	3-Apr-19	11:30	2.1	0.18	0.9	0.3	-0.02	8.07	14.58	99.7	*45.5*	8.82	N/A
							1.9	-0.02	8.06	14.57	99.6	*47.2*	9.46	
							2.4	-0.02	8.05	14.56	99.5	*49.1*	9.87	
Nelson River Upstream #9	US-9	3-Apr-19	8:40	2.3	0.15	1.3	0.3	-0.02	7.83	14.64	100.2	322.2	8.66	N/A
							1.8	-0.02	7.82	14.62	100.1	322.1	8.57	
							2.3	-0.02	7.80	14.61	100.0	322.1	8.79	
							2.8	-0.02	7.79	14.59	99.9	322.1	8.76	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Nelson River Upstream #10	US-10	3-Apr-19	9:45	3.9	0.25	0.86	0.3	-0.02	8.09	14.59	99.8	*193.3*	8.93	N/A
							1.4	-0.02	8.06	14.59	99.8	*195.9*	8.96	
							1.9	-0.02	8.03	14.58	99.8	*198.0*	9.26	
							2.4	-0.02	8.01	14.58	99.7	*202.2*	8.86	
							2.9	-0.02	8.00	14.57	99.7	*202.6*	9.38	
							3.4	-0.02	7.98	14.56	99.6	*205.2*	9.53	
Stephens Lake - Near-field #1	NF-1	3-Apr-19	13:15	19.0	0.20	1.02	0.3	-0.02	7.84	14.79	101.2	294.1	8.37	N/A
							2.0	-0.02	7.84	14.78	101.1	295.2	9.25	
							3.0	-0.02	7.84	14.77	101.1	298.6	9.57	
							4.0	-0.02	7.84	14.76	101.0	302.9	8.93	
							5.0	-0.02	7.84	14.74	100.9	301.7	9.34	
							6.0	-0.02	7.84	14.74	100.8	303.4	9.44	
							7.0	-0.02	7.84	14.72	100.8	303.4	9.58	
							8.0	-0.02	7.84	14.71	100.7	297.2	10.29	
							9.0	-0.02	7.83	14.70	100.6	298.6	10.28	
							10.0	-0.02	7.83	14.69	100.5	299.4	9.77	
							11.0	-0.02	7.83	14.67	100.4	302.3	10.27	
							12.0	-0.02	7.83	14.65	100.3	301.9	9.86	
							13.0	-0.02	7.83	14.64	100.2	300.9	10.26	
							14.0	-0.02	7.83	14.63	100.1	299.5	10.22	
							15.0	-0.02	7.83	14.61	100.0	303.1	9.00	
							16.0	-0.02	7.83	14.60	99.9	303.0	10.58	
							17.0	-0.02	7.83	14.58	99.8	304.2	10.28	
							18.0	-0.02	7.84	14.57	99.7	304.0	9.78	
Stephens Lake - Near-field #2	NF-2	3-Apr-19	16:50	10.1	0.21	0.97	0.3	-0.01	7.85	14.80	101.3	317.7	8.72	N/A
							2.0	-0.01	7.85	14.79	101.2	317.6	9.59	
							3.0	-0.01	7.85	14.78	101.1	317.7	9.95	
							4.0	-0.01	7.85	14.77	101.1	317.7	10.73	
							5.0	-0.01	7.85	14.75	101.0	317.7	9.50	
							6.0	-0.01	7.85	14.74	100.8	317.7	8.99	
							7.0	-0.01	7.85	14.72	100.7	317.8	9.34	
							8.0	-0.01	7.84	14.71	100.7	317.7	8.99	
							9.0	-0.01	7.84	14.70	100.6	317.7	9.06	
							10.0	-0.01	7.84	14.68	100.5	317.8	8.85	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Stephens Lake - Near-field #3	NF-3	3-Apr-19	14:10	18.2	0.23	1.03	0.3	-0.02	7.85	14.81	101.3	305.6	9.69	N/A
							2.0	-0.02	7.85	14.79	101.2	304.3	9.58	
							3.0	-0.02	7.85	14.78	101.1	304.0	9.10	
							4.0	-0.02	7.85	14.77	101.1	304.9	8.93	
							5.0	-0.02	7.85	14.75	101.0	305.8	9.69	
							6.0	-0.02	7.85	14.74	100.9	294.2	8.69	
							7.0	-0.02	7.84	14.73	100.8	297.1	9.68	
							8.0	-0.02	7.84	14.72	100.7	299.2	8.83	
							9.0	-0.02	7.84	14.70	100.6	305.7	8.96	
							10.0	-0.02	7.84	14.69	100.5	298.7	10.36	
							11.0	-0.02	7.84	14.67	100.4	303.2	9.38	
							12.0	-0.02	7.84	14.66	100.3	296.8	10.29	
							13.0	-0.02	7.84	14.65	100.2	300.8	10.27	
							14.0	-0.02	7.84	14.64	100.2	303.8	10.56	
							15.0	-0.02	7.84	14.62	100.1	300.7	9.93	
							16.0	-0.02	7.84	14.62	100.0	305.6	10.39	
							17.0	-0.02	7.84	14.61	99.9	301.8	10.30	
							18.0	-0.02	7.84	14.58	99.8	304.9	10.12	
Stephens Lake - Near-field #4	NF-4	3-Apr-19	16:05	4.5	0.15	0.97	0.3	-0.01	7.86	14.80	101.3	317.7	9.49	N/A
							1.8	-0.01	7.86	14.79	101.2	317.8	10.56	
							2.3	-0.01	7.86	14.79	101.2	317.7	10.52	
							2.8	-0.01	7.86	14.78	101.1	317.7	10.48	
							3.3	-0.01	7.86	14.77	101.1	317.9	9.02	
							3.8	-0.01	7.86	14.77	101.1	317.7	8.46	
							4.3	-0.01	7.85	14.76	101.0	317.8	8.74	
Stephens Lake - Near-field #5	NF-5	3-Apr-19	15:00	17.2	0.18	0.98	0.3	-0.01	7.85	14.80	101.3	318.8	8.92	N/A
							2.0	-0.01	7.85	14.80	101.3	316.0	9.09	
							3.0	-0.01	7.85	14.78	101.1	316.0	9.52	
							4.0	-0.01	7.85	14.77	101.0	316.0	9.86	
							5.0	-0.01	7.85	14.75	101.0	316.2	8.78	
							6.0	-0.01	7.84	14.74	100.9	316.0	9.88	
							7.0	-0.01	7.84	14.72	100.8	316.0	10.61	
							8.0	-0.01	7.84	14.71	100.7	316.1	10.42	
							9.0	-0.01	7.84	14.70	100.6	316.0	10.60	
							10.0	-0.02	7.84	14.69	100.5	316.1	8.71	
							11.0	-0.01	7.84	14.67	100.4	316.3	9.68	
							12.0	-0.01	7.84	14.66	100.3	316.3	10.28	
							13.0	-0.01	7.84	14.64	100.2	316.5	10.51	
							14.0	-0.01	7.84	14.63	100.2	316.4	9.76	
							15.0	-0.01	7.84	14.62	100.0	316.4	9.54	
							16.0	-0.01	7.84	14.61	99.9	316.5	9.99	
							17.0	-0.01	7.84	14.59	99.9	316.7	9.40	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Stephens Lake - Far-field #1	FF-1	5-Apr-19	10:15	22.0	0.20	0.99	0.3	0.01	7.93	14.67	100.5	316.1	9.10	N/A
							2.0	0.00	7.90	14.67	100.4	316.2	9.15	
							3.0	0.00	7.87	14.65	100.3	316.1	9.07	
							4.0	0.00	7.85	14.63	100.2	316.1	9.83	
							5.0	0.00	7.84	14.62	100.1	316.2	9.22	
							6.0	0.00	7.84	14.61	100.0	316.2	10.79	
							7.0	0.00	7.84	14.60	100.0	316.2	9.48	
							8.0	0.00	7.83	14.59	99.9	316.2	9.09	
							9.0	0.00	7.82	14.57	99.8	316.1	8.65	
							10.0	0.00	7.81	14.56	99.6	316.2	9.72	
							11.0	0.00	7.81	14.54	99.5	316.3	10.17	
							12.0	0.00	7.81	14.52	99.4	316.2	9.32	
							13.0	0.00	7.81	14.51	99.4	316.3	10.52	
							14.0	0.00	7.81	14.50	99.3	316.2	8.82	
							15.0	0.00	7.81	14.48	99.1	316.3	9.71	
							16.0	0.00	7.81	14.46	99.0	316.2	9.49	
							17.0	0.00	7.81	14.45	98.9	316.2	9.27	
							18.0	0.00	7.81	14.43	98.8	316.4	10.20	
							19.0	0.00	7.81	14.42	98.7	316.2	9.37	
							20.0	0.00	7.81	14.41	98.7	316.4	9.31	
							21.0	0.00	7.81	14.38	98.5	316.4	9.72	
Stephens Lake - Far-field #2	FF-2	5-Apr-19	11:55	14.6	0.20	1.20	0.3	-0.01	7.91	14.68	100.5	313.0	8.77	N/A
							2.2	-0.01	7.90	14.67	100.4	313.7	9.75	
							3.2	-0.01	7.88	14.67	100.4	314.4	9.57	
							4.2	0.00	7.87	14.65	100.3	317.3	9.24	
							5.2	-0.01	7.87	14.64	100.2	317.2	8.87	
							6.2	-0.01	7.86	14.63	100.1	317.3	9.51	
							7.2	0.00	7.86	14.62	100.0	317.2	9.59	
							8.2	0.00	7.86	14.60	100.0	317.2	9.57	
							9.2	0.00	7.86	14.59	99.9	317.3	8.84	
							10.2	0.00	7.86	14.58	99.8	317.3	8.79	
							11.2	-0.01	7.86	14.57	99.7	317.3	9.20	
							12.2	-0.01	7.86	14.56	99.7	317.2	9.31	
							13.2	0.00	7.86	14.54	99.6	317.4	9.33	
							14.2	0.00	7.86	14.43	99.5	317.3	9.21	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Stephens Lake - Far-field #3	FF-3	5-Apr-19	13:18	26.0	0.35	0.98	0.3	-0.01	7.89	14.74	100.9	317.5	9.33	N/A
							2.0	-0.01	7.87	14.73	100.8	317.6	9.09	
							3.0	-0.01	7.87	14.73	100.8	317.5	9.26	
							4.0	-0.01	7.87	14.71	100.7	317.4	9.26	
							5.0	-0.01	7.87	14.70	100.6	317.4	8.97	
							6.0	-0.01	7.87	14.68	100.5	317.5	8.97	
							7.0	-0.01	7.87	14.67	100.4	317.6	10.24	
							8.0	-0.01	7.87	14.67	100.4	317.6	9.12	
							9.0	-0.01	7.87	14.65	100.3	317.6	9.08	
							10.0	-0.01	7.87	14.63	100.2	317.5	9.37	
							11.0	-0.01	7.87	14.62	100.1	317.5	9.32	
							12.0	-0.01	7.86	14.61	100.0	317.5	9.19	
							13.0	-0.01	7.86	14.59	99.9	317.6	8.51	
							14.0	-0.01	7.86	14.58	99.8	317.6	10.35	
							15.0	-0.01	7.86	14.57	99.7	317.6	9.31	
							16.0	-0.01	7.86	14.55	99.6	317.7	8.80	
							17.0	-0.01	7.86	14.55	99.6	317.7	9.30	
							18.0	-0.01	7.86	14.54	99.4	317.7	8.87	
							19.0	-0.01	7.86	14.52	99.5	317.7	9.93	
							20.0	-0.01	7.86	14.51	99.3	317.7	9.99	
							21.0	-0.01	7.86	14.50	99.2	317.7	9.84	
							22.0	-0.01	7.86	14.48	99.2	317.6	9.67	
							23.0	-0.01	7.86	14.47	99.1	317.7	9.16	
							24.0	-0.01	7.86	14.46	99.0	317.7	9.18	
							25.0	-0.01	7.86	14.44	98.9	317.8	9.51	
Stephens Lake - Far-field #4	FF-4	5-Apr-19	12:30	13.8	0.26	1.1	0.3	0.00	7.88	14.70	100.6	317.4	9.49	N/A
							2.1	0.00	7.88	14.69	100.5	317.5	10.04	
							3.1	0.00	7.87	14.68	100.5	317.3	10.06	
							4.1	0.00	7.87	14.66	100.4	317.4	8.97	
							5.1	0.00	7.87	14.65	100.3	317.4	8.95	
							6.1	0.00	7.87	14.63	100.2	317.5	9.11	
							7.1	0.00	7.87	14.63	100.1	317.3	9.03	
							8.1	0.00	7.87	14.62	100.1	317.3	9.82	
							9.1	0.00	7.87	14.60	99.9	317.5	9.43	
							10.1	0.00	7.87	14.59	99.9	317.5	8.92	
							11.1	0.00	7.87	14.58	99.8	317.5	9.65	
							12.1	0.00	7.86	14.56	99.7	317.5	9.51	
							13.1	0.00	7.86	14.55	99.6	317.4	9.62	
Stephens Lake - Far-field #5	FF-5	5-Apr-19	11:15	10.6	0.26	0.97	0.3	0.00	7.86	14.66	100.4	316.4	9.47	N/A
							2.0	0.00	7.86	14.65	100.3	316.5	9.50	
							3.0	0.00	7.85	14.65	100.3	316.5	9.96	
							4.0	0.00	7.85	14.62	100.1	316.4	8.84	
							5.0	0.00	7.85	14.61	100.0	316.4	10.44	
							6.0	0.00	7.84	14.60	100.0	316.3	10.35	
							7.0	0.00	7.84	14.59	99.9	316.3	10.39	
							8.0	0.00	7.84	14.58	99.8	316.5	9.58	
							9.0	0.00	7.84	14.57	99.7	316.4	9.18	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Clark Lake #1	CL-1	24-Jun-19	9:32	11.5			0.3	16.17	7.94	9.78	99.5	278.3	16.11	0.55
							1.0	16.16	7.91	9.78	99.5	278.6	16.47	
							2.0	16.15	7.90	9.76	99.2	278.7	17.94	
							3.0	16.14	7.89	9.75	99.2	278.8	16.94	
							4.0	16.15	7.89	9.74	99.1	279.2	16.76	
							5.0	16.14	7.88	9.73	98.9	279.2	16.89	
							6.0	16.14	7.88	9.72	98.9	279.5	16.81	
							7.0	16.15	7.88	9.72	98.8	279.7	17.06	
							8.0	16.13	7.87	9.70	98.6	279.1	16.84	
							9.0	16.14	7.87	9.69	98.6	279.6	16.69	
							10.0	16.14	7.87	9.68	98.5	279.7	16.93	
							11.0	16.14	7.87	9.66	98.3	279.6	16.89	
Clark Lake #2	CL-2	24-Jun-19	10:02	13.1			0.3	16.20	7.98	9.79	99.6	277.5	16.05	0.575
							1.0	16.17	7.95	9.78	99.5	277.6	16.38	
							2.0	16.17	7.92	9.77	99.4	277.8	16.65	
							3.0	16.16	7.91	9.76	99.2	278.0	17.04	
							4.0	16.17	7.90	9.75	99.2	278.2	16.66	
							5.0	16.16	7.89	9.74	99.1	278.4	16.65	
							6.0	16.15	7.89	9.72	98.9	278.4	16.91	
							7.0	16.15	7.88	9.71	98.8	278.4	16.62	
							8.0	16.16	7.87	9.70	98.7	278.3	16.97	
							9.0	16.16	7.86	9.69	98.6	278.5	17.09	
							10.0	16.16	7.86	9.68	98.5	278.6	16.84	
							11.0	16.16	7.86	9.67	98.4	278.6	17.03	
							12.0	16.16	7.86	9.67	98.3	278.6	16.96	
Clark Lake #3	CL-3	24-Jun-19	10:24	9.6			0.3	16.25	7.90	9.80	99.8	276.5	15.21	0.55
							1.0	16.25	7.92	9.79	99.7	276.5	16.29	
							2.0	16.20	7.90	9.77	99.4	276.5	16.88	
							3.0	16.18	7.89	9.75	99.2	276.5	17.15	
							4.0	16.17	7.89	9.74	99.1	276.6	16.57	
							5.0	16.17	7.88	9.73	98.9	276.7	16.91	
							6.0	16.17	7.88	9.72	98.8	276.8	16.54	
							7.0	16.18	7.87	9.71	98.8	276.7	16.98	
							8.0	16.17	7.87	9.70	98.7	276.8	17.50	
Clark Lake #4	CL-4	24-Jun-19	10:42	6.9			0.3	16.23	7.97	9.79	99.7	272.6	16.46	0.575
							1.0	16.21	7.94	9.77	99.5	272.7	17.17	
							2.0	16.28	7.93	9.76	99.5	271.4	16.79	
							3.0	16.20	7.92	9.75	99.3	272.9	16.97	
							4.0	16.21	7.90	9.74	99.2	272.6	16.84	
							5.0	16.18	7.90	9.73	99.1	272.6	16.86	
							6.0	16.18	7.88	9.72	98.9	273.0	18.05	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Clark Lake #5	CL-5	24-Jun-19	10:55	7.7			0.3	16.28	7.96	9.80	99.9	267.5	16.65	0.625
							1.0	16.29	8.00	9.78	99.7	268.4	17.08	
							2.0	16.26	7.95	9.77	99.6	268.9	17.02	
							3.0	16.23	7.93	9.76	99.4	268.3	17.39	
							4.0	16.21	7.93	9.75	99.2	269.0	17.18	
							5.0	16.20	7.92	9.73	99.1	270.1	17.17	
							6.0	16.21	7.92	9.72	99.0	269.5	17.36	
							7.0	16.20	7.92	9.71	98.9	270.5	17.31	
Nelson River Upstream #1	US-1	25-Jun-19	11:25	12.0			0.3	16.66	7.92	9.61	98.9	273.7	16.12	0.525
							1.0	16.65	7.90	9.61	98.8	273.7	16.08	
							2.0	16.64	7.89	9.60	98.7	273.7	16.82	
							3.0	16.65	7.88	9.59	98.6	273.7	17.18	
							4.0	16.65	7.87	9.58	98.5	273.6	17.33	
							5.0	16.64	7.86	9.57	98.3	273.8	17.10	
							6.0	16.64	7.85	9.56	98.3	273.7	17.45	
							7.0	16.64	7.84	9.54	98.1	273.7	17.73	
							8.0	16.64	7.84	9.54	98.0	273.8	17.61	
							9.0	16.64	7.84	9.53	98.0	273.7	17.69	
							10.0	16.64	7.84	9.52	97.9	273.8	17.14	
							11.0	16.63	7.84	9.52	97.8	273.7	17.25	
							12.0	16.63	7.84	9.52	97.8	273.7	17.63	
Nelson River Upstream #2	US-2	25-Jun-19	11:55	5.3			0.3	16.45	7.99	9.62	98.4	276.5	16.55	0.475
							1.0	16.45	8.00	9.61	98.3	276.4	16.44	
							2.0	16.44	7.99	9.60	98.3	276.3	16.74	
							3.0	16.46	8.00	9.60	98.3	276.1	16.77	
							4.0	16.47	7.99	9.59	98.2	276.2	16.68	
							5.0	16.47	7.96	9.57	98.0	276.2	16.71	
Nelson River Upstream #3	US-3	25-Jun-19	12:20	9.0			0.3	16.59	7.96	9.63	98.8	274.3	16.73	0.475
							1.0	16.59	7.93	9.62	98.8	274.2	16.87	
							2.0	16.59	7.92	9.62	98.7	274.3	16.79	
							3.0	16.59	7.92	9.61	98.7	274.3	16.67	
							4.0	16.59	7.92	9.60	98.6	274.3	17.01	
							5.0	16.59	7.91	9.58	98.4	274.3	16.80	
							6.0	16.59	7.92	9.58	98.4	274.4	16.83	
							7.0	16.60	7.92	9.57	98.3	274.4	16.67	
							8.0	16.60	7.91	9.56	98.1	274.4	17.01	
							9.0	16.59	7.90	9.54	98.0	274.3	17.43	
Nelson River Upstream #4	US-4	25-Jun-19	12:48	9.1			0.3	16.65	8.05	9.62	98.8	273.9	16.72	0.55
							1.0	16.65	8.05	9.61	98.8	273.9	17.21	
							2.0	16.64	8.04	9.60	98.6	273.9	17.39	
							3.0	16.64	8.03	9.59	98.6	273.9	17.16	
							4.0	16.64	8.01	9.58	98.5	273.9	17.27	
							5.0	16.64	8.00	9.57	98.3	273.9	17.44	
							6.0	16.64	7.99	9.56	98.3	274.0	17.93	
							7.0	16.63	7.97	9.55	98.1	274.0	16.62	
							8.0	16.63	7.96	9.53	98.0	273.9	17.23	
							9.0	16.63	7.95	9.52	97.8	273.9	17.76	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Nelson River Upstream #5	US-5	25-Jun-19	13:05	8.5			0.3	16.42	8.02	9.61	98.3	277.5	16.85	0.575
							1.0	16.42	8.01	9.61	98.3	277.5	16.33	
							2.0	16.41	7.98	9.59	98.1	277.4	16.99	
							3.0	16.41	7.98	9.59	98.1	277.3	16.79	
							4.0	16.42	7.98	9.59	98.1	277.3	16.67	
							5.0	16.42	7.96	9.57	97.9	277.3	17.22	
							6.0	16.42	7.95	9.55	97.8	277.3	16.69	
							7.0	16.42	7.95	9.55	97.7	277.3	16.90	
							8.0	16.42	7.94	9.54	97.6	277.3	17.00	
Stephens Lake - Near-field #1	NF-1	26-Jun-19	11:49	19.7			0.3	16.46	8.07	9.85	100.9	277.1	15.61	0.55
							1.0	16.48	8.06	9.84	100.8	276.7	15.84	
							2.0	16.48	8.05	9.83	100.7	276.7	15.33	
							3.0	16.48	8.05	9.83	100.7	277.0	16.93	
							4.0	16.48	8.04	9.83	100.7	277.1	16.92	
							5.0	16.48	8.03	9.80	100.4	276.9	15.79	
							6.0	16.47	8.02	9.82	100.6	277.5	16.72	
							7.0	16.47	8.02	9.82	100.5	277.6	16.17	
							8.0	16.47	8.01	9.81	100.5	277.5	15.89	
							9.0	16.45	8.01	9.80	100.3	278.0	13.30	
							10.0	16.44	8.01	9.80	100.3	278.1	15.47	
							11.0	16.42	8.01	9.79	100.1	278.6	15.91	
							12.0	16.38	8.00	9.78	100.0	278.9	15.81	
							13.0	16.36	8.00	9.77	99.8	279.0	15.81	
							14.0	16.36	8.01	9.76	99.7	278.9	16.38	
							15.0	16.35	8.01	9.74	99.5	278.9	16.21	
							16.0	16.34	8.02	9.73	99.4	278.9	17.72	
							17.0	16.34	8.02	9.72	99.3	279.0	16.75	
							18.0	16.34	8.03	9.71	99.2	278.9	17.09	
Stephens Lake - Near-field #2	NF-2	26-Jun-19	12:42	11.1			0.3	16.47	8.08	9.89	101.3	277.9	15.60	0.55
							1.0	16.46	8.07	9.86	101.0	277.9	15.47	
							2.0	16.47	8.05	9.85	100.8	278.0	16.60	
							3.0	16.45	8.04	9.84	100.8	278.0	15.78	
							4.0	16.45	8.03	9.84	100.7	277.9	17.57	
							5.0	16.45	8.03	9.82	100.6	277.9	19.07	
							6.0	16.45	8.02	9.81	100.4	278.0	18.03	
							7.0	16.44	8.01	9.79	100.2	278.0	17.63	
							8.0	16.44	8.00	9.78	100.1	278.0	15.70	
							9.0	16.45	8.00	9.78	100.1	277.9	15.43	
							10.0	16.45	8.00	9.77	100.0	277.9	16.25	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Stephens Lake - Near-field #3	NF-3	26-Jun-19	12:13	19.1			0.3	16.51	8.10	9.94	101.9	277.8	15.14	0.55
							1.0	16.50	8.09	9.93	101.8	277.7	14.44	
							2.0	16.50	8.09	9.92	101.6	277.7	15.86	
							3.0	16.48	8.07	9.88	101.3	277.8	15.76	
							4.0	16.46	8.06	9.86	100.9	278.0	15.85	
							5.0	16.46	8.06	9.85	100.9	278.1	15.59	
							6.0	16.41	8.04	9.83	100.9	278.8	15.93	
							7.0	16.39	8.03	9.83	100.4	278.9	15.91	
							8.0	16.38	8.02	9.81	100.3	278.9	16.07	
							9.0	16.38	8.01	9.81	100.2	279.1	15.92	
							10.0	16.37	8.01	9.80	100.2	279.1	16.27	
							11.0	16.37	8.01	9.79	100.1	279.1	15.99	
							12.0	16.37	8.01	9.78	99.9	279.1	17.09	
							13.0	16.37	8.01	9.77	99.8	279.2	15.83	
							14.0	16.37	8.01	9.75	99.7	279.3	16.54	
							15.0	16.38	8.01	9.74	99.6	279.2	16.71	
							16.0	16.38	8.01	9.73	99.5	279.2	16.85	
							17.0	16.38	8.02	9.72	99.4	279.1	16.31	
							18.0	16.37	8.03	9.70	99.1	279.1	16.32	
Stephens Lake - Near-field #4	NF-4	26-Jun-19	13:00	5.8			0.3	16.53	8.09	9.83	100.7	277.0	16.57	0.55
							1.0	16.53	8.09	9.82	100.7	277.1	16.92	
							2.0	16.53	8.07	9.80	100.4	277.0	18.60	
							3.0	16.52	8.07	9.78	100.2	277.0	16.04	
							4.0	16.52	8.07	9.76	100.0	277.0	14.57	
							5.0	16.51	8.05	9.72	99.7	277.0	16.77	
Stephens Lake - Near-field #5	NF-5	26-Jun-19	11:25	19.2			0.3	16.47	8.07	9.88	101.2	277.1	15.74	0.55
							1.0	16.49	8.07	9.88	101.2	277.0	15.39	
							2.0	16.47	8.06	9.86	101.0	277.3	16.05	
							3.0	16.42	8.06	9.85	100.8	277.6	16.38	
							4.0	16.42	8.06	9.84	100.6	277.5	16.15	
							5.0	16.38	8.07	9.82	100.4	277.7	14.78	
							6.0	16.36	8.06	9.81	100.2	277.8	16.62	
							7.0	16.34	8.05	9.78	100.0	277.7	16.19	
							8.0	16.34	8.04	9.77	99.8	277.6	15.77	
							9.0	16.34	8.03	9.75	99.6	277.5	17.15	
							10.0	16.34	8.03	9.75	99.5	277.6	16.56	
							11.0	16.34	8.02	9.74	99.5	277.7	15.88	
							12.0	16.33	8.02	9.71	99.2	277.5	18.12	
							13.0	16.33	8.02	9.70	99.1	277.4	18.05	
							14.0	16.31	8.01	9.67	98.7	277.3	19.11	
							15.0	16.31	8.01	9.65	98.5	277.2	16.98	
							16.0	16.31	8.01	9.64	98.4	277.2	19.22	
							17.0	16.31	8.01	9.63	98.3	277.2	19.32	
							18.0	16.30	8.00	9.60	98.1	277.1	19.98	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Stephens Lake - Far-field #1	FF-1	26-Jun-19	8:23	22.9			0.3	15.92	8.06	9.73	98.5	273.0	12.33	0.65
							1.0	15.92	8.05	9.72	98.4	273.1	12.74	
							2.0	15.92	8.05	9.71	98.3	273.1	12.59	
							3.0	15.93	8.05	9.70	98.2	273.3	12.78	
							4.0	15.96	8.05	9.69	98.1	273.7	12.48	
							5.0	15.95	8.05	9.69	98.0	273.4	12.64	
							6.0	15.95	8.05	9.68	97.9	273.4	12.18	
							7.0	15.93	8.06	9.67	97.8	272.9	12.14	
							8.0	15.94	8.06	9.66	97.7	273.1	12.11	
							9.0	15.93	8.07	9.65	97.6	273.0	11.95	
							10.0	15.93	8.07	9.65	97.4	272.9	12.20	
							11.0	15.93	8.07	9.62	97.4	273.0	12.43	
							12.0	15.93	8.07	9.62	97.4	273.0	12.57	
							13.0	15.93	8.07	9.61	97.3	272.9	12.08	
							14.0	15.92	8.07	9.60	97.2	272.9	12.53	
							15.0	15.92	8.07	9.58	97.0	272.9	12.21	
							16.0	15.92	8.07	9.58	97.0	272.9	12.29	
							17.0	15.92	8.07	9.57	96.8	272.9	12.23	
							18.0	15.90	8.08	9.54	96.6	272.7	13.11	
							19.0	15.81	8.07	9.48	95.7	272.5	13.71	
							20.0	15.55	8.06	9.08	90.0	271.7	19.32	
							21.0	14.81	7.97	8.98	86.9	269.5	20.99	
							22.0	13.92	7.91	8.81	85.4	269.8	19.48	
Stephens Lake - Far-field #2	FF-2	26-Jun-19	9:10	15.4			0.3	16.05	8.08	9.76	99.1	276.1	13.60	0.575
							1.0	16.00	8.07	9.73	98.7	276.4	13.64	
							2.0	16.00	8.06	9.72	98.5	276.5	13.55	
							3.0	16.00	8.06	9.70	98.4	276.5	13.36	
							4.0	16.00	8.05	9.69	98.3	276.5	13.95	
							5.0	16.00	8.05	9.68	98.2	276.6	14.06	
							6.0	16.00	8.05	9.68	98.1	276.6	13.70	
							7.0	16.00	8.04	9.66	98.0	276.6	13.85	
							8.0	15.99	8.04	9.65	97.8	276.5	13.69	
							9.0	16.00	8.04	9.64	97.8	276.6	13.72	
							10.0	15.99	8.04	9.63	97.7	276.6	14.22	
							11.0	15.99	8.05	9.62	97.6	276.6	13.74	
							12.0	15.99	8.05	9.62	97.5	276.5	14.12	
							13.0	15.98	8.05	9.60	97.3	276.6	13.60	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Stephens Lake - Far-field #3	FF-3	26-Jun-19	9:55	27.6			0.3	16.29	8.06	9.75	99.4	276.9	13.85	0.625
							1.0	16.30	8.07	9.74	99.4	276.8	13.73	
							2.0	16.29	8.06	9.73	99.3	276.9	14.77	
							3.0	16.28	8.06	9.72	99.1	276.9	15.08	
							4.0	16.29	8.05	9.70	99.0	276.9	14.28	
							5.0	16.28	8.05	9.69	98.9	276.9	13.85	
							6.0	16.28	8.05	9.68	98.7	276.8	14.14	
							7.0	16.28	8.05	9.66	98.6	276.7	14.00	
							8.0	12.28	8.04	9.65	98.4	276.7	13.76	
							9.0	16.27	8.04	9.63	98.2	276.6	14.18	
							10.0	16.26	8.03	9.62	98.0	276.4	14.89	
							11.0	16.26	8.03	9.60	97.9	276.2	14.49	
							12.0	16.25	8.03	9.59	97.8	276.3	14.21	
							13.0	16.26	8.03	9.59	97.7	276.4	14.23	
							14.0	16.26	8.02	9.58	97.7	276.4	13.95	
							15.0	16.26	8.02	9.57	97.6	276.5	14.35	
							16.0	16.26	8.02	9.56	97.4	276.4	13.93	
							17.0	16.25	8.02	9.55	97.4	276.2	13.90	
							18.0	16.25	8.02	9.54	97.3	276.2	14.41	
							19.0	16.25	8.02	9.53	97.1	276.1	14.16	
							20.0	16.25	8.02	9.52	97.0	276.2	14.29	
							21.0	16.24	8.02	9.50	96.9	275.9	14.07	
							22.0	16.23	8.02	9.49	96.8	275.7	14.43	
							23.0	16.23	8.02	9.48	96.6	275.8	14.10	
							24.0	16.22	8.02	9.47	96.4	275.9	14.09	
							25.0	16.21	8.03	9.43	96.1	275.9	15.20	
Stephens Lake - Far-field #4	FF-4	26-Jun-19	9:35	14.8			0.3	16.06	8.04	9.72	98.7	276.5	13.93	0.65
							1.0	16.07	8.04	9.72	98.7	276.4	14.00	
							2.0	16.07	8.04	9.72	98.6	276.5	13.73	
							3.0	16.07	8.05	9.71	98.6	276.5	14.07	
							4.0	16.07	8.05	9.69	98.4	276.5	13.90	
							5.0	16.06	8.05	9.68	98.2	276.4	13.94	
							6.0	16.06	8.05	9.67	98.2	276.4	14.04	
							7.0	16.06	8.06	9.66	98.1	276.4	13.90	
							8.0	16.06	8.06	9.64	97.9	276.5	14.02	
							9.0	16.05	8.05	9.63	97.8	276.5	14.34	
							10.0	16.04	8.05	9.62	97.6	276.6	14.26	
							11.0	16.04	8.06	9.61	97.5	276.6	13.90	
							12.0	16.01	8.07	9.60	97.4	276.6	14.43	
							13.0	16.00	8.07	9.59	97.3	276.6	14.31	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Stephens Lake - Far-field #5	FF-5	26-Jun-19	8:50	12.1			0.3	15.99	8.07	9.73	98.6	275.4	13.46	0.65
							1.0	15.99	8.07	9.73	98.6	275.5	13.34	
							2.0	15.99	8.07	9.72	98.6	275.5	14.07	
							3.0	16.00	8.07	9.70	98.3	275.4	13.59	
							4.0	16.00	8.07	9.68	98.2	275.4	14.26	
							5.0	16.00	8.08	9.68	98.1	275.3	13.94	
							6.0	16.00	8.08	9.66	98.0	275.5	14.30	
							7.0	16.00	8.08	9.65	97.9	275.6	14.24	
							8.0	16.00	8.08	9.65	97.9	275.5	13.91	
							9.0	16.00	8.08	9.64	97.8	275.5	13.66	
							10.0	16.00	8.08	9.60	97.4	275.5	14.19	
							11.0	15.99	8.08	9.59	97.2	275.6	16.52	
Clark Lake #1	CL-1	21-Jul-19	10:25	11.3			0.3	18.72	8.60	9.01	96.7	249.7	20.14	0.425
							1.0	18.72	8.58	9.00	96.5	252.0	20.47	
							2.0	18.71	8.57	8.99	96.4	250.5	20.71	
							3.0	18.71	8.56	8.98	96.3	249.5	20.03	
							4.0	18.71	8.54	8.97	96.2	250.3	20.19	
							5.0	18.71	8.53	8.96	96.1	250.2	20.85	
							6.0	18.71	8.52	8.94	95.9	249.6	21.76	
							7.0	18.71	8.52	8.94	95.8	249.7	21.76	
							8.0	18.71	8.51	8.92	95.7	249.9	20.96	
							9.0	18.71	8.51	8.93	95.7	251.9	19.96	
							10.0	18.71	8.52	8.90	95.4	252.2	20.12	
Clark Lake #2	CL-2	21-Jul-19	10:48	13.0			0.3	18.76	8.69	9.01	96.8	259.0	19.17	0.45
							1.0	18.75	8.68	9.00	96.8	259.3	19.91	
							2.0	18.75	8.65	8.99	96.5	260.1	19.72	
							3.0	18.75	8.64	8.98	96.3	260.1	19.95	
							4.0	18.74	8.61	8.96	96.2	260.2	19.52	
							5.0	18.75	8.58	8.96	96.2	259.7	19.62	
							6.0	18.74	8.55	8.94	96.0	260.7	19.83	
							7.0	18.74	8.55	8.93	95.8	261.3	19.55	
							8.0	18.74	8.55	8.93	95.9	259.7	19.42	
							9.0	18.75	8.55	8.93	95.9	260.1	20.19	
							10.0	18.74	8.55	8.91	95.6	261.3	20.83	
							11.0	18.74	8.55	8.90	95.5	261.5	20.10	
							12.0	18.74	8.58	8.87	95.2	262.1	24.90	
Clark Lake #3	CL-3	21-Jul-19	11:05	9.2			0.3	18.79	8.69	9.01	96.8	263.2	18.88	0.475
							1.0	18.80	8.69	9.01	96.8	263.0	19.06	
							2.0	18.79	8.69	9.00	96.7	263.1	19.26	
							3.0	18.78	8.68	8.98	96.5	263.3	19.70	
							4.0	18.76	8.66	8.96	96.2	263.7	20.27	
							5.0	18.76	8.65	8.95	96.1	263.8	19.71	
							6.0	18.76	8.63	8.94	96.0	263.7	19.85	
							7.0	18.76	8.60	8.93	95.9	263.8	21.49	
							8.0	18.75	8.60	8.91	95.7	263.7	22.40	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Clark Lake #4	CL-4	21-Jul-19	11:45	9.0			0.3	18.78	8.72	9.03	96.9	265.1	18.93	0.45
							1.0	18.78	8.71	9.01	96.8	265.1	19.37	
							2.0	18.78	8.71	9.01	96.8	265.3	19.34	
							3.0	18.75	8.70	8.99	96.5	265.6	19.13	
							4.0	18.77	8.67	8.98	96.4	265.7	20.47	
							5.0	18.76	8.65	8.96	96.2	265.8	18.77	
							6.0	18.76	8.63	8.94	96.1	265.6	19.28	
							7.0	18.75	8.63	8.94	96.0	265.5	19.61	
							8.0	18.76	8.63	8.93	95.9	265.4	21.92	
Clark Lake #5	CL-5	21-Jul-19	11:25	7.3			0.3	18.76	8.69	9.03	96.9	241.3	20.93	0.45
							1.0	18.74	8.70	9.03	96.9	242.4	21.44	
							2.0	18.74	8.70	9.00	96.6	244.3	21.23	
							3.0	18.74	8.69	9.00	96.6	244.4	21.87	
							4.0	18.73	8.67	8.99	96.4	244.5	21.64	
							5.0	18.73	8.66	8.98	96.3	245.7	21.78	
							6.0	18.74	8.65	8.95	96.1	249.8	21.35	
							7.0	18.74	8.64	8.95	96.0	249.0	21.87	
Nelson River Upstream #1	US-1	22-Jul-19	11:30	11.3			0.3	19.08	8.85	9.06	97.8	257.5	21.75	0.45
							1.0	19.06	8.84	9.05	97.8	257.5	20.25	
							2.0	19.06	8.80	9.04	97.7	257.5	19.95	
							3.0	19.06	8.79	9.03	97.5	257.5	20.09	
							4.0	19.05	8.78	9.03	97.5	257.6	19.88	
							5.0	19.05	8.77	9.01	97.3	257.6	19.55	
							6.0	19.05	8.76	9.00	97.1	257.5	19.65	
							7.0	19.05	8.76	8.98	97.0	257.6	20.30	
							8.0	19.05	8.76	8.98	96.9	257.7	19.92	
							9.0	19.05	8.75	8.97	96.9	257.5	19.85	
							10.0	19.05	8.75	8.97	96.8	257.7	19.98	
							11.0	19.05	8.75	8.96	96.8	257.7	19.83	
Nelson River Upstream #2	US-2	22-Jul-19	11:51	5.7			0.3	19.05	8.76	9.01	97.3	266.1	19.43	0.45
							1.0	19.05	8.74	9.01	97.3	266.0	19.15	
							2.0	19.05	8.73	9.00	97.2	266.0	19.11	
							3.0	19.05	8.72	8.99	97.1	266.0	18.91	
							4.0	19.04	8.69	8.98	97.0	266.4	18.79	
							5.0	19.04	8.65	8.97	96.8	266.2	18.83	
Nelson River Upstream #3	US-3	22-Jul-19	12:45	8.5			0.3	19.25	8.87	9.10	98.7	260.1	19.53	0.475
							1.0	19.23	8.88	9.09	98.5	260.3	20.15	
							2.0	19.21	8.73	9.07	98.3	260.4	19.50	
							3.0	19.20	8.73	9.06	98.2	260.4	19.31	
							4.0	19.19	8.70	9.05	98.0	260.4	19.74	
							5.0	19.20	8.70	9.04	97.9	260.5	19.59	
							6.0	19.19	8.69	9.02	97.7	260.5	19.69	
							7.0	19.20	8.69	9.03	97.8	260.5	19.52	
							8.0	19.23	8.69	9.04	98.0	260.7	19.36	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Nelson River Upstream #4	US-4	22-Jul-19	12:15	10.6			0.3	19.09	8.66	9.06	97.9	258.9	19.61	0.45
							1.0	19.09	8.65	9.05	97.8	258.9	19.86	
							2.0	19.08	8.65	9.05	97.7	259.0	19.79	
							3.0	19.08	8.65	9.04	97.6	259.0	19.97	
							4.0	19.08	8.63	9.02	97.5	259.0	20.07	
							5.0	19.08	8.63	9.01	97.4	259.0	19.82	
							6.0	19.08	8.63	9.00	97.3	259.1	19.77	
							7.0	19.08	8.64	9.00	97.2	259.0	19.78	
							8.0	19.08	8.64	8.98	97.0	259.0	19.62	
							9.0	19.08	8.65	8.97	97.0	259.1	19.77	
							10.0	19.08	8.67	8.96	96.8	259.1	20.04	
Nelson River Upstream #5	US-5	22-Jul-19	13:05	7.3			0.3	19.17	8.74	9.03	97.8	266.3	19.14	0.45
							1.0	19.16	8.68	9.02	97.7	266.6	19.74	
							2.0	19.14	8.66	9.01	97.4	266.6	19.02	
							3.0	19.14	8.65	9.00	97.3	266.5	18.71	
							4.0	19.14	8.64	8.99	97.2	266.5	19.00	
							5.0	19.14	8.64	8.98	97.2	266.7	18.91	
							6.0	19.13	8.64	8.97	97.0	266.8	19.35	
							7.0	19.13	8.65	8.95	96.8	266.8	18.98	
Stephens Lake - Near-field #1	NF-1	23-Jul-19	13:10	19.9			0.3	19.51	8.63	9.52	103.5	264.0	18.87	0.475
							1.0	19.47	8.62	9.38	102.2	265.1	18.31	
							2.0	19.44	8.60	9.36	101.9	265.0	18.65	
							3.0	19.41	8.59	9.32	101.4	265.3	18.68	
							4.0	19.38	8.58	9.28	100.8	265.7	19.38	
							5.0	19.38	8.57	9.27	100.8	265.7	18.71	
							6.0	19.38	8.56	9.26	100.6	265.8	19.60	
							7.0	19.38	8.57	9.24	100.5	265.8	19.13	
							8.0	19.37	8.57	9.24	100.4	265.8	18.90	
							9.0	19.37	8.57	9.23	100.3	265.7	19.24	
							10.0	19.37	8.58	9.22	100.2	265.7	19.06	
							11.0	19.37	8.59	9.21	100.1	265.7	19.03	
							12.0	19.37	8.60	9.19	99.9	265.8	19.16	
							13.0	19.36	8.62	9.18	99.7	265.7	18.81	
							14.0	19.36	8.62	9.12	99.6	265.7	18.83	
							15.0	19.35	8.64	9.16	99.6	265.6	19.54	
							16.0	19.33	8.66	9.14	99.3	265.4	18.18	
							17.0	19.31	8.68	9.13	99.1	265.2	18.14	
							18.0	19.28	8.70	9.10	98.8	265.1	16.75	
							19.0	19.23	8.72	9.07	98.2	264.5	17.79	
							20.0	19.10	8.74	8.97	96.9	263.1	22.06	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Stephens Lake - Near-field #2	NF-2	23-Jul-19	14:00	11.9			0.3	20.82	8.82	9.82	109.3	266.3	16.62	0.475
							1.0	20.62	8.92	9.84	108.0	265.9	17.01	
							2.0	19.74	8.87	9.63	105.5	265.4	17.26	
							3.0	19.56	8.81	9.51	103.8	265.2	17.28	
							4.0	19.51	8.77	9.47	103.2	265.1	17.14	
							5.0	19.48	8.72	9.41	102.5	265.1	17.34	
							6.0	19.45	8.70	9.39	102.2	265.1	17.52	
							7.0	19.43	8.67	9.38	102.1	265.2	17.36	
							8.0	19.42	8.65	9.33	101.5	265.2	17.99	
							9.0	19.42	8.65	9.32	101.3	265.2	17.47	
							10.0	19.42	8.65	9.28	101.1	265.1	17.28	
							11.0	19.42	8.65	9.28	100.8	265.1	17.99	
							12.0	19.42	8.65	9.26	100.6	265.1	17.83	
Stephens Lake - Near-field #3	NF-3	23-Jul-19	13:35	19.0			0.3	19.57	8.80	9.49	103.4	264.7	18.05	0.425
							1.0	19.59	8.80	9.38	102.1	264.9	19.03	
							2.0	19.45	8.78	9.30	101.3	264.8	18.49	
							3.0	19.44	8.75	9.27	100.9	265.0	19.88	
							4.0	19.42	8.74	9.27	100.8	264.9	22.53	
							5.0	19.42	8.72	9.26	100.7	265.0	20.50	
							6.0	19.39	8.71	9.26	100.7	265.3	20.27	
							7.0	19.39	8.71	9.25	100.5	265.4	20.95	
							8.0	19.38	8.72	9.24	100.4	265.6	22.30	
							9.0	19.38	8.71	9.23	100.3	265.7	21.13	
							10.0	19.38	8.72	9.23	100.3	265.4	21.80	
							11.0	19.37	8.72	9.21	100.1	265.5	23.49	
							12.0	19.37	8.72	9.19	99.9	265.5	22.53	
							13.0	19.37	8.73	9.17	99.7	265.6	22.48	
							14.0	19.34	8.74	9.15	99.4	265.4	21.31	
							15.0	19.33	8.74	9.14	99.3	265.4	21.42	
							16.0	19.33	8.76	9.13	99.1	265.3	17.34	
							17.0	19.29	8.79	9.09	98.6	265.1	19.22	
							18.0	19.21	8.80	9.03	97.9	264.4	20.24	
Stephens Lake - Near-field #4	NF-4	23-Jul-19	14:25	5.8			0.3	20.02	8.78	9.79	107.8	266.5	16.74	0.425
							1.0	20.03	8.76	9.77	107.6	266.5	17.23	
							2.0	20.01	8.77	9.67	106.8	266.6	17.12	
							3.0	19.67	8.77	9.53	104.3	266.1	17.53	
							4.0	19.47	8.74	9.40	102.3	265.8	18.76	
							5.0	19.41	8.70	9.33	101.8	266.2	18.41	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Stephens Lake - Near-field #5	NF-5	23-Jul-19	12:35	18.3			0.3	19.78	8.69	9.64	105.5	265.1	17.91	0.425
							1.0	19.70	8.67	9.59	105.0	265.2	18.60	
							2.0	19.41	8.64	9.35	101.8	266.0	19.98	
							3.0	19.35	8.60	9.29	101.0	266.1	18.78	
							4.0	19.35	8.58	9.27	100.7	266.2	19.53	
							5.0	19.35	8.56	9.26	100.7	266.1	19.74	
							6.0	19.34	8.53	9.24	100.4	266.2	18.09	
							7.0	19.34	8.53	9.24	100.3	266.1	18.96	
							8.0	19.33	8.45	9.22	100.1	265.9	18.27	
							9.0	19.19	8.46	9.18	99.4	263.9	18.90	
							10.0	19.20	8.45	9.17	99.3	264.0	19.12	
							11.0	19.15	8.45	9.16	99.1	263.3	19.98	
							12.0	19.14	8.45	9.15	99.0	263.2	19.69	
							13.0	19.12	8.47	9.14	98.8	262.5	19.34	
							14.0	19.07	8.48	9.14	98.7	261.8	18.15	
							15.0	19.09	8.48	9.13	98.6	261.9	21.25	
							16.0	19.09	8.51	9.07	97.9	260.5	19.12	
							17.0	18.90	8.52	8.95	96.3	260.4	18.34	
							18.0	18.87	8.52	8.95	95.3	260.5	17.78	
Stephens Lake - Far-field #1	FF-1	23-Jul-19	9:00	23.2			0.3	19.06	8.70	9.12	98.6	257.2	13.49	0.65
							1.0	19.06	8.69	9.09	98.3	257.2	13.62	
							2.0	19.03	8.67	9.08	98.0	257.1	13.46	
							3.0	19.02	8.65	9.05	97.7	257.1	13.88	
							4.0	19.01	8.64	9.04	97.6	257.1	13.56	
							5.0	19.01	8.64	9.02	97.4	257.2	13.59	
							6.0	18.98	8.64	8.99	97.0	257.2	14.56	
							7.0	18.98	8.63	8.98	96.8	257.3	13.99	
							8.0	18.96	8.61	8.94	96.4	257.4	13.91	
							9.0	18.94	8.61	8.91	96.0	257.4	13.89	
							10.0	18.94	8.61	8.89	95.9	257.4	15.06	
							11.0	18.89	8.61	8.81	94.8	257.5	14.93	
							12.0	18.85	8.60	8.78	94.5	257.5	14.23	
							13.0	18.80	8.63	8.74	93.8	257.6	14.91	
							14.0	18.78	8.64	8.72	93.7	257.6	15.24	
							15.0	18.78	8.63	8.71	93.5	257.5	14.80	
							16.0	18.75	8.66	8.66	93.2	257.6	14.85	
							17.0	18.69	8.66	8.59	92.2	257.6	15.17	
							18.0	18.66	8.66	8.55	91.7	257.6	15.02	
							19.0	18.64	8.66	8.51	91.2	257.5	14.61	
							20.0	18.59	8.67	8.45	90.5	257.3	15.04	
							21.0	18.45	8.67	8.39	89.6	256.7	15.86	
							22.0	18.35	8.68	8.15	86.8	256.4	20.00	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Stephens Lake - Far-field #2	FF-2	23-Jul-19	9:50	17.0			0.3	19.49	8.78	9.36	102.0	257.3	13.01	0.625
							1.0	19.48	8.77	9.32	101.3	257.3	13.30	
							2.0	19.42	8.75	9.27	101.2	257.4	13.68	
							3.0	19.40	8.73	9.25	100.7	257.4	13.90	
							4.0	19.36	8.69	9.20	100.0	257.4	13.71	
							5.0	19.35	8.67	9.17	99.6	257.5	14.15	
							6.0	19.33	8.67	9.15	99.4	257.4	13.82	
							7.0	19.32	8.66	9.14	99.2	257.5	13.93	
							8.0	19.31	8.68	9.11	98.9	257.6	14.00	
							9.0	19.28	8.67	9.08	98.5	257.6	14.47	
							10.0	19.26	8.67	9.04	98.2	257.6	14.62	
							11.0	19.12	8.69	8.89	96.4	257.8	15.14	
							12.0	19.00	8.68	8.83	95.3	257.9	15.48	
							13.0	18.97	8.66	8.81	94.9	257.9	15.59	
							14.0	18.97	8.67	8.77	94.5	258.0	16.85	
							15.0	18.95	8.66	8.64	93.4	258.3	17.18	
							16.0	18.90	8.66	8.47	91.4	258.8	17.98	
Stephens Lake - Far-field #3	FF-3	23-Jul-19	10:50	26.8			0.3	19.68	8.76	9.44	103.2	258.2	14.76	0.625
							1.0	19.57	8.76	9.37	102.1	258.3	15.63	
							2.0	19.53	8.74	9.34	101.8	258.2	15.06	
							3.0	19.51	8.71	9.31	101.4	258.3	15.03	
							4.0	19.50	8.70	9.29	101.2	258.4	15.23	
							5.0	19.50	8.70	9.26	100.9	258.4	15.31	
							6.0	19.47	8.69	9.23	100.5	258.3	15.01	
							7.0	19.44	8.70	9.23	100.5	258.1	14.94	
							8.0	19.43	8.70	9.23	100.4	257.8	15.08	
							9.0	19.41	8.72	9.21	100.2	257.6	14.60	
							10.0	19.40	8.73	9.17	99.8	257.7	14.34	
							11.0	19.35	8.74	9.09	99.1	258.1	14.94	
							12.0	19.20	8.73	9.02	97.6	258.1	15.75	
							13.0	19.12	8.74	8.97	97.2	258.1	15.40	
							14.0	19.04	8.76	8.93	96.4	257.8	15.32	
							15.0	18.96	8.77	8.88	95.7	257.6	15.95	
							16.0	18.93	8.76	8.86	95.4	257.7	15.67	
							17.0	18.93	8.76	8.85	95.3	257.6	13.51	
							18.0	18.93	8.75	8.83	95.2	257.7	15.61	
							19.0	18.93	8.75	8.82	95.1	257.7	14.95	
							20.0	18.92	8.75	8.81	94.9	257.7	15.83	
							21.0	18.92	8.75	8.80	94.8	257.6	16.01	
							22.0	18.91	8.74	8.77	94.5	257.6	17.02	
							23.0	18.89	8.74	8.73	94.1	257.7	16.44	
							24.0	18.88	8.73	8.72	93.8	257.7	16.29	
							25.0	18.87	8.73	8.69	93.6	257.7	16.66	
							26.0	18.83	8.73	8.56	92.2	258.1	22.16	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)	Comments
Stephens Lake - Far-field #4	FF-4	23-Jul-19	10:15	14.4			0.3	19.48	8.75	9.33	101.6	257.3	14.21	0.625	
							1.0	19.39	8.73	9.30	101.1	257.3	14.19		
							2.0	19.41	8.73	9.30	101.2	257.3	14.07		
							3.0	19.36	8.69	9.26	100.6	257.3	14.15		
							4.0	19.35	8.68	9.24	100.4	257.3	14.64		
							5.0	19.35	8.67	9.22	100.3	257.3	14.32		
							6.0	19.34	8.68	9.21	100.0	257.3	14.09		
							7.0	19.34	8.68	9.20	100.0	257.4	14.69		
							8.0	19.33	8.69	9.17	99.5	257.4	14.23		
							9.0	19.31	8.69	9.16	99.4	257.3	14.24		
							10.0	19.25	8.71	9.06	98.2	257.4	14.53		
							11.0	19.19	8.70	8.99	97.5	257.5	14.73		
							12.0	19.08	8.70	8.90	96.2	257.7	14.91		
							13.0	19.02	8.71	8.82	95.2	257.9	15.38		
Stephens Lake - Far-field #5	FF-5	23-Jul-19	9:30	13.5			0.3	19.22	8.74	9.20	99.7	257.4	13.26	0.675	
							1.0	19.21	8.75	9.17	99.4	257.3	13.49		
							2.0	19.19	8.74	9.15	99.1	257.3	13.83		
							3.0	19.17	8.71	9.07	98.1	257.4	13.85		
							4.0	19.13	8.69	9.02	97.6	257.5	13.90		
							5.0	19.11	8.67	9.00	97.3	257.6	13.82		
							6.0	19.10	8.65	8.98	97.1	257.7	14.22		
							7.0	19.09	8.62	8.95	96.7	257.7	13.98		
							8.0	19.08	8.62	8.94	96.6	257.7	14.32		
							9.0	19.05	8.62	8.87	95.7	257.8	15.50		
							10.0	19.00	8.61	8.85	95.5	257.7	15.18		
							11.0	18.97	8.61	8.81	95.0	257.9	15.36		
							12.0	18.95	8.61	8.77	94.6	257.9	16.08		
							13.0	18.92	8.64	8.73	94.1	258.0	18.01		
Clark Lake #1	CL-1	25-Aug-19	11:15	8.4			0.3	17.11	-	9.36	97.1	265.7	17.22	0.525	pH 13.41 removed.[1]
							1.0	17.10	-	9.36	97.1	256.9	18.21		pH 13.05 removed.[1]
							2.0	17.11	-	9.34	97.0	256.5	18.41		pH 11.78 removed.[1]
							3.0	17.11	-	9.33	96.8	256.4	18.67		pH 11.71 removed.[1]
							4.0	17.11	-	9.32	96.7	256.4	18.15		pH 11.48 removed.[1]
							5.0	17.14	-	9.31	96.6	256.5	18.19		pH 11.43 removed.[1]
							6.0	17.11	-	9.30	96.5	256.6	17.84		pH 11.38 removed.[1]
							7.0	17.11	-	9.29	96.4	256.6	16.92		pH 11.35 removed.[1]
							8.0	17.11	-	9.28	96.3	256.7	18.24		pH 11.30 removed.[1]
Clark Lake #2	CL-2	25-Aug-19	10:56	12.7			0.3	17.10	-	9.36	97.1	253.3	17.32	0.55	pH 11.59 removed.[1]
							1.0	17.10	-	9.36	91.0	254.6	18.79		pH 11.63 removed.[1]
							2.0	17.10	-	9.33	96.8	254.8	19.79		pH 11.55 removed.[1]
							3.0	17.10	-	9.33	96.7	254.5	18.82		pH 11.42 removed.[1]
							4.0	17.10	-	9.32	96.7	254.2	17.90		pH 11.33 removed.[1]
							5.0	17.10	-	9.31	96.6	254.6	19.10		pH 11.22 removed.[1]
							6.0	17.09	-	9.30	96.5	252.9	18.93		pH 11.18 removed.[1]
							7.0	17.10	-	9.28	96.3	254.2	20.61		pH 11.10 removed.[1]
							8.0	17.10	-	9.27	96.2	254.6	18.25		pH 11.07 removed.[1]
							9.0	17.10	-	9.26	96.1	255.5	18.17		pH 11.04 removed.[1]
							10.0	17.10	-	9.25	96.0	255.7	18.03		pH 11.02 removed.[1]
							11.0	17.10	-	9.23	95.8	255.8	18.02		pH 10.95 removed.[1]

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)	Comments
Clark Lake #3	CL-3	25-Aug-19	11:37	6.8			0.3	17.10	-	9.35	97.0	257.8	18.18	0.48	pH 12.31 removed.[1]
							1.0	17.10	-	9.34	96.9	257.5	18.46		pH 11.61 removed.[1]
							2.0	17.10	-	9.34	96.9	257.2	18.04		pH 11.60 removed.[1]
							3.0	17.10	-	9.32	96.7	257.5	18.45		pH 11.59 removed.[1]
							4.0	17.10	-	9.31	96.6	257.2	18.17		pH 11.48 removed.[1]
							5.0	17.10	-	9.30	96.5	257.6	17.94		pH 11.43 removed.[1]
							6.0	17.10	-	9.29	96.4	257.8	18.03		pH 11.44 removed.[1]
Clark Lake #4	CL-4	25-Aug-19	10:20	7.3			0.3	17.11	-	9.35	97.0	255.8	17.88	0.50	pH 11.34 removed.[1]
							1.0	17.10	-	9.34	96.9	255.6	18.56		pH 11.47 removed.[1]
							2.0	17.10	-	9.34	96.9	254.2	18.43		pH 11.33 removed.[1]
							3.0	17.10	-	9.32	96.7	254.4	18.12		pH 11.20 removed.[1]
							4.0	17.10	-	9.31	96.6	254.9	18.50		pH 11.18 removed.[1]
							5.0	17.10	-	9.30	96.5	255.7	18.08		pH 11.14 removed.[1]
							6.0	17.10	-	9.29	96.4	254.9	18.30		pH 11.10 removed.[1]
Clark Lake #5	CL-5	25-Aug-19	10:45	7.7			0.3	17.06	-	9.38	97.2	234.9	18.67	N/A	pH 11.31 removed.[1]
							1.0	17.06	-	9.37	97.1	244.0	19.29		pH 11.37 removed.[1]
							2.0	17.07	-	9.35	97.0	245.7	18.74		pH 11.26 removed.[1]
							3.0	17.07	-	9.34	96.9	247.1	18.52		pH 11.20 removed.[1]
							4.0	17.07	-	9.33	96.8	247.8	18.49		pH 11.08 removed.[1]
							5.0	17.07	-	9.31	96.6	248.3	18.78		pH 11.06 removed.[1]
							6.0	17.07	-	9.31	96.5	248.4	17.24		pH 11.06 removed.[1]
							7.0	17.08	-	9.31	96.4	248.5	18.94		pH 11.05 removed.[1]
Nelson River Upstream #1	US-1	27-Aug-19	12:55	10.9			0.3	15.61	7.68	9.46	95.1	253.2	18.61	0.53	
							1.0	15.14	7.63	9.44	95.0	253.2	19.49		
							2.0	15.64	8.01	9.43	94.9	253.2	19.27		
							3.0	15.62	8.10	9.43	94.9	253.1	19.90		
							4.0	15.64	8.13	9.42	94.7	253.2	19.57		
							5.0	15.65	8.06	9.41	94.7	253.3	19.52		
							6.0	15.65	7.97	9.39	94.5	253.3	19.43		
							7.0	15.65	7.95	9.38	94.5	253.3	19.40		
							8.0	15.66	7.86	9.37	94.4	253.3	19.70		
							9.0	15.67	7.72	9.36	94.2	253.3	19.81		
							10.0	15.67	7.49	9.35	94.1	253.4	19.32		
Nelson River Upstream #2	US-2	27-Aug-19	13:15	6.2			0.3	15.91	8.78	9.39	95.1	257.0	19.35	0.53	
							1.0	15.93	8.28	9.38	95.0	257.3	19.35		
							2.0	15.95	8.11	9.37	94.9	257.4	19.61		
							3.0	15.95	8.16	9.35	94.8	257.5	22.02		
							4.0	15.96	8.30	9.35	94.7	257.6	19.46		
							5.0	15.97	8.25	9.33	94.5	257.6	19.43		
							6.0	15.97	8.12	9.32	94.4	257.7	19.41		
Nelson River Upstream #3	US-3	27-Aug-19	14:05	10.8			0.3	15.73	8.78	9.46	95.4	254.5	19.20	N/A	
							1.0	15.74	N/A	9.45	95.3	254.4	19.25		
							2.0	15.75	N/A	9.44	95.3	254.6	19.60		
							3.0	15.75	N/A	9.43	95.1	254.6	19.46		
							4.0	15.77	N/A	9.41	94.9	254.5	19.55		
							5.0	15.76	N/A	9.40	94.8	254.6	19.69		
							6.0	15.76	N/A	9.39	94.8	254.6	19.52		
							7.0	15.76	N/A	9.38	94.6	254.6	19.59		
							8.0	15.77	N/A	9.37	94.5	254.5	19.21		
							9.0	15.77	N/A	9.36	94.5	254.5	19.15		

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)	Comments
Nelson River Upstream #4	US-4	27-Aug-19	13:45	9.5			0.3	15.78	*9.29*	9.42	95.1	253.6	18.99	N/A	
							1.0	15.78	*9.01*	9.41	95.0	253.6	20.08		
							2.0	15.78	*8.56*	9.40	94.9	253.7	19.73		
							3.0	15.79	*8.41*	9.39	94.8	253.7	19.49		
							4.0	15.79	*8.30*	9.38	94.7	253.6	19.59		
							5.0	15.79	*8.41*	9.37	94.6	253.6	19.43		
							6.0	15.80	*8.38*	9.36	94.5	253.6	19.94		
							7.0	15.80	*8.37*	9.35	94.4	253.6	19.80		
							8.0	15.79	*8.26*	9.34	94.3	253.6	19.97		
							9.0	15.79	*8.06*	9.34	94.2	253.7	19.67		
							10.0	15.79	*8.05*	9.34	94.1	253.7	19.73		
Nelson River Upstream #5	US-5	27-Aug-19	14:20	9.3			0.3	15.78	N/A	9.45	95.3	255.2	19.35	N/A	
							1.0	15.78	N/A	9.44	95.2	255.2	19.70		
							2.0	15.77	N/A	9.43	95.1	255.3	19.63		
							3.0	15.79	N/A	9.41	95.0	255.6	19.68		
							4.0	15.77	N/A	9.41	94.9	255.4	19.66		
							5.0	15.77	N/A	9.40	94.9	255.4	19.59		
							6.0	15.83	N/A	9.38	94.7	255.8	19.50		
							7.0	15.82	N/A	9.36	94.5	255.8	19.73		
							8.0	15.84	N/A	9.36	94.5	255.8	19.85		
							9.0	15.84	N/A	9.35	94.4	255.8	19.91		
Stephens Lake - Near-field #1	NF-1	31-Aug-19	11:28	19.3			0.3	13.26	8.29	10.65	101.7	267.5	17.28	0.58	
							1.0	13.25	8.33	10.60	101.2	267.6	17.19		
							2.0	13.19	8.35	10.57	100.9	267.6	18.07		
							3.0	13.19	8.35	10.56	100.8	267.5	18.42		
							4.0	13.19	8.34	10.55	100.7	267.5	18.49		
							5.0	13.18	8.33	10.53	100.5	267.5	18.69		
							6.0	13.18	8.32	10.53	100.4	267.6	18.32		
							7.0	13.18	8.31	10.51	100.3	267.6	18.37		
							8.0	13.18	8.30	10.50	100.1	267.6	18.10		
							9.0	13.18	8.30	10.48	100.0	267.5	17.73		
							10.0	13.18	8.29	10.47	99.9	267.6	18.23		
							11.0	13.18	8.28	10.47	99.8	267.5	18.62		
							12.0	13.18	8.28	10.46	99.7	267.6	17.54		
							13.0	13.18	8.27	10.44	99.6	267.6	18.05		
							14.0	13.18	8.26	10.43	99.5	267.7	18.27		
							15.0	13.18	8.25	10.42	99.4	267.6	18.51		
							16.0	13.18	8.23	10.41	99.3	267.7	18.40		
							17.0	13.18	8.21	10.39	99.1	267.8	19.90		
							18.0	13.18	8.20	10.38	99.1	267.8	18.17		

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)	Comments
Stephens Lake - Near-field #2	NF-2	31-Aug-19	12:10	11.3			0.3	13.39	8.26	10.67	102.6	268.0	16.89	0.58	
							1.0	13.33	8.30	10.65	102.1	267.7	17.77		
							2.0	13.31	8.31	10.59	101.3	267.5	18.01		
							3.0	13.24	8.29	10.54	100.7	267.1	17.55		
							4.0	13.23	8.26	10.51	100.4	267.0	18.08		
							5.0	13.22	8.23	10.50	100.2	266.9	17.93		
							6.0	13.22	8.21	10.49	100.1	266.8	20.36		
							7.0	13.22	8.18	10.48	100.0	266.9	18.73		
							8.0	13.22	8.17	10.46	99.9	267.0	18.83		
							9.0	13.22	8.15	10.44	99.7	266.9	18.39		
							10.0	13.22	8.14	10.44	99.6	267.0	18.34		
Stephens Lake - Near-field #3	NF-3	31-Aug-19	11:45	19.0			0.3	13.36	8.37	10.65	102.0	267.3	17.07	0.58	
							1.0	13.31	8.39	10.59	101.1	267.3	17.84		
							2.0	13.23	8.38	10.58	101.0	267.3	18.00		
							3.0	13.21	8.31	10.55	100.7	267.3	17.73		
							4.0	13.20	8.30	10.55	100.7	267.2	17.99		
							5.0	13.20	8.27	10.53	100.5	267.3	18.14		
							6.0	13.20	8.21	10.52	100.4	267.4	17.99		
							7.0	13.20	8.20	10.50	100.2	267.3	17.77		
							8.0	13.20	8.19	10.50	100.1	267.3	18.10		
							9.0	13.20	8.18	10.49	100.1	267.4	17.77		
							10.0	13.20	8.17	10.47	99.9	267.3	17.91		
							11.0	13.20	8.16	10.47	99.9	267.4	17.96		
							12.0	13.20	8.15	10.46	99.8	267.4	18.17		
							13.0	13.20	8.14	10.45	99.6	267.5	17.94		
							14.0	13.20	8.12	10.43	99.5	267.4	18.12		
							15.0	13.20	8.11	10.42	99.4	267.6	18.49		
							16.0	13.20	8.10	10.41	99.3	267.6	18.06		
							17.0	13.20	8.08	10.40	99.2	267.5	18.65		
							18.0	13.20	8.06	10.38	99.0	267.5	18.90		
Stephens Lake - Near-field #4	NF-4	31-Aug-19	12:25	6.2			0.3	13.63	8.22	10.65	102.6	267.4	16.82	0.58	
							1.0	13.31	8.28	10.59	101.3	266.4	17.19		
							2.0	13.33	8.26	10.56	101.2	266.4	17.77		
							3.0	13.27	8.21	10.52	100.5	266.2	17.83		
							4.0	13.25	8.15	10.49	100.2	266.3	17.93		
							5.0	13.25	8.12	10.45	99.8	266.0	18.38		

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)	Comments
Stephens Lake - Near-field #5	NF-5	31-Aug-19	11:05	18.4			0.3	13.31	8.63	10.65	101.5	268.5	17.43	0.58	
							1.0	13.25	8.57	10.62	101.4	268.6	17.56		
							2.0	13.22	8.55	10.59	101.0	268.3	17.77		
							3.0	13.18	8.54	10.57	100.8	268.2	17.71		
							4.0	13.17	8.51	10.55	100.6	268.1	18.81		
							5.0	13.14	8.48	10.52	100.3	268.2	18.34		
							6.0	13.14	8.45	10.51	100.2	268.2	18.24		
							7.0	13.14	8.44	10.50	100.0	268.1	16.75		
							8.0	13.13	8.42	10.49	99.9	268.2	19.16		
							9.0	13.12	8.41	10.47	99.8	268.2	18.57		
							10.0	13.11	8.40	10.46	99.6	268.1	18.04		
							11.0	13.11	8.39	10.45	99.5	268.1	17.86		
							12.0	13.11	8.39	10.43	99.3	268.0	18.73		
							13.0	13.09	8.37	10.40	99.0	267.7	18.75		
							14.0	13.09	8.36	10.39	98.9	267.8	18.34		
							15.0	13.08	8.36	10.38	98.8	267.8	20.65		
							16.0	13.08	8.35	10.36	98.6	267.7	19.11		
							17.0	13.08	8.34	10.35	98.5	267.8	19.23		
							18.0	*13.08*	*8.33*	*10.30*	*98.1*	*267.8*	*85.67*		*Hit bottom*
Stephens Lake - Far-field #1	FF-1	31-Aug-19	8:37	22.7			0.3	13.71	8.16	9.96	96.1	255.7	16.99	0.55	
							1.0	13.71	8.20	9.95	96.1	255.7	17.18		
							2.0	13.71	8.23	9.95	96.0	255.6	17.36		
							3.0	13.71	8.30	9.93	95.9	255.6	17.62		
							4.0	13.71	8.27	9.92	95.7	255.6	17.21		
							5.0	13.71	8.23	9.90	95.6	255.6	17.46		
							6.0	13.71	8.20	9.89	95.5	255.6	16.94		
							7.0	13.71	8.22	9.88	95.4	255.6	18.65		
							8.0	13.71	8.22	9.87	95.2	255.4	18.43		
							9.0	13.70	8.22	9.86	95.1	255.4	18.72		
							10.0	13.70	8.22	9.85	95.0	255.5	18.85		
							11.0	13.70	8.21	9.84	94.9	255.5	18.01		
							12.0	13.71	8.21	9.83	94.8	255.5	17.99		
							13.0	13.71	8.21	9.82	94.7	255.6	18.25		
							14.0	13.71	8.21	9.81	94.7	255.5	18.23		
							15.0	13.71	8.20	9.80	94.5	255.6	17.34		
							16.0	13.71	8.20	9.79	94.5	255.6	18.20		
							17.0	13.71	8.20	9.78	94.4	255.6	20.61		
							18.0	13.71	8.19	9.77	94.2	255.6	19.26		
							19.0	13.70	8.19	9.76	94.1	255.4	19.04		
							20.0	13.70	8.18	9.74	93.9	255.4	17.65		
							21.0	13.70	8.18	9.73	93.9	255.4	19.57		
							22.0	13.70	8.17	9.72	93.8	255.4	19.25		

Table A1-1: ***In situ*** **parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).**

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Stephens Lake - Far-field #2	FF-2	31-Aug-19	9:29	15.3			0.3	N/A	N/A	N/A	N/A	N/A	N/A	0.58
							1.0	13.83	8.55	9.94	96.1	255.1	17.97	
							2.0	13.83	8.57	9.92	96.0	255.1	18.62	
							3.0	13.83	8.57	9.91	95.9	255.1	18.74	
							4.0	13.83	8.55	9.90	95.8	255.1	18.41	
							5.0	13.83	8.51	9.88	95.6	255.1	18.38	
							6.0	13.83	8.49	9.87	95.5	255.1	18.84	
							7.0	13.83	8.47	9.86	95.4	255.2	20.12	
							8.0	13.83	8.43	9.85	95.3	255.1	18.91	
							9.0	13.83	8.42	9.83	95.1	255.1	19.38	
							10.0	13.83	8.41	9.83	95.1	255.1	18.52	
							11.0	13.83	8.40	9.82	95.0	255.1	16.90	
							12.0	13.83	8.38	9.82	95.0	255.1	18.22	
							13.0	13.83	8.37	9.81	94.9	255.1	18.59	
							14.0	13.83	8.35	9.79	94.7	255.1	18.42	
Stephens Lake - Far-field #6	FF-6	31-Aug-19	10:05	16.6			0.3	13.84	8.43	9.93	96.1	255.0	18.10	0.55
							1.0	13.84	8.40	9.93	96.0	255.0	17.82	
							2.0	13.84	8.40	9.92	96.0	255.0	18.51	
							3.0	13.83	8.36	9.89	95.7	255.1	18.87	
							4.0	13.83	8.32	9.88	95.6	255.1	18.59	
							5.0	13.83	8.31	9.87	95.5	255.1	17.13	
							6.0	13.83	8.29	9.86	95.4	255.1	18.26	
							7.0	13.83	8.27	9.85	95.3	255.2	18.75	
							8.0	13.82	8.26	9.84	95.2	255.1	17.99	
							9.0	13.82	8.24	9.83	95.1	255.1	18.70	
							10.0	13.83	8.23	9.83	95.1	255.1	18.05	
							11.0	13.82	8.21	9.81	94.9	255.1	18.67	
							12.0	13.82	8.20	9.80	94.8	255.1	18.38	
							13.0	13.82	8.19	9.79	94.8	255.0	18.59	
							14.0	13.82	8.18	9.79	94.7	255.1	18.81	
							15.0	13.82	8.17	9.77	94.5	255.2	18.76	
							16.0	13.82	8.17	9.76	94.4	255.1	18.51	
Stephens Lake - Far-field #4	FF-4	31-Aug-19	9:50	15.5			0.3	13.75	8.60	10.04	96.9	253.7	18.14	0.55
							1.0	13.75	8.59	10.03	96.9	253.7	18.43	
							2.0	13.75	8.54	10.02	96.7	253.7	18.78	
							3.0	13.74	8.53	10.01	96.6	253.7	18.72	
							4.0	13.74	8.80	10.00	96.6	253.7	18.17	
							5.0	13.74	8.39	9.98	96.4	253.8	18.47	
							6.0	13.74	8.38	9.97	96.3	253.8	18.44	
							7.0	13.74	8.36	9.96	96.2	253.7	18.72	
							8.0	13.74	8.35	9.95	96.1	253.7	18.57	
							9.0	13.74	8.33	9.94	96.0	253.7	19.24	
							10.0	13.74	8.32	9.93	95.9	253.8	19.07	
							11.0	13.74	8.31	9.91	95.7	253.9	18.76	
							12.0	13.74	8.30	9.91	95.6	253.8	18.71	
							13.0	13.74	8.29	9.89	95.5	253.8	18.77	
							14.0	13.73	8.29	9.88	95.4	253.7	19.01	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Stephens Lake - Far-field #5	FF-5	31-Aug-19	9:01	11.7			0.3	13.66	8.59	9.96	95.9	255.4	17.93	0.53
							1.0	13.66	8.59	9.95	95.9	255.4	18.15	
							2.0	13.66	8.62	9.94	95.8	255.5	18.37	
							3.0	13.66	8.58	9.92	95.7	255.5	18.70	
							4.0	13.67	8.44	9.91	95.5	255.4	18.29	
							5.0	13.67	8.42	9.90	95.4	255.4	17.10	
							6.0	13.67	8.38	9.88	95.2	255.5	19.02	
							7.0	13.67	8.36	9.87	95.1	255.5	19.10	
							8.0	13.67	8.35	9.86	95.1	255.5	18.36	
							9.0	13.67	8.33	9.85	95.0	255.6	18.96	
							10.0	13.67	8.32	9.84	94.9	255.6	19.10	
							11.0	13.67	8.31	9.83	94.8	255.5	19.88	
Clark Lake #1	CL-1	15-Sep-19	9:52	11.2			0.3	13.40	8.27	10.23	98.0	243.5	14.65	0.53
							1.0	13.39	8.27	10.22	97.9	243.5	14.81	
							2.0	13.40	8.27	10.21	97.9	243.5	14.74	
							3.0	13.40	8.27	10.20	97.7	243.6	14.90	
							4.0	13.40	8.27	10.19	97.6	243.5	15.03	
							5.0	13.40	8.26	10.18	97.5	243.4	15.12	
							6.0	13.40	8.26	10.17	97.4	243.5	14.94	
							7.0	13.40	8.25	10.15	97.3	243.4	14.93	
							8.0	13.40	8.24	10.14	97.2	243.2	15.19	
							9.0	13.40	8.24	10.13	97.0	243.4	15.51	
							10.0	13.40	8.24	10.13	96.9	243.4	15.43	
Clark Lake #2	CL-2	15-Sep-19	10:42	12.4			0.3	13.37	8.28	10.24	98.1	237.5	15.70	0.45
							1.0	13.37	8.28	10.23	98.0	238.3	15.83	
							2.0	13.36	8.29	10.24	98.0	234.1	16.14	
							3.0	13.36	8.29	10.23	97.9	233.7	15.84	
							4.0	13.36	*8.02*	10.22	97.8	233.6	15.81	
							5.0	13.36	*4.62*	10.20	97.7	234.6	15.73	
							6.0	13.36	*4.34*	10.19	97.6	234.9	16.23	
							7.0	13.36	*4.81*	10.18	97.4	235.7	16.05	
							8.0	13.37	*4.90*	10.16	97.3	236.0	16.24	
							9.0	13.37	*4.82*	10.16	97.2	235.7	15.98	
							10.0	13.36	*4.94*	10.15	97.2	235.2	15.88	
							11.0	13.36	*5.11*	10.14	97.0	235.2	16.16	
							12.0	13.36	*5.22*	10.13	97.0	235.5	16.80	
Clark Lake #3	CL-3	15-Sep-19	11:00	9.1			0.3	13.43	7.40	10.23	98.2	244.3	14.49	0.48
							1.0	13.43	7.23	10.22	97.9	244.9	14.77	
							2.0	13.42	7.14	10.21	97.9	244.8	14.47	
							3.0	13.42	7.60	10.20	97.8	245.0	14.70	
							4.0	13.42	7.56	10.18	97.6	245.0	14.81	
							5.0	13.42	7.34	10.17	97.5	245.1	14.81	
							6.0	13.42	7.30	10.16	97.5	245.1	14.91	
							7.0	13.42	*6.80*	10.15	97.3	245.1	15.05	
							8.0	13.42	*6.25*	10.14	97.2	245.1	15.46	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Clark Lake #4	CL-4	15-Sep-19	10:26	7.4			0.3	13.34	8.35	10.26	98.2	232.2	16.13	0.53
							1.0	13.34	8.36	10.25	98.1	231.9	16.30	
							2.0	13.34	8.14	10.24	98.0	231.7	16.11	
							3.0	13.35	*6.99*	10.22	97.9	234.3	15.86	
							4.0	13.35	*6.61*	10.22	97.8	232.6	16.18	
							5.0	13.35	*5.90*	10.21	97.7	232.1	16.07	
							6.0	13.35	*6.38*	10.19	97.6	233.5	16.12	
							7.0	13.35	*7.04*	10.18	97.4	233.1	16.40	
Clark Lake #5	CL-5	15-Sep-19	10:12	7.4			0.3	13.33	8.36	10.26	98.1	231.4	16.16	0.50
							1.0	13.34	8.36	10.25	98.1	231.8	16.24	
							2.0	13.34	8.36	10.24	98.0	233.1	16.18	
							3.0	13.33	8.36	10.23	97.9	231.3	16.83	
							4.0	13.33	8.36	10.22	97.8	231.8	16.32	
							5.0	13.33	8.36	10.21	97.7	231.4	16.58	
							6.0	13.33	8.36	10.20	97.6	231.8	16.42	
							7.0	13.33	8.39	10.19	97.5	231.1	16.59	
Nelson River Upstream #1	US-1	16-Sep-19	13:20	10.8			0.3	13.75	8.16	10.18	98.4	240.9	15.29	0.58
							1.0	13.73	8.16	10.17	98.1	240.9	15.08	
							2.0	13.73	8.15	10.17	98.1	240.8	15.11	
							3.0	13.72	8.15	10.16	98.1	240.8	14.92	
							4.0	13.73	8.16	10.15	98.0	240.9	15.19	
							5.0	13.72	8.13	10.14	97.9	240.9	15.15	
							6.0	13.72	8.10	10.13	97.7	240.9	15.03	
							7.0	13.73	*6.98*	10.12	97.7	240.9	15.35	
							8.0	13.72	*6.58*	10.11	97.5	240.9	15.46	
							9.0	13.72	*7.01*	10.09	97.4	240.9	15.13	
							10.0	13.72	*6.96*	10.08	97.3	240.8	16.29	
Nelson River Upstream #2	US-2	16-Sep-19	13:30	4.8			0.3	13.77	8.08	10.19	98.4	241.1	15.42	0.58
							1.0	13.76	8.10	10.18	98.3	241.1	15.33	
							2.0	13.75	8.10	10.17	98.2	241.1	15.37	
							3.0	13.75	8.10	10.16	98.1	241.2	15.08	
							4.0	13.75	8.09	10.15	98.0	241.2	15.01	
Nelson River Upstream #3	US-3	16-Sep-19	14:30	9.1			0.3	13.88	8.14	10.21	98.9	240.5	15.45	0.53
							1.0	13.88	8.15	10.21	98.8	240.5	15.50	
							2.0	13.88	8.13	10.20	98.8	240.6	15.31	
							3.0	13.86	8.12	10.19	98.6	240.6	15.31	
							4.0	13.87	8.14	10.18	98.6	240.6	15.35	
							5.0	13.88	8.13	10.18	98.6	240.6	15.45	
							6.0	13.90	8.10	10.17	98.5	240.5	15.16	
							7.0	13.90	*6.98*	10.16	98.4	240.6	15.14	
							8.0	13.88	*7.13*	10.13	98.1	240.6	15.42	
							9.0	13.86	*7.24*	10.12	98.0	240.5	15.14	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Nelson River Upstream #4	US-4	16-Sep-19	14:11	9.7			0.3	13.80	8.11	10.19	98.5	240.5	15.42	0.55
							1.0	13.79	8.11	10.18	98.4	240.4	15.05	
							2.0	13.78	8.11	10.17	98.3	240.4	15.10	
							3.0	13.78	8.10	10.16	98.2	240.4	15.24	
							4.0	13.78	8.10	10.15	98.1	240.4	14.98	
							5.0	13.77	8.04	10.14	98.0	240.4	15.00	
							6.0	13.77	7.93	10.13	97.8	240.4	14.99	
							7.0	13.78	*6.90*	10.12	97.8	240.4	15.31	
							8.0	13.78	*6.42*	10.00	97.7	240.5	15.59	
							9.0	13.77	*7.07*	10.09	97.5	240.4	15.30	
Nelson River Upstream #5	US-5	16-Sep-19	14:46	8.8			0.3	13.90	8.16	10.22	99.0	240.4	15.37	0.53
							1.0	13.89	8.17	10.21	99.0	240.4	15.48	
							2.0	13.87	8.13	10.20	98.8	240.4	15.36	
							3.0	13.83	8.12	10.18	98.5	240.3	15.29	
							4.0	13.82	8.08	10.17	98.4	240.3	15.27	
							5.0	13.82	8.09	10.16	98.2	240.3	15.12	
							6.0	13.82	8.06	10.14	98.1	240.4	15.01	
							7.0	13.81	*7.56*	10.13	97.9	240.4	15.03	
							8.0	13.81	*7.24*	10.12	97.9	240.3	15.11	
Stephens Lake - Near-field #1	NF-1	17-Sep-19	9:40	19.4			0.3	13.94	8.19	10.46	101.4	241.4	15.47	0.48
							1.0	13.94	8.19	10.46	101.4	241.4	15.02	
							2.0	13.93	8.17	10.44	101.2	241.4	15.66	
							3.0	13.92	8.18	10.43	101.1	241.4	15.74	
							4.0	13.91	8.18	10.40	100.8	241.5	15.29	
							5.0	13.91	8.18	10.39	100.7	241.5	15.44	
							6.0	13.91	8.19	10.39	100.7	241.5	15.48	
							7.0	13.91	8.19	10.37	100.5	241.5	15.72	
							8.0	13.91	*7.46*	10.36	100.4	241.5	15.71	
							9.0	13.91	7.60	10.35	100.3	241.5	15.68	
							10.0	13.90	7.71	10.34	100.2	241.6	15.89	
							11.0	13.90	7.77	10.33	100.1	241.6	15.76	
							12.0	13.90	7.81	10.32	100.0	241.7	15.96	
							13.0	13.90	7.88	10.31	99.9	241.8	14.80	
							14.0	13.90	7.90	10.29	99.7	241.8	15.94	
							15.0	13.90	7.91	10.28	99.6	241.9	16.12	
							16.0	13.90	7.91	10.27	99.5	241.8	15.94	
							17.0	13.90	7.92	10.26	99.4	241.9	16.20	
							18.0	13.90	7.91	10.28	99.4	241.9	18.12	
Stephens Lake - Near-field #2	NF-2	17-Sep-19	10:32	10.4			0.3	13.99	8.20	10.50	101.9	242.6	15.29	0.48
							1.0	13.95	8.20	10.48	101.7	242.7	14.83	
							2.0	13.94	7.67	10.47	101.5	242.6	14.44	
							3.0	13.92	7.75	10.45	101.3	242.7	14.48	
							4.0	13.91	7.76	10.44	101.2	242.6	14.43	
							5.0	13.89	7.82	10.41	100.9	242.7	14.70	
							6.0	13.88	7.85	10.40	100.7	242.8	14.65	
							7.0	13.88	7.86	10.39	100.6	242.9	14.67	
							8.0	13.88	7.88	10.38	100.5	242.8	14.88	
							9.0	13.88	7.89	10.36	100.3	242.8	15.66	
							10.0	13.88	7.90	10.34	100.2	242.7	16.19	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Stephens Lake - Near-field #3	NF-3	17-Sep-19	10:04	18.4			0.3	13.95	8.19	10.46	101.5	241.2	14.71	0.48
							1.0	13.95	8.20	10.46	101.4	241.2	14.79	
							2.0	13.94	8.20	10.44	101.2	241.3	15.00	
							3.0	13.93	8.19	10.43	101.1	241.2	14.90	
							4.0	13.92	8.18	10.41	100.9	241.2	15.04	
							5.0	13.92	8.18	10.40	100.8	241.2	14.76	
							6.0	13.92	8.18	10.39	100.7	241.3	14.30	
							7.0	13.89	8.18	10.37	100.5	241.9	14.96	
							8.0	13.91	8.18	10.37	100.5	241.6	15.26	
							9.0	13.89	8.18	10.35	100.3	241.9	15.18	
							10.0	13.89	8.19	10.34	100.2	241.9	15.19	
							11.0	13.89	8.19	10.33	100.1	241.9	15.40	
							12.0	13.89	8.19	10.32	100.0	242.0	15.13	
							13.0	13.89	8.19	10.31	99.9	242.1	15.34	
							14.0	13.89	8.19	10.29	99.7	242.2	14.69	
							15.0	13.89	8.19	10.29	99.6	242.1	15.66	
							16.0	13.89	8.19	10.27	99.5	242.1	15.53	
							17.0	13.89	8.19	10.26	99.4	242.0	14.30	
							18.0	13.89	8.19	10.25	99.3	242.0	16.17	
Stephens Lake - Near-field #4	NF-4	17-Sep-19	10:52	4.8			0.3	14.01	8.18	10.53	102.2	243.3	14.55	0.53
							1.0	14.02	8.18	10.52	102.2	243.4	15.02	
							2.0	13.98	8.17	10.48	101.9	243.3	15.65	
							3.0	13.90	8.16	10.45	101.6	243.3	15.78	
							4.0	13.90	8.17	10.43	101.1	243.3	14.96	
Stephens Lake - Near-field #5	NF-5	17-Sep-19	9:18	18.1			0.3	13.88	8.27	10.45	101.2	241.7	15.87	0.53
							1.0	13.88	8.27	10.44	101.1	241.8	14.99	
							2.0	13.87	8.27	10.42	100.9	241.8	15.93	
							3.0	13.88	8.28	10.41	100.8	241.7	15.94	
							4.0	13.85	8.32	10.39	100.6	241.9	15.84	
							5.0	13.83	8.33	10.38	100.4	242.0	15.61	
							6.0	13.82	8.32	10.37	100.3	242.1	15.73	
							7.0	13.82	7.98	10.35	100.1	242.2	15.18	
							8.0	13.80	*7.00*	10.35	100.0	242.3	16.13	
							9.0	13.81	*6.62*	10.34	100.0	242.2	15.51	
							10.0	13.80	*6.98*	10.32	99.8	242.4	15.60	
							11.0	13.76	*7.01*	10.32	99.6	242.8	15.39	
							12.0	13.74	*7.33*	10.31	99.5	242.8	15.42	
							13.0	13.73	*7.14*	10.30	99.4	243.0	15.77	
							14.0	13.69	*7.18*	10.28	99.1	243.3	14.92	
							15.0	13.66	*7.20*	10.25	98.8	243.5	15.12	
							16.0	13.67	*7.20*	10.25	98.7	243.5	15.32	
							17.0	13.67	*7.21*	10.24	98.7	243.4	15.78	
							18.0	13.67	*7.20*	10.23	98.6	243.5	15.34	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Stephens Lake - Far-field #1	FF-1	18-Sep-19	7:35	20.3			0.3	13.70	8.22	10.27	99.1	247.8	12.01	0.58
							1.0	13.70	8.22	10.27	99.1	247.8	12.36	
							2.0	13.69	8.22	10.26	98.9	247.9	12.59	
							3.0	13.67	8.22	10.24	98.7	248.0	12.59	
							4.0	13.66	8.22	10.24	98.6	248.0	12.26	
							5.0	13.66	8.23	10.22	98.5	247.9	12.28	
							6.0	13.66	8.23	10.21	98.5	247.9	12.83	
							7.0	13.65	8.23	10.21	98.3	247.9	12.75	
							8.0	13.65	8.23	10.20	98.3	248.0	12.15	
							9.0	13.65	8.23	10.19	98.2	248.0	12.29	
							10.0	13.64	8.23	10.18	98.0	248.0	13.13	
							11.0	13.64	8.23	10.16	97.9	248.0	12.45	
							12.0	13.63	8.23	10.16	97.8	248.2	12.35	
							13.0	13.59	8.23	10.13	97.5	248.5	12.34	
							14.0	13.32	8.22	10.09	96.4	249.7	12.71	
							15.0	13.12	8.21	10.05	95.8	250.4	12.31	
							16.0	13.13	8.21	10.02	95.5	250.8	12.59	
							17.0	13.10	8.21	9.96	94.8	251.4	12.42	
							18.0	12.98	8.20	9.91	94.1	251.7	12.92	
							19.0	12.94	8.20	9.88	93.8	251.9	13.67	
							20.0	12.89	8.19	9.81	92.9	252.0	17.15	
Stephens Lake - Far-field #2	FF-2	18-Sep-19	8:17	14.8			0.3	13.93	8.24	10.33	100.1	245.6	12.83	0.58
							1.0	13.91	8.23	10.31	100.0	245.6	13.13	
							2.0	13.90	8.23	10.31	99.9	245.7	13.15	
							3.0	13.88	8.23	10.28	99.8	245.8	13.30	
							4.0	13.88	8.23	10.26	99.4	245.8	13.21	
							5.0	13.87	8.23	10.25	99.2	245.8	13.41	
							6.0	13.86	8.23	10.23	99.0	246.0	13.58	
							7.0	13.84	8.23	10.22	98.9	246.0	13.34	
							8.0	13.85	8.23	10.21	98.8	246.0	13.52	
							9.0	13.84	8.22	10.19	98.6	246.1	13.98	
							10.0	13.83	8.22	10.18	98.5	246.2	13.77	
							11.0	13.82	8.22	10.17	98.4	246.2	13.62	
							12.0	13.77	8.22	10.16	98.0	246.9	13.34	
							13.0	13.63	8.22	10.13	97.6	247.7	14.02	
							14.0	13.58	8.21	10.07	96.9	247.9	15.21	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Depth (m)
Stephens Lake - Far-field #3	FF-3	18-Sep-19	8:53	25.3			0.3	14.28	7.99	10.34	101.1	247.4	12.49	0.58
							1.0	14.25	8.03	10.33	100.8	247.2	12.98	
							2.0	14.18	8.03	10.30	100.4	246.8	12.50	
							3.0	14.14	8.05	10.29	100.2	246.7	13.22	
							4.0	14.03	8.06	10.28	99.8	245.8	12.75	
							5.0	14.02	8.06	10.27	99.7	245.7	12.88	
							6.0	14.00	8.06	10.26	99.6	245.8	12.94	
							7.0	13.96	8.06	10.25	99.4	245.8	13.18	
							8.0	13.94	8.06	10.24	99.3	246.0	13.55	
							9.0	13.90	8.06	10.23	99.1	246.0	13.94	
							10.0	13.88	8.06	10.22	98.9	246.0	13.19	
							11.0	13.81	8.05	10.21	98.6	245.8	13.41	
							12.0	13.77	8.06	10.19	98.5	245.8	13.43	
							13.0	13.73	8.06	10.19	98.3	245.9	13.42	
							14.0	13.71	8.05	10.18	98.2	245.8	13.70	
							15.0	13.69	8.05	10.16	97.9	245.8	13.99	
							16.0	13.63	8.05	10.13	97.5	246.0	14.17	
							17.0	13.58	8.04	10.10	97.1	246.3	14.66	
							18.0	13.54	8.04	10.08	96.9	245.5	14.14	
							19.0	13.53	8.05	10.07	96.8	246.5	14.80	
							20.0	13.52	8.05	10.06	96.6	246.6	14.66	
							21.0	13.52	8.05	10.03	96.4	246.6	14.21	
							22.0	13.52	8.05	10.02	96.3	246.7	15.05	
							23.0	13.51	8.05	10.01	96.2	246.6	15.04	
							24.0	13.51	8.05	10.00	96.1	246.6	16.11	
Stephens Lake - Far-field #4	FF-4	18-Sep-19	8:36	12.5			0.3	13.98	7.97	10.33	100.3	245.4	13.27	0.58
							1.0	13.99	8.19	10.33	100.3	245.4	13.65	
							2.0	13.96	8.19	10.31	100.0	245.4	14.46	
							3.0	13.96	8.20	10.28	99.8	245.3	13.82	
							4.0	13.94	8.20	10.27	99.5	245.5	14.06	
							5.0	13.93	8.19	10.25	99.4	245.6	13.83	
							6.0	13.92	8.19	10.24	99.2	245.5	14.17	
							7.0	13.91	8.19	10.23	99.1	245.7	13.88	
							8.0	13.85	8.18	10.21	98.8	246.0	13.69	
							9.0	13.84	8.18	10.19	98.6	246.0	13.56	
							10.0	13.78	8.18	10.18	98.4	246.3	13.69	
							11.0	13.72	8.18	10.16	98.0	246.5	14.21	
Stephens Lake - Far-field #5	FF-5	18-Sep-19	8:01	11.4			0.1	13.76	8.22	10.30	99.4	247.1	12.39	0.58
							1.0	13.74	8.22	10.28	99.3	247.3	12.48	
							2.0	13.73	8.21	10.27	99.1	247.3	12.44	
							3.0	13.71	8.22	10.26	99.0	247.6	12.64	
							4.0	13.69	8.22	10.26	98.9	247.9	12.50	
							5.0	13.67	8.22	10.25	98.8	247.9	12.74	
							6.0	13.65	8.24	10.25	98.7	248.0	12.45	
							7.0	13.65	8.24	10.24	98.7	248.0	12.75	
							8.0	13.65	8.23	10.23	98.6	248.1	13.13	
							9.0	13.63	8.23	10.21	98.3	248.2	13.13	
							10.0	13.62	8.23	10.18	98.0	248.2	14.07	

Table A1-2: Routine water chemistry parameters measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in bold exceed the benchmark.

					Alkalinity				Nitrogen						Phosphorus	
Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Total (CaCO3) (mg/L)	Bicarbonate (HCO_3) (mg/L)	Carbonate (CO_3) (mg/L)	Hydroxide (OH) (mg/L)	Ammonia (mg/L N)	Nitrate/ nitrite (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total N[1] (mg/L)	Dissolved P (mg/L)	Total P (mg/L)
Detection Limit 2019					**1.0**	**1.2**	**0.60**	**0.34**	**0.010**	**0.0051**	**0.0050**	**0.0010**	**0.20**		**0.0010**	**0.0010**
Split Lake #10	SPL-10	L2251830-1	31-Mar-19	10:29	94.7	116	<0.60	<0.34	0.019	0.0658	0.0658	<0.0010	0.35	0.42	0.0129	0.0247
Split Lake #11	SPL-11	L2251830-2	31-Mar-19	11:15	94.1	115	<0.60	<0.34	0.021	0.0641	0.0641	<0.0010	0.36	0.42	0.0128	0.0238
Split Lake #12	SPL-12	L2251830-3	31-Mar-19	13:30	105	128	<0.60	<0.34	<0.010	0.0628	0.0628	<0.0010	0.41	0.47	0.0115	0.0225
Split Lake #13	SPL-13	L2251830-4	31-Mar-19	12:45	92.8	113	<0.60	<0.34	<0.010	0.0634	0.0634	<0.0010	0.38	0.44	0.0115	0.0238
Split Lake #14	SPL-14	L2251830-5	31-Mar-19	12:10	113	138	<0.60	<0.34	<0.010	0.0614	0.0614	<0.0010	0.41	0.47	0.0128	0.0238
Nelson River Upstream #6	US-6	L2254087-8	3-Apr-19	12:10	111	136	<0.60	<0.34	0.023	0.0648	0.0648	<0.0010	0.39	0.45	0.0133	0.0240
Nelson River Upstream #7	US-7	L2254087-9	3-Apr-19	10:45	113	137	<0.60	<0.34	0.036	0.0605	0.0605	<0.0010	0.71	0.77	0.0145	0.0269
Nelson River Upstream #8	US-8	L2254087-10	3-Apr-19	11:30	111	136	<0.60	<0.34	0.011	0.0615	0.0615	<0.0010	0.34	0.40	0.0127	0.0240
Nelson River Upstream #9	US-9	L2254087-11	3-Apr-19	8:40	107	131	<0.60	<0.34	0.015	0.0625	0.0625	<0.0010	0.39	0.45	0.0178	0.0277
Nelson River Upstream #10	US-10	L2254087-12	3-Apr-19	9:45	110	135	<0.60	<0.34	0.012	0.0646	0.0646	<0.0010	0.37	0.43	0.0138	0.0245
Stephens Lake - Near-field #1	NF-1	L2254087-1	3-Apr-19	13:15	110	134	<0.60	<0.34	0.013	0.0621	0.0621	<0.0010	0.39	0.45	0.0130	0.0243
Stephens Lake - Near-field #2	NF-2	L2254087-2	3-Apr-19	16:50	110	134	<0.60	<0.34	<0.010	0.0626	0.0626	<0.0010	0.37	0.43	0.0130	0.0231
Stephens Lake - Near-field #3	NF-3	L2254087-3	3-Apr-19	14:10	110	134	<0.60	<0.34	<0.010	0.0632	0.0632	<0.0010	0.35	0.41	0.0134	0.0244
Stephens Lake - Near-field #4	NF-4	L2254087-4	3-Apr-19	16:05	111	136	<0.60	<0.34	0.013	0.0624	0.0624	<0.0010	0.35	0.41	0.0128	0.0236
Stephens Lake - Near-field #5	NF-5	L2254087-5	3-Apr-19	15:00	110	134	<0.60	<0.34	0.016	0.0632	0.0632	<0.0010	0.34	0.40	0.0118	0.0246
Stephens Lake - Far-field #1	FF-1	L2254658-1,-6,-7	5-Apr-19	10:15	105	128	<0.60	<0.34	<0.010	0.0655	0.0655	<0.0010	0.42	0.49	0.0140	0.0261
Stephens Lake - Far-field #2	FF-2	L2254658-2	5-Apr-19	11:55	105	128	<0.60	<0.34	0.039	0.0615	0.0615	<0.0010	0.40	0.46	0.0128	0.0258
Stephens Lake - Far-field #3	FF-3	L2254658-3	5-Apr-19	13:18	104	127	<0.60	<0.34	0.011	0.0627	0.0627	<0.0010	0.36	0.42	0.0137	0.0259
Stephens Lake - Far-field #4	FF-4	L2254658-4	5-Apr-19	12:30	104	127	<0.60	<0.34	<0.010	0.0633	0.0633	<0.0010	0.37	0.43	0.0127	0.0237
Stephens Lake - Far-field #5	FF-5	L2254658-5	5-Apr-19	11:15	105	128	<0.60	<0.34	<0.010	0.0631	0.0631	<0.0010	0.34	0.40	0.0137	0.0244
Clark Lake #1	CL-1	L2297681-1	24-Jun-19	9:32	96.3	117	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.37	0.37	0.0109	0.0304
Clark Lake #2	CL-2	L2297681-2	24-Jun-19	10:02	94.8	116	<0.60	<0.34	0.018	0.0085	0.0085	<0.0010	0.43	0.44	0.0105	0.0294
Clark Lake #3	CL-3	L2297681-3	24-Jun-19	10:24	96.1	117	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.35	0.35	0.0110	0.0300
Clark Lake #4	CL-4	L2297681-4	24-Jun-19	10:42	94.9	116	<0.60	<0.34	0.011	<0.0051	<0.0050	<0.0010	0.38	0.38	0.0122	0.0292
Clark Lake #5	CL-5	L2297681-5	24-Jun-19	10:55	93.6	114	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.46	0.46	0.0107	0.0324
Nelson River Upstream #1	US-1	L2299234-1	25-Jun-19	11:25	94.8	116	<0.60	<0.34	0.026	<0.0051	<0.0050	<0.0010	0.29	0.29	0.0094	0.0304
Nelson River Upstream #2	US-2	L2299234-2,-6,-7	25-Jun-19	11:55	96.5	117	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.32	0.33	0.0105	0.0302
Nelson River Upstream #3	US-3	L2299234-3	25-Jun-19	12:20	95.5	117	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.26	0.26	0.0095	0.0324
Nelson River Upstream #4	US-4	L2299234-4	25-Jun-19	12:48	96.6	118	<0.60	<0.34	0.013	<0.0051	<0.0050	<0.0010	0.27	0.27	0.0087	0.0326
Nelson River Upstream #5	US-5	L2299234-5	25-Jun-19	13:05	97.0	118	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.27	0.27	0.0091	0.0305
Stephens Lake - Near-field #1	NF-1	L2299712-8	26-Jun-19	11:49	96.6	118	<0.60	<0.34	0.036	<0.0051	<0.0050	<0.0010	0.40	0.40	0.0107	0.0256
Stephens Lake - Near-field #2	NF-2	L2299712-9	26-Jun-19	12:42	95.9	117	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.35	0.35	0.0305	0.0306
Stephens Lake - Near-field #3	NF-3	L2299712-10	26-Jun-19	12:13	95.7	117	<0.60	<0.34	0.018	<0.0051	<0.0050	<0.0010	0.34	0.34	0.0106	0.0318
Stephens Lake - Near-field #4	NF-4	L2299712-11	26-Jun-19	13:00	92.8	113	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.37	0.37	0.0092	0.0314
Stephens Lake - Near-field #5	NF-5	L2299712-12	26-Jun-19	11:25	93.2	114	<0.60	<0.34	0.079	<0.0051	<0.0050	<0.0010	0.36	0.36	0.0117	0.0278
Stephens Lake - Far-field #1	FF-1	L2299712-1	26-Jun-19	8:23	98.4	120	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.36	0.36	0.0105	0.0236
Stephens Lake - Far-field #2	FF-2	L2299712-2	26-Jun-19	9:10	94.2	115	<0.60	<0.34	0.038	<0.0051	<0.0050	<0.0010	0.41	0.41	0.0103	0.0243
Stephens Lake - Far-field #3	FF-3	L2299712-3	26-Jun-19	9:55	93.8	114	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.35	0.35	0.0097	0.0270
Stephens Lake - Far-field #4	FF-4	L2299712-4	26-Jun-19	9:35	93.7	114	<0.60	<0.34	0.014	<0.0051	<0.0050	<0.0010	0.39	0.39	0.0100	0.0255
Stephens Lake - Far-field #5	FF-5	L2299712-5	26-Jun-19	8:50	92.7	113	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.30	0.30	0.0101	0.0274

Table A1-2: Routine water chemistry parameters measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in bold exceed the benchmark (continued).

					Alkalinity				Nitrogen						Phosphorus	
Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Total (CaCO3) (mg/L)	Bicarbonate (HCO_3) (mg/L)	Carbonate (CO_3) (mg/L)	Hydroxide (OH) (mg/L)	Ammonia (mg/L N)	Nitrate/ nitrite (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total N[1] (mg/L)	Dissolved P (mg/L)	Total P (mg/L)
Detection Limit 2019					**1.0**	**1.2**	**0.60**	**0.34**	**0.010**	**0.0051**	**0.0050**	**0.0010**	**0.20**		**0.0010**	**0.0010**
Clark Lake #1	CL-1	L2314002-1	21-Jul-19	10:25	97.1	118	<0.60	<0.34	<0.010	0.0059	0.0059	<0.0010	0.36	0.37	0.0141	0.0369
Clark Lake #2	CL-2	L2314002-2	21-Jul-19	10:48	98.9	121	<0.60	<0.34	0.011	0.0058	0.0058	<0.0010	0.36	0.37	0.0145	0.0346
Clark Lake #3	CL-3	L2314002-3	21-Jul-19	11:05	99.9	122	<0.60	<0.34	0.019	0.0058	0.0058	<0.0010	0.36	0.37	0.0133	0.0290
Clark Lake #4	CL-4	L2314002-4	21-Jul-19	11:45	100	122	<0.60	<0.34	0.018	0.0061	0.0061	<0.0010	0.44	0.45	0.0146	0.0362
Clark Lake #5	CL-5	L2314002-5	21-Jul-19	11:25	94.5	115	<0.60	<0.34	0.010	0.0062	0.0062	<0.0010	0.35	0.36	0.0143	0.0372
Nelson River Upstream #1	US-1	L2314964-1	22-Jul-19	11:30	100	122	<0.60	<0.34	0.018	0.0065	0.0065	<0.0010	0.38	0.39	0.0146	0.0380
Nelson River Upstream #2	US-2	L2314964-2	22-Jul-19	11:51	104	127	<0.60	<0.34	0.027	0.0059	0.0059	<0.0010	0.39	0.40	0.0141	0.0320
Nelson River Upstream #3	US-3	L2314964-3	22-Jul-19	12:45	100	122	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.37	0.37	0.0147	0.0368
Nelson River Upstream #4	US-4	L2314964-4,-6,-7	22-Jul-19	12:15	103	125	<0.60	<0.34	0.012	<0.0051	<0.0050	<0.0010	0.42	0.42	0.0150	0.0362
Nelson River Upstream #5	US-5	L2314964-5	22-Jul-19	13:05	105	128	<0.60	<0.34	<0.010	0.0068	0.0068	<0.0010	0.39	0.40	0.0153	0.0385
Stephens Lake - Near-field #1	NF-1	L2315689-1	23-Jul-19	13:10	104	127	<0.60	<0.34	0.026	<0.0051	<0.0050	<0.0010	0.37	0.37	0.0144	0.0287
Stephens Lake - Near-field #2	NF-2	L2315689-2	23-Jul-19	14:00	104	127	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.37	0.37	0.0139	0.0328
Stephens Lake - Near-field #3	NF-3	L2315689-3	23-Jul-19	13:35	104	127	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.43	0.43	0.0132	0.0262
Stephens Lake - Near-field #4	NF-4	L2315689-4	23-Jul-19	14:25	104	127	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.42	0.42	0.0189	0.0303
Stephens Lake - Near-field #5	NF-5	L2315689-5	23-Jul-19	12:35	104	126	<0.60	<0.34	0.033	<0.0051	<0.0050	<0.0010	0.43	0.43	0.0145	0.0315
Stephens Lake - Far-field #1	FF-1	L2315689-6	23-Jul-19	9:00	103	126	<0.60	<0.34	0.018	<0.0051	<0.0050	<0.0010	0.36	0.36	0.0157	0.0272
Stephens Lake - Far-field #2	FF-2	L2315689-7	23-Jul-19	9:50	102	125	<0.60	<0.34	0.013	<0.0051	<0.0050	<0.0010	0.37	0.37	0.0141	0.0275
Stephens Lake - Far-field #3	FF-3	L2315689-8	23-Jul-19	10:50	103	125	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.38	0.38	0.0145	0.0329
Stephens Lake - Far-field #4	FF-4	L2315689-9	23-Jul-19	10:15	103	125	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.35	0.35	0.0135	0.0308
Stephens Lake - Far-field #5	FF-5	L2315689-10	23-Jul-19	9:30	102	125	<0.60	<0.34	0.011	<0.0051	<0.0050	<0.0010	0.36	0.36	0.0138	0.0298
Clark Lake #1	CL-1	L2335547-1	25-Aug-19	11:15	105	128	<0.60	<0.34	0.015	<0.0051	<0.0050	<0.0010	0.48	0.48	0.0159	0.0368
Clark Lake #2	CL-2	L2335547-2	25-Aug-19	10:56	105	128	<0.60	<0.34	0.015	<0.0051	<0.0050	<0.0010	0.47	0.47	0.0171	0.0408
Clark Lake #3	CL-3	L2335547-3	25-Aug-19	11:37	105	128	<0.60	<0.34	0.014	0.0145	0.0094	0.0051	0.39	0.40	0.0157	0.0334
Clark Lake #4	CL-4	L2335547-4	25-Aug-19	10:20	105	128	<0.60	<0.34	0.015	<0.0051	<0.0050	<0.0010	0.46	0.46	0.0187	0.0340
Clark Lake #5	CL-5	L2335547-5	25-Aug-19	10:45	99.3	121	<0.60	<0.34	0.013	<0.0051	<0.0050	<0.0010	0.35	0.35	0.0195	0.0355
Nelson River Upstream #1	US-1	L2338353-1	27-Aug-19	12:55	105	127	<0.60	<0.34	0.021	0.0168	0.0168	<0.0010	0.35	0.37	0.0202	0.0392
Nelson River Upstream #2	US-2	L2338353-2,-6,-7	27-Aug-19	13:15	103	125	<0.60	<0.34	0.023	0.0185	0.0185	<0.0010	0.34	0.36	0.0193	0.0396
Nelson River Upstream #3	US-3	L2338353-3	27-Aug-19	14:05	98.7	120	<0.60	<0.34	<0.010	0.0179	0.0179	<0.0010	0.37	0.39	0.0206	0.0399
Nelson River Upstream #4	US-4	L2338353-4	27-Aug-19	13:45	99.5	121	<0.60	<0.34	0.029	0.0174	0.0174	<0.0010	0.31	0.33	0.0185	0.0391
Nelson River Upstream #5	US-5	L2338353-5	27-Aug-19	14:20	104	127	<0.60	<0.34	0.029	0.0182	0.0182	<0.0010	0.40	0.42	0.0196	0.0402
Stephens Lake - Near-field #1	NF-1	L2339792-8	31-Aug-19	11:28	107	130	<0.60	<0.34	0.025	0.0234	0.0234	<0.0010	0.43	0.45	0.0198	0.0394
Stephens Lake - Near-field #2	NF-2	L2339792-9	31-Aug-19	12:10	111	136	<0.60	<0.34	0.016	0.0202	0.0202	<0.0010	0.33	0.35	0.0197	0.0392
Stephens Lake - Near-field #3	NF-3	L2339792-10	31-Aug-19	11:45	110	135	<0.60	<0.34	0.025	0.0212	0.0212	<0.0010	0.41	0.43	0.0202	0.0401
Stephens Lake - Near-field #4	NF-4	L2339792-11	31-Aug-19	12:25	110	134	<0.60	<0.34	0.014	0.0401	0.0358	0.0043	0.40	0.44	0.0203	0.0400
Stephens Lake - Near-field #5	NF-5	L2339792-12	31-Aug-19	11:05	110	134	<0.60	<0.34	0.037	0.0265	0.0255	0.0010	0.37	0.40	0.0196	0.0386
Stephens Lake - Far-field #1	FF-1	L2339792-1	31-Aug-19	8:37	107	130	<0.60	<0.34	0.032	0.0169	0.0169	<0.0010	0.41	0.43	0.0206	0.0383
Stephens Lake - Far-field #2	FF-2	L2339792-2	31-Aug-19	9:29	105	128	<0.60	<0.34	0.017	0.0253	0.0243	0.0010	0.35	0.38	0.0208	0.0372
Stephens Lake - Far-field #6	FF-6	L2339792-3	31-Aug-19	10:05	106	129	<0.60	<0.34	0.022	0.0465	0.0405	0.0060	0.37	0.42	0.0211	0.0400
Stephens Lake - Far-field #4	FF-4	L2339792-4	31-Aug-19	9:50	105	128	<0.60	<0.34	0.047	0.0215	0.0215	<0.0010	0.36	0.38	0.0196	0.0381
Stephens Lake - Far-field #5	FF-5	L2339792-5	31-Aug-19	9:01	104	127	<0.60	<0.34	0.026	0.0196	0.0196	<0.0010	0.41	0.43	0.0206	0.0382

Table A1-2: Routine water chemistry parameters measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in bold exceed the benchmark (continued).

					Alkalinity				Nitrogen						Phosphorus	
Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Total (CaCO3) (mg/L)	Bicarbonate (HCO_3) (mg/L)	Carbonate (CO_3) (mg/L)	Hydroxide (OH) (mg/L)	Ammonia (mg/L N)	Nitrate/ nitrite (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total N[1] (mg/L)	Dissolved P (mg/L)	Total P (mg/L)
Detection Limit 2019					**1.0**	**1.2**	**0.60**	**0.34**	**0.010**	**0.0051**	**0.0050**	**0.0010**	**0.20**		**0.0010**	**0.0010**
Clark Lake #1	CL-1	L2347794-1	15-Sep-19	9:52	99.1	121	<0.60	<0.34	0.028	<0.0051	<0.0050	<0.0010	0.40	0.40	0.0126	0.0340
Clark Lake #2	CL-2	L2347794-2	15-Sep-19	10:42	96.5	118	<0.60	<0.34	0.027	0.0206	0.0176	0.0030	0.42	0.44	0.0123	0.0355
Clark Lake #3	CL-3	L2347794-3	15-Sep-19	11:00	98.7	120	<0.60	<0.34	0.027	<0.0051	<0.0050	<0.0010	0.42	0.42	0.0137	0.0345
Clark Lake #4	CL-4	L2347794-4	15-Sep-19	10:26	92.5	113	<0.60	<0.34	<0.010	0.0069	0.0069	<0.0010	0.40	0.41	0.0122	0.0352
Clark Lake #5	CL-5	L2347794-5	15-Sep-19	10:12	93.6	114	<0.60	<0.34	0.021	<0.0051	<0.0050	<0.0010	0.41	0.41	0.0135	0.0327
Nelson River Upstream #1	US-1	L2350077-1	16-Sep-19	13:50	99.6	122	<0.60	<0.34	0.010	<0.0051	<0.0050	<0.0010	0.44	0.44	0.0136	0.0338
Nelson River Upstream #2	US-2	L2350077-2,-6,-7	16-Sep-19	13:50	102	125	<0.60	<0.34	0.026	<0.0051	<0.0050	<0.0010	0.42	0.42	0.0125	0.0348
Nelson River Upstream #3	US-3	L2350077-3	16-Sep-19	14:30	103	125	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.42	0.42	0.0112	0.0353
Nelson River Upstream #4	US-4	L2350077-4	16-Sep-19	14:11	102	124	<0.60	<0.34	0.011	<0.0051	<0.0050	<0.0010	0.38	0.38	0.0117	0.0339
Nelson River Upstream #5	US-5	L2350077-5	16-Sep-19	14:46	104	127	<0.60	<0.34	0.049	<0.0051	<0.0050	<0.0010	0.46	0.46	0.0117	0.0344
Stephens Lake - Near-field #1	NF-1	L2350076-1	00-Jan-00	9:40	104	127	<0.60	<0.34	<0.010	0.0379	0.0379	<0.0010	0.44	0.48	0.0126	0.0331
Stephens Lake - Near-field #2	NF-2	L2350076-2	17-Sep-19	10:32	104	127	<0.60	<0.34	0.020	0.0163	0.0163	<0.0010	0.41	0.43	0.0206	0.0327
Stephens Lake - Near-field #3	NF-3	L2350076-3	17-Sep-19	10:04	103	126	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.42	0.42	0.0131	0.0362
Stephens Lake - Near-field #4	NF-4	L2350076-4	17-Sep-19	10:52	103	125	<0.60	<0.34	0.014	0.0329	0.0329	<0.0010	0.41	0.44	0.0121	0.0332
Stephens Lake - Near-field #5	NF-5	L2350076-5	17-Sep-19	9:18	103	125	<0.60	<0.34	<0.010	0.0117	0.0117	<0.0010	0.42	0.43	0.0121	0.0345
Stephens Lake - Far-field #1	FF-1	L2350240-1	18-Sep-19	7:35	106	129	<0.60	<0.34	0.034	<0.0051	<0.0050	<0.0010	0.40	0.40	0.0141	0.0238
Stephens Lake - Far-field #2	FF-2	L2350240-2	18-Sep-19	8:17	103	125	<0.60	<0.34	0.027	0.0143	0.0132	0.0011	0.42	0.43	0.0127	0.0253
Stephens Lake - Far-field #3	FF-3	L2350240-3	18-Sep-19	8:53	104	127	<0.60	<0.34	0.024	0.0072	0.0072	<0.0010	0.42	0.43	0.0126	0.0216
Stephens Lake - Far-field #4	FF-4	L2350240-4	18-Sep-19	8:36	105	128	<0.60	<0.34	0.025	<0.0051	<0.0050	<0.0010	0.38	0.38	0.0142	0.0265
Stephens Lake - Far-field #5	FF-5	L2350240-5	18-Sep-19	8:01	106	129	<0.60	<0.34	0.014	<0.0051	<0.0050	<0.0010	0.39	0.39	0.0140	0.0324

Table A1-2: Routine water chemistry parameters measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in bold exceed the benchmark (continued).

					Carbon		Water Clarity						Productivity	
Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Total Organic C (mg/L)	Dissolved Organic C (mg/L)	Total Suspended Solids (mg/L)	Turbidity (NTU)	True Colour (CU)	Lab pH	Laboratory Conductivity (µmhos/cm)	Total Dissolved Solids (mg/L)	Chlorophyll *a* (µg/L)	Phaeophytin *a* (µg/L)
Detection Limit 2019					**0.50**	**0.50**	**2.0**	**0.10**	**5.0**	**0.10**	**1.0**	**4.0**	**0.10**	**0.10**
Split Lake #10	SPL-10	L2251830-1	31-Mar-19	10:29	7.99	8.57	5.6	12.0	16.5	7.99	251	187	1.37	0.92
Split Lake #11	SPL-11	L2251830-2	31-Mar-19	11:15	7.96	8.34	4.9	12.1	17.3	7.96	256	185	1.42	0.94
Split Lake #12	SPL-12	L2251830-3	31-Mar-19	13:30	8.04	8.51	3.1	10.7	15.8	7.99	292	190	1.67	1.05
Split Lake #13	SPL-13	L2251830-4	31-Mar-19	12:45	7.92	8.35	4.5	11.6	16.2	7.97	255	177	1.52	0.98
Split Lake #14	SPL-14	L2251830-5	31-Mar-19	12:10	8.06	9.02	3.6	9.89	14.8	8.01	320	231	1.71	1.03
Nelson River Upstream #6	US-6	L2254087-8	3-Apr-19	12:10	8.84	9.09	8.5	10.7	15.8	7.92	317	191	1.93	1.07
Nelson River Upstream #7	US-7	L2254087-9	3-Apr-19	10:45	8.78	10.0	9.1	10.5	18.0	7.90	315	199	1.60	1.00
Nelson River Upstream #8	US-8	L2254087-10	3-Apr-19	11:30	9.51	9.41	7.6	10.2	13.7	7.90	316	198	1.71	0.96
Nelson River Upstream #9	US-9	L2254087-11	3-Apr-19	8:40	11.0	11.1	7.2	10.1	13.5	7.57	316	196	1.55	0.92
Nelson River Upstream #10	US-10	L2254087-12	3-Apr-19	9:45	8.89	10.3	6.7	10.1	15.1	7.79	314	140	1.58	0.98
Stephens Lake - Near-field #1	NF-1	L2254087-1	3-Apr-19	13:15	9.05	9.43	5.9	10.2	16.8	7.91	311	203	2.47	1.16
Stephens Lake - Near-field #2	NF-2	L2254087-2	3-Apr-19	16:50	9.04	9.37	8.8	11.0	16.0	7.91	312	193	1.55	0.93
Stephens Lake - Near-field #3	NF-3	L2254087-3	3-Apr-19	14:10	8.97	9.99	7.6	10.9	16.3	7.89	313	200	3.39	1.19
Stephens Lake - Near-field #4	NF-4	L2254087-4	3-Apr-19	16:05	8.82	9.75	6.1	11.1	15.1	7.93	313	197	1.94	0.99
Stephens Lake - Near-field #5	NF-5	L2254087-5	3-Apr-19	15:00	8.79	9.51	5.7	10.5	15.1	7.92	311	196	1.56	0.90
Stephens Lake - Far-field #1	FF-1	L2254658-1,-6,-7	5-Apr-19	10:15	8.74	8.83	4.7	11.7	15.7	7.95	313	179	1.99	1.01
Stephens Lake - Far-field #2	FF-2	L2254658-2	5-Apr-19	11:55	8.68	8.72	6.3	11.6	14.0	7.97	312	201	7.65*	2.37
Stephens Lake - Far-field #3	FF-3	L2254658-3	5-Apr-19	13:18	8.41	8.64	6.9	11.0	13.9	7.93	312	146	4.19*	1.06
Stephens Lake - Far-field #4	FF-4	L2254658-4	5-Apr-19	12:30	8.59	8.73	6.0	10.8	14.8	7.93	312	200	1.70	0.90
Stephens Lake - Far-field #5	FF-5	L2254658-5	5-Apr-19	11:15	8.40	8.81	4.4	11.3	14.5	7.97	311	189	1.61	0.90
Clark Lake #1	CL-1	L2297681-1	24-Jun-19	9:32	8.95	8.61	6.9	17.2	16.0	8.24	264	171	4.80	2.20
Clark Lake #2	CL-2	L2297681-2	24-Jun-19	10:02	8.67	8.17	7.6	17.0	18.2	8.18	263	178	4.84	2.13
Clark Lake #3	CL-3	L2297681-3	24-Jun-19	10:24	8.04	8.04	7.1	17.2	17.3	8.18	262	165	4.84	2.19
Clark Lake #4	CL-4	L2297681-4	24-Jun-19	10:42	8.35	8.10	7.7	17.4	17.4	8.17	256	164	4.93	2.16
Clark Lake #5	CL-5	L2297681-5	24-Jun-19	10:55	8.28	8.20	7.6	18.6	17.1	8.17	256	184	4.93	2.23
Nelson River Upstream #1	US-1	L2299234-1	25-Jun-19	11:25	10.1	7.80	8.4	18.5	16.5	8.17	257	174	5.11	2.29
Nelson River Upstream #2	US-2	L2299234-2,-6,-7	25-Jun-19	11:55	7.53	7.76	7.7	19.0	13.8	8.17	257	177	4.81	2.65
Nelson River Upstream #3	US-3	L2299234-3	25-Jun-19	12:20	7.78	7.50	6.5	17.6	18.8	8.17	255	178	5.19	2.44
Nelson River Upstream #4	US-4	L2299234-4	25-Jun-19	12:48	7.09	8.26	8.8	18.2	16.9	8.17	255	182	5.11	2.36
Nelson River Upstream #5	US-5	L2299234-5	25-Jun-19	13:05	7.70	8.43	8.9	18.3	16.8	8.18	257	181	4.90	2.29
Stephens Lake - Near-field #1	NF-1	L2299712-8	26-Jun-19	11:49	7.27	6.13	5.6	15.8	8.9	8.05	257	166	5.45	2.22
Stephens Lake - Near-field #2	NF-2	L2299712-9	26-Jun-19	12:42	7.39	7.77	8.0	16.5	10.8	8.07	258	170	5.67	2.31
Stephens Lake - Near-field #3	NF-3	L2299712-10	26-Jun-19	12:13	7.37	7.49	8.4	16.1	9.9	8.07	259	167	6.08	2.27
Stephens Lake - Near-field #4	NF-4	L2299712-11	26-Jun-19	13:00	7.31	7.77	8.8	17.5	9.0	8.07	259	170	5.83	2.25
Stephens Lake - Near-field #5	NF-5	L2299712-12	26-Jun-19	11:25	7.31	7.87	5.7	15.8	10.4	8.06	258	170	5.69	2.19
Stephens Lake - Far-field #1	FF-1	L2299712-1	26-Jun-19	8:23	6.98	7.72	5.5	13.3	12.2	8.28	265	169	4.63	1.92
Stephens Lake - Far-field #2	FF-2	L2299712-2	26-Jun-19	9:10	7.27	7.72	3.5	13.9	11.4	8.04	257	163	5.28	2.13
Stephens Lake - Far-field #3	FF-3	L2299712-3	26-Jun-19	9:55	7.32	7.72	6.7	14.3	11.8	8.05	258	164	4.88	1.92
Stephens Lake - Far-field #4	FF-4	L2299712-4	26-Jun-19	9:35	7.29	6.00	7.2	14.5	12.4	8.05	258	168	4.86	1.73
Stephens Lake - Far-field #5	FF-5	L2299712-5	26-Jun-19	8:50	7.64	7.69	5.5	14.0	11.7	8.05	260	168	5.15	1.95

Table A1-2: Routine water chemistry parameters measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in bold exceed the benchmark (continued).

					Carbon		Water Clarity						Productivity	
Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Total Organic C (mg/L)	Dissolved Organic C (mg/L)	Total Suspended Solids (mg/L)	Turbidity (NTU)	True Colour (CU)	Lab pH	Laboratory Conductivity (µmhos/cm)	Total Dissolved Solids (mg/L)	Chlorophyll *a* (µg/L)	Phaeophytin *a* (µg/L)
Detection Limit 2019					**0.50**	**0.50**	**2.0**	**0.10**	**5.0**	**0.10**	**1.0**	**4.0**	**0.10**	**0.10**
Clark Lake #1	CL-1	L2314002-1	21-Jul-19	10:25	7.49	8.52	10.1	21.5	14.2	8.20	272	186	5.26	2.63
Clark Lake #2	CL-2	L2314002-2	21-Jul-19	10:48	7.81	8.27	10.5	19.4	15.3	8.22	281	191	5.48	2.53
Clark Lake #3	CL-3	L2314002-3	21-Jul-19	11:05	7.79	8.38	9.6	18.9	16.1	8.24	284	193	5.66	2.66
Clark Lake #4	CL-4	L2314002-4	21-Jul-19	11:45	7.49	8.22	10.1	19.2	15.3	8.23	286	188	5.66	2.56
Clark Lake #5	CL-5	L2314002-5	21-Jul-19	11:25	7.55	8.36	10.7	20.7	16.4	8.21	265	186	5.41	2.58
Nelson River Upstream #1	US-1	L2314964-1	22-Jul-19	11:30	10.7	10.6	9.9	20.1	15.0	8.24	284	195	5.19	2.54
Nelson River Upstream #2	US-2	L2314964-2	22-Jul-19	11:51	8.26	9.09	9.7	19.8	12.4	8.24	292	193	5.23	2.68
Nelson River Upstream #3	US-3	L2314964-3	22-Jul-19	12:45	10.8	10.6	9.6	20.4	12.5	8.24	287	188	5.97	2.80
Nelson River Upstream #4	US-4	L2314964-4,-6,-7	22-Jul-19	12:15	9.87	9.56	10.4	19.4	13.4	8.25	285	189	5.68	2.82
Nelson River Upstream #5	US-5	L2314964-5	22-Jul-19	13:05	10.7	10.7	9.6	19.0	13.3	8.25	292	187	5.91	2.84
Stephens Lake - Near-field #1	NF-1	L2315689-1	23-Jul-19	13:10	11.4	12.3	8.5	18.0	12.6	8.20	289	177	3.84	1.82
Stephens Lake - Near-field #2	NF-2	L2315689-2	23-Jul-19	14:00	11.3	11.7	7.3	17.9	13.3	8.21	289	182	4.49	2.15
Stephens Lake - Near-field #3	NF-3	L2315689-3	23-Jul-19	13:35	7.89	8.15	7.7	17.3	12.8	8.20	289	183	4.32	1.84
Stephens Lake - Near-field #4	NF-4	L2315689-4	23-Jul-19	14:25	7.85	8.90	9.1	17.3	13.8	8.20	290	183	7.54	3.24
Stephens Lake - Near-field #5	NF-5	L2315689-5	23-Jul-19	12:35	7.81	8.30	5.5	17.8	13.7	8.21	292	159	3.86	1.89
Stephens Lake - Far-field #1	FF-1	L2315689-6	23-Jul-19	9:00	7.82	8.15	5.1	13.9	12.4	8.18	281	176	5.05	2.02
Stephens Lake - Far-field #2	FF-2	L2315689-7	23-Jul-19	9:50	7.77	8.29	4.8	13.4	12.7	8.20	284	173	5.46	2.17
Stephens Lake - Far-field #3	FF-3	L2315689-8	23-Jul-19	10:50	8.02	8.52	4.8	15.0	13.1	8.19	286	176	6.01	2.52
Stephens Lake - Far-field #4	FF-4	L2315689-9	23-Jul-19	10:15	7.88	8.55	6.0	14.4	13.7	8.20	286	176	5.57	2.39
Stephens Lake - Far-field #5	FF-5	L2315689-10	23-Jul-19	9:30	7.97	8.33	<2.0	13.7	14.0	8.20	283	178	5.87	2.40
Clark Lake #1	CL-1	L2335547-1	25-Aug-19	11:15	8.17	8.26	8.0	18.9	13.8	8.24	287	192	6.07	2.43
Clark Lake #2	CL-2	L2335547-2	25-Aug-19	10:56	8.25	8.16	8.0	19.3	11.9	8.24	285	197	5.58	2.56
Clark Lake #3	CL-3	L2335547-3	25-Aug-19	11:37	7.42	8.88	7.5	19.7	12.6	8.21	287	187	5.90	2.65
Clark Lake #4	CL-4	L2335547-4	25-Aug-19	10:20	7.41	8.72	7.2	19.1	11.9	8.25	285	193	5.68	2.62
Clark Lake #5	CL-5	L2335547-5	25-Aug-19	10:45	7.37	8.71	7.6	20.1	12.9	8.25	271	182	5.56	2.52
Nelson River Upstream #1	US-1	L2338353-1	27-Aug-19	12:55	7.38	7.75	7.2	18.9	10.5	8.21	276	186	4.95 [2]	2.72 [2]
Nelson River Upstream #2	US-2	L2338353-2,-6,-7	27-Aug-19	13:15	7.44	7.96	9.0	18.6	12.7	8.18	284	190	4.56	2.60
Nelson River Upstream #3	US-3	L2338353-3	27-Aug-19	14:05	7.44	7.91	9.2	19.7	11.5	8.18	280	193	4.61	2.44
Nelson River Upstream #4	US-4	L2338353-4	27-Aug-19	13:45	7.45	7.87	6.9	18.8	11.5	8.19	279	201	4.62	2.62
Nelson River Upstream #5	US-5	L2338353-5	27-Aug-19	14:20	7.46	7.94	9.3	18.9	14.7	8.17	282	218	4.73	2.59
Stephens Lake - Near-field #1	NF-1	L2339792-8	31-Aug-19	11:28	7.63	7.93	**16.3***	18.9	14.4	8.15	296	198	4.99 [2]	2.10 [2]
Stephens Lake - Near-field #2	NF-2	L2339792-9	31-Aug-19	12:10	7.51	7.91	6.4	17.2	13.8	8.17	297	203	5.97 [2]	2.30 [2]
Stephens Lake - Near-field #3	NF-3	L2339792-10	31-Aug-19	11:45	7.50	8.00	6.4	18.4	12.0	8.17	293	193	3.83 [2]	1.92 [2]
Stephens Lake - Near-field #4	NF-4	L2339792-11	31-Aug-19	12:25	7.16	7.95	6.3	18.2	12.6	8.17	294	194	5.10 [2]	2.33 [2]
Stephens Lake - Near-field #5	NF-5	L2339792-12	31-Aug-19	11:05	7.53	7.80	7.9	18.5	12.2	8.17	299	195	5.06 [2]	2.32 [2]
Stephens Lake - Far-field #1	FF-1	L2339792-1	31-Aug-19	8:37	7.33	7.75	5.1	19.0	10.4	8.15	278	195	5.12 [2]	2.15 [2]
Stephens Lake - Far-field #2	FF-2	L2339792-2	31-Aug-19	9:29	7.36	7.89	6.9	19.6	11.4	8.16	277	191	4.06 [2]	1.76 [2]
Stephens Lake - Far-field #6	FF-6	L2339792-3	31-Aug-19	10:05	7.43	7.90	6.5	19.4	11.6	8.16	277	202	4.44 [2]	2.07 [2]
Stephens Lake - Far-field #4	FF-4	L2339792-4	31-Aug-19	9:50	7.46	7.73	7.1	19.2	11.4	8.16	275	207	4.37 [2]	2.06 [2]
Stephens Lake - Far-field #5	FF-5	L2339792-5	31-Aug-19	9:01	7.44	7.89	6.8	19.1	11.4	8.16	279	192	4.02 [2]	1.90 [2]

Table A1-2: Routine water chemistry parameters measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in bold exceed the benchmark (continued).

					Carbon		Water Clarity						Productivity	
Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Total Organic C (mg/L)	Dissolved Organic C (mg/L)	Total Suspended Solids (mg/L)	Turbidity (NTU)	True Colour (CU)	Lab pH	Laboratory Conductivity (µmhos/cm)	Total Dissolved Solids (mg/L)	Chlorophyll *a* (µg/L)	Phaeophytin *a* (µg/L)
Detection Limit 2019					**0.50**	**0.50**	**2.0**	**0.10**	**5.0**	**0.10**	**1.0**	**4.0**	**0.10**	**0.10**
Clark Lake #1	CL-1	L2347794-1	15-Sep-19	9:52	7.41	7.60	8.7	16.6	11.5	8.05	266	173	6.05	2.10
Clark Lake #2	CL-2	L2347794-2	15-Sep-19	10:42	7.27	7.44	7.3	17.1	13.2	8.06	261	172	6.38	2.31
Clark Lake #3	CL-3	L2347794-3	15-Sep-19	11:00	7.35	7.71	8.1	16.2	14.4	8.09	267	179	5.94	1.98
Clark Lake #4	CL-4	L2347794-4	15-Sep-19	10:26	7.32	7.56	8.5	18.4	14.5	8.09	251	166	6.36	2.24
Clark Lake #5	CL-5	L2347794-5	15-Sep-19	10:12	7.51	7.95	7.2	17.1	15.6	8.10	255	175	5.71	2.04
Nelson River Upstream #1	US-1	L2350077-1	16-Sep-19	13:50	7.29	8.47	7.2	16.0	13.0	8.09	269	183	5.79	2.43
Nelson River Upstream #2	US-2	L2350077-2,-6,-7	16-Sep-19	13:50	7.22	7.56	7.2	16.1	12.8	8.10	272	181	5.95	2.56
Nelson River Upstream #3	US-3	L2350077-3	16-Sep-19	14:30	7.04	7.74	7.2	16.0	11.9	8.09	272	196	6.72	2.55
Nelson River Upstream #4	US-4	L2350077-4	16-Sep-19	14:11	7.09	7.94	6.4	16.1	11.4	8.10	273	184	6.20	2.60
Nelson River Upstream #5	US-5	L2350077-5	16-Sep-19	14:46	7.18	7.46	7.3	16.2	11.1	8.12	275	179	5.94	2.48
Stephens Lake - Near-field #1	NF-1	L2350076-1	00-Jan-00	9:40	7.13	7.51	6.9	15.9	11.7	8.08	270	208	6.67	2.30
Stephens Lake - Near-field #2	NF-2	L2350076-2	17-Sep-19	10:32	7.13	8.13	4.8	14.5	11.4	8.14	277	231	6.12	2.05
Stephens Lake - Near-field #3	NF-3	L2350076-3	17-Sep-19	10:04	7.03	7.57	5.6	15.3	11.6	8.10	270	209	6.74	2.44
Stephens Lake - Near-field #4	NF-4	L2350076-4	17-Sep-19	10:52	6.75	7.46	5.3	13.2	11.5	8.09	272	194	7.05	2.50
Stephens Lake - Near-field #5	NF-5	L2350076-5	17-Sep-19	9:18	6.98	7.47	6.7	15.7	11.7	8.10	271	194	6.46	2.50
Stephens Lake - Far-field #1	FF-1	L2350240-1	18-Sep-19	7:35	7.36	7.41	4.0	12.8	10.2	8.23	293	182	6.44	2.05
Stephens Lake - Far-field #2	FF-2	L2350240-2	18-Sep-19	8:17	7.23	7.63	3.9	13.8	9.9	8.14	281	183	6.77	1.93
Stephens Lake - Far-field #3	FF-3	L2350240-3	18-Sep-19	8:53	7.44	7.53	3.6	12.8	11.2	8.16	283	188	7.44	2.06
Stephens Lake - Far-field #4	FF-4	L2350240-4	18-Sep-19	8:36	7.00	7.67	4.7	13.2	12.4	8.15	282	182	7.17	2.27
Stephens Lake - Far-field #5	FF-5	L2350240-5	18-Sep-19	8:01	6.99	7.55	4.0	13.8	13.7	8.18	283	186	6.07	1.94

* Result confirmed through laboratory reanalysis.
1. Total nitrogen calculated as the sum of total Kjeldahl nitrogen and nitrate/nitrite.
2. Productivity parameters were analysed past the hold time.

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in bold exceed the benchmark. Results in blue italics are considered suspect.

Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Hardness (as $CaCO_3$) (mg/L)	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Bismuth (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Cesium (mg/L)	Chloride (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)
Detection Limit 2019					**0.20**	**0.0030**	**0.00010**	**0.00010**	**0.00010**	**0.00010**	**0.000050**	**0.010**	**0.0000050**	**0.050**	**0.000010**	**0.10**	**0.00010**	**0.00010**	**0.00050**
Split Lake #10	SPL-10	L2251830-1	31-Mar-19	10:29	105	0.436	<0.00010	0.00097	0.0281	<0.00010	<0.000050	0.012	0.0000068	23.7	0.000057	11.9	0.00091	0.00022	0.00639*
Split Lake #11	SPL-11	L2251830-2	31-Mar-19	11:15	106	0.249	<0.00010	0.00097	0.0271	<0.00010	<0.000050	0.012	0.0000051	24.0	0.000037	12.3	0.00061	0.00018	0.00226
Split Lake #12	SPL-12	L2251830-3	31-Mar-19	13:30	119	0.298	<0.00010	0.00110	0.0309	<0.00010	<0.000050	0.014	<0.0000050	26.9	0.000039	15.2	0.00071	0.00019	0.00198
Split Lake #13	SPL-13	L2251830-4	31-Mar-19	12:45	106	0.255	<0.00010	0.00095	0.0273	<0.00010	<0.000050	0.012	<0.0000050	23.9	0.000035	12.2	0.00086	0.00019	0.00229
Split Lake #14	SPL-14	L2251830-5	31-Mar-19	12:10	129	0.400	<0.00010	0.00127	0.0344	<0.00010	<0.000050	0.017	0.0000059	28.7	0.000048	17.7	0.00087	0.00020	0.00213
Nelson River Upstream #6	US-6	L2254087-8	3-Apr-19	12:10	131	0.401	0.00010	0.00121	0.0349	<0.00010	<0.000050	0.016	0.0000055	27.9	0.000048	17.6	0.00072	0.00020	0.00404
Nelson River Upstream #7	US-7	L2254087-9	3-Apr-19	10:45	131	0.363	0.00011	0.00119	0.0348	<0.00010	<0.000050	0.017	0.0000104	29.1	0.000045	17.4	0.00067	0.00020	0.00240
Nelson River Upstream #8	US-8	L2254087-10	3-Apr-19	11:30	129	0.387	<0.00010	0.00114	0.0346	<0.00010	<0.000050	0.017	<0.0000050	28.3	0.000047	17.4	0.00082	0.00020	0.00345
Nelson River Upstream #9	US-9	L2254087-11	3-Apr-19	8:40	133	0.388	0.00010	0.00121	0.0346	<0.00010	<0.000050	0.017	0.0000087	28.9	0.000046	17.3	0.00064	0.00021	**0.0357** [1]
Nelson River Upstream #10	US-10	L2254087-12	3-Apr-19	9:45	131	0.364	<0.00010	0.00111	0.0352	<0.00010	<0.000050	0.017	<0.0000050	28.4	0.000047	17.4	0.00064	0.00020	0.00179
Stephens Lake - Near-field #1	NF-1	L2254087-1	3-Apr-19	13:15	124	0.382	<0.00010	0.00119	0.0341	<0.00010	<0.000050	0.016	0.0000077	27.4	0.000050	17.1	0.00069	0.00019	0.00349
Stephens Lake - Near-field #2	NF-2	L2254087-2	3-Apr-19	16:50	125	0.398	<0.00010	0.00123	0.0342	<0.00010	<0.000050	0.016	0.0000139	27.4	0.000048	17.1	0.00077	0.00020	0.00273
Stephens Lake - Near-field #3	NF-3	L2254087-3	3-Apr-19	14:10	125	0.334	<0.00010	0.00125	0.0342	<0.00010	<0.000050	0.016	0.0000150	27.5	0.000044	17.2	0.00069	0.00018	0.00532
Stephens Lake - Near-field #4	NF-4	L2254087-4	3-Apr-19	16:05	125	0.407	<0.00010	0.00122	0.0342	<0.00010	<0.000050	0.016	0.0000096	27.1	0.000055	17.1	0.00069	0.00021	0.00222
Stephens Lake - Near-field #5	NF-5	L2254087-5	3-Apr-19	15:00	130	0.317	0.00015	0.00113	0.0331	<0.00010	<0.000050	0.017	0.0000113	28.5	0.000043	17.0	0.00058	0.00019	0.00261
Stephens Lake - Far-field #1	FF-1	L2254658-1,-6,-7	5-Apr-19	10:15	126	0.379	0.00018	0.00118	0.0351	<0.00010	<0.000050	0.016	0.0000117	28.0	0.000050	17.0	0.00073	0.00019	0.00303
Stephens Lake - Far-field #2	FF-2	L2254658-2	5-Apr-19	11:55	127	0.343	0.00011	0.00115	0.0354	<0.00010	<0.000050	0.016	0.0000089	28.0	0.000043	17.1	0.00071	0.00018	0.00202
Stephens Lake - Far-field #3	FF-3	L2254658-3	5-Apr-19	13:18	125	0.290	0.00010	0.00113	0.0341	<0.00010	<0.000050	0.015	0.0000101	27.5	0.000041	17.0	0.00061	0.00017	0.00229
Stephens Lake - Far-field #4	FF-4	L2254658-4	5-Apr-19	12:30	125	0.304	0.00016	0.00123	0.0340	<0.00010	<0.000050	0.015	0.0000114	27.4	0.000041	17.1	0.00062	0.00018	0.00215
Stephens Lake - Far-field #5	FF-5	L2254658-5	5-Apr-19	11:15	125	0.282	0.00010	0.00116	0.0337	<0.00010	<0.000050	0.015	0.0000062	27.3	0.000040	16.9	0.00059	0.00017	0.00291
Clark Lake #1	CL-1	L2297681-1	24-Jun-19	9:32	114	0.431	<0.00010	0.00101	0.0307	<0.00010	<0.000050	0.023	0.0000061	26.1	0.000053	13.9	0.00088	0.00024	0.00174
Clark Lake #2	CL-2	L2297681-2	24-Jun-19	10:02	112	0.568	<0.00010	0.00102	0.0308	<0.00010	<0.000050	0.022	0.0000073	25.7	0.000065	13.7	0.00100	0.00027	0.00164
Clark Lake #3	CL-3	L2297681-3	24-Jun-19	10:24	113	0.545	<0.00010	0.00101	0.0314	<0.00010	<0.000050	0.022	0.0000067	25.8	0.000066	12.1	0.00118	0.00028	0.00192
Clark Lake #4	CL-4	L2297681-4	24-Jun-19	10:42	112	0.523	<0.00010	0.00102	0.0307	<0.00010	<0.000050	0.022	0.0000091	25.7	0.000066	12.4	0.00105	0.00027	0.00162
Clark Lake #5	CL-5	L2297681-5	24-Jun-19	10:55	108	0.369	<0.00010	0.00094	0.0285	<0.00010	<0.000050	0.021	0.0000061	25.0	0.000046	12.4	0.00077	0.00022	0.00147
Nelson River Upstream #1	US-1	L2299234-1	25-Jun-19	11:25	116	0.584	<0.00010	0.00100	0.0302	<0.00010	<0.000050	0.021	0.0000069	26.2	0.000069	12.7	0.00113	0.00029	0.00160
Nelson River Upstream #2	US-2	L2299234-2,-6,-7	25-Jun-19	11:55	120	0.576	<0.00010	0.00099	0.0310	<0.00010	<0.000050	0.021	0.0000059	27.3	0.000069	12.9	0.00110	0.00031	0.00165
Nelson River Upstream #3	US-3	L2299234-3	25-Jun-19	12:20	119	0.544	<0.00010	0.00097	0.0307	<0.00010	<0.000050	0.022	0.0000061	27.0	0.000066	12.7	0.00100	0.00029	0.00162
Nelson River Upstream #4	US-4	L2299234-4	25-Jun-19	12:48	119	0.595	<0.00010	0.00099	0.0309	<0.00010	<0.000050	0.022	0.0000056	27.5	0.000072	12.7	0.00107	0.00028	0.00163
Nelson River Upstream #5	US-5	L2299234-5	25-Jun-19	13:05	120	0.605	<0.00010	0.00100	0.0314	<0.00010	<0.000050	0.022	<0.0000050	26.9	0.000070	12.5	0.00109	0.00028	0.00161
Stephens Lake - Near-field #1	NF-1	L2299712-8	26-Jun-19	11:49	112	0.504	<0.00010	0.00100	0.0301	<0.00010	<0.000050	0.017	0.0000063	26.4	0.000064	12.9	0.00105	0.00027	0.00163
Stephens Lake - Near-field #2	NF-2	L2299712-9	26-Jun-19	12:42	114	0.522	<0.00010	0.00105	0.0305	<0.00010	<0.000050	0.017	0.0000063	26.6	0.000071	13.6	0.00109	0.00028	0.00160
Stephens Lake - Near-field #3	NF-3	L2299712-10	26-Jun-19	12:13	114	0.545	<0.00010	0.00103	0.0306	<0.00010	<0.000050	0.017	0.0000053	26.5	0.000071	13.0	0.00108	0.00028	0.00156
Stephens Lake - Near-field #4	NF-4	L2299712-11	26-Jun-19	13:00	168	0.584	0.00010	0.00105	0.0330	<0.00010	<0.000050	0.017	0.0000222	48.1	0.000072	13.1	0.00134	0.00030	0.00205
Stephens Lake - Near-field #5	NF-5	L2299712-12	26-Jun-19	11:25	111	0.503	<0.00010	0.00101	0.0299	<0.00010	<0.000050	0.016	0.0000051	26.1	0.000065	12.9	0.00103	0.00028	0.00154
Stephens Lake - Far-field #1	FF-1	L2299712-1	26-Jun-19	8:23	105	0.416	<0.00010	0.00089	0.0294	<0.00010	<0.000050	0.017	0.0000077	25.9	0.000054	12.6	0.00090	0.00022	0.00161
Stephens Lake - Far-field #2	FF-2	L2299712-2	26-Jun-19	9:10	104	0.447	<0.00010	0.00090	0.0309	<0.00010	<0.000050	0.018	<0.0000050	25.8	0.000062	12.9	0.00082	0.00023	0.00150
Stephens Lake - Far-field #3	FF-3	L2299712-3	26-Jun-19	9:55	102	0.443	<0.00010	0.00094	0.0306	<0.00010	<0.000050	0.018	0.0000062	24.7	0.000063	12.1	0.00090	0.00024	0.00151
Stephens Lake - Far-field #4	FF-4	L2299712-4	26-Jun-19	9:35	102	0.454	<0.00010	0.00093	0.0305	<0.00010	<0.000050	0.017	0.0000056	24.9	0.000061	13.1	0.00092	0.00023	0.00152
Stephens Lake - Far-field #5	FF-5	L2299712-5	26-Jun-19	8:50	105	0.472	<0.00010	0.00087	0.0313	<0.00010	<0.000050	0.018	<0.0000050	26.1	0.000059	12.8	0.00094	0.00024	0.00156

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in bold exceed the benchmark. Results in blue italics are considered suspect (continued).

Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Hardness (as $CaCO_3$) (mg/L)	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Bismuth (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Cesium (mg/L)	Chloride (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)
Detection Limit 2019					**0.20**	**0.0030**	**0.00010**	**0.00010**	**0.00010**	**0.00010**	**0.000050**	**0.010**	**0.0000050**	**0.050**	**0.000010**	**0.10**	**0.00010**	**0.00010**	**0.00050**
Clark Lake #1	CL-1	L2314002-1	21-Jul-19	10:25	121	0.749	<0.00010	0.00118	0.0338	<0.00010	<0.000050	0.014	0.0000098	28.0	0.000095	13.5	0.00143	0.00039	0.00184
Clark Lake #2	CL-2	L2314002-2	21-Jul-19	10:48	123	0.688	<0.00010	0.00120	0.0343	<0.00010	<0.000050	0.014	0.0000079	28.6	0.000091	14.2	0.00142	0.00036	0.00181
Clark Lake #3	CL-3	L2314002-3	21-Jul-19	11:05	126	0.662	<0.00010	0.00122	0.0347	<0.00010	<0.000050	0.015	0.0000093	29.2	0.000088	14.5	0.00127	0.00037	0.00181
Clark Lake #4	CL-4	L2314002-4	21-Jul-19	11:45	124	0.649	<0.00010	0.00119	0.0342	<0.00010	<0.000050	0.014	0.0000091	28.6	0.000081	14.6	0.00130	0.00036	0.00180
Clark Lake #5	CL-5	L2314002-5	21-Jul-19	11:25	118	0.745	<0.00010	0.00113	0.0328	<0.00010	<0.000050	0.013	0.0000068	27.4	0.000098	12.8	0.00149	0.00039	0.00183
Nelson River Upstream #1	US-1	L2314964-1	22-Jul-19	11:30	117	0.362	<0.00010	0.00109	0.0321	<0.00010	<0.000050	0.015	0.0000061	27.1	0.000057	14.0	0.00084	0.00029	0.00162
Nelson River Upstream #2	US-2	L2314964-2	22-Jul-19	11:51	122	0.507	<0.00010	0.00113	0.0338	<0.00010	<0.000050	0.015	0.0000069	27.7	0.000070	14.7	0.00097	0.00032	0.00163
Nelson River Upstream #3	US-3	L2314964-3	22-Jul-19	12:45	120	0.812	<0.00010	0.00123	0.0369	<0.00010	<0.000050	0.015	0.0000069	27.7	0.000098	14.2	0.00154	0.00038	0.00195
Nelson River Upstream #4	US-4	L2314964-4,-6,-7	22-Jul-19	12:15	119	0.610	<0.00010	0.00115	0.0345	<0.00010	<0.000050	0.015	0.0000060	27.5	0.000079	14.2	0.00123	0.00034	0.00178
Nelson River Upstream #5	US-5	L2314964-5	22-Jul-19	13:05	120	0.320	<0.00010	0.00115	0.0341	<0.00010	<0.000050	0.013	0.0000058	26.9	0.000053	14.8	0.00078	0.00027	0.00164
Stephens Lake - Near-field #1	NF-1	L2315689-1	23-Jul-19	13:10	122	0.553	<0.00010	0.00113	0.0330	<0.00010	<0.000050	0.026	0.0000086	27.8	0.000064	14.8	0.00108	0.00029	0.00181
Stephens Lake - Near-field #2	NF-2	L2315689-2	23-Jul-19	14:00	123	0.579	<0.00010	0.00115	0.0337	<0.00010	<0.000050	0.025	0.0000061	28.1	0.000069	14.8	0.00104	0.00029	0.00178
Stephens Lake - Near-field #3	NF-3	L2315689-3	23-Jul-19	13:35	120	0.251	<0.00010	0.00108	0.0301	<0.00010	<0.000050	0.024	0.0000060	27.4	0.000034	14.7	0.00069	0.00023	0.00171
Stephens Lake - Near-field #4	NF-4	L2315689-4	23-Jul-19	14:25	121	0.313	<0.00010	0.00107	0.0314	<0.00010	<0.000050	0.024	0.0000079	27.7	0.000043	14.9	0.00079	0.00023	0.00169
Stephens Lake - Near-field #5	NF-5	L2315689-5	23-Jul-19	12:35	122	0.656	<0.00010	0.00114	0.0341	<0.00010	<0.000050	0.024	0.0000085	28.1	0.000074	14.8	0.00120	0.00030	0.00183
Stephens Lake - Far-field #1	FF-1	L2315689-6	23-Jul-19	9:00	117	0.482	<0.00010	0.00105	0.0312	<0.00010	<0.000050	0.023	0.0000089	27.4	0.000052	14.0	0.00091	0.00022	0.00170
Stephens Lake - Far-field #2	FF-2	L2315689-7	23-Jul-19	9:50	117	0.368	<0.00010	0.00102	0.0301	<0.00010	<0.000050	0.023	<0.0000050	27.0	0.000044	14.1	0.00072	0.00021	0.00167
Stephens Lake - Far-field #3	FF-3	L2315689-8	23-Jul-19	10:50	119	0.960*	<0.00010	0.00116	0.0348	<0.00010	<0.000050	0.023	0.0000070	27.7	0.000104*	14.1	0.00151*	0.00033	0.00202
Stephens Lake - Far-field #4	FF-4	L2315689-9	23-Jul-19	10:15	119	0.344	<0.00010	0.00105	0.0304	<0.00010	<0.000050	0.025	0.0000087	27.7	0.000046	14.1	0.00075	0.00022	0.00187
Stephens Lake - Far-field #5	FF-5	L2315689-10	23-Jul-19	9:30	117	0.248	<0.00010	0.00099	0.0293	<0.00010	<0.000050	0.024	<0.0000050	27.5	0.000034	14.0	0.00063	0.00019	0.00180
Clark Lake #1	CL-1	L2335547-1	25-Aug-19	11:15	124	0.661	<0.00010	0.00140	0.0338	<0.00010	<0.000050	0.018	<0.0000050	28.5	0.000084	12.7	0.00127	0.00033	0.00177
Clark Lake #2	CL-2	L2335547-2	25-Aug-19	10:56	123	0.645	<0.00010	0.00138	0.0338	<0.00010	<0.000050	0.017	<0.0000050	28.1	0.000082	12.7	0.00118	0.00034	0.00176
Clark Lake #3	CL-3	L2335547-3	25-Aug-19	11:37	124	0.664	<0.00010	0.00142	0.0344	<0.00010	<0.000050	0.017	0.0000072	28.4	0.000084	12.7	0.00121	0.00033	0.00179
Clark Lake #4	CL-4	L2335547-4	25-Aug-19	10:20	122	0.670	<0.00010	0.00138	0.0340	<0.00010	<0.000050	0.017	<0.0000050	27.9	0.000083	12.6	0.00126	0.00034	0.00176
Clark Lake #5	CL-5	L2335547-5	25-Aug-19	10:45	112	0.644	0.00017	0.00132	0.0330	<0.00010	<0.000050	0.012	0.0000069	26.4	0.000099	11.6	0.00131	0.00034	0.00175
Nelson River Upstream #1	US-1	L2338353-1	27-Aug-19	12:55	131	0.714	<0.00010	0.00140	0.0356	<0.00010	<0.000050	0.012	0.0000051	30.4	0.000085	12.5	0.00142	0.00039	0.00190
Nelson River Upstream #2	US-2	L2338353-2,-6,-7	27-Aug-19	13:15	133	0.465	<0.00010	0.00136	0.0344	<0.00010	<0.000050	0.012	0.0000084	30.6	0.000062	12.7	0.00110	0.00033	0.00176
Nelson River Upstream #3	US-3	L2338353-3	27-Aug-19	14:05	132	0.707	<0.00010	0.00142	0.0357	<0.00010	<0.000050	0.012	0.0000062	30.4	0.000085	12.5	0.00134	0.00037	0.00187
Nelson River Upstream #4	US-4	L2338353-4	27-Aug-19	13:45	115	0.598	<0.00010	0.00133	0.0353	<0.00010	<0.000050	0.042	0.0000065	27.0	0.000083	12.4	0.00127	0.00035	0.00184
Nelson River Upstream #5	US-5	L2338353-5	27-Aug-19	14:20	136	0.737	<0.00010	0.00148	0.0365	<0.00010	<0.000050	0.013	0.0000107	31.4	0.000091	12.6	0.00159	0.00039	0.00194
Stephens Lake - Near-field #1	NF-1	L2339792-8	31-Aug-19	11:28	131	0.624	<0.00010	0.00141	0.0358	<0.00010	<0.000050	0.024	0.0000073	30.5	0.000078	12.9	0.00152	0.00035	0.00176
Stephens Lake - Near-field #2	NF-2	L2339792-9	31-Aug-19	12:10	129	0.512	<0.00010	0.00139	0.0352	<0.00010	<0.000050	0.025	<0.0000050	30.2	0.000062	13.2	0.00135	0.00031	0.00172
Stephens Lake - Near-field #3	NF-3	L2339792-10	31-Aug-19	11:45	131	0.642	<0.00010	0.00144	0.0357	<0.00010	<0.000050	0.025	<0.0000050	30.3	0.000076	13.1	0.00147	0.00035	0.00182
Stephens Lake - Near-field #4	NF-4	L2339792-11	31-Aug-19	12:25	131	0.365	<0.00010	0.00138	0.0341	<0.00010	<0.000050	0.025	0.0000056	30.6	0.000047	13.1	0.00127	0.00028	0.00171
Stephens Lake - Near-field #5	NF-5	L2339792-12	31-Aug-19	11:05	131	0.564	<0.00010	0.00146	0.0357	<0.00010	<0.000050	0.026	0.0000060	30.8	0.000064	13.3	0.00180	0.00031	0.00174
Stephens Lake - Far-field #1	FF-1	L2339792-1	31-Aug-19	8:37	128	0.654	<0.00010	0.00138	0.0341	<0.00010	<0.000050	0.023	0.0000066	30.0	0.000074	12.5	0.00193	0.00034	0.00191
Stephens Lake - Far-field #2	FF-2	L2339792-2	31-Aug-19	9:29	125	0.602	<0.00010	0.00135	0.0338	<0.00010	<0.000050	0.024	0.0000053	29.4	0.000070	12.4	0.00378	0.00037	0.00179
Stephens Lake - Far-field #6	FF-6	L2339792-3	31-Aug-19	10:05	124	0.463	<0.00010	0.00130	0.0328	<0.00010	<0.000050	0.024	0.0000077	28.9	0.000052	12.4	0.00164	0.00032	0.00172
Stephens Lake - Far-field #4	FF-4	L2339792-4	31-Aug-19	9:50	124	0.398	<0.00010	0.00131	0.0323	<0.00010	<0.000050	0.024	0.0000052	29.5	0.000047	12.3	0.00352	0.00030	0.00166
Stephens Lake - Far-field #5	FF-5	L2339792-5	31-Aug-19	9:01	124	0.663	<0.00010	0.00135	0.0337	<0.00010	<0.000050	0.024	0.0000086	29.0	0.000077	12.4	0.00160	0.00032	0.00180

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in bold exceed the benchmark. Results in blue italics are considered suspect (continued).

Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Hardness (as $CaCO_3$) (mg/L)	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Bismuth (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Cesium (mg/L)	Chloride (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)
Detection Limit 2019					**0.20**	**0.0030**	**0.00010**	**0.00010**	**0.00010**	**0.00010**	**0.000050**	**0.010**	**0.0000050**	**0.050**	**0.000010**	**0.10**	**0.00010**	**0.00010**	**0.00050**
Clark Lake #1	CL-1	L2347794-1	15-Sep-19	9:52	122	0.593	<0.00010	0.00117	0.0332	<0.00010	<0.000050	0.027	<0.0000050	28.9	0.000077	10.8	0.00116	0.00031	0.00176
Clark Lake #2	CL-2	L2347794-2	15-Sep-19	10:42	119	0.599	<0.00010	0.00116	0.0326	<0.00010	<0.000050	0.020	<0.0000050	27.9	0.000082	10.2	0.00121	0.00033	0.00170
Clark Lake #3	CL-3	L2347794-3	15-Sep-19	11:00	122	0.587	<0.00010	0.00118	0.0340	<0.00010	<0.000050	0.021	<0.0000050	28.8	0.000076	10.4	0.00111	0.00030	0.00168
Clark Lake #4	CL-4	L2347794-4	15-Sep-19	10:26	118	0.629	<0.00010	0.00115	0.0321	<0.00010	<0.000050	0.020	<0.0000050	27.9	0.000078	9.48	0.00129	0.00032	0.00178
Clark Lake #5	CL-5	L2347794-5	15-Sep-19	10:12	118	0.655	<0.00010	0.00113	0.0323	<0.00010	<0.000050	0.020	<0.0000050	27.5	0.000085	9.56	0.00126	0.00032	0.00172
Nelson River Upstream #1	US-1	L2350077-1	16-Sep-19	13:50	120	0.558	<0.00010	0.00105	0.0322	<0.00010	<0.000050	0.020	0.0000104	29.5	0.000071	11.8	0.00115	0.00028	0.00157
Nelson River Upstream #2	US-2	L2350077-2,-6,-7	16-Sep-19	13:50	115	0.607	<0.00010	0.00109	0.0326	<0.00010	<0.000050	0.020	0.0000084	27.9	0.000071	11.9	0.00121	0.00030	0.00171
Nelson River Upstream #3	US-3	L2350077-3	16-Sep-19	14:30	117	0.494	<0.00010	0.00106	0.0317	<0.00010	<0.000050	0.020	0.0000074	28.4	0.000058	11.9	0.00088	0.00028	0.00152
Nelson River Upstream #4	US-4	L2350077-4	16-Sep-19	14:11	119	0.573	<0.00010	0.00111	0.0324	<0.00010	<0.000050	0.020	0.0000084	29.0	0.000078	11.9	0.00157	0.00030	0.00157
Nelson River Upstream #5	US-5	L2350077-5	16-Sep-19	14:46	117	0.580	<0.00010	0.00111	0.0319	<0.00010	<0.000050	0.019	<0.0000050	27.9	0.000061	11.8	0.00115	0.00029	0.00156
Stephens Lake - Near-field #1	NF-1	L2350076-1	00-Jan-00	9:40	119	0.585	<0.00010	0.00104	0.0329	<0.00010	<0.000050	0.021	0.0000089	29.5	0.000071	11.8	0.00111	0.00027	0.00159
Stephens Lake - Near-field #2	NF-2	L2350076-2	17-Sep-19	10:32	118	0.384	<0.00010	0.00106	0.0313	<0.00010	<0.000050	0.021	0.0000071	29.1	0.000046	12.1	0.00077	0.00024	0.00147
Stephens Lake - Near-field #3	NF-3	L2350076-3	17-Sep-19	10:04	120	0.439	<0.00010	0.00103	0.0318	<0.00010	<0.000050	0.021	<0.0000050	29.3	0.000053	11.8	0.00080	0.00025	0.00146
Stephens Lake - Near-field #4	NF-4	L2350076-4	17-Sep-19	10:52	119	0.470	<0.00010	0.00108	0.0317	<0.00010	<0.000050	0.020	0.0000051	29.0	0.000059	12.0	0.00128	0.00025	0.00150
Stephens Lake - Near-field #5	NF-5	L2350076-5	17-Sep-19	9:18	118	0.346	<0.00010	0.00106	0.0308	<0.00010	<0.000050	0.020	0.0000061	28.9	0.000043	11.9	0.00099	0.00023	0.00150
Stephens Lake - Far-field #1	FF-1	L2350240-1	18-Sep-19	7:35	117	0.179	<0.00010	0.00108	0.0295	<0.00010	<0.000050	0.020	0.0000069	29.1	0.000017	10.7	0.00053	0.00018	0.00148
Stephens Lake - Far-field #2	FF-2	L2350240-2	18-Sep-19	8:17	119	0.182	<0.00010	0.00104	0.0297	<0.00010	<0.000050	0.019	<0.0000050	29.2	0.000022	12.2	0.00053	0.00018	0.00136
Stephens Lake - Far-field #3	FF-3	L2350240-3	18-Sep-19	8:53	117	0.368	<0.00010	0.00113	0.0311	<0.00010	<0.000050	0.019	<0.0000050	29.0	0.000045	10.7	0.00075	0.00021	0.00159
Stephens Lake - Far-field #4	FF-4	L2350240-4	18-Sep-19	8:36	124	0.275	<0.00010	0.00106	0.0303	<0.00010	<0.000050	0.021	<0.0000050	32.0	0.000036	10.6	0.00078	0.00019	0.00150
Stephens Lake - Far-field #5	FF-5	L2350240-5	18-Sep-19	8:01	122	0.169	<0.00010	0.00107	0.0295	<0.00010	<0.000050	0.021	<0.0000050	31.1	0.000025	10.7	0.00051	0.00016	0.00137

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in bold exceed the benchmark. Results in blue italics are considered suspect (continued).

Sample Location	Site ID	ALS Sample ID	Sample Date	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Rubidium (mg/L)	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Sodium (mg/L)
Detection Limit 2019				**0.010**	**0.000050**	**0.0010**	**0.0050**	**0.00010**	**0.00000050**	**0.000050**	**0.00050**	**0.030**	**0.05**	**0.00020**	**0.000050**	**0.10**	**0.000010**	**0.050**
Split Lake #10	SPL-10	L2251830-1	31-Mar-19	0.498	0.000219	0.0085	11.1	0.0144	0.00000064	0.000464	0.00142	<0.030	2.22	0.00225	0.000098	1.93	<0.000010	12.4
Split Lake #11	SPL-11	L2251830-2	31-Mar-19	0.338	0.000176	0.0086	11.1	0.0135	0.00000128	0.000447	0.00126	<0.030	2.20	0.00192	0.000110	1.53	<0.000010	13.0
Split Lake #12	SPL-12	L2251830-3	31-Mar-19	0.365	0.000166	0.0097	12.6	0.0136	<0.00000050	0.000539	0.00134	<0.030	2.50	0.00208	0.000107	1.54	<0.000010	15.7
Split Lake #13	SPL-13	L2251830-4	31-Mar-19	0.346	0.000175	0.0084	11.3	0.0137	0.00000069	0.000421	0.00128	<0.030	2.21	0.00193	0.000121	1.56	<0.000010	13.1
Split Lake #14	SPL-14	L2251830-5	31-Mar-19	0.421	0.000173	0.0110	13.9	0.0138	0.00000066	0.000650	0.00135	<0.030	2.71	0.00219	0.000129	1.68	<0.000010	17.6
Nelson River Upstream #6	US-6	L2254087-8	3-Apr-19	0.425	0.000175	0.0106	14.8	0.0135	0.00000083	0.000619	0.00136	<0.030	2.88	0.00216	0.000144	1.69	<0.000010	17.8
Nelson River Upstream #7	US-7	L2254087-9	3-Apr-19	0.395	0.000182	0.0108	14.2	0.0132	0.00000085	0.000587	0.00148	<0.030	2.68	0.00210	0.000115	1.64	<0.000010	17.2
Nelson River Upstream #8	US-8	L2254087-10	3-Apr-19	0.418	0.000324*	0.0108	14.2	0.0132	0.00000072	0.000592	0.00131	<0.030	2.67	0.00219	0.000148	1.71	<0.000010	17.3
Nelson River Upstream #9	US-9	L2254087-11	3-Apr-19	0.410	0.000191	0.0106	14.9	0.0136	0.00000068	0.000598	0.00136	<0.030	2.94	0.00232	0.000114	1.71	<0.000010	18.4
Nelson River Upstream #10	US-10	L2254087-12	3-Apr-19	0.400	0.000186	0.0105	14.5	0.0132	0.00000074	0.000588	0.00134	<0.030	2.68	0.00220	0.000114	1.63	<0.000010	17.2
Stephens Lake - Near-field #1	NF-1	L2254087-1	3-Apr-19	0.404	0.000170	0.0102	13.4	0.0131	0.00000076	0.000606	0.00129	<0.030	2.68	0.00213	0.000106	1.69	<0.000010	17.0
Stephens Lake - Near-field #2	NF-2	L2254087-2	3-Apr-19	0.415	0.000190	0.0103	13.8	0.0131	0.00000063	0.000637	0.00133	<0.030	2.71	0.00217	0.000142	1.69	<0.000010	16.8
Stephens Lake - Near-field #3	NF-3	L2254087-3	3-Apr-19	0.377	0.000215	0.0102	13.6	0.0130	0.00000071	0.000644	0.00128	<0.030	2.78	0.00201	0.000112	1.54	<0.000010	16.9
Stephens Lake - Near-field #4	NF-4	L2254087-4	3-Apr-19	0.416	0.000175	0.0103	13.8	0.0130	0.00000070	0.000621	0.00134	<0.030	2.75	0.00227	0.000090	1.76	<0.000010	17.0
Stephens Lake - Near-field #5	NF-5	L2254087-5	3-Apr-19	0.363	0.000165	0.0105	14.3	0.0127	0.00000062	0.000594	0.00125	<0.030	2.56	0.00208	0.000157	1.50	<0.000010	17.1
Stephens Lake - Far-field #1	FF-1	L2254658-1,-6,-7	5-Apr-19	0.415	0.000196	0.0106	13.5	0.0123	0.00000098	0.000632	0.00136	<0.030	2.60	0.00215	0.000118	1.72	<0.000010	17.0
Stephens Lake - Far-field #2	FF-2	L2254658-2	5-Apr-19	0.384	0.000183	0.0108	13.8	0.0127	0.00000153	0.000604	0.00131	<0.030	2.59	0.00214	0.000119	1.65	<0.000010	17.5
Stephens Lake - Far-field #3	FF-3	L2254658-3	5-Apr-19	0.343	0.000170	0.0103	13.6	0.0123	0.00000117	0.000615	0.00125	<0.030	2.57	0.00196	0.000122	1.50	<0.000010	17.0
Stephens Lake - Far-field #4	FF-4	L2254658-4	5-Apr-19	0.353	0.000172	0.0104	13.8	0.0123	0.00000149	0.000597	0.00127	<0.030	2.58	0.00204	0.000118	1.54	<0.000010	17.3
Stephens Lake - Far-field #5	FF-5	L2254658-5	5-Apr-19	0.340	0.000162	0.0102	13.7	0.0121	0.00000110	0.000580	0.00129	<0.030	2.55	0.00206	0.000112	1.47	<0.000010	17.2
Clark Lake #1	CL-1	L2297681-1	24-Jun-19	0.470	0.000279	0.0087	12.0	0.0151	0.00000085	0.000481	0.00146	0.032	2.41	0.00209	0.000086	1.71	<0.000010	13.8
Clark Lake #2	CL-2	L2297681-2	24-Jun-19	0.568	0.000315	0.0088	11.7	0.0151	0.00000080	0.000503	0.00153	0.034	2.37	0.00238	0.000098	2.01	<0.000010	13.6
Clark Lake #3	CL-3	L2297681-3	24-Jun-19	0.570	0.000287	0.0088	11.7	0.0150	0.00000082	0.000511	0.00154	0.032	2.34	0.00231	0.000104	1.98	<0.000010	13.8
Clark Lake #4	CL-4	L2297681-4	24-Jun-19	0.564	0.000298	0.0087	11.5	0.0155	0.00000076	0.000486	0.00153	0.033	2.39	0.00239	0.000090	1.86	<0.000010	13.3
Clark Lake #5	CL-5	L2297681-5	24-Jun-19	0.406	0.000252	0.0083	11.2	0.0138	0.00000074	0.000425	0.00131	<0.030	2.26	0.00199	0.000103	1.61	<0.000010	12.7
Nelson River Upstream #1	US-1	L2299234-1	25-Jun-19	0.608	0.000271	0.0084	12.2	0.0152	0.00000089	0.000495	0.00153	0.032	2.24	0.00250	0.000093	1.98	<0.000010	13.6
Nelson River Upstream #2	US-2	L2299234-2,-6,-7	25-Jun-19	0.614	0.000287	0.0087	12.5	0.0164	0.00000087	0.000515	0.00156	<0.030	2.31	0.00252	0.000106	1.97	<0.000010	14.0
Nelson River Upstream #3	US-3	L2299234-3	25-Jun-19	0.585	0.000271	0.0087	12.4	0.0160	0.00000089	0.000484	0.00154	<0.030	2.28	0.00250	0.000067	1.91	<0.000010	13.9
Nelson River Upstream #4	US-4	L2299234-4	25-Jun-19	0.600	0.000276	0.0087	12.2	0.0150	0.00000083	0.000555	0.00158	0.036	2.30	0.00256	0.000114	2.09	<0.000010	13.8
Nelson River Upstream #5	US-5	L2299234-5	25-Jun-19	0.613	0.000266	0.0088	12.7	0.0151	0.00000089	0.000522	0.00156	0.034	2.35	0.00258	0.000104	2.02	<0.000010	14.4
Stephens Lake - Near-field #1	NF-1	L2299712-8	26-Jun-19	0.549	0.000254	0.0086	11.3	0.0129	0.00000082	0.000511	0.00161	0.031	2.33	0.00229	0.000083	1.83	<0.000010	13.3
Stephens Lake - Near-field #2	NF-2	L2299712-9	26-Jun-19	0.559	0.000259	0.0085	11.5	0.0132	0.00000084	0.000517	0.00146	0.036	2.37	0.00224	0.000108	1.88	<0.000010	13.6
Stephens Lake - Near-field #3	NF-3	L2299712-10	26-Jun-19	0.570	0.000259	0.0087	11.6	0.0127	0.00000080	0.000545	0.00144	0.031	2.35	0.00237	0.000081	1.93	<0.000010	13.5
Stephens Lake - Near-field #4	NF-4	L2299712-11	26-Jun-19	0.634	0.000493	0.0085	11.7	0.0165	0.00000085	0.000519	0.00169	0.067	2.39	0.00249	0.000147	1.98	<0.000010	13.9
Stephens Lake - Near-field #5	NF-5	L2299712-12	26-Jun-19	0.541	0.000250	0.0084	11.1	0.0128	0.00000084	0.000515	0.00145	0.032	2.32	0.00240	0.000102	1.80	<0.000010	13.2
Stephens Lake - Far-field #1	FF-1	L2299712-1	26-Jun-19	0.462	0.000262	0.0073	9.66	0.0107	0.00000072	0.000499	0.00134	<0.030	2.23	0.00228	0.000093	1.57	<0.000010	11.7
Stephens Lake - Far-field #2	FF-2	L2299712-2	26-Jun-19	0.482	0.000224	0.0075	9.52	0.0107	0.00000072	0.000533	0.00131	<0.030	2.24	0.00216	0.000104	1.71	<0.000010	11.9
Stephens Lake - Far-field #3	FF-3	L2299712-3	26-Jun-19	0.477	0.000220	0.0076	9.74	0.0111	0.00000075	0.000531	0.00130	<0.030	2.28	0.00229	0.000111	1.65	<0.000010	12.3
Stephens Lake - Far-field #4	FF-4	L2299712-4	26-Jun-19	0.479	0.000228	0.0074	9.77	0.0115	0.00000076	0.000526	0.00132	<0.030	2.29	0.00224	0.000103	1.64	<0.000010	12.4
Stephens Lake - Far-field #5	FF-5	L2299712-5	26-Jun-19	0.489	0.000243	0.0075	9.60	0.0111	0.00000080	0.000529	0.00136	<0.030	2.27	0.00224	0.000114	1.70	<0.000010	12.3

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in bold exceed the benchmark. Results in blue italics are considered suspect (continued).

Sample Location	Site ID	ALS Sample ID	Sample Date	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Rubidium (mg/L)	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Sodium (mg/L)
Detection Limit 2019				**0.010**	**0.000050**	**0.0010**	**0.0050**	**0.00010**	**0.00000050**	**0.000050**	**0.00050**	**0.030**	**0.05**	**0.00020**	**0.000050**	**0.10**	**0.000010**	**0.050**
Clark Lake #1	CL-1	L2314002-1	21-Jul-19	0.774	0.000372	0.0096	12.4	0.0206	0.00000084	0.000579	0.00184	0.040	2.47	0.00301	0.000097	2.67	<0.000010	14.4
Clark Lake #2	CL-2	L2314002-2	21-Jul-19	0.744	0.000333	0.0098	12.4	0.0200	0.00000087	0.000600	0.00177	0.039	2.50	0.00283	0.000102	2.55	<0.000010	14.7
Clark Lake #3	CL-3	L2314002-3	21-Jul-19	0.711	0.000325	0.0099	12.9	0.0198	0.00000077	0.000570	0.00175	0.038	2.57	0.00283	0.000118	2.49	<0.000010	15.4
Clark Lake #4	CL-4	L2314002-4	21-Jul-19	0.684	0.000321	0.0098	12.8	0.0194	0.00000086	0.000564	0.00175	0.035	2.55	0.00279	0.000118	2.42	<0.000010	14.9
Clark Lake #5	CL-5	L2314002-5	21-Jul-19	0.787	0.000364	0.0092	12.0	0.0206	0.00000098	0.000532	0.00190	0.043	2.42	0.00309	0.000104	2.68	<0.000010	13.6
Nelson River Upstream #1	US-1	L2314964-1	22-Jul-19	0.481	0.000278	0.0088	12.0	0.0180	0.00000083	0.000479	0.00157	<0.030	2.58	0.00222	0.000099	1.82	<0.000010	14.1
Nelson River Upstream #2	US-2	L2314964-2	22-Jul-19	0.591	0.000283	0.0094	12.8	0.0187	0.00000080	0.000546	0.00147	0.032	2.49	0.00255	0.000103	2.11	<0.000010	15.5
Nelson River Upstream #3	US-3	L2314964-3	22-Jul-19	0.843	0.000350	0.0094	12.4	0.0210	0.00000082	0.000595	0.00179	0.040	2.66	0.00311	0.000123	2.84	<0.000010	14.6
Nelson River Upstream #4	US-4	L2314964-4,-6,-7	22-Jul-19	0.672	0.000315	0.0090	12.2	0.0193	0.00000078	0.000551	0.00166	0.035	2.63	0.00276	0.000101	2.37	<0.000010	14.2
Nelson River Upstream #5	US-5	L2314964-5	22-Jul-19	0.442	0.000267	0.0086	12.8	0.0183	0.00000076	0.000519	0.00137	0.033	2.57	0.00218	0.000112	1.72	<0.000010	14.9
Stephens Lake - Near-field #1	NF-1	L2315689-1	23-Jul-19	0.572	0.000282	0.0094	12.8	0.0155	0.00000079	0.000524	0.00159	<0.030	2.48	0.00261	0.000089	2.16	<0.000010	14.8
Stephens Lake - Near-field #2	NF-2	L2315689-2	23-Jul-19	0.573	0.000254	0.0095	12.9	0.0147	0.00000067	0.000540	0.00152	0.031	2.51	0.00259	0.000092	2.26	<0.000010	14.9
Stephens Lake - Near-field #3	NF-3	L2315689-3	23-Jul-19	0.353	0.000218	0.0090	12.5	0.0136	0.00000075	0.000463	0.00140	<0.030	2.39	0.00208	0.000104	1.48	<0.000010	14.5
Stephens Lake - Near-field #4	NF-4	L2315689-4	23-Jul-19	0.395	0.000225	0.0090	12.5	0.0144	0.00000074	0.000474	0.00134	0.031	2.42	0.00216	0.000099	1.62	<0.000010	14.5
Stephens Lake - Near-field #5	NF-5	L2315689-5	23-Jul-19	0.640	0.000271	0.0095	12.7	0.0156	0.00000070	0.000562	0.00153	<0.030	2.64	0.00280	0.000116	2.40	<0.000010	14.7
Stephens Lake - Far-field #1	FF-1	L2315689-6	23-Jul-19	0.457	0.000228	0.0086	11.8	0.0122	0.00000066	0.000514	0.00137	<0.030	2.28	0.00233	0.000113	2.03	<0.000010	13.8
Stephens Lake - Far-field #2	FF-2	L2315689-7	23-Jul-19	0.383	0.000186	0.0088	12.0	0.0113	0.00000071	0.000532	0.00126	<0.030	2.26	0.00206	0.000102	1.80	<0.000010	13.7
Stephens Lake - Far-field #3	FF-3	L2315689-8	23-Jul-19	0.834*	0.000298	0.0094	12.2	0.0151	0.00000065	0.000656	0.00177	0.034	2.66	0.00314*	0.000093	3.04*	<0.000010	13.9
Stephens Lake - Far-field #4	FF-4	L2315689-9	23-Jul-19	0.390	0.000199	0.0090	12.0	0.0116	0.00000067	0.000479	0.00129	<0.030	2.30	0.00212	0.000089	1.75	<0.000010	14.3
Stephens Lake - Far-field #5	FF-5	L2315689-10	23-Jul-19	0.310	0.000167	0.0087	11.8	0.0111	0.00000067	0.000462	0.00117	<0.030	2.14	0.00187	0.000083	1.54	<0.000010	13.9
Clark Lake #1	CL-1	L2335547-1	25-Aug-19	0.688	0.000309	0.0096	12.9	0.0197	0.00000080	0.000576	0.00160	0.042	2.46	0.00280	0.000102	2.89	<0.000010	14.6
Clark Lake #2	CL-2	L2335547-2	25-Aug-19	0.657	0.000308	0.0096	12.9	0.0193	0.00000068	0.000548	0.00161	0.039	2.45	0.00276	0.000098	2.81	<0.000010	14.4
Clark Lake #3	CL-3	L2335547-3	25-Aug-19	0.680	0.000311	0.0096	12.8	0.0193	0.00000062	0.000571	0.00166	0.037	2.45	0.00287	0.000091	2.90	<0.000010	14.4
Clark Lake #4	CL-4	L2335547-4	25-Aug-19	0.690	0.000326	0.0097	12.8	0.0199	0.00000067	0.000566	0.00164	0.043	2.47	0.00279	0.000104	2.81	<0.000010	14.4
Clark Lake #5	CL-5	L2335547-5	25-Aug-19	0.669	0.000372	0.0081	11.3	0.0200	0.00000066	0.000579	0.00155	0.043	2.29	0.00283	0.000143	2.63	<0.000010	14.0
Nelson River Upstream #1	US-1	L2338353-1	27-Aug-19	0.770	0.000352	0.0099	13.5	0.0216	0.00000083	0.000562	0.00194	0.044	2.39	0.00297	0.000117	3.03	<0.000010	14.2
Nelson River Upstream #2	US-2	L2338353-2,-6,-7	27-Aug-19	0.573	0.000318	0.0099	13.8	0.0216	0.00000069	0.000547	0.00173	0.035	2.33	0.00248	0.000125	2.44	<0.000010	14.5
Nelson River Upstream #3	US-3	L2338353-3	27-Aug-19	0.747	0.000341	0.0100	13.7	0.0214	0.00000068	0.000602	0.00185	0.038	2.39	0.00298	0.000144	3.00	<0.000010	14.2
Nelson River Upstream #4	US-4	L2338353-4	27-Aug-19	0.642	0.000346	0.0077	11.5	0.0212	0.00000080	0.000593	0.00160	0.043	2.30	0.00263	0.000093	2.69	<0.000010	14.4
Nelson River Upstream #5	US-5	L2338353-5	27-Aug-19	0.783	0.000400	0.0101	13.9	0.0229	0.00000073	0.000615	0.00223	0.046	2.45	0.00293	0.000115	3.03	<0.000010	14.4
Stephens Lake - Near-field #1	NF-1	L2339792-8	31-Aug-19	0.644	0.000294	0.0106	13.3	0.0196	0.00000056	0.000644	0.00294	0.041	2.50	0.00262	0.000121	2.85	<0.000010	15.1
Stephens Lake - Near-field #2	NF-2	L2339792-9	31-Aug-19	0.564	0.000272	0.0106	13.1	0.0179	0.00000053	0.000631	0.00236	0.039	2.43	0.00244	0.000117	2.64	<0.000010	14.9
Stephens Lake - Near-field #3	NF-3	L2339792-10	31-Aug-19	0.666	0.000305	0.0104	13.5	0.0197	0.00000052	0.000609	0.00221	0.050	2.48	0.00267	0.000110	2.90	<0.000010	15.1
Stephens Lake - Near-field #4	NF-4	L2339792-11	31-Aug-19	0.451	0.000250	0.0102	13.2	0.0180	0.00000053	0.000583	0.00225	0.044	2.39	0.00215	0.000077	2.28	<0.000010	15.1
Stephens Lake - Near-field #5	NF-5	L2339792-12	31-Aug-19	0.598	0.000287	0.0106	13.2	0.0182	<0.00000050	0.000681	0.00241	0.045	2.47	0.00260	0.000102	2.78	<0.000010	14.9
Stephens Lake - Far-field #1	FF-1	L2339792-1	31-Aug-19	0.658	0.000315	0.0097	12.9	0.0179	0.00000058	0.000639	0.00260	0.036	2.47	0.00274	0.000099	2.85	<0.000010	14.5
Stephens Lake - Far-field #2	FF-2	L2339792-2	31-Aug-19	0.640	0.000296	0.0101	12.5	0.0179	0.00000053	0.000890	0.00452*	0.044	2.40	0.00258	0.000100	2.78	<0.000010	13.9
Stephens Lake - Far-field #6	FF-6	L2339792-3	31-Aug-19	0.515	0.000278	0.0098	12.5	0.0170	0.00000057	0.000608	0.00296	0.045	2.34	0.00240	0.000095	2.46	<0.000010	14.3
Stephens Lake - Far-field #4	FF-4	L2339792-4	31-Aug-19	0.471	0.000255	0.0097	12.2	0.0166	0.00000055	0.000761	0.00278	0.042	2.33	0.00216	0.000079	2.30	<0.000010	13.8
Stephens Lake - Far-field #5	FF-5	L2339792-5	31-Aug-19	0.661	0.000297	0.0100	12.5	0.0172	0.00000052	0.000612	0.00205	0.045	2.39	0.00264	0.000112	2.82	<0.000010	14.0

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in bold exceed the benchmark. Results in blue italics are considered suspect (continued).

Sample Location	Site ID	ALS Sample ID	Sample Date	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Rubidium (mg/L)	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Sodium (mg/L)
Detection Limit 2019				**0.010**	**0.000050**	**0.0010**	**0.0050**	**0.00010**	**0.00000050**	**0.000050**	**0.00050**	**0.030**	**0.05**	**0.00020**	**0.000050**	**0.10**	**0.000010**	**0.050**
Clark Lake #1	CL-1	L2347794-1	15-Sep-19	0.635	0.000292	0.0087	12.1	0.0175	0.00000058	0.000547	0.00153	0.038	2.33	0.00254	0.000105	2.72	<0.000010	13.0
Clark Lake #2	CL-2	L2347794-2	15-Sep-19	0.670	0.000287	0.0085	11.9	0.0176	0.00000056	0.000459	0.00164	0.038	2.24	0.00260	0.000105	2.73	<0.000010	12.6
Clark Lake #3	CL-3	L2347794-3	15-Sep-19	0.638	0.000272	0.0086	12.3	0.0167	0.00000052	0.000519	0.00157	0.031	2.32	0.00251	0.000144	2.70	<0.000010	13.1
Clark Lake #4	CL-4	L2347794-4	15-Sep-19	0.686	0.000312	0.0083	11.6	0.0177	0.00000057	0.000482	0.00156	0.035	2.20	0.00259	0.000121	2.78	<0.000010	12.3
Clark Lake #5	CL-5	L2347794-5	15-Sep-19	0.701	0.000298	0.0083	11.9	0.0180	0.00000058	0.000474	0.00161	0.033	2.24	0.00265	0.000130	2.80	<0.000010	12.8
Nelson River Upstream #1	US-1	L2350077-1	16-Sep-19	0.550	0.000315	0.0084	11.2	0.0162	0.00000058	0.000517	0.00169	0.032	2.34	0.00224	<0.000050	2.83	<0.000010	12.4
Nelson River Upstream #2	US-2	L2350077-2,-6,-7	16-Sep-19	0.619	0.000271	0.0082	11.1	0.0170	0.00000057	*0.0141*	0.00153	0.037	2.35	0.00232	0.000075	2.93	<0.000010	12.5
Nelson River Upstream #3	US-3	L2350077-3	16-Sep-19	0.528	0.000261	0.0082	11.1	0.0164	0.00000057	0.000462	0.00128	<0.030	2.29	0.00224	0.000063	2.77	<0.000010	12.2
Nelson River Upstream #4	US-4	L2350077-4	16-Sep-19	0.562	0.000272	0.0083	11.3	0.0165	0.00000057	0.000535	0.00195	0.032	2.34	0.00216	0.000079	3.10	<0.000010	12.6
Nelson River Upstream #5	US-5	L2350077-5	16-Sep-19	0.564	0.000247	0.0081	11.4	0.0170	0.00000057	0.000494	0.00158	0.031	2.33	0.00240	<0.000050	2.87	<0.000010	12.7
Stephens Lake - Near-field #1	NF-1	L2350076-1	00-Jan-00	0.582	0.000268	0.0084	11.1	0.0163	0.00000061	0.00113	0.00166	0.033	2.35	0.00236	0.000055	3.11	<0.000010	12.2
Stephens Lake - Near-field #2	NF-2	L2350076-2	17-Sep-19	0.398	0.000217	0.0080	11.1	0.0145	0.00000063	0.000467	0.00132	<0.030	2.33	0.00197	<0.000050	2.59	<0.000010	12.5
Stephens Lake - Near-field #3	NF-3	L2350076-3	17-Sep-19	0.445	0.000230	0.0081	11.3	0.0152	0.00000062	0.000475	0.00120	0.033	2.31	0.00226	0.000068	2.77	<0.000010	12.5
Stephens Lake - Near-field #4	NF-4	L2350076-4	17-Sep-19	0.448	0.000222	0.0081	11.3	0.0153	0.00000059	0.000532	0.00146	<0.030	2.34	0.00206	0.000067	2.67	<0.000010	12.7
Stephens Lake - Near-field #5	NF-5	L2350076-5	17-Sep-19	0.387	0.000235	0.0080	11.2	0.0156	0.00000062	0.00121	0.00152	<0.030	2.28	0.00182	0.000079	2.48	<0.000010	12.5
Stephens Lake - Far-field #1	FF-1	L2350240-1	18-Sep-19	0.240	0.000193	0.0083	10.8	0.0117	0.00000062	0.000975	0.00135	<0.030	2.21	0.00161	0.000065	1.96	<0.000010	12.3
Stephens Lake - Far-field #2	FF-2	L2350240-2	18-Sep-19	0.248	0.000191	0.0082	11.3	0.0118	0.00000058	0.000473	0.00127	<0.030	2.29	0.00170	0.000079	1.89	<0.000010	12.8
Stephens Lake - Far-field #3	FF-3	L2350240-3	18-Sep-19	0.400	0.000229	0.0085	10.8	0.0122	0.00000053	0.000568	0.00170	<0.030	2.30	0.00199	0.000058	2.33	<0.000010	12.8
Stephens Lake - Far-field #4	FF-4	L2350240-4	18-Sep-19	0.334	0.000235	0.0089	10.7	0.0127	0.00000051	0.000609	0.00145	<0.030	2.27	0.00178	0.000091	2.15	<0.000010	12.6
Stephens Lake - Far-field #5	FF-5	L2350240-5	18-Sep-19	0.234	0.000205	0.0088	10.8	0.0112	0.00000051	0.000542	0.00122	<0.030	2.24	0.00158	0.000076	1.91	<0.000010	12.7

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2010. Values in bold exceed the benchmark. Results in blue italics are considered suspect (continued).

Sample Location	Site ID	ALS Sample ID	Sample Date	Strontium (mg/L)	Sulfate (mg/L)	Sulfur (mg/L)	Tellurium (mg/L)	Thallium (mg/L)	Thorium (mg/L)	Tin (mg/L)	Titanium (mg/L)	Tungsten (mg/L)	Uranium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)	Zirconium (mg/L)
Detection Limit 2019				**0.00020**	**0.30**	**0.50**	**0.00020**	**0.000010**	**0.00010**	**0.00010**	**0.00030**	**0.00010**	**0.000010**	**0.00050**	**0.0030**	**0.000060**
Split Lake #10	SPL-10	L2251830-1	31-Mar-19	0.0858	24.0	7.86	<0.00020	<0.000010	0.00013	<0.00010	0.0199	<0.00010	0.000518	0.00132	<0.0030	0.000451
Split Lake #11	SPL-11	L2251830-2	31-Mar-19	0.0897	24.5	8.27	<0.00020	<0.000010	0.00011	<0.00010	0.0124	<0.00010	0.000509	0.00114	<0.0030	0.000428
Split Lake #12	SPL-12	L2251830-3	31-Mar-19	0.101	30.8	9.95	<0.00020	<0.000010	<0.00010	<0.00010	0.0134	<0.00010	0.000594	0.00124	<0.0030	0.000398
Split Lake #13	SPL-13	L2251830-4	31-Mar-19	0.0869	24.4	8.23	<0.00020	<0.000010	0.00010	<0.00010	0.0129	<0.00010	0.000508	0.00120	<0.0030	0.000417
Split Lake #14	SPL-14	L2251830-5	31-Mar-19	0.111	35.0	11.7	<0.00020	<0.000010	<0.00010	<0.00010	0.0170	<0.00010	0.000692	0.00142	<0.0030	0.000368
Nelson River Upstream #6	US-6	L2254087-8	3-Apr-19	0.115	34.9	11.3	<0.00020	<0.000010	<0.00010	<0.00010	0.0173	<0.00010	0.000683	0.00130	<0.0030	0.000378
Nelson River Upstream #7	US-7	L2254087-9	3-Apr-19	0.110	33.0	11.8	<0.00020	<0.000010	<0.00010	0.00011	0.0156	<0.00010	0.000678	0.00121	0.0034	0.000360
Nelson River Upstream #8	US-8	L2254087-10	3-Apr-19	0.110	34.6	11.8	<0.00020	<0.000010	<0.00010	<0.00010	0.0167	<0.00010	0.000661	0.00124	<0.0030	0.000368
Nelson River Upstream #9	US-9	L2254087-11	3-Apr-19	0.115	35.0	11.4	<0.00020	<0.000010	<0.00010	<0.00010	0.0167	<0.00010	0.000672	0.00128	0.0078	0.000373
Nelson River Upstream #10	US-10	L2254087-12	3-Apr-19	0.112	34.3	11.1	<0.00020	<0.000010	<0.00010	<0.00010	0.0162	<0.00010	0.000693	0.00125	<0.0030	0.000362
Stephens Lake - Near-field #1	NF-1	L2254087-1	3-Apr-19	0.110	33.8	11.6	<0.00020	<0.000010	<0.00010	<0.00010	0.0172	<0.00010	0.000691	0.00129	<0.0030	0.000394
Stephens Lake - Near-field #2	NF-2	L2254087-2	3-Apr-19	0.114	34.3	11.2	<0.00020	<0.000010	<0.00010	<0.00010	0.0174	<0.00010	0.000710	0.00138	<0.0030	0.000430
Stephens Lake - Near-field #3	NF-3	L2254087-3	3-Apr-19	0.116	34.5	11.4	<0.00020	<0.000010	<0.00010	<0.00010	0.0150	<0.00010	0.000700	0.00132	0.0033	0.000404
Stephens Lake - Near-field #4	NF-4	L2254087-4	3-Apr-19	0.113	34.4	11.3	<0.00020	<0.000010	<0.00010	<0.00010	0.0176	<0.00010	0.000676	0.00145	<0.0030	0.000403
Stephens Lake - Near-field #5	NF-5	L2254087-5	3-Apr-19	0.110	33.8	11.2	<0.00020	<0.000010	<0.00010	<0.00010	0.0141	<0.00010	0.000647	0.00113	<0.0030	0.000380
Stephens Lake - Far-field #1	FF-1	L2254658-1,-6,-7	5-Apr-19	0.109	33.4	11.4	<0.00020	<0.000010	<0.00010	<0.00010	0.0163	<0.00010	0.000692	0.00124	0.0036	0.000423
Stephens Lake - Far-field #2	FF-2	L2254658-2	5-Apr-19	0.106	33.6	11.7	<0.00020	<0.000010	<0.00010	0.00011	0.0147	<0.00010	0.000697	0.00121	0.0031	0.000382
Stephens Lake - Far-field #3	FF-3	L2254658-3	5-Apr-19	0.108	34.0	11.1	<0.00020	<0.000010	<0.00010	<0.00010	0.0137	<0.00010	0.000665	0.00114	<0.0030	0.000373
Stephens Lake - Far-field #4	FF-4	L2254658-4	5-Apr-19	0.110	33.2	11.6	<0.00020	<0.000010	<0.00010	<0.00010	0.0141	<0.00010	0.000679	0.00114	<0.0030	0.000381
Stephens Lake - Far-field #5	FF-5	L2254658-5	5-Apr-19	0.109	33.1	11.3	<0.00020	<0.000010	<0.00010	<0.00010	0.0133	<0.00010	0.000669	0.00114	<0.0030	0.000364
Clark Lake #1	CL-1	L2297681-1	24-Jun-19	0.0974	28.5	9.12	<0.00020	<0.000010	0.00014	<0.00010	0.0183	<0.00010	0.000576	0.00176	0.0033	0.00053
Clark Lake #2	CL-2	L2297681-2	24-Jun-19	0.0971	28.3	9.09	<0.00020	<0.000010	0.00017	<0.00010	0.0231	<0.00010	0.000564	0.00194	0.0040	0.00065
Clark Lake #3	CL-3	L2297681-3	24-Jun-19	0.0973	24.5	9.09	<0.00020	<0.000010	0.00015	<0.00010	0.0232	<0.00010	0.000557	0.00190	0.0053	0.00056
Clark Lake #4	CL-4	L2297681-4	24-Jun-19	0.0954	25.2	8.71	<0.00020	0.000010	0.00016	<0.00010	0.0229	<0.00010	0.000549	0.00197	0.0055	0.00057
Clark Lake #5	CL-5	L2297681-5	24-Jun-19	0.0941	25.3	8.63	<0.00020	<0.000010	0.00013	<0.00010	0.0156	<0.00010	0.000528	0.00160	<0.0030	0.00052
Nelson River Upstream #1	US-1	L2299234-1	25-Jun-19	0.0968	25.5	8.77	<0.00020	<0.000010	0.00016	<0.00010	0.0246	<0.00010	0.000511	0.00184	<0.0030	0.00055
Nelson River Upstream #2	US-2	L2299234-2,-6,-7	25-Jun-19	0.100	26.0	9.12	<0.00020	<0.000010	0.00016	<0.00010	0.0245	<0.00010	0.000535	0.00177	<0.0030	0.00055
Nelson River Upstream #3	US-3	L2299234-3	25-Jun-19	0.0979	25.6	9.00	<0.00020	<0.000010	0.00015	<0.00010	0.0236	<0.00010	0.000525	0.00174	<0.0030	0.00053
Nelson River Upstream #4	US-4	L2299234-4	25-Jun-19	0.102	25.8	9.00	<0.00020	<0.000010	0.00017	<0.00010	0.0247	<0.00010	0.000525	0.00176	<0.0030	0.00055
Nelson River Upstream #5	US-5	L2299234-5	25-Jun-19	0.101	24.9	8.99	<0.00020	0.000010	0.00016	<0.00010	0.0248	<0.00010	0.000536	0.00177	<0.0030	0.00055
Stephens Lake - Near-field #1	NF-1	L2299712-8	26-Jun-19	0.0920	26.6	8.82	<0.00020	0.000010	0.00015	<0.00010	0.0216	<0.00010	0.000561	0.00168	<0.0030	0.00051
Stephens Lake - Near-field #2	NF-2	L2299712-9	26-Jun-19	0.0960	27.5	8.95	<0.00020	<0.000010	0.00017	<0.00010	0.0227	<0.00010	0.000551	0.00166	0.0031	0.00053
Stephens Lake - Near-field #3	NF-3	L2299712-10	26-Jun-19	0.0931	26.6	9.00	<0.00020	<0.000010	0.00016	<0.00010	0.0228	<0.00010	0.000568	0.00177	<0.0030	0.00054
Stephens Lake - Near-field #4	NF-4	L2299712-11	26-Jun-19	0.107	26.8	8.82	<0.00020	0.000011	0.00019	<0.00010	0.0248	<0.00010	0.000577	0.00179	0.0105	0.00154
Stephens Lake - Near-field #5	NF-5	L2299712-12	26-Jun-19	0.0915	26.7	8.71	<0.00020	<0.000010	0.00014	<0.00010	0.0215	<0.00010	0.000566	0.00164	0.0038	0.00051
Stephens Lake - Far-field #1	FF-1	L2299712-1	26-Jun-19	0.0946	25.3	7.94	<0.00020	<0.000010	0.00014	<0.00010	0.0176	<0.00010	0.000511	0.00131	0.0045	0.00049
Stephens Lake - Far-field #2	FF-2	L2299712-2	26-Jun-19	0.0977	26.1	8.18	<0.00020	<0.000010	0.00014	<0.00010	0.0184	<0.00010	0.000522	0.00137	<0.0030	0.00050
Stephens Lake - Far-field #3	FF-3	L2299712-3	26-Jun-19	0.0983	24.2	8.06	<0.00020	<0.000010	0.00015	<0.00010	0.0183	<0.00010	0.000522	0.00139	<0.0030	0.00051
Stephens Lake - Far-field #4	FF-4	L2299712-4	26-Jun-19	0.0989	26.1	8.05	<0.00020	<0.000010	0.00014	<0.00010	0.0184	<0.00010	0.000516	0.00143	<0.0030	0.00049
Stephens Lake - Far-field #5	FF-5	L2299712-5	26-Jun-19	0.0957	26.0	8.11	<0.00020	<0.000010	0.00015	<0.00010	0.0190	<0.00010	0.000497	0.00146	<0.0030	0.00050

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in bold exceed the benchmark. Results in blue italics are considered suspect (continued).

Sample Location	Site ID	ALS Sample ID	Sample Date	Strontium (mg/L)	Sulfate (mg/L)	Sulfur (mg/L)	Tellurium (mg/L)	Thallium (mg/L)	Thorium (mg/L)	Tin (mg/L)	Titanium (mg/L)	Tungsten (mg/L)	Uranium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)	Zirconium (mg/L)
Detection Limit 2019				**0.00020**	**0.30**	**0.50**	**0.00020**	**0.000010**	**0.00010**	**0.00010**	**0.00030**	**0.00010**	**0.000010**	**0.00050**	**0.0030**	**0.000060**
Clark Lake #1	CL-1	L2314002-1	21-Jul-19	0.103	27.6	9.36	<0.00020	0.000014	0.00022	<0.00010	0.0323	<0.00010	0.000564	0.00210	<0.0030	0.00069
Clark Lake #2	CL-2	L2314002-2	21-Jul-19	0.106	29.5	9.43	<0.00020	0.000011	0.00020	<0.00010	0.0308	<0.00010	0.000603	0.00202	<0.0030	0.00063
Clark Lake #3	CL-3	L2314002-3	21-Jul-19	0.110	30.1	10.1	<0.00020	0.000012	0.00019	<0.00010	0.0292	<0.00010	0.000611	0.00206	<0.0030	0.00064
Clark Lake #4	CL-4	L2314002-4	21-Jul-19	0.107	30.6	9.83	<0.00020	0.000012	0.00019	<0.00010	0.0285	<0.00010	0.000574	0.00197	<0.0030	0.00058
Clark Lake #5	CL-5	L2314002-5	21-Jul-19	0.0982	26.4	8.91	<0.00020	0.000012	0.00022	<0.00010	0.0327	<0.00010	0.000533	0.00211	0.0049	0.00067
Nelson River Upstream #1	US-1	L2314964-1	22-Jul-19	0.109	28.4	9.96	<0.00020	<0.000010	0.00015	<0.00010	0.0173	<0.00010	0.000579	0.00164	<0.0030	0.00058
Nelson River Upstream #2	US-2	L2314964-2	22-Jul-19	0.111	29.7	10.3	<0.00020	<0.000010	0.00016	<0.00010	0.0229	<0.00010	0.000579	0.00171	<0.0030	0.00056
Nelson River Upstream #3	US-3	L2314964-3	22-Jul-19	0.103	28.7	10.1	<0.00020	0.000014	0.00021	<0.00010	0.0343	<0.00010	0.000633	0.00232	<0.0030	0.00062
Nelson River Upstream #4	US-4	L2314964-4,-6,-7	22-Jul-19	0.102	28.9	9.74	<0.00020	0.000011	0.00018	<0.00010	0.0270	<0.00010	0.000589	0.00200	<0.0030	0.00057
Nelson River Upstream #5	US-5	L2314964-5	22-Jul-19	0.112	29.8	10.3	<0.00020	<0.000010	0.00014	<0.00010	0.0164	<0.00010	0.000578	0.00159	<0.0030	0.00055
Stephens Lake - Near-field #1	NF-1	L2315689-1	23-Jul-19	0.102	30.0	9.24	<0.00020	<0.000010	0.00014	<0.00010	0.0229	<0.00010	0.000529	0.00183	0.0035	0.00047
Stephens Lake - Near-field #2	NF-2	L2315689-2	23-Jul-19	0.102	30.2	9.28	<0.00020	<0.000010	0.00015	<0.00010	0.0233	<0.00010	0.000587	0.00182	<0.0030	0.00049
Stephens Lake - Near-field #3	NF-3	L2315689-3	23-Jul-19	0.101	30.0	9.32	<0.00020	<0.000010	0.00011	<0.00010	0.0121	<0.00010	0.000541	0.00147	<0.0030	0.00041
Stephens Lake - Near-field #4	NF-4	L2315689-4	23-Jul-19	0.102	30.4	9.53	<0.00020	<0.000010	0.00011	<0.00010	0.0146	<0.00010	0.000527	0.00154	<0.0030	0.00041
Stephens Lake - Near-field #5	NF-5	L2315689-5	23-Jul-19	0.102	30.6	9.39	<0.00020	<0.000010	0.00016	<0.00010	0.0263	<0.00010	0.000561	0.00195	<0.0030	0.00051
Stephens Lake - Far-field #1	FF-1	L2315689-6	23-Jul-19	0.0978	28.5	8.68	<0.00020	<0.000010	0.00012	<0.00010	0.0179	<0.00010	0.000535	0.00159	<0.0030	0.00043
Stephens Lake - Far-field #2	FF-2	L2315689-7	23-Jul-19	0.0986	28.6	9.10	<0.00020	<0.000010	0.00010	<0.00010	0.0149	<0.00010	0.000512	0.00145	<0.0030	0.00040
Stephens Lake - Far-field #3	FF-3	L2315689-8	23-Jul-19	0.101	28.9	8.69	<0.00020	0.000010	0.00019	<0.00010	0.0338	<0.00010	0.000593	0.00217	<0.0030	0.00060
Stephens Lake - Far-field #4	FF-4	L2315689-9	23-Jul-19	0.0980	28.8	8.99	<0.00020	<0.000010	0.00011	<0.00010	0.0146	<0.00010	0.000523	0.00152	0.0031	0.00042
Stephens Lake - Far-field #5	FF-5	L2315689-10	23-Jul-19	0.0970	28.7	8.43	<0.00020	<0.000010	<0.00010	<0.00010	0.0114	<0.00010	0.000498	0.00134	<0.0030	0.00036
Clark Lake #1	CL-1	L2335547-1	25-Aug-19	0.115	28.9	10.3	<0.00020	0.000012	0.00017	<0.00010	0.0279	<0.00010	0.000575	0.00272	<0.0030	0.00060
Clark Lake #2	CL-2	L2335547-2	25-Aug-19	0.113	29.0	9.95	<0.00020	0.000011	0.00016	<0.00010	0.0277	<0.00010	0.000568	0.00257	<0.0030	0.00059
Clark Lake #3	CL-3	L2335547-3	25-Aug-19	0.116	29.1	9.77	<0.00020	0.000012	0.00017	<0.00010	0.0281	<0.00010	0.000572	0.00265	<0.0030	0.00060
Clark Lake #4	CL-4	L2335547-4	25-Aug-19	0.114	28.7	9.96	<0.00020	0.000011	0.00018	<0.00010	0.0287	<0.00010	0.000570	0.00261	<0.0030	0.00060
Clark Lake #5	CL-5	L2335547-5	25-Aug-19	0.113	26.7	8.13	<0.00020	0.000015	0.00024	<0.00010	0.0284	<0.00010	0.000524	0.00214	<0.0030	0.00070
Nelson River Upstream #1	US-1	L2338353-1	27-Aug-19	0.112	27.6	9.66	<0.00020	0.000012	0.00018	<0.00010	0.0316	<0.00010	0.000558	0.00237	<0.0030	0.00062
Nelson River Upstream #2	US-2	L2338353-2,-6,-7	27-Aug-19	0.115	28.3	10.1	<0.00020	<0.000010	0.00016	<0.00010	0.0212	<0.00010	0.000557	0.00208	<0.0030	0.00056
Nelson River Upstream #3	US-3	L2338353-3	27-Aug-19	0.116	27.7	10.3	<0.00020	0.000013	0.00018	<0.00010	0.0309	<0.00010	0.000559	0.00237	<0.0030	0.00060
Nelson River Upstream #4	US-4	L2338353-4	27-Aug-19	0.115	27.6	8.74	<0.00020	0.000011	0.00017	<0.00010	0.0276	<0.00010	0.000559	0.00209	<0.0030	0.00068
Nelson River Upstream #5	US-5	L2338353-5	27-Aug-19	0.119	28.0	10.1	<0.00020	0.000013	0.00019	<0.00010	0.0320	<0.00010	0.000573	0.00249	0.0032	0.00068
Stephens Lake - Near-field #1	NF-1	L2339792-8	31-Aug-19	0.128	29.6	10.2	<0.00020	<0.000010	0.00015	<0.00010	0.0267	<0.00010	0.000592	0.00219	<0.0030	0.00058
Stephens Lake - Near-field #2	NF-2	L2339792-9	31-Aug-19	0.126	29.6	10.3	<0.00020	<0.000010	0.00013	<0.00010	0.0219	<0.00010	0.000594	0.00210	<0.0030	0.00056
Stephens Lake - Near-field #3	NF-3	L2339792-10	31-Aug-19	0.125	29.3	10.1	<0.00020	<0.000010	0.00016	<0.00010	0.0271	<0.00010	0.000615	0.00223	<0.0030	0.00057
Stephens Lake - Near-field #4	NF-4	L2339792-11	31-Aug-19	0.123	29.4	10.3	<0.00020	<0.000010	0.00012	<0.00010	0.0165	<0.00010	0.000592	0.00193	<0.0030	0.00050
Stephens Lake - Near-field #5	NF-5	L2339792-12	31-Aug-19	0.123	29.8	10.6	<0.00020	<0.000010	0.00015	<0.00010	0.0239	<0.00010	0.000603	0.00217	<0.0030	0.00052
Stephens Lake - Far-field #1	FF-1	L2339792-1	31-Aug-19	0.119	27.0	9.43	<0.00020	<0.000010	0.00018	<0.00010	0.0268	<0.00010	0.000571	0.00220	0.0036	0.00060
Stephens Lake - Far-field #2	FF-2	L2339792-2	31-Aug-19	0.116	27.3	9.40	<0.00020	<0.000010	0.00016	<0.00010	0.0253	<0.00010	0.000570	0.00212	<0.0030	0.00057
Stephens Lake - Far-field #6	FF-6	L2339792-3	31-Aug-19	0.115	27.3	9.55	<0.00020	<0.000010	0.00015	<0.00010	0.0202	<0.00010	0.000562	0.00197	0.0030	0.00053
Stephens Lake - Far-field #4	FF-4	L2339792-4	31-Aug-19	0.114	27.1	9.24	<0.00020	<0.000010	0.00013	<0.00010	0.0172	<0.00010	0.000539	0.00190	0.0032	0.00054
Stephens Lake - Far-field #5	FF-5	L2339792-5	31-Aug-19	0.115	27.2	9.38	<0.00020	<0.000010	0.00017	<0.00010	0.0272	<0.00010	0.000576	0.00220	<0.0030	0.00058

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019. Values in bold exceed the benchmark. Results in blue italics are considered suspect (continued).

Sample Location	Site ID	ALS Sample ID	Sample Date	Strontium (mg/L)	Sulfate (mg/L)	Sulfur (mg/L)	Tellurium (mg/L)	Thallium (mg/L)	Thorium (mg/L)	Tin (mg/L)	Titanium (mg/L)	Tungsten (mg/L)	Uranium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)	Zirconium (mg/L)
Detection Limit 2019				**0.00020**	**0.30**	**0.50**	**0.00020**	**0.000010**	**0.00010**	**0.00010**	**0.00030**	**0.00010**	**0.000010**	**0.00050**	**0.0030**	**0.000060**
Clark Lake #1	CL-1	L2347794-1	15-Sep-19	0.113	26.4	8.69	<0.00020	<0.000010	0.00014	<0.00010	0.0258	<0.00010	0.000523	0.00206	<0.0030	0.00060
Clark Lake #2	CL-2	L2347794-2	15-Sep-19	0.104	23.8	8.20	<0.00020	<0.000010	0.00017	<0.00010	0.0269	<0.00010	0.000490	0.00201	<0.0030	0.00061
Clark Lake #3	CL-3	L2347794-3	15-Sep-19	0.110	24.8	8.64	<0.00020	<0.000010	0.00016	0.00010	0.0260	<0.00010	0.000503	0.00196	<0.0030	0.00057
Clark Lake #4	CL-4	L2347794-4	15-Sep-19	0.102	21.8	7.90	<0.00020	<0.000010	0.00017	<0.00010	0.0280	<0.00010	0.000485	0.00204	<0.0030	0.00061
Clark Lake #5	CL-5	L2347794-5	15-Sep-19	0.104	23.2	8.40	<0.00020	<0.000010	0.00019	<0.00010	0.0282	<0.00010	0.000492	0.00201	<0.0030	0.00063
Nelson River Upstream #1	US-1	L2350077-1	16-Sep-19	0.116	29.7	8.82	<0.00020	<0.000010	0.00011	<0.00010	0.0234	<0.00010	0.000549	0.00170	0.0043	0.00054
Nelson River Upstream #2	US-2	L2350077-2,-6,-7	16-Sep-19	0.110	30.0	9.47	<0.00020	<0.000010	0.00012	<0.00010	0.0248	<0.00010	0.000513	0.00180	<0.0030	0.00053
Nelson River Upstream #3	US-3	L2350077-3	16-Sep-19	0.109	29.6	9.85	<0.00020	<0.000010	0.00012	<0.00010	0.0205	<0.00010	0.000491	0.00159	<0.0030	0.00054
Nelson River Upstream #4	US-4	L2350077-4	16-Sep-19	0.114	29.0	9.22	<0.00020	<0.000010	0.00013	<0.00010	0.0231	<0.00010	0.000542	0.00175	<0.0030	0.00055
Nelson River Upstream #5	US-5	L2350077-5	16-Sep-19	0.110	29.7	8.77	<0.00020	<0.000010	0.00012	<0.00010	0.0235	<0.00010	0.000488	0.00178	<0.0030	0.00053
Stephens Lake - Near-field #1	NF-1	L2350076-1	00-Jan-00	0.109	27.4	9.42	<0.00020	<0.000010	0.00011	<0.00010	0.0235	<0.00010	0.000511	0.00172	<0.0030	0.00055
Stephens Lake - Near-field #2	NF-2	L2350076-2	17-Sep-19	0.108	29.4	9.94	<0.00020	<0.000010	<0.00010	<0.00010	0.0161	<0.00010	0.000479	0.00146	<0.0030	0.00058
Stephens Lake - Near-field #3	NF-3	L2350076-3	17-Sep-19	0.109	29.6	9.45	<0.00020	<0.000010	0.00010	<0.00010	0.0179	<0.00010	0.000504	0.00154	<0.0030	0.00050
Stephens Lake - Near-field #4	NF-4	L2350076-4	17-Sep-19	0.108	30.2	9.63	<0.00020	<0.000010	0.00010	<0.00010	0.0187	<0.00010	0.000486	0.00159	<0.0030	0.00049
Stephens Lake - Near-field #5	NF-5	L2350076-5	17-Sep-19	0.108	29.6	9.38	<0.00020	<0.000010	<0.00010	<0.00010	0.0147	<0.00010	0.000515	0.00145	<0.0030	0.00047
Stephens Lake - Far-field #1	FF-1	L2350240-1	18-Sep-19	0.115	26.4	9.45	<0.00020	<0.000010	<0.00010	<0.00010	0.00861	<0.00010	0.000525	0.00125	<0.0030	0.00041
Stephens Lake - Far-field #2	FF-2	L2350240-2	18-Sep-19	0.119	30.9	8.95	<0.00020	<0.000010	<0.00010	<0.00010	0.00842	<0.00010	0.000553	0.00126	<0.0030	0.00044
Stephens Lake - Far-field #3	FF-3	L2350240-3	18-Sep-19	0.121	26.4	9.56	<0.00020	<0.000010	0.00011	<0.00010	0.0142	<0.00010	0.000564	0.00149	<0.0030	0.00047
Stephens Lake - Far-field #4	FF-4	L2350240-4	18-Sep-19	0.125	26.1	9.47	<0.00020	<0.000010	0.00011	<0.00010	0.0115	<0.00010	0.000600	0.00134	<0.0030	0.00127
Stephens Lake - Far-field #5	FF-5	L2350240-5	18-Sep-19	0.127	26.2	9.35	<0.00020	<0.000010	<0.00010	<0.00010	0.00798	<0.00010	0.000593	0.00123	<0.0030	0.00047

* Result confirmed through laboratory reanalysis.

1. Result confirmed through laboratory verification of the analytical QAQC.
2. Mean included one anomalously high result that was confirmed at the laboratory through reanalysis and verification of the analytical QAQC. See Table A2-2 for additional details.

Table A1-4: Hydrocarbons measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019.

Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Benzene (mg/L)	Ethyl benzene (mg/L)	Toluene (mg/L)	o-Xylene (mg/L)	m+p-Xylenes (mg/L)	Xylenes (Total) (mg/L)	F1 (C6-C10) (mg/L)	F1-BTEX (mg/L)	Total Hydrocarbons (C6-C50) (mg/L)	F2 (C10-C16) (mg/L)	F3 (C16-C34) (mg/L)	F4 (C34-C50) (mg/L)
Detection Limit 2019					**0.00050**	**0.00050**	**0.0010/0.00050**	**0.00050**	**0.00040/0.001**	**0.00064/0.0011**	**0.10**	**0.10**	**0.38**	**0.10**	**0.25**	**0.25**
Manitoba Water Quality Guideline for the Protection of Aquatic Life					**0.370**	**0.090**	**0.0020**									
Split Lake #10	SPL-10	L2251830-1	31-Mar-19	10:29	-	-	-	-	-	-	-	-	-	-	-	-
Split Lake #11	SPL-11	L2251830-2	31-Mar-19	11:15	-	-	-	-	-	-	-	-	-	-	-	-
Split Lake #12	SPL-12	L2251830-3	31-Mar-19	13:30	-	-	-	-	-	-	-	-	-	-	-	-
Split Lake #13	SPL-13	L2251830-4	31-Mar-19	12:45	-	-	-	-	-	-	-	-	-	-	-	-
Split Lake #14	SPL-14	L2251830-5	31-Mar-19	12:10	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream #6	US-6	L2254087-8	3-Apr-19	12:10	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #7	US-7	L2254087-9	3-Apr-19	10:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #8	US-8	L2254087-10	3-Apr-19	11:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #9	US-9	L2254087-11	3-Apr-19	8:40	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #10	US-10	L2254087-12	3-Apr-19	9:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #1	NF-1	L2254087-1	3-Apr-19	13:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #2	NF-2	L2254087-2	3-Apr-19	16:50	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #3	NF-3	L2254087-3	3-Apr-19	14:10	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #4	NF-4	L2254087-4	3-Apr-19	16:05	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #5	NF-5	L2254087-5	3-Apr-19	15:00	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Far-field #1	FF-1	L2254658-1,-6,-7	5-Apr-19	10:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Far-field #2	FF-2	L2254658-2	5-Apr-19	11:55	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #3	FF-3	L2254658-3	5-Apr-19	13:18	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #4	FF-4	L2254658-4	5-Apr-19	12:30	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #5	FF-5	L2254658-5	5-Apr-19	11:15	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #1	CL-1	L2297681-1	24-Jun-19	9:32	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #2	CL-2	L2297681-2	24-Jun-19	10:02	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #3	CL-3	L2297681-3	24-Jun-19	10:24	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #4	CL-4	L2297681-4	24-Jun-19	10:42	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #5	CL-5	L2297681-5	24-Jun-19	10:55	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream #1	US-1	L2299234-1	25-Jun-19	11:25	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #2	US-2	L2299234-2,-6,-7	25-Jun-19	11:55	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #3	US-3	L2299234-3	25-Jun-19	12:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #4	US-4	L2299234-4	25-Jun-19	12:48	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #5	US-5	L2299234-5	25-Jun-19	13:05	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #1	NF-1	L2299712-8	26-Jun-19	11:49	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #2	NF-2	L2299712-9	26-Jun-19	12:42	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #3	NF-3	L2299712-10	26-Jun-19	12:13	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #4	NF-4	L2299712-11	26-Jun-19	13:00	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #5	NF-5	L2299712-12	26-Jun-19	11:25	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Far-field #1	FF-1	L2299712-1	26-Jun-19	8:23	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #2	FF-2	L2299712-2	26-Jun-19	9:10	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #3	FF-3	L2299712-3	26-Jun-19	9:55	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #4	FF-4	L2299712-4	26-Jun-19	9:35	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #5	FF-5	L2299712-5	26-Jun-19	8:50	-	-	-	-	-	-	-	-	-	-	-	-

Table A1-4: Hydrocarbons measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019 (continued).

Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Benzene (mg/L)	Ethyl benzene (mg/L)	Toluene (mg/L)	o-Xylene (mg/L)	m+p-Xylenes (mg/L)	Xylenes (Total) (mg/L)	F1 (C6-C10) (mg/L)	F1-BTEX (mg/L)	Total Hydrocarbons (C6-C50) (mg/L)	F2 (C10-C16) (mg/L)	F3 (C16-C34) (mg/L)	F4 (C34-C50) (mg/L)
Detection Limit 2019					**0.00050**	**0.00050**	**0.0010/0.00050**	**0.00050**	**0.00040/0.001**	**0.00064/0.0011**	**0.10**	**0.10**	**0.38**	**0.10**	**0.25**	**0.25**
Manitoba Water Quality Guideline for the Protection of Aquatic Life					**0.370**	**0.090**	**0.0020**									
Clark Lake #1	CL-1	L2314002-1	21-Jul-19	10:25	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #2	CL-2	L2314002-2	21-Jul-19	10:48	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #3	CL-3	L2314002-3	21-Jul-19	11:05	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #4	CL-4	L2314002-4	21-Jul-19	11:45	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #5	CL-5	L2314002-5	21-Jul-19	11:25	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream #1	US-1	L2314964-1	22-Jul-19	11:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #2	US-2	L2314964-2	22-Jul-19	11:51	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #3	US-3	L2314964-3	22-Jul-19	12:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #4	US-4	L2314964-4,-6,-7	22-Jul-19	12:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #5	US-5	L2314964-5	22-Jul-19	13:05	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #1	NF-1	L2315689-1	23-Jul-19	13:10	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #2	NF-2	L2315689-2	23-Jul-19	14:00	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #3	NF-3	L2315689-3	23-Jul-19	13:35	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #4	NF-4	L2315689-4	23-Jul-19	14:25	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #5	NF-5	L2315689-5	23-Jul-19	12:35	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Far-field #1	FF-1	L2315689-6	23-Jul-19	9:00	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #2	FF-2	L2315689-7	23-Jul-19	9:50	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #3	FF-3	L2315689-8	23-Jul-19	10:50	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #4	FF-4	L2315689-9	23-Jul-19	10:15	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #5	FF-5	L2315689-10	23-Jul-19	9:30	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #1	CL-1	L2335547-1	25-Aug-19	11:15	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #2	CL-2	L2335547-2	25-Aug-19	10:56	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #3	CL-3	L2335547-3	25-Aug-19	11:37	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #4	CL-4	L2335547-4	25-Aug-19	10:20	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #5	CL-5	L2335547-5	25-Aug-19	10:45	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream #1	US-1	L2338353-1	27-Aug-19	12:55	<0.00050 [1]	<0.00050 [1]	<0.0010 [1]	<0.00050 [1]	<0.00040 [1]	<0.00064	<0.10 [1]	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #2	US-2	L2338353-2,-6,-7	27-Aug-19	13:15	<0.00050 [1]	<0.00050 [1]	<0.0010 [1]	<0.00050 [1]	<0.00040 [1]	<0.00064	<0.10 [1]	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #3	US-3	L2338353-3	27-Aug-19	14:05	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #4	US-4	L2338353-4	27-Aug-19	13:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #5	US-5	L2338353-5	27-Aug-19	14:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #1	NF-1	L2339792-8	31-Aug-19	11:28	<0.00050 [1]	<0.00050 [1]	<0.0010 [1]	<0.00050 [1]	<0.00040 [1]	<0.00064	<0.10 [1]	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #2	NF-2	L2339792-9	31-Aug-19	12:10	<0.00050 [1]	<0.00050 [1]	<0.0010 [1]	<0.00050 [1]	<0.00040 [1]	<0.00064	<0.10 [1]	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #3	NF-3	L2339792-10	31-Aug-19	11:45	<0.00050 [1]	<0.00050 [1]	<0.0010 [1]	<0.00050 [1]	<0.00040 [1]	<0.00064	<0.10 [1]	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #4	NF-4	L2339792-11	31-Aug-19	12:25	<0.00050 [1]	<0.00050 [1]	<0.0010 [1]	<0.00050 [1]	<0.00040 [1]	<0.00064	<0.10 [1]	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #5	NF-5	L2339792-12	31-Aug-19	11:05	<0.00050 [1]	<0.00050 [1]	<0.0010 [1]	<0.00050 [1]	<0.00040 [1]	<0.00064	<0.10 [1]	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Far-field #1	FF-1	L2339792-1	31-Aug-19	8:37	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #2	FF-2	L2339792-2	31-Aug-19	9:29	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #6	FF-6	L2339792-3	31-Aug-19	10:05	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #4	FF-4	L2339792-4	31-Aug-19	9:50	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #5	FF-5	L2339792-5	31-Aug-19	9:01	-	-	-	-	-	-	-	-	-	-	-	-

Table A1-4: Hydrocarbons measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2019 (continued).

Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Benzene (mg/L)	Ethyl benzene (mg/L)	Toluene (mg/L)	o-Xylene (mg/L)	m+p-Xylenes (mg/L)	Xylenes (Total) (mg/L)	F1 (C6-C10) (mg/L)	F1-BTEX (mg/L)	Total Hydrocarbons (C6-C50) (mg/L)	F2 (C10-C16) (mg/L)	F3 (C16-C34) (mg/L)	F4 (C34-C50) (mg/L)
Detection Limit 2019					**0.00050**	**0.00050**	**0.0010/0.00050**	**0.00050**	**0.00040/0.001**	**0.00064/0.0011**	**0.10**	**0.10**	**0.38**	**0.10**	**0.25**	**0.25**
Manitoba Water Quality Guideline for the Protection of Aquatic Life					**0.370**	**0.090**	**0.0020**									
Clark Lake #1	CL-1	L2347794-1	15-Sep-19	9:52	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #2	CL-2	L2347794-2	15-Sep-19	10:42	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #3	CL-3	L2347794-3	15-Sep-19	11:00	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #4	CL-4	L2347794-4	15-Sep-19	10:26	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake #5	CL-5	L2347794-5	15-Sep-19	10:12	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream #1	US-1	L2350077-1	16-Sep-19	13:50	<0.00050 [2]	<0.00050 [2]	<0.00050 [2]	<0.00050 [2]	<0.0010 [2]	<0.0011	<0.10 [2]	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #2	US-2	L2350077-2,-6,-7	16-Sep-19	13:50	<0.00050 [2]	<0.00050 [2]	<0.00050 [2]	<0.00050 [2]	<0.0010 [2]	<0.0011	<0.10 [2]	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #3	US-3	L2350077-3	16-Sep-19	14:30	<0.00050 [2]	<0.00050 [2]	<0.00050 [2]	<0.00050 [2]	<0.0010 [2]	<0.0011	<0.10 [2]	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #4	US-4	L2350077-4	16-Sep-19	14:11	<0.00050 [2]	<0.00050 [2]	<0.00050 [2]	<0.00050 [2]	<0.0010 [2]	<0.0011	<0.10 [2]	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream #5	US-5	L2350077-5	16-Sep-19	14:46	<0.00050 [2]	<0.00050 [2]	<0.00050 [2]	<0.00050 [2]	<0.0010 [2]	<0.0011	<0.10 [2]	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #1	NF-1	L2350076-1	00-Jan-00	9:40	<0.00050 [3]	<0.00050 [3]	<0.00050 [3]	<0.00050 [3]	<0.0010 [3]	<0.0011	<0.10 [3]	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #2	NF-2	L2350076-2	17-Sep-19	10:32	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.0011	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #3	NF-3	L2350076-3	17-Sep-19	10:04	<0.00050 [3]	<0.00050 [3]	<0.00050 [3]	<0.00050 [3]	<0.0010 [3]	<0.0011	<0.10 [3]	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #4	NF-4	L2350076-4	17-Sep-19	10:52	<0.00050 [3]	<0.00050 [3]	<0.00050 [3]	<0.00050 [3]	<0.0010 [3]	<0.0011	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Near-field #5	NF-5	L2350076-5	17-Sep-19	9:18	<0.00050 [3]	<0.00050 [3]	<0.00050 [3]	<0.00050 [3]	<0.0010 [3]	<0.0011	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Far-field #1	FF-1	L2350240-1	18-Sep-19	7:35	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #2	FF-2	L2350240-2	18-Sep-19	8:17	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #3	FF-3	L2350240-3	18-Sep-19	8:53	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #4	FF-4	L2350240-4	18-Sep-19	8:36	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Far-field #5	FF-5	L2350240-5	18-Sep-19	8:01	-	-	-	-	-	-	-	-	-	-	-	-

1. Sample submitted with headspace; results may be biased low.
2. VOC analysis was conducted for a water sample that contained > 5% headspace. Results may be biased low.
3. Water sample contained visible sediment (must be included as part of analysis). Measured concentrations of organic substances in water can be biased high due to presence of sediment.

APPENDIX 2:
RESULTS OF QUALITY ASSURANCE/QUALITY CONTROL SAMPLES, 2019

Table A2-1: Quality assurance/quality control results for routine water chemistry variables measured in the laboratory during the ice-cover and open-water seasons, 2019. Percent relative standard deviations (PRSD) were calculated for triplicate samples where all results exceeded five times the detection limit (DL); values exceeding 18% are indicated in bold red.

					Alkalinity				Nitrogen						Phosphorus	
Sample Location	Sample ID	ALS Sample ID	Sample Date	Sample Time	Total ($CaCO_3$) (mg/L)	Bicarbonate (HCO_3) (mg/L)	Carbonate (CO_3) (mg/L)	Hydroxide (OH) (mg/L)	Ammonia (mg/L N)	Nitrate/ nitrite (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total N[3] (mg/L)	Dissolved P (mg/L)	Total P (mg/L)
Detection Limit 2019					**1.0**	**1.2**	**0.60**	**0.34**	**0.010**	**0.0051**	**0.0050**	**0.0010**	**0.20**	**-**	**0.0010**	**0.0010**
Stephens Lake - Far-field #1	FF-1	L2254658-1	5-Apr-19	10:15	106	129	<0.60	<0.34	0.012	0.0649	0.0649	<0.0010	0.47	0.53	0.0152	0.0257
	FF-1B	L2254658-6	5-Apr-19	10:20	105	128	<0.60	<0.34	<0.010	0.0661	0.0661	<0.0010	0.39	0.46	0.0138	0.0270
	FF-1C	L2254658-7	5-Apr-19	10:25	105	128	<0.60	<0.34	<0.010	0.0656	0.0656	<0.0010	0.40	0.47	0.0131	0.0257
	FF-1			Mean	105	128	<0.60	<0.34	<0.010	0.0655	0.0655	<0.0010	0.42		0.0140	0.0261
				SD	0.6	0.6	-	-	-	0.00060	0.00060	-	0.044		0.00107	0.00075
				PRSD	1	0	-	-	-	1	1	-	-		8	3
Nelson River Upstream #2	US-2	L2299234-2	25-Jun-19	11:55	96.3	117	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.26	0.26	0.0117	0.0310
	US-2B	L2299234-6	25-Jun-19	12:00	96.9	118	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.30	0.30	0.0097	0.0258
	US-2C	L2299234-7	25-Jun-19	12:05	96.3	117	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.41	0.41	0.0101	0.0337
	US-2			Mean	96.5	117	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.32		0.0105	0.0302
				SD	0.3	0.6	-	-	-	-	-	-	0.078		0.00106	0.00402
				PRSD	0	0	-	-	-	-	-	-	-		10	13
Nelson River Upstream #4	US-4	L2314964-4	22-Jul-19	12:15	103	126	<0.60	<0.34	0.013	0.0053	0.0053	<0.0010	0.40	0.41	0.0157	0.0377
	US-4B	L2314964-6	22-Jul-19	12:20	102	124	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.45	0.45	0.0152	0.0355
	US-4C	L2314964-7	22-Jul-19	12:25	103	126	<0.60	<0.34	0.017	<0.0051	0.0050	<0.0010	0.40	0.40	0.0140	0.0354
	US-4			Mean	103	125	<0.60	<0.34	0.012	<0.0051	<0.0050	<0.0010	0.42		0.0150	0.0362
				SD	0.6	1.2	-	-	0.0061	-	-	-	0.029		0.00087	0.00130
				PRSD	1	1	-	-	-	-	-	-	-		6	4
Nelson River Upstream #2	US-2	L2338353-2	27-Aug-19	13:15	105	128	<0.60	<0.34	0.023	0.0185	0.0185	<0.0010	0.35	0.37	0.0189	0.0383
	US-2B	L2338353-6	27-Aug-19	13:20	104	126	<0.60	<0.34	0.031	0.0185	0.0185	<0.0010	0.29	0.31	0.0186	0.0374
	US-2C	L2338353-7	27-Aug-19	13:25	99.7	122	<0.60	<0.34	0.016	0.0184	0.0184	<0.0010	0.37	0.39	0.0204	0.0432
	US-2			Mean	103	125	<0.60	<0.34	0.023	0.0185	0.0185	<0.0010	0.34		0.0193	0.0396
				SD	2.8	3.1	-	-	0.0075	0.00006	0.00006	-	0.042		0.00096	0.00312
				PRSD	3	2	-	-	-	-	-	-	-		5	8
Nelson River Upstream #2	US-2	L2350077-2	16-Sep-19	13:50	103	126	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.40	0.40	0.0125	0.0344
	US-2B	L2350077-6	16-Sep-19	14:00	104	126	<0.60	<0.34	0.035	<0.0051	<0.0050	<0.0010	0.42	0.42	0.0118	0.0361
	US-2C	L2350077-7	16-Sep-19	14:15	100	122	<0.60	<0.34	0.039	<0.0051	<0.0050	<0.0010	0.43	0.43	0.0132	0.0338
	US-2			Mean	102	125	<0.60	<0.34	0.026	<0.0051	<0.0050	<0.0010	0.42		0.0125	0.0348
				SD	2.1	2.3	-	-	0.0186	-	-	-	0.015		0.00070	0.00119
				PRSD	2	2	-	-	-	-	-	-	-		6	3
Field Blanks																
Field Blank	TF-2	L2254087-7	03-Apr-19	12:30	<1.0	<1.2	<0.60	<0.34	<0.010	0.0064	0.0064	<0.0010	<0.20	<0.20	<0.0010	<0.0010
Field Blank	TF-2	L2299712-7	26-Jun-19	9:20	<1.0	<1.2	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	<0.20	<0.0010	<0.0010
Field Blank	TF-2	L2315689-12	23-Jul-19	10:25	1.4	1.7	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	<0.20	<0.0010	<0.0010
Field Blank	TF-2	L2339792-7	31-Aug-19	8:40	1.1	1.3	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	<0.20	<0.0010	<0.0010
Field Blank	TF-2	L2350076-7	17-Sep-19	9:55	<1.0	<1.2	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	<0.20	<0.0010	<0.0010
Trip Blanks																
Trip Blank	TF-1	L2254087-6	03-Apr-19		1.3	1.6	<0.60	<0.34	0.023	<0.0051	<0.0050	<0.0010	<0.20	<0.20	<0.0010	<0.0010
Trip Blank	TF-1	L2299712-6	26-Jun-19		<1.0	<1.2	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	<0.20	<0.0010	<0.0010
Trip Blank	TF-1	L2315689-11	23-Jul-19		1.1	1.3	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	<0.20	<0.0010	<0.0010
Trip Blank	TF-1	L2339792-6	31-Aug-19		1.0	1.2	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	<0.20	<0.0010	<0.0010
Trip Blank	TF-1	L2350076-6	17-Sep-19		<1.0	<1.2	<0.60	<0.34	<0.010	<0.0051	<0.0050	0.0012	<0.20	<0.20	<0.0010	<0.0010

Table A2-1: Quality assurance/quality control results for routine water chemistry variables measured in the laboratory during the ice-cover and open-water seasons, 2019. Percent relative standard deviations (PRSD) were calculated for triplicate samples where all results exceeded five times the detection limit (DL); values exceeding 18% are indicated in bold red (continued).

					Carbon		Water Clarity						Productivity	
Sample Location	Sample ID	ALS Sample ID	Sample Date	Sample Time	Total Organic C (mg/L)	Dissolved Organic C (mg/L)	Total Suspended Solids (mg/L)	Turbidity (NTU)	True Colour (CU)	Lab pH	Laboratory Conductivity (µmhos/cm)	Total Dissolved Solids (mg/L)	Chlorophyll *a* (µg/L)	Phaeophytin *a* (µg/L)
Detection Limit 2019					**0.50**	**0.50**	**2.0**	**0.10**	**5.0**	**0.10**	**1.0**	**4.0**	**0.10**	**0.10**
Stephens Lake - Far-field #1	FF-1	L2254658-1	5-Apr-19	10:15	8.86	8.95	4.7	11.2	15.0	7.96	312	148	2.44	1.08
	FF-1B	L2254658-6	5-Apr-19	10:20	8.78	8.75	5.6	12.0	16.7	7.95	313	192	1.86	0.99
	FF-1C	L2254658-7	5-Apr-19	10:25	8.58	8.79	3.9	11.9	15.4	7.94	313	197	1.67	0.95
	FF-1			Mean	8.74	8.83	4.7	11.7	15.7	7.95	313	179	1.99	1.01
				SD	0.144	0.106	0.85	0.44	0.89	0.010	0.6	27.0	0.401	0.067
				PRSD	2	1	-	4	-	0	0	15	**20**	7
Nelson River Upstream #2	US-2	L2299234-2	25-Jun-19	11:55	7.56	7.38	6.5	18.2	17.2	8.17	257	171	4.91	2.47
	US-2B	L2299234-6	25-Jun-19	12:00	7.46	8.27	9.1	19.6	11.8	8.18	258	180	4.77	2.69
	US-2C	L2299234-7	25-Jun-19	12:05	7.56	7.62	7.6	19.2	12.4	8.16	257	179	4.75	2.80
	US-2			Mean	7.53	7.76	7.7	19.0	13.8	8.17	257	177	4.81	2.65
				SD	0.058	0.460	1.31	0.72	2.96	0.010	0.6	4.9	0.087	0.168
				PRSD	1	6	-	4	-	0	0	3	2	6
Nelson River Upstream #4	US-4	L2314964-4	22-Jul-19	12:15	10.6	10.7	11.1	20.8	12.8	8.25	284	190	5.58	2.89
	US-4B	L2314964-6	22-Jul-19	12:20	8.42	8.40	9.9	19.4	13.8	8.25	285	188	5.71	2.74
	US-4C	L2314964-7	22-Jul-19	12:25	10.6	9.57	10.1	18.1	13.5	8.25	285	189	5.75	2.82
	US-4			Mean	9.87	9.56	10.4	19.4	13.4	8.25	285	189	5.68	2.82
				SD	1.259	1.150	0.64	1.35	0.51	0.000	0.6	1.0	0.089	0.075
				PRSD	13	12	-	7	-	0	0	1	2	3
Nelson River Upstream #2	US-2	L2338353-2	27-Aug-19	13:15	7.47	7.91	8.3	18.4	11.2	8.18	281	196	4.65	2.57
	US-2B	L2338353-6	27-Aug-19	13:20	7.35	8.10	9.3	18.6	13.3	8.18	285	186	4.62	2.64
	US-2C	L2338353-7	27-Aug-19	13:25	7.49	7.86	9.3	18.9	13.6	8.18	285	188	4.41	2.58
	US-2			Mean	7.44	7.96	9.0	18.6	12.7	8.18	284	190	4.56	2.60
				SD	0.076	0.127	0.58	0.25	1.31	0.000	2.3	5.3	0.131	0.038
				PRSD	1	2	-	1	-	0	1	3	3	1
Nelson River Upstream #2	US-2	L2350077-2	16-Sep-19	13:50	7.09	7.44	6.8	15.8	13.6	8.09	273	187	5.81	2.53
	US-2B	L2350077-6	16-Sep-19	14:00	7.10	7.46	7.7	16.8	10.9	8.10	272	176	5.91	2.56
	US-2C	L2350077-7	16-Sep-19	14:15	7.46	7.78	7.1	15.8	14.0	8.10	270	179	6.14	2.60
	US-2			Mean	7.22	7.56	7.2	16.1	12.8	8.10	272	181	5.95	2.56
				SD	0.211	0.191	0.46	0.58	1.69	0.006	1.5	5.7	0.169	0.035
				PRSD	3	3	-	4	-	0	1	3	3	1
Field Blanks														
Field Blank	TF-2	L2254087-7	03-Apr-19	12:30	<0.50	<0.50	<2.0	0.16	<5.0	5.91	1.9	<4.0	<0.10	<0.10
Field Blank	TF-2	L2299712-7	26-Jun-19	9:20	<0.50	<0.50	<2.0	0.13	<5.0	5.87	<1.0	<4.0	<0.10	<0.10
Field Blank	TF-2	L2315689-12	23-Jul-19	10:25	<0.50	<0.50	<2.0	<0.10	<5.0	6.02	1.2	<4.0	<0.10	<0.10
Field Blank	TF-2	L2339792-7	31-Aug-19	8:40	<0.50	<0.50	<2.0	<0.10	<5.0	5.82	<1.0	<4.0	<0.10	<0.10
Field Blank	TF-2	L2350076-7	17-Sep-19	9:55	<0.50	<0.50	<2.0	<0.10	<5.0	5.66	<1.0	<4.0	<0.10	<0.10
Trip Blanks														
Trip Blank	TF-1	L2254087-6	03-Apr-19		<0.50	<0.50	<2.0	0.20	<5.0	6.17	<1.0	<4.0	<0.10	<0.10
Trip Blank	TF-1	L2299712-6	26-Jun-19		<0.50	<0.50	<2.0	<0.10	<5.0	5.48	<1.0	<4.0	<0.10	0.19
Trip Blank	TF-1	L2315689-11	23-Jul-19		<0.50	<0.50	<2.0	<0.10	<5.0	5.86	<1.0	<4.0	<0.10	<0.10
Trip Blank	TF-1	L2339792-6	31-Aug-19		<0.50	<0.50	<2.0	<0.10	<5.0	5.77	1.0	<4.0	<0.10	<0.10
Trip Blank	TF-1	L2350076-6	17-Sep-19		<0.50	<0.50	<2.0	<0.10	<5.0	5.41	<1.0	<4.0	<0.10	<0.10

Table A2-2: Quality assurance/quality control results for metals and major ions measured in the laboratory during the ice-cover and open-water seasons, 2019. Percent relative standard deviations (PRSD) were calculated for triplicate samples where all results exceeded five times the detection limit (DL); values exceeding 18% are indicated in bold red. Blank values exceeding five times the DL are indicated in bold red.

Sample Location	Sample ID	ALS Sample ID	Sample Date	Sample Time	Hardness (as $CaCO_3$) (mg/L)	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Bismuth (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Cesium (mg/L)
Detection Limit 2019					**0.20**	**0.0030**	**0.00010**	**0.00010**	**0.00010**	**0.00010**	**0.000050**	**0.010**	**0.0000050**	**0.050**	**0.000010**
Stephens Lake - Far-field #1	FF-1	L2254658-1	5-Apr-19	10:15	126	0.350	0.00019	0.00120	0.0350	<0.00010	<0.000050	0.016	0.0000122	27.7	0.000047
	FF-1B	L2254658-6	5-Apr-19	10:20	126	0.400	0.00018	0.00118	0.0348	<0.00010	<0.000050	0.016	0.0000111	28.6	0.000055
	FF-1C	L2254658-7	5-Apr-19	10:25	125	0.386	0.00018	0.00116	0.0355	<0.00010	<0.000050	0.016	0.0000119	27.6	0.000048
	FF-1			Mean	126	0.379	0.00018	0.00118	0.0351	<0.00010	<0.000050	0.016	0.0000117	28.0	0.000050
				SD	0.6	0.0258	0.000006	0.000020	0.00036	-	-	0.0000	0.00000057	0.55	0.0000044
				PRSD	0	7	-	2	1	-	-	-	-	2	-
Nelson River Upstream #2	US-2	L2299234-2	25-Jun-19	11:55	123	0.653	<0.00010	0.00103	0.0314	<0.00010	<0.000050	0.022	0.0000057	28.4	0.000077
	US-2B	L2299234-6	25-Jun-19	12:00	117	0.457	<0.00010	0.00097	0.0303	<0.00010	<0.000050	0.021	0.0000059	26.3	0.000058
	US-2C	L2299234-7	25-Jun-19	12:05	119	0.618	<0.00010	0.00096	0.0312	<0.00010	<0.000050	0.021	0.0000061	27.2	0.000072
	US-2			Mean	120	0.576	<0.00010	0.00099	0.0310	<0.00010	<0.000050	0.021	0.0000059	27.3	0.000069
				SD	3.1	0.1045	-	0.000038	0.00059	-	-	0.0006	0.00000020	1.05	0.0000098
				PRSD	3	**18.1**	-	4	2	-	-	-	-	4	14
Nelson River Upstream #4	US-4	L2314964-4	22-Jul-19	12:15	122	0.554	<0.00010	0.00112	0.0338	<0.00010	<0.000050	0.016	0.0000063	28.7	0.000069
	US-4B	L2314964-6	22-Jul-19	12:20	117	0.650	<0.00010	0.00113	0.0344	<0.00010	<0.000050	0.014	0.0000059	26.8	0.000086
	US-4C	L2314964-7	22-Jul-19	12:25	118	0.626	<0.00010	0.00119	0.0353	<0.00010	<0.000050	0.014	0.0000058	27.1	0.000081
	US-4			Mean	119	0.610	<0.00010	0.00115	0.0345	<0.00010	<0.000050	0.015	0.0000060	27.5	0.000079
				SD	2.6	0.0500	-	0.000038	0.00075	-	-	0.0012	0.00000026	1.02	0.0000087
				PRSD	2	8	-	3	2	-	-	-	-	4	11
Nelson River Upstream #2	US-2	L2338353-2	27-Aug-19	13:15	131	0.508	<0.00010	0.00134	0.0343	<0.00010	<0.000050	0.012	0.0000079	30.1	0.000066
	US-2B	L2338353-6	27-Aug-19	13:20	134	0.299	<0.00010	0.00134	0.0336	<0.00010	<0.000050	0.012	0.0000086	31.0	0.000045
	US-2C	L2338353-7	27-Aug-19	13:25	134	0.588	<0.00010	0.00139	0.0353	<0.00010	<0.000050	0.012	0.0000086	30.6	0.000076
	US-2			Mean	133	0.465	<0.00010	0.00136	0.0344	<0.00010	<0.000050	0.012	0.0000084	30.6	0.000062
				SD	1.7	0.1492	-	0.000029	0.00085	-	-	0.0000	0.00000040	0.45	0.0000158
				PRSD	1	**32**	-	2	2	-	-	-	-	1	-
Nelson River Upstream #2	US-2	L2350077-2	16-Sep-19	13:50	117	0.534	<0.00010	0.00108	0.0320	<0.00010	<0.000050	0.020	0.0000080	28.6	0.000066
	US-2B	L2350077-6	16-Sep-19	14:00	117	0.769	<0.00010	0.00109	0.0337	<0.00010	<0.000050	0.020	0.0000059	28.1	0.000085
	US-2C	L2350077-7	16-Sep-19	14:15	112	0.517	<0.00010	0.00110	0.0320	<0.00010	<0.000050	0.019	0.0000112	27.1	0.000063
	US-2			Mean	115	0.607	<0.00010	0.00109	0.0326	<0.00010	<0.000050	0.020	0.0000084	27.9	0.000071
				SD	2.9	0.1408	-	0.000010	0.00098	-	-	0.0006	0.00000267	0.76	0.0000119
				PRSD	3	**23**	-	1	3	-	-	-	-	3	17
Field Blanks															
Field Blank	TF-2	L2254087-7	03-Apr-19	12:30	0.34	<0.0030	<0.00010	<0.00010	0.00012	<0.00010	<0.000050	<0.010	<0.0000050	0.138	<0.000010
Field Blank	TF-2	L2299712-7	26-Jun-19	9:20	0.51	<0.0030	<0.00010	0.00013	**0.00053***	<0.00010	<0.000050	<0.010	<0.0000050	0.148	<0.000010
Field Blank	TF-2	L2315689-12	23-Jul-19	10:25	<0.20	<0.0030	<0.00010	<0.00010	0.00038	<0.00010	<0.000050	<0.010	<0.0000050	<0.050	<0.000010
Field Blank	TF-2	L2339792-7	31-Aug-19	8:40	0.21	0.0065	<0.00010	<0.00010	0.00047	<0.00010	<0.000050	<0.010	<0.0000050	0.066	<0.000010
Field Blank	TF-2	L2350076-7	17-Sep-19	9:55	0.22	<0.0030	<0.00010	<0.00010	0.00046	<0.00010	<0.000050	0.011	<0.0000050	0.074	<0.000010
Trip Blanks															
Trip Blank	TF-1	L2254087-6	03-Apr-19		<0.20	<0.0030	<0.00010	<0.00010	<0.00010	<0.00010	<0.000050	<0.010	<0.0000050	<0.050	<0.000010
Trip Blank	TF-1	L2299712-6	26-Jun-19		<0.20	<0.0030	<0.00010	<0.00010	<0.00010	<0.00010	<0.000050	<0.010	<0.0000050	0.066	<0.000010
Trip Blank	TF-1	L2315689-11	23-Jul-19		<0.20	<0.0030	<0.00010	<0.00010	<0.00010	<0.00010	<0.000050	<0.010	<0.0000050	<0.050	<0.000010
Trip Blank	TF-1	L2339792-6	31-Aug-19		<0.20	<0.0030	<0.00010	<0.00010	<0.00010	<0.00010	<0.000050	<0.010	<0.0000050	<0.050	<0.000010
Trip Blank	TF-1	L2350076-6	17-Sep-19		<0.20	<0.0030	<0.00010	<0.00010	<0.00010	<0.00010	<0.000050	0.010	<0.0000050	<0.050	<0.000010

Table A2-2: Quality assurance/quality control results for metals and major ions measured in the laboratory during the ice-cover and open-water seasons, 2019. Percent relative standard deviations (PRSD) were calculated for triplicate samples where all results exceeded five times the detection limit (DL); values exceeding 18% are indicated in bold red. Blank values exceeding five times the DL are indicated in bold red (continued).

Sample Location	Sample ID	ALS Sample ID	Sample Date	Sample Time	Chloride (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)
Detection Limit 2019					**0.10**	**0.00010**	**0.00010**	**0.00050**	**0.010**	**0.000050**	**0.0010**	**0.0050**	**0.00010**	**0.00000050**	**0.000050**
Stephens Lake - Far-field #1	FF-1	L2254658-1	5-Apr-19	10:15	17.1	0.00070	0.00018	0.00253	0.390	0.000191	0.0105	13.8	0.0124	0.00000100	0.000609
	FF-1B	L2254658-6	5-Apr-19	10:20	17.1	0.00078	0.00019	0.00321	0.432	0.000203	0.0108	13.2	0.0122	0.00000096	0.000664
	FF-1C	L2254658-7	5-Apr-19	10:25	16.9	0.00072	0.00019	0.00334	0.422	0.000195	0.0105	13.5	0.0123	0.00000098	0.000623
	FF-1			Mean	17.0	0.00073	0.00019	0.00303	0.415	0.000196	0.0106	13.5	0.0123	0.00000098	0.000632
				SD	0.12	0.000042	0.000006	0.000435	0.0219	0.0000061	0.00017	0.30	0.00010	0.000000020	0.0000286
				PRSD	1	6	-	14	5	-	2	2	1	-	5
Nelson River Upstream #2	US-2	L2299234-2	25-Jun-19	11:55	12.8	0.00116	0.00031	0.00163	0.661	0.000298	0.0090	12.6	0.0160	0.00000081	0.000545
	US-2B	L2299234-6	25-Jun-19	12:00	12.9	0.00094	0.00030	0.00159	0.529	0.000273	0.0085	12.4	0.0167	0.00000092	0.000476
	US-2C	L2299234-7	25-Jun-19	12:05	12.9	0.00119	0.00031	0.00172	0.653	0.000289	0.0086	12.5	0.0165	0.00000089	0.000524
	US-2			Mean	12.9	0.00110	0.00031	0.00165	0.614	0.000287	0.0087	12.5	0.0164	0.00000087	0.000515
				SD	0.06	0.000137	0.000006	0.000067	0.0740	0.0000127	0.00026	0.10	0.00036	0.000000057	0.0000354
				PRSD	0	12	-	-	12	4	3	1	2	-	7
Nelson River Upstream #4	US-4	L2314964-4	22-Jul-19	12:15	14.2	0.00112	0.00032	0.00171	0.619	0.000309	0.0091	12.2	0.0191	0.00000080	0.000544
	US-4B	L2314964-6	22-Jul-19	12:20	14.2	0.00136	0.00035	0.00178	0.714	0.000317	0.0091	12.2	0.0193	0.00000077	0.000574
	US-4C	L2314964-7	22-Jul-19	12:25	14.3	0.00121	0.00034	0.00184	0.682	0.000319	0.0089	12.2	0.0194	0.00000078	0.000534
	US-4			Mean	14.2	0.00123	0.00034	0.00178	0.672	0.000315	0.0090	12.2	0.0193	0.00000078	0.000551
				SD	0.06	0.000121	0.000015	0.000065	0.0483	0.0000053	0.00012	0.00	0.00015	0.000000015	0.0000208
				PRSD	0	10	-	-	7	2	1	0	1	-	4
Nelson River Upstream #2	US-2	L2338353-2	27-Aug-19	13:15	12.8	0.00118	0.00034	0.00177	0.618	0.000327	0.0099	13.7	0.0221	0.00000069	0.000535
	US-2B	L2338353-6	27-Aug-19	13:20	12.7	0.00083	0.00029	0.00166	0.431	0.000294	0.0099	13.7	0.0200	0.00000073	0.000565
	US-2C	L2338353-7	27-Aug-19	13:25	12.7	0.00130	0.00037	0.00186	0.670	0.000333	0.0098	13.9	0.0226	0.00000065	0.000541
	US-2			Mean	12.7	0.00110	0.00033	0.00176	0.573	0.000318	0.0099	13.8	0.0216	0.00000069	0.000547
				SD	0.06	0.000244	0.000040	0.000100	0.1257	0.0000210	0.00006	0.12	0.00138	0.000000040	0.0000159
				PRSD	0	**22**	-	-	**22**	7	1	1	6	-	3
Nelson River Upstream #2	US-2	L2350077-2	16-Sep-19	13:50	12.0	0.00119	0.00028	0.00152	0.544	0.000248	0.0082	11.0	0.0167	0.00000059	0.000513
	US-2B	L2350077-6	16-Sep-19	14:00	11.9	0.00131	0.00033	0.00204	0.739	0.000290	0.0082	11.4	0.0178	0.00000057	0.000544
	US-2C	L2350077-7	16-Sep-19	14:15	11.7	0.00112	0.00029	0.00158	0.575	0.000274	0.0082	10.8	0.0165	0.00000056	0.0412*
	US-2			Mean	11.9	0.00121	0.00030	0.00171	0.619	0.000271	0.0082	11.1	0.0170	0.00000057	0.0141
				SD	0.15	0.000096	0.000026	0.000284	0.1048	0.0000212	0.00000	0.31	0.00070	0.000000015	0.0234817
				PRSD	1	8	-	-	17	-	0	3	4	-	**167**
Field Blanks															
Field Blank	TF-2	L2254087-7	03-Apr-19	12:30	<0.10	<0.00010	<0.00010	<0.00050	<0.010	<0.000050	<0.0010	<0.0050	<0.00010	<0.00000050	<0.000050
Field Blank	TF-2	L2299712-7	26-Jun-19	9:20	<0.10	0.00026	<0.00010	0.00133	<0.010	<0.000050	<0.0010	**0.0332***	0.00024	<0.00000050	<0.000050
Field Blank	TF-2	L2315689-12	23-Jul-19	10:25	<0.10	0.00038	<0.00010	0.00071	<0.010	<0.000050	<0.0010	<0.0050	<0.00010	<0.00000050	0.000057
Field Blank	TF-2	L2339792-7	31-Aug-19	8:40	<0.10	0.00042	<0.00010	<0.00050	<0.010	<0.000050	<0.0010	0.0119	0.00022	<0.00000050	<0.000050
Field Blank	TF-2	L2350076-7	17-Sep-19	9:55	<0.10	**0.00061***	<0.00010	<0.00050	<0.010	<0.000050	<0.0010	0.0097	0.00017	<0.00000050	<0.000050
Trip Blanks															
Trip Blank	TF-1	L2254087-6	03-Apr-19		<0.10	<0.00010	<0.00010	<0.00050	<0.010	<0.000050	<0.0010	<0.0050	<0.00010	<0.00000050	<0.000050
Trip Blank	TF-1	L2299712-6	26-Jun-19		<0.10	<0.00010	<0.00010	<0.00050	<0.010	<0.000050	<0.0010	0.0062	<0.00010	<0.00000050	<0.000050
Trip Blank	TF-1	L2315689-11	23-Jul-19		<0.10	<0.00010	<0.00010	<0.00050	<0.010	<0.000050	<0.0010	<0.0050	<0.00010	<0.00000050	<0.000050
Trip Blank	TF-1	L2339792-6	31-Aug-19		<0.10	**0.00055**	<0.00010	<0.00050	<0.010	<0.000050	<0.0010	<0.0050	<0.00010	<0.00000050	0.000060
Trip Blank	TF-1	L2350076-6	17-Sep-19		<0.10	0.00013	<0.00010	<0.00050	<0.010	<0.000050	<0.0010	<0.0050	<0.00010	<0.00000050	<0.000050

Table A2-2: Quality assurance/quality control results for metals and major ions measured in the laboratory during the ice-cover and open-water seasons, 2019. Percent relative standard deviations (PRSD) were calculated for triplicate samples where all results exceeded five times the detection limit (DL); values exceeding 18% are indicated in bold red. Blank values exceeding five times the DL are indicated in bold red (continued).

Sample Location	Sample ID	ALS Sample ID	Sample Date	Sample Time	Nickel (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Rubidium (mg/L)	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Sodium (mg/L)	Strontium (mg/L)	Sulfate (mg/L)	Sulfur (mg/L)
Detection Limit 2019					**0.00050**	**0.030**	**0.05**	**0.00020**	**0.000050**	**0.10**	**0.000010**	**0.050**	**0.00020**	**0.30**	**0.50**
Stephens Lake - Far-field #1	FF-1	L2254658-1	5-Apr-19	10:15	0.00133	<0.030	2.60	0.00214	0.000115	1.64	<0.000010	17.0	0.106	33.5	11.1
	FF-1B	L2254658-6	5-Apr-19	10:20	0.00137	0.031	2.59	0.00220	0.000118	1.81	<0.000010	17.0	0.110	33.5	11.6
	FF-1C	L2254658-7	5-Apr-19	10:25	0.00138	<0.030	2.62	0.00210	0.000120	1.70	<0.000010	17.0	0.110	33.1	11.6
	FF-1			Mean	0.00136	<0.030	2.60	0.00215	0.000118	1.72	<0.000010	17.0	0.109	33.4	11.4
				SD	0.000026	0.0092	0.015	0.000050	0.0000025	0.086	-	0.00	0.0023	0.23	0.29
				PRSD	-	-	1	2	-	5	-	0	2	1	3
Nelson River Upstream #2	US-2	L2299234-2	25-Jun-19	11:55	0.00158	0.033	2.33	0.00267	0.000113	2.19	<0.000010	14.3	0.103	25.7	9.14
	US-2B	L2299234-6	25-Jun-19	12:00	0.00150	<0.030	2.27	0.00237	0.000101	1.66	<0.000010	13.8	0.0981	26.2	8.88
	US-2C	L2299234-7	25-Jun-19	12:05	0.00160	<0.030	2.32	0.00252	0.000104	2.07	<0.000010	14.0	0.0977	26.1	9.35
	US-2			Mean	0.00156	<0.030	2.31	0.00252	0.000106	1.97	<0.000010	14.0	0.100	26.0	9.12
				SD	0.000053	0.0104	0.032	0.000150	0.0000062	0.278	-	0.25	0.0030	0.26	0.235
				PRSD	-	-	1	6	-	14	-	2	3	1	3
Nelson River Upstream #4	US-4	L2314964-4	22-Jul-19	12:15	0.00161	0.031	2.57	0.00265	0.000109	2.24	<0.000010	14.0	0.101	28.7	9.90
	US-4B	L2314964-6	22-Jul-19	12:20	0.00175	0.034	2.60	0.00286	0.000089	2.46	<0.000010	14.1	0.106	29.1	9.60
	US-4C	L2314964-7	22-Jul-19	12:25	0.00162	0.039	2.72	0.00276	0.000105	2.40	<0.000010	14.4	0.0998	28.8	9.72
	US-4			Mean	0.00166	0.035	2.63	0.00276	0.000101	2.37	<0.000010	14.2	0.102	28.9	9.74
				SD	0.000078	0.0040	0.079	0.000105	0.0000106	0.114	-	0.21	0.0033	0.21	0.151
				PRSD	-	-	3	4	-	5	-	1	3	1	2
Nelson River Upstream #2	US-2	L2338353-2	27-Aug-19	13:15	0.00173	0.030	2.31	0.00261	0.000120	2.58	<0.000010	14.0	0.116	28.4	10.2
	US-2B	L2338353-6	27-Aug-19	13:20	0.00153	0.036	2.31	0.00226	0.000163	2.09	<0.000010	14.6	0.114	28.3	10.1
	US-2C	L2338353-7	27-Aug-19	13:25	0.00192	0.040	2.37	0.00256	0.000092	2.66	<0.000010	14.8	0.116	28.3	10.1
	US-2			Mean	0.00173	0.035	2.33	0.00248	0.000125	2.44	<0.000010	14.5	0.115	28.3	10.1
				SD	0.000195	0.0050	0.035	0.000189	0.0000358	0.309	-	0.42	0.0012	0.06	0.06
				PRSD	-	-	1	8	-	13	-	3	1	0	1
Nelson River Upstream #2	US-2	L2350077-2	16-Sep-19	13:50	0.00145	0.034	2.33	0.00210	0.000078	2.84	<0.000010	12.2	0.111	30.4	9.64
	US-2B	L2350077-6	16-Sep-19	14:00	0.00163	0.040	2.42	0.00262	0.000092	3.31	<0.000010	12.8	0.110	29.8	9.50
	US-2C	L2350077-7	16-Sep-19	14:15	0.00150	0.036	2.29	0.00223	0.000056	2.63	<0.000010	12.5	0.109	29.7	9.26
	US-2			Mean	0.00153	0.037	2.35	0.00232	0.000075	2.93	<0.000010	12.5	0.110	30.0	9.47
				SD	0.000093	0.0031	0.067	0.000271	0.0000181	0.348	-	0.30	0.0010	0.38	0.192
				PRSD	-	-	3	12	-	12	-	2	1	1	2
Field Blanks															
Field Blank	TF-2	L2254087-7	03-Apr-19	12:30	<0.00050	<0.030	<0.050	<0.00020	<0.000050	<0.10	<0.000010	<0.050	<0.00020	<0.30	<0.50
Field Blank	TF-2	L2299712-7	26-Jun-19	9:20	<0.00050	<0.030	<0.050	<0.00020	<0.000050	0.14	<0.000010	0.215	0.00033	<0.30	<0.50
Field Blank	TF-2	L2315689-12	23-Jul-19	10:25	<0.00050	<0.030	<0.050	<0.00020	<0.000050	<0.10	<0.000010	0.227	<0.00020	<0.30	<0.50
Field Blank	TF-2	L2339792-7	31-Aug-19	8:40	0.00082	<0.030	<0.050	<0.00020	<0.000050	0.21	<0.000010	0.170	0.00031	<0.30	<0.50
Field Blank	TF-2	L2350076-7	17-Sep-19	9:55	<0.00050	<0.030	<0.050	<0.00020	<0.000050	0.16	<0.000010	0.199	0.00033	<0.30	<0.50
Trip Blanks															
Trip Blank	TF-1	L2254087-6	03-Apr-19		<0.00050	<0.030	<0.050	<0.00020	<0.000050	<0.10	<0.000010	<0.050	<0.00020	<0.30	<0.50
Trip Blank	TF-1	L2299712-6	26-Jun-19		<0.00050	<0.030	<0.050	<0.00020	<0.000050	<0.10	<0.000010	<0.050	<0.00020	<0.30	<0.50
Trip Blank	TF-1	L2315689-11	23-Jul-19		<0.00050	<0.030	<0.050	<0.00020	<0.000050	<0.10	<0.000010	<0.050	<0.00020	<0.30	<0.50
Trip Blank	TF-1	L2339792-6	31-Aug-19		<0.00050	<0.030	<0.050	<0.00020	<0.000050	<0.10	<0.000010	<0.050	<0.00020	<0.30	<0.50
Trip Blank	TF-1	L2350076-6	17-Sep-19		<0.00050	<0.030	<0.050	<0.00020	<0.000050	<0.10	<0.000010	<0.050	<0.00020	<0.30	<0.50

Table A2-2: Quality assurance/quality control results for metals and major ions measured in the laboratory during the ice-cover and open-water seasons, 2019. Percent relative standard deviations (PRSD) were calculated for triplicate samples where all results exceeded five times the detection limit (DL); values exceeding 18% are indicated in bold red. Blank values exceeding five times the DL are indicated in bold red (continued).

Sample Location	Sample ID	ALS Sample ID	Sample Date	Sample Time	Tellurium (mg/L)	Thallium (mg/L)	Thorium (mg/L)	Tin (mg/L)	Titanium (mg/L)	Tungsten (mg/L)	Uranium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)	Zirconium (mg/L)
Detection Limit 2019					**0.00020**	**0.000010**	**0.00010**	**0.00010**	**0.00030**	**0.00010**	**0.000010**	**0.00050**	**0.0030**	**0.000060**
Stephens Lake - Far-field #1	FF-1	L2254658-1	5-Apr-19	10:15	<0.00020	<0.000010	<0.00010	<0.00010	0.0154	<0.00010	0.000693	0.00119	0.0038	0.000432
	FF-1B	L2254658-6	5-Apr-19	10:20	<0.00020	<0.000010	0.00010	<0.00010	0.0168	<0.00010	0.000707	0.00130	0.0034	0.000425
	FF-1C	L2254658-7	5-Apr-19	10:25	<0.00020	<0.000010	<0.00010	<0.00010	0.0166	<0.00010	0.000677	0.00124	0.0035	0.000411
	FF-1			Mean	<0.00020	<0.000010	<0.00010	<0.00010	0.0163	<0.00010	0.000692	0.00124	0.0036	0.000423
				SD	-	-	-	-	0.00076	-	0.0000150	0.000055	0.00021	0.0000107
				PRSD	-	-	-	-	5	-	2	-	-	3
Nelson River Upstream #2	US-2	L2299234-2	25-Jun-19	11:55	<0.00020	0.000011	0.00017	<0.00010	0.0266	<0.00010	0.000551	0.00191	<0.0030	0.00060
	US-2B	L2299234-6	25-Jun-19	12:00	<0.00020	<0.000010	0.00015	<0.00010	0.0205	<0.00010	0.000524	0.00164	<0.0030	0.00054
	US-2C	L2299234-7	25-Jun-19	12:05	<0.00020	0.000010	0.00015	<0.00010	0.0263	<0.00010	0.000530	0.00176	<0.0030	0.00052
	US-2			Mean	<0.00020	<0.000010	0.00016	<0.00010	0.0245	<0.00010	0.000535	0.00177	<0.0030	0.00055
				SD	-	0.0000032	0.000012	-	0.00344	-	0.0000142	0.000135	-	0.000042
				PRSD	-	-	-	-	14	-	3	-	-	-
Nelson River Upstream #4	US-4	L2314964-4	22-Jul-19	12:15	<0.00020	0.000011	0.00018	<0.00010	0.0244	<0.00010	0.000582	0.00193	<0.0030	0.00056
	US-4B	L2314964-6	22-Jul-19	12:20	<0.00020	0.000011	0.00017	<0.00010	0.0287	<0.00010	0.000586	0.00204	<0.0030	0.00060
	US-4C	L2314964-7	22-Jul-19	12:25	<0.00020	0.000011	0.00018	<0.00010	0.0278	<0.00010	0.000599	0.00203	<0.0030	0.00056
	US-4			Mean	<0.00020	0.000011	0.00018	<0.00010	0.0270	<0.00010	0.000589	0.00200	<0.0030	0.00057
				SD	-	0.0000000	0.000006	-	0.00227	-	0.0000089	0.000061	-	0.000023
				PRSD	-	-	-	-	8	-	2	-	-	-
Nelson River Upstream #2	US-2	L2338353-2	27-Aug-19	13:15	<0.00020	<0.000010	0.00017	<0.00010	0.0236	<0.00010	0.000551	0.00214	<0.0030	0.00058
	US-2B	L2338353-6	27-Aug-19	13:20	<0.00020	<0.000010	0.00013	<0.00010	0.0139	<0.00010	0.000562	0.00186	<0.0030	0.00051
	US-2C	L2338353-7	27-Aug-19	13:25	<0.00020	0.000011	0.00017	<0.00010	0.0260	<0.00010	0.000558	0.00224	<0.0030	0.00059
	US-2			Mean	<0.00020	<0.000010	0.00016	<0.00010	0.0212	<0.00010	0.000557	0.00208	<0.0030	0.00056
				SD	-	-	0.000023	-	0.00641	-	0.0000056	0.000197	-	0.000044
				PRSD	-	-	-	-	**30**	-	1	-	-	-
Nelson River Upstream #2	US-2	L2350077-2	16-Sep-19	13:50	<0.00020	<0.000010	0.00012	0.00012	0.0217	<0.00010	0.000495	0.00170	<0.0030	0.00052
	US-2B	L2350077-6	16-Sep-19	14:00	<0.00020	0.000011	0.00014	<0.00010	0.0305	<0.00010	0.000521	0.00195	<0.0030	0.00054
	US-2C	L2350077-7	16-Sep-19	14:15	<0.00020	<0.000010	0.00010	<0.00010	0.0221	<0.00010	0.000523	0.00174	<0.0030	0.00054
	US-2			Mean	<0.00020	<0.000010	0.00012	<0.00010	0.0248	<0.00010	0.000513	0.00180	<0.0030	0.00053
				SD	-	-	0.000020	-	0.00497	-	0.0000156	0.000134	-	0.000012
				PRSD	-	-	-	-	**20**	-	3	-	-	-
Field Blanks														
Field Blank	TF-2	L2254087-7	03-Apr-19	12:30	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0030	<0.000060
Field Blank	TF-2	L2299712-7	26-Jun-19	9:20	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0030	<0.00020
Field Blank	TF-2	L2315689-12	23-Jul-19	10:25	<0.00020	<0.000010	<0.00010	0.00022	<0.00030	<0.00010	<0.000010	<0.00050	<0.0030	<0.00020
Field Blank	TF-2	L2339792-7	31-Aug-19	8:40	<0.00020	<0.000010	<0.00010	0.00048	<0.00030	<0.00010	<0.000010	<0.00050	<0.0030	<0.00020
Field Blank	TF-2	L2350076-7	17-Sep-19	9:55	<0.00020	<0.000010	<0.00010	**0.00056**	<0.00030	<0.00010	<0.000010	<0.00050	0.0040	<0.00020
Trip Blanks														
Trip Blank	TF-1	L2254087-6	03-Apr-19		<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0030	<0.000060
Trip Blank	TF-1	L2299712-6	26-Jun-19		<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0030	<0.00020
Trip Blank	TF-1	L2315689-11	23-Jul-19		<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0030	<0.00020
Trip Blank	TF-1	L2339792-6	31-Aug-19		<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0030	<0.00020
Trip Blank	TF-1	L2350076-6	17-Sep-19		<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0030	<0.00020

* Result confirmed through laboratory reanalysis.

Table A2-3: Quality assurance/quality control results for hydrocarbons during the ice-cover and open-water seasons, 2019. Percent relative standard deviations (PRSD) were calculated for triplicate samples where all results exceeded five times the detection limit.

Sample Location	Sample ID	ALS Sample ID	Sample Date	Sample Time	Benzene (mg/L)	Ethyl benzene (mg/L)	Toluene (mg/L)	o-Xylene (mg/L)	m+p-Xylenes (mg/L)	Xylenes (Total) (mg/L)	F1 (C6-C10) (mg/L)	F1-BTEX (mg/L)	Total Hydrocarbons (C6-C50) (mg/L)	F2 (C10-C16) (mg/L)	F3 (C16-C34) (mg/L)	F4 (C34-C50) (mg/L)
Detection Limit 2019					**0.00050**	**0.00050**	**0.0010/0.00050**	**0.00050**	**0.00040/ 0.001**	**0.00064/ 0.0011**	**0.10**	**0.10**	**0.38**	**0.10**	**0.25**	**0.25**
Manitoba Water Quality Guideline for the Protection of Aquatic Life					**0.370**	**0.090**	**0.0020**									
Stephens Lake - Far-field #1	FF-1	L2254658-1	5-Apr-19	10:15	-	-	-	-	-	-	-	-	-	-	-	-
	FF-1B	L2254658-6	5-Apr-19	10:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	FF-1C	L2254658-7	5-Apr-19	10:25	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	FF-1			Mean	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
				SD	-	-	-	-	-	-	-	-	-	-	-	-
				PRSD	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream #2	US-2	L2299234-2	25-Jun-19	11:55	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	US-2B	L2299234-6	25-Jun-19	12:00	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	US-2C	L2299234-7	25-Jun-19	12:05	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	US-2			Mean	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
				SD	-	-	-	-	-	-	-	-	-	-	-	-
				PRSD	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream #4	US-4	L2314964-4	22-Jul-19	12:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	US-4B	L2314964-6	22-Jul-19	12:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	US-4C	L2314964-7	22-Jul-19	12:25	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	US-4			Mean	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
				SD	-	-	-	-	-	-	-	-	-	-	-	-
				PRSD	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream #2	US-2	L2338353-2	27-Aug-19	13:15	<0.00050 [1]	<0.00050 [1]	<0.0010 [1]	<0.00050 [1]	<0.00040 [1]	<0.00064	<0.10 [1]	<0.10	<0.38	<0.10	<0.25	<0.25
	US-2B	L2338353-6	27-Aug-19	13:20	<0.00050 [1]	<0.00050 [1]	<0.0010 [1]	<0.00050 [1]	<0.00040 [1]	<0.00064	<0.10 [1]	<0.10	<0.38	<0.10	<0.25	<0.25
	US-2C	L2338353-7	27-Aug-19	13:25	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	US-2			Mean	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
				SD	-	-	-	-	-	-	-	-	-	-	-	-
				PRSD	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream #2	US-2	L2350077-2	16-Sep-19	13:50	<0.00050 [2]	<0.00050 [2]	<0.00050 [2]	<0.00050 [2]	<0.0010 [2]	<0.0011	<0.10 [2]	<0.10	<0.38	<0.10	<0.25	<0.25
	US-2B	L2350077-6	16-Sep-19	14:00	<0.00050 [2]	<0.00050 [2]	<0.00050 [2]	<0.00050 [2]	<0.0010 [2]	<0.0011	<0.10 [2]	<0.10	<0.38	<0.10	<0.25	<0.25
	US-2C	L2350077-7	16-Sep-19	14:15	<0.00050 [2]	<0.00050 [2]	<0.00050 [2]	<0.00050 [2]	<0.0010 [2]	<0.0011	<0.10 [2]	<0.10	<0.38	<0.10	<0.25	<0.25
	US-2			Mean	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.0011	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
				SD	-	-	-	-	-	-	-	-	-	-	-	-
				PRSD	-	-	-	-	-	-	-	-	-	-	-	-
Field Blanks																
Field Blank	TF-2	L2254087-7	03-Apr-19	12:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Field Blank	TF-2	L2299712-7	26-Jun-19	9:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Field Blank	TF-2	L2315689-12	23-Jul-19	10:25	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Field Blank	TF-2	L2339792-7	31-Aug-19	8:40	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Field Blank	TF-2	L2350076-7	17-Sep-19	9:55	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.0011	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Trip Blanks																
Trip Blank	TF-1	L2254087-6	03-Apr-19		<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Trip Blank	TF-1	L2299712-6	26-Jun-19		<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Trip Blank	TF-1	L2315689-11	23-Jul-19		<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Trip Blank	TF-1	L2339792-6	31-Aug-19		<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Trip Blank	TF-1	L2350076-6	17-Sep-19		<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.0011	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25

1. Sample submitted with headspace; results may be biased low.
2. VOC analysis was conducted for a water sample that contained > 5% headspace. Results may be biased low.