technical report

Sherridon Orphaned Mine Reclamation Project
2019 Water Quality Monitoring Program Summary

DJRC | D.J. Ramsey Consulting

27 May 2020

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May 2020

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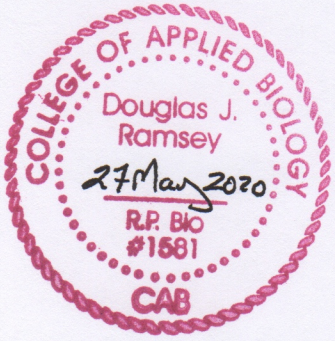

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Date: 27 May 2020

Cover Photo Credit: Camp Lake Discharge, 5 March 2020, taken by Eishen Doctolero (Tetra Tech Canada Inc.)

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Acknowledgements

This project report represents the work of many individuals. Overall project management was provided by Gord Steiss, Brian McIntosh, and Jennifer Wilson in the Winnipeg office of Tetra Tech Canada Inc. Sample collection was by, Bill Hatch (Sherridon); Jennifer Pieniuta, Eishen Doctolero, and Matt Randell, (Tetra Tech). Dennis Hatch (Sherridon) also assisted in the field. Kelly Jones and Lindsay Lutes (Tetra Tech) provided QA/QC review of the laboratory results. Brian McIntosh and Jennifer Wilson, both of Tetra Tech, reviewed the draft report.

Executive Summary

Planning of the Sherridon Orphaned Mine Reclamation Project was initiated in 2006, leading to implementation (construction) of the plan beginning in 2009 and continuing to the present. The reclamation approach employed in the project is sub-aqueous disposal of the sulphide mine waste in the adjacent Camp Lake, which is a demonstrated best management practice for the long-term control of acid rock drainage (ARD) from sulphide-bearing mine waste materials. Sherlett Creek, the natural inflow to Camp Lake, was diverted around Camp Lake to enable placement of the mine waste. The bulk of the construction work has been completed, and Sherlett Creek flow through Camp Lake was restored in August 2018. Prior to 2019, lime treatment was used to manage water quality and water levels in Camp Lake. Restoration of the creek flow has since eliminated any need for lime treatment. The remaining project construction work involves removal of pockets of mine waste from the north shore of the East basin of Camp Lake and removal of the access road adjacent to the South basin of Camp Lake. This work is currently planned for completion in the 2020 construction season. This report describes and summarises the results of the 2019 water quality monitoring program for the project. Results are compared to applicable Manitoba water quality criteria, and effects of water discharges from Camp Lake to the Cold Lake arm of Kississing Lake are examined.

Manitoba manages water quality using the Manitoba Water Quality Standards, Objectives, and Guidelines (MWQSOG). These consist of Tier I Standards, Tier II Objectives, and Tier III Guidelines. Tier I Standards typically are applied to discharges and must be met – no Tier I standards are applicable to the Sherridon project. Tier II Objectives have been defined for a limited number of common pollutants and typically are applied to receiving waters rather than to discharges; representing the concentrations to be achieved after allowance for mixing. Tier II objectives are established for long-term (chronic) exposures and for short-term (acute) exposures. The acute exposure objectives typically are higher than the chronic exposure objectives. Tier II Objectives are targets that should be met most of the time, except during extraordinary climate conditions (e.g., severe drought) or when background concentrations exceed the objective. Tier III Guidelines cover a wide range of water quality parameters that are not otherwise included in the Tier II Objectives. The Tier III numerical guidelines provide a basis for evaluation of water quality, and a means to evaluate any need for site-specific criteria, but do not require strict compliance.

Sherlett Creek flow was returned through Camp lake in August 2018, with 2019 representing the first full year of this operating regime. Sherlett Creek provided sufficient alkalinity to carry the lake through the entire year without requiring a lime treatment. Camp Lake pH was stable through the year, with no late summer development of acidic conditions as occurred before creek flow was restored.

Elimination of lime treatment has made it possible to more fully understand the effect of the remaining mine waste adjacent to Camp Lake on water quality. Throughout the 2019 open

water season, the combined effects of local mine waste sources, spring runoff, and heavy rainfall events were the primary factors affecting water turbidity and appearance and the concentrations of key metals (iron, aluminum, cadmium, copper, and zinc) This was most evident under winter ice cover, which isolates the lake from local watershed runoff, when the concentrations of turbidity and all metals reach their annual lows. Sherlett Creek water quality ultimately determines the best possible water quality that can be achieved in Camp Lake on completion of reclamation. Iron and aluminum concentrations in the lake were the same as in Sherlett Creek under ice cover in both February 2019 and March 2020. Winter cadmium, copper, and zinc concentrations in the lake ranged from the same as in Sherlett Creek (South basin) to slightly higher (East basin). The slightly higher concentrations in the East basin than in the rest of Camp Lake under winter ice cover is related to isolation of the basin from the rest of the lake by the ice cover. The mine waste that has been placed in Camp Lake does not affect metal concentrations in the Camp Lake discharge.

Alkalinity also was highest in the lake under winter ice cover, and was higher than in the inflowing Sherlett Creek, indicating net alkalinity generation occurs in the lake in the absence of watershed runoff. This may be one of the first indications that Camp Lake is beginning to function as a lake rather than just providing the essential water cover for the submerged mine waste. Net alkalinity generation also was noted in Cold Lake under winter ice cover.

The role of heavy rainfall events in affecting water quality in Camp Lake was first identified in 2018, with decreases in alkalinity and peaks in metal concentrations occurring in the lake following rainfall events. This pattern continued in 2019, with a heavy rainfall event producing the second peaks in all of the key metals in early August.

The effect of spring runoff on metal concentrations in the lake was previously obscured by the lime treatments – the high pH in the lake following a lime treatment would have quickly precipitated any metals delivered by spring runoff. The spring runoff effect became evident in 2019 in the absence of a lime treatment, driving the first peaks in all of the key metals and the corresponding first drop in alkalinity in late May/early June. Runoff events, whether in the form of the spring melt runoff or as rainfall events over the course of the open water period, carry the products of Acid Rock Drainage (ARD) and the leachable metals from the mine waste into the lake.

Mine waste remaining adjacent to the East basin of Camp Lake is the primary contributor of aluminum, cadmium, copper, and zinc to the lake, as indicated by the higher peak concentrations that develop in the East basin than in the rest of the lake during runoff events. Concentrations of these metals are less affected by runoff to the South basin where, even during the runoff periods, concentrations remained the lowest in the lake and, at times, the same as in Sherlett Creek. Concentrations in the Central and North basins are typically intermediate between those in the South and East basins, reflecting the mixing of water from the two basins in passing to the lake outlet. The mine wastes adjacent to both the East and the South basins are a source of iron in runoff to both parts of the lake, with similar iron concentrations developing

in all basins during spring runoff and with higher peak iron concentrations developing in the South and Central basins during the second peak.

The differing effects of the two areas of mine waste are explained by the different types of waste. Mine waste remaining in the area of the East basin is primarily in the form of poorly weathered tailings – ore that was ground for recovery of economic minerals (zinc and copper) and then sat at the bottom of the tailings pile, protected from exposure to weathering, until it was uncovered in 2011-2012. Mine waste remaining adjacent to the South basin (primarily) of Camp Lake is largely waste rock, pyritic (iron sulphide) rock with uneconomic concentrations of other metals, that has been exposed to weathering for an extended period, possibly since the late 1920's when mining first started at Sherridon.

The red-coloured turbidity that developed in the lake in late July 2019 was caused by particulate iron delivered to the lake in runoff from the adjacent mine waste. Particulate iron accounted for 83% of turbidity and 70% of TSS in the Camp Lake discharge on average in 2019. The particulate iron turbidity that developed in 2019 differs from the lime floc that occurred in the lake following lime treatments in previous years. The lime floc was a larger particle that settled readily during calm periods and was resuspended by wind action in the South and Central basins during periods of strong northerly winds. The East basin is more protected from wind action and no floc resuspension occurred in that basin. The particulate iron in 2019 is a much smaller particle that does not settle well and now causes red-coloured turbidity in all basins of the lake. Elimination of the turbidity will require removal of the remaining adjacent mine waste in the watershed from exposure to weathering. This will be done by excavation and burial of the waste in clay borrow pits.

The three silt curtains installed in Camp Lake were ineffective in preventing the movement of turbidity from Camp Lake. The particulate iron that is now formed in the lake is a much smaller particle than the lime floc that formed during lime treatment and the particulate iron that causes the red-coloured turbidity passes through the silt curtains. A 50% reduction in the silt curtain mesh size was tested in the lab and also had no effect on reducing particulate iron.

The Camp Lake discharge had no effect on concentrations of the parameters that affect the appearance of the water – TSS, turbidity, total iron – at any station on Cold Lake outside the mixing zone on any sampling date in 2019. Aluminum concentrations in Cold Lake also were not affected outside the mixing zone in 2019.

Turbidity is the primary real-time monitoring parameter for detection of discharge effects on appearance of the water in Cold Lake. Turbidity in the discharge ranged to a maximum of 57 NTU in 2019, with no effect observed at the margin of the mixing zone. Turbidity would have to be considerably higher than 57 NTU in the discharge to have any effect beyond the margin of the mixing zone, leaving a considerable additional margin of safety before the discharge could affect the appearance of water in Cold Lake.

The discharge had no effect on concentrations of cadmium, copper, or zinc in Cold Lake outside the mixing zone over most of the year. The only exception was for a period of one (zinc), two (copper), to three (cadmium) weeks during the peak spring runoff period. Total copper concentrations at station CL-2 were elevated on May 28 and June 4, total zinc was elevated at CL-4 on May 28, and total cadmium was elevated at CL-2 and CL-4 on May 28, June 4, and June 18. Cadmium, copper, and zinc concentrations were within historical background levels before May 28 and after June 18.

The turbidity, suspended solids, and metals in the Camp Lake discharge have not caused increases in the concentrations of any of the key metal parameters (iron, aluminum, cadmium, copper, and zinc) in sediments at any station in Cold Lake, including the three stations located within the mixing zone.

The generally improved water quality in Cold Lake has however caused increased concentrations of 12 minor metals and metalloids (calcium, chromium, magnesium, manganese, nickel, phosphorus, potassium, sodium, strontium, thallium, titanium, and zirconium) that previously occurred in reduced concentrations in the sediments due to the acidic conditions that existed before the reclamation project. The acidic conditions prevented the sedimentation of some metals and also were responsible for leaching some metals from the sediments, both leading to reduced concentrations compared to natural background concentrations. Increases were smaller to negligible at station CL-6, which was much less acidic than the other stations on Cold Lake prior to reclamation. None of the increases represents an adverse change.

Sediment arsenic concentrations were elevated at all stations in Cold Lake in 2019 compared to the 2008 survey, with the largest increase occurring at station CL-5 and the lowest increases at the three mixing zone stations. This is not a result of the Camp Lake discharge - total arsenic concentrations in the discharge are lower than in Cold Lake. Runoff from recent forest fire burn areas in the Sherlett Creek watershed is the most likely source of the arsenic and explains why the highest sediment arsenic concentration occurred at CL-5. Elevated sediment lead and mercury concentrations at CL-5 also are attributable to runoff from recently burned areas. None of the increases in sediment arsenic, lead, or mercury is substantial or a concern for the health of aquatic life.

The 2019 water quality monitoring results illustrate the importance of completing the reclamation work to remove the remaining adjacent mine waste in the local watershed. In the absence of runoff from the mine waste, as demonstrated both under winter ice cover and during dry periods in the open water season, water quality in Camp Lake, and therefore in the Camp Lake discharge, approaches that in Sherlett Creek.

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1.1 Camp Lake Water and Water Quality Management – 2019

The entire flow of Sherlett Creek was directed into Camp Lake on August 12, 2018, and a discharge from Camp Lake via the North weir to the Cold Lake arm of Kississing Lake was initiated on August 21, 2018. The full flow of Sherlett Creek to Camp Lake was maintained until October 19, 2018 when the creek flow was split, with (nominally) 85% of the flow continuing into and through Camp Lake and with 15% (nominally) of the flow directed to Portage Lake and lower Sherlett Creek via the diversion channel. The split flow configuration continues to date and will be maintained year-round going forward. The split flow has eliminated any requirement for lake treatment to date and is expected to eliminate any future need for batch lime treatment.

Until August 2018, an interim water and water quality management plan was used to establish and maintain the operating level of Camp Lake. This involved operating Camp Lake as a periodic batch discharge system. The lake would accumulate water due to direct precipitation and runoff from the local watershed in the absence of a discharge. Water quality in the lake degraded over the course of the open water season due primarily to remaining adjacent sources of acid rock drainage (ARD) in the local watershed. Water quality was managed using periodic (typically annual) batch treatment of Camp Lake with lime to neutralize and precipitate metals from the ARD-affected lake water, followed by the discharge of treated water over the North weir to the Cold Lake arm of Kississing Lake.

The restoration of Sherlett Creek flow to Camp Lake in August 2018 was made possible by the progress of the Sherridon Reclamation Project. Removal of ARD source materials from the local watershed had progressed to the point that the alkalinity delivered by Sherlett Creek was sufficient to neutralize the remaining sources of ARD in runoff to the lake, as has been demonstrated. The reclamation project remains to be completed, with removal of the remaining ARD sources from the local watershed.

1.2 Status of Sherridon Reclamation Works – 2019

No reclamation work was done in 2019. Work completed prior to 2019 is summarized below.

The bulk of the 7 million tonnes of acid generating mine waste in the Sherridon tailings pile was relocated to the adjacent Camp Lake over the period 2009 to 2012. The lake was re-filled with

water from Kississing Lake in 2013. However, remaining mine waste on the former Sherridon mill site (principally waste rock) and in the site-access causeway and the site access road, along with potential exchange of water with the Glory Hole (a direct opening to the underground mine workings), and the temporary Tailings Berm placed at the south end of Camp Lake at the start of the reclamation project, continued to contribute to water quality degradation in Camp Lake. Water treatment plant (WTP) sludge that had been deposited in the North basin earlier in the reclamation project was a further contributor to water quality degradation.

The summer 2016 construction program removed the WTP sludge from the North basin to Trap Lake, and the mill site and causeway waste materials were placed in Camp Lake, removing these ARD and metals sources from further degrading water quality Camp Lake going forward. No reclamation work was done in 2017. Work completed in 2018 included:

- Removal of mine waste adjacent to the access road in a former ore load-out area;
- Construction of the dam to isolate the Glory Hole adjacent to the South basin, where there was the potential for exchange of ARD influenced groundwater with the South basin;
- Earthworks reinforcement and overflow spillway construction at the outlet of Fox Lake, which periodically flows south into the East basin of Camp Lake, in order to maintain the water level of Fox Lake and prevent uncontrolled breaching of the temporary clay dyke that had been placed at the lake outlet in 2012;
- Identification and removal of mine waste on the discharge pathway between Fox and Camp Lake;
- Identification and partial removal of remnant mine waste along the north shore of the east basin of Camp Lake;
- Removal of the tailings berm (constructed of mine waste) across the inlet to Camp Lake from Sherlett Creek;
- Notching of the coffer dam at the inlet of Camp Lake to restore flows of Sherlett Creek into and through the lake beginning August 12; and,
- Installation of flow limitation plates on the inlets of the diversion channel culverts to split Sherlett Creek flow between Camp Lake (nominally 85% of flow) and Portage Lake/lower Sherlett Creek (nominally 15% of flow).

Known sources of ARD remaining adjacent to Camp Lake going into the 2019 construction season, include:

- Mine waste used to construct the access road (runoff to Central and South basins); and,
- Remnant mine waste along the north shore of the East basin of Camp Lake and around the peninsula separating the East basin from the North basin of Camp Lake (runoff to the East basin primarily, but also to the North and Central basins).

2.0 Water and Sediment Quality Monitoring Program – 2019

2.1 Water Quality

The water quality monitoring program involved periodic sampling of the following locations, with the frequency and parameters listed in Table 1:

- Sherlett Creek, upstream of Camp Lake (SC-1);
- 8 stations on Camp Lake (NB-1, NB-2, CB-1, CB-2, SB-1, SB-2, EB-1, and EB-2; Figure 1);
- Camp Lake discharge, at the North Weir (Figure 3);
- 3 stations in the discharge mixing zone of Cold Lake (CL3, CL7, and CL8; Figures 2 and 3); and,
- 4 other stations on Cold Lake (CL2, CL4, CL5, and CL6; Figure 3).

The Camp Lake discharge at the North weir also was sampled for testing of acute toxicity (96-hour LC-50) to Rainbow Trout on 6 dates (June 5, June 26, July 23, August 7, September 25, and October 8).

All samples from Camp Lake, the Camp Lake discharge, and Sherlett Creek for laboratory analysis were collected as dip samples from approximately 0.25 m depth. The mixing zone and Cold Lake station samples included a near-surface dip sample collected from approximately 0.25 m and a near-bottom sample, collected from approximately 0.5 m above the lake bottom using a Wildco trace-metal grade beta bottle. Field measurements included Secchi disk visibility at each station on Camp Lake and Cold Lake; a surface pH measurement using a handheld pH meter at all locations, and measurements of water temperature, specific conductance, pH, dissolved oxygen, and turbidity using a YSI multi-parameter sonde. Sherlett Creek and the Camp Lake discharge were measured near-surface only. Camp Lake profiles included measurements at 0.25 m, and at 1.0 m intervals to 0.5 m above the lake bottom. Cold Lake profiles included measurements at 0.25 m, and at 1 m intervals to 0.5 m above the lake bottom.

Sherlett Creek essentially represents background water quality for the watershed and is the water source that will dominate Camp Lake water quality following restoration of creek flows through the lake. Station SC-1 is located at the bridge crossing immediately upstream of the project area and is not influenced by any of the project activities.

The discharge mixing zone is the portion of the Cold Lake arm of Kississing Lake within a 100 m radius of the point where the Camp Lake discharge enters the lake, as required by the Manitoba Water Quality Standards Objectives and Guidelines (MWQSOGs, Manitoba Water Stewardship 2011). Stations CL-7 and CL-8 are located on the margin of the mixing zone, 100 m from the discharge (Figure 2). Station CL-3 is located within the mixing zone, 75 m from the discharge.

Lab analyses for the Camp Lake discharge, and for mixing zone samples while the discharge was flowing, were completed on a rush basis. All laboratory analyses were conducted by Bureau Veritas (formerly Maxxam) Laboratories, a CAEAL accredited independent laboratory.

2.2 Sediment Quality

Sediment samples were collected at all stations in Cold Lake (CL-2, CL-3, CL-4, CL-5, CL-6, CL-7, and CL-8) for physical and chemical analysis and comparison with values measured in 2008 before the reclamation project began. The sampling method replicated the method used in the September 2008 study (Tetra Tech WEI 2016). Samples were collected using a stainless-steel Ekman dredge (15.2 cm x 15.2 cm x 22.9 cm) fitted with lead weights. The upper five cm of the sediment collected in the dredge was sampled for analysis using a 5 cm diameter x 5 cm long cellulose-acetate-butyrate (CAB) core tube by pressing the core tube into the sediment until the top of the core tube was level with the sediment surface. Eight core sub-samples (approximately 0.6 L) were taken from each station. The individual sediment cores collected at a station were composited in a plastic Ziploc bag. Multiple dredge hauls (typically 2 to 3) were required per station to collect sufficient sediment for analysis. One duplicate sample of sediments was collected at Station CL-3 using the same procedure. Samples were refrigerated between the time of collection and delivery to Bureau Veritas Laboratories for analysis of: moisture content; pH; and, total metals.

2.3 QA/QC

The field quality assurance/quality control (QA/QC) program for water quality monitoring was based on the field QA/QC requirements of the Metal and Diamond Mining Effluent Regulations (MDMER, Minister of Justice 2020). A field duplicate sample was collected on each sampling day. An equipment blank was taken from the water sampler on each day of use to check for equipment contamination before use. A trip blank was sent with each sample shipment to check for contamination of samples during shipment. Field water quality meters were standardised (i.e., checked against standards) each day and calibrated as needed based on the standardisation results.

2.4 Data Screening

Water quality monitoring data were screened against two sets of criteria:

- MDMER – Metal and Diamond Mining Effluent Regulations (Minister of Justice 2020; Table 2); and,

- MWQSOG – the Manitoba Water Quality Standards, Objectives, and Guidelines (Manitoba Water Stewardship 2011; Table 3).

Table 1. Sherridon Reclamation Project: Water quality monitoring parameters and frequency, 2019.

Location	Frequency	Parameters
Camp Lake Discharge at North Weir	2019: Monthly in Jan, Feb, Nov, and Dec; Weekly from May 29 to Oct 8	Lab: pH, alkalinity, TSS[a], turbidity, total and dissolved metals in sample from weir discharge Field: pH, temperature, dissolved oxygen, specific conductance, turbidity
Camp Lake (NB-1, NB-2, CB-1, CB-2, SB-1, SB-2, EB-1, and EB-2)	2019: Once in Feb; Weekly from May 29 to Oct 8	Lab: pH, alkalinity, TSS, turbidity, total and dissolved metals from 0.3 m below surface Field: pH, temperature, dissolved oxygen, specific conductance, and turbidity profiles with depth; Secchi disc visibility
Sherlett Creek (SC-1)	2019: Monthly in Jan, Feb, Nov, and Dec; Weekly from May 29 to Oct 8	Lab: pH, alkalinity, TSS, turbidity, total and dissolved metals in a surface sample Field: pH, temperature, dissolved oxygen, specific conductance, turbidity
Discharge Mixing Zone (CL3, CL7, and CL8)	2019: Once in Feb; Weekly from May 29 to Oct 9	Lab: pH, alkalinity, TSS, turbidity, total and dissolved metals from 0.3 m below surface and 0.5 m above lake bottom Field: pH, temperature, dissolved oxygen, specific conductance, and turbidity profiles with depth; Secchi disc visibility
Cold Lake (CL2, CL4, CL5, and CL6)	2019: Once in Feb; Bi-monthly from May 29 to Oct 9	Lab: pH, alkalinity, TSS, turbidity, total and dissolved metals from 0.3 m below surface and 0.5 m above lake bottom Field: pH, temperature, dissolved oxygen, specific conductance, and turbidity profiles with depth; Secchi disc visibility

a. TSS reportable detection limit (RDL) lowered to 1 mg/L starting in May 2019. Previous RDL was 4 mg/L

Table 2. Metal and Diamond Mining Effluent Regulations (MDMER) discharge quality limits (Minister of Justice 2020). Units are mg/L except as noted.

Parameter	Grab Sample	Monthly Mean
TSS	30.00	15.00
pH (pH units)	6.0 to 9.5	6.0 to 9.5
Arsenic, total	1.00	0.50
Copper, total	0.60	0.30
Lead, total	0.40	0.20
Nickel, total	1.00	0.50
Zinc, total	1.00	0.50
Radium 226	1.11 Bq/L	0.37 Bq/L
Rainbow trout 96 hr LC_{50}	Non-toxic	Non-toxic

The MWQSOG are the water quality criteria used by Manitoba Conservation and Climate to manage surface water quality. The MWQSOG consist of three tiers:

- Tier I Standards, which must be met if applicable. These are compliance requirements set out in law/regulation (e.g., MDMER) or in a permit or license (e.g., a Manitoba Environment Act License). There are no Tier I standards applicable to the Sherridon project.

- Tier II Objectives – These have been defined for a limited number of common pollutants and typically are applied to receiving waters rather than to discharges; representing the concentrations to be achieved after allowance for mixing. Tier II objectives are established for long-term (chronic) exposures and for short-term (acute) exposures. The acute exposure objectives typically are higher than the chronic exposure objectives. Some Tier II Objectives for metals are calculated on the basis of the water hardness for a specific water body, with the objective increasing with water hardness. Hardness provides protection against the toxicity of some metals. Tier II Objectives are targets that should be met most of the time, except during extraordinary climate conditions (e.g., severe drought) or when background concentrations exceed the objective.

- Tier III Guidelines – These cover a wide range of water quality parameters that are not otherwise included in the Tier II Objectives and include both numerical and narrative guidelines. The Tier III numerical guidelines provide a basis for evaluation of water quality, and a means to evaluate any need for site-specific criteria, but do not require strict compliance. The Tier III narrative guidelines, which refer to general non-numeric water quality characteristics, should be met at all times.

Table 3. Manitoba Water Quality Standards, Objectives, and Guidelines (MWQSOGs; Manitoba Water Stewardship 2011) for protection of cool water aquatic life applicable to Cold Lake arm of Kississing Lake. Units are mg/L except as noted. Key parameters in bold face.

Parameter	TIER II Objective (acute)		TIER II Objective (chronic)		TIER III Guideline
	Dissolved	Total	Dissolved	Total	
TSS	--	25 mg/L increase	--	5 mg/L increase	--
pH (pH Unit)	--	--	--	--	6.5 to 9.0
Nitrite	--	--	--	--	0.06
Dissolved Oxygen	5.0	--	6.0	--	--
Ammonia[a]	3.976	--	9.939	--	--
Phosphorus	--	--	--	--	0.025 (total)
Aluminum (Al)	--	--	--	--	0.1 (total; pH ≥6.5) 0.005 (total; pH < 6.5)
Arsenic (As)	0.340	--	0.150	--	--
Cadmium (Cd)[b]	0.00121	0.00125	0.00017	0.00018	--
Chromium (Cr^{III})[b]	0.372	1.176	0.048	0.056	--
Copper (Cu)[b]	0.00823	0.00857	0.00574	0.00598	--
Iron (Fe)	--	--	--	--	0.3 (total)
Lead (Pb)[b]	0.0365	0.0421	0.00142	0.00164	--
Mercury (Hg)	--	--	--	--	0.000026 (total)
Molybdenum (Mo)	--	--	--	--	0.073 (total)
Nickel (Ni)[b]	0.301	0.302	0.0335	0.0336	--
Selenium (Se)	--	--	--	--	0.001 (total)
Silver (Ag)	--	--	--	--	0.0001 (total)
Thallium (Tl)	--	--	--	--	0.0008 (total)
Uranium (U)	--	--	--	--	0.015 (total)
Zinc (Zn)[b]	0.0754	0.0771	0.0760	0.0771	--

a. Calculated as per Manitoba Conservation (2011) using pH 7.6 and 10 °C.
b. Calculated as per Manitoba Conservation (2011) using mean total hardness of 59.4 mg/L as $CaCO_3$ as measured in Cold Lake on 11 May 2016.

The MDMER set out the minimum national standards that must be met by operating metals and diamond mines in Canada. The MDMER supersede the MMER (Metal Mining Effluent Regulations) and the effluent quality limits remain the same for existing facilities. Although they are not applicable to the Sherridon Project, the MDMER are considered in data screening to compare how the project is performing in comparison to this standard.

Data screening primarily focused on what we have termed, since 2015, the "key parameters" for the project: pH, alkalinity, TSS, and the total fractions of the metals iron, aluminum, cadmium, copper, and zinc. The key parameters are those which have been found to be relevant to understanding the effects of water from Camp Lake on receiving water quality in Cold Lake. Some of the key parameters have historically occurred in Camp Lake in concentrations at or above the applicable MWQSOGs (pH, aluminum, cadmium, copper, iron, and zinc; Tetra Tech WEI (2016) and DJRC (2016)). Alkalinity was first introduced as a key parameter to track the performance of lime treatments and, through its consumption over the season, as a measure of continuing acid sources to the lake. With the lime treatment discontinued and Sherlett Creek inflow augmenting buffering capacity in Camp Lake, alkalinity is now monitored to assess the performance of the project in maintaining adequate alkalinity. TSS is a focus because of local concerns regarding the effect of any discharge from Camp Lake on the appearance of water in Cold Lake. Turbidity, both field and lab measured, was added to the analyses in the 2017 program, and has been continued, to provide another means of detecting possible changes in appearance of the water and also is considered here as a key parameter.

The Tier II objectives for six metals (cadmium, chromium, copper, lead, nickel, and zinc) are determined by water hardness, and the objectives increase with increasing water hardness based on the equations presented in Manitoba Water Stewardship (2011). The objectives for the six metals were initially calculated for Cold Lake based on the 11 May 2016 pre-discharge mean surface hardness value of 59.4 mg/L as $CaCO_3$ (DJRC 2016). In 2017, 102 near-surface hardness measurements were made at stations CL-2, Cl-3, CL-4, CL-5, CL-6, CL-7, and CL-8. The mean hardness over those measurements was 60.1 mg/L as $CaCO_3$, which is the same as the initial value for 11 May 2016 within the analytical precision of +/- 10%. Consequently, the Tier II objectives for cadmium, chromium, copper, lead, nickel, and zinc have been maintained as stated in DJRC (2016). Higher hardness concentrations typically occurred in the near-bottom samples than in the surface samples from Cold Lake stations CL-2, CL-4, CL-5, and CL-6 where thermal stratification developed during the open water season (see section 3.1 below for further discussion regarding the effects of summer stratification). The lower near-surface values have been used for Tier II objective calculation.

Sediment quality data were screened against the CCME sediment quality guidelines (CCME 2011), which also have been incorporated into the Tier III Guidelines of the MWQSOGs (Manitoba Conservation 2011; Table 4). The sediment quality guidelines have two tiers, with the Interim Sediment Quality Guidelines (ISTGs) representing the concentrations below which adverse effects of that parameter are not expected to occur. The Probable Effects Levels (PELs) represent the concentrations above which adverse effects of that parameter on aquatic biota can be expected to occur.

Table 4. Canadian Sediment Quality Guidelines/MWQSOG Tier III Sediment Quality Guidelines, for protection of aquatic life (CCME 2011; Manitoba Conservation 2011). ISQG – Interim Sediment Quality Guideline. PEL – Probable Effects Level. Units are mg/kg dry weight.

Parameter	ISQG	PEL
Arsenic (As), Total	5.9	17
Cadmium (Cd), Total	0.6	3.5
Chromium (Cr), Total	37.3	90
Copper (Cu), Total	35.7	197
Lead (Pb), Total	35	91.3
Mercury (Hg), Total	0.17	0.486
Zinc (Zn), Total	123	315

Figure 1. Camp Lake water quality monitoring station locations.

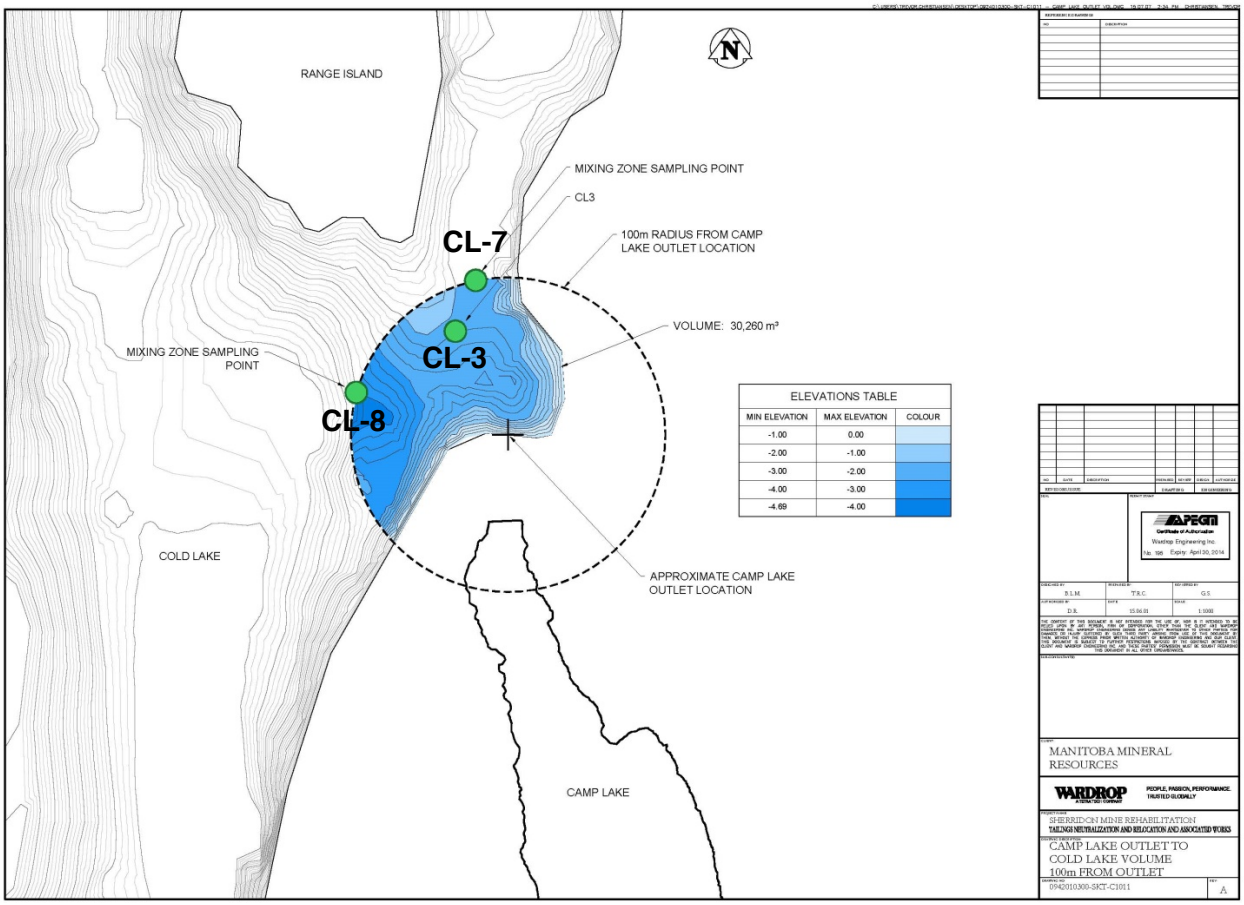

Figure 2. Camp Lake discharge mixing zone in Cold Lake and locations of sampling stations (CL-3, CL-7, and CL-8).

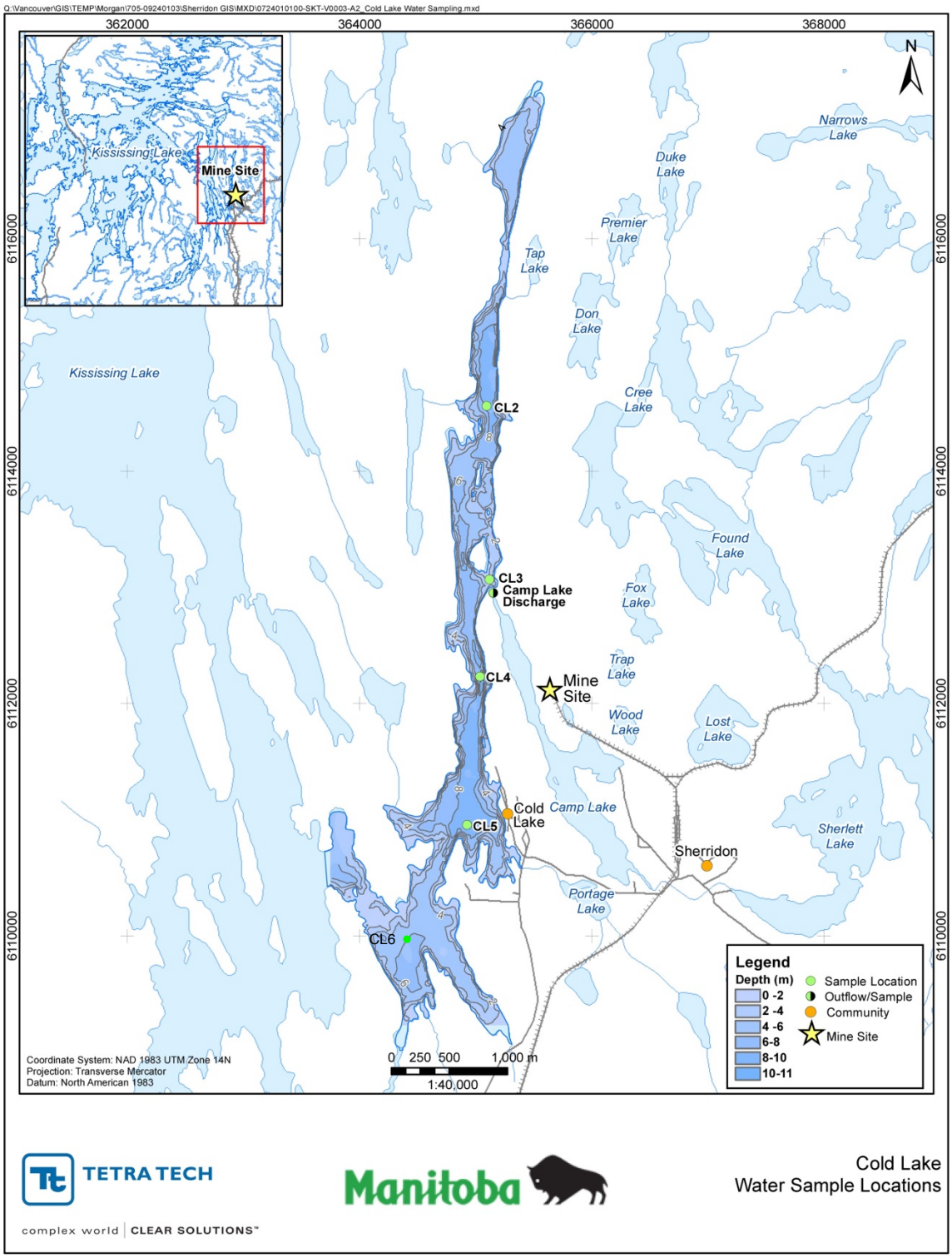

Figure 3. Water quality monitoring station locations in the Cold Lake arm of Kississing Lake.

3.0 Results and Discussion

The 2019 water quality monitoring program represents the first full year of Sherlett Creek flow through Camp Lake in the absence of a lime treatment and without the potentially cumulative effects of adjacent construction activity. In the following sections, Camp Lake water quality is compared with water quality in Sherlett Creek, immediately upstream of Camp Lake, as a benchmark for the progress of water quality recovery. The comparison between the Camp Lake water quality and Sherlett Creek water quality provides further understanding regarding the water quality expected to be discharged from Camp Lake following completion of the Sherridon Reclamation Project. Effects of the discharge from Camp Lake on water quality in Cold Lake also are examined.

The focus of the following summary is on the key water quality parameters of pH, alkalinity, TSS, and turbidity, and the metals total iron, aluminum, cadmium, copper, and zinc. All field data are tabulated in Appendix A. Laboratory analyses are tabulated in Appendix B.

3.1 pH and Alkalinity

The monitoring focus on field pH values started in 2018 was continued through 2019 for all locations. Water pH begins to change as soon as a sample is exposed to air, due to the exchange of gases that results from sample collection (e.g., CO_2 combines with water to form carbonic acid, and that reduces the pH of an air-exposed sample), such that a field pH measurement made within 15 minutes of sample collection is considered to be more representative of actual conditions and is the method of pH determination required by the MDMER. Laboratory pH values also are presented for all stations to allow comparison with previous years' data.

The seasonal pattern of pH fluctuation in Camp Lake was very different in 2019 than in 2018. There was no early season pH peak immediately following ice-out because no lime treatment was necessary to start the open water season, and the Sherlett Creek flow adequately maintained alkalinity in the lake so there was no development of acidic conditions in midsummer. Camp Lake pH was typically in the range of 6.5 to 7.5 throughout 2019 (Figure 4a). Lake pH tended to fluctuate with pH in Sherlett Creek in all basins, with two notable exceptions. The first was at Station CB-2 in early July, where pH was 6.2 to 6.4 from July 3 through July 16. The second exception was at stations SB-1 and SB-2 on September 25 and October 8, where pH was 6.18-6.22 (SB-1) and 6.21-5.96 (SB-2). Discharge pH was generally at or above pH 6.5, except on August 28 and September 4, when pH was 6.33-6.34. pH at all Camp Lake stations was somewhat lower after August 28, and this was consistent with the somewhat lower pH in Sherlett Creek during the same period (Figure 4a).

The lab pH values in both Camp Lake and Sherlett Creek showed a distinct and consistent declining trend over most of the open water season, dropping from 6.8-7.1 at the end of May to 5.8-6.2 at the end of September, with slight increases occurring in early October (Figure 4b). The same declining trend also was evident in the lab values for all stations in Cold Lake (see below). Given the trend was present at all locations, whether influenced by Camp Lake or not, it is not related to the reclamation project or the discharge from Camp Lake. The absence of the trend in

the field pH values for all sites indicates the trend is not representative of conditions in the waterbodies and may be an artefact of sample handling or laboratory procedures. The matter has been discussed with Bureau Veritas, although a full response from the lab has not yet been received.

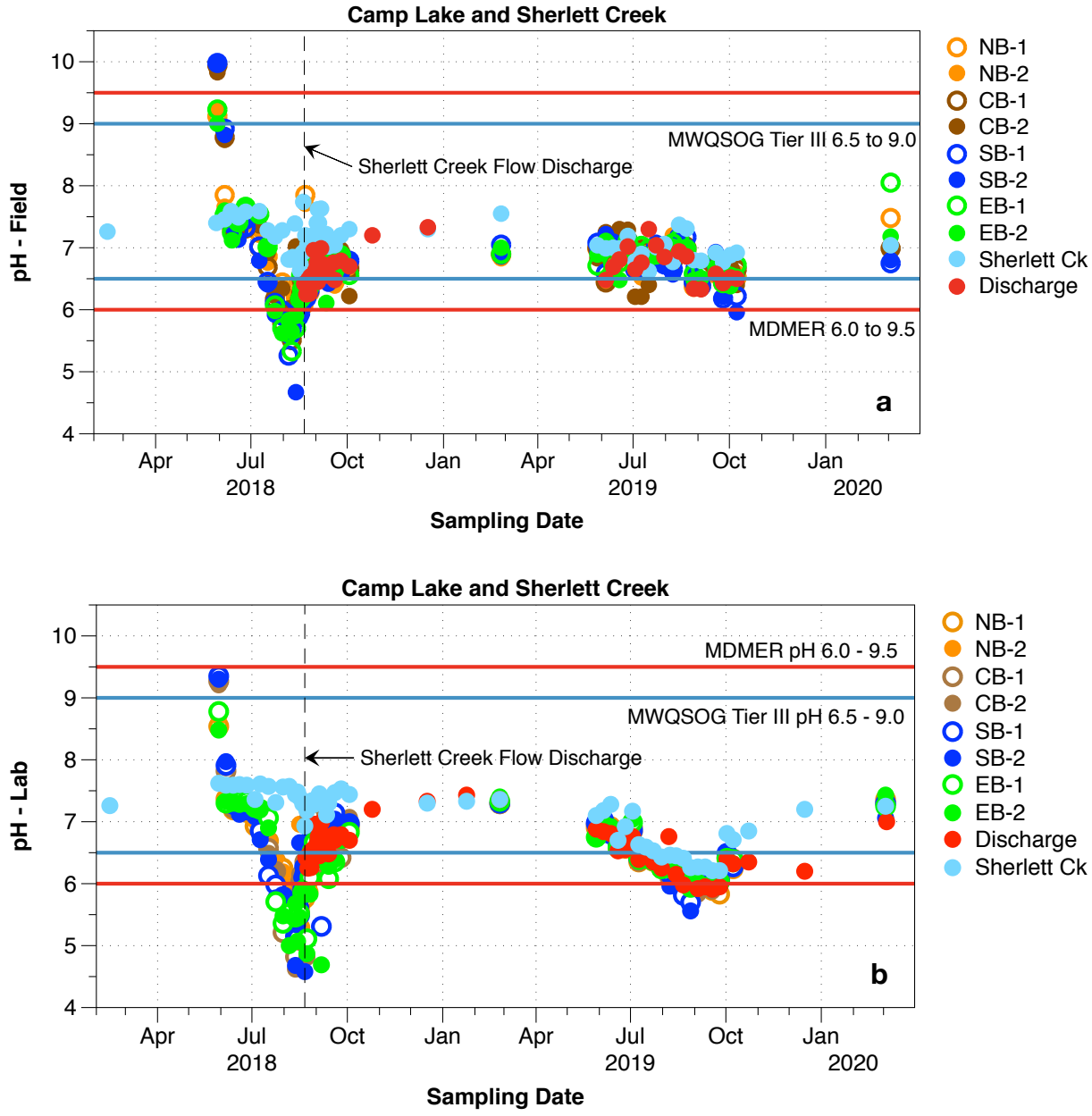

Figure 4. Field (a) and Lab (b) pH in Camp Lake, the Camp Lake discharge, and Sherlett Creek, 2018 to March 2020.

Total alkalinity in Camp Lake was highest under winter ice cover, at 32 to 44 mg $CaCO_3$/L in February 2019, and 25 to 38 mg $CaCO_3$/L in March 2020 (Figure 5). Alkalinity in Camp Lake declined in spring following ice-out, leveling out in the 8 to 12 mg $CaCO_3$/L range from early

June through the end of July. A second decline occurred at all Camp Lake stations through August, with the seasonal minimum alkalinity concentrations (2.5 to 6.0 mg $CaCO_3$/L) occurring at the end of August/early September. Alkalinity then gradually increased from early September to early October, reaching 5.1 to 9.1 mg $CaCO_3$/L when open water season sampling ended on October 8 (Figure 5). With positive alkalinity maintained in all parts of Camp Lake throughout the open water period, no depression in pH occurred, unlike in previous years (Figure 4a). Total alkalinity in the Camp Lake discharge followed this same seasonal pattern through the open water season, with the late season increase noted in Camp Lake continuing under ice cover to reach 13 mg $CaCO_3$/L on December 16. Alkalinity in Sherlett Creek was consistently in the 24 to 27 mg $CaCO_3$/L range from late May through to December 16, 2019.

The seasonal fluctuations of alkalinity in Camp Lake are a result of the runoff of ARD from the remaining mine waste adjacent to Camp Lake and are not an effect of the mine waste that has been placed in Camp Lake for the reclamation project. The first drop in alkalinity occurred during the spring runoff period and the second drop occurred immediately following the only heavy rainfall period of the open water period, which occurred over the last week of July (see section 3.2.1 for more details). Alkalinity was much higher in Camp Lake under winter ice cover in both winter 2018/2019 and winter 2019/2020. Ice cover isolates the lake from local runoff sources and any local ARD sources. Under ice cover, there is no net consumption of alkalinity in Camp Lake as the Sherlett Creek flow passes through the lake, and most parts of Camp Lake (all basins in February 2019 and the North, Central, and East basins in March 2020) appear to generate alkalinity in winter.

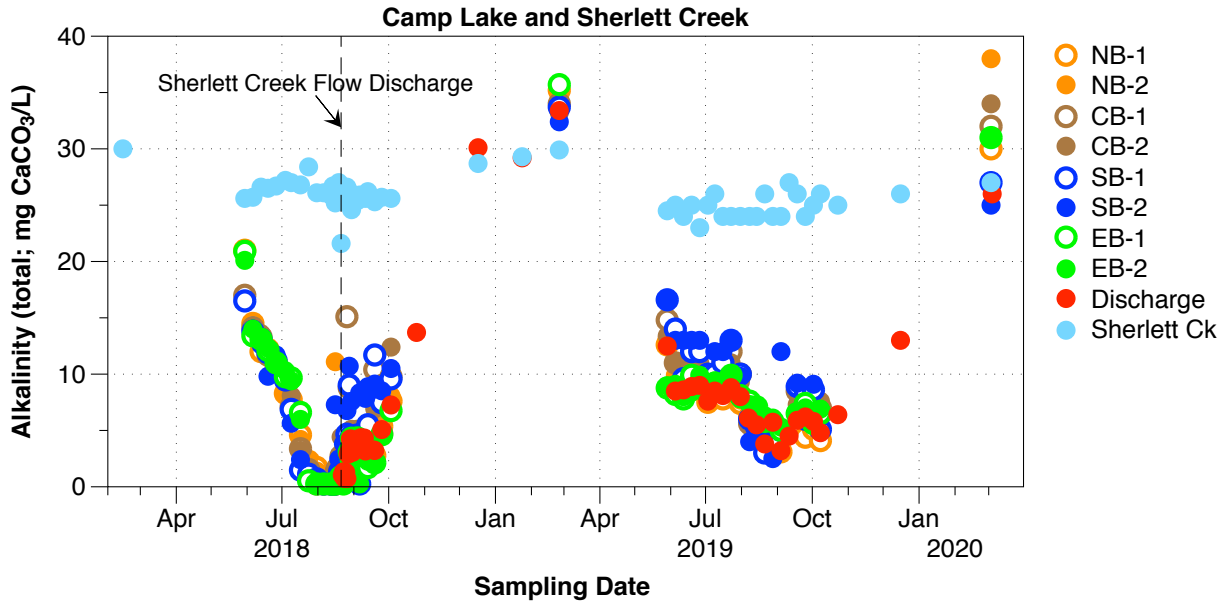

Figure 5. Total alkalinity in Camp Lake, the Camp Lake discharge, and Sherlett Creek, 2018 to March 2020.

The Camp Lake discharge had no effect on pH in the Cold Lake mixing zone or beyond the mixing zone in any part of Cold Lake. Field pH at all three mixing zone stations was consistently in the range of 6.7 to 7.8 and showed no response to periods when the pH of the Camp Lake discharge was lower than in the mixing zone (Figure 6a). Discharge pH was lower than in the mixing zone during spring runoff (May 28 through June 18) and again from late August through to the end of open water sampling on October 8, yet there was no deflection in pH at the mixing zone stations (Figure 6a). Mixing zone pH remained within the MWQSOG Tier III lower (6.5) and upper (9.0) guideline limits throughout 2019 as well as in March 2020.

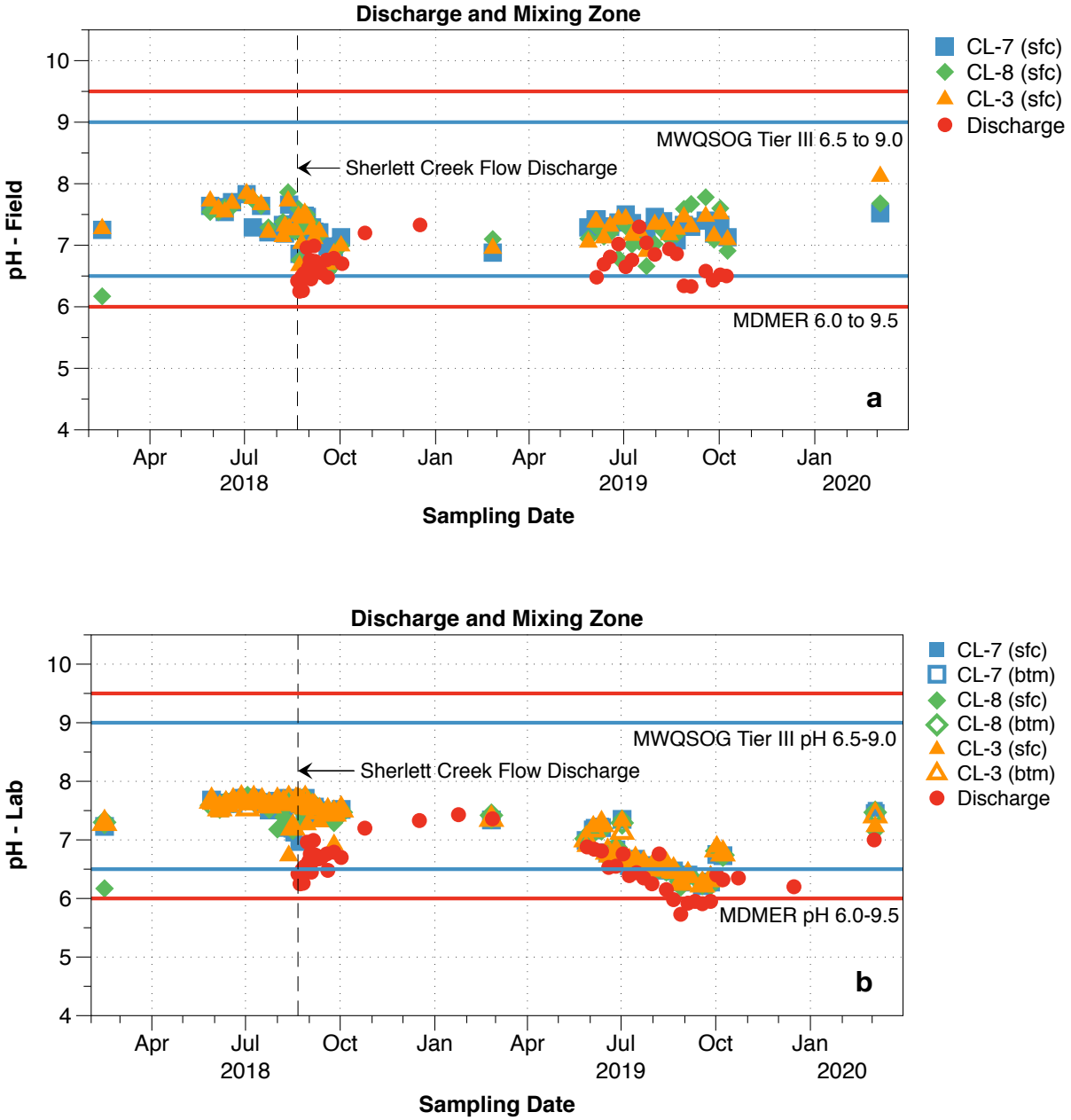

Figure 6. Field (a) and Lab (b) pH in the Camp Lake Discharge and Cold Lake Mixing Zone, 2018 to March 2020.

Outside of the mixing zone, temporal fluctuations in Cold Lake field pH occurred independently of pH in the discharge or in the mixing zone (Figures 6a and 7a). Field pH also varied over a wider range than in the mixing zone, from a minimum of 6.29 at CL-5 (sfc) on September 26 to a high of 8.38 at CL-4 (sfc) on March 4, 2020.

Lab pH at the mixing zone stations and in Cold Lake (Figure 7b) showed the same declining trend through the open water period as observed in Camp Lake and Sherlett Creek (Figures 4b and 6b). Given the trend was present at all locations, whether influenced by Camp Lake or not, it is not related to the reclamation project or the discharge from Camp Lake.

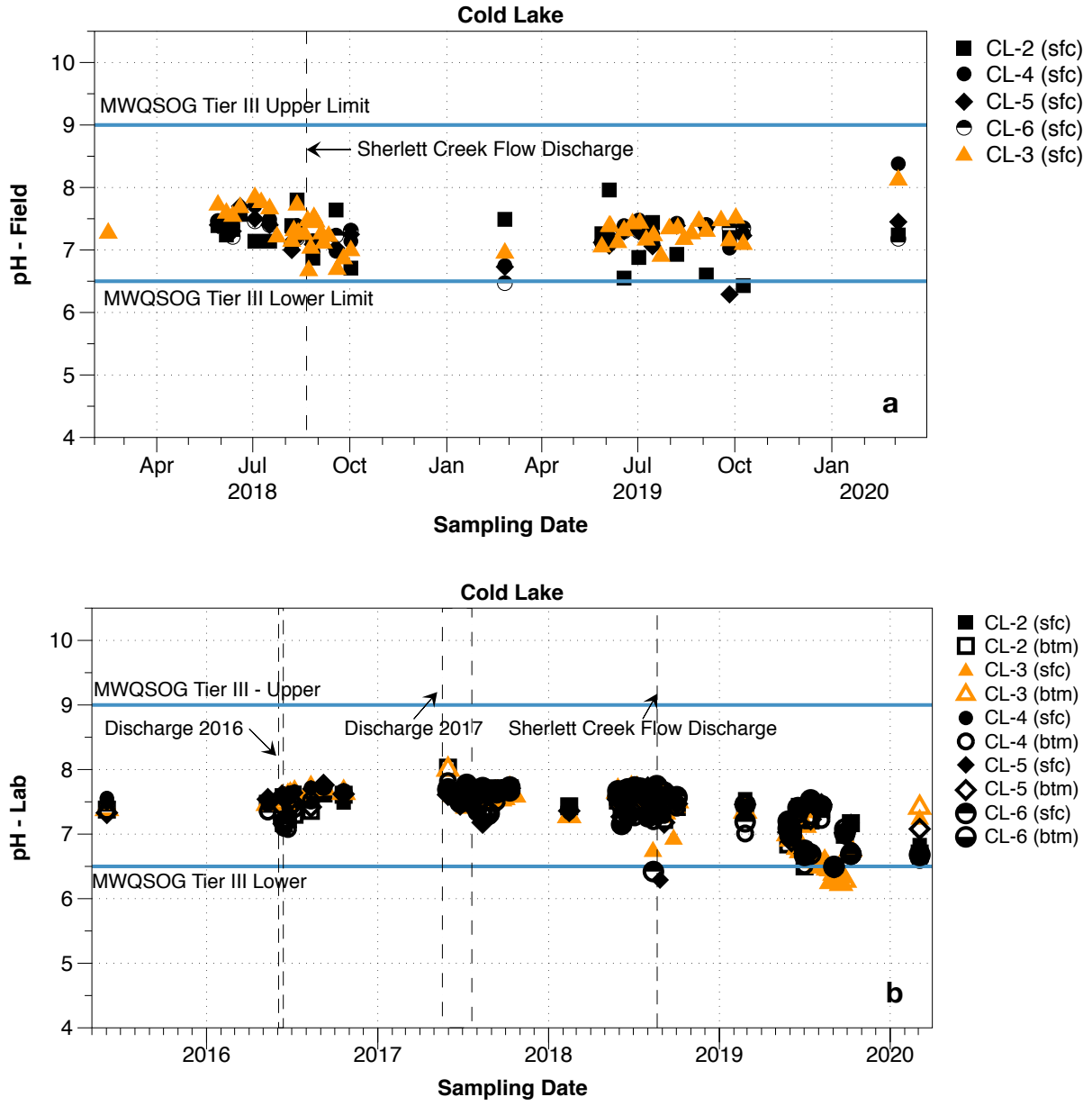

Figure 7. Field (a) and Lab (b) pH in the Cold Lake arm of Kississing Lake, May 2015 to March 2020.

The lower alkalinity in the Camp Lake discharge than in the Cold Lake mixing zone in 2019 had almost no effect on alkalinity at the mixing zone stations, with only slight depressions during the spring runoff period but otherwise stable alkalinity through the open water season (Figure 8). The discharge had no effect on alkalinity in Cold Lake outside the mixing zone (Figure 9).

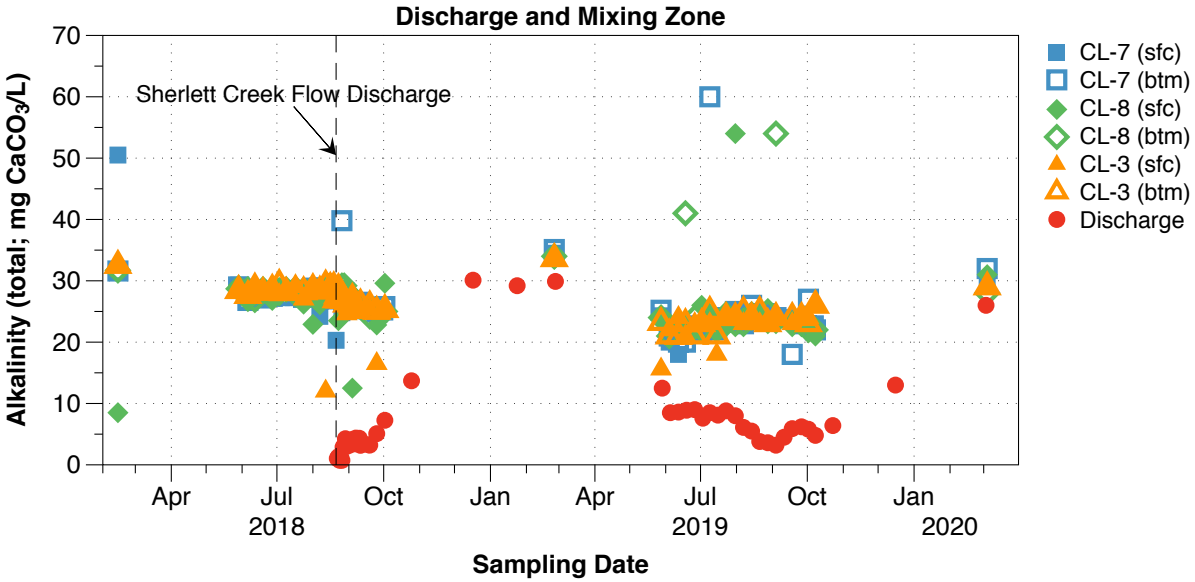

Figure 8. Total alkalinity in the Camp Lake Discharge and Cold Lake Mixing Zone, 2018 to March 2020.

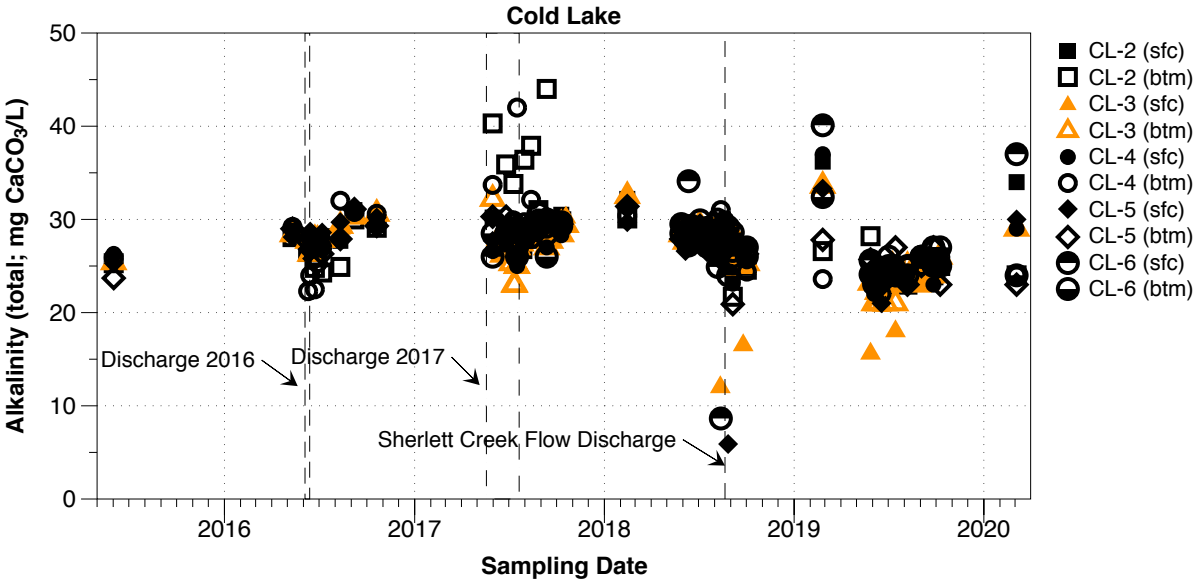

Figure 9. Total alkalinity in the Cold Lake arm of Kississing Lake, May 2015 to March 2020.

3.2 Water Appearance – TSS, Turbidity, and Iron

The Community has expressed considerable concern regarding the effect of any discharge from Camp Lake on the appearance of water in the Cold Lake arm of Kississing Lake, with specific concerns regarding the potential for red staining of boats. Three of the parameters measured – TSS (total suspended solids), Turbidity, and Iron - have the potential to affect the appearance of water, with iron being a source of red staining.

In the years before Sherlett Creek was directed back through Camp Lake, lime treatment was used to manage water quality and water level on the lake. The lime treatment created a floc that settled on the lake bottom during calm periods, with the floc being resuspended in parts of the lake during strong and sustained north wind events. This periodic floc suspension was most evident in the South and Central basins of Camp Lake because this part of the lake has the greatest exposure to north winds (i.e., has the longest fetch) (DJRC 2019). The floc suspension created a red-coloured turbidity in the South and Central basins, because of the iron associated with the floc. Floc suspension was temporary, with the relatively heavy floc settling out once again after the wind subsided. Turbidity in Camp Lake and the associated red colour also diminished as the lake became acidic over the course of the open water season. The acidic conditions dissolved the floc and converted any particulate iron to the dissolved phase, resulting in very clear, albeit brown stained, water that was considered more visually appealing although it was unsuitable for discharge due to the low pH and high concentrations of metals.

The reclamation works had progressed to the point in 2018 that Sherlett Creek flow could be restored through Camp Lake and maintain sufficient alkalinity that lime treatment would no longer be required. Sherlett Creek was directed back through Camp Lake in August 2018 and no lime treatment has been needed since. The lake no longer becomes acidic, ending the need for lime treatment and eliminating the formation of lime floc. Conditions in the lake since August 2018 are very different from those during the years of lime treatment. Now that the lake no longer becomes acidic, the effects of remnant mine waste adjacent to Camp Lake have become evident, leading to the targeted removals now planned for the 2020 construction season.

The remaining mine waste adjacent to Camp Lake represents a continuing source of dissolved and particulate iron, and therefore of TSS and turbidity, to Camp Lake during the open water season, with increased concentrations developing in the lake during spring runoff and following major rainfall events. The adjacent mine waste contributes particulate iron to the lake in two ways: directly as particulates eroded from the mine waste, and indirectly as iron dissolved from the waste by ARD that becomes particulate on entering the neutral waters of the lake. The resulting particulate iron in the lake has a much smaller particle size than the lime floc, and is not effectively controlled by the silt curtains, unlike the lime floc. The particulate iron also does not settle well, remaining present in the water column whether or not there is a strong north wind and explaining the now lake wide occurrence of elevated TSS, turbidity, and iron.

Consistent with previous years, any elevated levels of TSS, turbidity, or iron discharged from Camp Lake settled out before reaching the margins of the mixing zone. The monitoring data and further details are discussed in the following sections, by parameter.

3.2.1 TSS

TSS concentrations in Camp Lake varied considerably over the course of 2019 – with a bimodal (two-peaked) pattern evident at all stations, although the pattern was most evident at the East basin stations (EB-1 and EB-2) (Figure 10). TSS was below 4 mg/L under ice-cover on February 25 at all stations (the detection limit was 4 mg/L for that sampling date, dropping to 1 mg/L for all subsequent sampling dates). The first peak in TSS was evident immediately following ice-out at all stations. Maximum concentrations during this peak are not precisely known, because concentrations were at or declining from their peak by the time sampling started. TSS continued to decline from the start of sampling to the end of July, when TSS was in the range of 1 to 4 mg/L throughout the lake. The highest TSS concentrations (peaking at 10 mg/L at EB-1 and 12 mg/L at EB-2) occurred at the East basin stations in this first peak.

TSS concentrations at all stations increased sharply from the late July minimum through the first week of August (Figure 10). The increases to the second peak were initially greater in the South, Central, and North basins than in the East basin, with the maximum TSS concentrations in the second peak, which occurred in the South and Central basins (13 mg/L) , similar to those documented in the East basin during the first peak.

The two peaks of TSS closely corresponded with two major runoff periods, the first occurring during spring runoff and the second following the only major rainfall event of the 2019 open water season – 43.7 mm on July 25 - and coincident with the wettest week of 2019 – with 80 mm falling between July 25 and 31. The next largest rainfall event in 2019 was 22.1 mm on September 1, all other events were <20 mm, and most rainfall events (50 of 62) were <10 mm. Total monthly rainfall was <80 mm in each of May (14.5 mm), June (77.9 mm), August (74.1 mm), September (67 mm), and October (26.9 mm) (Manitoba Conservation and Climate, Wildfire Program, Sherridon weather records, 2019).

This is the second consecutive year in which elevated TSS concentrations have occurred in the East basin. The first occurrence of elevated East basin TSS was in late-August/September 2018 and was attributed to overburden and mine waste erosion related to Fox Lake overflows and the subsequent construction activities in the areas of the Fox Lake outlet control and removal of mine waste from the north shore of the East basin (DJRC 2019). Floc resuspension by wind action was ruled out as the cause, because of the poor exposure to wind action in the East basin. The elevated TSS concentrations that developed in the East basin in 2019 occurred in absence of both construction activity and lime treatment. The peaks in TSS observed in 2019 developed during major runoff events, with runoff from the remaining mine waste and disturbed overburden adjacent to the East basin representing the only possible source of the suspended solids. Given the similar seasonal patterns in TSS concentrations at all stations in Camp Lake,

occurring across a range of wind exposures, it is apparent that wind resuspension is not a cause of the observed TSS concentrations.

TSS concentrations in the Camp Lake discharge to Cold Lake generally tracked the concentrations in the North basin and values typically were intermediate between concentrations in the East and Central basins (Figure 10).

TSS concentrations in Sherlett Creek did not follow the same V-shaped seasonal pattern, with values consistently occurring in the range of <1 mg/L to 4.8 mg/L throughout the open water season (Figure 10).

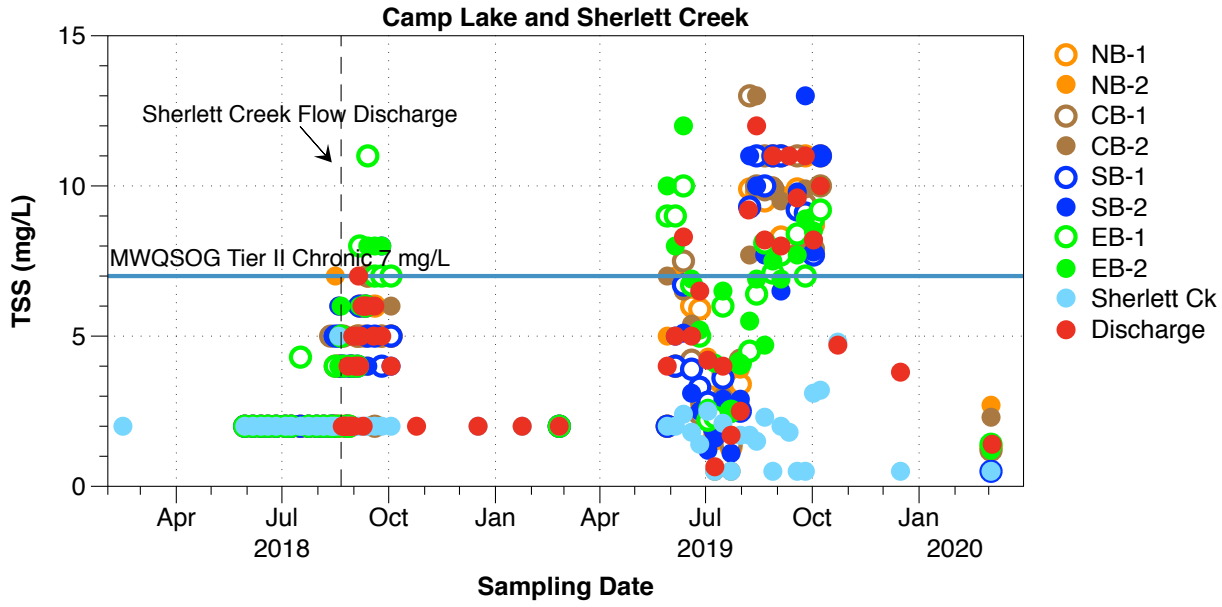

Figure 10. Total suspended solids concentrations in Camp Lake, the Camp Lake discharge, and Sherlett Creek, 2018 to March 2020.

TSS concentrations in the Cold Lake mixing zone followed a V-shaped seasonal pattern that was superficially similar to that in Camp Lake, although the concentrations involved were considerably lower, ranging from <1 mg/L to a maximum of 4.0 mg/L (Figure 11). The V-shaped seasonal pattern of TSS variation in the mixing zone was not a result of the Camp Lake discharge – the lowest concentrations at the mixing zone stations during the open water period occurred when the highest TSS concentrations occurred in the Camp Lake discharge (Figure 11). It is not known if a similar seasonal TSS pattern occurred at the mixing zone stations before 2019 because of the 4 mg/L analytical detection limit previously employed and all of the seasonal variation in 2019 occurred below this limit. TSS at the mixing zone stations remained well below the MWQSOG Tier II chronic exposure objective of 7 mg/L throughout 2019.

TSS concentrations in Cold Lake beyond the mixing zone followed a similar V-shaped seasonal pattern of variation to that observed in the mixing zone, with concentrations in the same range as the mixing zone. Again, it is not known if a similar seasonal TSS pattern occurred in Cold

Lake outside at the mixing zone before 2019 because of the 4 mg/L analytical detection limit previously employed and almost all of the seasonal variation in 2019 occurring below this limit. The Camp Lake discharge had no effect on TSS concentrations at any station in Cold Lake in 2019 (Figure 12).

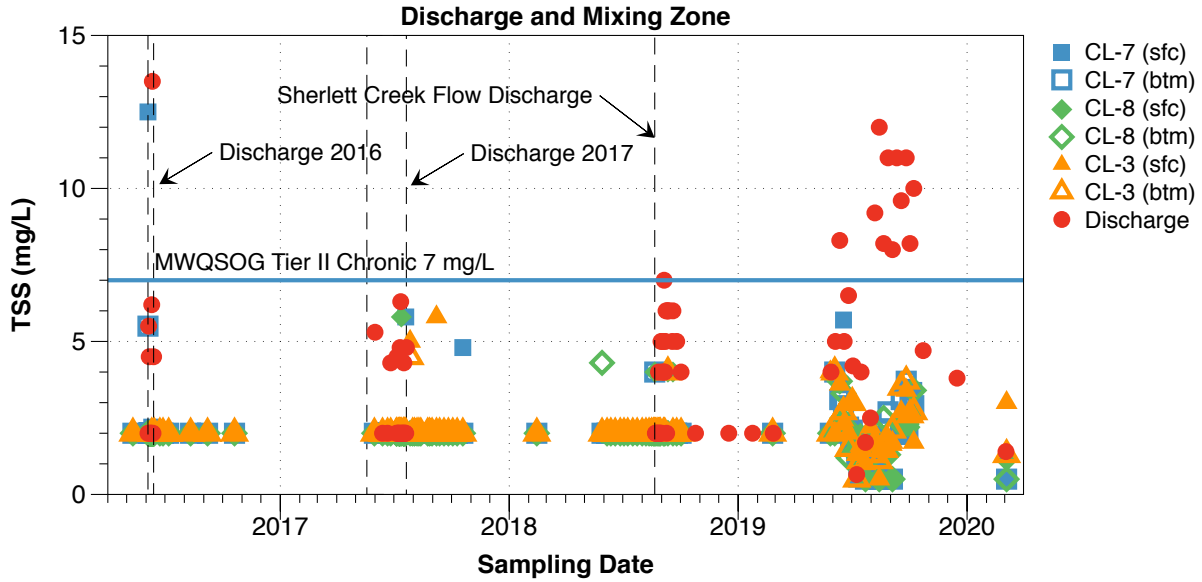

Figure 11. Total suspended solids concentrations in the Camp Lake Discharge and Cold Lake Mixing Zone, May 2016 to March 2020.

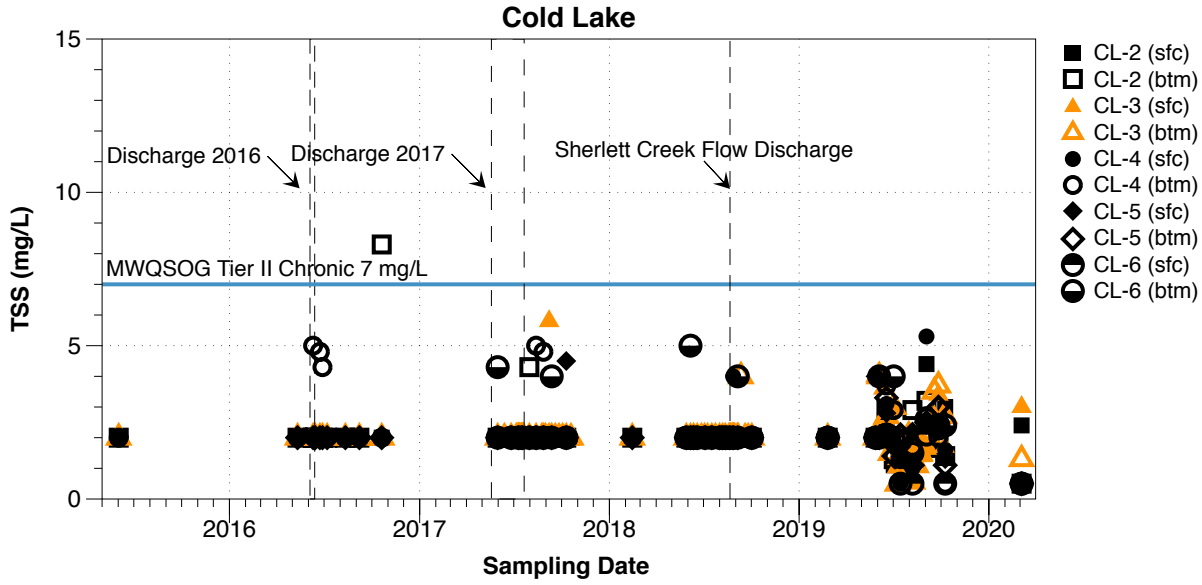

Figure 12. Total suspended solids concentrations in Cold Lake, May 2015 to March 2020.

3.2.2 Turbidity

Turbidity is a measure of the optical properties of the water and increases with the amount of material in the water that can reflect or refract light – it is a measure of the "cloudiness" of the water. An increased quantity of material in the water, such as suspended sediment eroded from a shoreline or stirred up from a shallow lake bottom by the wind, will typically result in increased turbidity. Turbidity can also be affected if there is a change in the reflective properties of suspended material, such that a change in the suspended solids concentration will not always be related to a change in turbidity and there will also be circumstances in which turbidity will change in the absence of a change in the suspended solids concentration. Further, relatively small increases in the concentration of suspended material can cause a disproportionately larger increase in turbidity if that material is more reflective.

Turbidity in all parts of Camp Lake was very low under winter ice cover in February 2019 (<1 to 1.5 NTU) and was generally in the 5 to 15 NTU range from the start of open water season sampling at the end of May through July 23 (Figure 13). Turbidity increased sharply over the following month in all parts of Camp Lake, peaking during the last week of August in the range of 45 NTU (EB-1 and EB-2) to 80 NTU (SB-2). The largest increases occurred in the South and Central basins with the smallest increases in the East basin. North basin turbidity was intermediate to that in the Central and East basins, and turbidity in the Camp Lake discharge was similar to that in the North basin. Following this peak, turbidity in all basins of Camp Lake declined continually through the remainder of the open water season and under ice cover. By March 4, 2020, turbidity was again low (<1 to 2.8 NTU) across the lake.

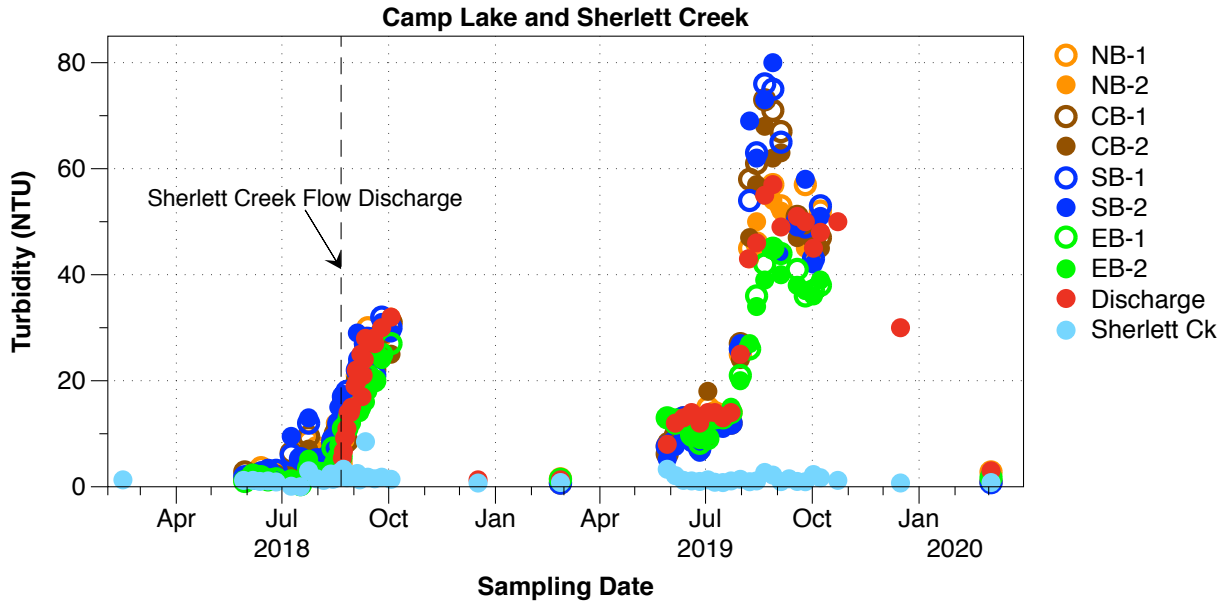

Figure 13. Turbidity (NTU) in Camp Lake, the Camp Lake Discharge, and Sherlett Creek, 2018 to March 2020.

Concerns related to effects of the Camp Lake discharge on the appearance of water in Cold Lake relate specifically to near-surface waters. The Camp Lake discharge had no effect on turbidity measured in the near-surface samples at any station in Cold Lake beyond the mixing zone (Figure 14). Near-surface turbidity was typically near or below 5 NTU at all Cold Lake stations, with the exception of the May 28 sample at CL-3, within the mixing zone, when turbidity was 7.1 NTU (Figure 14). Outside of the one measurement at CL-3, the Camp Lake discharge had no effect on turbidity in Cold Lake in 2019.

There was some seasonal variation in turbidity at all stations in Cold Lake, with higher values in late spring and fall than in mid-summer. The cause of this slight variation could be a result of spring and fall algae blooms, and near-surface turbidity may also be affected by tree pollen deposition in the spring.

The discharge also had no effect on near-bottom turbidity in the Cold Lake mixing zone (Figure 15). Near-bottom turbidity was, at times, considerably higher at thermally stratified stations during the summer period and particularly at stations CL-4 and CL-2. Near-bottom water chemistry is affected by thermal stratification and the development of anoxic conditions, and these chemical changes can also affect water turbidity. Near-bottom turbidity also can be affected by even minor disturbance of the lake bottom during sample collection. Thermal stratification and bottom disturbance account for the occasional higher near-bottom turbidities in Cold Lake, which have occurred in similar magnitude both in the presence and absence of a discharge from Camp Lake (Figure 15).

The 2019 turbidity monitoring results clearly indicate that turbidity of up to 57 NTU in the Camp Lake discharge has no effect at all on turbidity at the margins of the mixing zone or at any station in Cold Lake outside the mixing zone. The material responsible for the elevated turbidity in the discharge dissipates rapidly on entering Cold Lake, well within a distance of 75 m from the point of entry to the lake, such that there was only one occurrence of elevated turbidity at station CL-3, within the mixing zone, in 2019 and this occurrence did not extend to the margins of the mixing zone.

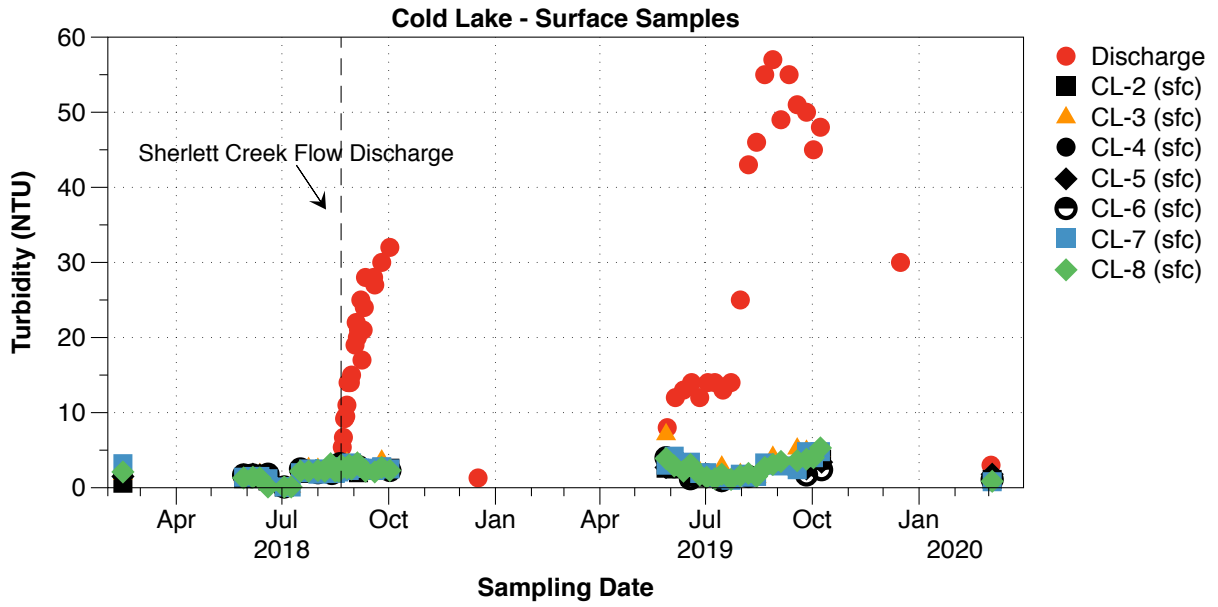

Figure 14. Turbidity (NTU) in the Camp Lake Discharge and in near-surface samples in the Cold Lake arm of Kississing Lake, 2018 to March 2020.

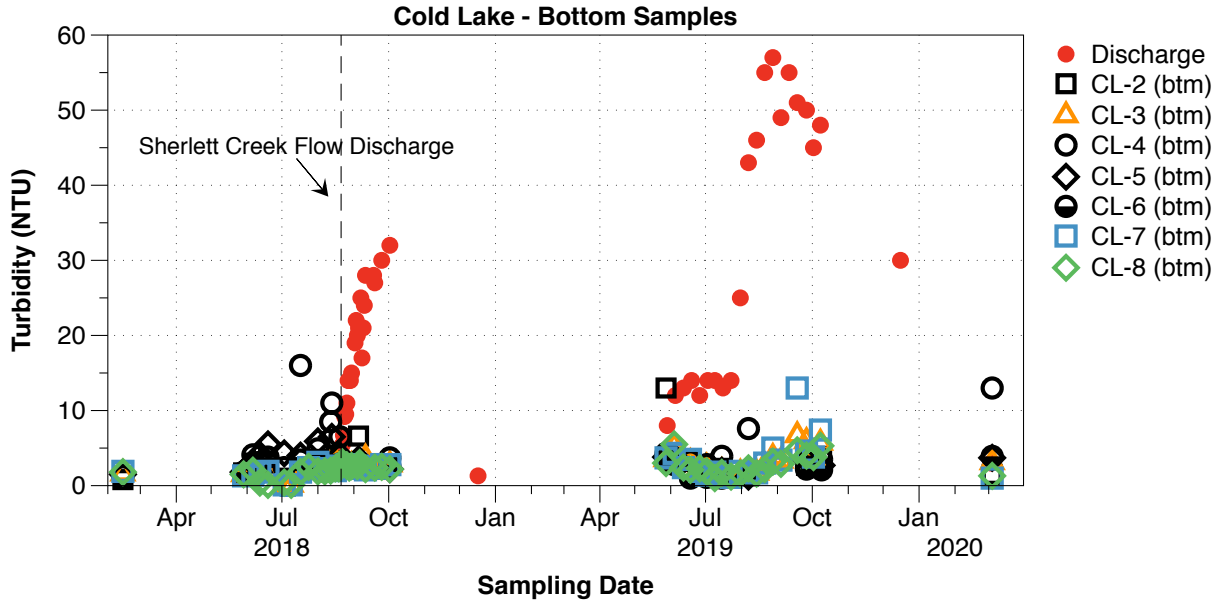

Figure 15. Turbidity (NTU) in the Camp Lake Discharge and in near-bottom samples in the Cold Lake arm of Kississing Lake, 2018 to March 2020.

3.2.3 Iron

Total iron concentrations in Camp Lake varied considerably over the monitoring period, Concentrations were low (0.21 to 0.38 mg/L) under ice cover during winter in both 2019 and 2020, with two clear peaks in concentration during the open water season (Figure 16). The first peak developed in late May/early June, shortly after ice-out. The specific timing of the increase is not known for all stations on Camp Lake because sampling is not possible around the time of ice-out, but the increase at EB-1 started after May 29. Maximum concentrations during the first peak ranged from 3.8 mg/L at SB-2, to 4.5 mg/L at EB-1/EB-2 to 5.5 mg/L at SB-1 and NB-1 and in the discharge. Concentrations at all locations then declined through July 23, bottoming out in the range of 2.8 mg/L (SB-2, EB-1, and EB-2) to 3.2 mg/L (NB-2 and discharge).

The second peak started in the last week of July, with maximum concentrations reached quickly in early August. The maximum concentrations during this second peak were up to a factor of 2 higher than during the first peak in all parts of the lake except the East basin (Figure 16). Following the second peak, total iron concentrations then gradually and continually declined through to the end of the open water season sampling in early October, with the declines continuing at all stations under ice cover. By March 3, 2020, total iron concentrations at all stations in Camp Lake were in the range of 0.19 to 0.5 mg/L, representing as much as a 98% decrease from the early August peak.

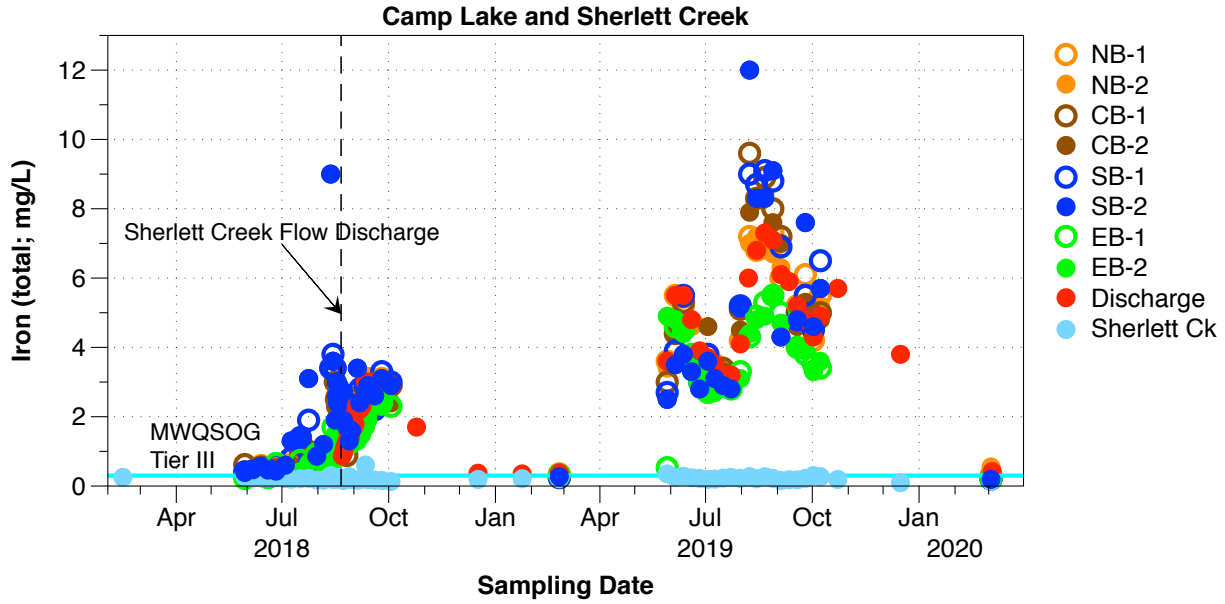

Figure 16. Total iron concentrations in Camp Lake, the Camp Lake Discharge, and Sherlett Creek, 2018 to March 2020.

The first total iron peak in the South and Central basins was the product of increased concentrations of both dissolved and particulate iron, whereas particulate iron formed the bulk of the first peak in both the North and East basins (Figures 16, 17, and 18). The second peak was predominantly the product of increased particulate iron concentrations in all basins, although

there were short term increases in dissolved iron in the South, Central, and East basins during the first week of August as well. The second peak also was prolonged by late-September/early-October increases of dissolved iron in all basins.

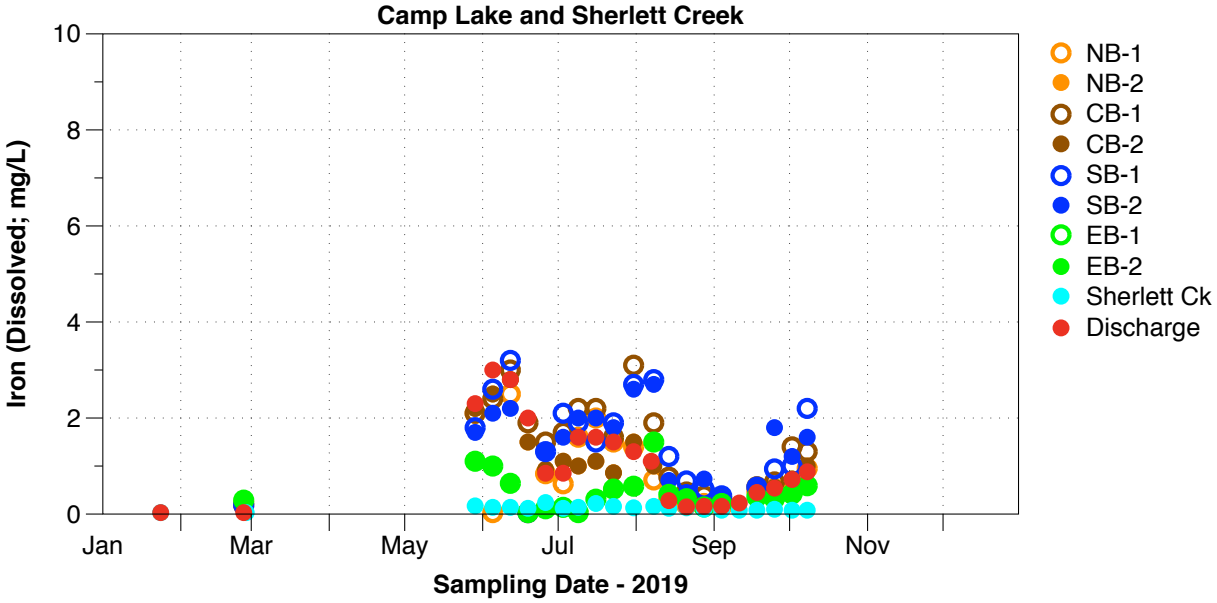

Figure 17. Dissolved iron concentrations in Camp Lake, the Camp Lake Discharge, and Sherlett Creek, 2019.

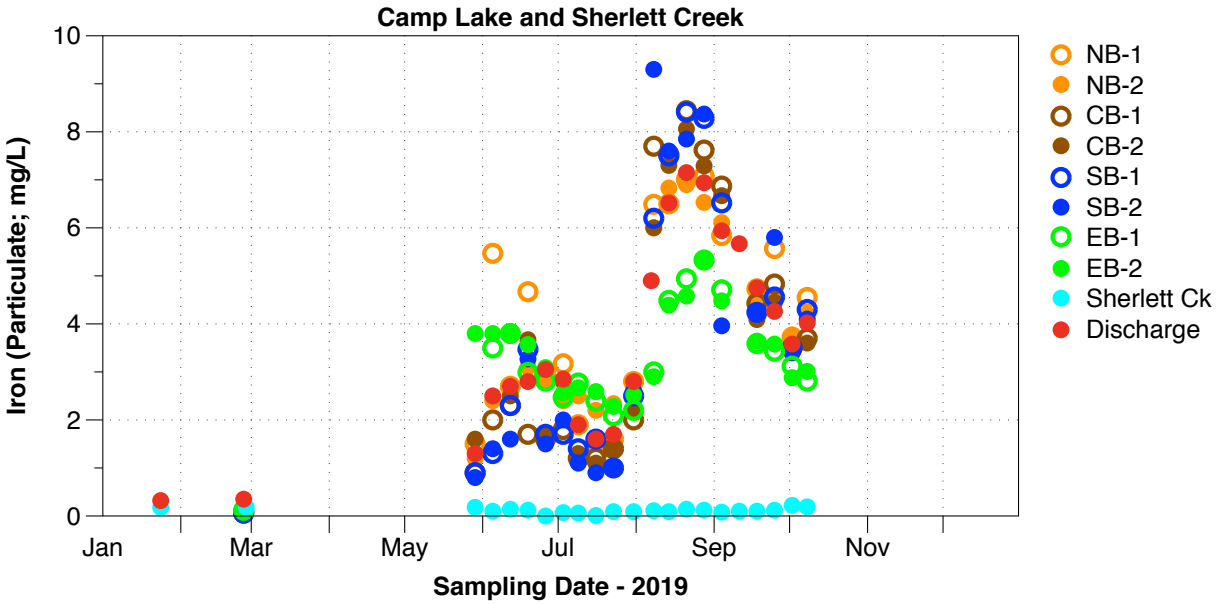

Figure 18. Particulate iron concentrations in Camp Lake, the Camp Lake Discharge, and Sherlett Creek, 2019.

The primary form of iron in the Camp Lake discharge was particulate, which accounted for 76% of total iron on average over 2019. The same mean percentage as particulate occurred at NB-1 (76%) with a similar value (73%) at NB-2. The particulate iron percentage was lower in the Central and South basins, at 61 to 63%, while the particulate percentage was higher in the East basin than in the rest of Camp Lake (83% at EB-1 and 85% at EB-2).

Total iron concentrations were consistently low in Sherlett Creek over the 2019 monitoring period, with just one value (0.35 mg/L on May 29) exceeding 0.3 mg/L. Total iron was about equally distributed between the particulate (47%) and dissolved (53%) fractions.

All evidence points to the elevated total iron concentrations in Camp Lake originating from an external source. Under ice cover, which isolates Camp Lake from local watershed runoff but maintains contact between the overlying water and tailings within the lake, total iron concentrations were similar to those in Sherlett Creek (Figure 16). Concentrations in the lake increase during major runoff events over the open water season, and then decline during the subsequent low rainfall/runoff periods and under ice cover. The remaining mine waste adjacent to Camp Lake represents the most likely source of the iron delivered to the lake during runoff events.

The influence of spring runoff on iron concentrations in Camp Lake was not observed in previous years. However, late winter lime treatments had been applied in previous years and lake pH was very high (typically in the pH 9+ range) during the spring runoff period. The high pH quickly and effectively precipitated metals from the water column, as was intended, preventing the spring peak. In the absence of a lime treatment in 2019, the spring peak was able to develop and was captured in the monitoring program.

Turbidity in Camp Lake, and in the Camp Lake discharge, was closely correlated with particulate iron concentrations, explaining 83% of the variation in turbidity in the discharge and 80% of the variation in turbidity across Camp Lake overall (Figures 19 and 20). Similar relationships were identified in 2017 and 2018 (DJRC 2018 and 2019).

TSS concentrations also were positively correlated with particulate iron concentrations in 2019 (Figure 22), as was the case in 2018 (DJRC 2019). Conditions in the lake have evidently changed since 2017, when TSS and particulate iron were not correlated (DJRC 2018). Elimination of lime treatment may at least partially explain the change in the TSS/particulate iron relationship. In 2017, the bulk of any TSS in the lake would have been in the form of lime floc whereas, in 2019, no lime floc would have been present in the lake. In 2018, lime floc would have dominated early in the open water season, when TSS was relatively low, while disturbance of mine wastes during construction activities and the release of both particulate and dissolved iron dominated during the periods of higher TSS concentrations, the dissolved iron becoming particulate on entering the near neutral lake.

Turbidity and TSS were positively correlated in 2019 (Figure 21), also as found in 2018 (DJRC 2019). However, the relationship between turbidity and TSS in 2019 was primarily a product of

a bimodal distribution. The relationship was not continuous across the ranges of TSS and turbidity, with no obvious linear trend in the region of 0 to 25 NTU and 0 to 8 mg/L TSS, but with a second population of points in the region of 43 to 57 NTU and 8 to 12 mg/L TSS. While higher TSS generally co-occurs with higher turbidity, turbidity is not a predictor of TSS at turbidities below 40 NTU.

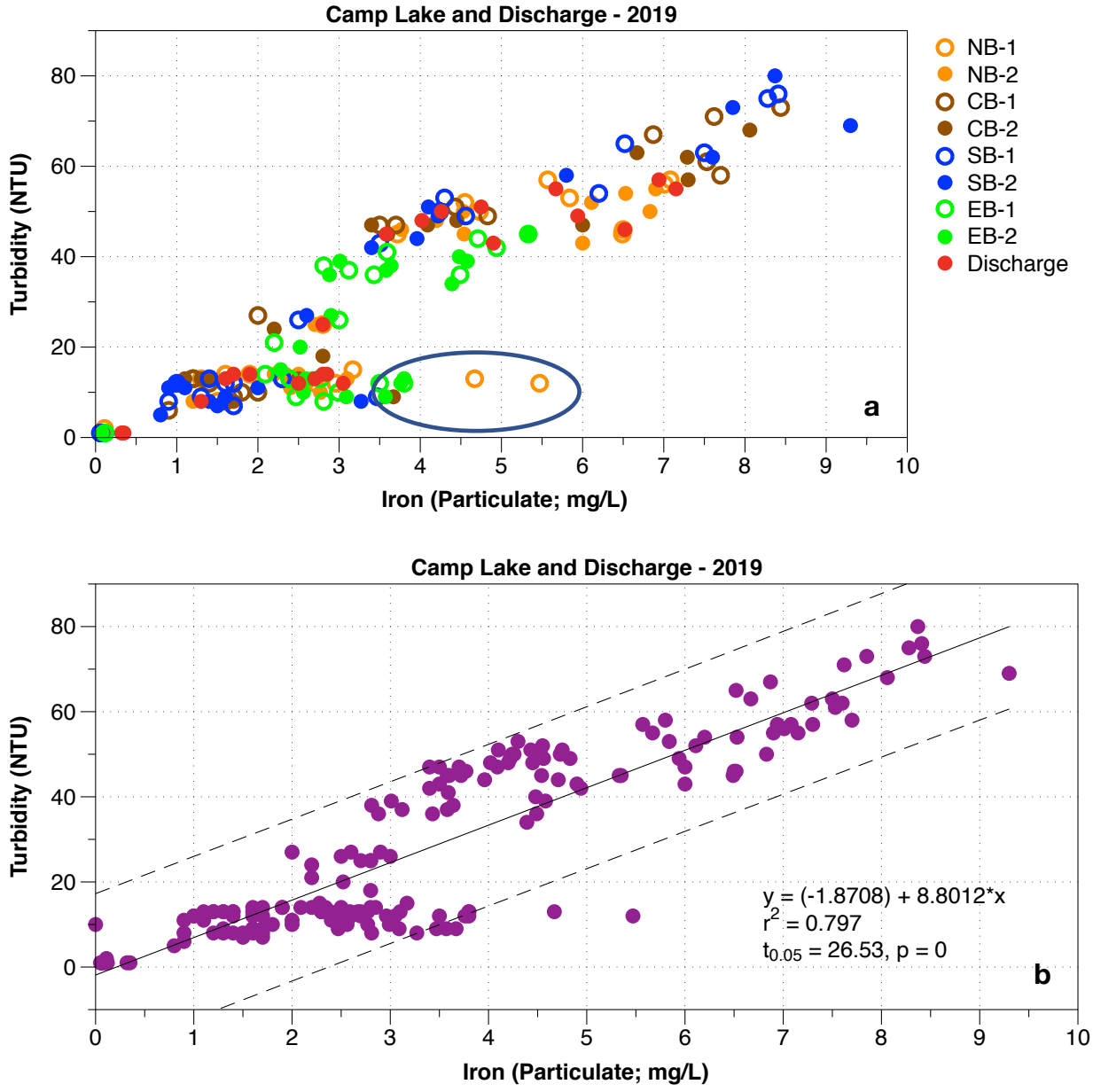

Figure 19. Relationship between particulate iron concentrations and turbidity in Camp Lake and the Camp Lake Discharge, 2019: (a) Relationship showing individual station data, with circled values representing lower turbidity than expected given particulate iron; and (b) Relationship showing pooled station data and linear regression.

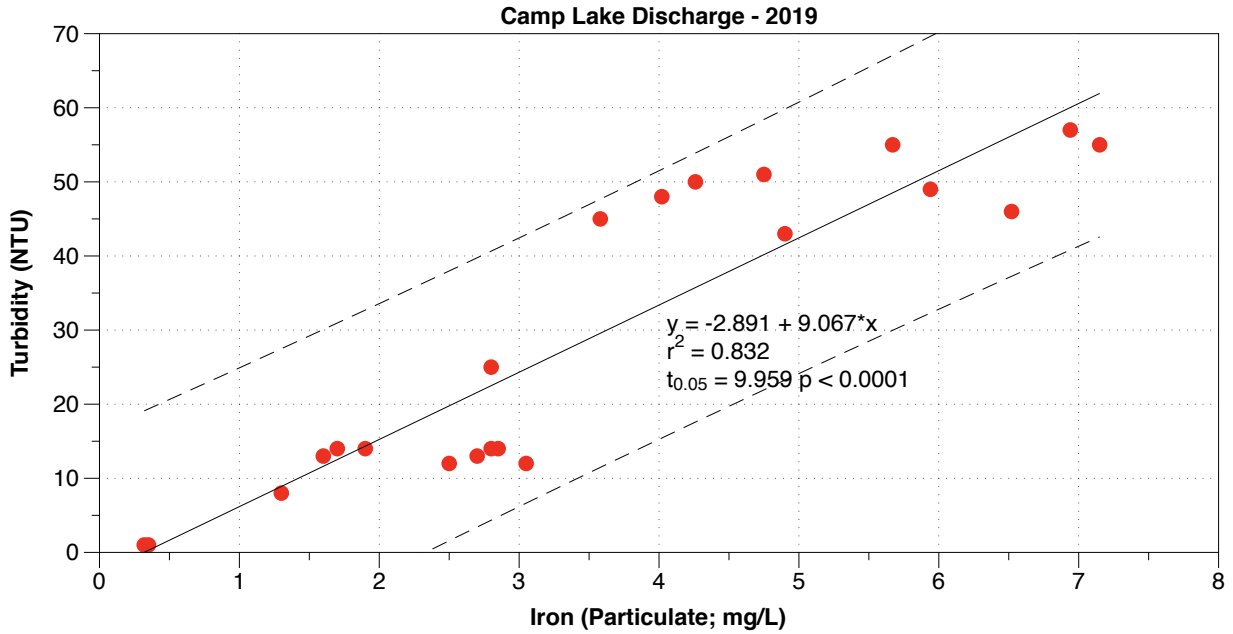

Figure 20. Relationship between Particulate Iron concentrations and Turbidity in the Camp Lake Discharge, 2019.

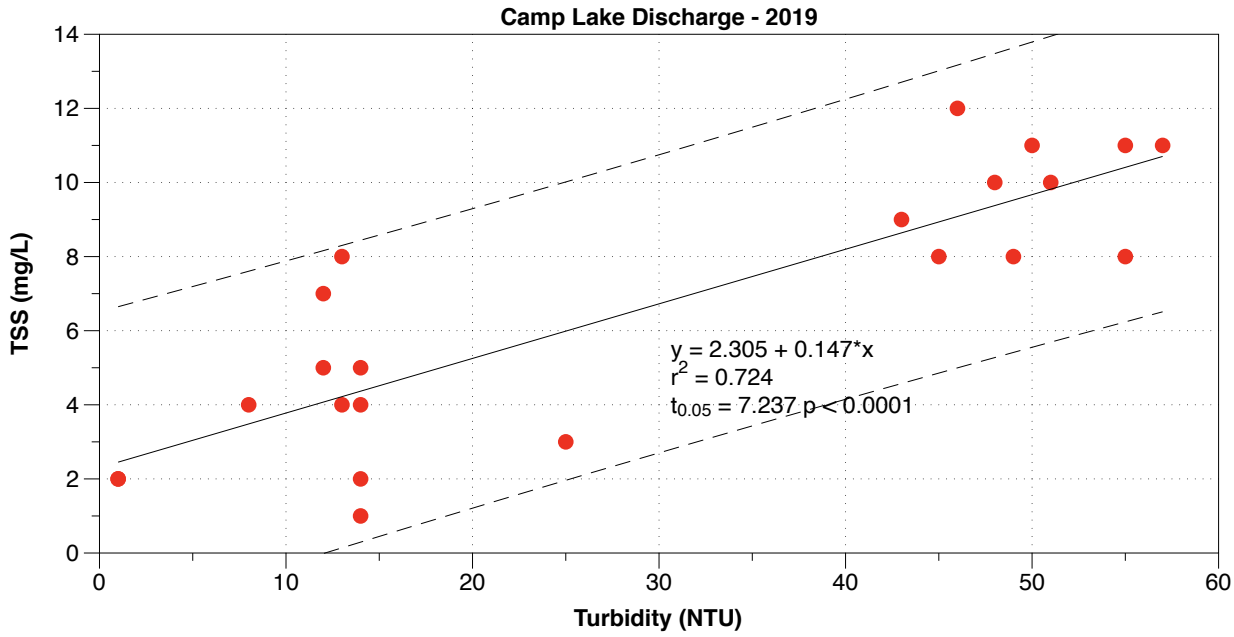

Figure 21. Relationship between Turbidity and Total Suspended Solids (TSS) in the Camp Lake Discharge, 2019.

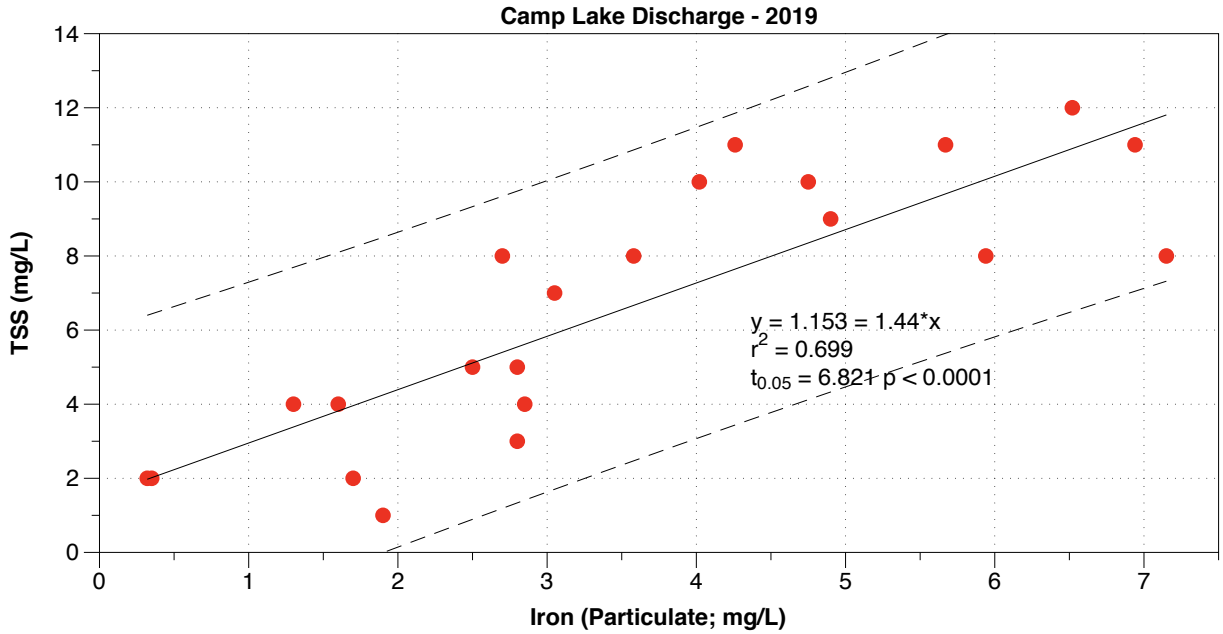

Figure 22. Relationship between Particulate Iron concentrations and Total Suspended Solids (TSS) in the Camp Lake Discharge, 2019.

As noted in 2016, 2017, and 2018 (DJRC 2016, 2018, and 2019), iron discharged from Camp Lake into Cold Lake typically does not move much beyond the point of discharge (Figure 23), in most conditions not even reaching the monitoring stations within (CL-3) or at the margins (CL-7 and CL-8) of the mixing zone. This was generally the case in 2019 as well, with the exception of a short period early during spring runoff. Increased total iron concentrations occurred at CL-3, within the mixing zone, on May 28, when total iron at CL-3 (3.0 mg/L) was almost as high as in the discharge (3.6 mg/L). Measured concentrations at the mixing zone stations were typically much lower than in the discharge in 2018 and previous discharge periods. However, 2019 differed from earlier years, as noted previously, with the development of spring peaks in key parameters in Camp Lake during the spring runoff period. The spring peak did not appear in previous years because Camp Lake had been treated with lime, precipitating metals entering the lake in spring runoff. The spring peak also occurred at the same time as annual maximum Sherlett Creek flows. Discharge flow is important because it determines the residence time of the discharged water in the mixing zone and, the higher the flow, the shorter the residence time. Although the total iron concentration in the Camp Lake discharge was not much higher in May 2019 than in previous discharge years with no observed effect at CL-3, the higher spring flow evidently carried the iron farther into the mixing zone. The high flow effect was short-lived, rapidly diminishing over the following two weeks, even in the presence of increasing total iron concentrations in the discharge (Figure 23).

Outside of the spring runoff period, the higher total iron concentrations in the discharge than in previous years had a small effect on total iron concentrations at the mixing zone stations through the open water period. Resulting concentrations were 0.2 to 0.3 mg/L higher than in

previous years at all three stations, although concentrations remained within the historical range observed outside of discharge periods (Figure 23) and had no effect on turbidity, as noted above.

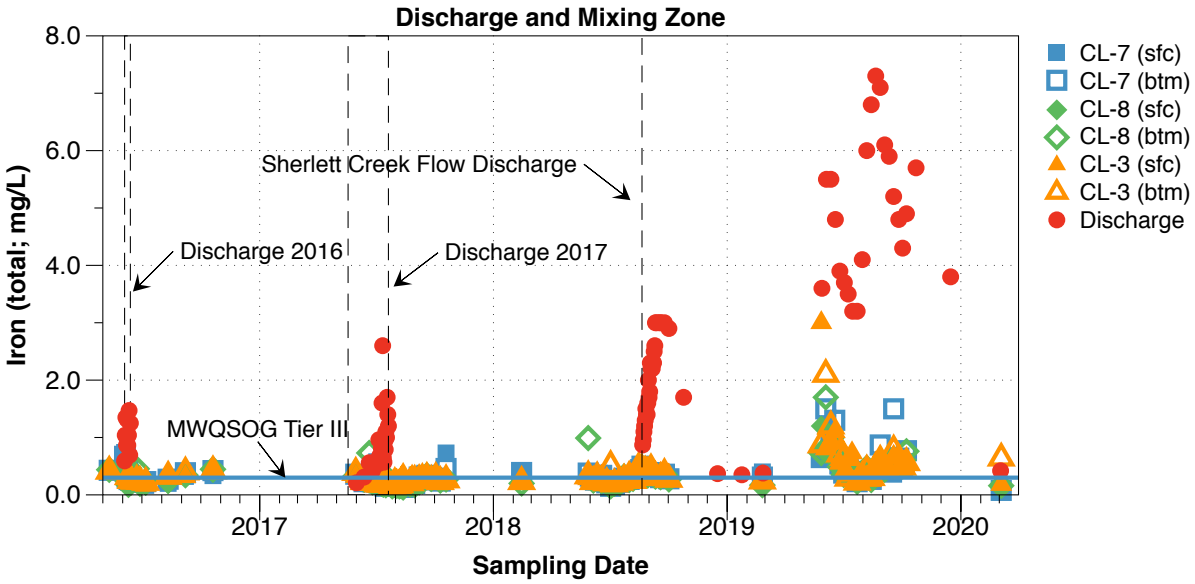

Figure 23. Total iron concentrations in the Camp Lake discharge and Cold Lake mixing zone, 2016 to March 2020.

When the entire Cold Lake arm of Kississing Lake is examined, there is no evidence of an effect of the Camp Lake discharge on total iron concentrations outside the mixing zone (Figure 24). There was a single elevated near-surface value at CL-5 (5.10 mg/L) on May 28, the first sampling day of the open water season. This value cannot be accounted for by total iron in the Camp Lake discharge – the concentration in the discharge was lower, 3.6 mg/L and the concentrations at stations CL-7 and CL-8, at the outer margin of the mixing zone, were lower still, at 0.68 and 1.20 mg/L. A week later (June 4), the near-surface concentration at CL-5 had decreased to 0.52 mg/L while the concentration in the discharge was increasing. The reported value also isn't supported by any of the other related parameters. Both turbidity and TSS were much lower than would be expected based on total iron (Figures 12 and 15), and none of the other metals was similarly elevated (see Section 3.3 below). Further, the discharge could not affect total iron concentrations at CL-5 without also having some effect at stations CL-4, and/or CL-2, both of which are much closer to the discharge (Figure 3). Near-surface total iron concentrations at both CL-4 and CL-2 were within the historical ranges measured in the absence of a discharge (Figure 24). On this basis, the reported total iron concentration at CL-5 on May 28, 2019 is considered anomalous and not representative of conditions at that time.

Near-bottom total iron concentrations in Cold Lake have tended to be higher than the near surface values, on occasion, and particularly at stations CL-2 and CL-4, since 2016 (Figure 24). The occasionally higher near-bottom values that occurred in 2019 were unrelated to the discharge as they also were similar in frequency and magnitude to the historical occurrences in

the absence of a discharge. There is considerable iron accumulation on the bottom of the Cold Lake arm as a result of the long period of uncontrolled ARD-influenced discharge that occurred for decades prior to the reclamation project (Section 3.5 below). Bottom disturbances during sampling, along with the development of anoxic conditions at depth during periods of thermal stratification can cause elevated total iron concentrations in near-bottom samples.

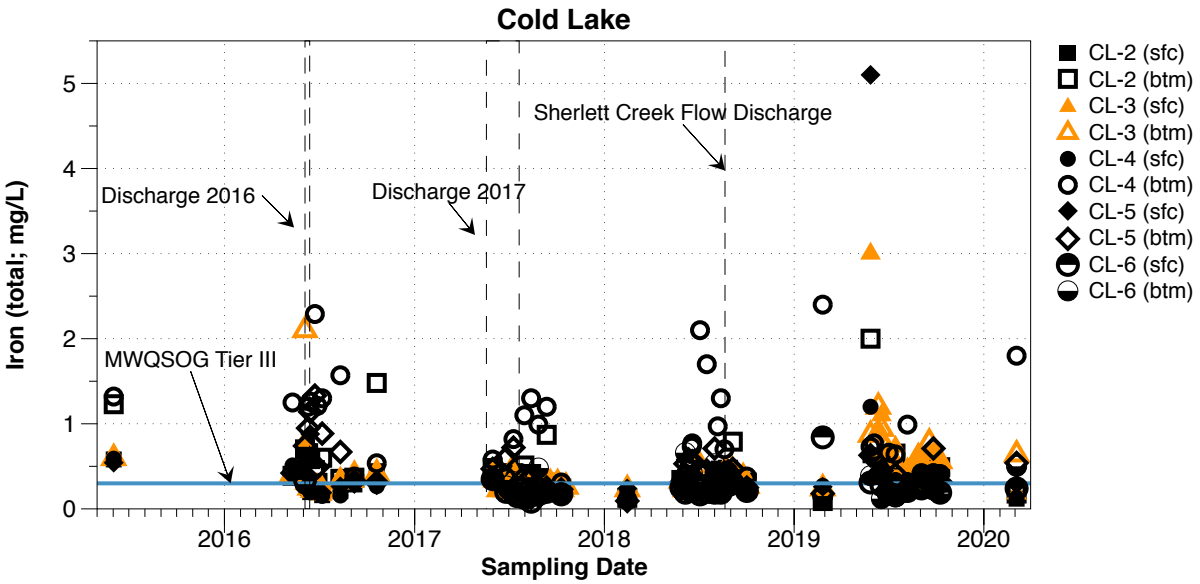

Figure 24. Total iron concentrations in the Cold Lake arm of Kississing Lake, 2015 to March 2020.

3.2.4 Silt Curtain Performance

The three silt curtains installed in Camp Lake prior to any discharge from the lake were not effective in containing particulate matter in Camp Lake in 2019, based on the turbidity, TSS, and total/particulate iron measurements in Camp Lake and in the lake discharge (Sections 3.2.1, 3.2.2, and 3.2.3).

The silt curtains can be effective in preventing the movement of the floating and very near surface particulate matter across the curtain because the float collar of the curtain is fabricated from impervious material. The remainder of the silt curtain below the float collar is constructed with 425-micron (0.425 mm) mesh to allow the necessary water flow.

The TSS, turbidity, and particulate iron particles all are smaller than 425 microns. Other silt curtain materials with a smaller mesh-size (212-micron, 0.212 mm) were tested at the end of the 2019 open water season, using high turbidity Camp Lake water, to determine if the smaller mesh-size would be able to reduce passage of turbidity. The smaller mesh-size had no effect on the turbidity or TSS concentrations in water passed through the fabric (Tetra Tech Canada Inc. memo to Manitoba Conservation and Climate 6 January 2020) indicating the particle sizes involved are considerably smaller than 212-microns.

Installation of a turbidity curtain with a smaller mesh-size than the 212-micron material that has been tested is not practical in this location because of the need to pass the flow of Sherlett Creek. Removal of the source material, the remnant mine waste adjacent to Camp Lake, will be necessary to reduce the particulate-iron caused turbidity that is the source of concern in Camp Lake.

3.3 Metals

Throughout the open water season, the combined effects of remnant mine waste adjacent to the lake, spring runoff, and heavy rainfall events, were the primary factors affecting metal concentrations in Camp Lake and in the lake discharge. This is indicated by multiple sources of evidence, including water quality responses to spring runoff and to specific rainfall events as well as to isolation of the lake from these sources by freeze-up.

3.3.1 Aluminum

Total aluminum concentrations in Camp Lake followed the two peak pattern that characterised all of the metals in 2019. Concentrations were below the Tier III MWQSOG of 0.1 mg/L under ice cover in winter 2019 and then again in winter 2020 (Figure 25). The first peak occurred shortly after ice out, during spring runoff. Maximum concentrations during this peak are not precisely known, because concentrations may have been on the declining limb of the peak by the time sampling started on May 29, which may have been as many as 10 days after ice out. Total aluminum concentrations in the South basin during this first peak were the same as in Sherlett Creek, where a spring peak also occurred. Concentrations were only slightly higher in the Central and North basins than in the South basin during the spring peak, but were much higher in the East basin, by about a factor of 2 over the course of the first peak.

Aluminum concentrations in all parts of Camp Lake and in Sherlett Creek declined steadily from the start of sampling through to the last week of July (Figure 25). A second peak in total aluminum concentrations developed between the last week of July and the first week of August in all basins of Camp Lake but not in Sherlett Creek. Peak concentrations in the South, Central, and North basins occurred between July 31 and August 8, in the range of 0.11 to 0.14 mg/L. Much larger peaks developed at the East basin stations, with peak values in the range of 0.28 to 0.35 mg/L during the same period.

Both the first and second peaks developed during periods of high runoff, the first peak during spring melt and the second peak following the only major rainfall event of the 2019 open water season – 43.7 mm on July 25 - and coincident with the wettest week of 2019 – with 80 mm falling between July 25 and 31. The next largest rainfall event in 2019 was 22.1 mm on September 1, all other events were <20 mm, and most rainfall events (50 of 62) were <10 mm. Total monthly rainfall was <80 mm in each of May (14.5 mm), June (77.9 mm), August (74.1 mm), September (67 mm), and October (26.9 mm) (Manitoba Conservation and Climate, Wildfire Program, Sherridon weather records, 2019).

The occurrence of peaks in metal concentrations following heavy rainfall events also was identified in 2018 (DJRC 2019). Heavy rainfall events obviously result in more runoff from the local watershed, and this will carry metals leached from the remaining mine waste in the local watershed. Spring runoff can be expected to have the same effect, and 2019 is the first year in which this could be observed. In previous years, including 2018, the lake was treated with lime in late winter and any metals entering the lake in runoff would have quickly precipitated on reaching the high pH treated lake water, preventing the appearance of a spring peak. Camp Lake was near-neutral and well buffered in spring 2019, but lake pH was not so high as to cause precipitation (e.g., in the range of pH 8 to 10) of metals delivered in spring runoff, resulting in the spring peak.

The higher aluminum concentrations in the East basin than in the rest of Camp Lake are consistent with water quality monitoring results in 2017 and 2018 (DJRC 2018 and 2019) and are likely a reflection of the different types of mine waste remaining adjacent to different parts of the lake. Relatively fresh mine tailings dominate the mine waste adjacent to the East basin. The remaining tailings in this area were located at the bottom of the original tailings pile and were not exposed to weathering until the overlying tailings were relocated in 2011-2012. Waste rock dominates the mine waste remaining adjacent to the South and Central basins, primarily occurring as roadbed material in the access road that has been in place and exposed to weathering for as long as 90 years. The mine tailings originated from the highly mineralized ore zone of the Sherridon deposit whereas the waste rock originated from the pyritic, but less mineralized, host rock surrounding the mineralized ore zone. Notably, iron was the only metal that occurred in lower concentrations in the East basin than in the rest of Camp Lake.

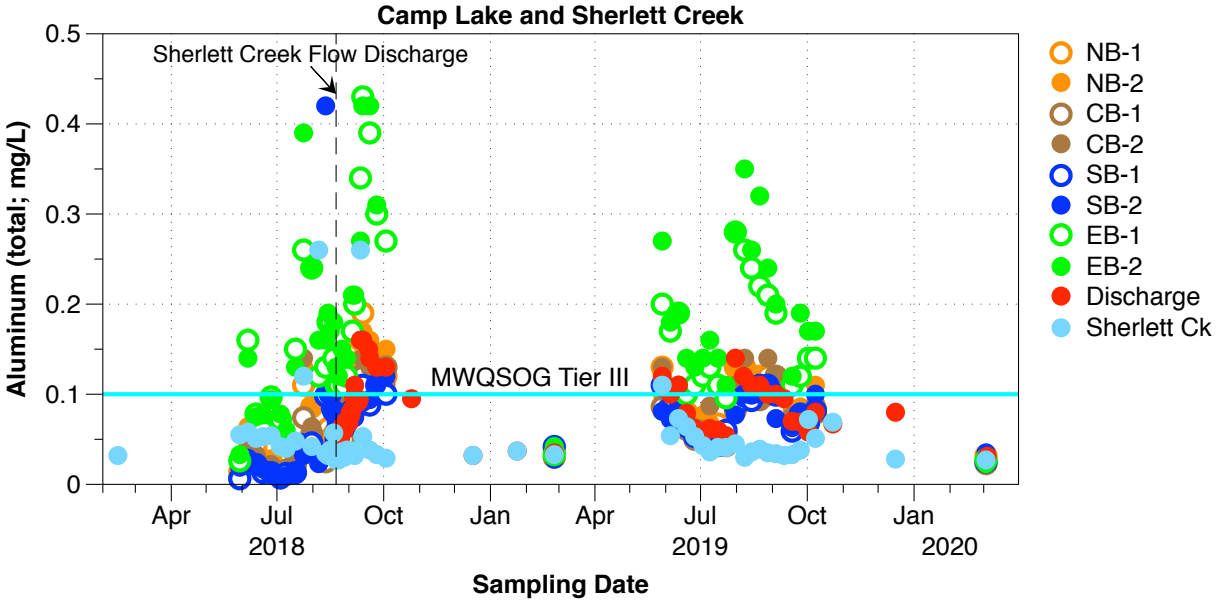

Figure 25. Total aluminum concentrations in Camp Lake, the Camp Lake Discharge, and Sherlett Creek, February 2018 to March 2020.

Aluminum concentrations in the Camp Lake discharge were the same as in the inflowing Sherlett Creek under ice cover in January, February, and December 2019 and in March 2020, and concentrations were only slightly higher than in Sherlett Creek from late May through to July 23 (Figure 25). The aluminum concentration in the discharge increased to the second seasonal peak over the last week of July, with similar peak concentrations occurring in the discharge and in all of the South, Central, and North basins. The second seasonal peak developed in the East basin during the same period, although the resulting maximum concentration was more than double that in the rest of the lake. Aluminum concentrations in all lake basins, and the discharge, gradually declined from this peak in early August over the following weeks, with total aluminum concentrations in the South, Central and North basins all below 0.1 mg/L by September 18 and concentrations at both East basin stations in the range of 0.11 to 0.12 mg/L. There was a small, approximately 0.4 mg/L, increase in the total aluminum concentration in Sherlett Creek in the last week of September and first week of October, with corresponding increases occurring in all basins of Camp Lake over the same period (Figure 25). Ice cover developed on Camp Lake by the third week of October, and by early March 2020, concentrations in all parts of the lake were in the range of 0.23 to 0.35 mg/L and were comparable to that in Sherlett Creek (0.31 mg/L).

The Camp Lake discharge had no effect on total aluminum concentrations in the Cold Lake mixing zone. Concentrations on all sampling dates in 2019 were within the historical range during periods absent the discharge (Figure 26). The highest aluminum concentrations occurred in late May at all three stations, and values declined steadily through the end of July. The only exceedance of the 0.1 mg/L MWQSOG Tier III guideline occurred on May 28, in the near-surface samples from CL-3 (0.11 mg/L) and CL-8 (0.11 mg/L). The spring-summer decline appeared to follow the decline of aluminum concentrations in the discharge over the same period, but the decline at the mixing zone stations was similar to a decline during the same period in 2017 that was unrelated to aluminum concentrations in the discharge (Figure 26). Aluminum concentrations at the mixing zone stations also remained near the end of July low during the subsequent second peak of aluminum in the discharge. Overall, total aluminum concentrations at the mixing zone stations were unresponsive to variations of concentrations in the Camp Lake discharge, as was observed in 2017 and 2018 (DJRC 2018 and 2019).

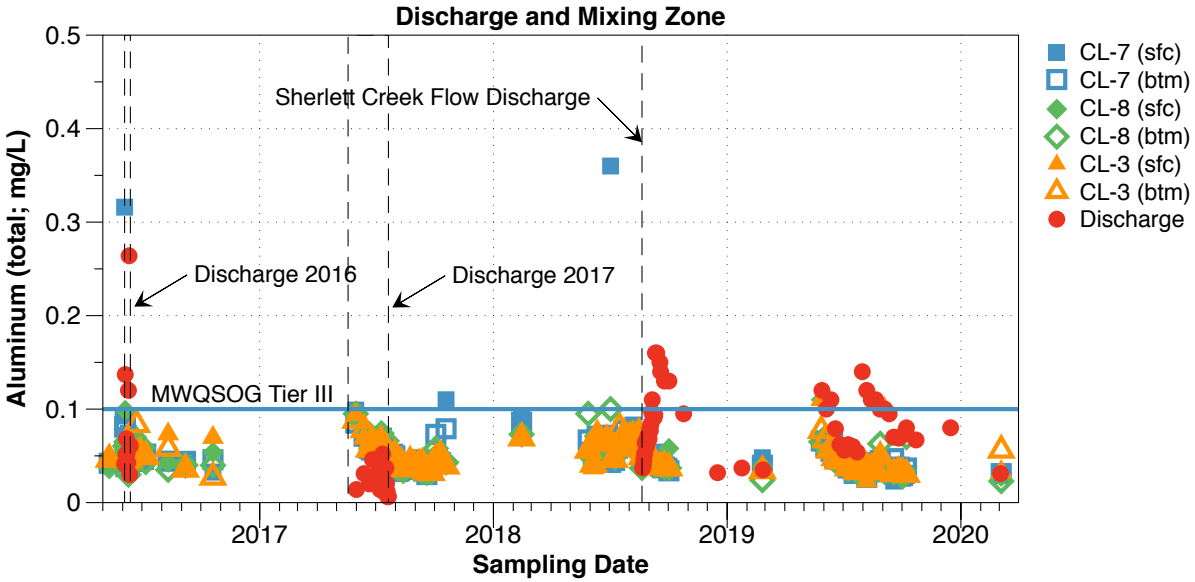

Figure 26. Total aluminum concentrations in the Camp Lake Discharge and Cold Lake Mixing Zone, May 2016 to March 2020.

The discharge had no effect on total aluminum concentrations in Cold Lake (Figure 27). Total aluminum concentrations in Cold Lake occasionally exceeded the Tier III MWQSOG guideline of 0.1 mg/L, but these exceedances were unrelated to the Camp Lake discharge and were within the historical range in the absence of a discharge. The spring-summer decline of total aluminum concentrations observed in the mixing zone also occurred across the Cold Lake stations, as is typical for Cold Lake (Figure 27).

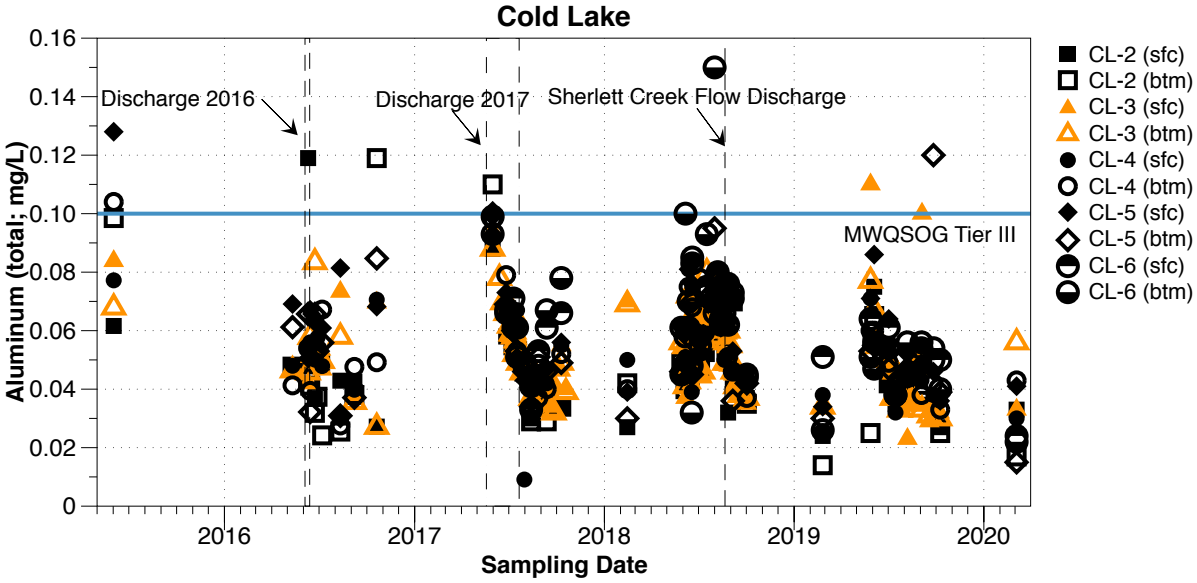

Figure 27. Total aluminum concentrations in the Cold Lake arm of Kississing Lake, May 2015 to March 2020.

3.3.2 Cadmium

Total cadmium concentrations in Camp Lake followed the same two-peak pattern of seasonal fluctuations as observed in the concentrations of aluminum, copper, and zinc in the lake. Total cadmium concentrations were higher in the East basin than in the remainder of Camp Lake throughout the open water season (Figure 28). The lowest concentrations occurred at the South basin stations, and these were the same as, or just marginally higher than in the inflowing Sherlett Creek. Total cadmium concentrations in the Central and North basins and in the discharge were intermediate between those in the South and East basins. Overall, the lowest cadmium concentrations occurred during periods of ice cover at all stations in Camp Lake.

Total cadmium concentrations in Sherlett Creek in 2019 were very similar to values measured in 2018, whereas concentrations at the Camp Lake stations and in the discharge were generally lower in 2019 than in 2018 (Figure 28). The lower values in Camp Lake than in 2018 are likely due, in part, to the absence of construction activity adjacent to the lake in 2019 – monitoring in 2018 directly connected runoff from various construction activities to increased cadmium concentrations at stations closest to the activity (DJRC 2019). Fewer heavy rainfall events in 2019 (1 event) than in 2018 (2 events) also may have contributed to the lower concentrations. Finally, installation of the Fox Lake outlet control structure and removal of mine waste along the outlet flow path were completed in 2018 and this would have substantially reduced the potential for disturbance and transport of ARD materials to the East basin during an overflow event from Fox Lake.

Total cadmium concentrations in Sherlett Creek were consistently at or above the MWQSOG Tier II chronic exposure objective during the 2019 open water season, dropping below the chronic objective during late winter in February 2019 and again in March 2020 (Figure 28). The two-peak seasonal pattern in cadmium concentrations that was evident in Camp Lake also was somewhat evident in Sherlett Creek – the second peak amounting to a single higher value (0.00084 mg/L) on July 31, at the end of the week of heavy rainfall. Investigation in 2017 and 2018 identified a groundwater inflow to Sherlett Creek that could account for the much higher concentrations of several metals that periodically occur in Sherlett Creek above Camp Lake (DJRC 2019). However, in the absence of sampling multiple stations on Sherlett Creek between Sherlett Lake and Camp Lake, it is not known if this second peak in cadmium originated from this groundwater source.

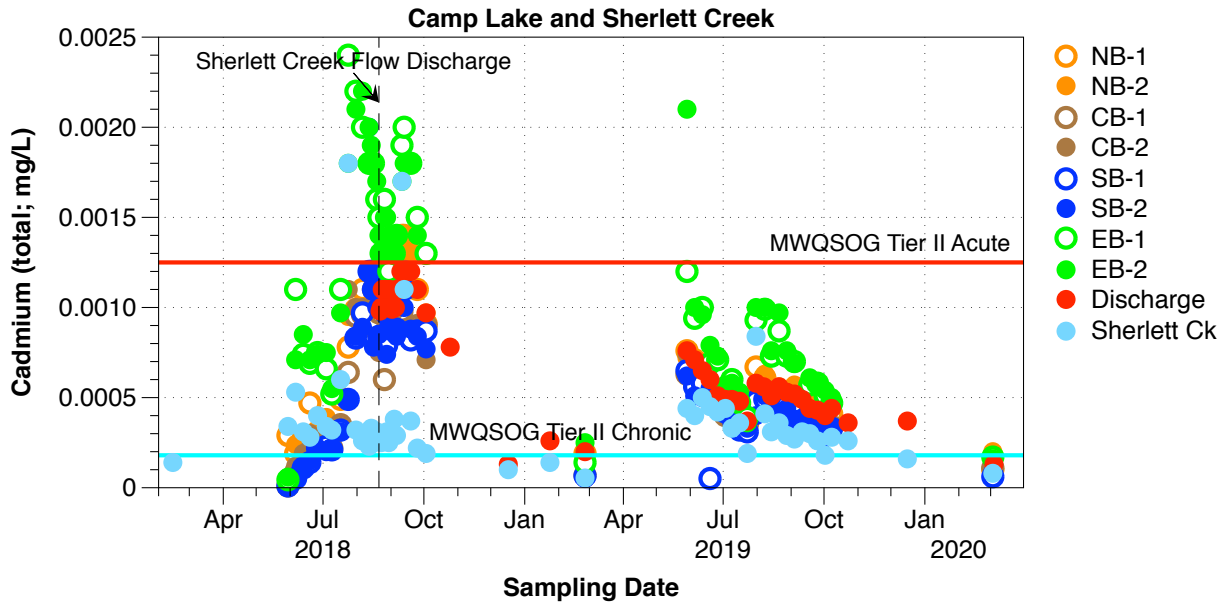

Figure 28. Total cadmium concentrations in Camp Lake, the Camp Lake Discharge, and Sherlett Creek, February 2018 to March 2020.

Total cadmium concentrations in Sherlett Creek and in the South, Central, and North basins of Camp Lake generally were well below the Tier II acute exposure objective throughout 2019 (Figure 28). Total cadmium concentrations in the East basin approached the Tier II acute objective during both peaks, with a single measurement (0.0021 mg/L at EB-2 on May 29) exceeding the Tier II acute objective.

There was a short-term effect of the discharge on cadmium concentrations in the Cold Lake mixing zone early in the spring runoff period – cadmium concentrations at CL-3 on May 28, both near-surface and near-bottom, were higher than historically observed outside a discharge period, and concentrations at all three mixing zone stations declined along with concentrations in the discharge through the first three weeks of sampling. The discharge had no effect at all on total cadmium concentrations at the mixing zone stations after June 18. Total cadmium concentrations at all three mixing zone stations were well below the Tier II acute exposure objective throughout 2019. Concentrations were below the Tier II chronic exposure objective under winter ice cover and after June 18, 2019. The Tier II chronic objective was exceeded at all stations in the mixing zone from May 29 through June 18, although only the values measured at CL-3 on May 29 were higher than historical values measured at these stations in the absence of a discharge. In this specific context, the discharge did not have an adverse effect on total cadmium concentrations at the mixing zone stations in 2019 given the short-term elevation that was limited to CL-3.

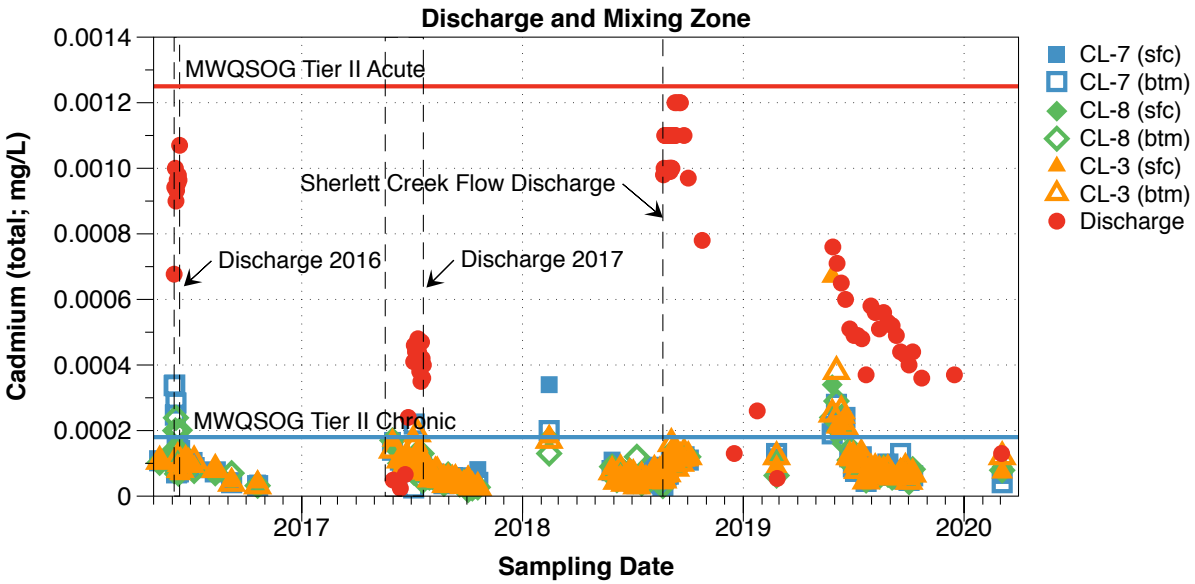

Figure 29. Total cadmium concentrations in the Camp Lake Discharge and Cold Lake Mixing Zone, May 2016 to March 2020.

In comparison to the observations in 2019, the much higher concentrations in the discharge in 2018 had little effect on concentrations in the mixing zone. The absence of an effect in 2018 is attributable to the much lower mid-summer and autumn flows when these higher concentrations occurred in 2018 than during spring 2019. The effect of the discharge on the concentration of any parameter in the mixing zone is a function of both the concentration in the discharge as well as the discharge flow. The effect observed in 2019 occurred when flow through the discharge was at its annual maximum during spring runoff, whereas the discharge did not begin until mid-summer in 2018, when flows were much below the spring peak.

The short-term increases in total cadmium concentrations at the margin of the mixing zone at the end of May carried through to the closest stations in Cold Lake (CL-2 and CL-4) outside the mixing zone during the same period (Figure 30). Cadmium concentrations at other Cold Lake stations outside the mixing zone were not affected by the Camp Lake discharge. Near-surface concentrations remained within the range historically observed in the absence of a discharge. Near-bottom concentrations at both CL-2 and CL-5 on September 5 were outside the range observed since 2015, but these are not attributable to the discharge. As noted in previous years and for other metals, near-bottom concentrations tend to increase during periods of thermal stratification due to the development of near-bottom anoxia, as noted in previous years (DJRC 2018 and 2019)

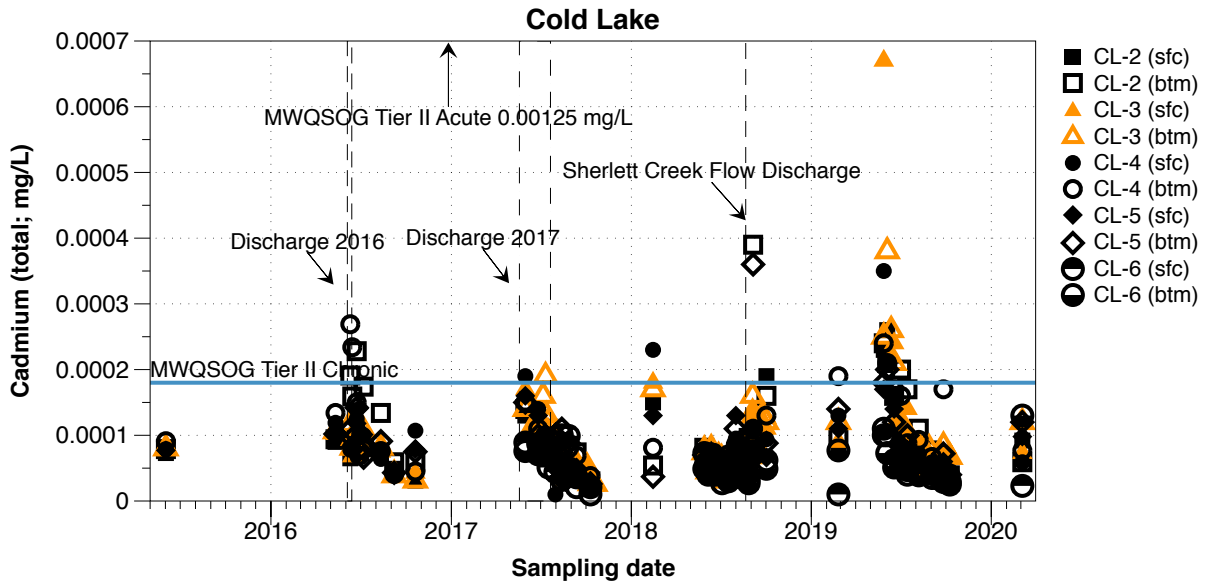

Figure 30. Total cadmium concentrations in the Cold Lake arm of Kississing Lake, May 2015 to March 2020.

3.3.3 Copper

Total copper concentrations in Camp Lake followed a two-peak pattern of seasonal fluctuations (Figure 31) that was the same as observed in the concentrations of aluminum, cadmium, and zinc in the lake (Sections 3.3.1, 3.3.2, and 3.3.4). Total copper concentrations were higher in the East basin than in the remainder of Camp Lake for short periods during the peaks, but otherwise were similar to concentrations in other parts of the lake. Outside of the peaks, there was little spread in concentrations across the lake. The lowest concentrations in Camp Lake occurred at the South basin stations, and these were the same as, or just marginally higher than in the inflowing Sherlett Creek. Total copper concentrations in the Central and North basins and in the Camp Lake discharge were intermediate between those in the South and East basins. Overall, the lowest copper concentrations occurred at all stations during periods of ice cover, once again highlighting the influence of runoff from the local watershed as the primary source of copper to Camp Lake, as was noted in 2018 (DJRC 2019). Other than during the two peaks in the open water season, total copper concentrations at all stations in Camp Lake were similar to concentrations in Sherlett Creek (Figure 31).

The two-peak seasonal pattern in copper concentrations that was evident in Camp Lake also was somewhat evident in Sherlett Creek – the second peak amounting to a single higher value (0.035 mg/L) on July 31, at the end of the week of heavy rainfall. Investigation in 2017 and 2018 identified a groundwater inflow to Sherlett Creek that could account for the much higher concentrations of several metals that periodically occur in Sherlett Creek above Camp Lake (DJRC 2019). However, in the absence of sampling multiple stations on Sherlett Creek between Sherlett Lake and Camp Lake, it is not known if this second peak in copper originated from this

groundwater source. All measurements in Sherlett Creek during the open water season exceeded the MWQSOG Tier II chronic exposure objective and all but three exceeded the Tier II acute exposure objective. Under winter ice cover, total copper in Sherlett Creek was near or below the Tier II chronic exposure objective.

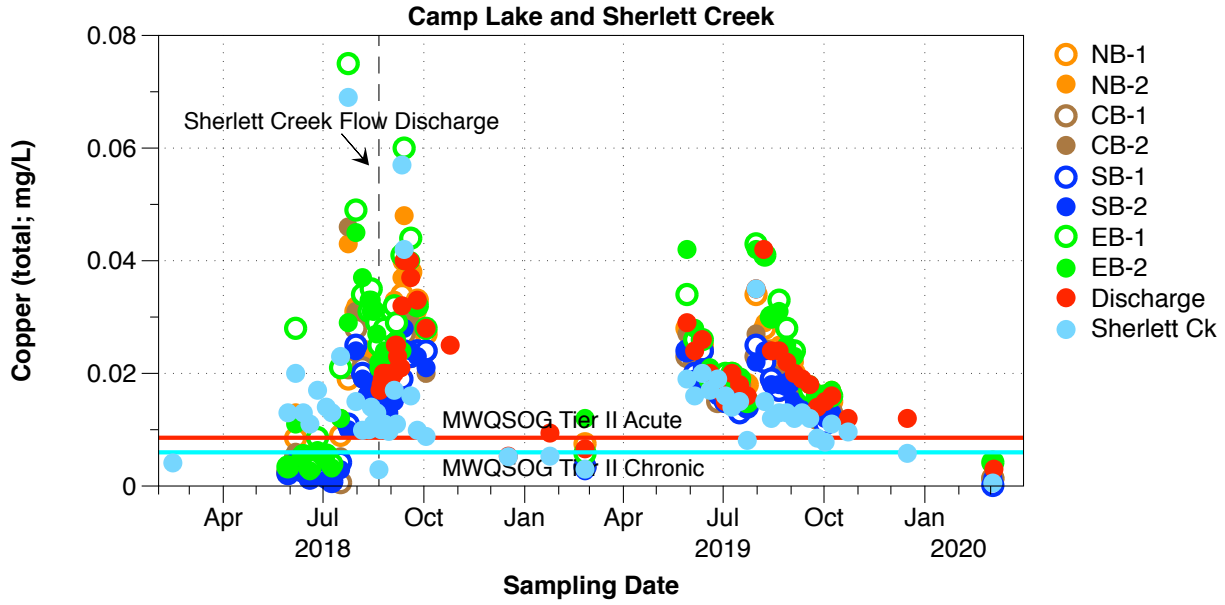

Figure 31. Total copper concentrations in Camp Lake, the Camp Lake Discharge, and Sherlett Creek, February 2018 to March 2020.

The Camp Lake discharge had a short-term effect on total copper concentrations in the Cold Lake mixing zone and in parts of Cold Lake during the spring runoff period of 2019 (Figures 32 and 33). The discharge affected copper concentrations at the mixing zone stations between May 28 and June 18. Total copper concentrations in Cold Lake have recently ranged as high as 0.011 mg/L outside of discharge events, both within the mixing zone and in other parts of Cold Lake, which sets the upper range of background concentrations (Figures 32 and 33). Concentrations at CL-3, within the mixing zone, were higher than 0.011 mg/L on two occasions in the near-surface samples (0.024 mg/L on May 28 and 0.018 mg/L on June 18) and on three occasions in the near-bottom samples (0.013 on May 28, 0.014 on June 4, and 0.012 mg/L on June 18). Total copper concentrations at CL-3 were within the recent historical range before May 28 and after June 18. Lower peak concentrations occurred at both CL-7 and CL-8, at the margins of the mixing zone, than at CL-3 within the mixing zone, although the 0.011 mg/L background concentration was exceeded on one occasion at CL-7 (0.012 mg/L near-surface on May 28) and on two occasions at CL-8 (0.015 mg/L near-surface on May 28 and 0.014 mg/L near-bottom on June 4). Total copper concentrations at CL-7 and Cl-8 were within the recent historical background range before May 28 and after June 4. This occurred despite total copper concentrations in the discharge during the first peak being approximately 35% lower than the peak values in September 2018 (Figure 32). As noted above, the effect of the discharge on parameter concentrations in the mixing zone

is a function of both concentration and discharge flow, and discharge flow was likely at its annual maximum in late-May/early-June 2019.

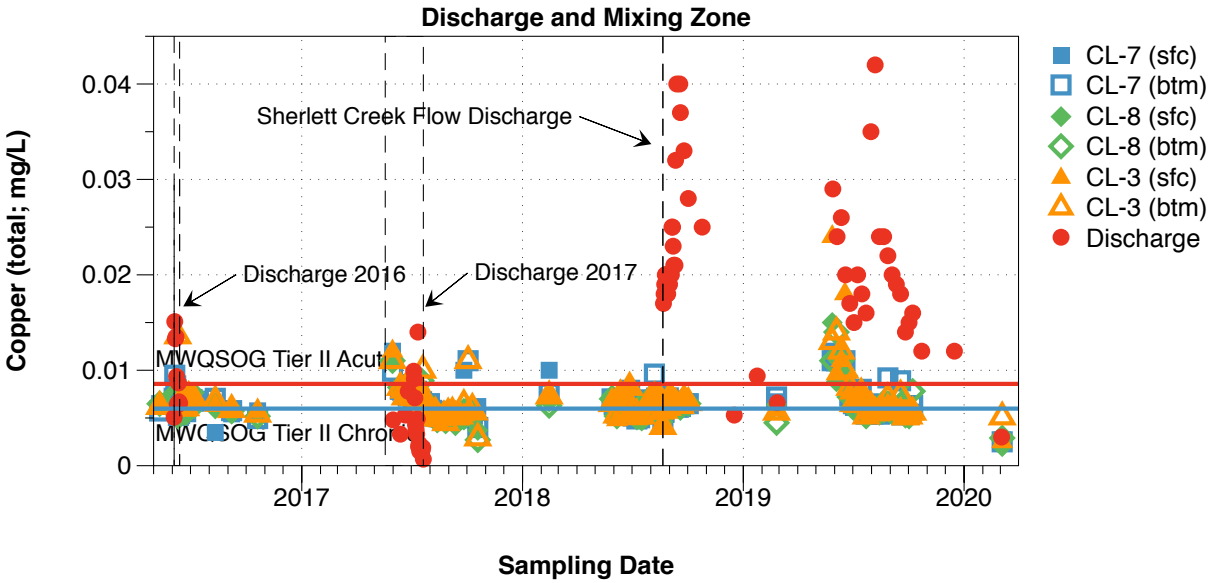

Figure 32. Total copper concentrations in the Camp Lake Discharge and Cold Lake Mixing Zone, May 2016 to March 2020 (note y-axis break).

Slightly elevated total copper concentrations also occurred at CL-2 (0.014 mg/L near-surface on May 28 and 0.013 mg/L near-surface and 0.012 mg/L near-bottom on June 4) and at CL-4 (0.014 mg/L near-surface 28 May). Other than during this short period, total copper concentrations at CL-2 and CL-4 were within the historical background range in 2019 and under ice cover in March 2020. Total copper concentrations at the other stations in Cold Lake (CL-5 and CL-6) were within the historical background range at all times in 2019 and under ice in March 2020.

Overall, both Sherlett Creek and Cold Lake support unusually high background total copper concentrations. In Sherlett Creek, values in excess of the MWQSOG Tier II acute exposure objective (0.00857 mg/L) were the norm during the open water period (Figure 31). In Cold Lake, values were frequently in excess of the MWQSOG Tier II chronic exposure objective (0.00598 mg/L) and occasionally above the acute objective. The high background concentrations in Cold Lake reflect the long history of uncontrolled ARD discharges from the Sherridon site prior to the start of the reclamation project (Tetra Tech WEI 2016). Although these discharges ended in the second quarter of 2009, the long-term effects of historical discharges from the mine site, beginning as early as 1927, remain to the present.

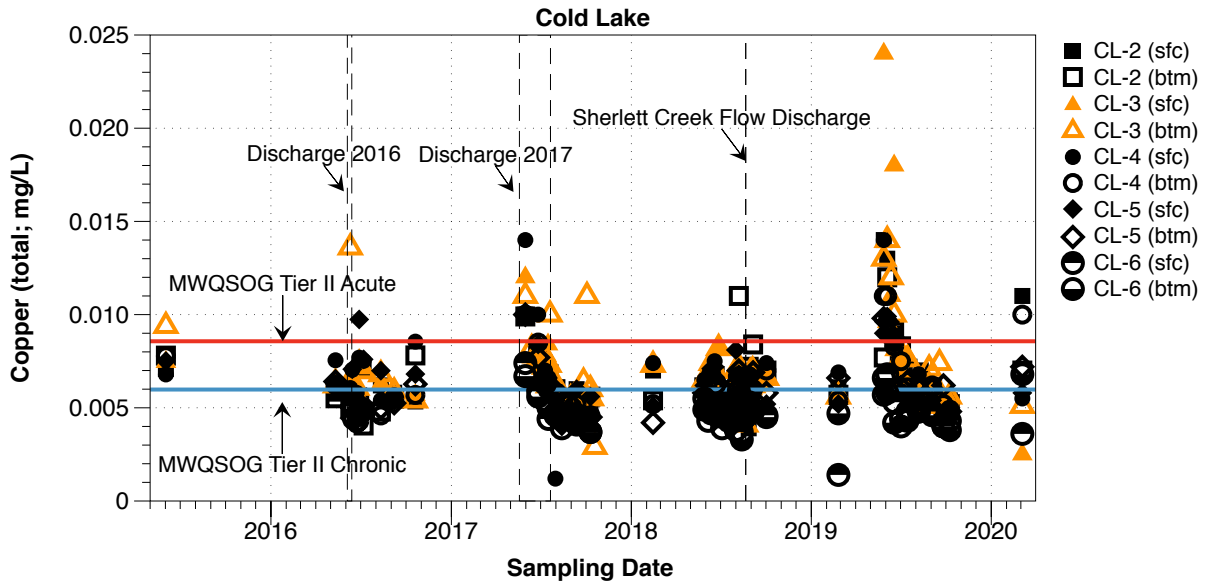

Figure 33. Total copper concentrations in the Cold Lake arm of Kississing Lake, May 2015 to March 2020.

3.3.4 Zinc

Total zinc concentrations in Camp Lake followed a two-peak pattern of seasonal fluctuations (Figure 34) that was the same as observed in the concentrations of aluminum, cadmium, and copper in the lake (Sections 3.3.1, 3.3.2, and 3.3.3). Total zinc concentrations were generally higher in the East basin than in the remainder of Camp Lake during the open water season. The lowest concentrations in Camp Lake occurred at the South basin stations, and these were the same as, or just marginally higher than in the inflowing Sherlett Creek. Total zinc concentrations in the Central and North basins and in the Camp Lake discharge were intermediate between those in the South and East basins. Overall, the lowest zinc concentrations occurred at all stations in the lake during periods of ice cover, once again highlighting the influence of runoff from the local watershed as the primary source of zinc to Camp Lake, particularly to the East basin, as was noted in 2018 (DJRC 2019). Total zinc concentrations in Camp Lake exceeded both the MWQSOG Tier II chronic and acute objectives (both set at 0.0771 mg/L) throughout the open water period. Concentrations in the South, Central, and North basins were below both objectives under winter ice cover in February 2019 and March 2020. Under-ice zinc concentrations were slightly higher in the East basin than in the rest of Camp Lake, ranging around the Tier II objectives in both February 2019 and March 2020.

Total zinc concentrations in Camp Lake were generally lower in 2019 than in 2018, with correspondingly lower concentrations in the Camp Lake discharge during the open water period. The mean total zinc concentration between May 29 and October 8, 2019 was 0.161 mg/L and the maximum was 0.24 mg/L on May 29, 2019. In comparison, the mean total zinc concentration between August 22, 2018, when the discharge started, and October 25, when

sampling ended for the open water season, was 0.33 mg/L and the maximum was 0.37 mg/L on 13 and 18 September 2018 (from Appendix B1 of DJRC 2019). The lower mean and maximum total zinc concentrations in 2019 are likely a combined result of fewer heavy rainfall events and the absence of construction activity adjacent to the lake.

The two-peak seasonal pattern in zinc concentrations evident in Camp Lake was much less distinct in Sherlett Creek. Zinc concentrations were only very slightly higher during spring runoff than later in the open water period, and the second peak amounted to a single elevated value (0.29 mg/L) on July 31, at the end of the week of heavy rainfall. As already noted, investigation in 2017 and 2018 identified a groundwater inflow to Sherlett Creek that could account for the much higher concentrations of several metals that periodically occur in Sherlett Creek above Camp Lake (DJRC 2019). However, in the absence of sampling multiple stations on Sherlett Creek between Sherlett Lake and Camp Lake, it is not known if this second peak in zinc originated from this groundwater source. Most total zinc measurements in Sherlett Creek during the open water season exceeded the MWQSOG Tier II chronic and acute exposure objectives, with values below the objectives on just two dates (0.07 mg/L on July 23 and 0.062 mg/L on October 2).

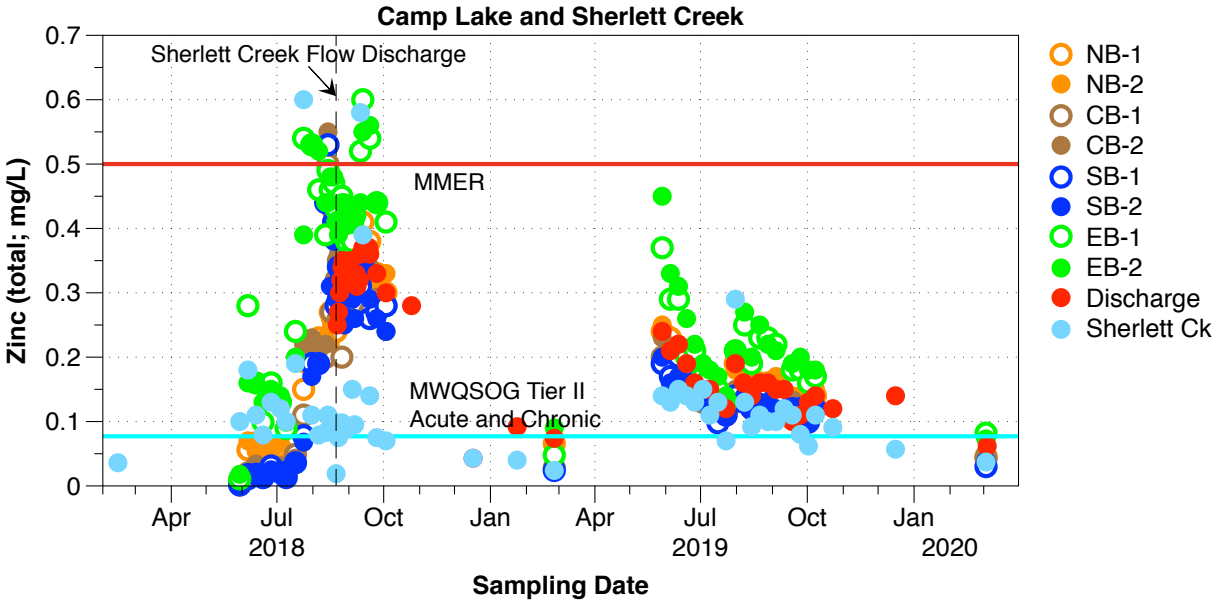

Figure 34. Total zinc concentrations in Camp Lake, the Camp Lake Discharge, and Sherlett Creek, February 2018 to March 2020.

The Camp Lake discharge had a short-term effect on total zinc concentrations in the Cold Lake mixing zone and in parts of Cold Lake during the spring runoff period of 2019 (Figures 35 and 36). This occurred despite total zinc concentrations in the discharge during the first peak being approximately 35% lower than the peak values in September 2018 (Figure 34). As noted above, the effect of the discharge on the concentration of any parameter in the mixing zone is a function of both the concentration in the discharge as well as the discharge flow. The effect observed in 2019 occurred when flow through the discharge was at its annual maximum during

spring runoff, whereas the discharge did not begin until mid-summer in 2018, when flows were much below the spring peak.

The Camp Lake discharge had a very short-term effect on total zinc concentrations in the Cold Lake mixing zone between May 28 and June 4 of 2019, during the spring runoff period, (Figure 35). Total zinc concentrations in Cold Lake have recently ranged at least as high as 0.092 mg/L within the mixing zone, outside of discharge events, which sets the upper range of background concentrations (Figure 35). Concentrations at CL-3, within the mixing zone, were higher than 0.092 mg/L on one occasion in the near-surface samples (0.21 mg/L on May 28) and on two occasions in the near-bottom samples (0.10 on May 28 and 0.12 on June 4). Total zinc concentrations at CL-3 were within the recent historical range before May 28 and after June 4. Lower peak concentrations occurred at both CL-7 and CL-8, at the margins of the mixing zone, than at CL-3 within the mixing zone, although the 0.092 mg/L background concentration was exceeded on one occasion at CL-7 (0.095 mg/L near-bottom on June 4) and on two occasions at CL-8 (0.11 mg/L near-surface on May 28 and 0.10 mg/L near-bottom on June 4). Total zinc concentrations at CL-7 and Cl-8 were within the recent historical background range before May 28 and after June 4.

The discharge affected zinc concentrations in the mixing zone despite zinc concentrations in the discharge during the first peak being approximately 35% lower than the peak values in September 2018 (Figure 35). As noted above, the effect of the discharge on parameter concentrations in the mixing zone is a function of both concentration and discharge flow, and discharge flow was likely at its annual maximum in late-May/early-June 2019.

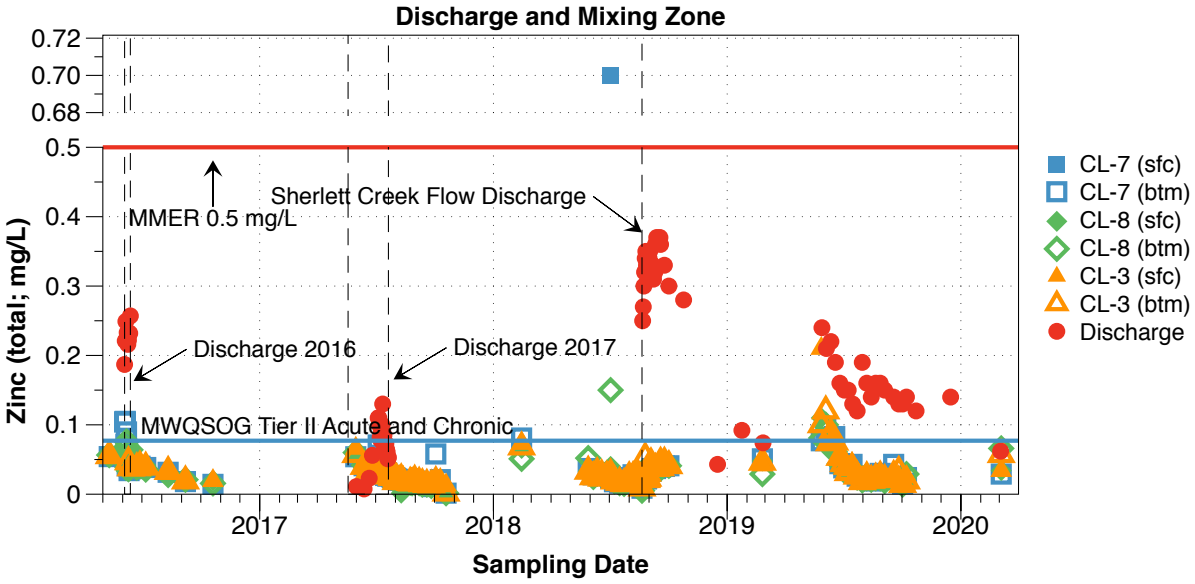

Figure 35. Total zinc concentrations in the Camp Lake Discharge and Cold Lake Mixing Zone, May 2016 to March 2020 (note y-axis break).

The discharge-affected zinc concentrations in the mixing zone briefly extended to station CL-4, where the near-surface total zinc concentration (0.11 mg/L) was slightly above the background maximum of 0.092 mg/L on May 28 (Figure 36). This appears to be a direct effect of the discharge. In contrast, total zinc in the near-surface sample from CL-2, at 0.13 mg/L, was higher than the background maximum on March 3, 2020 (Figure 36), but was not a result of the discharge; this value was substantially higher than had been measured in the mixing zone on any date since the previous May. As noted in Section 3.5 below, the sediments of the Cold Lake arm remain heavily contaminated from the historical mine activities, and this contamination can be expected to appear in the water column from time to time.

Outside of the one clear effect at CL-4, total zinc concentrations in Cold lake outside the mixing zone remained within the historical range in 2019. Concentrations were generally highest in late May/early June, and this was at least partially due to the discharge while also reflecting the trend noted in 2016, when concentrations were higher in spring, before a discharge was started, than later in the open water season, and well after the short discharge period (Figure 36). Total zinc concentrations were generally below the MWQSOG Tier II acute/chronic exposure objective of 0.0771 mg/L, other than between May 28 and June 4 or the noted occurrence at CL-2 in March 2020.

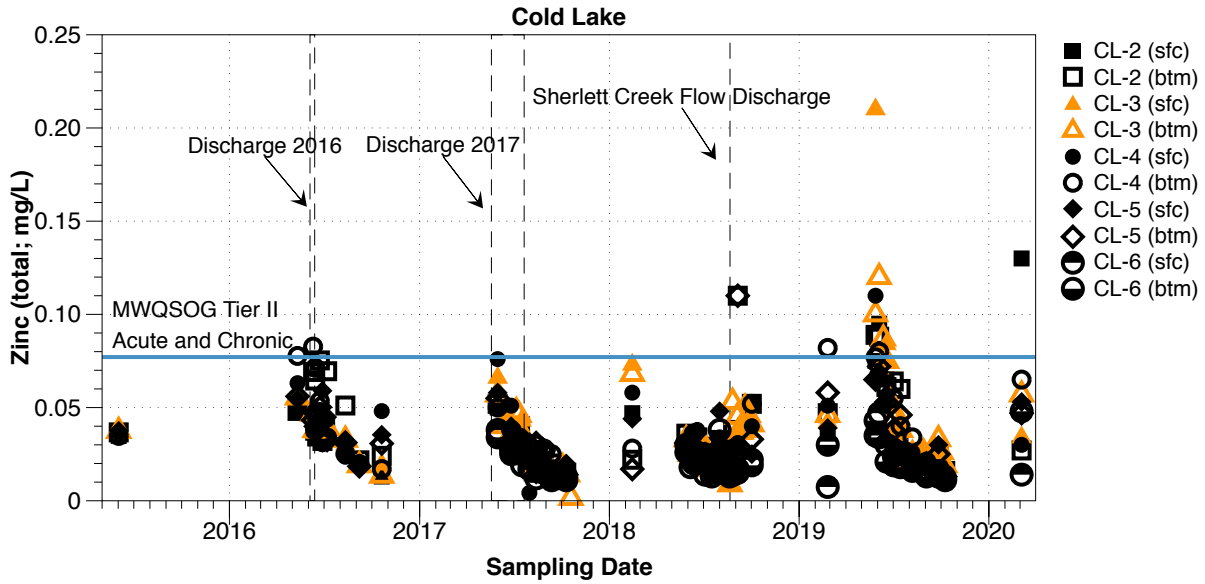

Figure 36. Total zinc concentrations in the Cold Lake arm of Kississing Lake, May 2015 to March 2020.

3.4 Discharge Toxicity

The Camp Lake discharge at the North weir was sampled for testing of acute toxicity (96-hour LC_{50}) to juvenile Rainbow trout on 6 dates in 2019 (June 5, June 26, July 23, August 7, September 25, and October 8). The LC_{50} is the effluent concentration that is lethal to 50% of the fish tested. Rainbow trout are one of the standard test organisms and are used because they are more sensitive to potentially toxic materials than many other fish species. An LC_{50} result of >100% indicates the discharge is not acutely toxic to fish. All 6 test results returned an LC_{50} > 100% (Appendix B). The Camp Lake discharge was not acutely toxic to fish at any time over the five-month period considered in this study.

3.5 Sediment Quality

Sediment quality sampling was added to the monitoring program in 2019 because questions were being asked about the possible effect of the Camp Lake discharge on sediment quality in Cold Lake, and in the mixing zone in particular given the significant attenuation of metals and turbidity from the discharge that occurs in the mixing zone, as discussed in Sections 3.1, 3.2, and 3.3. Sediment quality was last sampled in Cold Lake in 2008 as part of the environmental baseline study conducted before the start of the reclamation project. That study sampled stations CL-2, CL-3, CL-4, CL-5, and CL-6, in addition to other locations on Kississing Lake. Stations CL-7 and CL-8 were established in 2016 and were not sampled in 2008.

Sediment iron concentrations are of particular interest, because of the periodically elevated total iron concentrations and turbidity in the discharge and the documented attenuation of iron in the mixing zone. The 2008 baseline study found the highest sediment iron concentrations at CL-3, with only slightly lower concentrations at CL-2, by 8%, and CL-4, by 19%, which are the stations closest to CL-3.

Total iron concentrations at CL-3 in 2019 were unchanged from 2008, with the range measured in 2019 occurring within the range measured in 2008 (Table 5). Iron concentrations at CL-7 and CL-8 also were within or very near (i.e., within 6%) the range measured at CL-3 in 2008. Concentrations at CL-2 in 2019 were slightly lower than in 2008, by approximately 13% below the 2008 mean. The iron concentration at CL-5 in 2019 also was lower than in 2008, by 32%, while the concentration at CL-6 in 2019 was within the range measured in 2008. In contrast to all of the other stations, where concentrations in 2019 were the same as or lower than in 2008, the iron concentration at CL-4 in 2019 was slightly higher than in 2008, by approximately 10% above the 2008 mean. With the exception of the reduction at CL-5, the iron concentrations measured at the other stations are not considered to be significantly different from the values measured in 2008. Resumption of the Camp Lake discharge in 2018 has not affected sediment iron concentrations in Cold Lake.

The lowest sediment aluminum concentrations occurred in the mixing zone in 2019 - at all of stations CL-3, CL-7, and CL-8 – and the concentrations at all three stations were within the

range measured at CL-3 in 2008 (Table 5). Aluminum concentrations at all other stations in Cold Lake were slightly above the ranges measured in 2008. However, given the absence of a change in sediment aluminum in the mixing zone, where any increase due to the Camp Lake discharge would be focused, none of the minor increases in sediment aluminum outside the mixing zone can be attributed to the discharge.

The lowest sediment cadmium concentrations occurred in the mixing zone in 2019 - at all of the stations CL-3, CL-7, and CL-8 – and the concentrations at all three mixing zone stations were within the range measured at CL-3 in 2008 (Table 5). The sediment cadmium concentration at CL-4 also was within the range measured there in 2008 while the concentration at CL-6 was slightly below the 2008 range. Sediment cadmium concentrations at CL-2 and CL-5 were slightly above the ranges measured in 2008. Sediment cadmium concentrations in Cold Lake considerably exceeded the Probable Effects Level (PEL) of 3.5 mg/kg (dry weight) in 2019 at all stations except CL-3 by a factor of 1.7 (CL-4) to 3.8 (CL-5). The value at CL-3 only marginally exceeded the PEL and values at CL-7 and CL-8 were below the PEL, but still exceeded the ISQG of 0.6 mg/kg (dry weight). The Camp Lake discharge is not affecting cadmium concentrations in Cold Lake sediments.

The lowest sediment copper concentrations occurred in the mixing zone in 2019 - at all of the stations CL-3, CL-7, and CL-8 – and the concentrations at all three mixing zone stations were within the range measured at CL-3 in 2008 (Table 5). Sediment copper concentrations were markedly higher at all stations outside the mixing zone in 2019, by 47% (CL-4) to 106% (CL-5) (Table 5). The total copper concentration at CL-2 in 2019 was higher than the range measured in 2008; the concentrations at CL-4 and CL-5 were within or very near the ranges measured in 2008; and the concentration measured at CL-6 was below the 2008 range. Sediment copper concentrations in Cold Lake considerably exceeded the PEL of 197 mg/kg (dry weight) in 2019, by a factor of 1.8 (CL-8) to 5.5 (CL-5), consistent with observations in 2008. The Camp Lake discharge is not affecting copper concentrations in Cold Lake sediments.

Consistent with the trends in aluminum, cadmium, and copper in 2019, total zinc concentrations in sediments also were lower at all the mixing zone stations – CL-3, CL-7, and CL-8 - than at the other stations in Cold Lake (Table 5). Sediment zinc at all three stations in the mixing zone in 2019 was within the range measured at CL-3 in 2008, indicating no change. Sediment zinc concentrations outside the mixing zone were markedly higher than at stations in the in 2019, by 67% (CL-4) to 230% (CL-5). The total zinc concentrations at CL-2 and CL-5 in 2019 were higher than the respective ranges measured in 2008, and the concentrations at CL-4 and CL-6 were within or near the respective 2008 ranges. Sediment zinc concentrations considerably exceeded the PEL of 315 mg/kg (dry weight) at all stations in Cold Lake, by a factor of 2.9 (CL-8) to 12.9 (CL-5), consistent with observations in 2008. The resumed Camp Lake discharge is not affecting zinc concentrations in Cold Lake sediments.

The pattern of aluminum, cadmium, copper and zinc concentrations in Cold Lake sediments, with the lowest concentrations occurring in the mixing zone and the highest concentrations occurring at CL-5 or CL-6 was present in 2008 at the end of the period of uncontrolled ARD

discharge to Camp Lake (Tetra Tech WEI 2016). The very acidic discharge maintained these metals in the dissolved phase and carried them some distance from the Camp Lake discharge, where they could finally begin precipitating out under the less acidic conditions at CL-5 and CL-6. Now that the discharge is no longer highly acidic and is consistently near-neutral pH, any elevated metal concentrations in the discharge are not carried far out into the lake as occurred prior to the reclamation project.

The sediment sampling program also measured concentrations of metals/metalloids, referred to here as minor metals, that do not occur in the Camp Lake discharge in elevated concentrations in comparison to Cold Lake. Some of the changes in the concentrations of the minor metals that have occurred since 2008 are indicative of the improvement in environmental quality that has occurred in Cold Lake since the uncontrolled discharge of ARD-affected water was discontinued in late 2008. However, an improvement in environmental quality does not necessarily mean a reduction in metal concentrations in sediments, because one of the effects of the previous acidic conditions in the Cold Lake arm was that metals were kept in solution and could not precipitate in Cold Lake or may have been leached from the sediments. Consequently, some 13 metals and metalloids (including: barium, calcium, chromium, magnesium, manganese, nickel, phosphorus, potassium, sodium, strontium, thallium, titanium, and zirconium; Tetra Tech WEI 2016) occurred in lower concentrations in Cold Lake sediments than in a comparable part of Kississing Lake, referred to in that study as the Near-Field Reference Area, that was not influenced by the acidic discharge. Consistent with this explanation, 12 of these parameters (all but barium) occurred in higher concentrations in 2019 than in 2008 at most or all of the Cold Lake stations (Table 5). The effects were less pronounced at CL-6 than at the other stations in Cold Lake for most parameters because CL-6 was much less acidic in 2008 than were the other stations. None of these increases in the minor metals/metalloids represents an adverse effect – all are indicative of an improvement in environmental conditions in Cold Lake.

Arsenic was not a parameter of concern associated with the Camp Lake discharge prior to the reclamation project (Tetra Tech WEI 2016) and isn't a parameter of concern associated with the recent discharge – concentrations of total arsenic in the Camp Lake discharge are lower than in Cold Lake (data in Appendix B). Arsenic does, however, occur in Cold Lake sediments at concentrations above the Interim Sediment Quality Guideline (ISQG) of 5.9 mg/kg (dry weight) and sediment arsenic concentrations at all stations in Cold Lake in 2019 were above the range of values measured in 2008 (Table 5), indicating an increase in sediment arsenic across the Cold Lake arm of Kississing Lake. The largest increases occurred at CL-5, as was the case for several metals. The lowest sediment arsenic concentrations occurred at the mixing zone stations (CL-3, CL-7, and CL-8). The Camp Lake discharge is not responsible for the observed increase in sediment arsenic concentrations in Cold Lake sediments since 2008. Relief from acidic leaching also is not an explanation, since arsenic sorption to lake sediments decreases with increasing pH (e.g., Smedley and Kinniburgh 2002).

The most likely source of the arsenic in Cold Lake is runoff from forest fire burn areas, which also would explain occurrence of the highest sediment arsenic concentration at station CL-5. Forest fires have been shown to increase arsenic export from burned areas, both in runoff and in

airborne ash (Abraham et al. 2017; Johnston et al. 2019). Any effect of ash export on downwind water quality would be limited to the relatively short period during and immediately following the fire. Effects on runoff quality can persist for longer periods. Large forest fires occurred in the Sherridon area, affecting the Sherlett Creek watershed, in both 2008 and 2015. Sherlett Creek flowed directly into Cold Lake (i.e., not via Camp Lake) from late 2008 until August 2018. Station CL-5 on Cold Lake is located closest to the mouth of Sherlett Creek (Figure 3) and would, therefore, be most affected by any increased arsenic export from burned areas in the watershed, generally explaining the larger increase at CL-5 than at other stations in Cold Lake.

Prior to the start of the reclamation project, total lead concentrations in the Camp Lake discharge were elevated in comparison to background concentrations in Kississing Lake but total lead concentrations in Cold Lake sediments were, on average, the same as in the reference area (Tetra Tech WEI 2016). Total lead concentrations in the recent Camp Lake discharge are not obviously elevated, consistently occurring below the analytical limit of detection, as are concentrations in Cold Lake (Appendix B). Although the magnitude of the reduction in lead in the discharge cannot be fully quantified, as the current concentration is below the limit of detection (<0.00020 mg/L), the decrease has been at least 50%, and more likely 75% (assuming the actual concentration is one half the detection limit), from the 0.000395 mg/L measured on 30 September 2008. Sediment lead concentrations at CL-2, CL-3, Cl-4, and CL-6 in 2019 were within the ranges measured in 2008 (Table 5), indicating no change at these stations. The sediment lead concentration at CL-5 in 2019 was 31% higher than in 2008 and this apparent increase is not attributable to the current Camp Lake discharge. Lead concentrations in Camp Lake sediments were below the ISQG at all stations except CL-5, where the sediment lead concentration exceeded the ISQG of 35 mg/kg (dry weight) by 31%.

The increased lead concentration in sediments at station CL-5 in Cold Lake is not explained by the elimination of acidic conditions in Cold Lake or by the Camp Lake discharge. Limitation of the increase to CL-5 again suggests that the Sherlett Creek watershed is the source of the increase since 2008, with leaching from the recent forest fire burned areas representing a possible source (Abraham et al. 2017; Johnston et al. 2019).

Mercury has not been identified as a parameter of concern in relation to the Camp Lake discharge, but some comment on the 2019 results is warranted. In 2008, sediment mercury concentrations at CL-2, CL-3, and CL-4, the stations in Cold Lake closest to the Camp Lake discharge, were similar to reference area values, while concentrations at CL-5 and CL-6 were 60% to 90% higher (Table 5). Sediment mercury concentrations in 2019 were within the 2008 range at CL-3, with values at CL-7 and CL-8 within the 2008 range at CL-3 as well. Sediment mercury concentrations at CL-4 and CL-6 also were unchanged, remaining within the respective 2008 ranges. However, increases were evident at CL-2, by 39%, and at CL-5, by 48%, in 2019 compared to 2008. In 2008, mercury concentrations at both CL-5 and CL-6 exceeded the ISQG of 0.17 mg/kg (dry weight). This remained the case in 2019 at these stations, and the increased concentration at CL-2 also exceeded the ISQG. Neither of the increases is attributable to the Camp Lake discharge. Leaching from recently burned areas also is a possible explanation for

the increase at CL-5, but the study was not designed to assess all possible sources of metals to Cold Lake, and there is no readily identifiable source to explain the increase at CL-2.

The sediment sampling conducted in 2019 clearly demonstrates the resumed Camp Lake discharge is not affecting sediment quality in Cold Lake. This finding is consistent with the routine water quality monitoring in the mixing zone and more widely in Cold Lake. Any elevated parameter concentrations attenuate very quickly in the mixing zone, typically well within 75 m of the point of discharge and any effect on sediment quality would, at most, be limited to a distance of less than 75 m into the lake. The sediment sampling program also demonstrated that sediments in the Cold Lake arm of Kississing Lake remain heavily contaminated by the long-term discharge of uncontrolled ARD from the Sherridon mine site that was finally terminated in early 2009. Sediment toxicity was not assayed in 2019 but, on the basis of the 2019 sediment quality survey, sediments across the Cold Lake arm are likely to still be acutely toxic to sensitive benthic organisms, like *Hyalella azteca*, as was determined in 2008 (Tetra Tech WEI 2016). Current Camp Lake discharge quality is considerably improved, in comparison to discharge quality before reclamation, and is expected to further improve once the reclamation works have been completed. Improved sediment quality can then be expected to occur over time.

Table 5. Cold Lake sediment quality, 2008 and 2019. Data for 2008 from Tetra Tech WEI (2016). Values in bold face italics exceed the Interim Sediment Quality Guideline (ISQG). Shaded values exceed the Probable Effects Level (PEL).

Station	CL-2			Mixing Zone						CL-4			CL-5			CL-6		
				CL-3				CL-7	CL-8									
Sampling Date	9-Oct-19	7-Jul-08	28-Sep-08	9-Oct-19	9-Oct-19 DUP	7-Jul-08	30-Sep-08	9-Oct-19	9-Oct-19	9-Oct-19	7-Jul-08	30-Sep-08	9-Oct-19	7-Jul-08	30-Sep-08	9-Oct-19	7-Jul-08	30-Sep-08
Physical Properties																		
Soluble (2:1) pH	6.23	5.96	6.61	5.58	5.52	5.94	6.51	5.29	5.49	5.72	6.01	6.70	5.61	5.40	6.67	5.40	3.96	6.13
Moisture (%)	94	83	97	85	85	85	98	87	91	91	94	93	89	74	25	87	87	88
Soluble Metals																		
Soluble (Hot water) Boron	1.00	1.30	1.10	0.64	0.62	1.20	0.60	0.69	1.10	0.89	1.70	0.80	1.20	2.60	0.60	1.50	2.10	0.90
Total Metals by ICPMS (mg/kg dry weight)																		
Aluminum (Al)	20,800	15,400	16400	15,800	16,000	7,700	16,600	14,900	13,000	21,400	16,300	20,500	34,100	29,400	28,800	32,500	31,100	30,400
Antimony (Sb)	0.36	0.50	0.50	0.57	0.57	0.50	0.50	0.51	0.46	0.39	0.50	0.60	0.62	0.60	0.60	0.36	0.40	0.40
Arsenic (As)	***13.00***	***9.10***	***9.50***	***10.40***	***10.70***	5.10	***8.90***	***9.88***	***10.20***	***13.20***	***9.20***	***11.60***	***15.00***	***10.90***	***10.80***	***11.60***	***9.90***	***10.40***
Barium (Ba)	48.4	55.3	51.4	66.0	67.0	120	61.0	74.6	60.3	73.3	127	106	129	100	95.8	145	144	144
Beryllium (Be)	0.79	0.60	0.60	0.44	0.42	0.20	0.70	0.39	0.34	0.79	0.70	0.80	1.34	1.10	1.10	1.26	1.40	1.10
Bismuth (Bi)	0.31	0.20	0.20	0.15	0.19	0.10	0.20	0.14	0.17	0.24	0.20	0.30	0.73	0.50	0.50	0.48	0.50	0.50
Cadmium (Cd)	**6.29**	**5.04**	**3.75**	**3.59**	**3.62**	***1.35***	**4.84**	***3.14***	***2.54***	**5.99**	**4.09**	**6.97**	**13.30**	**10.30**	**10.60**	**8.86**	**9.48**	**9.03**
Calcium (Ca)	7970	2260	2460	6070	6080	2190	2730	7420	7330	7000	3630	2900	6760	3650	3380	6660	4920	4470
Cesium (Cs)	<1.0	--	--	<1.0	<1.0	--	--	<1.0	<1.0	1.2	--	--	2.7	--	--	3.0	--	--
Chromium (Cr)	22.6	17.0	16.0	20.9	21.2	12.0	17.0	17.3	15.4	26.4	21.0	24.0	***55.6***	***39.0***	***41.0***	***59.4***	***56.0***	***54.0***
Cobalt (Co)	12.10	8.10	6.40	8.02	8.22	2.10	6.70	5.89	5.59	13.00	11.10	12.60	30.40	20.30	20.80	25.60	26.80	27.90
Copper (Cu)	**752**	**617**	**585**	**415**	**429**	**285**	**633**	**433**	**362**	**602**	**505**	**778**	**1090**	**1000**	**1060**	**610**	**699**	**683**
Iron (Fe)	246000	297,000	271,000	305,000	325,000	331,000	282,000	345,000	311,000	281,000	259,000	254,000	111,000	167,000	160,000	85,600	84,500	89,300
Lead (Pb)	21.0	20.2	17.1	18.7	18.7	11.3	18.7	16.6	19.0	21.1	18.7	24.4	***46.0***	***35.3***	***35.3***	29.6	32.2	30.7
Magnesium (Mg)	3,220	2,070	1,840	3,010	3,100	1,230	2,040	2,320	2,200	3,800	2,840	3,360	8,940	6,110	6,100	8,900	9,470	8,400
Manganese (Mn)	340	201	205	741	723	1200	229	721	817	581	270	434	416	312	320	501	482	544
Mercury (Hg)	***0.174***	0.140	0.110	0.097	0.105	<0.05	0.140	0.100	0.126	0.130	0.090	0.150	***0.369***	***0.250***	***0.250***	***0.224***	***0.220***	***0.210***
Molybdenum (Mo)	1.31	1.20	1.20	1.98	2.03	1.50	1.70	1.99	1.68	1.36	1.60	1.80	0.88	0.90	0.90	0.57	0.60	0.60
Nickel (Ni)	16.4	12.1	11.3	12.9	13.1	6.2	11.8	10.7	9.47	18.3	19.7	18.9	39.7	29.8	30.0	40.2	41.7	40.4
Phosphorus (P)	1400	878	683	852	868	498	685	802	815	1,330	722	963	1,220	1,170	1,190	1,230	1,210	1,260
Potassium (K)	1370	1000	934	1340	1370	580	975	965	964	1,970	1,460	1,660	4,700	3,110	3,050	4,980	4,670	4,270
Rubidium (Rb)	16.8	--	--	13.0	13.5	--	--	9.9	10.4	20.7	--	--	50.9	--	--	55.8	--	--
Selenium (Se)	2.93	1.90	2.30	2.15	2.14	2.20	1.90	2.14	2.36	2.31	1.40	1.70	3.08	1.50	1.70	1.63	0.80	1.50
Silver (Ag)	0.375	0.35	0.24	0.159	0.173	0.20	0.31	0.162	0.202	0.243	0.27	0.41	1.11	0.62	0.63	0.393	0.57	0.47
Sodium (Na)	179	<100	150	112	120	<100	121	<100	147	198	329	196	346	260	210	353	307	266
Strontium (Sr)	15.2	8.0	11.2	13.5	13.8	8.0	13.9	15.7	20.5	16.7	22.3	15.9	24.9	16.1	16.3	27.3	22.8	23.6
Sulphur (S)	45,200	--	--	6,900	7,440	--	--	9,570	13,900	19,900	--	--	26,400	--	--	7,990	--	--
Tellurium (Te)	<0.30	--	--	<0.30	<0.30	--	--	<0.30	<0.30	<0.30	--	--	<0.30	--	--	<0.30	--	--
Thallium (Tl)	0.168	0.13	0.14	0.141	0.14	0.05	0.13	0.095	0.10	0.18	0.15	0.22	0.458	0.33	0.34	0.443	0.39	0.41
Thorium (Th)	4.54	--	--	3.34	3.49	--	--	2.85	3.04	4.87	--	--	9.96	--	--	11.1	--	--
Tin (Sn)	0.79	0.60	0.50	0.91	0.87	0.70	0.70	0.62	0.74	1.07	0.80	1.30	4.12	2.80	2.90	2.04	2.10	1.90
Titanium (Ti)	373	269	237	405	393	177	254	267	256	479	161	410	1,150	749	719	1,240	1,090	1,020
Uranium (U)	3.63	3.39	3.37	2.73	2.83	1.90	3.55	2.92	2.39	3.2	3.07	4.26	4.16	4.18	4.44	3.44	3.45	3.66
Vanadium (V)	21.4	17	14	21.8	22.0	11	15	16.6	15.1	27.6	27	25	54.7	41	39	59.0	59	55
Zinc (Zn)	**2,160**	**1,660**	**1,340**	**1,390**	**1,450**	**416**	**1,540**	**1,120**	**912**	**2,030**	**1,380**	**2,160**	**4,050**	**3,350**	**3,200**	**2,940**	**3,090**	**3,040**
Zirconium (Zr)	9.77	4.2	5.1	5.22	5.83	2.6	4.1	6.58	6.15	9.03	5.1	6.0	18.5	8.7	8.9	17.7	10.0	10.1

4.0 Conclusions

Sherlett Creek flow was returned through Camp lake in August 2018, with 2019 representing the first full year of this operating regime. Sherlett Creek provided sufficient alkalinity to carry the lake through the entire year without requiring a lime treatment. Camp Lake pH was stable through the year, with no late summer development of acidic conditions.

Elimination of lime treatment has made it possible to more fully understand the effect of the remaining mine waste adjacent to Camp Lake on water quality. Winter conditions isolate the lake from local watershed runoff and the concentrations of all metals reach their annual lows under winter ice cover. Iron, turbidity, TSS, and aluminum concentrations in all basins of the lake were the same as in Sherlett Creek under ice cover in both February 2019 and March 2020. Winter cadmium, copper, and zinc concentrations in the lake ranged from the same as in Sherlett Creek (South basin) to slightly higher (East basin).

The slightly higher cadmium, copper, and zinc concentrations in the East basin than in the rest of Camp Lake under ice-cover are the product of one or more of three possible causes. The flooded tailings clearly have no effect on overlying water quality in the South, Central, and North basins of the lake subject to Sherlett Creek flow-through under ice. Circulation to the East basin may be impaired by ice-cover – water depth in the two narrows that connect the East basin to the Central basin is less than 1.5 m and could freeze to near-bottom, limiting or eliminating water circulation to the East basin in winter. A reduction in water circulation from Sherlett Creek would then result in incomplete flushing of the metals that entered the East basin during the open water period. Reduced circulation also may incompletely flush metals that are the product of freeze-out from the accumulated ice cover or may represent a minor effect of the underlying tailings under the low-circulation winter conditions in the basin. The relative importance of these causes remains to be investigated, but it is clear that the effect is minor and limited to the East basin. Camp Lake discharge quality was comparable to inflowing Sherlett Creek water quality in both February 2019 and March 2020.

Alkalinity also was highest in the lake under winter ice cover, and was higher than in the inflowing Sherlett Creek, indicating net alkalinity generation occurs in the lake in the absence of watershed runoff. This may be one of the first indications that Camp Lake is beginning to function as a lake rather than just providing the essential water cover for the submerged mine waste. Net alkalinity generation also was noted in Cold Lake under winter ice cover.

The role of heavy rainfall events in affecting water quality in Camp Lake was first identified in 2018, with decreases in alkalinity and peaks in metal concentrations occurring in the lake following rainfall events. This pattern continued in 2019, with a heavy rainfall event producing the second peaks in all of the key metals in early August.

The effect of spring runoff on metal concentrations in the lake was previously obscured by the lime treatments – the high pH in the lake during runoff would have quickly precipitated any metals delivered by runoff. The spring runoff effect became evident in 2019 in the absence of a

lime treatment, driving the first peaks in all of the key metals and the corresponding first drop in alkalinity in late May/early June. Runoff events, whether in the form of the spring melt runoff or as rainfall events over the course of the open water period, carry the products of Acid Rock Drainage (ARD) and the leachable metals from the mine waste into the lake.

Mine waste remaining adjacent to the East basin of Camp Lake is the primary contributor of aluminum, cadmium, copper, and zinc to the lake, as indicated by the higher peak concentrations that develop in the East basin than in the rest of the lake during runoff events. Concentrations of these metals are less affected by runoff to the South basin where, even during the runoff periods, concentrations remained the lowest in the lake and, at times, the same as in Sherlett Creek. Concentrations in the Central and North basins are typically intermediate between those in the South and East basins, reflecting the mixing of water from the two basins in passing to the lake outlet. The mine wastes adjacent to both the East and the South basins are a source of iron in runoff to both parts of the lake, with similar iron concentrations developing in all basins during spring runoff and with higher peak iron concentrations developing in the South and Central basins during the second peak.

The differing effects of the two areas of mine waste are explained by the different types of waste. Mine waste remaining in the area of the East basin is primarily in the form of poorly weathered tailings – ore that was ground for recovery of economic minerals (zinc and copper) and then sat at the bottom of the tailings pile until it was uncovered in 2011-2012. Mine waste remaining adjacent to the South basin (primarily) of Camp Lake is largely waste rock, pyritic (iron sulphide) rock with uneconomic concentrations of other metals, that has been exposed to weathering for an extended period, possibly since the late 1920's when mining first started at Sherridon.

The red-coloured turbidity that developed in the lake in 2019 was caused by particulate iron delivered to the lake in runoff from the adjacent mine waste. Particulate iron accounted for 83% of turbidity and 70% of TSS in the Camp Lake discharge on average in 2019. The particulate iron turbidity that developed in 2019 differs from the lime floc that occurred in the lake following lime treatments in previous years. The lime floc was a larger particle that settled readily during calm periods and was resuspended by wind action in the South and Central basins during periods of strong northerly winds. The East basin is more protected from wind action and no floc resuspension occurred in that basin. The particulate iron in 2019 is a much smaller particle that does not settle well and now causes red-coloured turbidity in all basins of the lake. Elimination of the turbidity will require removal of the mine waste.

The three silt curtains installed in Camp Lake were ineffective in prevented the movement of turbidity from Camp Lake. The particulate iron that is now formed in the lake is much smaller particle than the lime floc that formed during lime treatment and the particulate iron that causes the red-coloured turbidity passes through the silt curtains. A 50% reduction in the silt curtain mesh size was tested in the lab and also had no effect on reducing particulate iron.

With the rapid dissipation of metals and turbidity from the Camp Lake discharge on release to the Cold Lake mixing zone, the discharge had no effect on concentrations of the parameters that affect the appearance of the water – TSS, turbidity, total iron – at any station on Cold Lake outside the mixing zone on any sampling date in 2019. Aluminum concentrations in Cold Lake also were not affected outside the mixing zone in 2019.

Turbidity is the primary real-time monitoring parameter for detection of discharge effects on appearance of the water in Cold Lake. Turbidity in the discharge ranged to a maximum of 57 NTU in 2019, with no effect observed at the margin of the mixing zone. Turbidity would have to be considerably higher than 57 NTU in the discharge to have any effect beyond the margin of the mixing zone, leaving a considerable additional margin of safety before the discharge could affect the appearance of water in Cold Lake.

The discharge had no effect on concentrations of cadmium, copper, or zinc in Cold Lake outside the mixing zone over most of the year. The only exception was for a period of one (zinc), two (copper), to three (cadmium) weeks during the peak spring runoff period. Total copper concentrations at station CL-2 were elevated on May 28 and June 4, total zinc was elevated at CL-4 on May 28, and total cadmium was elevated at CL-2 and CL-4 on May 28, June 4, and June 18. Cadmium, copper, and zinc concentrations were within historical background levels before May 28 and after June 18. These short-term elevations were a product of the initial spring runoff peaks that developed in Camp Lake, coupled with the annual maximum Sherlett Creek flow during spring runoff. Completion of the adjacent mine waste removal is expected to eliminate the runoff -related peaks in metal concentrations that develop in Camp Lake.

The turbidity, suspended solids, and metals in the Camp Lake discharge largely precipitate within 75 m of the point of release to Cold Lake and have not caused increases in the concentrations of any of the key metal parameters (iron, aluminum, cadmium, copper, and zinc) in sediments at any station in Cold Lake.

Sediment arsenic concentrations at all stations in Cold Lake were higher in 2019 than in 2008, but this increase was not due to the Camp Lake discharge. Total arsenic concentrations in the discharge were lower than in Cold Lake throughout 2019 and do not explain the increase. The largest increase occurred at station CL-5 with the smallest increases at the mixing zone stations (CL-3, CL-7, and CL-8). The general increase in sediment arsenic, and particularly at station CL-5, is attributable to runoff from recently burned areas (2008 and 2015) in the Sherlett Creek watershed. The entire Sherlett Creek flow reported to Cold Lake near CL-5 from late 2008 until August 2018.

The sediment lead concentration also was elevated at CL-5, and the sediment mercury concentration was elevated at both CL-2 and CL-5 in comparison to 2008. The elevated lead and mercury concentrations at CL-5 are both attributable to runoff from the recently burned areas in the Sherlett Creek watershed – the Camp Lake discharge is not responsible. The elevated mercury concentration at CL-2 is not attributable to runoff from burned areas in Sherlett Creek or to the Camp Lake discharge – the potential for other sources remains to be investigated.

None of the increases in sediment arsenic, lead, or mercury is substantial or a concern for the health of aquatic life.

The sediment sampling program also measured concentrations of metals/metalloids, referred to here as minor metals, that do not occur in the Camp Lake discharge in elevated concentrations in comparison to Cold Lake. Some of the changes in the concentrations of the minor metals that have occurred since 2008 are indicative of the improvement in environmental quality that has occurred in Cold Lake since the uncontrolled discharge of ARD-affected water was discontinued in late 2008. In this instance, an improvement in environmental quality does not necessarily mean a reduction in metal concentrations in sediments, because one of the effects of the previous acidic conditions in the Cold Lake arm was that metals were kept in solution and could not precipitate in Cold Lake or may have been leached from the sediments at the low pH. Consequently, some 13 metals and metalloids (including: barium, calcium, chromium, magnesium, manganese, nickel, phosphorus, potassium, sodium, strontium, thallium, titanium, and zirconium; Tetra Tech WEI 2016) occurred in lower concentrations in Cold Lake sediments in 2008 than in the Near-Field Reference Area of Kississing Lake, that was not influenced by the acidic discharge. Consistent with this explanation, 12 of these parameters (all but barium) occurred in higher concentrations in 2019 than in 2008 at most or all of the Cold Lake stations. The effects were less pronounced at CL-6 than at the other stations in Cold Lake for most parameters because CL-6 was much less acidic in 2008 than were the other stations. None of these increases in the minor metals/metalloids represents an adverse effect – all are indicative of an improvement in environmental conditions in Cold Lake.

The 2019 water quality monitoring results illustrate the importance of completing the reclamation work to remove the remaining mine waste in the local watershed. In the absence of runoff from the mine waste, as demonstrated both under winter ice cover and during dry periods in the open water season, water quality in Camp Lake, and therefore in the Camp Lake discharge, approaches that in Sherlett Creek.

5.0 References

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Appendix A – Field Data

Note: Shaded values in the Cold Lake tables approximate the depth of the hypolimnion and indicate the layer of the lake that is isolated by summer thermal stratification.

Table A.1. Camp Lake Station NB-1 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	2.5	1.2	--	0.25	0.1	11.98	125	6.88	0.8	202
				1.0	0.8	11.56	130	6.89	0.8	171
				2.0	3.1	3.05	122	6.43	10.5	174
28-May-19	2.0	1.0	--	0.25	14.1	9.81	366	6.98	6.2	81
				1.0	14.1	9.80	366	6.98	6.2	80
5-Jun-19	1.3	0.7	--	0.25	13.2	9.81	405	6.42	11.3	87
				1.0	12.9	9.66	427	6.36	12.8	85
12-Jun-19	1.3	0.5	--	0.25	15.3	9.81	858	6.71	11.1	128
				1.0	14.8	9.67	883	6.62	13.1	122
18-Jun-19	1.4	0.7	--	0.25	20.6	9.02	849	6.84	10.7	161
				1.0	19.7	9.09	846	6.85	10.6	156
26-Jun-19	1.1	0.7	--	0.25	18.8	8.83	88	6.98	8.8	67
3-Jul-19	1.8	0.9	--	0.25	17.2	8.71	397	6.73	12.3	89
				1.0	17.2	8.71	397	6.72	14.1	88
9-Jul-19	1.7	0.9	--	0.25	20.6	8.92	383	6.71	12.0	93
				1.0	20.5	8.88	384	6.80	12.1	88
16-Jul-19	2.7	1.0	--	0.25	21.3	8.44	379	6.90	10.4	44
				1.0	20.9	8.51	387	6.92	10.2	43
23-Jul-19	2.5	1.2	7.04	0.25	22.9	8.54	435	--	10.2	87
				1.0	21.8	8.56	441	--	10.4	81
31-Jul-19	2.0	0.7	--	0.25	20.2	8.21	437	6.84	20.2	167
				1.0	20.3	8.17	438	6.83	20.3	169
8-Aug-19	1.8	0.2	--	0.25	17.2	8.71	466	6.81	36.6	64
				1.0	17.2	8.55	464	6.74	36.7	66
14-Aug-19	1.8	0.2	6.95	0.25	18.5	8.72	455	--	39.7	93
				1.0	18.5	8.66	462	--	42.4	96
21-Aug-19	--	0.2	6.92	0.25	14.3	9.87	457	--	46.9	125
				1.0	14.3	9.98	457	--	46.3	113
				2.0	14.1	9.40	459	--	45.6	106
28-Aug-19	2.0	0.2	--	0.25	14.7	9.80	466	6.37	52.4	105
				1.0	14.8	9.35	466	6.24	52.4	96
4-Sep-19	2.2	0.2	--	0.25	13.5	9.62	456	6.41	50.2	111
				1.0	13.5	9.50	456	6.39	51.0	114
18-Sep-19	1.6	0.5	--	0.25	16.4	9.14	429	6.61	47.8	62
				1.0	16.1	9.08	430	6.58	47.8	69

Table A.1. Continued. Camp Lake Station NB-1 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Sep-19	1.9	--	7.15	0.25	12.5	9.45	426	6.43	49.3	67
				1.0	12.5	9.43	423	6.43	49.1	65
2-Oct-19	3.30	0.20	6.63	0.25	6.5	11.14	417	6.56	42.6	82
				1.0	6.5	11.10	417	6.55	42.9	84
				2.0	6.4	11.04	418	6.56	42.8	85
8-Oct-19	1.90	0.30	7.22	0.25	6.7	11.37	414	6.52	47.4	65
				1.0	6.8	11.22	414	6.51	47.3	62

Table A.2. Camp Lake Station NB-2 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	1.4	1.4	--	0.25	0.4	11.58	118	6.83	0.7	154
				1.0	1.1	11.03	168	6.83	1.1	163
28-May-19	1.7	1.0	--	0.25	14.3	9.77	345	6.98	5.8	63
				1.0	13.9	9.71	341	6.98	6.7	67
5-Jun-19	1.2	0.8	6.42	0.25	13.2	9.82	369	--	9.9	69
				1.0	13.3	9.77	368	--	9.8	72
12-Jun-19	1.2	0.7	--	0.25	15.2	9.76	819	6.69	11.4	100
				1.0	14.5	9.63	770	6.66	11.3	96
18-Jun-19	1.0	0.7	--	0.25	26.7	8.94	844	6.84	10.6	186
26-Jun-19	1.1	0.8	--	0.25	18.6	8.87	844	6.87	7.8	51
				1.0	18.3	8.78	838	6.95	7.9	55
3-Jul-19	1.3	1.0	--	0.25	16.8	8.93	383	6.78	10.5	80
				1.0	16.8	8.92	385	6.82	10.6	81
9-Jul-19	1.2	1.0	--	0.25	20.5	8.81	373	6.52	11.9	71
				0.85	20.0	8.83	378	6.66	11.9	67
16-Jul-19	1.5	1.0	--	0.25	21.0	8.42	378	6.82	10.3	36
				1.0	20.8	8.37	379	6.92	13.3	32
23-Jul-19	1.3	1.1	7.01	0.25	23.4	8.51	430	--	9.8	92
31-Jul-19	1.4	0.6	--	0.25	19.9	8.19	431	6.89	19.8	146
				1.0	19.9	8.18	432	6.89	19.7	149
8-Aug-19	1.2	0.2	--	0.25	17.0	8.66	497	6.22	34.6	60
14-Aug-19	1.6	0.5	6.97	0.25	18.6	8.67	437	--	43.7	74
				1.0	17.9	8.54	432	--	65.8	85
21-Aug-19	--	0.2	6.94	0.25	14.1	9.82	450	--	45.7	105
				1.0	14.1	9.55	451	--	45.2	103

Table A.2. Continued. Camp Lake Station NB-2 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
28-Aug-19	1.2	0.2	--	0.25	14.3	9.92	452	6.36	50.6	93
				1.0	14.2	9.54	454	6.48	50.7	79
4-Sep-19	1.6	0.2	--	0.25	13.7	9.59	436	6.47	52.9	107
18-Sep-19	1.3	0.3	--	0.25	15.4	9.22	415	6.55	46.3	50
				1.0	15.4	9.15	416	6.59	46.8	58
25-Sep-19	1.1	0.3	7.22	0.25	12.2	9.69	408	6.52	78.5	48
				1.0	12.2	9.66	408	6.53	79.4	47
2-Oct-19	1.2	0.2	6.61	0.25	6.5	11.14	392	6.44	43.2	70
				1.0	6.4	11.09	400	6.47	50.4	73
8-Oct-19	1.2	0.3	7.23	0.25	6.6	11.36	394	6.59	46.9	88
				1.0	6.6	11.34	394	6.60	47.0	87

Table A.3. Camp Lake Station CB-1 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	2.1	1.4	--	0.25	0.2	11.54	76	6.90	0.6	102
				1.0	1.5	11.30	83	6.90	0.6	107
				2.0	4.3	3.90	1042	6.38	20	88
28-May-19	3.2	1.0	--	0.25	13.7	9.83	291	7.00	4.9	45
				1.0	13.6	9.83	296	7.00	5.0	48
				2.0	12.0	9.65	317	6.96	5.9	55
5-Jun-19	3.0	0.8	--	0.25	13.0	9.83	323	6.44	8.6	88
				1.0	13.0	9.79	323	6.46	8.5	96
				2.0	12.8	9.70	325	6.48	9.2	95
				3.0	12.3	9.58	330	6.47	9.9	92
12-Jun-19	3.9	0.5	--	0.25	14.8	9.75	737	6.74	11.7	159
				1.0	14.6	9.63	728	6.65	13.5	148
				2.0	13.8	9.34	726	6.54	13.2	131
18-Jun-19	3.3	0.8	--	0.25	20.6	9.02	706	6.92	7.3	95
				1.0	20.3	9.02	736	6.90	8.0	101
				2.0	16.9	9.27	746	6.80	9.5	106
26-Jun-19	3.1	1.0	--	0.25	18.3	8.83	724	7.12	5.3	105
				1.0	18.2	8.76	726	7.11	5.5	103
				2.0	17.9	8.69	736	7.10	6.0	102
3-Jul-19	2.9	1.1	--	0.25	17.4	8.53	330	6.82	9.0	90
				1.0	17.4	8.52	330	6.79	9.2	85
				2.0	17.3	8.53	341	6.72	10.8	23

Table A.3. Continued. Camp Lake Station CB-1 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
9-Jul-19	3.5	1.0	--	0.25	20.0	8.79	316	6.97	10.2	73
				1.0	19.8	8.75	328	6.90	10.8	70
				2.0	18.9	8.57	330	6.82	13.6	62
16-Jul-19	3.1	1.2	--	0.25	20.8	8.26	319	6.97	9.6	17
				1.0	20.7	8.22	321	6.98	9.7	18
				2.0	20.6	8.20	326	6.97	9.9	20
				2.7	19.8	7.62	345	6.85	5.8	5
23-Jul-19	3.4	1.2	7.01	0.25	22.8	8.41	355	--	8.3	109
				1.0	22.4	8.37	357	--	8.4	99
				2.0	21.4	8.35	370	--	8.9	97
31-Jul-19	3.3	0.7	--	0.25	20.3	7.94	349	6.80	21.0	139
				1.0	20.2	7.92	350	6.79	21.0	143
				2.0	20.2	7.91	351	6.79	20.8	144
				3.0	20.1	7.70	353	6.70	26.8	120
8-Aug-19	3.3	0.2	--	0.25	17.4	8.55	381	6.78	47.9	39
				1.0	17.4	8.42	381	6.71	47.7	38
				2.0	17.4	8.40	382	6.67	48.1	41
				3.0	17.4	8.36	385	6.59	49.0	41
14-Aug-19	3.2	0.2	7.02	0.25	18.3	8.55	384	--	54.4	85
				1.0	17.8	8.50	385	--	57.5	89
				2.0	17.2	8.41	395	--	56.5	93
				3.0	17.0	8.28	402	--	55.1	97
21-Aug-19	--	0.1	7.00	0.25	14.3	9.56	383	--	61.9	77
				1.0	14.3	9.39	383	--	62.0	72
				2.0	14.3	9.33	383	--	61.8	74
				3.0	14.2	9.26	387	--	85.7	66
28-Aug-19	3.4	0.2	--	0.25	14.6	9.37	391	6.47	65.1	86
				1.0	14.6	9.31	391	6.43	64.7	84
				2.0	14.6	9.26	391	6.40	65.3	82
				3.0	14.5	9.22	391	6.37	65.4	81
4-Sep-19	3.2	0.1	--	0.25	13.5	9.38	370	6.56	67.2	100
				1.0	13.5	9.31	370	6.49	67.3	102
				2.0	13.5	9.26	371	6.47	62.5	103
18-Sep-19	3.3	0.3	--	0.25	15.4	9.11	359	6.74	46.9	61
				1.0	15.4	9.09	358	6.72	46.9	63
				2.0	15.4	9.06	360	6.69	47.2	61
				3.0	15.3	8.99	365	6.63	50.7	50

Table A.3. Continued. Camp Lake Station CB-1 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Sep-19	3.5	0.2	7.23	0.25	12.4	9.80	347	6.59	47.6	93
				1.0	12.4	9.72	347	6.58	47.8	88
				2.0	12.4	9.69	347	6.59	47.8	86
2-Oct-19	3.3	0.3	6.59	0.25	7.0	11.18	354	6.63	45.1	99
				1.0	7.0	11.00	354	6.64	45.1	99
				2.0	6.7	10.96	354	6.63	45.0	99
				3.0	6.7	10.93	355	6.63	44.8	100
8-Oct-19	3.2	0.3	7.29	0.25	6.8	11,22	340	6.65	44.9	64
				1.0	6.8	11.20	340	6.65	44.8	63
				2.0	6.8	11.18	340	6.65	44.8	62

Table A.4. Camp Lake Station CB-2 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	2.3	1.0	--	0.25	0.2	11.53	76	6.86	0.7	139
				1.0	1.6	11.45	101	6.99	0.6	153
				2.0	4.8	2.01	1347	6.40	4.4	31
28-May-19	3.1	0.9	--	0.25	14.1	9.88	321	6.83	6.5	151
				1.0	14.1	9.85	321	6.84	6.6	148
				2.0	12.8	9.57	323	6.80	6.8	148
5-Jun-19	13.1	3.2	7.25	0.25	13.4	9.72	329	--	8.7	148
				1.0	13.4	9.72	329	--	8.6	157
				2.0	13.3	9.69	327	--	8.6	162
12-Jun-19	3.3	0.7	--	0.25	14.6	9.55	756	6.53	11.8	175
				1.0	14.6	9.55	756	6.55	11.7	171
				2.0	14.4	9.54	757	6.57	11.6	166
18-Jun-19	2.9	0.9	--	0.25	20.9	8.85	716	7.30	7.5	88
				1.0	20.1	9.30	802	7.17	8.6	94
				2.0	16.3	9.03	791	7.12	9.9	98
26-Jun-19	3.0	10	--	0.25	18.2	8.84	752	7.29	5.4	87
				1.0	18.2	8.81	752	7.26	5.5	89
				2.0	15.3	5.67	1212	6.84	8.7	104
3-Jul-19	3.0	0.8	--	0.25	16.8	8.64	343	6.21	13.2	88
				1.0	16.8	8.63	343	6.26	13.2	80
				2.0	16.8	8.63	343	6.26	13.0	78
9-Jul-19	3.2	1.0	--	0.25	20.4	8.65	331	7.09	10.6	86
				1.0	20.0	8.62	324	7.03	10.4	91
				2.0	19.1	8.69	348	6.99	11.9	95

Table A.4. Continued. Camp Lake Station CB-2 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
16-Jul-19	3.4	1.2	--	0.25	20.9	8.45	328	6.40	9.6	96
				1.0	20.8	8.31	331	6.58	9.9	100
				2.0	20.5	8.20	337	6.61	11.8	63
23-Jul-19	3.1	1.2	6.83	0.25	22.7	8.38	379	--	8.8	88
				1.0	22.7	8.40	378	--	9.0	87
				2.0	22.4	8.35	381	--	9.3	88
31-Jul-19	3.0	0.8	--	0.25	20.3	8.20	369	6.87	19.3	144
				1.0	20.3	8.19	369	6.88	19.4	150
				2.0	19.7	7.96	391	6.82	18.0	156
8-Aug-19	3.2	0.3	--	0.25	16.9	8.70	387	6.75	44.1	88
				1.0	16.9	8.69	388	6.70	39.9	93
				2.0	16.9	8.62	388	6.68	40.1	98
14-Aug-19	3.0	0.2	7.17	0.25	18.6	8.73	386	--	51.8	55
				1.0	18.0	8.63	390	--	51.5	66
				2.0	18.1	8.58	393	--	53.0	75
21-Aug-19	3.1	0.1	7.05	0.25	14.2	9.40	386	--	59.0	83
				1.0	14.0	9.25	389	--	59.4	86
				2.0	14.0	9.26	389	--	59.5	86
28-Aug-19	2.6	0.1	--	0.25	14.2	9.53	399	6.50	58.5	108
				1.0	14.1	9.39	400	6.48	59.0	102
				2.0	14.1	9.35	400	6.48	59.2	102
4-Sep-19	2.9	0.2	--	0.25	14.0	9.49	387	6.41	64.8	130
				1.0	14.0	9.44	387	6.42	64.8	128
				2.0	14.0	9.39	385	6.43	65.3	128
18-Sep-19	3.1	0.2	--	0.25	15.5	9.15	378	6.75	43.9	71
				1.0	15.5	9.14	378	6.75	43.9	73
				2.0	15.4	9.13	381	6.75	44.1	75
25-Sep-19	2.9	0.2	7.28	0.25	12.2	9.73	352	6.52	46.7	55
				1.0	12.2	9.56	352	6.55	46.9	55
				2.0	12.2	9.52	352	6.56	46.8	55
2-Oct-19	2.9	0.3	6.46	0.25	7.1	11.22	360	6.70	44.5	76
				1.0	6.9	10.99	363	6.69	49.7	80
				2.0	6.8	10.94	363	6.68	44.4	83
8-Oct-19	3.0	0.2	7.27	0.25	6.8	11.30	355	6.40	42.5	76
				1.0	6.8	11.25	355	6.46	42.5	76
				2.0	6.8	11.23	355	6.48	42.5	75

Table A.5. Camp Lake Station SB-1 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	2.4	1.5	--	0.25	0.1	11.50	75	7.05	0.7	98
				1.0	1.4	10.09	220	6.91	1.3	116
				2.0	3.8	2.30	1079	6.26	19.0	136
28-May-19	3.4	1.1	--	0.25	14.2	10.07	266	7.08	4.2	144
				1.0	14.2	9.86	270	7.05	4.3	129
				2.0	13.2	9.80	284	7.01	4.8	120
5-Jun-19	2.9	0.9	--	0.25	13.2	9.69	299	6.52	7.6	111
				1.0	13.2	9.67	299	6.50	7.7	111
				2.0	13.2	9.67	299	6.51	7.6	111
12-Jun-19	2.6	0.8	--	0.25	14.9	9.52	718	6.82	11.5	162
				1.0	14.9	9.52	710	6.73	11.5	143
				2.0	14.8	9.49	702	6.71	11.5	134
18-Jun-19	2.7	0.9	--	0.25	20.4	9.12	632	6.96	6.3	154
				1.0	19.4	9.28	697	6.95	8.5	153
				2.0	16.2	9.45	708	6.93	10.3	152
26-Jun-19	2.5	1.1	--	0.25	18.6	8.86	700	7.11	5.1	113
				1.0	18.5	8.82	698	7.11	5.1	111
				2.0	18.3	8.80	707	7.11	5.3	110
3-Jul-19	2.8	1.0	--	0.25	17.4	8.44	318	6.65	10.0	50
				1.0	17.4	8.40	318	6.67	9.8	48
				2.0	17.4	8.36	319	6.71	10.1	44
9-Jul-19	2.8	1.0	--	0.25	20.5	8.73	309	6.88	9.8	101
				1.0	20.2	8.67	312	6.85	10.1	99
16-Jul-19	2.5	1.2	--	0.25	21.4	8.29	306	6.71	8.8	77
				1.0	21.1	8.26	312	6.78	9.4	75
				2.0	20.7	8.24	311	6.80	9.2	73
23-Jul-19	2.6	1.4	7.01	0.25	23.1	8.41	352	--	8.2	101
				1.0	22.8	8.30	353	--	8.3	102
				2.0	22.4	8.24	357	--	9.3	101
31-Jul-19	2.8	0.7	--	0.25	20.1	7.87	348	6.73	21.5	113
				1.0	20.1	7.84	348	6.73	21.6	120
				2.0	19.9	7.50	346	6.69	22.3	129
8-Aug-19	2.5	0.2	--	0.25	17.2	8.77	378	6.65	45.6	102
				1.0	17.2	8.71	378	6.61	45.7	99
				2.0	17.1	8.65	378	6.58	46.9	95

Table A.5. Continued. Camp Lake Station SB-1 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
14-Aug-19	2.5	0.2	7.17	0.25	18.0	8.48	369	--	55.7	56
				1.0	18.0	8.41	368	--	55.8	66
				2.0	17.7	8.32	376	--	59.9	70
21-Aug-19	2.7	0.2	7.17	0.25	14.4	9.37	374	--	65.9	62
				1.0	14.4	9.23	376	--	64.8	66
				2.0	14.3	9.19	379	--	63.9	69
28-Aug-19	2.7	0.2	--	0.25	14.5	9.77	364	6.39	70.3	100
				1.0	14.5	9.41	385	6.30	70.2	80
				2.0	14.4	9.28	386	6.28	68.3	74
4-Sep-19	2.6	0.2	--	0.25	13.9	9.35	362	6.38	67.2	94
				1.0	13.9	9.30	362	6.41	67.1	103
				2.0	13.8	9.25	369	6.42	67.5	108
18-Sep-19	2.6	0.2	--	0.25	15.1	9.13	345	6.75	45.6	75
				1.0	15.1	--	345	6.73	45.3	76
				2.0	15.1	9.10	345	6.72	45.6	76
25-Sep-19	2.5	0.3	7.59	0.25	12.4	9.58	344	6.18	47.9	56
				1.0	12.4	9.46	346	6.31	48.0	59
				2.0	12.4	9.45	350	6.34	47.8	61
2-Oct-19	2.7	0.30	--	0.25	7.0	11.18	323	6.72	42.2	58
				1.0	7.0	10.82	333	6.70	43.9	66
				2.0	6.8	10.79	339	6.69	44.4	76
8-Oct-19	2.5	0.2	7.13	0.25	6.8	11.11	341	6.22	46.2	66
				1.0	6.8	11.08	341	6.26	46.0	63
				2.0	6.8	11.07	341	6.27	46.3	62

Table A.6. Camp Lake Station SB-2 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	2.9	1.3	--	0.25	0.0	11.11	73	6.86	0.7	137
				1.0	1.8	19.86	560	6.60	6.3	164
				2.0	4.8	1.83	1210	5.70	6.5	118
28-May-19	3.4	1.1	--	0.25	14.2	9.96	251	6.93	3.8	85
				1.0	14.1	9.87	257	6.95	4.1	86
				2.0	12.3	9.60	299	6.89	5.4	91
				3.0	7.0	--	--	--	--	--
5-Jun-19	3.8	0.9	7.22	0.25	13.4	9.72	280	--	7.0	71
				1.0	13.4	9.69	280	--	7.0	74
				2.0	13.4	9.67	284	--	7.2	77

Table A.6. Continued. Camp Lake Station SB-2 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
12-Jun-19	3.2	1.0	7.1	0.25	15.0	9.60	545	--	8.5	135
				1.0	15.0	9.53	527	--	8.3	127
				2.0	14.9	9.47	530	--	8.5	117
				3.0	13.9	8.03	2147	--	20.1	28
18-Jun-19	4.2	1.0	--	0.25	19.4	9.14	549	6.88	5.5	105
				1.0	18.0	9.28	674	6.88	8.3	105
				2.0	16.2	9.25	696	6.85	9.6	106
26-Jun-19	4.1	2.0	--	0.25	18.8	8.75	655	7.15	4.5	109
				1.0	18.7	8.71	656	7.15	4.6	107
				2.0	18.5	8.68	670	7.15	4.7	106
				3.0	14.0	5.24	673	5.26	15.8	64
3-Jul-19	2.8	1.1	--	0.25	17.4	8.50	315	6.79	9.0	44
				1.0	17.4	8.47	315	6.79	9.1	42
				2.0	17.4	8.44	315	6.77	9.1	33
9-Jul-19	3.3	1.0	–	0.25	20.7	8.75	293	6.86	8.9	87
				1.0	20.6	8.67	292	6.87	9.0	83
				2.0	20.0	8.58	281	6.90	10.1	83
16-Jul-19	4.1	1.0	--	0.25	21.5	8.37	289	6.75	8.8	50
				1.0	21.1	8.29	306	6.81	8.8	48
				2.0	20.8	8.23	309	6.83	9.5	42
23-Jul-19	3.9	1.3	7.08	0.25	23.3	8.25	329	--	7.9	91
				1.0	23.1	8.23	329	--	8.0	88
				2.0	22.1	8.12	352	--	8.9	88
31-Jul-19	4.0	0.6	--	0.25	20.0	7.82	344	6.74	21.3	203
				1.0	19.8	7.60	338	6.69	21.5	208
				2.0	19.8	7.44	348	6.62	22.8	201
				3.0	19.2	6.30	363	6.09	31.8	103
8-Aug-19	3.8	0.1	--	0.25	17.3	8.90	364	6.57	56.4	77
				1.0	17.4	8.55	364	6.34	56.6	69
				2.0	17.4	8.44	363	6.31	56.5	69
				3.0	17.4	8.40	363	6.28	56.0	69
14-Aug-19	4.2	0.3	7.15	0.25	18.3	8.64	356	--	59.6	132
				1.0	18.3	8.46	363	--	55.4	128
				2.0	17.9	8.41	364	--	57.7	128
				3.0	17.2	8.09	379	--	66.0	57

Table A.6. Continued. Camp Lake Station SB-2 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
21-Aug-19	4.2	0.1	--	0.25	14.3	9.94	361	7.02	61.3	54
				1.0	14.3	9.56	365	6.80	62.3	38
				2.0	14.2	9.33	376	6.62	63.8	37
				3.0	14.2	9.24	377	6.50	63.5	42
28-Aug-19	3.3	0.2	--	0.25	14.6	9.31	381	6.68	71.7	26
				1.0	14.6	9.20	382	6.52	72.2	32
				2.0	14.6	9.19	382	6.44	71.5	91
4-Sep-19	4.2	0.2	--	0.25	13.9	9.02	261	6.43	47.6	175
				1.0	13.9	8.93	351	6.44	69.7	176
				2.0	13.6	8.99	363	6.35	69.5	172
				3.0	13.5	9.04	374	6.26	70.0	131
18-Sep-19	3.0	0.2	--	0.25	15.1	9.19	342	6.93	45.0	90
				1.0	15.1	9.14	343	6.87	45.5	79
				2.0	15.1	9.13	343	6.84	47.7	65
25-Sep-19	3.8	0.2	7.16	0.25	12.5	9.45	343	6.21	52.0	22
				1.0	12.5	9.35	343	6.11	52.0	29
				2.0	12.5	9.30	343	6.06	51.6	33
2-Oct-19	3.5	0.3	--	0.25	7.4	10.66	311	7.20	40.2	131
				1.0	7.4	10.63	321	7.13	42.6	132
				2.0	7.2	10.62	323	7.08	42.6	133
				3.0	7.2	10.61	324	7.05	43.2	134
8-Oct-19	3.1	0.3	7.3	0.25	6.9	10.94	336	5.96	46.5	113
				1.0	6.8	10.95	336	6.18	46.3	81
				2.0	6.8	10.95	336	6.22	46.3	74
				3.0	6.8	10.95	337	6.23	48.1	72

Table A.7. Camp Lake Station EB-1 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	1.3	1.3	--	0.25	0.2	12.41	84	6.90	0.8	149
				1.0	3.0	3.20	845	6.04	4.6	130
28-May-19	1.9	0.7	--	0.25	13.8	9.80	390	6.71	11.3	135
				1.0	13.8	9.80	390	6.71	11.6	130
5-Jun-19	13.4	1.7	7.06	0.25	13.1	10.20	410	--	11.4	103
				1.0	12.8	10.14	413	--	11.4	89
12-Jun-19	1.8	0.8	--	0.25	14.6	9.96	936	6.76	11.2	146
				1.0	14.5	9.90	934	6.77	11.1	141

Table A.7. Continued. Camp Lake Station EB-1 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
18-Jun-19	1.5	0.8	--	0.25	21.1	8.91	860	6.76	8.4	129
				1.0	20.6	8.93	916	6.81	8.7	126
26-Jun-19	1.5	0.8	--	0.25	18.3	9.19	953	7.11	7.4	61
				1.0	18.2	9.19	960	7.11	7.6	63
3-Jul-19	1.8	0.8	--	0.25	15.9	9.32	420	6.93	9.9	110
				1.0	15.9	9.30	420	6.95	9.8	105
9-Jul-19	1.7	0.8	--	0.25	20.4	9.20	408	7.03	11.8	56
				1.0	20.2	9.15	409	7.04	11.8	53
16-Jul-19	1.7	0.8	--	0.25	20.9	8.76	396	6.98	10.9	--
				1.0	20.7	8.78	404	7.00	10.9	--
23-Jul-19	1.6	1.0	6.93	0.25	22.5	8.77	453	--	10.8	85
				1.0	22.1	8.69	458	--	11.2	80
31-Jul-19	1.5	0.7	--	0.25	19.9	8.48	442	6.99	17.7	129
				1.0	19.8	8.40	432	7.00	19.1	123
8-Aug-19	1.7	0.5	--	0.25	16.0	9.29	465	7.07	20.6	24
				1.0	16.1	9.14	466	7.11	20.6	30
14-Aug-19	1.7	0.2	7.14	0.25	18.2	8.98	472	--	29.6	72
				1.0	18.1	8.95	473	--	30.4	80
21-Aug-19	1.7	0.1	6.98	0.25	13.3	9.89	466	--	31.7	87
				1.0	13.3	9.87	466	--	31.7	90
28-Aug-19	1.2	0.2	--	0.25	14.2	9.88	465	6.58	41.5	156
				1.0	14.1	9.68	464	6.61	42.0	144
4-Sep-19	1.5	0.2	--	0.25	13.4	9.87	459	6.65	41.8	100
				1.0	13.4	9.80	460	6.68	42.0	104
18-Sep-19	1.6	0.5	--	0.25	16.50	9.27	453	6.78	36.6	55
				1.00	16.50	9.10	454	6.77	36.5	59
25-Sep-19	1.7	--	7.30	0.25	11.20	10.32	450	6.43	34.2	125
				1.00	11.20	10.22	451	6.57	34.3	121
2-Oct-19	1.60	0.30	6.57	0.25	5.70	11.75	453	6.53	33.2	95
				1.00	5.60	11.73	460	6.55	32.6	97
8-Oct-19	1.80	0.20	7.27	0.25	6.70	11.50	439	6.72	35.7	82
				1.00	6.70	11.50	439	6.70	35.7	83

Table A.8. Camp Lake Station EB-2 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	1.2	1.2	–	0.25	0.2	15.42	115	7.00	3.8	127
				1.0	1.9	10.60	350	6.77	2.8	140
28-May-19	1.8	0.7	6.89	0.25	14.7	9.73	393	--	11.5	177
				1.0	14.4	9.66	394	--	11.7	113
5-Jun-19	1.5	0.8	7.11	0.25	13.5	9.98	415	--	11.6	65
				1.0	13.5	9.96	416	--	11.6	66
12-Jun-19	1.7	0.5	--	0.25	15.0	9.82	966	6.64	11.5	81
				1.0	14.8	9.78	964	6.69	11.3	78
18-Jun-19	1.3	0.6	--	0.25	21.3	8.84	962	6.48	8.5	100
				1.0	19.5	9.22	986	6.63	9.3	98
26-Jun-19	1.3	0.8	--	0.25	18.4	9.12	985	6.95	7.9	79
				1.0	18.4	9.09	988	6.97	8.3	76
3-Jul-19	1.5	0.7	--	0.25	16.3	9.17	431	6.78	11.6	81
				1.0	16.3	9.15	432	6.80	12.8	79
9-Jul-19	1.6	0.6	--	0.25	20.9	8.77	415	6.91	12.2	30
				1.0	20.7	8.77	415	6.91	11.9	32
16-Jul-19	1.5	0.9	--	0.25	21.3	8.51	406	6.81	11.5	--
				1.0	21.3	8.44	407	6.89	11.6	--
23-Jul-19	1.5	1.0	6.86	0.25	22.8	8.52	467	--	11.9	50
				1.0	22.6	8.55	467	--	11.7	54
31-Jul-19	1.5	0.6	--	0.25	20.1	8.52	456	6.93	17.4	114
				1.0	20.1	8.52	457	6.94	17.8	119
8-Aug-19	1.5	0.3	--	0.25	16.1	9.18	471	7.02	21.8	20
				1.0	16.1	9.13	471	7.06	21.9	24
14-Aug-19	1.4	0.3	7.01	0.25	18.7	8.91	476	--	28.9	57
				1.0	18.6	8.88	477	--	28.5	62
21-Aug-19	1.4	0.2	7.01	0.25	13.4	10.04	482	--	30.5	93
				1.0	13.4	10.00	482	--	31.4	94
28-Aug-19	1.3	0.1	--	0.25	14.1	9.93	470	6.48	40.8	148
				1.0	14.1	9.75	471	6.52	41.0	144
4-Sep-19	1.4	0.2	--	0.25	13.7	9.85	473	6.51	37.2	87
				1.0	13.8	9.73	473	6.59	37.5	93
18-Sep-19	1.3	0.3	--	0.25	16.2	9.20	467	6.69	35.3	37
				1.0	16.2	9.17	468	6.75	35.2	45

Table A.8. Continued. Camp Lake Station EB-2 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Sep-19	1.4	0.2	7.34	0.25	11.3	10.18	468	6.40	35.7	97
				1.0	11.3	10.16	468	6.42	35.7	96
2-Oct-19	1.30	0.30	6.46	0.25	6.2	11.50	468	6.38	32.9	78
				1.0	6.1	11.53	468	6.42	32.8	81
8-Oct-19	1.50	0.20	7.33	0.25	6.7	11.54	443	6.53	36.6	65
				1.0	6.7	11.53	443	6.54	36.6	67

Table A.9. Camp Lake Discharge - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	–	–	–	–	1.3	11.32	150	6.97	0.8	163
28-May-19	–	–	–	–	13.8	10.06	369	7.02	6.4	129
5-Jun-19	–	–	6.48	–	12.7	9.92	409	–	11.2	108
12-Jun-19	–	–	–	–	14.7	9.68	870	6.69	11.2	141
18-Jun-19	–	–	–	–	19.7	9.16	866	6.81	10.9	151
26-Jun-19	–	–	–	–	18.6	8.84	880	7.02	9.3	81
3-Jul-19	–	–	–	–	17.3	8.73	406	6.65	12.5	115
9-Jul-19	–	–	–	–	20.0	9.04	386	6.76	12.1	115
15-Jul-19	–	–	7.3	–	20.4	8.62	386	–	10.2	73
23-Jul-19	–	–	7.04	–	22.3	8.47	439	–	10.2	181
31-Jul-19	–	–	–	–	20.3	8.19	441	6.85	19.8	142
8-Aug-19	–	–	7.12	–	17.4	8.97	480	–	35.6	94
14-Aug-19	–	–	6.94	–	18.0	8.65	463	–	39.8	100
21-Aug-19	–	–	6.86	–	14.3	9.35	467	–	46.1	87
28-Aug-19	–	–	6.34	–	14.6	9.72	474	–	51.8	115
4-Sep-19	–	–	--	–	13.2	9.47	461	6.33	50.4	131
18-Sep-19	–	–	–	–	16.0	9.15	430	6.58	47.3	81
25-Sep-19	–	–	7.45	–	12.9	9.28	434	6.43	48.9	70
2-Oct-19	–	–	6.64	–	6.8	11.64	418	6.52	42.7	57
8-Oct-19	–	–	7.40	–	6.8	11.53	414	6.50	46.5	67

Table A.10. Sherlett Creek Station SC-1 - Field Measurements - 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	–	–	–	0.25	0.2	10.86	73	7.55	0.6	259
28-May-19	–	–	–	0.25	12.9	10.00	64	7.04	0.6	32
5-Jun-19	–	–	6.99	0.25	12.8	9.65	67	–	1.2	102
12-Jun-19	–	–	–	0.25	15.0	9.80	151	7.00	0.8	8
18-Jun-19	–	–	–	0.25	18.6	8.61	154	6.99	–	30
26-Jun-19	–	–	--	0.25	19.1	9.74	154	7.19	–	12
3-Jul-19	–	–	–	0.25	16.8	8.92	67	6.78	1.0	121
9-Jul-19	–	–	–	0.25	20.8	8.90	64	6.90	1.0	29
16-Jul-19	–	–	–	0.25	20.6	7.77	62	6.62	0.9	17
23-Jul-19	–	–	7.01	0.25	22.0	7.51	68	–	0.6	48
31-Jul-19	–	–	–	0.25	20.5	7.27	72	7.06	0.5	139
8-Aug-19	–	–	–	0.25	17.8	7.76	69	6.77	–	59
14-Aug-19	–	–	7.37	0.25	19.2	8.09	70	–	–	94
21-Aug-19	–	–	7.31	0.25	15.9	8.93	69	–	–	75
28-Aug-19	–	–	–	0.25	15.4	8.85	68	6.80	1.3	88
4-Sep-19	–	–	--	0.25	14.1	8.32	67	6.79	–	96
18-Sep-19	–	–	--	0.25	15.1	8.60	70	6.92	2.2	72
25-Sep-19	–	–	7.47	0.25	12.4	9.09	68	6.77	1.7	76
2-Oct-19	–	–	7.00	0.25	8.2	10.49	67	6.88	-0.1	70
8-Oct-19	–	–	7.88	0.25	7.8	10.74	69	6.92	1.0	56

Table A.11 Cold Lake Station CL2 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	8.2	1.8	–	0.25	0.2	13.40	124	7.49	0.5	174
				1.0	0.6	13.26	128	7.43	0.4	191
				2.0	0.8	12.88	134	7.39	0.6	196
				3.0	0.9	12.83	137	7.33	0.6	200
				4.0	1.2	12.57	154	7.29	0.5	205
				5.0	1.8	11.53	181	7.20	0.5	210
				6.0	2.8	9.10	363	7.02	0.7	221
				7.0	3.7	8.58	425	6.91	0.7	227
				8.0	3.9	5.20	201	6.78	7.8	210
28-May-19	8.5	1.6	–	0.25	11.0	10.60	173	7.26	2.3	128
				1.0	11.6	10.61	174	7.14	2.4	108
				2.0	10.0	10.61	173	7.09	2.5	117
				3.0	9.8	10.61	173	7.02	2.5	122
				4.0	9.1	10.23	174	6.98	2.5	128
				5.0	8.3	9.87	178	6.94	2.7	131
				6.0	6.8	9.15	187	6.83	3.2	137
				7.0	6.0	7.78	283	6.70	6.4	144
				8.0	4.3	3.66	268	6.57	23.4	149

Table A.11. Continued. Cold Lake Station CL2 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
4-Jun-19	9.4	1.8	–	0.25	11.5	10.27	333	7.96	2.1	166
				1.0	11.4	10.27	334	7.82	2.1	169
				2.0	11.2	10.27	333	7.77	2.1	169
				3.0	10.6	10.31	337	7.70	2.1	171
				4.0	10.6	10.29	339	7.61	2.2	174
				5.0	10.4	10.25	335	7.56	2.0	175
				6.0	10.1	10.20	331	7.53	2.0	176
				7.0	7.5	9.25	388	7.49	3.0	179
				8.0	5.5	7.01	630	7.34	8.1	187
18-Jun-19	9.2	2.0	–	0.25	19.9	9.57	411	6.55	--	109
				1.0	18.3	9.97	407	6.97	--	100
				2.0	15.7	9.97	396	6.95	--	105
				3.0	13.5	9.82	394	6.90	--	108
				4.0	12.8	9.48	397	6.84	--	112
				5.0	11.1	8.97	403	6.75	--	117
				6.0	10.0	8.31	421	6.66	--	121
				8.0	8.7	7.78	488	6.60	--	125
2-Jul-19	9.2	2.3	–	0.25	18.3	8.87	160	6.88	0.8	134
				1.0	18.2	8.87	160	7.01	0.7	125
				2.0	18.2	8.87	160	7.09	0.7	117
				3.0	18.1	8.86	160	7.13	0.7	115
				4.0	17.9	8.81	160	7.13	0.7	114
				5.0	13.0	7.91	163	7.01	1.0	125
				6.0	9.5	7.42	182	6.88	1.1	131
				7.0	7.4	4.86	244	6.50	4.3	142
				8.0	5.9	1.80	376	6.35	22.2	147
15-Jul-19	10.5	2.9	–	0.25	21.2	8.60	122	7.44	0.2	72
				1.0	21.0	8.63	122	7.38	0.2	78
				2.0	20.2	8.64	121	7.40	0.3	80
				3.0	17.5	8.09	102	7.49	0.2	83
				4.0	16.0	7.55	118	7.26	0.3	93
				5.0	13.9	6.80	124	7.19	0.7	100
				6.0	11.2	6.03	140	7.17	0.8	107
				7.0	7.9	3.40	200	7.12	4.9	118
				8.0	6.4	1.51	285	6.72	23.3	7

Table A.11. Continued. Cold Lake Station CL2 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
7-Aug-19	9.0	2.5	–	0.25	19.1	8.34	157	6.93	--	115
				1.0	19.2	7.93	157	6.65	--	142
				2.0	19.2	7.92	156	6.67	--	145
				3.0	19.2	7.88	157	6.71	--	150
				4.0	19.2	7.86	157	6.73	--	155
				5.0	17.8	4.32	161	6.56	--	165
				6.0	19.8	4.33	171	6.31	--	170
				7.0	10.5	3.40	218	6.15	--	175
				8.0	8.0	1.90	288	5.96	--	180
4-Sep-19	9.2	2.0	--	0.25	15.1	8.98	159	6.60	1.7	189
				1.0	15.1	8.91	159	6.84	1.7	185
				2.0	15.1	8.89	159	6.93	1.7	183
				3.0	15.1	8.88	159	6.98	1.8	182
				4.0	14.9	8.83	159	7.01	1.7	181
				5.0	14.8	8.77	159	7.02	1.7	181
				6.0	14.8	8.74	159	7.04	1.8	181
				7.0	14.6	8.24	163	7.01	2.2	181
				8.0	10.8	1.19	266	6.56	17.3	110
26-Sep-19	8.9	2.0	7.45	0.25	13.6	9.29	175	7.20	1.6	154
				1.0	13.6	9.27	175	7.20	1.7	153
				2.0	13.7	9.21	175	7.24	1.5	77
				3.0	13.7	9.20	175	7.22	1.6	80
				4.0	13.7	9.18	175	7.22	1.6	83
				5.0	13.7	9.16	175	7.21	1.6	88
				6.0	13.7	9.15	175	7.21	1.6	91
				7.0	13.7	9.15	175	7.21	1.6	93
				8.0	13.6	9.13	175	7.21	1.6	94
9-Oct-19	9.2	2.0	7.37	0.25	9.0	10.32	187	6.43	2.6	112
				1.0	8.9	9.91	186	6.53	2.7	125
				2.0	8.9	9.87	186	6.56	2.8	137
				3.0	8.9	9.86	186	6.56	2.7	138
				4.0	8.9	9.86	186	6.58	2.7	138
				5.0	8.9	9.85	186	6.58	2.8	138
				6.0	8.9	9.85	186	6.58	2.8	138
				7.0	8.8	9.85	186	6.58	2.8	138
				8.0	8.8	9.85	186	6.58	3.5	139

Table A.12 Cold Lake Station CL3 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	2.5	1.4	–	0.25	0.0	12.37	97	6.95	0.9	150
				1.0	0.3	12.23	104	6.93	0.7	155
				2.0	0.8	12.18	121	6.98	0.5	152
28-May-19	3.9	1.1	–	0.25	14.2	10.12	340	7.05	6.2	98
				1.0	13.0	10.22	280	7.07	4.5	93
				2.0	10.2	10.66	175	7.14	2.6	74
				3.0	9.8	10.59	168	7.13	2.8	78
4-Jun-19	4.1	1.7	–	0.25	12.7	10.37	349	7.38	2.2	210
				1.0	12.7	10.34	332	7.30	2.2	208
				2.0	12.3	10.30	398	7.21	5.5	211
				3.0	11.0	10.24	385	7.20	3.1	207
12-Jun-19	3.6	1.7	–	0.25	13.5	10.36	433	7.12	0.0	192
				1.0	13.5	10.29	444	7.09	0.0	192
				2.0	13.5	10.24	444	7.08	0.2	192
18-Jun-19	3.7	1.9	–	0.25	21.1	9.63	490	7.31	1.5	139
				1.0	18.9	9.51	559	7.26	3.5	142
				2.0	15.9	9.83	397	7.34	0.3	139
				3.0	13.7	9.69	379	7.24	0.7	143
26-Jun-19	3.5	2.0	–	0.25	17.9	9.40	396	7.42	0.1	126
				1.0	17.8	9.33	408	7.45	0.5	88
				2.0	17.3	9.13	613	7.36	4.4	100
2-Jul-19	4.2	2.1	–	0.25	18.3	8.96	155	7.43	1.0	44
				1.0	18.3	8.91	156	7.45	1.1	45
				2.0	18.3	8.87	179	7.40	1.9	48
				3.0	18.5	8.72	283	7.27	6.1	55
9-Jul-19	4.1	–	–	0.25	19.5	8.94	151	7.16	1.1	146
				1.0	19.3	8.81	160	7.25	1.7	137
				2.0	19.0	8.77	163	7.26	1.7	132
				3.0	18.4	8.73	142	7.33	1.8	128
15-Jul-19	3.8	2.0	–	0.25	21.7	8.75	133	7.23	1.2	84
				1.0	21.8	8.66	132	7.25	1.6	85
				2.0	21.7	8.62	153	7.27	2.3	83
23-Jul-19	3.7	--	6.9	0.25	22.3	8.61	149	–	0.5	133
				1.0	22.2	8.57	150	–	0.6	121
				2.0	22.1	8.55	162	–	1.0	114

Table A.12. Continued. Cold Lake Station CL3 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
31-Jul-19	3.6	2.6	–	0.25	20.3	8.15	149	7.34	1.1	218
				1.0	20.3	8.08	151	7.37	1.2	217
				2.0	20.3	8.06	155	7.36	1.3	219
				3.0	20.2	8.05	334	7.15	13.2	230
7-Aug-19	2.9	--	–	0.25	19.3	8.32	161	7.35	--	109
				1.0	19.3	8.29	163	7.36	--	107
				2.0	19.3	8.27	166	7.34	--	107
14-Aug-19	3.9	2.0	–	0.25	18.8	8.78	149	7.17	0.3	136
				1.0	18.8	8.71	149	7.19	0.4	134
				2.0	18.8	8.66	150	7.15	0.3	137
21-Aug-19	3.6	2.0	–	0.25	16.0	8.90	167	7.26	--	180
				1.0	16.0	8.69	167	7.19	--	173
				2.0	16.0	8.66	167	7.15	--	173
28-Aug-19	3.6	1.5	–	0.25	15.1	9.83	173	7.46	3.7	172
				1	15.3	9.16	174	7.37	3.6	168
				2	15.3	8.92	175	7.3	3.9	166
				3	15.3	8.82	325	7.09	149.5	168
4-Sep-19	3.5	1.8	--	0.25	15.5	9.12	155	7.30	2.5	132
				1.0	15.5	9.04	156	7.30	2.4	132
				2.0	15.4	9.01	159	7.30	3.0	135
18-Sep-19	3.1	1.5	--	0.25	15.5	9.36	196	7.47	6.5	139
				1.0	15.6	9.31	197	7.41	6.6	137
				2.0	15.6	9.29	199	7.40	6.8	136
26-Sep-19	3.1	1.7	7.44	0.25	13.2	9.26	190	7.15	3.2	89
				1.0	13.2	9.25	185	7.15	3.3	88
				2.0	13.2	9.24	185	7.15	3.2	88
2-Oct-19	3.7	2	7.1	0.25	10.4	9.82	179	7,51	2.3	119
				1.0	10.5	9.70	179	7.44	2.3	120
				2.0	10.3	9.66	178	7.41	2.2	127
9-Oct-19	2.8	1.3	7.55	0.25	8.2	10.89	190	7.09	3.8	137
				1.0	8.2	10.81	190	7.08	3.7	136
				2.0	8.2	10.75	190	7.08	3.8	135

Table A.13 Cold Lake Station CL4 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	9.8	1.5	–	0.25	0.0	12.34	91	6.75	0.9	130
				1.0	0.6	12.32	116	6.99	0.5	153
				2.0	0.9	12.27	121	7.01	0.6	155
				3.0	0.9	12.30	133	6.92	0.7	161
				4.0	1.2	12.15	147	6.90	0.9	165
				5.0	2.0	10.84	173	6.88	1.0	166
				6.0	3.3	7.40	349	6.71	2.1	175
				7.0	3.9	4.10	392	6.57	8.0	177
				8.0	4.3	1.70	419	6.46	17.5	177
				9.0	4.5	0.79	430	6.43	27.0	144
28-May-19	12.0	1.4	–	0.25	13.3	10.64	196	7.12	2.8	117
				1.0	13.0	10.62	195	7.12	2.9	114
				2.0	10.6	10.66	161	7.13	2.4	110
				3.0	9.7	10.62	154	7.13	2.4	109
				4.0	8.9	10.40	147	7.12	2.3	110
				5.0	8.1	10.27	146	7.09	2.3	111
				6.0	7.6	10.02	152	7.04	2.4	113
				7.0	6.1	9.34	176	6.98	3.1	117
				8.0	6.1	9.09	187	6.93	3.4	119
				9.0	6.1	8.98	187	6.91	3.4	119
				10.0	6.0	8.79	188	6.88	3.9	119
				11.0	6.0	8.72	189	6.86	4.3	114
4-Jun-19	12.1	1.9	–	0.25	12.2	10.41	305	7.20	2.0	197
				1.0	12.1	10.44	306	7.17	2.0	196
				2.0	10.9	10.50	302	7.17	2.1	195
				3.0	10.6	10.44	310	7.15	2.1	196
				4.0	10.5	10.38	316	7.12	2.2	196
				5.0	10.2	10.29	326	7.10	2.3	197
				6.0	9.7	10.08	346	7.07	2.4	199
				7.0	8.5	9.29	359	7.05	3.0	129
				8.0	7.5	8.42	373	6.99	5.1	135
				9.0	7.2	8.12	357	6.93	4.3	125
				10.0	7.0	8.09	355	6.90	4.3	123
				11.0	6.9	8.04	354	6.87	4.3	121

Table A.13. Continued. Cold Lake Station CL4 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
18-Jun-19	10.4	1.9	–	0.25	20.8	9.86	394	7.39	--	190
				1.0	17.0	10.30	434	7.44	--	186
				2.0	15.3	10.36	378	7.43	--	184
				3.0	13.1	10.15	339	7.37	--	185
				4.0	11.9	9.45	355	7.16	--	190
				5.0	11.0	9.16	356	7.09	--	192
				6.0	9.7	8.58	385	6.97	--	195
				7.0	8.6	7.41	403	6.85	--	200
				8.0	8.0	6.55	402	6.73	--	203
				9.0	7.9	6.01	403	6.66	--	205
				10.0	7.8	5.80	406	6.63	--	205
2-Jul-19	11.5	2.1	–	0.25	18.1	9.09	140	7.48	0.9	91
				1.0	18.1	9.03	140	7.47	0.9	86
				2.0	18.0	9.00	140	7.50	0.9	82
				3.0	17.9	8.96	140	7.50	0.9	79
				4.0	16.0	8.63	149	7.42	0.9	85
				5.0	14.7	8.41	155	7.21	0.8	91
				6.0	13.2	7.78	157	7.05	1.2	97
				7.0	11.7	7.00	166	7.00	1.8	100
				8.0	10.8	6.63	167	6.89	2.2	103
				9.0	10.5	6.07	170	6.83	2.5	106
				10.0	10.2	5.44	170	6.70	3.0	107
15-Jul-19	11.3	2.1	–	0.25	21.5	8.82	123	7.25	0.4	167
				1.0	21.5	8.76	123	7.30	0.5	153
				2.0	21.5	8.74	123	7.33	0.4	145
				3.0	21.2	8.70	122	7.36	0.4	138
				4.0	17.8	8.35	110	7.50	0.3	134
				5.0	13.3	6.47	124	7.41	1.0	142
				6.0	1.2	5.04	132	7.25	2.2	148
				7.0	9.5	3.60	135	7.10	11.5	155
				8.0	9.2	2.81	137	6.85	15.9	158
				9.0	9.0	2.48	137	6.64	17.3	160

Table A.13. Continued. Cold Lake Station CL4 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
7-Aug-19	12.6	2.1	–	0.25	19.5	8.26	154	7.38	--	136
				1.0	19.6	8.23	154	7.39	--	133
				2.0	19.6	8.21	155	7.39	--	130
				3.0	19.6	8.20	155	7.38	--	129
				4.0	19.6	8.19	155	7.37	--	128
				5.0	19.6	8.17	155	7.37	--	127
				6.0	19.5	8.07	153	7.35	--	127
				7.0	19.9	5.72	162	7.09	--	134
				8.0	11.9	3.02	170	6.80	--	143
				9.0	11.2	1.45	172	6.55	--	82
				10.0	11.0	1.25	174	6.49	--	92
				11.0	10.7	0.73	175	6.42	--	102
4-Sep-19	11.0	1.8	--	0.25	15.5	9.31	145	7.35	2.0	215
				1.0	15.5	9.17	145	7.37	2.0	209
				2.0	15.5	9.11	145	7.36	2.1	207
				3.0	15.5	9.05	146	7.37	2.2	204
				4.0	15.2	8.95	151	7.35	2.4	203
				5.0	15.1	8.88	151	7.33	2.5	203
				6.0	15.0	8.85	153	7.31	2.4	202
				7.0	15.0	8.81	154	7.30	2.5	201
				8.0	15.0	8.78	154	7.29	2.6	201
				9.0	14.9	8.75	154	7.23	2.7	200
				10.0	14.9	8.72	154	7.26	2.7	200
26-Sep-19	11.1	2.0	7.20	0.25	13.6	9.29	165	7.03	1.6	70
				1.0	13.6	9.19	165	7.08	1.7	66
				2.0	13.6	9.17	166	7.08	1.6	66
				3.0	13.6	9.15	166	7.09	1.6	65
				4.0	13.6	9.14	166	7.09	1.7	65
				5.0	13.6	9.12	166	7.10	1.7	65
				6.0	13.6	9.10	166	7.10	1.6	65
				7.0	13.6	9.09	166	7.11	1.7	64
				8.0	13.6	9.08	166	7.12	1.6	64
				9.0	13.6	9.07	166	7.12	1.6	64
				10.0	13.6	9.06	166	7.13	1.6	64

Table A.13. Continued. Cold Lake Station CL4 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
9-Oct-19	11.6	1.3	7.51	0.25	8.9	10.51	169	7.26	2.7	88
				1.0	8.9	10.45	168	7.23	2.6	94
				2.0	8.9	10.42	169	7.22	2.6	96
				3.0	8.9	10.38	169	7.22	2.6	98
				4.0	8.9	10.35	169	7.22	2.6	100
				5.0	8.9	10.32	169	7.22	2.6	103
				6.0	8.9	10.29	169	7.22	2.6	105
				7.0	8.8	10.27	169	7.22	2.6	106
				8.0	8.8	10.26	169	7.21	2.6	108
				9.0	8.8	10.24	169	7.21	2.6	109
				10.0	8.8	10.23	171	7.21	2.7	110

Table A.14 Cold Lake Station CL5 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	8.7	1.5	–	0.25	0.1	11.70	85	6.73	0.9	219
				1.0	0.6	11.72	109	6.68	0.5	222
				2.0	0.8	12.08	112	6.78	0.4	224
				3.0	1.2	11.89	120	6.84	0.5	226
				4.0	1.4	11.90	127	6.88	0.6	227
				5.0	1.8	11.92	152	6.88	0.8	230
				6.0	2.6	9.05	339	6.85	0.8	235
				7.0	3.3	9.67	369	6.89	0.8	233
				8.0	3.8	7.90	391	6.85	1.9	234
28-May-19	9.3	1.6	--	0.25	12.9	10.84	148	7.12	2.2	139
				1.0	12.2	10.82	142	7.14	2.1	131
				2.0	11.2	10.87	138	7.15	2.3	128
				3.0	10.1	10.86	141	7.14	2.4	128
				4.0	9.6	10.67	145	7.11	2.3	105
				5.0	7.9	10.04	154	7.05	2.5	115
				6.0	7.2	9.89	161	7.02	2.7	118
				7.0	6.5	9.72	170	6.99	2.9	120
				8.0	6.3	9.43	174	6.96	3.1	122
				9.0	6.0	9.34	175	6.94	3.5	124

Table A.14. Continued. Cold Lake Station CL5 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
4-Jun-19	9.4	1.9	–	0.25	11.9	10.43	290	7.07	2.2	155
				1.0	11.9	10.49	290	7.08	2.2	153
				2.0	11.8	10.51	290	7.08	2.4	152
				3.0	11.4	10.53	291	7.09	2.2	152
				4.0	10.8	10.48	299	7.08	2.3	152
				5.0	9.7	10.22	307	7.07	2.3	151
				6.0	8.8	9.82	325	7.04	2.4	154
				7.0	7.9	9.25	349	6.99	2.5	157
				8.0	7.3	8.80	350	6.95	3.0	160
				9.0	6.5	8.12	353	6.91	4.0	162
18-Jun-19	9.3	2.0	--	0.25	20.8	9.85	384	7.30	--	133
				1.0	18.6	10.14	369	7.41	--	128
				2.0	15.5	10.55	341	7.48	--	125
				3.0	13.7	10.28	317	7.42	--	127
				4.0	12.2	9.84	325	7.29	--	131
				5.0	11.8	9.58	329	7.20	--	135
				6.0	9.8	8.73	359	7.03	--	140
				7.0	8.6	7.72	396	6.87	--	146
				8.0	8.5	7.44	399	6.81	--	149
2-Jul-19	9.3	2.0	–	0.25	18.0	9.09	135	7.30	1.1	110
				1.0	18.0	9.04	135	7.42	1.1	103
				2.0	18.0	9.02	135	7.45	1.1	99
				3.0	18.0	9.01	135	7.48	1.1	97
				4.0	16.9	8.79	137	7.43	0.9	98
				5.0	12.5	8.00	150	7.25	1.2	109
				6.0	11.2	7.27	154	7.06	1.3	115
				7.0	10.3	6.60	160	6.93	2.0	120
				8.0	9.8	6.25	161	6.87	1.2	121
15-Jul-19	9.6	2.9	–	0.25	21.1	8.80	112	7.06	0.4	84
				1.0	21.1	8.76	112	7.17	0.3	82
				2.0	21.0	8.75	112	7.22	0.3	79
				3.0	20.8	8.73	111	7.26	0.3	77
				4.0	20.7	8.72	110	7.27	0.3	75
				5.0	18.2	8.13	111	7.38	0.5	76
				6.0	13.9	6.28	114	7.24	1.3	88
				7.0	11.4	5.09	129	7.22	1.7	99
				8.0	9.8	4.31	132	7.04	4.3	103

Table A.14. Continued. Cold Lake Station CL5 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
7-Aug-19	10.2	2.0	–	0.25	19.6	8.41	144	7.39	--	167
				1.0	19.6	8.30	144	7.45	--	157
				2.0	19.6	8.34	144	7.46	--	153
				3.0	19.6	8.33	144	7.47	--	150
				4.0	19.6	8.33	144	7.47	--	147
				5.0	19.6	8.32	144	7.48	--	145
				6.0	19.6	8.32	144	7.47	--	144
				7.0	19.6	8.31	144	7.47	--	143
				8.0	13.9	5.15	163	7.21	--	150
4-Sep-19	8.9	2.0	--	0.25	15.4	9.43	139	7.37	2.0	209
				1.0	15.4	9.28	140	7.38	2.0	204
				2.0	15.4	9.20	140	7.39	2.1	202
				3.0	15.4	9.08	141	7.39	2.3	200
				4.0	15.3	8.99	141	7.38	2.3	198
				5.0	15.3	8.95	141	7.38	2.4	196
				6.0	15.3	8.91	141	7.37	2.3	194
				7.0	15.2	8.89	141	7.37	2.2	193
				8.0	15.1	8.86	140	7.36	2.1	192
26-Sep-19	9.0	1.9	7.30	0.25	13.1	9.49	138	6.29	0.6	81
				1.0	13.1	9.42	138	6.37	0.8	88
				2.0	13.0	9.41	138	6.43	0.6	94
				3.0	13.0	9.40	137	6.46	0.9	96
				4.0	13.0	9.40	137	6.49	0.8	101
				5.0	13.0	9.40	137	6.50	0.8	103
				6.0	13.0	9.39	138	6.53	1.0	108
				7.0	13.0	9.38	138	6.59	0.9	109
9-Oct-19	9.3	1.3	7.49	0.25	8.7	10.78	161	7.23	2.2	136
				1.0	8.7	10.74	161	7.23	2.2	134
				2.0	8.7	10.68	161	7.24	2.2	132
				3.0	8.7	10.64	161	7.24	2.1	131
				4.0	8.7	10.61	162	7.24	2.2	130
				5.0	8.7	10.57	161	7.24	2.2	129
				6.0	8.7	10.53	161	7.25	2.2	128
				7.0	8.6	10.51	160	7.25	2.2	126
				8.0	8.6	10.48	160	7.25	2.3	125

Table A.15. Cold Lake Station CL6 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	7.1	1.5	–	0.25	0.1	6.08	95	6.47	1.8	197
				1.0	0.3	6.15	95	6.49	1.7	199
				2.0	0.8	11.19	111	6.94	0.7	198
				3.0	1.2	11.22	116	6.98	0.6	199
				4.0	1.3	11.16	118	6.99	0.7	200
				5.0	1.5	11.39	127	7.03	0.7	201
				6.0	3.3	3.20	287	6.60	4.8	215
				7.0	4.4	0.65	351	6.79	16.6	215
28-May-19	7.6	1.7	--	0.25	10.9	11.20	120	7.12	2.0	119
				1.0	10.9	11.16	120	7.17	2.0	98
				2.0	10.9	11.15	119	7.18	2.0	99
				3.0	10.8	11.15	118	7.20	2.0	100
				4.0	10.4	11.13	118	7.20	2.0	101
				5.0	8.2	10.58	126	7.14	2.2	106
				6.0	7.4	10.50	129	7.12	2.1	107
				7.0	6.3	9.73	145	7.06	3.2	111
4-Jun-19	8.3	1.5	--	0.25	11.1	10.65	251	7.12	2.0	148
				1.0	11.0	10.66	252	7.11	2.0	147
				2.0	11.0	10.65	250	7.11	2.0	147
				3.0	10.9	10.65	249	7.11	1.9	147
				4.0	10.3	10.63	244	7.12	1.7	147
				5.0	9.5	10.58	243	7.12	1.6	147
				6.0	8.4	10.49	242	7.12	1.5	148
				7.0	7.9	10.44	235	7.11	1.4	149
				8.0	7.7	10.04	237	7.10	2.3	150
18-Jun-19	7.8	2.0	--	0.25	21.2	9.72	308	7.30	--	192
				1.0	17.5	10.16	322	7.44	--	189
				2.0	15.1	10.56	292	7.50	--	185
				3.0	13.2	10.60	280	7.44	--	184
				4.0	11.8	9.47	279	7.33	--	186
				5.0	11.2	10.03	275	7.25	--	188
				6.0	9.5	8.83	311	7.02	--	195
				7.0	9.3	6.96	354	6.89	--	199
2-Jul-19	8.0	2.1	–	0.25	17.6	9.30	118	7.30	0.8	94
				1.0	17.6	9.22	118	7.42	0.8	87
				2.0	17.6	9.18	118	7.51	0.8	83
				3.0	17.6	9.16	117	7.54	0.9	80
				4.0	17.6	9.13	117	7.52	0.9	78
				5.0	13.0	8.18	136	7.09	0.7	96
				6.0	10.4	6.05	154	6.90	2.0	105
				7.0	9.8	4.82	158	6.73	3.3	111

Table A.15. Continued. Cold Lake Station CL6 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
15-Jul-19	8.5	2.5	–	0.25	21.5	8.83	100	7.09	0.3	128
				1.0	21.5	8.80	100	7.26	0.2	120
				2.0	21.5	8.80	100	7.30	0.2	114
				3.0	21.5	8.79	100	7.34	0.2	106
				4.0	21.4	8.77	99	7.36	0.3	101
				5.0	16.6	8.07	99	7.53	0.3	102
				6.0	11.5	3.82	125	7.45	12.7	116
				7.0	10.4	1.60	129	7.15	38.6	54
7-Aug-19	7.6	--	–	0.25	19.1	8.48	131	7.42	--	147
				1.0	19.1	8.44	131	7.48	--	141
				2.0	19.1	8.43	131	7.44	--	139
				3.0	19.1	8.42	131	7.50	--	138
				4.0	19.1	8.41	131	7.49	--	137
				5.0	19.1	8.38	131	7.49	--	137
				6.0	15.5	6.41	144	7.18	--	21
4-Sep-19	7.7	2.0	--	0.25	15.8	9.64	127	7.40	1.3	197
				1.0	15.4	9.40	127	7.41	1.4	191
				2.0	15.4	9.34	127	7.41	1.4	189
				3.0	15.4	9.31	127	7.47	1.5	187
				4.0	15.4	9.28	127	7.47	1.4	185
				5.0	15.2	9.19	126	7.47	1.3	184
				6.0	15.0	9.13	126	7.46	1.3	184
				7.0	14.8	8.99	123	7.46	2.2	184
26-Sep-19	7.6	--	--	0.25	13.5	9.29	158	7.05	1.4	49
				1.0	13.5	9.28	158	7.05	1.4	79
				0.0	13.5	9.26	158	7.04	1.4	80
				3.0	13.5	9.23	158	7.04	1.5	79
				4.0	13.5	9.22	158	7.06	1.5	78
				5.0	13.5	9.19	158	7.09	1.4	76
				6.0	13.5	9.19	158	7.10	1.4	76
				7.0	13.5	9.18	159	7.12	1.4	75
				8.0	13.5	9.18	159	7.12	1.3	75
9-Oct-19	7.8	2.3	7.6	0.25	8.2	11.06	132	7.35	1.4	119
				1.0	8.2	11.02	132	7.31	1.4	120
				0.0	8.2	10.99	132	7.31	1.4	119
				3.0	8.2	10.96	132	7.31	1.4	119
				4.0	8.2	10.93	132	7.31	1.4	118
				5.0	8.2	10.91	132	7.31	1.4	117
				6.0	8.2	10.89	132	7.31	1.4	116

Table A.16 Cold Lake Station CL7 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	1.2	1.5	–	0.25	0.0	12.85	101	6.88	1.0	144
				1.0	0.4	12.48	111	6.96	1.5	149
28-May-19	3.9	1.6	–	0.25	13.1	10.71	172	7.29	2.3	101
				1.0	11.6	10.74	179	7.24	2.5	103
				2.0	10.2	10.78	170	7.22	2.5	103
				3.0	9.7	10.58	162	7.17	2.5	105
4-Jun-19	2.9	1.5	–	0.25	12.8	10.40	386	7.42	3.4	212
				1.0	12.6	10.56	467	7.34	3.7	210
				2.0	12.5	10.30	499	7.28	5.4	209
12-Jun-19	2.8	1.5	–	0.25	13.6	10.93	432	7.30	–	201
				1.0	13.5	10.30	447	7.24	–	199
				2.0	13.5	10.09	598	7.14	–	125
18-Jun-19	2.9	1.6	–	0.25	21.1	9.65	471	7.30	1.2	119
				1.0	19.5	9.39	548	7.29	3.3	121
				2.0	16.7	9.68	406	7.38	0.5	120
26-Jun-19	2.7	2.0	–	0.25	17.6	9.3	392	7.37	0.1	106
				1.0	17.6	9.3	397	7.36	0.3	106
				2.0	17.5	9.3	410	7.37	0.6	105
2-Jul-19	2.9	2.1	7.15	0.25	18.3	8.98	153	–	1.0	60
				1.0	18.3	8.94	153	–	1.0	60
				2.0	18.4	8.84	214	–	3.3	65
9-Jul-19	3.1	3.0	–	0.25	19.4	9.06	154	7.36	1.3	144
				1.0	19.4	8.83	169	7.36	1.9	139
				2.0	19.3	8.77	174	7.36	2.5	135
15-Jul-19	3.1	--	–	0.25	21.6	8.83	126	7.23	0.5	163
				1.0	21.7	8.75	126	7.30	0.5	149
				2.0	21.3	8.70	144	7.33	1.6	136
23-Jul-19	2.7	2.5	7.15	0.25	22.3	8.62	151	–	0.6	121
				1.0	22.2	8.58	151	–	0.5	109
				2.0	21.9	8.54	171	–	1.1	105
31-Jul-19	2.9	2.7	–	0.25	20.2	8.11	150	7.46	1.0	186
				1.0	20.3	8.08	158	7.42	1.5	158
				2.0	20.3	8.09	299	7.20	13.0	182
7-Aug-19	--	1.0	--	0.25	19.4	8.28	155	7.39	–	145
				1.0	19.4	8.27	155	7.39	–	137
				2.0	19.4	8.26	153	7.40	–	134

Table A.16. Continued. Cold Lake Station CL7 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
14-Aug-19	1.8	1.5	–	0.25	18.9	8.72	150	7.25	0.4	149
				1.0	18.8	8.65	151	7.28	0.5	150
21-Aug-19	2.4	2.0	--	0.25	16.1	9.23	166	7.08	–	44
				1.0	16.1	8.79	169	7.06	–	51
				2.0	16.0	8.70	181	7.03	–	58
28-Aug-19	1.5	--	--	0.25	15.4	9.35	168	7.33	3.0	188
				1.0	15.4	8.95	170	7.25	4.5	183
4-Sep-19	2.8	1.8	--	0.25	15.5	9.25	154	7.30	2.4	192
				1.0	15.5	9.15	157	7.31	2.9	190
				2.0	15.4	9.07	159	7.31	3.2	187
18-Sep-19	1.4	<1.4	--	0.25	15.5	9.42	177	7.40	2.4	147
				1.0	15.5	9.36	185	7.37	7.6	147
26-Sep-19	3.7	1.3	7.45	0.25	13.2	9.26	186	7.19	3.6	111
				1.0	13.2	9.24	187	7.19	3.5	109
2-Oct-19		1.8	7.11	0.25	10.4	9.85	180	7.33	2.5	150
				1.0	10.3	9.72	179	7.29	2.3	148
9-Oct-19	2.8	1.3	7.45	0.25	8.3	10.54	188	7.13	3.6	153
				1.0	8.3	10.50	189	7.14	3.6	151
				2.0	8.2	10.46	194	7.14	4.8	149

Table A.17 Cold Lake Station CL8 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
25-Feb-19	3.9	1.5	–	0.25	0.1	12.36	98	7.10	0.8	1535
				1.0	0.5	12.33	111	7.08	0.5	152
				2.0	0.8	12.32	126	7.07	0.6	151
				3.0	0.9	12.27	134	7.02	0.7	153
28-May-19	2.9	1.3	--	0.25	12.9	10.64	176	7.11	2.4	85
				1.0	12.1	10.68	171	7.12	2.3	83
				2.0	10.1	10.71	168	7.12	2.5	84
4-Jun-19	4.0	1.9	–	0.25	12.7	10.28	320	7.32	2.0	221
				1.00	12.6	10.40	339	7.25	2.3	215
				2.00	11.3	10.43	389	7.20	2.6	215
				3.00	10.3	10.35	383	7.17	3.6	208
12-Jun-19	3.5	2.0	–	0.25	13.5	10.19	401	7.14	–	132
				1.0	13.5	10.18	425	7.10	–	139
				2.0	13.4	10.10	441	7.07	–	142
				3.0	13.4	10.01	517	7.03	–	149

Table A.17. Continued. Cold Lake Station CL8 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
18-Jun-19	3.6	1.5	–	0.25	21.1	9.73	489	7.20	1.5	194
				1.0	19.3	9.82	488	7.29	1.8	127
				2.0	15.7	10.05	405	7.32	0.4	138
26-Jun-19	3.6	1.9	–	0.25	17.7	9.26	390	6.79	–	90
				1.0	17.7	9.25	389	6.97	–	90
				2.0	17.3	9.18	427	7.02	–	90
2-Jul-19	3.5	2.1	--	0.25	18.3	8.91	152	7.31	1.0	42
				1.0	18.3	8.89	153	7.32	0.9	37
				2.0	18.3	8.88	154	7.32	0.9	39
				3.0	18.3	8.86	154	7.40	2.7	40
9-Jul-19	4.6	3.6	–	0.25	19.5	8.84	152	7.01	1.1	98
				1.0	19.3	8.78	151	7.08	1.1	105
				2.0	18.7	8.73	141	7.13	1.1	107
				3.0	17.7	8.68	137	7.16	1.1	109
15-Jul-19	4.3	2.7	–	0.25	21.6	8.76	126	7.06	0.6	99
				1.0	21.6	8.72	135	7.15	0.7	87
				2.0	21.2	8.67	134	7.23	1.0	79
				3.0	19.3	8.68	134	7.35	0.4	74
23-Jul-19	3.5	3.1	6.66	0.25	22.4	8.54	147	–	0.4	80
				1.0	22.2	8.53	149	–	0.4	79
				2.0	21.9	8.45	191	–	1.3	82
31-Jul-19	3.7	2.1	–	0.25	20.3	8.10	146	7.02	0.8	192
				1.0	20.3	8.08	147	7.09	0.8	196
				2.0	20.3	8.07	148	7.11	0.9	210
				3.0	20.3	8.04	172	7.13	1.8	215
7-Aug-19	4.0	2.0	--	0.25	19.4	8.31	161	7.23	–	81
				1.0	19.4	8.26	163	7.29	–	83
				2.0	19.4	8.25	165	7.31	–	87
				3.0	19.4	8.24	165	7.31	–	88
14-Aug-19	3.6	2.5	7.12	0.25	18.8	8.59	150	--	0.2	112
				1.0	18.8	8.67	149	--	0.3	128
				2.0	18.7	8.57	150	--	0.4	139
21-Aug-19	3.6	2.0	–	0.25	16.1	8.77	167	7.18	–	69
				1.0	16.2	8.61	167	7.04	–	89
				2.0	16.1	8.61	167	6.91	–	106
				3.0	16.1	8.63	168	6.87	–	117

Table A.17. Continued. Cold Lake Station CL8 - Field Measurements 2019

Date	Station Depth (m)	Secchi (m)	Pen pH	Sample Depth (m)	Temp. (ºC)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
28-Aug-19	3.5	1.9	--	0.25	15.5	8.95	171	7.59	3.0	67
				1.0	15.4	8.65	169	7.31	3.0	95
				2.0	15.4	8.62	170	7.23	3.1	107
				3.0	15.4	8.59	146	7.12	16.6	124
4-Sep-19	3.6	2.0	--	0.25	15.5	9.18	153	7.67	2.3	183
				1.0	15.5	9.01	153	7.21	2.2	181
				2.0	15.5	8.98	155	7.23	2.5	179
18-Sep-19	3.80	1.9	--	0.25	15.5	9.44	179	7.78	3.1	99
				1.0	15.5	9.29	181	7.51	4.4	86
				2.0	15.3	9.16	181	7.33	4.0	108
				3.0	14.8	9.00	173	7.25	2.9	115
26-Sep-19	3.7	--	7.45	0.25	13.4	9.33	181	7.09	2.7	67
				1.0	13.4	9.32	181	7.08	2.8	67
				2.0	13.4	9.31	181	7.09	2.8	67
				3.0	13.3	9.28	182	7.09	2.8	67
2 0ct 19	3.8	1.6	7.6	0.25	10.6	9.78	187	7.81	2.2	73
				1.0	10.6	9.66	182	7.72	2.2	80
				2.0	10.5	9.59	181	7.62	2.2	89
				3.0	10.5	9.56	181	7.57	2.2	98
9-Oct-19	3.4	1.3	7.5	0.25	8.5	10.75	190	6.91	3.9	139
				1.0	8.5	10.69	190	6.92	3.9	136
				2.0	8.4	10.64	190	6.92	3.9	133
				3.0	8.3	10.58	193	6.92	5.2	131

Appendix B – Laboratory Data

Table B.1. Camp Lake Discharge Water Quality - Laboratory Data

Parameter/Sample Date	24-Jan-19	26-Feb-19	29-May-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	7-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	11-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19	23-Oct-19	2-Nov-19	16-Dec-19
Physical-Chemical (mg/L)																									
pH (pH units)	7.43	7.36	6.88	6.84	6.81	6.53	6.55	6.76	6.39	6.44	6.35	6.25	6.76	6.15	5.98	5.73	5.92	5.95	5.91	5.95	6.4	6.32	6.35	6.43	6.20
Alkalinity (Total as $CaCO_3$)	29.2	33.4	12.5	8.5	8.6	8.9	9.0	7.6	8.5	8.1	8.8	8.0	6.1	5.5	3.8	3.6	3.2	4.5	5.9	6.2	5.8	4.8	6.4	4.7	13
Bicarbonate (HCO_3)	35.6	40.7	15.3	10	11	11	11	9.3	10	9.9	11	9.8	7.4	6.7	4.6	4.4	3.9	5.5	7.2	7.6	7.0	5.9	7.8	5.7	16
Carbonate (CO_3)	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	75	77	180	180	--	170	--	190	180	190	180	190	220	220	220	210	--	200	180	180	190	190	180	170	--
Total Hardness ($CaCO_3$)	70.3	76.8	147	163	--	149	--	184	176	184	190	195	211	211	--	211	--	200	191	203	185	174	188	--	--
Turbidity (NTU)	1.0	1.3	8.0	12	13	14	12	14	14	13	14	25	43	46	55	57	49	55	51	50	45	48	50	51	30
Total Suspended Solids (TSS)	<4.0	<4.0	4.0	5.0	8.3	5.0	6.5	4.2	<1.3	4.0	1.7	2.5	9.2	12	8.2	11	8.0	11	9.6	11	8.2	10	4.7	5.0	3.8
Total Metals (mg/L)																									
Aluminum (Al)	0.037	0.035	0.120	0.100	0.110	0.079	0.062	0.056	0.062	0.060	0.054	0.140	0.12	0.11	0.11	0.10	0.10	0.095	0.070	0.069	0.072	0.080	0.067	0.13	0.080
Antimony (Sb)	0.0017	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.021	<0.00060	0.00068	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00060	0.00052	0.00027	<0.00020	0.00037	0.00026	0.00049	0.00021	0.00044	0.00023	0.00028	0.00032	0.00028	0.00034	0.00042	0.00034	0.00033	0.00071	0.00038	0.00041	0.00040	0.00027	0.00032	0.00041	0.00052
Barium (Ba)	<0.010	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.011	0.011	0.010	0.012	0.011	0.011	0.010	<0.010	0.010	0.011	0.011
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.26	0.20	0.76	0.71	0.65	0.60	0.51	0.49	0.49	0.48	0.37	0.58	0.56	0.51	0.56	0.53	0.52	0.49	0.44	0.43	0.40	0.44	0.36	0.49	0.37
Calcium (Ca)	21	23	46	51	51	45	51	58	55	57	59	61	67	67	67	65	64	62	59	64	58	54	59	58	45
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	0.0012	<0.0010	0.0013	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	0.00042	0.00033	0.0016	0.0014	0.0012	0.0011	0.00085	0.00066	0.00059	0.00057	0.00053	0.00086	0.00060	0.00047	0.00052	0.00054	0.00053	0.00045	0.00042	0.00043	0.00036	0.00050	0.00036	0.00051	0.00033
Copper (Cu)	0.0094	0.0066	0.029	0.024	0.026	0.020	0.017	0.015	0.020	0.018	0.016	0.035	0.042	0.024	0.024	0.022	0.020	0.019	0.018	0.014	0.015	0.016	0.012	0.016	0.012
Iron (Fe)	0.35	0.38	3.6	5.5	5.5	4.8	3.9	3.7	3.5	3.2	3.2	4.1	6.0	6.8	7.3	7.1	6.1	5.9	5.2	4.8	4.3	4.9	5.7	5.6	3.8
Lead (Pb)	0.00033	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00090	<0.00020	0.00023	<0.00020	<0.00020	<0.00020	0.00022	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	4.2	4.5	8.0	8.9	9.3	9.0	9.2	9.6	9.4	9.9	10	10	11	11	11	11	11	11	10	11	10	9.2	10	10	8.7
Manganese (Mn)	0.029	0.034	0.170	0.230	0.180	0.150	0.140	0.140	0.110	0.096	0.085	0.100	0.12	0.094	0.11	0.12	0.097	0.091	0.082	0.095	0.073	0.081	0.089	0.087	0.057
Molybdenum (Mo)	0.00022	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0440	<0.00020	<0.00020	<0.00020	<0.00020	0.0016	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00087	0.00089	0.0020	0.0013	0.0016	0.0014	0.0011	0.0013	0.0012	0.00076	0.00098	0.0019	0.0035	0.00094	0.00093	0.0013	0.0011	0.0012	0.00079	0.00092	0.00081	0.00096	0.0011	0.0012	0.00094
Potassium (K)	2.2	2.4	3.4	3.9	3.9	3.6	3.9	3.9	3.8	4.2	4.2	4.3	4.6	4.3	4.6	4.9	4.6	4.7	4.4	4.6	4.3	4.1	4.4	4.7	3.9
Selenium (Se)	0.0014	<0.00020	<0.00020	<0.00020	<0.00020	0.00021	<0.00020	<0.00020	0.00023	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.012	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00023	0.00074
Silicon (Si)	1.9	2.0	1.2	1.2	1.2	1.0	0.99	0.91	0.8	0.73	0.68	0.76	0.85	0.91	0.94	0.97	0.99	1.0	1.0	1.1	1.1	1.0	1.1	1.3	1.5
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00011
Sodium (Na)	2.1	2.4	2.4	2.5	2.7	2.8	2.7	2.8	2.8	2.8	2.9	3.0	2.9	2.9	2.9	3.2	3.0	3.2	2.8	3.0	3.1	2.4	2.9	3.2	2.8
Strontium (Sr)	0.036	0.038	0.052	0.057	0.054	0.052	0.057	0.060	0.058	0.061	0.066	0.069	0.067	0.065	0.068	0.071	0.067	0.069	0.065	0.067	0.061	0.059	0.062	0.058	0.053
Sulphur (S)	13	13	45	52	51	48	52	57	55	60	61	62	68	66	69	69	67	66	61	64	59	56	60	57	42
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	0.0015	<0.0010	0.0012	0.0049	0.0025	0.0021	0.0012	<0.0010	0.0011	<0.0010	0.0012	0.0045	0.0020	0.0041	0.0022	0.0026	0.0025	0.0020	0.0022	0.0014	0.0015	0.0023	0.0017	0.0054	0.0025
Uranium (U)	0.00017	<0.00010	0.00011	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.092	0.074	0.24	0.21	0.22	0.19	0.16	0.15	0.15	0.13	0.12	0.19	0.16	0.14	0.16	0.16	0.15	0.15	0.14	0.13	0.13	0.14	0.12	0.16	0.14

Table B.1. Continued. Camp Lake Discharge Water Quality - Laboratory Data

Parameter/Sample Date	24-Jan-19	26-Feb-19	29-May-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	7-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	11-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19	23-Oct-19	2-Nov-19	16-Dec-19
Dissolved Metals (mg/L)																									
Aluminum (Al)	0.022	0.016	0.051	0.029	0.034	0.021	0.010	0.010	0.059	0.031	0.032	0.044	0.0085	0.0068	<0.0030	<0.0030	0.0038	<0.0030	0.0060	0.0053	0.0061	0.010	0.071	0.086	0.065
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00039	0.00042	0.00023	<0.00020	0.00026	0.00021	0.00028	0.00023	0.00022	0.00023	0.00020	<0.00020	0.00022	0.00038	<0.00020	0.00025	<0.00020	<0.00020	0.00020	0.00027	<0.00020	<0.00020	0.00032	0.00032	0.00043
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.011	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.19	0.15	0.67	0.56	0.52	0.41	0.34	0.34	0.39	0.35	0.29	0.46	0.41	0.34	0.44	0.40	0.40	0.40	0.34	0.35	0.30	0.29	0.39	0.41	0.35
Calcium (Ca)	23	23	55	55	55	53	53	58	55	60	56	59	70	68	67	67	66	62	54	58	58	58	57	54	46
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0012	<0.0010
Cobalt (Co)	0.00030	<0.00030	0.0014	0.0012	0.0011	0.00082	0.00062	0.00063	0.00054	0.00049	<0.00030	0.00052	0.00063	0.00039	0.00045	0.00048	0.00046	0.00038	0.00033	0.00037	<0.00030	0.00033	0.00035	0.00034	<0.00030
Copper (Cu)	0.007	0.0045	0.021	0.015	0.014	0.011	0.0083	0.0093	0.013	0.012	0.013	0.021	0.010	0.0083	0.0086	0.0072	0.0072	0.0075	0.0064	0.0069	0.0069	0.0071	0.012	0.013	0.014
Iron (Fe)	<0.060	<0.060	2.3	3.0	2.8	2.0	0.85	0.85	1.6	1.6	1.5	1.3	1.1	0.28	0.15	0.16	0.16	0.23	0.45	0.54	0.72	0.88	5.1	5.6	3.9
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00046
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	4.5	4.6	9.8	9.7	10	10	9.5	9.8	9.4	11	9.8	10	12	11	12	12	11	11	9.8	9.8	10	10	9.5	9.6	9.0
Manganese (Mn)	0.029	0.031	0.20	0.24	0.19	0.17	0.14	0.14	0.11	0.097	0.074	0.094	0.13	0.093	0.11	0.12	0.099	0.086	0.074	0.087	0.072	0.082	0.081	0.082	0.060
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00079	0.00084	0.00081	0.0013	0.0011	0.0011	0.0012	0.0012	0.00093	0.00067	0.0012	0.0011	0.00096	0.00081	0.0011	0.00095	0.0010	0.00099	0.00088	<0.00050	0.00070	0.00090	0.00067	0.00084	0.00088
Potassium (K)	2.3	2.4	4.2	4.1	4.2	4.1	4.0	4.0	4.0	4.6	4.2	4.3	4.9	4.3	5.0	4.9	4.9	4.7	4.2	4.3	4.3	4.5	4.4	4.5	4.0
Selenium (Se)	0.00037	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00023	<0.00020
Silicon (Si)	1.9	1.9	1.3	1.2	1.2	0.96	0.93	0.81	0.71	0.71	0.60	0.64	0.76	0.76	0.82	0.86	0.88	0.91	0.89	0.93	1.0	1.0	1.1	1.2	1.4
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.7	2.5	3.0	2.7	2.9	3.0	2.8	3.0	2.8	3.1	2.9	2.9	3.3	2.9	2.8	3.2	3.1	3.2	2.7	2.8	3.0	2.9	3.1	3.0	2.9
Strontium (Sr)	0.040	0.038	0.062	0.060	0.058	0.057	0.058	0.060	0.057	0.063	0.062	0.066	0.069	0.064	0.070	0.070	0.068	0.066	0.059	0.060	0.060	0.061	0.059	0.056	0.053
Sulphur (S)	14	14	48	58	55	48	54	58	55	62	58	62	71	68	71	71	70	65	58	61	62	61	59	56	44
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0012	0.0045	0.0040
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.085	0.074	0.23	0.18	0.17	0.14	0.12	0.12	0.13	0.10	0.11	0.14	0.13	0.11	0.12	0.11	0.12	0.12	0.10	0.11	0.099	0.11	0.12	0.13	0.13
Toxicity (LC50)				Collected			Collected				Collected		Collected							Collected		Collected			

Table B.2. Camp Lake Station NB-1 Water Quality - Laboratory Data

Parameter/Sample Date	26-Feb-19	29-May-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	3-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	31-Jul-19	8-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	2-Oct-19	8-Oct-19
Physical-Chemical (mg/L)								**Duplicate**					**Duplicate**									**Duplicate**	
pH (pH units)	7.29	6.90	6.88	6.92	6.57	6.57	6.84	6.82	6.35	6.42	6.36	6.24	6.25	6.18	6.07	5.98	5.77	5.90	5.89	5.83	6.40	6.40	6.24
Alkalinity (Total as $CaCO_3$)	35.2	12.6	9.1	10	8.6	9.1	7.5	7.5	8.3	7.8	9.3	7.4	7.9	6.2	5.7	4.2	4.0	3.1	5.3	4.4	5.1	5.0	4.1
Bicarbonate (HCO_3)	43	15.4	11	12	10	11	9.1	9.1	10	9.5	11	9.0	9.6	7.6	7.0	5.1	4.8	3.8	6.4	5.4	6.3	6.1	5.0
Carbonate (CO_3)	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	65	180	170	--	170	--	180	180	170	190	180	190	190	210	210	210	--	--	180	180	180	180	190
Total Hardness ($CaCO_3$)	67.3	149	162	--	145	--	170	172	174	184	189	191	196	216	209	--	--	--	186	202	185	184	177
Turbidity (NTU)	1.5	7.7	12	12	13	12	15	15	14	13	14	25	24	45	46	56	57	53	50	57	45	45	52
Total Suspended Solids (TSS)	<4.0	<4.0	4.0	6.9	6.0	5.9	3.0	4.7	1.7	3.8	1.3	3.4	2.7	9.9	9.8	9.5	11	8.3	9.9	11	8.7	8.0	11
Total Metals (mg/L)																							
Aluminum (Al)	0.038	0.13	0.10	0.10	0.080	0.071	0.062	0.056	0.068	0.067	0.057	0.13	0.14	0.13	0.11	0.12	0.12	0.10	0.071	0.082	0.069	0.070	0.084
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00070	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00039	0.00029	0.00042	0.00036	0.00033	0.00031	0.00035	0.00026	0.00034	0.00029	0.00028	0.00026	0.00021	0.00029	0.00022	0.00047	0.00032	0.00030	0.00033	0.00025	0.00031	0.00023	0.00026
Barium (Ba)	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.011	<0.010	0.010	0.011	<0.010	0.011	0.011	0.010	0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.19	0.76	0.71	0.62	0.55	0.51	0.43	0.40	0.49	0.47	0.36	0.67	0.67	0.61	0.54	0.51	0.53	0.53	0.42	0.47	0.37	0.39	0.41
Calcium (Ca)	20	46	50	45	43	51	53	54	54	57	59	60	61	68	66	63	64	60	58	63	57	57	55
Chromium (Cr)	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0012	0.0011	0.0010	0.0010	0.0017	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	0.0013	<0.0010	<0.0010	0.0013
Cobalt (Co)	<0.00030	0.0015	0.0014	0.0011	0.00087	0.00084	0.00065	0.00069	0.00073	0.00055	0.00046	0.00079	0.00092	0.00057	0.00052	0.00054	0.00050	0.00052	0.00035	0.00044	0.00033	<0.00030	0.00045
Copper (Cu)	0.0075	0.028	0.025	0.025	0.019	0.017	0.017	0.016	0.020	0.018	0.018	0.035	0.036	0.028	0.024	0.023	0.022	0.020	0.017	0.016	0.015	0.015	0.015
Iron (Fe)	0.35	3.6	5.5	5.2	4.7	3.8	3.8	3.9	3.5	3.3	3.1	4.2	4.3	7.2	6.8	7.2	7.3	6.0	5.2	6.1	4.2	4.2	5.5
Lead (Pb)	0.00049	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	4.5	8.1	9.0	8.6	8.9	9.1	9.1	9.2	9.2	10	10	10	10	11	11	11	11	10	10	11	10	10	9.6
Manganese (Mn)	0.029	0.17	0.23	0.16	0.15	0.14	0.13	0.13	0.11	0.096	0.083	0.098	0.10	0.12	0.093	0.099	0.11	0.090	0.081	0.097	0.072	0.071	0.084
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	0.00034	0.00021	<0.00020	<0.00020	0.00039	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00083	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00086	0.00076	0.0014	0.0013	0.0011	0.0011	0.0012	0.0012	0.0014	0.0009	0.0014	0.0015	0.0013	0.00082	0.0013	0.0014	0.0012	0.0012	0.00094	0.00093	0.00091	0.00076	0.0010
Potassium (K)	2.2	3.4	3.9	3.6	3.6	3.8	3.7	3.7	3.9	4.2	4.2	4.3	4.4	4.6	4.3	4.5	4.8	4.4	4.3	4.7	4.3	4.3	4.2
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00025	<0.00020	<0.00020	0.00031	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	2.2	1.2	1.2	1.2	1.0	1.0	0.86	0.86	0.80	0.77	0.70	0.76	0.79	0.92	0.90	0.94	1.0	0.95	1.0	1.2	1.1	1.1	1.1
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.6	2.5	2.5	2.6	2.8	2.7	2.6	2.7	2.7	2.9	2.9	3.0	3.0	3.2	2.9	2.8	3.2	2.9	2.7	3.1	3.1	3.0	2.5
Strontium (Sr)	0.038	0.053	0.057	0.050	0.053	0.058	0.056	0.057	0.058	0.061	0.065	0.068	0.070	0.071	0.064	0.065	0.070	0.064	0.063	0.068	0.061	0.061	0.06
Sulphur (S)	9	46	52	45	46	51	53	53	54	59	60	61	63	71	65	65	68	63	59	65	59	59	57
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	0.0014	0.0018	0.0034	0.0014	0.0025	0.0013	<0.0010	0.0011	0.0027	<0.0010	0.0015	0.0025	0.0014	<0.0010	0.0026	0.0026	0.0029	0.0042	0.0013	0.0018	0.0017	0.0012	0.0015
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.066	0.24	0.23	0.21	0.17	0.16	0.15	0.14	0.16	0.13	0.12	0.19	0.19	0.17	0.15	0.16	0.16	0.15	0.13	0.13	0.13	0.12	0.14

Table B.2. Continued. Camp Lake Station NB-1 Water Quality - Laboratory Data

Parameter/Sample Date	26-Feb-19	29-May-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	3-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	31-Jul-19	8-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	2-Oct-19	8-Oct-19
Dissolved Metals (mg/L)								**Duplicate**					**Duplicate**									**Duplicate**	
Aluminum (Al)	0.018	0.044	<0.0030	0.040	<0.0030	0.013	0.012	0.0096	0.024	0.029	0.034	0.047	0.049	0.0054	0.0080	<0.0030	<0.0030	0.0039	0.0067	0.0080	0.011	0.011	0.010
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00035	<0.00020	<0.00020	0.00028	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00024	0.00021	0.00026	0.00028	0.00024	<0.00020	0.00021	0.00021	<0.00020	<0.00020	<0.00020	0.00026	0.00023
Barium (Ba)	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.14	0.67	0.33	0.62	0.32	0.35	0.33	0.33	0.38	0.35	0.33	0.52	0.49	0.45	0.37	0.43	0.41	0.41	0.35	0.38	0.35	0.31	0.31
Calcium (Ca)	19	56	54	54	52	52	57	56	54	59	56	58	58	67	65	65	65	65	54	56	57	57	58
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	0.0014	0.0013	0.0012	0.00084	0.00062	0.00069	0.00053	0.00054	0.00039	<0.00030	0.00064	0.00071	0.00049	0.00041	0.00044	0.00044	0.00045	0.00038	0.00037	<0.00030	<0.00030	0.00033
Copper (Cu)	0.0047	0.018	0.0023	0.017	0.0036	0.0091	0.0088	0.0089	0.012	0.012	0.014	0.021	0.021	0.0096	0.0087	0.0087	0.0077	0.0071	0.0067	0.0078	0.0093	0.0098	0.0073
Iron (Fe)	0.24	2.1	<0.060	2.5	<0.060	0.84	0.63	0.87	1.6	2.0	1.5	1.4	1.4	0.71	0.30	0.19	0.22	0.16	0.47	0.53	0.48	0.75	0.95
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	4.3	9.5	9.7	10	10	9.5	9.8	9.7	9.3	10	9.9	10	9.9	12	11	11	11	11	9.9	9.7	9.9	10	10
Manganese (Mn)	0.027	0.20	0.24	0.19	0.17	0.14	0.14	0.14	0.11	0.095	0.073	0.093	0.093	0.12	0.089	0.10	0.11	0.096	0.076	0.086	0.070	0.071	0.083
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00026	<0.00020	0.0035	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00074	0.00071	0.00088	0.0014	0.0011	0.0011	0.00090	0.0010	0.0011	0.00085	0.0011	0.00093	0.00081	0.00056	0.00089	0.00093	0.0010	0.0011	0.00098	<0.00050	0.00086	0.00067	0.00091
Potassium (K)	2.2	4.3	4.2	4.1	4.1	4.0	4.1	4.0	3.9	4.5	4.3	4.4	4.3	5.0	4.4	4.8	4.9	4.8	4.2	4.3	4.2	4.3	4.5
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	2.1	1.3	1.1	1.2	0.95	0.94	0.82	0.81	0.72	0.72	0.61	0.64	0.64	0.72	0.74	0.80	0.86	0.88	0.90	0.94	1.0	0.99	1.0
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.5	2.9	3.3	2.9	3.3	3.0	2.9	2.8	2.7	3.1	3.0	3.0	2.9	3.4	3.1	2.3	3.2	3.1	2.7	2.8	3.0	3.0	3.0
Strontium (Sr)	0.036	0.061	0.060	0.057	0.058	0.058	0.060	0.059	0.057	0.063	0.063	0.066	0.065	0.071	0.064	0.066	0.069	0.068	0.060	0.059	0.059	0.059	0.061
Sulphur (S)	8.8	45	57	53	46	54	57	57	54	60	57	62	62	64	66	69	70	69	58	60	61	61	61
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.066	0.21	0.15	0.20	0.12	0.12	0.12	0.11	0.12	0.10	0.11	0.15	0.15	0.12	0.10	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.11

Table B.3. Camp Lake Station NB-2 Water Quality - Laboratory Data

Parameter/Sample Date	26-Feb-19	29-May-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	8-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	4-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19
Physical-Chemical (mg/L)									**Duplicate**									**Duplicate**				
pH (pH units)	7.3	6.94	6.98	6.9	6.6	6.58	6.96	6.40	6.40	6.44	6.37	6.26	6.21	6.08	5.92	5.82	5.95	5.93	5.96	6.01	6.41	6.36
Alkalinity (Total as $CaCO_3$)	34.5	13.2	9.9	11	8.6	9.9	9.4	9.2	8.9	8.6	10	7.7	6.2	5.7	3.9	4.3	3.9	4.0	6.4	6.7	5.9	6.9
Bicarbonate (HCO_3)	42	16.2	12	13	10	12	12	11	11	10	12	9.3	7.5	6.9	4.8	5.2	4.7	4.9	7.8	8.2	7.2	8.5
Carbonate (CO_3)	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	61	160	160	--	170	--	170	170	170	190	180	190	210	200	200	--	--	--	170	170	170	170
Total Hardness ($CaCO_3$)	58.5	140	146	--	142	--	171	169	171	182	188	189	209	198	--	--	--	--	179	191	168	167
Turbidity (NTU)	0.8	7.7	11	12	13	9.5	12	14	14	14	14	25	43	50	55	54	52	52	50	45	46	48
Total Suspended Solids (TSS)	<4.0	5.0	7.0	6.5	5.1	2.7	4.3	1.5	2.9	3.3	1.7	3.9	9.4	11	7.8	10	9.7	9.1	9.3	7.9	7.7	11
Total Metals (mg/L)																						
Aluminum (Al)	0.034	0.10	0.10	0.11	0.074	0.074	0.077	0.068	0.071	0.053	0.057	0.13	0.13	0.12	0.11	0.11	0.12	0.10	0.083	0.086	0.071	0.11
Antimony (Sb)	0.0012	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.0011	<0.00060	<0.00060
Arsenic (As)	0.00043	0.00021	0.00034	0.00042	0.00041	0.00021	0.00027	0.00039	0.00037	<0.00020	0.00027	0.00032	0.00033	0.00044	0.00026	0.00033	0.00034	0.00031	0.00044	0.00043	0.00022	0.00021
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	0.011	0.010	0.010	0.011	0.010	<0.010	0.011	0.011	0.010	0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.17	0.72	0.67	0.69	0.56	0.53	0.54	0.51	0.51	0.36	0.39	0.53	0.63	0.51	0.56	0.52	0.57	0.49	0.47	0.46	0.35	0.45
Calcium (Ca)	17	43	45	49	43	49	53	53	53	57	59	59	65	62	63	61	59	59	55	59	52	52
Chromium (Cr)	<0.0010	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0014	0.0013	<0.0010	<0.0010	0.0013	0.0010	<0.0010	<0.0010	0.0014	<0.0010	<0.0010	<0.0010	0.0026	<0.0010	0.0010
Cobalt (Co)	<0.00030	0.0014	0.0014	0.0012	0.00097	0.00083	0.00072	0.00062	0.00061	0.00057	0.00050	0.00070	0.00060	0.00043	0.00044	0.00051	0.00054	0.00045	0.00035	0.00039	<0.00030	0.00041
Copper (Cu)	0.0057	0.028	0.023	0.026	0.019	0.019	0.020	0.019	0.020	0.016	0.018	0.034	0.029	0.023	0.025	0.023	0.022	0.021	0.017	0.016	0.014	0.017
Iron (Fe)	0.31	3.4	4.9	5.4	4.6	3.7	3.5	3.5	3.5	3.3	3.2	4.2	7.0	7.2	7.1	6.7	6.3	6.2	5.00	5.1	4.5	5.2
Lead (Pb)	0.00041	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.9	7.7	8.3	9.1	8.8	8.9	9.2	9.1	9.2	9.9	10	10	11	10	11	11	11	10	9.9	10	9.3	9.1
Manganese (Mn)	0.026	0.16	0.19	0.17	0.15	0.13	0.12	0.11	0.11	0.095	0.082	0.094	0.11	0.090	0.094	0.093	0.088	0.087	0.073	0.080	0.065	0.073
Molybdenum (Mo)	<0.00020	<0.00020	0.00038	<0.00020	<0.00020	0.00022	<0.00020	0.064	0.067	<0.00020	<0.00020	0.053	<0.00020	0.00086	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00086	0.00073	0.0013	0.0014	0.0012	0.0011	0.0013	0.0016	0.0018	0.00067	0.00099	0.0013	0.00081	0.0013	0.0012	0.0016	0.0012	0.0012	0.00067	0.0012	0.00081	0.00098
Potassium (K)	2.1	3.4	3.6	3.8	3.6	3.8	3.7	3.8	3.9	4.1	4.3	4.3	4.6	4.1	4.4	4.7	4.5	4.5	4.3	4.5	4.0	4.0
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00025	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00035	<0.00020	<0.00020
Silicon (Si)	1.9	1.2	1.2	1.2	0.97	1.0	0.92	0.82	0.84	0.75	0.71	0.77	0.94	0.92	0.92	0.98	1.0	0.98	1.1	1.2	1.1	1.1
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.3	2.5	2.4	2.6	2.7	2.7	2.7	2.8	2.8	2.9	3	3.1	3.2	2.8	2.8	3.1	3.0	2.9	2.7	3.0	3.0	2.4
Strontium (Sr)	0.034	0.050	0.053	0.053	0.050	0.057	0.057	0.057	0.057	0.061	0.065	0.068	0.069	0.062	0.066	0.068	0.065	0.064	0.062	0.065	0.057	0.058
Sulphur (S)	7.8	42	45	49	46	49	52	52	53	58	60	61	68	61	65	65	63	62	57	60	53	53
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	0.0014	<0.0010	0.0025	0.0022	0.0018	0.0011	<0.0010	0.0013	0.0014	0.0014	<0.0010	0.0027	0.0018	0.0019	<0.0010	0.0022	0.0029	0.0026	0.0023	0.0025	0.0020	0.0046
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.064	0.25	0.20	0.22	0.18	0.18	0.16	0.15	0.16	0.11	0.13	0.18	0.17	0.14	0.16	0.16	0.17	0.15	0.14	0.14	0.12	0.15

Table B.3. Continued. Camp Lake Station NB-2 Water Quality - Laboratory Data

Parameter/Sample Date	26-Feb-19	29-May-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	8-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	4-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19
Dissolved Metals (mg/L)									**Duplicate**									**Duplicate**				
Aluminum (Al)	0.010	0.046	0.035	0.038	0.015	0.016	0.016	0.025	0.028	0.024	0.025	0.038	0.0083	0.0085	<0.0030	0.0034	0.0041	0.0039	0.0072	0.0063	0.0089	0.011
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00034	<0.00020	0.00020	0.00029	0.00026	0.00026	<0.00020	0.00022	0.00021	0.00022	0.00028	<0.00020	<0.00020	0.00027	0.00020	0.00027	0.00020	0.00025	0.00022	0.00025	0.00030	<0.00020
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.058	0.63	0.54	0.51	0.38	0.35	0.33	0.37	0.43	0.32	0.30	0.40	0.47	0.34	0.48	0.37	0.36	0.40	0.32	0.33	0.29	0.24
Calcium (Ca)	18	51	48	50	51	50	54	52	52	58	55	58	65	61	64	63	61	61	52	54	52	54
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	0.0014	0.0010	0.00093	0.00081	0.00057	0.00067	0.00056	0.00063	0.00042	<0.00030	0.00061	0.00047	0.00039	0.00042	0.00042	0.0004	0.00041	0.00032	<0.00030	<0.00030	0.00034
Copper (Cu)	0.0026	0.019	0.015	0.014	0.0098	0.0095	0.012	0.014	0.014	0.011	0.012	0.018	0.010	0.0084	0.0084	0.0078	0.0070	0.0071	0.0069	0.0078	0.0070	0.0074
Iron (Fe)	0.25	2.2	2.5	2.8	1.5	0.93	1.1	1.0	1.7	1.1	0.86	1.5	1.0	0.37	0.20	0.17	0.19	0.23	0.47	0.56	0.73	1.0
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	4.1	9.1	8.9	9.8	9.9	9.2	9.4	9.0	9.1	10	9.8	10	11	11	11	11	11	11	9.4	9.5	9.5	9.6
Manganese (Mn)	0.025	0.19	0.20	0.17	0.16	0.13	0.12	0.10	0.10	0.095	0.072	0.088	0.10	0.086	0.096	0.094	0.089	0.089	0.066	0.073	0.065	0.071
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00046	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00059	<0.00050	0.0014	0.0011	0.0010	0.0010	0.0012	0.00096	0.0012	0.0006	0.0012	0.00089	0.00065	0.00086	0.0011	0.00090	0.00094	0.0011	0.00092	<0.00050	0.00075	0.00077
Potassium (K)	2.1	4.1	3.9	4.1	3.9	4.0	3.9	3.9	3.9	4.4	4.3	4.3	4.7	4.4	4.7	4.8	4.7	4.7	4.0	4.1	4.1	4.3
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	2.0	1.3	1.2	1.2	0.98	0.95	0.84	0.72	0.75	0.72	0.59	0.66	0.75	0.76	0.8	0.87	0.88	0.88	0.89	0.93	1.0	1.0
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.4	2.8	2.7	2.9	3.0	3.0	2.8	2.7	2.8	3.2	3.1	3.0	3.2	3.0	2.3	3.2	3.1	3.1	2.6	2.8	3.0	2.8
Strontium (Sr)	0.035	0.058	0.056	0.055	0.056	0.057	0.058	0.056	0.057	0.062	0.062	0.066	0.068	0.062	0.065	0.068	0.066	0.065	0.057	0.058	0.056	0.058
Sulphur (S)	8.3	45	50	50	48	51	54	52	53	60	56	61	64	63	67	67	65	66	54	57	56	56
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.04	0.21	0.18	0.16	0.13	0.12	0.12	0.13	0.14	0.10	0.10	0.12	0.12	0.10	0.13	0.12	0.11	0.12	0.10	0.12	0.091	0.10

Table B.4. Camp Lake Station CB-1 Water Quality - Laboratory Data

Parameter/Sample Date	26-Feb-19	29-May-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	8-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	28-Aug-19	4-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19
Physical-Chemical (mg/L)							**Duplicate**										**Duplicate**					
pH (pH units)	7.29	6.95	6.96	6.83	6.67	6.65	6.61	6.91	6.39	6.43	6.42	6.26	6.10	6.05	5.92	5.81	5.73	5.92	6.03	6.06	6.43	6.40
Alkalinity (Total as $CaCO_3$)	34	14.8	11	9.5	11	11	12	11	10	11	12	10	5.6	5.1	3.6	4.6	3.9	4.4	8.5	8.2	6.4	7.0
Bicarbonate (HCO_3)	41.5	18	13	12	14	14	14	13	12	13	14	12	6.8	6.3	4.4	5.6	4.7	5.4	10	10	7.8	8.6
Carbonate (CO_3)	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	39	140	140	--	130	--	--	150	140	160	140	140	170	170	170	--	--	--	140	140	150	150
Total Hardness ($CaCO_3$)	41	114	125	--	115	--	--	141	137	152	154	150	171	165	--	--	--	--	153	157	153	137
Turbidity (NTU)	0.7	6.2	9.7	13	9.3	8.0	7.5	9.8	13	13	12	27	58	61	73	71	71	67	51	49	47	47
Total Suspended Solids (TSS)	<4.0	<4.0	4.0	7.5	4.2	2.4	2.1	2.3	1.9	2.9	1.4	4.2	13	10	11	9.9	10	11	11	9.4	7.9	10
Total Metals (mg/L)																						
Aluminum (Al)	0.030	0.086	0.088	0.094	0.061	0.050	0.054	0.051	0.056	0.053	0.043	0.082	0.11	0.10	0.094	0.10	0.11	0.12	0.066	0.075	0.076	0.079
Antimony (Sb)	0.00061	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00070	<0.00060	<0.00060
Arsenic (As)	0.00043	0.00031	0.00034	0.00039	0.00029	0.00048	0.00051	0.00026	0.00045	0.00033	0.00037	0.00022	0.00034	0.00028	0.00060	0.00037	0.00033	0.00038	<0.00020	0.00038	0.00027	0.00036
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	<0.010	0.010	0.011	0.011	<0.010	0.010	0.011	0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.028	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.069	0.63	0.57	0.62	0.57	0.47	0.50	0.40	0.49	0.44	0.35	0.43	0.54	0.47	0.46	0.46	0.51	0.48	0.42	0.37	0.36	0.34
Calcium (Ca)	11	35	38	39	34	39	40	43	42	46	47	45	52	51	50	50	50	47	46	48	47	42
Chromium (Cr)	<0.0010	0.0010	0.0011	<0.0010	0.0014	<0.0010	<0.0010	<0.0010	0.0017	0.0013	0.0011	0.0017	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0016	<0.0010	0.0014	<0.0010	0.0014
Cobalt (Co)	<0.00030	0.0011	0.0011	0.0010	0.00091	0.00054	0.00073	0.00053	0.00054	0.00052	0.00035	0.00045	0.00051	0.00052	0.00032	0.00039	0.00042	0.00039	<0.00030	0.00032	<0.00030	0.00030
Copper (Cu)	0.0034	0.023	0.022	0.024	0.018	0.015	0.018	0.015	0.018	0.018	0.015	0.023	0.024	0.019	0.017	0.018	0.020	0.019	0.014	0.012	0.012	0.013
Iron (Fe)	0.24	3.0	4.4	5.3	3.6	3.1	3.2	3.5	3.4	3.4	3.0	5.1	9.6	8.3	8.9	8.0	8.0	7.2	5.0	5.5	4.9	5.0
Lead (Pb)	<0.00020	<0.00020	0.00026	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00021	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.4	6.7	7.5	8.1	7.5	7.8	7.9	8.2	8.0	9.0	9.2	9.0	10	9.2	9.6	9.9	10	9.3	8.9	9.1	8.9	7.8
Manganese (Mn)	0.019	0.13	0.15	0.14	0.11	0.11	0.11	0.098	0.089	0.083	0.068	0.076	0.090	0.082	0.084	0.085	0.085	0.079	0.067	0.067	0.061	0.056
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	0.00028	0.00033	0.00045	<0.00020	<0.00020	<0.00020	0.0092	0.031	<0.00020	0.0010	<0.00020	<0.00020	<0.00020	0.0080	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00055	0.00054	0.0011	0.0012	0.0012	0.00076	0.0014	0.0099	0.0013	0.00088	0.0010	0.0014	0.00077	0.00087	0.00089	<0.00050	<0.00050	0.0011	0.0007	0.00082	0.00086	0.0012
Potassium (K)	1.5	2.9	3.4	3.5	3.2	3.5	3.5	3.5	3.4	4.0	3.9	4.0	4.4	3.9	4.3	4.4	4.5	4.2	3.9	4.2	4.0	3.6
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	0.00029	<0.00020	<0.00020	<0.00020	0.00039	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	2.0	1.2	1.2	1.2	0.97	1.0	1.0	0.90	0.82	0.82	0.79	0.83	0.95	0.96	1.0	1.0	1.0	1.1	1.1	1.2	1.2	1.1
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.0	2.2	2.3	2.5	2.5	2.5	2.5	2.6	2.6	2.8	2.9	2.9	3.1	2.7	2.7	3.0	3.0	2.8	2.6	2.8	3.0	2.2
Strontium (Sr)	0.028	0.044	0.048	0.047	0.043	0.050	0.051	0.051	0.051	0.055	0.059	0.060	0.062	0.056	0.059	0.062	0.062	0.058	0.056	0.058	0.055	0.05
Sulphur (S)	1.6	33	38	40	35	39	40	42	42	48	48	47	56	51	53	54	54	51	47	49	48	43
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	0.0034	0.0041	0.0019	0.0013	0.0020	0.0014	0.0024	<0.0010	<0.0010	0.0019	0.0028	0.0025	0.0023	0.0027	0.0030	0.0029	0.0018	0.0024	0.0031	0.0023
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.028	0.20	0.19	0.19	0.17	0.14	0.17	0.13	0.15	0.13	0.11	0.13	0.15	0.12	0.13	0.13	0.14	0.14	0.13	0.11	0.11	0.12

Table B.4. Continued. Camp Lake Station CB-1 Water Quality - Laboratory Data

Parameter/Sample Date	26-Feb-19	29-May-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	8-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	28-Aug-19	4-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19
Dissolved Metals (mg/L)							**Duplicate**										**Duplicate**					
Aluminum (Al)	0.011	0.041	0.030	0.035	0.016	0.018	0.019	0.015	0.019	0.026	0.030	0.033	<0.0030	0.0092	<0.0030	0.0032	0.0032	0.0039	0.0065	0.0086	0.0087	0.011
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00043	0.00023	<0.00020	0.00034	0.00021	0.00024	0.00023	<0.00020	0.00022	<0.00020	0.00029	<0.00020	0.00023	0.00020	<0.00020	0.00028	0.00024	0.00023	0.00028	0.00029	0.00023	<0.00020
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.054	0.58	0.49	0.46	0.36	0.36	0.35	0.30	0.31	0.29	0.33	0.31	0.33	0.30	0.34	0.34	0.32	0.32	0.30	0.29	0.25	0.25
Calcium (Ca)	10	43	41	44	40	41	41	44	42	47	43	43	52	51	50	51	52	49	43	44	47	45
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	0.0011	0.0010	0.00092	0.00056	0.00042	0.00043	0.00042	0.00041	0.00036	<0.00030	0.00040	0.00038	0.00035	0.00032	0.00033	0.00032	0.00034	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0016	0.018	0.015	0.014	0.011	0.011	0.010	0.012	0.012	0.012	0.013	0.016	0.0082	0.0079	0.0060	0.0067	0.0062	0.0064	0.0062	0.0072	0.0063	0.0065
Iron (Fe)	0.18	2.1	2.4	3.0	1.9	1.5	1.6	1.7	2.2	2.2	1.6	3.1	1.9	0.77	0.46	0.38	0.36	0.33	0.57	0.67	1.4	1.3
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.3	8.2	8.0	9.1	8.4	8.2	8.2	8.5	8.2	9.4	8.4	8.7	10	9.7	9.8	10	10	9.8	8.5	8.4	8.9	8.6
Manganese (Mn)	0.015	0.15	0.16	0.15	0.12	0.10	0.11	0.099	0.088	0.082	0.051	0.070	0.087	0.081	0.084	0.085	0.086	0.081	0.060	0.062	0.060	0.056
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.018	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	0.0033	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	<0.00050	<0.00050	0.0012	0.0011	0.0010	0.0014	0.00092	0.00098	0.00095	0.00052	0.0010	0.00065	<0.00050	0.00086	0.00077	0.00087	0.00085	0.00080	0.00081	<0.00050	0.00077	0.00075
Potassium (K)	1.5	3.7	3.7	3.8	3.5	3.6	3.6	3.8	3.6	4.2	3.9	3.8	4.4	4.2	4.4	4.5	4.6	4.3	3.8	3.8	4.0	4.0
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	1.9	1.3	1.2	1.2	1.0	0.96	0.96	0.86	0.77	0.77	0.67	0.73	0.78	0.78	0.85	0.89	0.9	0.92	0.92	0.95	1.0	1.0
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2	2.7	2.6	2.8	2.8	2.7	2.8	2.7	2.6	3.0	2.8	2.8	3.0	2.9	2.2	3.1	3.1	2.9	2.5	2.7	2.9	2.8
Strontium (Sr)	0.026	0.053	0.051	0.051	0.049	0.052	0.051	0.052	0.051	0.056	0.054	0.057	0.060	0.057	0.057	0.062	0.062	0.058	0.052	0.052	0.053	0.053
Sulphur (S)	1.5	34	42	44	37	41	41	44	42	48	44	47	53	53	56	57	56	53	45	46	50	47
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.023	0.19	0.16	0.16	0.13	0.12	0.12	0.11	0.11	0.096	0.10	0.10	0.095	0.095	0.093	0.10	0.094	0.099	0.094	0.099	0.087	0.093

Table B.5. Camp Lake Station CB-2 Water Quality - Laboratory Data

Parameter/Sample Date	26-Feb-19	29-May-19	5-Jun-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	16-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	8-Aug-19	8-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19
Physical-Chemical (mg/L)				**Duplicate**							**Duplicate**				**Duplicate**								
pH (pH units)	7.29	6.91	6.97	6.98	6.83	6.62	6.62	6.86	6.33	6.44	6.47	6.40	6.28	6.19	6.16	6.14	5.93	5.85	5.83	5.88	6.06	6.33	6.41
Alkalinity (Total as $CaCO_3$)	33.2	13.4	11	11	9.5	11	11	8	10	10	11	11	9.3	6.3	6.1	5.5	4.1	4.7	4.2	7.3	8.2	5.5	7.6
Bicarbonate (HCO_3)	40.5	16.3	13	13	12	14	14	9.8	13	12	13	14	11	7.7	7.4	6.7	5.0	5.7	5.1	9.0	10	6.7	9.3
Carbonate (CO_3)	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	40	150	140	140	--	140	--	150	150	160	160	150	150	180	180	170	170	--	--	150	140	150	160
Total Hardness ($CaCO_3$)	38.3	129	135	129	--	120	--	148	141	154	156	163	158	173	170	171	--	--	--	160	160	154	149
Turbidity (NTU)	1.3	8.5	9.7	9.4	13	9.4	7.5	18	13	13	13	13	24	47	48	57	68	62	63	47	48	47	45
Total Suspended Solids (TSS)	<4.0	7	4	7	6.5	5.4	2.8	2.5	<1.0	2.7	2.9	<1.0	2.7	7.7	9.1	13	9.8	10	9.5	7.8	9.9	8.2	10
Total Metals (mg/L)																							
Aluminum (Al)	0.029	0.13	0.096	0.093	0.11	0.071	0.063	0.061	0.087	0.059	0.063	0.058	0.11	0.14	0.15	0.11	0.095	0.14	0.12	0.076	0.077	0.079	0.090
Antimony (Sb)	0.00091	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00065	<0.00060	<0.00060
Arsenic (As)	0.00047	0.00026	0.00031	0.00037	0.00056	0.00034	0.00024	0.00033	0.00035	0.00022	0.00027	0.00041	0.00028	0.00033	0.00030	0.00047	0.00035	0.00036	0.00034	0.00023	0.00030	0.00039	0.00027
Barium (Ba)	<0.010	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.011	0.011	0.010	0.010	0.012	0.01	0.011	0.011	0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.021	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.086	0.74	0.56	0.66	0.65	0.53	0.46	0.40	0.40	0.33	0.41	0.36	0.51	0.52	0.52	0.48	0.47	0.49	0.45	0.42	0.37	0.36	0.32
Calcium (Ca)	10	39	41	39	41	35	43	45	43	46	47	49	48	53	52	53	51	54	49	49	49	47	46
Chromium (Cr)	<0.0010	0.0012	0.0011	0.0012	<0.0010	0.0010	0.0017	<0.0010	<0.0010	<0.0010	0.0012	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0037	0.0012	<0.0010	0.0013	<0.0010	<0.0010
Cobalt (Co)	<0.00030	0.0016	0.0012	0.0011	0.0012	0.00086	0.0007	0.0006	0.00062	0.00032	0.00047	0.00036	0.00049	0.00044	0.00043	0.00042	0.00036	0.00049	0.00038	0.00035	<0.00030	<0.00030	0.00034
Copper (Cu)	0.0039	0.027	0.021	0.022	0.025	0.018	0.018	0.015	0.016	0.014	0.014	0.015	0.027	0.023	0.023	0.020	0.018	0.020	0.018	0.016	0.013	0.012	0.013
Iron (Fe)	0.23	3.6	4.4	4.5	5.4	3.7	3.2	4.6	3.4	3.3	3.3	3.0	4.5	7.9	7.5	8.3	8.4	7.6	7.0	4.6	5.3	4.7	4.8
Lead (Pb)	0.00021	0.00027	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.1	7.5	8.0	7.7	8.3	7.7	8.4	8.8	8.2	9.1	9.3	9.6	9.3	10	10	9.5	9.8	11	9.7	9.3	9.3	8.9	8.5
Manganese (Mn)	0.017	0.17	0.16	0.15	0.14	0.12	0.11	0.10	0.089	0.080	0.081	0.067	0.072	0.080	0.078	0.094	0.084	0.081	0.077	0.063	0.065	0.059	0.054
Molybdenum (Mo)	<0.00020	0.00025	<0.00020	<0.00020	<0.00020	<0.00020	0.00022	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0011	<0.00020	<0.00020	0.00055	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00056	0.0010	0.0013	0.0015	0.0020	0.0013	0.0019	0.0011	0.0010	0.00076	0.0011	0.0013	0.0013	0.00090	0.00078	0.0014	0.0011	0.0023	0.0012	0.00097	0.00082	0.00088	0.0012
Potassium (K)	1.6	3.3	3.7	3.5	3.5	3.2	3.7	3.8	3.5	4.0	4.1	4.2	4.1	4.4	4.3	4.1	4.4	4.8	4.3	4.1	4.2	4.0	3.9
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00025	<0.00020	0.00022	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	1.9	1.3	1.3	1.2	1.2	1.0	1.0	0.93	0.82	0.78	0.81	0.72	0.78	0.96	0.98	0.98	0.99	1.1	1.0	1.0	1.2	1.1	1.1
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	1.9	2.4	2.5	2.3	2.5	2.6	2.6	2.7	2.6	2.8	2.8	3.0	2.9	3.1	3.0	2.8	2.7	3.2	2.9	2.6	2.9	2.9	2.4
Strontium (Sr)	0.027	0.048	0.052	0.050	0.048	0.046	0.054	0.054	0.051	0.055	0.056	0.061	0.061	0.063	0.061	0.058	0.06	0.066	0.060	0.058	0.059	0.055	0.054
Sulphur (S)	1.5	39	41	40	42	37	43	45	43	48	49	51	50	56	54	53	54	58	53	50	50	49	46
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	0.0015	0.0034	0.0040	0.0037	0.0026	0.0027	0.0014	0.0021	0.0020	0.0025	0.0016	0.0012	0.0021	0.0036	0.0056	0.0030	<0.0010	0.0055	0.0044	0.0030	0.0030	0.0026	0.0035
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.035	0.23	0.19	0.19	0.21	0.17	0.16	0.13	0.13	0.11	0.11	0.12	0.15	0.14	0.14	0.13	0.13	0.15	0.14	0.13	0.12	0.11	0.12

Table B.5. Continued. Camp Lake Station CB-2 Water Quality - Laboratory Data

Parameter/Sample Date	26-Feb-19	29-May-19	5-Jun-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	16-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	8-Aug-19	8-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19
Dissolved Metals (mg/L)				**Duplicate**							**Duplicate**				**Duplicate**								
Aluminum (Al)	0.011	0.042	0.059	0.061	0.035	<0.0030	0.013	0.012	0.022	0.031	0.031	0.027	0.040	0.011	0.012	0.0063	0.0031	0.0042	0.0043	0.0077	0.0052	0.0080	0.0076
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00041	<0.00020	0.00024	0.00034	0.00025	<0.00020	0.00023	0.00024	<0.00020	<0.00020	0.00022	0.00034	0.00028	0.00027	0.00034	0.00025	0.00034	0.00030	0.00021	0.00025	0.00033	0.00022	<0.00020
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.046	0.63	0.50	0.58	0.48	0.25	0.32	0.29	0.33	0.33	0.32	0.26	0.36	0.34	0.39	0.30	0.34	0.33	0.34	0.32	0.25	0.27	0.24
Calcium (Ca)	11	45	41	42	45	40	43	46	44	49	50	46	46	55	55	51	51	53	52	45	44	47	47
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	0.0015	0.00096	0.0010	0.0011	0.00053	0.00044	0.00049	0.00044	0.00037	0.00033	<0.00030	0.00046	0.00034	0.00038	0.00036	0.00041	0.00038	0.00034	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0019	0.018	0.020	0.021	0.013	0.0041	0.0091	0.0094	0.012	0.012	0.012	0.011	0.018	0.010	0.010	0.007	0.0067	0.0070	0.0063	0.0064	0.0061	0.0062	0.0060
Iron (Fe)	0.18	2.0	4.5	2.4	2.9	<0.060	1.5	1.8	2.1	2.2	2.2	1.6	2.3	1.9	2.7	1.0	0.34	0.31	0.33	0.51	0.85	1.3	1.2
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.3	8.5	8.0	8.2	9.3	8.5	8.5	9.1	8.5	9.8	9.7	9.0	9.1	10	10	9.7	10	11	10	8.8	8.5	9.0	8.9
Manganese (Mn)	0.016	0.19	0.16	0.16	0.16	0.12	0.11	0.10	0.089	0.080	0.081	0.053	0.063	0.079	0.094	0.079	0.083	0.078	0.079	0.056	0.058	0.058	0.051
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0002	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	<0.00050	0.00082	0.0011	0.0014	0.0011	0.00080	0.0011	0.00095	0.00091	0.00087	0.00089	0.00079	0.00092	0.00055	0.00060	0.00080	0.00083	0.00097	0.00092	0.00080	<0.00050	0.00063	0.00095
Potassium (K)	1.5	3.8	3.7	3.7	3.9	3.5	3.8	4.0	3.9	4.4	4.4	4.1	4.1	4.7	4.4	4.2	4.4	4.7	4.6	3.9	3.9	4.0	4.2
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	1.9	1.3	1.2	1.2	1.2	0.97	0.93	0.82	0.75	0.74	0.75	0.62	0.66	0.77	0.79	0.78	0.85	0.87	0.88	0.87	0.95	1.0	1.0
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2	2.7	2.5	2.6	2.8	2.8	2.7	2.8	2.7	3.0	3.0	2.9	2.9	3.2	3.0	2.9	2.2	3.1	3.0	2.6	2.6	2.9	2.8
Strontium (Sr)	0.027	0.054	0.051	0.052	0.052	0.049	0.053	0.055	0.053	0.058	0.058	0.056	0.059	0.063	0.061	0.058	0.058	0.063	0.061	0.054	0.052	0.054	0.055
Sulphur (S)	1.5	39	42	43	46	38	44	47	45	49	49	48	50	54	55	54	56	58	56	48	47	52	50
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	0.0014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.022	0.21	0.18	0.19	0.16	0.099	0.11	0.10	0.12	0.10	0.098	0.092	0.12	0.10	0.11	0.091	0.094	0.10	0.10	0.10	0.096	0.085	0.090

Table B.6. Camp Lake Station SB-1 Water Quality - Laboratory Data

Parameter/Sample Date	26-Feb-19	29-May-19	29-May-19	5-Jun-19	12-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	8-Aug-19	14-Aug-19	21-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19
Physical-Chemical (mg/L)			**Duplicate**			**Duplicate**											**Duplicate**						
pH (pH units)	7.30	6.98	7.00	7.03	6.80	6.87	6.64	6.67	6.86	6.41	6.48	6.41	6.27	6.16	5.99	5.81	5.89	5.70	6.00	6.05	6.05	6.49	6.27
Alkalinity (Total as $CaCO_3$)	33.7	16.6	16.1	14	9.6	10	12	12	10	10	11	12	10	6.0	5.3	3.0	3.7	3.8	5.0	8.9	8.5	8.6	5.1
Bicarbonate (HCO_3)	41.1	20.2	19.7	17	12	12	15	14	13	13	13	15	12	7.3	6.4	3.6	4.5	4.7	6.1	11	10	10	6.2
Carbonate (CO_3)	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	40	120	120	130	--	--	130	--	140	140	150	140	140	170	160	170	160	--	--	140	140	140	150
Total Hardness ($CaCO_3$)	40.8	106	106	113	--	--	111	--	135	133	140	150	150	170	162	--	--	--	--	147	158	135	137
Turbidity (NTU)	0.7	7.6	5.7	8.6	13	13	8.9	7.1	12	13	12	12	26	54	63	76	76	75	65	50	49	43	53
Total Suspended Solids (TSS)	<4.0	<4.0	<4.0	4.0	6.7	6.7	3.9	3.3	2.8	1.9	3.6	2.5	2.5	9.3	11	10	11	11	11	9.2	9.1	7.7	11
Total Metals (mg/L)																							
Aluminum (Al)	0.042	0.11	0.10	0.085	0.10	0.096	0.064	0.053	0.048	0.046	0.043	0.060	0.087	0.098	0.093	0.11	0.097	0.11	0.099	0.059	0.078	0.068	0.082
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00068	<0.00060	<0.00060
Arsenic (As)	0.00039	0.00038	0.00029	0.00029	0.00030	0.00036	0.00035	0.0005	0.00021	0.00039	<0.00020	0.00046	0.00020	0.00029	0.00037	0.0004	0.00029	0.00034	0.00031	0.00044	0.00043	0.00037	0.00028
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	0.011	0.010	0.011	<0.010	0.010	0.011	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.066	0.65	0.61	0.56	0.58	0.64	0.51	0.48	0.42	0.42	0.32	0.31	0.48	0.49	0.43	0.45	0.45	0.46	0.47	0.41	0.39	0.29	0.33
Calcium (Ca)	11	32	32	34	39	38	33	39	41	40	42	45	45	51	50	50	50	49	46	45	48	41	42
Chromium (Cr)	<0.0010	<0.0010	0.0011	<0.0010	0.0010	<0.0010	0.0013	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0020	0.0012	0.0011	0.0015	<0.0010	<0.0010
Cobalt (Co)	<0.00030	0.0010	0.0011	0.00081	0.0011	0.0010	0.00083	0.00056	0.00053	0.00045	0.00041	0.00037	0.00061	0.00039	<0.00030	0.00033	0.00034	0.00042	0.00041	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0034	0.024	0.025	0.020	0.024	0.023	0.018	0.017	0.015	0.016	0.013	0.014	0.025	0.022	0.019	0.017	0.017	0.018	0.019	0.014	0.013	0.011	0.012
Iron (Fe)	0.25	2.7	2.7	3.9	5.5	5.3	3.5	3.0	3.8	3.3	3.1	2.9	5.2	9.0	8.7	9.1	9.5	8.8	6.9	4.8	5.5	4.5	6.5
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.4	6.3	6.3	6.8	8.1	7.9	7.3	7.7	8.0	7.8	8.3	8.9	9.0	10	9.2	9.7	9.6	9.9	9.0	8.6	9.2	7.9	8.0
Manganese (Mn)	0.019	0.12	0.12	0.13	0.13	0.13	0.11	0.11	0.10	0.087	0.077	0.067	0.078	0.087	0.085	0.092	0.092	0.090	0.078	0.066	0.069	0.057	0.064
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	0.0014	<0.00020	<0.00020	<0.00020	0.00069	<0.00020	0.00023	0.0016	<0.00020	<0.00020	<0.00020	0.0012	<0.00020	<0.00020	<0.00020	0.0011	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00061	0.0014	0.0018	0.0011	0.0015	0.0014	0.0012	0.0012	0.0010	0.0010	0.0008	0.0010	0.0018	0.00078	0.00095	0.0009	0.00079	0.0015	0.0012	0.0011	0.0011	0.00066	0.00096
Potassium (K)	1.5	2.8	2.8	3.1	3.4	3.3	3.1	3.4	3.3	3.4	3.7	3.9	4.0	4.3	3.8	4.2	4.3	4.4	4.0	3.8	4.1	3.5	3.7
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	0.00021	<0.00020	<0.00020	<0.00020	<0.00020	0.00027	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	2.0	1.3	1.3	1.2	1.3	1.2	1.0	1.0	0.93	0.81	0.80	0.79	0.84	0.96	1.0	1.1	1.0	1.1	1.0	1.1	1.2	1.2	1.1
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.0	2.2	2.2	2.1	2.5	2.5	2.5	2.5	2.6	2.5	2.6	2.8	2.8	3.0	2.7	2.7	2.8	3.0	2.8	2.5	2.9	2.7	2.3
Strontium (Sr)	0.028	0.042	0.042	0.045	0.047	0.046	0.043	0.050	0.050	0.049	0.051	0.057	0.059	0.061	0.056	0.059	0.059	0.062	0.056	0.055	0.058	0.050	0.051
Sulphur (S)	1.5	30	30	34	39	38	33	38	40	40	43	46	47	55	50	53	53	54	49	45	49	41	44
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	0.0038	0.0037	0.0040	0.0020	0.0035	0.0022	0.0012	0.0013	0.0016	<0.0010	<0.0010	0.0032	0.0016	0.0019	0.0031	0.0019	0.0035	0.0033	0.0016	0.0032	0.0022	0.0019
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.024	0.19	0.19	0.17	0.20	0.20	0.17	0.16	0.14	0.13	0.098	0.11	0.14	0.13	0.12	0.12	0.12	0.14	0.14	0.12	0.12	0.099	0.12

Table B.6. Continued. Camp Lake Station SB-1 Water Quality - Laboratory Data

Parameter/Sample Date	26-Feb-19	29-May-19	29-May-19	5-Jun-19	12-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	8-Aug-19	14-Aug-19	21-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19
Dissolved Metals (mg/L)			**Duplicate**			**Duplicate**											**Duplicate**						
Aluminum (Al)	0.018	0.040	0.038	0.025	0.033	0.033	<0.0030	0.019	0.011	0.015	0.018	0.020	0.026	0.0048	0.010	<0.0030	<0.0030	0.0033	0.0048	0.0057	0.0054	0.0076	0.0077
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00036	<0.00020	<0.00020	0.00030	0.00032	0.00026	0.00020	0.00024	0.00022	<0.00020	<0.00020	0.00031	0.00033	0.00029	0.00030	0.00029	0.00024	0.00024	0.00024	0.00024	0.00035	<0.00020	<0.00020
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.022
Cadmium (Cd)	<0.020	0.55	0.49	0.47	0.44	0.46	0.13	0.38	0.31	0.34	0.29	0.25	0.35	0.36	0.29	0.36	0.27	0.33	0.29	0.26	0.25	0.24	0.26
Calcium (Ca)	10	36	37	38	42	42	38	40	42	41	44	41	43	51	48	50	50	50	48	41	43	41	45
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	0.00086	0.00087	0.00075	0.00085	0.00082	0.00038	0.00042	0.00041	0.00043	0.00033	<0.00030	0.00037	0.00033	0.00031	<0.00030	0.00034	0.00036	0.00031	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0014	0.018	0.017	0.013	0.014	0.014	0.0028	0.011	0.011	0.011	0.010	0.011	0.016	0.0088	0.0084	0.0058	0.0061	0.0063	0.0060	0.0061	0.0064	0.0058	0.0061
Iron (Fe)	0.19	1.8	1.9	2.6	3.2	3.0	<0.060	1.3	2.1	1.9	1.5	1.9	2.7	2.8	1.2	0.69	0.59	0.52	0.38	0.56	0.94	1.0	2.2
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.3	7.1	7.1	7.5	8.9	8.8	8.0	8.0	8.4	8.0	8.9	8.2	8.6	9.9	9.3	9.9	9.9	10	9.6	8.1	8.4	8.0	8.7
Manganese (Mn)	0.016	0.13	0.13	0.14	0.14	0.14	0.11	0.10	0.10	0.087	0.076	0.050	0.069	0.083	0.082	0.088	0.088	0.090	0.080	0.059	0.062	0.055	0.066
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00033	<0.00020	<0.00020	0.00093	<0.00020	<0.00020	<0.00020	0.00045	<0.00020	<0.00020	<0.00020	0.00052	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	<0.00050	<0.00050	0.00051	0.0010	0.0011	0.00082	0.00065	0.0011	0.0011	0.0011	0.00059	0.00088	0.0010	0.00059	0.00088	0.00070	0.00078	0.00085	0.00078	0.00074	<0.00050	0.00061	0.00094
Potassium (K)	1.6	3.1	3.2	3.4	3.8	3.7	3.3	3.4	3.6	3.6	3.9	3.7	3.8	4.3	4.0	4.5	4.4	4.4	4.3	3.6	3.8	3.5	4.0
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	1.9	1.3	1.3	1.2	1.2	1.2	0.96	0.96	0.89	0.78	0.78	0.70	0.71	0.79	0.82	0.88	0.87	0.9	0.93	0.93	0.95	1.0	1.0
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2	2.5	2.5	2.4	2.7	2.8	2.7	2.8	2.7	2.6	3.0	2.7	2.8	3.1	2.7	2.4	2.2	3.0	2.9	2.5	2.6	2.7	2.8
Strontium (Sr)	0.027	0.047	0.047	0.048	0.050	0.050	0.046	0.05	0.051	0.050	0.053	0.052	0.056	0.061	0.055	0.058	0.058	0.060	0.057	0.050	0.052	0.049	0.053
Sulphur (S)	1.5	31	29	38	42	42	35	40	43	41	47	43	46	53	50	55	54	55	52	43	46	44	47
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.014	0.17	0.17	0.15	0.16	0.15	0.074	0.13	0.11	0.11	0.089	0.093	0.10	0.097	0.093	0.089	0.093	0.097	0.096	0.087	0.095	0.080	0.096

Table B.7. Camp Lake Station SB-2 Water Quality - Laboratory Data

Parameter/Sample Date	26-Feb-19	26-Feb-19	29-May-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	23-Jul-19	31-Jul-19	8-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	18-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19	8-Oct-19
Physical-Chemical (mg/L)		**Duplicate**										**Duplicate**								**Duplicate**				**Duplicate**
pH (pH units)	7.35	7.37	7.00	7.05	6.92	6.69	6.67	6.71	6.44	6.48	6.42	6.43	6.29	5.96	6.04	6.00	5.56	6.18	6.05	6.05	5.96	6.51	6.33	6.35
Alkalinity (Total as $CaCO_3$)	32.4	33.1	16.6	13	13	13	13	8.7	12	12	13	12	9.8	4.0	6.1	4.7	2.5	12	9.2	9.3	5.8	9.1	6.1	6.0
Bicarbonate (HCO_3)	39.6	40.4	20.2	16	15	16	16	11	14	14	16	15	12	4.9	7.4	5.7	3.1	15	11	11	7.1	11	7.5	7.3
Carbonate (CO_3)	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	39	39	110	120	--	110	--	140	130	140	130	130	140	170	150	160	--	--	140	130	140	130	140	150
Total Hardness ($CaCO_3$)	41.6	41.2	98.2	105	--	103	--	136	130	133	143	143	148	158	154	--	--	--	147	144	154	136	136	139
Turbidity (NTU)	1.0	0.7	5.2	7.6	9.3	8.3	6.5	11	11	11	12	12	27	69	62	73	80	44	49	49	58	42	51	49
Total Suspended Solids (TSS)	<4.0	<4.0	<4.0	5.0	5.1	3.1	2.5	1.2	1.6	2.9	1.1	<1.0	2.9	11	10	7.7	11	6.5	9.8	8.3	13	7.8	11	9.7
Total Metals (mg/L)																								
Aluminum (Al)	0.028	0.028	0.081	0.072	0.087	0.062	0.053	0.047	0.043	0.059	0.044	0.043	0.077	0.10	0.099	0.10	0.11	0.073	0.063	0.061	0.077	0.071	0.10	0.097
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00074	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00034	0.00039	0.00033	0.00029	0.00039	0.00042	0.00029	0.00043	0.00046	0.00024	0.00044	0.00042	0.00022	0.00036	0.00047	0.00046	0.00038	0.00039	0.00034	0.00034	0.00039	0.00034	0.00031	0.00037
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	<0.010	0.010	0.011	<0.010	0.010	0.010	0.011	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.051	0.055	0.62	0.51	0.50	0.55	0.49	0.42	0.36	0.42	0.33	0.36	0.40	0.51	0.42	0.41	0.44	0.38	0.42	0.36	0.38	0.31	0.34	0.35
Calcium (Ca)	11	11	29	31	28	30	37	41	39	40	43	43	44	47	47	47	49	30	44	44	47	41	42	42
Chromium (Cr)	<0.0010	<0.0010	0.0013	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	0.0011	<0.0010	0.0013	<0.0010	<0.0010	<0.0010	0.0010	0.0012	<0.0010	<0.0010	0.0014	<0.0010	0.0011	<0.0010
Cobalt (Co)	<0.00030	<0.00030	0.0011	0.00081	0.00077	0.00075	0.00055	0.00057	0.00046	0.00042	0.00036	<0.00030	0.00053	0.00042	0.00044	0.00040	0.00040	<0.00030	0.00044	0.00032	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0027	0.0029	0.024	0.019	0.021	0.018	0.016	0.015	0.015	0.016	0.014	0.014	0.022	0.024	0.018	0.018	0.018	0.015	0.015	0.014	0.013	0.012	0.013	0.013
Iron (Fe)	0.27	0.25	2.5	3.5	3.8	3.3	2.8	3.6	3.1	2.9	2.8	2.8	5.2	12	8.3	8.3	9.1	4.3	4.8	4.7	7.6	4.6	5.7	5.9
Lead (Pb)	<0.00020	0.00022	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.4	3.4	6.0	6.4	6.1	6.8	7.5	8.1	7.6	7.9	8.5	8.6	8.9	9.7	8.8	9.0	9.8	6.4	8.7	8.5	9.0	8.1	7.9	8.0
Manganese (Mn)	0.019	0.019	0.11	0.12	0.097	0.10	0.10	0.10	0.085	0.073	0.065	0.066	0.078	0.10	0.082	0.082	0.093	0.058	0.067	0.065	0.078	0.058	0.061	0.062
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	0.0027	0.0022	<0.00020	<0.00020	<0.00020	0.0023	<0.00020	<0.00020	<0.00020	<0.00020	0.0017	<0.00020	<0.00020	0.0049	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00064	<0.00050	0.0010	0.0013	0.0011	0.0011	0.00098	0.0012	0.0012	0.00091	0.0011	0.00095	0.0013	0.00079	0.00097	0.00087	0.0011	0.0013	0.00097	0.00083	0.00075	0.00071	0.0010	0.00094
Potassium (K)	1.5	1.5	2.8	2.9	2.6	2.8	3.2	3.4	3.3	3.5	3.7	3.7	4.0	4.1	3.7	4.0	4.3	2.8	3.8	3.8	4.0	3.6	3.7	3.7
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00021	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	2.0	2.0	1.3	1.2	1.2	1.0	1.1	0.97	0.87	0.84	0.80	0.81	0.85	0.98	1.0	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.1	1.1
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.0	2.0	2.1	2.0	2.1	2.4	2.5	2.6	2.5	2.6	2.7	2.8	2.8	3.0	2.6	2.6	3.0	2.3	2.6	2.5	2.8	2.8	2.2	2.3
Strontium (Sr)	0.030	0.029	0.041	0.042	0.038	0.041	0.048	0.051	0.049	0.049	0.055	0.056	0.059	0.059	0.054	0.056	0.061	0.042	0.055	0.054	0.057	0.051	0.051	0.052
Sulphur (S)	1.5	1.5	28	31	27	30	36	41	38	41	43	43	46	52	48	49	54	30	45	44	49	42	43	43
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	0.0017	0.0025	0.0027	0.0019	<0.0010	0.0014	<0.0010	0.015	0.0016	<0.0010	0.0035	0.0016	0.0023	0.0031	0.0033	0.0038	0.0022	0.0020	0.0020	0.0021	0.0026	0.0034
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.023	0.025	0.20	0.16	0.17	0.16	0.15	0.14	0.12	0.12	0.11	0.11	0.13	0.14	0.12	0.13	0.13	0.12	0.12	0.11	0.12	0.10	0.12	0.12

Table B.7. Continued. Camp Lake Station SB-2 Water Quality - Laboratory Data

Parameter/Sample Date	26-Feb-19	26-Feb-19	29-May-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	23-Jul-19	31-Jul-19	8-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	18-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19	8-Oct-19
Dissolved Metals (mg/L)		**Duplicate**										**Duplicate**								**Duplicate**				**Duplicate**
Aluminum (Al)	0.015	0.016	0.042	0.032	0.029	<0.0030	0.015	0.011	0.021	0.027	0.022	0.022	0.023	0.0074	0.0095	<0.0030	0.0033	0.0070	0.0083	0.011	0.0058	0.0056	0.0071	0.0082
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00041	0.00039	0.00028	0.00033	0.00026	0.00028	0.00025	<0.00020	<0.00020	<0.00020	0.00025	0.00029	<0.00020	0.00033	0.00023	0.00023	0.00021	0.00028	0.00028	0.00024	<0.00020	0.00023	<0.00020	<0.00020
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.021	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.035	0.050	0.49	0.49	0.40	0.19	0.36	0.29	0.33	0.33	0.31	0.27	0.27	0.39	0.28	0.31	0.31	0.31	0.25	0.27	0.26	0.23	0.24	0.24
Calcium (Ca)	10	10	34	35	31	33	37	42	39	42	39	40	43	51	46	48	49	32	41	40	42	40	44	44
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	<0.00030	0.00077	0.00078	0.00054	<0.00030	0.00036	0.00047	0.00035	<0.00030	<0.00030	<0.00030	0.00032	0.00040	<0.00030	0.00032	0.00035	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0019	0.0019	0.017	0.015	0.013	0.0045	0.012	0.0099	0.012	0.011	0.011	0.011	0.014	0.0096	0.0076	0.0061	0.0062	0.008	0.0066	0.0064	0.0065	0.0057	0.0057	0.0062
Iron (Fe)	0.18	0.19	1.7	2.1	2.2	<0.060	1.3	1.6	2.0	2.0	1.8	1.2	2.6	2.7	0.70	0.45	0.73	0.34	0.58	0.59	1.8	1.2	1.6	1.7
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.2	3.3	6.9	7.0	6.8	7.2	7.6	8.3	7.6	8.7	7.9	8.1	8.5	9.7	8.9	9.5	10	6.8	8.2	8.0	8.3	7.8	8.5	8.5
Manganese (Mn)	0.015	0.016	0.12	0.12	0.10	0.092	0.094	0.098	0.081	0.072	0.047	0.049	0.070	0.098	0.079	0.083	0.092	0.055	0.060	0.058	0.071	0.051	0.059	0.060
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	0.0014	<0.00020	<0.00020	<0.00020	<0.00020	0.0011	<0.00020	<0.00020	<0.00020	<0.00020	0.0015	0.0030	<0.00020	0.0045	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00051	<0.00050	<0.00050	0.00097	0.00070	0.00074	0.00096	0.00095	0.00084	0.00070	0.00088	0.00096	0.00071	0.00054	0.00091	0.00068	0.00086	0.00065	0.00075	0.00076	<0.00050	0.00056	0.00093	0.00097
Potassium (K)	1.5	1.5	3.0	3.1	2.9	3.0	3.3	3.6	3.3	3.9	3.6	3.7	3.8	4.3	3.9	4.3	4.3	3.0	3.6	3.5	3.8	3.5	4.0	4.0
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00025	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	1.9	1.9	1.3	1.2	1.2	0.94	0.98	0.87	0.79	0.80	0.70	0.69	0.72	0.84	0.83	0.89	0.91	1.1	0.93	0.93	0.96	1.0	1.0	1.0
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.0	2.0	2.4	2.4	2.3	2.6	2.7	2.7	2.5	2.8	2.7	2.9	2.7	2.9	2.7	2.3	3.0	2.4	2.5	2.4	2.6	2.7	2.6	2.7
Strontium (Sr)	0.026	0.027	0.045	0.046	0.041	0.042	0.048	0.051	0.048	0.052	0.051	0.052	0.055	0.059	0.053	0.056	0.060	0.044	0.051	0.050	0.051	0.048	0.052	0.052
Sulphur (S)	1.4	1.4	28	35	29	31	37	42	38	43	41	41	45	51	48	53	55	31	43	42	46	43	46	47
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.022	0.023	0.16	0.16	0.14	0.094	0.12	0.11	0.11	0.096	0.10	0.11	0.089	0.10	0.087	0.090	0.094	0.10	0.09	0.092	0.10	0.078	0.090	0.094

Table B.8. Camp Lake Station EB-1 Water Quality - Laboratory Data

Parameter/Sample Date	26-Feb-19	29-May-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	8-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19
Physical-Chemical (mg/L)																				
pH (pH units)	7.33	6.75	6.94	6.85	6.59	6.63	6.99	6.41	6.41	6.37	6.24	6.25	6.21	6.11	5.94	5.99	5.98	6.03	6.41	6.39
Alkalinity (Total as $CaCO_3$)	35.7	8.77	8.2	7.8	9.9	9.1	8.3	9.2	8.8	9.9	8.1	7.6	7.1	5.8	5.8	5.0	6.5	7.4	5.6	6.5
Bicarbonate (HCO_3)	43.6	10.7	9.9	9.5	12	11	10	11	11	12	9.9	9.3	8.6	7.1	7.0	6.1	7.9	9.0	6.9	7.9
Carbonate (CO_3)	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	44	190	180	--	160	--	190	190	200	180	190	220	210	210	--	--	180	190	200	200
Total Hardness ($CaCO_3$)	46.2	59	162	--	144	--	184	182	191	202	197	216	215	--	--	--	196	212	199	177
Turbidity (NTU)	1.4	13	12	12	9.8	8.2	9.1	13	13	14	21	26	36	42	45	44	41	36	37	38
Total Suspended Solids (TSS)	<4.0	9	9	10	6.7	5.0	2.2	2.3	6.0	2.5	4.1	4.5	6.4	8.1	7.1	7.7	8.4	7	8.9	9.2
Total Metals (mg/L)																				
Aluminum (Al)	0.033	0.20	0.17	0.19	0.10	0.11	0.12	0.13	0.11	0.096	0.28	0.26	0.24	0.22	0.21	0.19	0.11	0.12	0.14	0.14
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00066	<0.00060	<0.00060
Arsenic (As)	0.00051	0.00037	0.00024	0.00044	0.00029	<0.00020	0.00030	0.00034	0.00023	0.00042	0.00026	0.00038	0.00044	0.00047	0.00034	0.00029	0.00022	0.00043	0.00026	0.00021
Barium (Ba)	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.012	0.012	0.012	0.013	0.013	0.011	0.012	0.012	0.012	0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.02	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.14	1.2	0.94	1.0	0.69	0.71	0.54	0.6	0.47	0.37	0.93	0.99	0.73	0.87	0.73	0.70	0.57	0.58	0.51	0.47
Calcium (Ca)	12	18	50	53	43	56	57	57	59	62	61	67	68	66	63	61	61	66	62	55
Chromium (Cr)	<0.0010	0.0012	<0.0010	<0.0010	0.0011	0.0010	<0.0010	<0.0010	<0.0010	0.0015	0.0015	0.0011	<0.0010	<0.0010	0.0012	0.0012	<0.0010	0.0016	<0.0010	<0.0010
Cobalt (Co)	<0.00030	0.0038	0.0027	0.0024	0.0014	0.0015	0.0010	0.00095	0.00073	0.00048	0.0014	0.00093	0.00064	0.00063	0.00062	0.00058	0.00051	0.00045	0.00040	0.00037
Copper (Cu)	0.0058	0.034	0.026	0.026	0.019	0.019	0.020	0.020	0.019	0.015	0.043	0.041	0.030	0.033	0.028	0.024	0.017	0.016	0.016	0.016
Iron (Fe)	0.32	0.53	4.6	4.5	3.8	3.0	2.7	2.8	2.9	2.8	3.3	4.3	4.9	5.3	5.5	5.0	4.0	3.8	3.5	3.4
Lead (Pb)	0.00037	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00022	0.0018	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.8	3.3	9.0	9.8	9.0	10	10	9.8	11	11	11	12	11	12	12	11	11	12	11	9.5
Manganese (Mn)	0.020	0.052	0.31	0.26	0.17	0.17	0.13	0.11	0.092	0.075	0.091	0.075	0.065	0.066	0.066	0.060	0.056	0.050	0.046	0.041
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00027	<0.00020	0.00026	<0.00020	<0.00020	<0.00020	<0.00020	0.0010	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.0012	0.0018	0.0021	0.0027	0.0016	0.0017	0.0016	0.0016	0.0014	0.0015	0.0023	0.0016	0.0018	0.0015	0.0021	0.0018	0.0013	0.0015	0.0013	0.0016
Potassium (K)	1.7	1.7	4.0	4.1	3.6	4.3	4.2	4.2	4.6	4.9	4.8	5.0	4.7	5.1	5.1	4.9	4.7	5.1	4.8	4.3
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00023	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00022	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	2.2	0.99	1.3	1.3	1.1	0.94	0.82	0.75	0.67	0.64	0.79	0.78	0.90	0.87	0.89	0.82	0.85	0.93	0.99	0.84
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.3	1.9	2.6	2.9	2.9	3.0	3.0	3.0	3.1	3.3	3.3	3.4	3.2	3.3	3.4	3.2	2.9	3.3	3.3	2.5
Strontium (Sr)	0.032	0.032	0.058	0.057	0.052	0.064	0.063	0.062	0.065	0.072	0.073	0.074	0.068	0.072	0.072	0.069	0.068	0.072	0.067	0.061
Sulphur (S)	2.3	12	52	54	46	57	57	57	61	65	64	70	67	68	67	65	62	68	64	57
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	0.0027	0.0048	0.0035	0.0028	0.0026	0.0025	0.0031	<0.0010	0.0013	0.0035	0.0050	0.0064	0.0033	0.0047	0.0038	0.0021	0.0030	0.0040	0.0044
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00012	<0.00010	<0.00010	0.00011	0.00013	0.00013	0.00017	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00012
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.048	0.37	0.29	0.29	0.20	0.21	0.17	0.17	0.15	0.13	0.27	0.25	0.19	0.23	0.23	0.22	0.18	0.18	0.16	0.17

Table B.8. Continued. Camp Lake Station EB-1 Water Quality - Laboratory Data

Parameter/Sample Date	26-Feb-19	29-May-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	8-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19
Dissolved Metals (mg/L)																				
Aluminum (Al)	0.012	0.024	0.016	0.030	0.011	0.0079	0.012	0.0062	0.020	0.032	0.046	0.045	0.033	0.0088	0.0066	0.0068	0.011	0.0097	0.0071	0.012
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00034	<0.00020	0.00022	<0.00020	0.00020	0.00021	<0.00020	<0.00020	<0.00020	0.0016	<0.00020	0.00025	0.00024	0.00022	0.00026	0.00025	0.00024	0.00024	0.00024	<0.00020
Barium (Ba)	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.011	0.010	0.011	0.012	0.011	0.010	0.010	0.010	0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.032	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.057	1.0	0.84	0.66	0.42	0.43	0.39	0.31	0.33	1.1	0.75	0.74	0.52	0.62	0.53	0.48	0.42	0.46	0.39	0.36
Calcium (Ca)	12	58	54	59	49	58	60	58	62	57	58	69	67	66	65	65	57	60	61	62
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	0.0032	0.0029	0.0021	0.0011	0.0012	0.0011	0.00088	0.00056	0.00040	0.0013	0.00079	0.00059	0.00054	0.00054	0.00050	0.00041	0.00034	<0.00030	0.00035
Copper (Cu)	0.003	0.013	0.0099	0.010	0.0088	0.0077	0.010	0.0052	0.0093	0.010	0.020	0.017	0.013	0.010	0.0081	0.0073	0.0068	0.0084	0.0075	0.0076
Iron (Fe)	0.20	1.3	1.1	0.7	0.81	0.19	0.23	<0.060	0.51	0.71	1.1	1.3	0.41	0.36	0.17	0.29	0.41	0.37	0.38	0.59
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.6	11	9.8	11	9.8	10	10	10	11	10	11	12	11	12	12	12	10	10	11	11
Manganese (Mn)	0.017	0.40	0.33	0.28	0.18	0.17	0.13	0.11	0.093	0.062	0.084	0.073	0.060	0.062	0.066	0.063	0.052	0.045	0.042	0.044
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	<0.00050	0.0016	0.0019	0.0017	0.0012	0.0015	0.0012	0.0013	0.0009	0.0011	0.0016	0.0012	0.0015	0.0015	0.0015	0.0013	0.0013	0.00070	0.00094	0.0011
Potassium (K)	1.7	4.5	4.2	4.7	3.9	4.5	4.5	4.4	5.0000	4.6	4.7	5.1	4.8	5.2	5.2	5.2	4.5	4.6	4.7	4.9
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	2.1	1.3	1.2	1.2	0.99	0.84	0.66	0.58	0.58	0.48	0.59	0.61	0.59	0.64	0.70	0.68	0.69	0.68	0.73	0.77
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.2	3.3	2.9	3.2	3.1	3.1	3.2	3.1	3.5	3.2	3.2	3.3	3.3	2.6	3.5	3.4	2.9	3.0	3.3	3.2
Strontium (Sr)	0.03	0.067	0.062	0.062	0.057	0.065	0.064	0.063	0.068	0.065	0.069	0.072	0.068	0.069	0.073	0.071	0.063	0.064	0.064	0.066
Sulphur (S)	2.2	52	57	60	46	60	61	58	63	61	64	68	68	69	69	69	61	64	67	65
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.029	0.32	0.28	0.22	0.15	0.14	0.13	0.12	0.097	0.097	0.21	0.19	0.15	0.17	0.17	0.16	0.14	0.16	0.14	0.14

Table B.9. Camp Lake Station EB-2 Water Quality - Laboratory Data

Parameter/Sample Date	26-Feb-19	29-May-19	5-Jun-19	12-Jun-19	19-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	8-Aug-19	14-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	18-Sep-19	25-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19
Physical-Chemical (mg/L)						Duplicate									Duplicate						Duplicate		
pH (pH units)	7.4	6.77	6.94	6.92	6.59	6.60	6.59	7.04	6.36	6.38	6.39	6.27	6.25	6.22	6.18	6.14	5.94	6.02	5.98	6.03	6.03	6.41	6.32
Alkalinity (Total as $CaCO_3$)	44.4	8.96	9.1	8.0	8.4	8.5	9.9	8.5	9.4	8.8	10	7.8	7.3	7.2	7.8	6.3	6.1	5.3	6.5	7.0	6.9	5.6	6.9
Bicarbonate (HCO_3)	54.1	10.9	11	9.7	10	10	12	10	11	11	12	9.6	8.9	8.7	9.5	7.7	7.5	6.5	8.0	8.5	8.4	6.9	8.4
Carbonate (CO_3)	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	61	180	180	--	190	190	--	200	180	210	190	190	220	210	220	220	--	--	190	200	200	210	200
Total Hardness ($CaCO_3$)	63.3	155	166	--	165	169	--	190	186	196	203	203	222	220	214	--	--	--	203	224	224	208	186
Turbidity (NTU)	0.9	13	13	12	9.3	9.8	8.9	9.6	13	13	15	20	27	34	34	39	45	40	38	37	38	36	39
Total Suspended Solids (TSS)	<4.0	10	8.0	12	6.9	9.1	5.2	2.6	4.1	6.5	2.5	4.1	5.5	6.9	6.9	4.7	7.5	6.9	7.7	8.9	8.2	8.5	10
Total Metals (mg/L)																							
Aluminum (Al)	0.042	0.27	0.18	0.19	0.14	0.13	0.13	0.14	0.16	0.14	0.11	0.28	0.35	0.26	0.25	0.32	0.24	0.20	0.12	0.19	0.20	0.17	0.17
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00072	0.00081	<0.00060	<0.00060
Arsenic (As)	0.00064	0.00028	0.00030	0.00038	0.00024	0.00032	0.00038	0.00025	0.00032	0.00030	0.00047	0.00023	0.00037	0.00041	0.00046	0.00035	0.00031	0.00036	0.00029	0.00034	0.00032	0.00036	0.00024
Barium (Ba)	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.010	0.010	0.010	0.012	0.013	0.012	0.012	0.013	0.013	0.012	0.012	0.014	0.014	0.012	0.011
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.25	2.1	1.0	0.96	0.79	0.84	0.73	0.57	0.58	0.53	0.39	1.0	1.0	0.76	0.71	0.97	0.76	0.69	0.61	0.57	0.67	0.54	0.50
Calcium (Ca)	17	47	51	55	50	51	61	60	58	61	63	63	69	69	68	68	64	65	63	70	70	65	58
Chromium (Cr)	<0.0010	0.0014	<0.0010	0.0012	<0.0010	0.0011	<0.0010	<0.0010	0.0014	<0.0010	0.0012	0.0014	0.0012	<0.0010	<0.0010	<0.0010	0.0013	0.0012	<0.0010	0.0014	0.0029	<0.0010	0.0011
Cobalt (Co)	<0.00030	0.0043	0.0030	0.0027	0.0023	0.0021	0.0018	0.0012	0.0011	0.00093	0.00063	0.0017	0.0010	0.00081	0.00085	0.00082	0.00062	0.00066	0.00055	0.00049	0.00056	0.00044	0.00040
Copper (Cu)	0.012	0.042	0.028	0.026	0.021	0.020	0.018	0.018	0.019	0.019	0.015	0.042	0.041	0.030	0.030	0.031	0.025	0.023	0.018	0.016	0.017	0.016	0.017
Iron (Fe)	0.37	4.9	4.8	4.4	3.6	3.6	3.2	2.7	2.7	2.9	2.8	3.1	4.4	4.8	4.7	4.9	5.5	4.7	4.0	3.9	3.9	3.3	3.6
Lead (Pb)	0.00022	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00021	0.00022	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	5.0	9.0	9.2	9.9	9.9	10	11	10	9.9	11	11	11	12	11	11	11	12	11	11	12	12	11	10
Manganese (Mn)	0.017	0.35	0.33	0.28	0.22	0.23	0.19	0.14	0.11	0.099	0.078	0.089	0.079	0.068	0.066	0.060	0.067	0.059	0.058	0.054	0.055	0.046	0.044
Molybdenum (Mo)	<0.00020	0.0014	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00027	<0.00020	0.00046	<0.00020	<0.00020	0.00092	0.00097	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00095	0.0045	0.0028	0.0026	0.0019	0.0020	0.0020	0.0020	0.0018	0.0015	0.0015	0.0022	0.0018	0.0019	0.0020	0.0020	0.0018	0.0018	0.0012	0.0015	0.0017	0.0012	0.0014
Potassium (K)	2.4	3.8	4.1	4.2	4.0	4.1	4.6	4.2	4.3	4.7	4.8	4.9	5.2	4.7	4.6	5.1	5.1	4.9	4.8	5.3	5.2	4.9	4.5
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00023	<0.00020	<0.00020	<0.00020	<0.00020	0.00025	<0.00020	0.00023	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	2.8	1.4	1.3	1.4	1.1	1.1	1.1	0.86	0.82	0.75	0.64	0.78	0.94	0.94	0.94	1.0	0.96	0.84	0.86	1.1	1.1	1.1	0.93
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	3.1	2.7	2.7	2.9	3.1	3.2	3.2	3.0	3.0	3.1	3.3	3.3	3.5	3.2	3.1	3.2	3.4	3.2	3.0	3.4	3.4	3.4	2.7
Strontium (Sr)	0.042	0.056	0.060	0.058	0.058	0.059	0.068	0.064	0.063	0.066	0.072	0.075	0.076	0.069	0.068	0.073	0.074	0.070	0.069	0.075	0.075	0.069	0.064
Sulphur (S)	4.3	51	53	56	54	55	61	59	58	63	65	66	72	68	66	70	68	68	65	72	71	67	60
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	0.0016	0.0097	0.0061	0.0043	0.0040	0.0037	0.0033	0.0023	0.0041	0.0018	0.0012	0.0038	0.0049	0.0066	0.0056	0.0098	0.0064	0.0039	0.0050	0.0076	0.0069	0.0044	0.0057
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00014	0.00013	0.00014	0.00012	0.00014	<0.00010	<0.00010	<0.00010	0.00011	<0.00010	<0.00010	0.00013
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.09	0.45	0.33	0.31	0.26	0.25	0.22	0.19	0.18	0.17	0.14	0.27	0.27	0.20	0.20	0.25	0.22	0.21	0.19	0.20	0.20	0.18	0.18

Table B.9. Continued. Camp Lake Station EB-2 Water Quality - Laboratory Data

Parameter/Sample Date	26-Feb-19	29-May-19	5-Jun-19	12-Jun-19	19-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	8-Aug-19	14-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	18-Sep-19	25-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19
Dissolved Metals (mg/L)						Duplicate									Duplicate						Duplicate		
Aluminum (Al)	0.020	0.027	0.014	0.017	<0.0030	<0.0030	0.0069	0.0084	0.0061	0.016	0.030	0.063	0.033	0.038	0.038	0.0093	0.0070	0.0069	0.0081	0.0088	0.023	0.0091	0.016
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00059	<0.00020	0.00020	<0.00020	<0.00020	0.00020	<0.00020	0.00022	<0.00020	<0.00020	0.00034	0.00026	0.00022	0.00034	0.00029	<0.00020	0.00025	0.00022	0.00025	<0.00020	0.00027	<0.00020	<0.00020
Barium (Ba)	0.013	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	0.010	0.011	0.011	0.011	0.011	0.012	0.011	0.011	0.011	0.011	0.011	0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.022	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.16	1.0	0.81	0.69	0.38	0.33	0.39	0.34	0.29	0.32	0.26	0.73	0.70	0.49	0.54	0.63	0.54	0.54	0.43	0.48	0.52	0.39	0.38
Calcium (Ca)	16	56	55	61	59	59	61	63	56	65	60	60	70	67	67	69	65	67	59	63	63	65	62
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	0.0035	0.0028	0.0024	0.0018	0.0016	0.0012	0.0010	0.00091	0.00069	0.00045	0.0014	0.00089	0.00059	0.00064	0.00068	0.00058	0.00053	0.00044	0.00043	0.00049	<0.00030	0.00033
Copper (Cu)	0.0066	0.012	0.0091	0.0080	0.0028	0.0025	0.0063	0.0075	0.0045	0.0082	0.0089	0.022	0.015	0.012	0.013	0.0086	0.0079	0.0073	0.0064	0.0070	0.0097	0.0065	0.0072
Iron (Fe)	0.29	1.1	1.0	0.64	<0.060	0.083	0.11	0.14	<0.060	0.31	0.52	0.58	1.5	0.41	0.41	0.32	0.15	0.22	0.36	0.32	0.33	0.42	0.59
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	4.9	10	9.8	11	11	11	11	11	9.6	12	11	11	12	11	11	12	12	12	11	11	11	11	11
Manganese (Mn)	0.015	0.40	0.34	0.31	0.25	0.25	0.18	0.14	0.11	0.10	0.066	0.083	0.073	0.062	0.062	0.060	0.066	0.061	0.054	0.048	0.048	0.047	0.044
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00068	0.0017	0.0022	0.0020	0.0017	0.0017	0.0021	0.0015	0.0012	0.0012	0.0012	0.0018	0.0014	0.0014	0.0016	0.0018	0.0015	0.0015	0.0011	0.0011	0.00088	0.0010	0.0010
Potassium (K)	2.4	4.3	4.3	4.7	4.5	4.6	4.6	4.7	4.2	5.2	5.0	4.7	5.2	4.9	4.9	5.3	5.1	5.3	4.7	4.8	4.9	4.9	5.0
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00021	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	2.7	1.3	1.2	1.2	1.0	1.0	0.89	0.70	0.57	0.61	0.49	0.56	0.63	0.60	0.59	0.64	0.70	0.67	0.69	0.69	0.68	0.73	0.77
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	3.0	3.0	2.9	3.2	3.4	3.4	3.2	3.2	3.0	3.6	3.3	3.3	3.4	3.3	3.3	2.7	3.4	3.4	3.0	3.1	3.2	3.3	3.2
Strontium (Sr)	0.041	0.063	0.062	0.064	0.062	0.062	0.067	0.066	0.060	0.071	0.068	0.072	0.073	0.068	0.069	0.072	0.072	0.072	0.066	0.066	0.067	0.068	0.066
Sulphur (S)	4.3	51	58	62	56	55	62	63	57	63	63	65	69	69	68	73	70	72	64	67	67	70	65
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.069	0.33	0.26	0.23	0.15	0.14	0.13	0.12	0.12	0.099	0.097	0.21	0.18	0.15	0.15	0.17	0.17	0.17	0.14	0.17	0.18	0.14	0.14

Table B.10. Camp Lake Station SC-1 Water Quality - Laboratory Data

Parameter/Sample Date	24-Jan-19	27-Feb-19	29-May-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	8-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	11-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19	23-Oct-19	2-Nov-19	16-Dec-19
Physical-Chemical (mg/L)																									
pH (pH units)	7.33	7.36	7.10	7.18	7.21	6.70	6.92	7.17	6.63	6.59	6.53	6.43	6.46	6.45	6.41	6.26	6.27	6.27	6.21	6.21	6.81	6.71	6.85	7.18	7.20
Alkalinity (Total as $CaCO_3$)	29.3	29.9	24.5	25	23	25	23	25	26	24	24	24	24	24	26	24	24	27	26	24	25	26	25	27	26
Bicarbonate (HCO_3)	35.7	36.4	29.9	31	28	30	28	30	31	30	29	30	29	30	32	29	30	32	32	30	31	31	31	33	32
Carbonate (CO_3)	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	37	39	31	29	--	31	--	31	29	31	29	30	32	31	31	--	--	30	28	31	29	30	30	29	--
Total Hardness ($CaCO_3$)	34.3	36.7	26.4	26.7	--	26.9	--	29.9	27.6	30.3	29.8	30.7	31.4	30.2	--	--	--	30.0	30.6	31.6	29.8	30.0	31.7	--	--
Turbidity (NTU)	0.5	0.8	3.3	2.1	1.2	1.1	1.0	1.3	0.85	0.79	1.1	1.4	0.95	1.1	2.7	2.2	0.97	1.5	1.0	0.95	2.3	1.7	1.2	3.0	0.71
Total Suspended Solids (TSS)	<4.0	<4.0	<4.0	<4.0	2.4	1.8	1.4	2.5	<1.0	2.1	<1.0	1.7	1.7	1.5	2.3	<1.0	2	1.8	<1.0	<1.0	3.1	3.2	4.8	1.8	<1.0
Total Metals (mg/L)																									
Aluminum (Al)	0.037	0.033	0.11	0.054	0.073	0.064	0.053	0.043	0.036	0.041	0.041	0.045	0.030	0.036	0.039	0.035	0.034	0.032	0.033	0.038	0.058	0.051	0.069	0.037	0.028
Antimony (Sb)	0.0010	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.018	<0.00060	0.00082	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00050	0.00048	0.00041	0.00037	0.00051	0.00060	0.00045	0.00056	0.00043	0.00048	0.00040	0.00032	0.00047	0.00053	0.00057	0.00042	0.00037	0.00052	0.00048	0.00041	0.00052	0.00039	0.00039	0.00032	0.00054
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.14	0.054	0.44	0.40	0.50	0.45	0.42	0.44	0.33	0.36	0.19	0.84	0.41	0.31	0.36	0.29	0.27	0.31	0.30	0.26	0.18	0.28	0.26	0.35	0.16
Calcium (Ca)	9.0	9.7	6.8	7.0	7.5	6.8	7.7	7.9	7.2	7.8	7.7	7.9	8.1	8.0	8.1	7.5	7.3	7.6	7.9	8.2	7.7	7.9	8.3	7.8	8.6
Chromium (Cr)	<0.0010	<0.0010	0.0012	<0.0010	<0.0010	0.0012	0.0010	<0.0010	0.0012	0.0032	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0045	0.0013	<0.0010	<0.0010	0.0013	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0053	0.0030	0.019	0.016	0.020	0.017	0.019	0.016	0.014	0.015	0.0081	0.035	0.015	0.012	0.013	0.013	0.012	0.013	0.012	0.0085	0.0078	0.011	0.0096	0.012	0.0058
Iron (Fe)	0.21	0.21	0.35	0.24	0.28	0.24	0.22	0.19	0.20	0.23	0.25	0.22	0.27	0.21	0.27	0.22	0.16	0.18	0.18	0.22	0.30	0.27	0.19	0.13	0.099
Lead (Pb)	0.00036	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	2.9	3.0	2.3	2.2	2.4	2.4	2.5	2.5	2.3	2.6	2.6	2.6	2.7	2.5	2.6	2.6	2.5	2.7	2.6	2.7	2.6	2.5	2.7	2.6	2.8
Manganese (Mn)	0.016	0.018	0.035	0.027	0.035	0.034	0.025	0.025	0.022	0.028	0.038	0.035	0.031	0.024	0.027	0.020	0.018	0.022	0.022	0.023	0.022	0.021	0.018	0.012	0.0067
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	0.00040	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0017	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00078	0.00077	0.00059	<0.00050	0.00089	0.00070	0.00068	0.00069	0.00068	0.0022	0.00058	0.00095	<0.00050	<0.00050	0.00056	0.0021	0.00053	0.00074	0.00057	0.00051	<0.00050	<0.00050	0.00063	0.00061	0.00064
Potassium (K)	1.4	1.4	1.2	1.1	1.2	1.1	1.2	1.1	1.0	1.1	1.0	1.2	1.1	1.0	1.1	1.2	1.1	1.2	1.2	1.3	1.1	1.2	1.3	1.3	1.2
Selenium (Se)	0.00053	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00024	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0071	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00023	0.00081
Silicon (Si)	1.8	1.8	1.4	1.3	1.3	1.0	1.1	1.1	0.91	1.1	1.1	1.1	1.3	1.2	1.3	1.3	1.2	1.2	1.3	1.5	1.4	1.3	1.4	1.3	1.4
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010
Sodium (Na)	1.6	1.8	1.3	1.2	1.4	1.5	1.5	1.5	1.4	1.5	1.5	1.6	1.6	1.4	1.4	1.6	1.5	1.9	1.4	1.7	1.7	1.3	1.6	1.7	1.6
Strontium (Sr)	0.024	0.025	<0.020	0.020	<0.020	0.020	0.022	0.021	<0.020	0.022	0.023	0.025	0.023	0.021	0.022	0.023	0.021	0.023	0.023	0.024	0.022	0.022	0.023	0.021	0.023
Sulphur (S)	1.2	1.2	1.4	1.4	1.5	1.4	1.6	1.6	1.3	1.5	1.3	2.3	1.5	1.4	1.5	1.5	1.4	1.6	1.5	1.5	1.4	1.6	1.6	1.6	1.5
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	0.0012	0.0013	0.0038	0.0031	0.0025	0.0025	0.0022	0.0015	0.0013	0.0018	<0.0010	0.0021	<0.0010	<0.0010	0.0017	0.0021	0.0013	0.0012	0.0011	0.0016	0.0028	0.0019	0.0053	<0.0010	0.0012
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.040	0.024	0.14	0.13	0.15	0.14	0.13	0.15	0.11	0.13	0.07	0.29	0.13	0.092	0.11	0.10	0.10	0.12	0.11	0.080	0.062	0.11	0.091	0.12	0.057

Table B.10. Continued. Camp Lake Station SC-1 Water Quality - Laboratory Data

Parameter/Sample Date	24-Jan-19	27-Feb-19	29-May-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	3-Jul-19	9-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	8-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	4-Sep-19	11-Sep-19	18-Sep-19	25-Sep-19	2-Oct-19	8-Oct-19	23-Oct-19	2-Nov-19	16-Dec-19
Dissolved Metals (mg/L)																									
Aluminum (Al)	0.016	0.018	0.028	0.023	0.030	0.0067	0.022	0.019	0.020	0.017	0.015	0.022	0.011	0.018	0.011	0.013	0.013	0.010	0.014	0.014	0.012	0.015	0.053	0.026	0.017
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00039	0.00042	<0.00020	0.00026	0.00038	0.00032	0.00036	0.00037	0.00043	0.00031	0.00049	0.00028	0.00040	0.00044	0.00040	0.00038	0.00038	0.00037	0.00046	0.00034	0.00033	0.00023	0.00036	0.00042	0.00049
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.094	0.034	0.30	0.34	0.39	0.18	0.38	0.43	0.28	0.29	0.13	0.77	0.38	0.25	0.29	0.27	0.26	0.27	0.29	0.18	0.13	0.23	0.24	0.28	0.14
Calcium (Ca)	9.6	10	8.2	7.7	8.3	8.0	7.9	8.0	7.5	8.0	7.2	7.7	8.3	8.2	7.9	7.8	7.7	7.7	7.1	7.9	7.3	7.8	7.8	7.5	8.9
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0035	0.0016	0.013	0.014	0.016	0.007	0.015	0.016	0.012	0.011	0.0071	0.030	0.013	0.011	0.011	0.011	0.010	0.011	0.010	0.0081	0.006	0.0084	0.0093	0.011	0.0055
Iron (Fe)	<0.060	<0.060	0.17	0.14	0.14	0.12	0.24	0.12	0.14	0.22	0.16	0.13	0.16	0.12	0.13	0.10	0.081	0.084	0.079	0.096	0.079	0.078	0.15	0.12	0.096
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.1	3.2	2.5	2.4	2.7	2.7	2.5	2.6	2.4	2.7	2.5	2.6	2.7	2.6	2.6	2.7	2.6	2.6	2.4	2.6	2.5	2.6	2.5	2.5	3.0
Manganese (Mn)	0.0093	0.015	0.015	0.016	0.018	0.029	0.019	0.020	0.016	0.017	0.018	0.027	0.014	0.0094	0.0095	0.011	0.010	0.014	0.011	0.012	0.0068	0.0081	0.016	0.012	0.0071
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00033	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00058	0.00050	<0.00050	0.00052	<0.00050	<0.00050	<0.00050	0.00062	0.00060	<0.00050	0.00058	0.00063	<0.00050	0.00056	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Potassium (K)	1.5	1.5	1.2	1.2	1.3	1.2	1.1	1.1	1.1	1.2	1.1	1.2	1.3	1.0	1.2	1.2	1.1	1.3	1.1	1.2	1.1	1.3	1.3	1.3	1.4
Selenium (Se)	0.00039	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00026	<0.00020
Silicon (Si)	1.8	1.9	1.3	1.3	1.2	0.95	0.95	0.99	0.88	0.98	0.93	1.0	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.3	1.3	1.3	1.3	1.3	1.5
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00012
Sodium (Na)	2.0	2.2	1.4	1.3	1.5	1.6	1.7	1.5	1.5	1.8	1.6	1.6	1.6	1.5	0.86	1.6	1.6	1.7	1.3	1.6	1.7	1.6	1.7	1.6	1.7
Strontium (Sr)	0.026	0.027	0.021	0.021	0.021	0.022	0.022	0.022	0.021	0.022	0.024	0.024	0.023	0.021	0.022	0.023	0.022	0.023	0.021	0.023	0.021	0.022	0.021	0.021	0.023
Sulphur (S)	1.4	1.4	1.4	1.6	1.6	1.4	1.7	1.7	1.5	1.5	1.8	2.4	1.6	1.5	1.6	1.5	1.4	1.5	1.4	1.5	1.5	1.7	1.6	1.6	1.6
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0024	0.0011	0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0002	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.037	0.018	0.11	0.12	0.14	0.085	0.13	0.15	0.11	0.11	0.063	0.28	0.13	0.098	0.099	0.098	0.10	0.11	0.11	0.079	0.058	0.095	0.090	0.11	0.052

Table B.11. Cold Lake Station CL-2 Water Quality - Laboratory Analyses

Sample Date	25-Feb-19	25-Feb-19	28-May-19	28-May-19	4-Jun-19	4-Jun-19	18-Jun-19	18-Jun-19	2-Jul-19	2-Jul-19	15-Jul-19	15-Jul-19	7-Aug-19	7-Aug-19	3-Sep-19	3-Sep-19	26-Sep-19	26-Sep-19	9-Oct-19	9-Oct-19
Parameter/Station	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**
Physical-Chemical (mg/L)																				
pH (pH units)	7.40	7.54	6.84	7.07	7.00	7.03	7.26	7.45	6.50	6.77	7.21	7.49	7.39	7.38	6.47	6.45	6.99	6.98	7.17	7.16
Alkalinity (Total as $CaCO_3$)	26.6	36.2	28.2	24.2	24	23	24	21	23	24	25	24	23	24	25	24	24	24	25	25
Bicarbonate (HCO_3)	32.5	44.1	34.4	29.5	29	28	29	26	29	29	31	29	28	29	31	29	29	29	38	31
Carbonate (CO_3)	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	150	62	180	80	72	70	79	78	81	68	84	67	71	70	--	--	74	73	75	75
Total Hardness ($CaCO_3$)	132	54.1	159	66.9	74.9	76.6	67.3	66.9	70.8	65.1	82.9	62.5	63.2	62.9	--	--	76.3	78.0	76.0	77.1
Turbidity (NTU)	0.7	0.8	13	2.6	3.2	2.5	1.8	1.5	1.5	1.4	2.3	1.1	1.3	1.5	2.3	2.1	2.7	2.8	3.9	3.8
Total Suspended Solids (TSS)	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	2.9	2.2	1.3	1.1	1.3	<1.0	2.9	1.6	3.2	4.4	1.8	1.6	1.4	3
Total Metals (mg/L)																				
Aluminum (Al)	0.014	0.024	0.025	0.058	0.065	0.075	0.046	0.042	0.042	0.042	0.038	0.035	0.042	0.041	0.036	0.049	0.034	0.032	0.025	0.027
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	0.00065	0.00073	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00064	<0.00060	<0.00060
Arsenic (As)	0.00037	0.00047	0.00054	0.00041	0.00053	0.00054	0.00055	0.00051	0.00049	0.00042	<0.00020	0.00042	0.00041	0.00043	0.00037	0.00037	0.00045	0.00046	0.00029	0.00036
Barium (Ba)	0.012	0.010	0.015	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	0.012	<0.010	0.011	0.011	0.011	0.011	0.011	0.012	0.011	0.011
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	0.076	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.029	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.10	0.08	0.24	0.23	0.21	0.26	0.16	0.16	0.20	0.087	0.17	0.076	0.11	0.066	0.077	0.059	0.060	0.050	0.046	0.039
Calcium (Ca)	45	16	55	21	23	24	20	21	23	20	27	19	19	19	20	20	23	24	23	24
Chromium (Cr)	<0.0010	<0.0010	0.0012	<0.0010	0.0011	0.0011	0.0011	0.0011	0.0013	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0013	0.0018	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	<0.00030	0.00091	<0.00030	0.00031	0.00043	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0057	0.0061	0.0077	0.014	0.012	0.013	0.0091	0.0090	0.0083	0.0067	0.0071	0.0058	0.0069	0.0064	0.0061	0.0059	0.0049	0.0049	0.0052	0.0054
Iron (Fe)	0.092	0.11	2.0	0.63	0.70	0.68	0.52	0.54	0.50	0.36	0.65	0.39	0.29	0.28	0.39	0.39	0.46	0.46	0.49	0.49
Lead (Pb)	<0.00020	0.00094	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	4.7	3.7	5.2	3.5	4.0	4.1	4.0	3.8	3.5	3.7	4.0	3.7	3.8	3.8	4.0	4.1	4.4	4.5	4.4	4.5
Manganese (Mn)	0.023	0.0064	0.26	0.066	0.061	0.062	0.020	0.041	0.037	0.011	0.100	0.0088	0.015	0.017	0.026	0.026	0.033	0.035	0.029	0.029
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00023	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00026	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00069	<0.00050	0.00091	0.0018	0.00088	0.00088	0.00063	<0.00050	0.00068	0.00062	0.00051	0.00057	0.00071	0.00063	0.00062	0.00064	<0.00050	<0.00050	<0.00050	0.00063
Potassium (K)	3.3	2.4	4.0	1.9	2.1	2.1	2.0	1.9	2.0	1.9	2.4	1.9	2.0	1.9	2.0	2.1	2.1	2.2	2.2	2.2
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00022	<0.00020
Silicon (Si)	0.82	0.99	1.4	1.0	1.0	1.1	0.78	0.84	0.98	0.64	1.1	0.51	0.57	0.56	0.66	0.65	0.72	0.74	0.71	0.72
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	3.1	2.5	3.4	2.0	2.1	2.2	2.3	2.2	2.2	2.1	2.5	2.2	2.1	2.1	2.3	2.3	2.2	2.3	2.2	2.3
Strontium (Sr)	0.056	0.035	0.068	0.034	0.036	0.037	0.034	0.034	0.037	0.035	0.042	0.035	0.035	0.036	0.037	0.038	0.041	0.041	0.04	0.04
Sulphur (S)	34	6.6	45	15	16	16	16	15	16	14	20	14	13	13	15	15	17	17	17	17
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	0.0017	0.0022	0.0012	0.0015	0.0014	0.0013	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0021	<0.0010	<0.0010	0.0013	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00011	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.047	0.036	0.089	0.075	0.088	0.095	0.061	0.065	0.064	0.036	0.06	0.033	0.026	0.026	0.022	0.021	0.024	0.019	0.016	0.017

Table B.11. Continued. Cold Lake Station CL-2 Water Quality - Laboratory Analyses

Sample Date	25-Feb-19	25-Feb-19	28-May-19	28-May-19	4-Jun-19	4-Jun-19	18-Jun-19	18-Jun-19	2-Jul-19	2-Jul-19	15-Jul-19	15-Jul-19	7-Aug-19	7-Aug-19	3-Sep-19	3-Sep-19	26-Sep-19	26-Sep-19	9-Oct-19	9-Oct-19
Parameter/Station	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**	**CL-2 (btm)**	**CL-2 (sfc)**
Dissolved Metals (mg/L)																				
Aluminum (Al)	0.0056	0.0098	0.011	0.031	0.030	0.034	0.0047	0.017	0.026	0.017	0.018	0.017	0.015	0.016	0.0085	0.010	0.0074	0.0063	0.0070	0.0083
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00093	<0.00060
Arsenic (As)	0.00021	0.00041	0.00022	0.00023	0.00039	0.00047	0.00034	0.00021	0.00032	0.00038	<0.00020	<0.00020	0.00038	0.00039	0.00044	0.00032	0.00044	0.00046	0.00042	0.00035
Barium (Ba)	0.013	0.011	0.016	0.011	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	<0.010	0.011	0.011	0.010	0.010	0.011	0.010	0.010	0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	0.089	<0.020	<0.020	<0.020	<0.020	<0.020	0.026	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.035	0.064	0.19	0.18	0.19	0.18	0.042	0.14	0.16	0.079	0.16	0.069	0.042	0.042	0.025	0.026	0.027	0.029	<0.020	0.023
Calcium (Ca)	49	18	63	25	23	22	25	24	26	21	27	20	21	21	21	21	22	22	23	23
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	<0.00030	0.00059	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0021	0.0051	0.0055	0.0088	0.0083	0.0085	0.0032	0.0073	0.0078	0.0069	0.0068	0.0056	0.0050	0.0050	0.0047	0.0046	0.0044	0.0040	0.0051	0.0042
Iron (Fe)	<0.060	<0.060	1.1	0.44	0.40	0.33	<0.060	0.32	0.24	0.25	0.34	0.18	0.15	0.15	0.11	0.10	0.091	0.085	0.11	0.13
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	5.5	4.4	5.8	4.3	3.9	3.8	4.3	4.4	4.0	3.8	4.1	4.0	4.2	4.2	4.2	4.2	4.5	4.4	4.3	4.3
Manganese (Mn)	0.022	0.0054	0.28	0.067	0.046	0.042	<0.0040	<0.0040	<0.0040	<0.0040	0.047	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	0.00025	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	<0.00050	0.00063	<0.00050	<0.00050	<0.00050	0.00061	<0.00050	0.00062	0.00072	0.00064	0.00073	0.00051	<0.00050	<0.00050	<0.00050	<0.00050	0.00057	<0.00050	0.00056	0.00070
Potassium (K)	4.0	3.0	4.5	2.3	2.3	2.2	2.4	2.2	2.4	2.0	2.4	2.0	2.1	2.1	2.2	2.3	2.3	2.2	2.3	2.3
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00028	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	0.93	1.1	1.5	1.1	0.93	0.92	0.86	0.75	0.97	0.53	1.1	0.49	0.51	0.50	0.58	0.58	0.62	0.61	0.70	0.70
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	3.7	3.3	3.8	2.3	2.5	2.5	2.5	2.4	2.4	2.4	2.7	2.4	2.3	2.2	2.4	2.4	2.5	2.5	2.5	2.5
Strontium (Sr)	0.064	0.041	0.075	0.040	0.037	0.036	0.039	0.038	0.040	0.036	0.041	0.036	0.039	0.038	0.038	0.038	0.040	0.040	0.038	0.038
Sulphur (S)	40	8	46	16	16	16	15	16	16	13	20	14	12	12	14	14	16	16	20	19
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.030	0.036	0.073	0.066	0.069	0.067	0.033	0.049	0.066	0.034	0.058	0.027	0.020	0.022	0.015	0.015	0.013	0.013	0.012	0.014

Table B.12. Cold Lake Station CL-4 Water Quality - Laboratory Analyses

Sample Date	25-Feb-19	25-Feb-19	28-May-19	28-May-19	4-Jun-19	4-Jun-19	18-Jun-19	18-Jun-19	2-Jul-19	2-Jul-19	15-Jul-19	15-Jul-19	7-Aug-19	7-Aug-19	3-Sep-19	3-Sep-19	26-Sep-19	26-Sep-19	9-Oct-19	9-Oct-19
Parameter/Station	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**
Physical-Chemical (mg/L)																				
pH (pH units)	7.01	7.44	6.97	7.02	6.96	6.91	7.20	7.40	6.51	6.79	7.28	7.57	7.22	7.42	6.46	6.48	7.03	6.95	6.74	7.14
Alkalinity (Total as $CaCO_3$)	23.6	37	24.1	23	24	22	22	23	25	25	25	24	25	24	25	26	25	23	26	25
Bicarbonate (HCO_3)	28.8	45.1	29.4	28	30	27	27	28	31	31	30	29	30	29	30	32	30	28	32	31
Carbonate (CO_3)	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	190	49	85	96	74	64	75	73	75	62	71	65	73	64	--	--	69	69	69	67
Total Hardness ($CaCO_3$)	183	43.4	69.9	81.8	78.3	68.3	68.4	63.5	66.8	55.5	63.7	60.9	64.8	62.7	--	--	71.6	73.0	70.0	69.3
Turbidity (NTU)	13	1.2	4.3	4.1	2.9	2.6	3.3	1.7	2.8	1.3	3.9	1.0	7.6	1.7	2.7	2.4	2.5	3.0	3.5	3.5
Total Suspended Solids (TSS)	<4.0	<4.0	<4.0	4.0	4.0	<4.0	3.7	3.1	2.9	1.9	1.3	<1.0	1.7	1.0	2.7	5.3	2.0	2.3	<1.0	1.6
Total Metals (mg/L)																				
Aluminum (Al)	0.025	0.038	0.060	0.071	0.060	0.055	0.048	0.039	0.049	0.055	0.040	0.032	0.046	0.043	0.038	0.043	0.042	0.038	0.033	0.036
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00078	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00088	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00028	0.00055	0.00040	0.00035	0.00052	0.00051	0.00062	0.00044	0.00050	0.00039	0.00037	0.00029	0.00032	0.00038	0.00042	0.00041	0.00058	0.00042	0.00027	0.00037
Barium (Ba)	0.018	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	0.011	<0.010	0.011	0.012	0.010	0.010	0.012	0.011	0.011	0.011
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	0.11	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.19	0.13	0.24	0.35	0.21	0.21	0.17	0.16	0.16	0.079	0.088	0.076	0.093	0.072	0.067	0.059	0.17	0.054	0.042	0.041
Calcium (Ca)	64	12	22	25	25	21	21	19	21	17	20	18	20	19	19	18	22	22	21	21
Chromium (Cr)	<0.0010	<0.0010	0.0010	0.0011	0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	0.0094	0.0016	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	0.0014	<0.00030	0.00037	0.00051	0.00033	0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0054	0.0069	0.011	0.014	0.011	0.0097	0.0083	0.0084	0.0075	0.0059	0.0061	0.0053	0.0062	0.0068	0.0062	0.0053	0.0052	0.0047	0.0049	0.0049
Iron (Fe)	2.4	0.27	0.73	1.2	0.77	0.54	0.73	0.48	0.66	0.30	0.64	0.34	0.99	0.34	0.42	0.37	0.42	0.44	0.41	0.40
Lead (Pb)	<0.00020	0.00071	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00026	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	5.9	3.5	3.5	4.4	4.0	3.8	3.7	3.8	3.5	3.4	3.6	3.7	3.6	3.9	3.8	3.7	4.3	4.3	4.2	4.1
Manganese (Mn)	0.48	0.021	0.081	0.084	0.072	0.050	0.096	0.018	0.074	0.011	0.10	0.0095	0.19	0.018	0.025	0.024	0.021	0.021	0.019	0.019
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00053	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00031	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00087	0.00070	0.00065	<0.00050	0.00082	0.00082	0.00062	0.00068	0.00055	0.00064	<0.00050	0.00057	0.00075	0.00073	0.0023	0.00055	0.00057	<0.00050	<0.00050	0.00051
Potassium (K)	4.4	2.4	2.1	2.2	2.2	2.0	1.9	1.9	1.9	1.7	1.9	1.8	2.1	1.9	1.9	1.9	2.0	2.1	2.0	2.0
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00023	<0.00020
Silicon (Si)	1.8	1.9	1.1	1.0	1.1	0.97	1.1	0.71	1.0	0.56	0.91	0.47	1.1	0.56	0.61	0.60	0.69	0.70	0.67	0.66
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00014	<0.00010	<0.00010	<0.00010
Sodium (Na)	3.8	2.3	2.1	2.1	2.2	2.1	2.3	2.2	2.1	2.0	2.2	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.2
Strontium (Sr)	0.072	0.029	0.036	0.037	0.037	0.034	0.035	0.033	0.035	0.032	0.035	0.034	0.035	0.036	0.036	0.035	0.040	0.040	0.038	0.038
Sulphur (S)	52	2.5	16	21	17	14	15	14	15	11	14	13	13	13	13	12	15	15	15	15
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0014	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	0.0010	0.0014	0.0014	0.0014	0.0013	0.0018	0.0018	0.0016	0.0021	0.0013	<0.0010	<0.0010	0.0017	0.0010	0.0020	0.0014	0.0013	0.0016	0.0017
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00028	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.082	0.051	0.077	0.11	0.080	0.068	0.060	0.055	0.055	0.030	0.040	0.028	0.034	0.026	0.021	0.021	0.017	0.017	0.014	0.015

Table B.12. Continued. Cold Lake Station CL-4 Water Quality - Laboratory Analyses

Sample Date	25-Feb-19	25-Feb-19	28-May-19	28-May-19	4-Jun-19	4-Jun-19	18-Jun-19	18-Jun-19	2-Jul-19	2-Jul-19	15-Jul-19	15-Jul-19	7-Aug-19	7-Aug-19	3-Sep-19	3-Sep-19	26-Sep-19	26-Sep-19	9-Oct-19	9-Oct-19
Parameter/Station	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**	**CL-4 (btm)**	**CL-4 (sfc)**
Dissolved Metals (mg/L)																				
Aluminum (Al)	0.0059	0.014	0.026	0.030	0.025	0.021	0.020	<0.0030	0.020	0.016	0.017	0.016	0.016	0.015	0.0093	0.010	0.0078	0.0074	0.0096	0.0099
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	<0.00020	0.00033	0.00025	0.00023	0.00037	0.00038	0.00029	0.00021	0.00032	0.00039	0.00021	0.00023	0.00039	0.00039	0.00044	0.00038	0.00044	0.00041	0.00036	0.00032
Barium (Ba)	0.019	0.011	0.011	0.010	0.010	<0.010	0.010	<0.010	0.010	0.010	0.010	<0.010	0.012	<0.010	0.010	0.010	0.010	0.010	0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	0.11	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.21	0.13	0.16	0.24	0.16	0.14	0.12	0.025	0.12	0.055	0.091	0.075	0.074	0.042	0.026	0.024	0.026	0.029	0.024	<0.020
Calcium (Ca)	67	13	27	30	23	20	23	22	24	19	22	19	23	19	19	19	20	21	21	20
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	0.0014	<0.00030	<0.00030	0.00037	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0035	0.0052	0.0075	0.010	0.0077	0.0068	0.0063	0.0033	0.0073	0.0059	0.0056	0.0055	0.0051	0.0049	0.0046	0.0043	0.0041	0.0043	0.0039	0.0042
Iron (Fe)	0.21	0.12	0.43	0.77	0.42	0.30	0.34	<0.060	0.25	0.22	0.26	0.15	0.40	0.14	0.092	0.11	0.077	0.081	0.096	0.10
Lead (Pb)	<0.00020	0.0003	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	6.3	3.9	4.2	5.3	3.8	3.6	4.0	4.3	3.9	3.7	4.0	4.0	4.0	3.9	4.1	4.0	4.3	4.3	4.1	4.0
Manganese (Mn)	0.51	0.020	0.088	0.086	0.062	0.029	0.074	<0.0040	0.026	<0.0040	0.054	0.0051	0.17	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Molybdenum (Mo)	<0.00020	0.00022	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00038	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00069	0.00055	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00072	0.0006	<0.00050	0.00070	0.00057	<0.00050	0.00058	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Potassium (K)	5.0	2.9	2.5	2.6	2.4	2.0	2.3	2.2	2.3	1.9	2.2	2.0	2.1	1.8	2.2	2.2	2.2	2.1	2.2	2.1
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	1.9	2.1	1.2	1.1	0.98	0.87	1.1	0.72	0.97	0.42	0.89	0.46	1.0	0.44	0.55	0.52	0.57	0.57	0.61	0.60
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	4.1	2.6	2.4	2.4	3.2	2.0	2.4	2.4	2.3	2.5	2.5	2.2	2.2	2.1	2.5	2.4	2.4	2.4	2.5	2.4
Strontium (Sr)	0.077	0.032	0.042	0.043	0.038	0.034	0.037	0.037	0.039	0.035	0.037	0.035	0.038	0.034	0.037	0.037	0.039	0.039	0.036	0.036
Sulphur (S)	56	2.9	17	22	17	14	16	15	14	9.9	14	14	13	13	13	12	15	15	17	16
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.083	0.051	0.059	0.085	0.065	0.057	0.052	0.020	0.058	0.027	0.040	0.026	0.032	0.019	0.013	0.015	0.017	0.012	0.012	0.013

Table B.13. Cold Lake Station CL-5 Water Quality - Laboratory Analyses

Sample Date	26-Feb-19	26-Feb-19	28-May-19	28-May-19	4-Jun-19	4-Jun-19	18-Jun-19	18-Jun-19	2-Jul-19	2-Jul-19	15-Jul-19	15-Jul-19	7-Aug-19	7-Aug-19	3-Sep-19	3-Sep-19	26-Sep-19	26-Sep-19	9-Oct-19	9-Oct-19
Parameter/Station	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**
Physical-Chemical (mg/L)																				
pH (pH units)	7.46	7.41	7.03	7.14	6.89	7.06	7.33	7.37	6.70	6.64	7.23	6.68	7.46	7.47	6.49	6.49	7.02	6.97	6.67	7.18
Alkalinity (Total as $CaCO_3$)	27.8	33.3	25.7	23.9	24	25	23	21	24	24	27	24	23	23	25	26	27	25	23	25
Bicarbonate (HCO_3)	34	40.6	31.3	29.2	29	31	28	26	30	30	33	30	28	28	31	31	33	31	28	30
Carbonate (CO_3)	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	110	46	78	67	75	62	71	69	62	59	68	61	60	65	--	--	65	66	67	69
Total Hardness ($CaCO_3$)	112	40.6	67.6	159	78.4	65.2	61.0	63.1	56.5	53.4	65.8	56.7	57.3	57.2	--	--	67.6	68.3	64.6	65.8
Turbidity (NTU)	0.9	1.0	3.8	2.7	3.8	2.8	1.6	1.8	1.5	1.4	2.0	0.92	1.2	1.7	2.8	2.4	3.4	2.5	2.7	3.4
Total Suspended Solids (TSS)	<4.0	<4.0	<4.0	4.0	<4.0	<4.0	3.3	2.8	1.4	1.7	2.1	1.3	1.1	2.2	2.5	2.5	3.0	2.5	1.1	1.3
Total Metals (mg/L)																				
Aluminum (Al)	0.030	0.034	0.053	0.071	0.055	0.086	0.045	0.045	0.047	0.064	0.041	0.039	0.047	0.052	0.048	0.048	0.12	0.046	0.039	0.036
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00094	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00061	0.00068	<0.00060	<0.00060
Arsenic (As)	0.00035	0.00043	0.00040	0.00035	0.00043	0.00059	0.00052	0.00038	0.00041	0.00040	0.00033	0.00039	0.00039	0.00044	0.00058	0.00033	0.00046	0.00047	0.00032	0.00042
Barium (Ba)	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	0.011	<0.010	<0.010	0.010	0.010	0.010	0.012	0.012	0.011	0.011
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.14	0.11	0.18	0.17	0.20	0.17	0.12	0.14	0.083	0.074	0.10	0.078	0.060	0.059	0.053	0.041	0.072	0.060	0.040	0.037
Calcium (Ca)	37	11	21	49	25	20	18	19	17	16	20	17	17	17	18	17	20	21	19	20
Chromium (Cr)	<0.0010	<0.0010	0.0012	<0.0010	0.0014	<0.0010	<0.0010	0.0013	0.0010	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	0.0015	0.0020	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0066	0.0052	0.0098	0.0090	0.0096	0.0099	0.0086	0.0089	0.0061	0.0058	0.0064	0.0057	0.0060	0.0055	0.0060	0.0054	0.0062	0.0046	0.0048	0.0049
Iron (Fe)	0.18	0.26	0.63	5.1	0.74	0.52	0.45	0.48	0.31	0.27	0.41	0.22	0.23	0.24	0.38	0.34	0.71	0.35	0.32	0.33
Lead (Pb)	<0.00020	0.00033	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	4.4	3.3	3.5	9.0	3.9	3.7	3.6	3.9	3.3	3.3	3.7	3.5	3.6	3.6	3.7	3.7	4.1	4.1	3.9	4.0
Manganese (Mn)	0.016	0.019	0.072	0.34	0.082	0.046	0.026	0.018	0.018	0.011	0.041	0.0084	0.014	0.015	0.027	0.023	0.021	0.020	0.016	0.017
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00067	<0.00020	0.0041	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00067	0.00083	<0.00050	<0.00050	0.00079	0.00066	0.00060	0.00075	0.00054	0.00059	<0.00050	0.00065	0.00053	0.00078	0.00095	0.00097	<0.00050	<0.00050	0.00054	0.0006
Potassium (K)	2.7	1.3	1.9	3.7	2.2	1.9	1.8	1.9	1.7	1.6	2.0	1.7	1.8	1.8	1.8	1.8	2.0	2.0	1.9	2.0
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00023	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	0.96	1.8	1.0	1.4	1.1	0.95	0.72	0.73	0.63	0.54	0.95	0.45	0.49	0.52	0.61	0.59	0.75	0.69	0.63	0.62
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.8	2.0	2.1	2.7	2.2	2.0	2.1	2.3	2.0	2.0	2.3	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1
Strontium (Sr)	0.049	0.027	0.035	0.056	0.038	0.033	0.032	0.034	0.032	0.032	0.036	0.033	0.033	0.033	0.035	0.035	0.038	0.039	0.036	0.037
Sulphur (S)	24	2.0	15	51	17	13	13	14	11	10	14	12	11	11	12	11	14	14	13	13
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	0.0010	0.0014	<0.0010	0.0011	0.0024	0.0022	0.0016	0.0022	0.0028	0.0015	<0.0010	<0.0010	0.0026	<0.0010	0.0014	0.0034	0.0027	0.0019	0.0023
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00013	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.058	0.039	0.065	0.064	0.072	0.069	0.053	0.057	0.038	0.030	0.046	0.027	0.020	0.020	0.020	0.017	0.025	0.030	0.013	0.015

Table B.13. Continued. Cold Lake Station CL-5 Water Quality - Laboratory Analyses

Sample Date	26-Feb-19	26-Feb-19	28-May-19	28-May-19	4-Jun-19	4-Jun-19	18-Jun-19	18-Jun-19	2-Jul-19	2-Jul-19	15-Jul-19	15-Jul-19	7-Aug-19	7-Aug-19	3-Sep-19	3-Sep-19	26-Sep-19	26-Sep-19	9-Oct-19	9-Oct-19
Parameter/Station	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**	**CL-5 (btm)**	**CL-5 (sfc)**
Dissolved Metals (mg/L)																				
Aluminum (Al)	0.0057	0.018	0.029	0.032	0.030	0.028	0.027	0.018	0.017	0.015	0.019	0.016	0.014	0.014	0.010	0.0091	0.008	0.008	0.007	0.010
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00027	0.00032	0.00033	0.00022	0.00027	0.00026	0.00031	0.00039	0.00033	0.00038	<0.00020	0.00022	0.00037	0.00042	0.00034	0.00038	0.00047	0.00043	0.00033	0.00030
Barium (Ba)	0.011	0.010	0.011	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	0.010	0.010	0.010	0.01	0.011	0.011
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	0.021	<0.020	<0.020	<0.020	0.028	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.063	0.072	0.16	0.15	0.16	0.13	0.12	0.11	0.071	0.045	0.088	0.061	0.028	0.042	0.028	0.023	0.029	0.020	0.022	<0.020
Calcium (Ca)	37	12	24	21	24	19	22	21	19	18	21	18	18	19	18	18	19	20	20	21
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0027	0.0038	0.0077	0.0078	0.0075	0.0069	0.0064	0.0073	0.0063	0.0053	0.0065	0.0052	0.0045	0.0048	0.0044	0.0038	0.0037	0.0040	0.0039	0.0041
Iron (Fe)	<0.060	<0.060	0.41	0.32	0.34	0.25	0.29	0.35	0.23	0.11	0.30	0.21	0.11	0.10	0.092	0.10	0.084	0.077	0.063	0.075
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	5.0	3.8	4.0	3.8	3.7	3.5	4.1	4.1	3.5	3.6	3.8	3.8	3.7	4.1	3.9	3.8	4.1	4.1	4.1	4.2
Manganese (Mn)	0.012	0.018	0.069	0.045	0.069	0.021	0.017	<0.0040	<0.0040	<0.0040	0.012	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Molybdenum (Mo)	0.0018	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	<0.00050	0.00060	<0.00050	<0.00050	0.00053	0.00054	0.00063	0.00061	0.00066	0.00060	0.00071	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Potassium (K)	3.2	1.7	2.2	2.1	2.4	2.0	2.1	2.1	1.9	1.9	2.0	1.8	1.7	1.9	2.1	2.1	2.1	2.0	2.1	2.1
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	1.1	2.0	1.1	0.98	1.0	0.80	0.73	0.74	0.54	0.41	0.93	0.43	0.41	0.43	0.52	0.49	0.55	0.54	0.58	0.60
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	3.2	2.6	2.3	2.2	2.7	3.0	2.5	2.3	2.4	2.2	2.4	2.3	2.1	2.2	2.4	2.4	2.4	2.4	2.5	2.5
Strontium (Sr)	0.053	0.031	0.040	0.036	0.039	0.034	0.037	0.035	0.035	0.034	0.035	0.033	0.034	0.038	0.036	0.036	0.038	0.038	0.037	0.037
Sulphur (S)	28	2.5	15	13	17	13	14	15	11	9.4	15	13	12	11	11	11	14	13	15	15
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.040	0.040	0.060	0.059	0.063	0.053	0.051	0.052	0.037	0.026	0.048	0.024	0.017	0.018	0.012	0.011	0.011	0.011	0.011	0.012

Table B.14. Cold Lake Station CL-6 Water Quality - Laboratory Analyses

Sample Date	26-Feb-19	26-Feb-19	28-May-19	28-May-19	4-Jun-19	4-Jun-19	18-Jun-19	18-Jun-19	2-Jul-19	2-Jul-19	15-Jul-19	15-Jul-19	7-Aug-19	7-Aug-19	3-Sep-19	3-Sep-19	26-Sep-19	26-Sep-19	9-Oct-19	9-Oct-19
Parameter/Station	**CL-6 (btm)**	**CL-6 (sfc)**	**CL-6 (btm)**	**CL-6 (sfc)**	**CL-6 (btm)**	**CL-6 (sfc)**	**CL-6 (btm)**	**CL-6 (sfc)**	**CL-6 (btm)**	**CL-6 (sfc)**	**CL-6 (btm)**	**CL-6 (sfc)**	**CL-6 (btm)**	**CL-6 (sfc)**	**CL-6 (btm)**	**CL-6 (sfc)**	**CL-6 (btm)**	**CL-6 (sfc)**	**CL-6 (btm)**	**CL-6 (sfc)**
Physical-Chemical (mg/L)																				
pH (pH units)	7.46	7.19	7.09	7.20	7.07	6.98	7.41	7.33	6.75	6.67	7.53	6.69	7.44	7.43	6.50	6.49	7.08	7.01	6.69	6.69
Alkalinity (Total as $CaCO_3$)	32.4	40.1	24.1	25.6	23	24	24	24	26	25	24	24	25	24	26	26	27	25	27	25
Bicarbonate (HCO_3)	39.6	48.9	29.4	31.2	29	30	30	29	31	31	29	29	30	29	32	32	33	31	32	30
Carbonate (CO_3)	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	66	53	62	56	53	53	52	54	54	51	54	54	54	54	--	--	57	57	56	54
Total Hardness ($CaCO_3$)	57.8	46.6	52.9	46.1	54.6	57.0	46.5	47.9	49.4	46.3	50.5	52.0	52.3	53.0	--	--	60.3	61.4	53.7	53.0
Turbidity (NTU)	1.1	2.3	3.9	4.0	2.8	2.8	1.0	1.2	1.1	1.7	0.99	0.95	1.5	1.5	1.6	1.7	2.2	1.7	2.1	2.4
Total Suspended Solids (TSS)	<4.0	<4.0	<4.0	<4.0	4.0	<4.0	2.1	2.1	4.0	2.0	1.9	<1.0	1.5	<1.0	2.6	2.1	2.4	2.3	2.4	<1.0
Total Metals (mg/L)																				
Aluminum (Al)	0.026	0.051	0.051	0.064	0.047	0.056	0.032	0.048	0.054	0.061	0.038	0.038	0.056	0.045	0.056	0.054	0.054	0.050	0.040	0.050
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00083	0.00081	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00069	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00046	0.00054	0.00040	0.00054	0.00064	0.00058	0.00072	0.00060	0.00045	0.00051	0.00041	0.00051	0.00042	0.00035	0.00042	0.00033	0.00053	0.00040	0.00038	0.00048
Barium (Ba)	<0.010	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.011	0.010	0.010	0.011	0.010	0.010	0.010	0.012	0.012	0.011	0.011
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.077	<0.020	0.11	0.10	0.073	0.10	0.051	0.062	0.057	0.051	0.047	0.040	0.039	0.041	0.041	0.035	0.043	0.029	0.029	0.025
Calcium (Ca)	17	12	16	14	16	17	14	14	15	14	15	15	15	16	15	16	18	18	16	15
Chromium (Cr)	<0.0010	<0.0010	0.0010	<0.0010	0.0012	<0.0010	0.0015	<0.0010	0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0015	0.0015	<0.0010	<0.0010	<0.0010	0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0047	0.0014	0.0066	0.0057	0.0058	0.0068	0.0042	0.0053	0.0044	0.0040	0.0043	0.0048	0.0048	0.0048	0.0046	0.0048	0.0040	0.0040	0.0038	0.0043
Iron (Fe)	0.15	0.84	0.39	0.31	0.29	0.34	0.12	0.28	0.20	0.18	0.14	0.16	0.23	0.21	0.23	0.24	0.25	0.24	0.18	0.19
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.6	3.9	3.0	2.9	3.4	3.4	3.1	3.1	3.1	3.0	3.3	3.4	3.4	3.5	3.5	3.5	3.8	3.9	3.5	3.5
Manganese (Mn)	0.012	0.065	0.046	0.031	0.028	0.031	0.011	0.012	0.013	0.011	0.009	0.0089	0.026	0.026	0.018	0.017	0.018	0.018	0.017	0.017
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0028	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00055	<0.00050	<0.00050	<0.00050	0.00065	<0.00050	<0.00050	<0.00050	0.00082	0.00085	0.00058	0.00073	0.00055	0.00063	0.00060	0.00093	0.00055	<0.00050	0.00056	0.00069
Potassium (K)	1.7	1.8	1.6	1.4	1.7	1.7	1.4	1.6	1.5	1.5	1.6	1.7	1.7	1.7	1.7	1.7	1.8	1.9	1.7	1.7
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00021	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00021
Silicon (Si)	0.86	1.8	0.77	0.69	0.61	0.72	0.34	0.53	0.48	0.38	0.38	0.39	0.49	0.47	0.53	0.53	0.59	0.62	0.48	0.49
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.3	2.4	1.9	1.8	2.0	2.0	2.1	2	2.0	1.9	2.1	2.1	2.0	2.1	2.2	2.2	2.1	2.2	2.1	2.1
Strontium (Sr)	0.034	0.034	0.030	0.028	0.031	0.032	0.030	0.028	0.031	0.030	0.032	0.033	0.033	0.033	0.034	0.034	0.037	0.038	0.034	0.034
Sulphur (S)	8.9	1.6	10	8.0	9.2	9.8	7.6	8.5	8.5	7.5	9.2	9.5	9.2	9.3	9.5	9.8	11	11	9.4	9.1
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	0.0013	0.0016	0.0015	0.0020	0.0019	0.0018	0.0022	0.0030	0.0012	0.0019	0.0055	0.0012	0.0025	0.0014	0.0025	0.0021	0.0027	0.0028
Uranium (U)	<0.00010	<0.00010	<0.00010	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00012
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.030	0.0074	0.043	0.035	0.034	0.047	0.021	0.030	0.024	0.019	0.018	0.020	0.016	0.017	0.013	0.016	0.013	0.013	0.011	0.012

Table B.14. Continued. Cold Lake Station CL-6 Water Quality - Laboratory Analyses

Sample Date	26-Feb-19	26-Feb-19	28-May-19	28-May-19	4-Jun-19	4-Jun-19	18-Jun-19	18-Jun-19	2-Jul-19	2-Jul-19	15-Jul-19	15-Jul-19	7-Aug-19	7-Aug-19	3-Sep-19	3-Sep-19	26-Sep-19	26-Sep-19	9-Oct-19	9-Oct-19
Parameter/Station	CL-6 (btm)	CL-6 (sfc)	CL-6 (btm)	CL-6 (sfc)	CL-6 (btm)	CL-6 (sfc)	CL-6 (btm)	CL-6 (sfc)	CL-6 (btm)	CL-6 (sfc)	CL-6 (btm)	CL-6 (sfc)	CL-6 (btm)	CL-6 (sfc)	CL-6 (btm)	CL-6 (sfc)	CL-6 (btm)	CL-6 (sfc)	CL-6 (btm)	CL-6 (sfc)
Dissolved Metals (mg/L)																				
Aluminum (Al)	0.0062	0.022	0.022	0.024	0.020	0.022	0.0075	0.020	0.015	0.014	0.014	0.017	0.016	0.014	0.010	0.0098	0.0076	0.0072	0.0078	0.0068
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00097	0.0011
Arsenic (As)	0.0004	0.00041	0.00023	0.00029	0.00029	0.00041	0.00029	0.00026	0.00041	0.00039	0.00039	0.00024	0.00037	0.00041	0.00048	0.00037	0.00052	0.00053	0.00038	0.0003
Barium (Ba)	0.011	0.015	0.010	0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	0.012	<0.010	0.01	0.01	0.01	0.01	0.011	0.01
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.037	<0.020	0.094	0.076	0.072	0.062	0.030	0.054	0.038	0.028	0.024	0.024	<0.020	0.021	<0.020	0.022	0.022	<0.020	<0.020	<0.020
Calcium (Ca)	19	14	19	17	16	16	15	16	16	15	16	16	16	16	16	16	17	17	17	16
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0023	0.00099	0.0056	0.0050	0.0044	0.0051	0.0028	0.0047	0.0048	0.0045	0.0039	0.0043	0.0039	0.0040	0.0036	0.0037	0.0035	0.0033	0.0040	0.0039
Iron (Fe)	<0.060	0.5	0.2	0.16	0.11	0.15	<0.060	0.2	0.079	<0.060	0.13	0.13	0.074	0.080	0.064	0.068	<0.060	<0.060	<0.060	<0.060
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	4.2	4.6	3.5	3.5	3.2	3.2	3.4	3.5	3.3	3.2	3.5	3.5	3.6	3.5	3.6	3.7	3.7	3.8	3.6	3.5
Manganese (Mn)	0.0098	0.071	0.028	0.015	<0.0040	0.0047	<0.0040	0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0071	<0.0040
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00027	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00061	0.00056	<0.00050	0.00054	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00058	<0.00050
Potassium (K)	2.2	2.2	1.8	1.9	1.8	1.8	1.7	1.8	1.7	1.7	1.7	1.7	2.0	1.6	1.9	2.0	1.8	1.8	1.9	1.8
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	0.93	1.9	0.77	0.66	0.51	0.59	0.31	0.5	0.36	0.26	0.33	0.35	0.38	0.38	0.41	0.41	0.43	0.43	0.37	0.39
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.7	2.8	2.1	2.1	2.7	2.2	2.3	2.1	2.2	2.1	2.3	2.3	2.4	2.0	2.3	2.5	2.3	2.3	2.4	2.3
Strontium (Sr)	0.039	0.038	0.035	0.034	0.033	0.032	0.033	0.031	0.033	0.032	0.033	0.032	0.036	0.032	0.034	0.035	0.036	0.036	0.034	0.033
Sulphur (S)	11	2.0	10	8.3	9.0	9.6	7.9	8.9	8.2	7.3	9.5	10	9.2	9.7	9.5	9.6	11	10	9.3	10
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.024	0.0097	0.037	0.030	0.028	0.035	0.017	0.027	0.024	0.016	0.015	0.016	0.013	0.013	0.0091	0.0088	0.0094	0.0091	0.011	0.013

Table B.15. Cold Lake Station CL-3 Water Quality - Laboratory Analyses

Sample Date	25-Feb-19	25-Feb-19	25-Feb-19	28-May-19	28-May-19	28-May-19	4-Jun-19	4-Jun-19	12-Jun-19	12-Jun-19	18-Jun-19	18-Jun-19	26-Jun-19	26-Jun-19	2-Jul-19	2-Jul-19	2-Jul-19	9-Jul-19	9-Jul-19	15-Jul-19	15-Jul-19	23-Jul-19	23-Jul-19
Parameter/Station	**CL-3 (btm)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**
Physical-Chemical (mg/L)		**Duplicate**				**Duplicate**										**Duplicate**							
pH (pH units)	7.35	7.32	7.35	7.00	6.89	6.88	7.17	7.23	7.26	7.28	6.79	6.71	6.79	6.82	7.13	7.31	7.33	6.61	6.57	6.65	6.65	6.58	6.59
Alkalinity (Total as $CaCO_3$)	33.6	32.2	33.5	23.2	15.6	15.1	21	22	21	24	23	21	21	23	23	21	23	25	23	21	18	24	24
Bicarbonate (HCO_3)	41.0	39.3	40.8	28.2	19.0	18.4	25	27	26	30	28	26	26	28	28	25	28	30	28	26	22	30	29
Carbonate (CO_3)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	49	49	48	85	160	160	100	72	--	--	82	93	--	--	75	73	67	60	63	73	84	57	57
Total Hardness ($CaCO_3$)	50.9	50.6	49.6	70.9	133	136	99.4	67.5	--	--	75.0	79.3	--	--	74.4	75.5	68.2	60.4	65.5	73.4	81.9	61.1	61.3
Turbidity (NTU)	0.8	0.9	0.9	3.5	7.1	7.8	5.2	3.2	3.0	2.8	3.1	2.9	2.6	2.1	2.5	2.2	1.7	1.1	1.3	1.9	2.8	1.1	1.1
Total Suspended Solids (TSS)	<4.0	<4.0	<4.0	<4.0	4.0	<4.0	4.0	<4.0	2.5	3.6	2.7	2.3	1.5	2.0	3.0	1.1	3.0	<1.0	1.3	1.1	1.6	1.5	1.0
Total Metals (mg/L)																							
Aluminum (Al)	0.034	0.033	0.034	0.077	0.11	0.11	0.067	0.054	0.056	0.058	0.048	0.042	0.047	0.048	0.050	0.041	0.051	0.037	0.038	0.046	0.046	0.033	0.033
Antimony (Sb)	<0.00060	0.00068	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.0008	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00055	0.00046	0.00044	0.00044	0.00033	0.00024	0.00033	0.00034	0.00036	0.00056	0.00032	0.00038	0.00043	0.00051	0.00041	0.00055	0.00037	0.00054	0.00057	0.00048	0.00040	0.00041	0.00057
Barium (Ba)	0.011	0.011	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	<0.010	0.010	0.010	<0.010	<0.010	0.010	<0.010	0.010	0.012
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.029	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.12	0.097	0.090	0.25	0.67	0.66	0.38	0.21	0.26	0.22	0.21	0.24	0.12	0.11	0.12	0.11	0.089	0.078	0.11	0.10	0.14	0.046	0.046
Calcium (Ca)	14	14	13	22	42	42	31	21	25	23	23	24	24	23	23	23	21	18	20	22	25	18	18
Chromium (Cr)	<0.0010	<0.0010	<0.0010	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0013	0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0014	<0.0010	<0.0010	0.0011	0.0011	0.0014
Cobalt (Co)	<0.00030	<0.00030	<0.00030	0.00045	0.0012	0.0014	0.00064	<0.00030	0.00031	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0056	0.0057	0.0058	0.013	0.024	0.028	0.014	0.0096	0.012	0.011	0.010	0.018	0.0082	0.0076	0.0065	0.0075	0.0067	0.0064	0.0066	0.0076	0.0078	0.0052	0.0055
Iron (Fe)	0.24	0.23	0.25	0.87	3.0	3.1	2.1	0.8	1.2	0.94	0.94	1.1	0.71	0.55	0.65	0.57	0.39	0.29	0.34	0.51	0.73	0.22	0.22
Lead (Pb)	0.00036	0.00055	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.9	3.8	3.9	3.9	7.1	7.5	5.4	3.7	4.6	4.3	4.5	4.8	4.4	4.2	4.2	4.3	3.9	3.6	3.8	4.4	4.8	3.9	3.9
Manganese (Mn)	0.017	0.015	0.018	0.069	0.15	0.16	0.11	0.060	0.060	0.052	0.033	0.039	0.026	0.019	0.022	0.017	0.012	0.0098	0.0099	0.015	0.023	0.008	0.011
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0011	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00030	<0.00020	<0.00020	<0.00020	<0.00020	0.071	<0.00020	0.00030	<0.00020	<0.00020
Nickel (Ni)	0.00078	0.00065	0.00094	0.0010	0.0014	0.0019	0.00098	0.00061	0.00090	0.0011	0.00062	0.0031	0.00073	0.00089	0.00072	0.00086	0.00062	0.00074	0.00079	0.00064	0.00080	0.00076	0.00085
Potassium (K)	1.8	1.8	1.8	1.9	3.1	3.3	2.7	2.0	2.3	2.2	2.1	2.3	2.2	2.1	2.0	2.0	1.9	1.8	1.9	2.1	2.3	1.8	1.8
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0002	0.00025	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	1.8	1.6	1.9	1.0	1.2	1.2	1.0	0.90	0.95	0.93	0.82	0.76	0.77	0.77	0.68	0.65	0.66	0.53	0.58	0.57	0.59	0.48	0.50
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.4	2.4	2.4	2.0	2.3	2.5	2.1	1.9	2.2	2.1	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.1	2.3	2.2	2.3	2.2	2.3
Strontium (Sr)	0.035	0.034	0.033	0.035	0.048	0.051	0.043	0.035	0.036	0.035	0.036	0.037	0.038	0.039	0.037	0.038	0.036	0.033	0.035	0.037	0.039	0.036	0.038
Sulphur (S)	3.8	4.2	3.5	16	39	42	27	16	20	18	19	20	18	16	17	17	14	12	14	17	20	12	12
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	0.0012	<0.0010	0.0014	<0.0010	<0.0010	0.0040	0.0039	0.0010	0.0022	0.0026	0.0012	0.0014	0.0015	0.0012	0.0012	0.0022	0.0017	0.0013	0.0024	0.0025	0.0012	0.0011
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.046	0.039	0.042	0.10	0.21	0.22	0.12	0.071	0.087	0.076	0.075	0.084	0.053	0.050	0.044	0.046	0.037	0.031	0.036	0.038	0.044	0.026	0.025

Table B.15. Continued. Cold Lake Station CL-3 Water Quality - Laboratory Analyses

Sample Date	31-Jul-19	31-Jul-19	7-Aug-19	7-Aug-19	14-Aug-19	14-Aug-19	28-Aug-19	28-Aug-19	4-Sep-19	4-Sep-19	18-Sep-19	18-Sep-19	26-Sep-19	26-Sep-19	2-Oct-19	2-Oct-19	9-Oct-19	9-Oct-19
Parameter/Station	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**
Physical-Chemical (mg/L)																		
pH (pH units)	6.51	6.51	6.50	6.54	6.56	6.52	6.26	6.27	6.39	6.40	6.23	6.22	6.28	6.32	6.83	6.88	6.76	6.75
Alkalinity (Total as $CaCO_3$)	24	24	25	23	24	23	23	23	24	24	24	23	24	24	23	24	26	26
Bicarbonate (HCO_3)	30	30	31	28	30	28	28	29	29	29	29	28	29	29	28	29	32	32
Carbonate (CO_3)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	59	60	71	69	63	62	72	73	--	--	74	71	74	76	74	73	79	79
Total Hardness ($CaCO_3$)	61.7	62.1	67.7	66.2	62.7	61.6	71.8	72.8	--	--	79.0	76.9	81.3	81.1	73.3	74.9	72.2	74.3
Turbidity (NTU)	1.7	1.8	1.9	1.6	1.7	1.4	3.8	4.1	3.3	2.9	6.7	5.2	5.9	4.9	3.6	3.9	5.7	4.9
Total Suspended Solids (TSS)	1.3	2.2	1.3	1.8	1.1	<1.0	1.7	1.4	2.1	1.7	3.5	2.7	3.7	3.4	2.6	2.6	2.7	1.7
Total Metals (mg/L)																		
Aluminum (Al)	0.040	0.038	0.038	0.023	0.036	0.036	0.049	0.046	0.033	0.032	0.031	0.029	0.033	0.034	0.032	0.028	0.030	0.032
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.0011	0.00069	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00036	0.00055	0.00040	0.00043	0.00046	0.00050	0.00047	0.00041	0.00039	0.00035	0.00027	0.00032	0.00044	0.00035	0.00038	0.00048	0.00035	0.00032
Barium (Ba)	0.011	0.011	0.011	0.010	<0.010	<0.010	0.011	0.011	<0.010	0.010	0.011	0.011	0.011	0.011	0.010	0.011	0.010	0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.082	0.073	0.083	0.067	0.076	0.056	0.080	0.064	0.058	0.060	0.069	0.079	0.084	0.074	0.045	0.053	0.067	0.070
Calcium (Ca)	18	18	20	20	19	19	22	22	20	20	24	23	25	25	22	23	22	23
Chromium (Cr)	0.0012	0.0015	<0.0010	<0.0010	<0.0010	<0.0010	0.0013	0.0014	0.0011	0.0011	<0.0010	<0.0010	0.0021	0.0027	<0.0010	<0.0010	<0.0010	0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0062	0.0058	0.0056	0.0055	0.0057	0.0053	0.0071	0.0064	0.0058	0.0058	0.0074	0.0060	0.0051	0.0053	0.0052	0.0052	0.0056	0.0054
Iron (Fe)	0.32	0.32	0.43	0.31	0.3	0.25	0.60	0.65	0.45	0.45	0.78	0.67	0.61	0.64	0.48	0.49	0.56	0.58
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.8	3.9	4.1	4.0	3.6	3.6	4.3	4.4	4.0	4.0	4.6	4.5	4.7	4.7	4.3	4.4	4.1	4.2
Manganese (Mn)	0.014	0.014	0.016	0.015	0.015	0.014	0.034	0.034	0.025	0.026	0.020	0.018	0.027	0.029	0.022	0.023	0.023	0.024
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	0.00085	0.00089	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00053	<0.00050	<0.00050	<0.00050	<0.00050	0.00063	0.00067	0.00092	<0.00050	<0.00050	<0.00050	<0.00050	0.0007	<0.00050	<0.00050	<0.00050	0.00057	0.00065
Potassium (K)	1.8	1.9	2.0	1.9	1.6	1.6	2.1	2.2	1.9	1.9	2.1	2.1	2.2	2.2	2.0	2.1	2.0	2.0
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	0.50	0.51	0.55	0.49	0.51	0.51	0.68	0.68	0.60	0.62	0.64	0.62	0.74	0.74	0.70	0.71	0.67	0.69
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.3	2.3	2.3	2.3	2.0	2.0	2.4	2.4	2.2	2.2	2.1	2.1	2.4	2.4	2.4	2.5	1.9	1.9
Strontium (Sr)	0.038	0.038	0.037	0.037	0.033	0.033	0.039	0.040	0.036	0.037	0.040	0.040	0.042	0.042	0.038	0.039	0.037	0.038
Sulphur (S)	13	13	14	14	12	12	16	16	14	14	18	18	18	18	16	17	17	17
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	0.0016	0.0033	0.0011	<0.0010	0.0019	0.0023	0.0015	0.0012	<0.0010	0.0013	<0.0010	0.0031	<0.0010	0.0013	<0.0010	<0.0010	<0.0010	0.0012
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00013	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.029	0.025	0.025	0.023	0.020	0.020	0.026	0.024	0.021	0.020	0.027	0.024	0.033	0.025	0.014	0.015	0.019	0.025

Table B.15. Continued. Cold Lake Station CL-3 Water Quality - Laboratory Analyses

Sample Date	25-Feb-19	25-Feb-19	25-Feb-19	28-May-19	28-May-19	28-May-19	4-Jun-19	4-Jun-19	12-Jun-19	12-Jun-19	18-Jun-19	18-Jun-19	26-Jun-19	26-Jun-19	2-Jul-19	2-Jul-19	2-Jul-19	9-Jul-19	9-Jul-19	15-Jul-19	15-Jul-19	23-Jul-19	23-Jul-19
Parameter/Station	**CL-3 (btm)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**
Dissolved Metals (mg/L)		**Duplicate**				**Duplicate**										**Duplicate**							
Aluminum (Al)	0.016	0.016	0.011	0.032	0.045	0.040	0.042	0.022	0.029	0.032	0.019	0.016	0.014	0.014	0.015	0.012	0.014	0.013	0.013	0.012	0.013	0.011	0.012
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00052	0.00041	0.00045	0.00026	0.00023	0.00022	0.00022	0.00039	0.00033	0.00037	0.00021	0.00023	0.00028	0.00035	0.00034	0.00026	0.00034	0.00032	0.00028	0.00026	0.00033	0.00036	0.00032
Barium (Ba)	0.010	0.010	0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.13	0.099	0.037	0.24	0.58	0.51	0.31	0.14	0.17	0.18	0.14	0.14	0.091	0.080	0.093	0.085	0.061	0.057	0.063	0.052	0.10	0.034	0.033
Calcium (Ca)	14	14	13	26	51	50	31	22	27	25	25	28	24	23	23	22	20	18	19	22	26	17	17
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	0.0012	0.00098	0.00046	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0042	0.0042	0.0030	0.0098	0.018	0.016	0.013	0.0075	0.0092	0.0092	0.0078	0.0074	0.0061	0.0064	0.0062	0.0058	0.0057	0.0053	0.0062	0.0061	0.0073	0.0045	0.0046
Iron (Fe)	0.15	0.15	0.18	0.57	2.0	1.9	2.0	0.43	0.67	0.48	0.44	0.57	0.26	0.22	0.26	0.22	0.15	0.16	0.15	0.28	0.36	0.21	0.21
Lead (Pb)	0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.8	3.8	3.7	4.7	8.8	8.5	5.5	3.9	5.0	4.7	4.7	5.4	4.5	4.3	4.3	4.2	3.9	3.5	3.6	4.3	4.9	3.6	3.6
Manganese (Mn)	0.013	0.013	0.016	0.070	0.18	0.17	0.11	0.044	0.028	0.017	0.0042	0.022	0.0040	<0.0040	0.0065	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0097	<0.0040	<0.0040
Molybdenum (Mo)	0.00025	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00024	<0.00020	<0.00020	<0.00020	0.00023	<0.00020	<0.00020
Nickel (Ni)	<0.00050	0.00055	<0.00050	<0.00050	0.00062	<0.00050	0.00081	<0.00050	0.0007	0.00068	0.00050	0.00050	0.00059	0.00062	0.00052	<0.00050	0.00061	0.00059	0.00074	<0.00050	<0.00050	0.00054	0.00057
Potassium (K)	1.9	1.8	1.8	2.4	4.0	3.8	2.7	2.2	2.5	2.4	2.2	2.5	2.2	2.1	2.1	2.0	1.9	1.8	1.8	2.0	2.3	1.7	1.8
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	1.5	1.5	1.8	1.0	1.2	1.2	0.98	0.91	0.94	0.92	0.75	0.77	0.66	0.65	0.54	0.54	0.52	0.42	0.47	0.49	0.50	0.39	0.38
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.4	2.4	2.4	2.4	2.9	2.7	2.2	2.1	2.4	2.4	2.4	2.5	2.3	2.3	2.4	2.2	2.2	2.2	2.1	2.4	2.5	2.3	2.4
Strontium (Sr)	0.033	0.033	0.032	0.041	0.058	0.056	0.043	0.036	0.039	0.038	0.038	0.040	0.039	0.038	0.037	0.036	0.035	0.033	0.033	0.036	0.039	0.034	0.035
Sulphur (S)	4.2	4.2	3.4	17	43	40	28	17	22	19	18	21	19	17	17	16	14	12	14	17	20	13	13
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.040	0.034	0.030	0.077	0.19	0.17	0.12	0.068	0.073	0.067	0.054	0.059	0.039	0.038	0.037	0.032	0.027	0.027	0.032	0.028	0.034	0.020	0.12

Table B.15. Continued. Cold Lake Station CL-3 Water Quality - Laboratory Analyses

Sample Date	31-Jul-19	31-Jul-19	7-Aug-19	7-Aug-19	14-Aug-19	14-Aug-19	28-Aug-19	28-Aug-19	4-Sep-19	4-Sep-19	18-Sep-19	18-Sep-19	26-Sep-19	26-Sep-19	2-Oct-19	2-Oct-19	9-Oct-19	9-Oct-19
Parameter/Station	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**	**CL-3 (btm)**	**CL-3 (sfc)**
Dissolved Metals (mg/L)																		
Aluminum (Al)	0.014	0.016	0.0066	0.009	0.014	0.014	0.0084	0.0082	0.010	0.009	0.009	0.0086	0.011	0.0073	0.0064	0.0077	0.0086	0.0098
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00034	0.00035	0.00036	0.00045	0.00040	0.00047	0.00033	0.00036	0.00034	0.00037	0.00034	0.00037	0.00037	0.00036	0.00027	0.00024	0.00037	0.00031
Barium (Ba)	<0.010	<0.010	0.010	0.010	<0.010	<0.010	0.010	0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.027	0.028	0.055	0.048	0.033	0.036	0.040	0.043	0.031	0.029	0.047	0.038	0.060	0.042	0.027	0.031	0.039	0.024
Calcium (Ca)	18	18	22	21	19	19	22	22	21	21	22	21	22	23	22	22	24	24
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0050	0.0057	0.0045	0.0046	0.0050	0.0053	0.0048	0.0043	0.0045	0.0046	0.0044	0.0046	0.0050	0.0043	0.0043	0.0044	0.0045	0.0044
Iron (Fe)	0.13	0.13	0.16	0.16	0.093	0.092	0.12	0.12	0.11	0.11	0.12	0.11	0.13	0.11	0.15	0.14	0.17	0.14
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.7	3.8	4.1	4.0	3.8	3.7	4.3	4.4	4.1	4.2	4.4	4.3	4.3	4.4	4.3	4.3	4.5	4.5
Manganese (Mn)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.004	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.020	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Molybdenum (Mo)	0.040	0.00031	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00038	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00052	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00064	<0.00050
Potassium (K)	1.9	2.0	2.0	2.0	1.7	1.8	2.1	2.1	2.0	2.1	2.0	2.0	2.2	2.1	2.0	2.0	2.3	2.3
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	0.40	0.40	0.49	0.49	0.45	0.44	0.59	0.59	0.57	0.57	0.54	0.55	0.61	0.59	0.65	0.63	0.69	0.68
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.6	2.3	2.2	2.2	2.2	2.2	2.4	2.4	2.3	2.3	2.1	2.1	2.2	2.2	2.4	2.4	2.3	2.4
Strontium (Sr)	0.036	0.037	0.037	0.037	0.034	0.034	0.038	0.039	0.037	0.037	0.037	0.037	0.038	0.038	0.037	0.037	0.039	0.039
Sulphur (S)	13	13	14	14	13	12	16	16	15	15	18	17	17	17	17	18	18	18
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.018	0.021	0.017	0.019	0.017	0.017	0.018	0.015	0.014	0.014	0.018	0.015	0.021	0.016	0.011	0.0085	0.014	0.014

Table B.16. Cold Lake Station CL-7 Water Quality - Laboratory Analyses

Sample Date	25-Feb-19	25-Feb-19	28-May-19	28-May-19	4-Jun-19	4-Jun-19	12-Jun-19	12-Jun-19	18-Jun-19	18-Jun-19	26-Jun-19	26-Jun-19	2-Jul-19	2-Jul-19	9-Jul-19	9-Jul-19	15-Jul-19	15-Jul-19	23-Jul-19	23-Jul-19	31-Jul-19	31-Jul-19	31-Jul-19
Parameter/Station	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (btm)**	**CL-7 (sfc)**
Physical-Chemical (mg/L)																							
pH (pH units)	7.34	7.33	6.99	7.00	7.17	7.23	7.21	7.25	6.78	6.76	6.83	6.78	7.35	7.37	6.56	6.59	6.67	6.65	6.56	6.59	6.51	6.51	6.52
Alkalinity (Total as $CaCO_3$)	35.1	34.5	25.2	24.3	21	20	20	18	20	23	22	22	22	22	60	24	22	24	24	23	25	25	25
Bicarbonate (HCO_3)	42.8	42.1	30.7	29.6	25	25	25	22	25	28	26	26	27	26	73	29	27	30	30	28	30	30	30
Carbonate (CO_3)	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	50	50	73	80	91	82	--	--	92	86	--	--	65	65	68	67	70	68	57	57	60	60	60
Total Hardness ($CaCO_3$)	52.7	52.4	61.7	66.0	84.0	75.7	--	--	80.8	72.6	--	--	65.5	64.2	68.3	67.9	69.6	68.3	61.2	62.3	60.2	60.2	62.8
Turbidity (NTU)	1.1	1.3	3.7	3.0	4.3	4.2	2.4	2.9	3.5	3.4	1.9	1.9	1.4	2.0	1.8	1.4	1.3	1.2	1.1	1.0	1.9	1.9	1.8
Total Suspended Solids (TSS)	<4.0	<4.0	<4.0	<4.0	4.0	<4.0	3.1	3.6	2.9	5.7	2.2	1.7	2.1	1.9	1.2	<1.0	1.8	1.1	<1.0	1.4	1.9	1.9	<1.0
Total Metals (mg/L)																							
Aluminum (Al)	0.040	0.048	0.066	0.064	0.060	0.061	0.055	0.055	0.048	0.074	0.046	0.051	0.049	0.047	0.037	0.038	0.039	0.029	0.033	0.033	0.039	0.039	0.045
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00061	0.00053	0.00048	0.00034	0.00036	0.00035	0.00046	0.00050	0.00039	0.00049	0.00033	0.00036	0.00046	0.00045	0.00054	0.00056	0.00041	0.00044	0.00047	0.00062	0.00029	0.00029	0.00051
Barium (Ba)	0.012	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	0.010	0.010	<0.010	<0.010	0.010	0.010	0.010	0.011	0.011	0.011	0.011
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	0.044	<0.020	<0.020	<0.020	<0.020	0.022	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.13	0.12	0.19	0.22	0.28	0.25	0.21	0.22	0.24	0.22	0.12	0.13	0.089	0.069	0.091	0.098	0.12	0.11	0.045	0.040	0.081	0.081	0.059
Calcium (Ca)	14	14	19	21	26	23	23	24	24	22	22	22	20	20	21	21	21	21	18	19	18	18	19
Chromium (Cr)	<0.0010	<0.0010	0.0011	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0013	<0.0010	0.0019	0.0011	0.0017	0.0017	0.0012
Cobalt (Co)	<0.00030	<0.00030	<0.00030	0.00038	0.00034	0.00040	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0072	0.0067	0.011	0.012	0.011	0.011	0.010	0.010	0.011	0.011	0.0073	0.0077	0.0065	0.0061	0.0069	0.0070	0.0080	0.0067	0.0054	0.0055	0.0064	0.0064	0.0067
Iron (Fe)	0.31	0.40	0.65	0.68	1.5	1.2	1.0	1.0	1.3	1.0	0.54	0.55	0.38	0.36	0.45	0.40	0.41	0.33	0.23	0.24	0.32	0.32	0.34
Lead (Pb)	0.00092	0.00038	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	4.1	4.1	3.5	3.6	4.6	4.2	4.3	4.4	4.8	4.4	4.1	4.1	3.8	3.8	3.9	3.9	4.2	4.1	3.8	3.9	3.8	3.8	3.9
Manganese (Mn)	0.021	0.020	0.059	0.063	0.087	0.074	0.055	0.056	0.044	0.037	0.019	0.019	0.012	0.011	0.013	0.012	0.012	0.011	0.0085	0.0087	0.014	0.014	0.014
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	0.00024	<0.00020	0.0032	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0012	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020
Nickel (Ni)	0.00084	0.00088	0.0011	0.00082	0.00078	0.00069	0.0011	0.00084	0.0010	0.00089	0.00069	0.00065	0.00078	<0.00050	0.00057	0.00071	0.00091	0.00059	<0.00050	0.00079	0.00082	0.00082	0.00064
Potassium (K)	2.2	1.9	1.8	1.9	2.4	2.2	2.2	2.3	2.2	2.1	2.0	2.1	1.8	1.8	1.9	1.9	2.1	2.0	1.8	1.8	1.8	1.8	1.9
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00023	0.00026	<0.00020	0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	2.1	1.9	0.99	0.99	0.95	0.94	0.92	0.94	0.81	0.80	0.74	0.75	0.64	0.62	0.58	0.57	0.55	0.54	0.48	0.48	0.50	0.50	0.52
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.6	2.6	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.2	2.1	2.2	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3
Strontium (Sr)	0.036	0.035	0.033	0.034	0.039	0.037	0.035	0.036	0.037	0.035	0.037	0.038	0.035	0.035	0.035	0.035	0.037	0.036	0.036	0.037	0.038	0.038	0.039
Sulphur (S)	3.6	4.0	14	15	22	19	18	19	21	18	16	16	13	13	15	15	15	15	12	13	13	13	13
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	0.0016	0.0015	<0.0010	0.0031	0.0022	<0.0010	0.0019	0.0014	0.0042	0.0021	0.0020	0.0022	0.0018	0.0013	0.0015	0.0021	0.0010	0.0012	0.0014	0.0024	0.0024	0.0011
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.051	0.051	0.077	0.090	0.095	0.085	0.082	0.077	0.083	0.081	0.044	0.049	0.038	0.034	0.038	0.035	0.043	0.032	0.026	0.025	0.029	0.029	0.028

Table B.16. Continued. Cold Lake Station CL-7 Water Quality - Laboratory Analyses

Sample Date	7-Aug-19	7-Aug-19	14-Aug-19	14-Aug-19	21-Aug-19	21-Aug-19	28-Aug-19	28-Aug-19	4-Sep-19	4-Sep-19	18-Sep-19	18-Sep-19	26-Sep-19	26-Sep-19	2-Oct-19	2-Oct-19	9-Oct-19	9-Oct-19
Parameter/Station	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**
Physical-Chemical (mg/L)																		
pH (pH units)	6.51	6.45	6.51	6.52	6.47	6.47	6.28	6.30	6.40	6.38	6.22	6.25	6.30	6.28	6.75	6.78	6.73	6.75
Alkalinity (Total as $CaCO_3$)	23	23	26	24	24	25	24	25	24	24	18	24	23	23	27	23	22	23
Bicarbonate (HCO_3)	28	28	32	30	29	30	29	30	29	29	22	29	28	29	33	28	27	29
Carbonate (CO_3)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	69	67	63	63	70	71	77	69	--	--	89	65	74	74	73	74	84	78
Total Hardness ($CaCO_3$)	66.6	65.7	63.7	62.3	--	--	75.0	68.6	--	--	94.7	68.8	80.9	82.9	74.8	73.7	77.3	76.1
Turbidity (NTU)	1.8	1.4	1.7	1.5	3.0	3.3	5.0	3.0	3.4	2.9	13	2.4	4.6	4.8	3.8	4.0	7.4	4.8
Total Suspended Solids (TSS)	1.8	1.8	<1.0	1.2	2.1	<1.0	2.7	1.8	<1.0	<1.0	3.1	1.9	3.7	3.5	3.2	1.9	2.9	3.4
Total Metals (mg/L)																		
Aluminum (Al)	0.027	0.026	0.038	0.035	0.036	0.032	0.045	0.034	0.033	0.037	0.047	0.023	0.038	0.034	0.029	0.026	0.037	0.029
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00077	0.00076	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00040	0.00038	0.00050	0.00052	0.00032	0.00046	0.00039	0.00039	0.00036	0.00039	0.00045	0.00048	0.00046	0.00046	0.00034	0.00027	0.00025	0.00029
Barium (Ba)	0.011	0.010	<0.010	<0.010	<0.010	0.010	0.011	0.011	<0.010	<0.010	0.011	0.011	0.011	0.012	0.011	0.010	<0.010	0.011
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.066	0.064	0.064	0.066	0.078	0.068	0.098	0.062	0.064	0.062	0.13	0.046	0.061	0.073	0.048	0.045	0.062	0.055
Calcium (Ca)	20	20	19	19	21	21	23	21	20	19	29	21	25	25	23	22	24	23
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0015	0.0011	0.0010	0.0011	<0.0010	<0.0010	0.0017	0.0014	<0.0010	<0.0010	0.0011	<0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0060	0.0052	0.0054	0.0065	0.0060	0.0056	0.0092	0.0056	0.0057	0.0056	0.0089	0.0051	0.0055	0.0054	0.0054	0.0052	0.0063	0.0055
Iron (Fe)	0.34	0.31	0.27	0.27	0.44	0.45	0.87	0.49	0.49	0.43	1.5	0.36	0.64	0.64	0.50	0.47	0.77	0.58
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	4.1	4.0	3.7	3.6	3.9	4.1	4.4	4.1	4.0	3.9	5.4	4.1	4.6	4.8	4.4	4.3	4.4	4.3
Manganese (Mn)	0.015	0.015	0.014	0.014	0.019	0.019	0.036	0.032	0.026	0.025	0.030	0.014	0.028	0.029	0.023	0.023	0.026	0.024
Molybdenum (Mo)	<0.00020	<0.00020	0.00093	0.00087	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	<0.00050	<0.00050	0.00055	0.00062	<0.00050	<0.00050	0.00086	0.00050	0.00055	<0.00050	<0.00050	<0.00050	0.00059	0.00057	<0.00050	<0.00050	0.00053	0.00061
Potassium (K)	2.0	1.9	1.7	1.7	1.9	2.0	2.2	2.1	1.9	1.9	2.5	2.0	2.3	2.3	2.0	2.0	2.1	2.1
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	0.52	0.53	0.53	0.51	0.57	0.60	0.69	0.63	0.60	0.60	0.71	0.58	0.74	0.76	0.70	0.69	0.69	0.71
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.3	2.3	2.1	2.1	1.9	2.0	2.4	2.3	2.1	2.2	2.3	2.1	2.4	2.4	2.5	2.4	1.9	2.0
Strontium (Sr)	0.037	0.037	0.034	0.033	0.036	0.036	0.040	0.038	0.036	0.036	0.044	0.038	0.041	0.042	0.038	0.038	0.038	0.039
Sulphur (S)	14	14	12	12	15	15	17	15	14	14	24	15	18	19	17	16	18	17
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	0.0013	<0.0010	<0.0010	0.0017	<0.0010	0.0023	<0.0010	0.0013	0.0015	0.0020	0.0017	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.022	0.021	0.019	0.020	0.024	0.023	0.030	0.019	0.021	0.021	0.043	0.015	0.022	0.022	0.015	0.016	0.024	0.019

Table B.16. Continued. Cold Lake Station CL-7 Water Quality - Laboratory Analyses

Sample Date	25-Feb-19	25-Feb-19	28-May-19	28-May-19	4-Jun-19	4-Jun-19	12-Jun-19	12-Jun-19	18-Jun-19	18-Jun-19	26-Jun-19	26-Jun-19	2-Jul-19	2-Jul-19	9-Jul-19	9-Jul-19	15-Jul-19	15-Jul-19	23-Jul-19	23-Jul-19	31-Jul-19	31-Jul-19	31-Jul-19
Parameter/Station	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (btm)**	**CL-7 (sfc)**
Dissolved Metals (mg/L)																							
Aluminum (Al)	0.022	0.019	0.032	0.030	0.023	0.023	0.028	0.032	0.015	<0.0030	0.013	0.013	0.012	0.013	0.012	0.014	0.011	0.011	0.016	0.015	0.015	0.015	0.017
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00052	0.00054	0.00033	0.00025	0.00023	0.00037	0.00035	0.00029	0.00022	0.00025	0.00028	0.00034	0.00024	0.00027	0.00026	0.00027	<0.00020	0.00028	0.00043	0.00042	0.00035	0.00035	0.00026
Barium (Ba)	0.011	0.011	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	0.041	0.050	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.14	0.16	0.17	0.20	0.22	0.20	0.19	0.19	0.17	0.11	0.083	0.073	0.055	0.068	0.084	0.066	0.058	0.059	0.029	0.045	0.041	0.041	0.045
Calcium (Ca)	13	14	23	25	28	25	27	26	28	26	23	23	20	20	21	20	21	20	17	17	18	18	18
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00043	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0057	0.0057	0.0088	0.0086	0.0098	0.0082	0.0092	0.0092	0.0072	0.0045	0.0060	0.0061	0.0055	0.0058	0.0066	0.0065	0.0061	0.0060	0.0047	0.0045	0.0054	0.0054	0.0051
Iron (Fe)	0.20	0.19	0.40	0.44	0.91	0.70	0.62	0.61	0.72	<0.060	0.22	0.22	0.16	0.16	0.20	0.19	0.27	0.25	0.11	0.11	0.13	0.13	0.13
Lead (Pb)	0.00037	0.00034	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	4.0	3.9	4.0	4.3	5.0	4.5	4.9	4.9	5.3	5.0	4.2	4.3	3.9	3.8	3.9	3.8	4.2	4.1	3.6	3.6	3.7	3.7	3.7
Manganese (Mn)	0.019	0.016	0.054	0.064	0.078	0.061	0.024	0.023	0.014	0.015	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0021	<0.00020	<0.00020	<0.00020	0.00030	0.00030	<0.00020
Nickel (Ni)	<0.00050	0.00064	<0.00050	<0.00050	<0.00050	0.00063	0.0015	0.00068	0.00057	0.00050	0.00067	0.00056	0.00052	0.00061	0.00091	0.00087	<0.00050	0.00058	0.00071	<0.00050	<0.00050	<0.00050	<0.00050
Potassium (K)	2.1	2.3	2.1	2.4	2.5	2.4	2.4	2.5	2.5	2.3	2.1	2.1	1.9	1.8	2.0	1.9	2.0	2.0	1.8	1.7	2.0	2.0	1.9
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	1.9	1.8	0.99	1.0	0.97	0.94	0.93	0.94	0.77	0.75	0.64	0.65	0.51	0.51	0.49	0.49	0.49	0.48	0.39	0.39	0.41	0.41	0.41
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.5	2.5	2.1	2.3	2.2	2.2	2.3	2.3	2.4	2.5	2.4	2.5	2.2	2.2	2.1	2.1	2.4	2.4	2.2	2.2	2.8	2.8	2.6
Strontium (Sr)	0.033	0.033	0.036	0.040	0.041	0.039	0.038	0.039	0.040	0.038	0.038	0.039	0.035	0.035	0.034	0.034	0.036	0.035	0.034	0.034	0.036	0.036	0.036
Sulphur (S)	3.3	3.8	14	15	24	20	20	20	21	20	17	17	14	13	15	14	16	15	12	14	13	13	13
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0018	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	0.0010	0.0017
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.049	0.051	0.069	0.065	0.090	0.077	0.070	0.072	0.063	0.057	0.035	0.036	0.028	0.028	0.033	0.034	0.025	0.024	0.023	0.021	0.023	0.023	0.022

Table B.16. Continued. Cold Lake Station CL-7 Water Quality - Laboratory Analyses

Sample Date	7-Aug-19	7-Aug-19	14-Aug-19	14-Aug-19	21-Aug-19	21-Aug-19	28-Aug-19	28-Aug-19	04-Sep-19	4-Sep-19	18-Sep-19	18-Sep-19	26-Sep-19	26-Sep-19	2-Oct-19	2-Oct-19	9-Oct-19	9-Oct-19
Parameter/Station	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**	**CL-7 (btm)**	**CL-7 (sfc)**
Dissolved Metals (mg/L)																		
Aluminum (Al)	0.0098	0.0077	0.014	0.015	0.011	0.0082	0.0082	0.0087	0.0090	0.0088	0.0084	0.0081	0.0071	0.0076	0.0077	0.0065	0.0081	0.0078
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00039	0.00041	0.00040	0.00041	0.00035	0.00033	0.00036	0.00039	0.00031	0.00038	0.00032	0.00036	0.00025	0.00034	0.00029	0.00033	0.00027	<0.00020
Barium (Ba)	0.010	0.011	<0.010	<0.010	<0.010	0.010	0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	0.028	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.030	<0.020	<0.020	<0.020	0.021	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.048	0.053	0.036	0.031	0.050	0.061	0.059	0.038	0.034	0.033	0.069	0.030	0.033	0.032	0.029	0.031	0.041	0.022
Calcium (Ca)	21	20	19	19	21	21	23	21	21	20	27	19	23	23	22	22	26	24
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0047	0.0049	0.0054	0.0060	0.0050	0.0049	0.0050	0.0047	0.0043	0.0044	0.0047	0.0040	0.0046	0.0044	0.0039	0.0038	0.0044	0.0045
Iron (Fe)	0.17	0.14	0.096	0.096	0.13	0.13	0.13	0.12	0.11	0.11	0.18	0.082	0.14	0.12	0.13	0.16	0.21	0.16
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	4.0	3.9	3.8	3.8	4.2	4.3	4.6	4.2	4.2	4.1	5.2	3.9	4.3	4.3	4.3	4.3	4.8	4.5
Manganese (Mn)	0.0054	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0064	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00059	<0.00020	0.0011	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	<0.00050	<0.00050	<0.00050	0.00052	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00051	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Potassium (K)	2.0	2.0	1.7	1.8	2.1	2.1	2.2	2.1	2.1	2.0	2.4	1.9	2.1	2.1	2.0	2.0	2.4	2.2
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	0.49	0.50	0.44	0.44	0.53	0.53	0.60	0.59	0.57	0.56	0.60	0.52	0.61	0.60	0.63	0.65	0.70	0.68
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.3	2.3	2.2	2.2	1.7	1.8	2.4	2.3	2.3	2.3	2.2	2.0	2.2	2.2	2.4	2.4	2.3	2.3
Strontium (Sr)	0.037	0.037	0.034	0.034	0.037	0.037	0.04	0.038	0.037	0.037	0.041	0.035	0.038	0.038	0.037	0.037	0.040	0.039
Sulphur (S)	13	14	12	12	16	16	18	15	15	15	24	14	17	17	17	18	21	18
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.017	0.019	0.016	0.018	0.016	0.017	0.019	0.014	0.015	0.014	0.028	0.011	0.016	0.015	0.011	0.0080	0.017	0.013

Table B.17. Cold Lake Station CL-8 Water Quality - Laboratory Analyses

Sample Date	25-Feb-19	25-Feb-19	28-May-19	28-May-19	4-Jun-19	4-Jun-19	12-Jun-19	12-Jun-19	18-Jun-19	18-Jun-19	26-Jun-19	26-Jun-19	2-Jul-19	2-Jul-19	9-Jul-19	9-Jul-19	15-Jul-19	15-Jul-19	23-Jul-19	23-Jul-19	31-Jul-19	31-Jul-19	31-Jul-19
Parameter/Station	**CL-8 (sfc)**	**CL-8 (sfc)**	**CL-8 (sfc)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (btm)**	**CL-8 (sfc)**
Physical-Chemical (mg/L)																							
pH (pH units)	7.34	7.42	7.00	7.02	7.15	7.21	7.19	7.25	6.72	6.79	6.87	6.85	7.29	7.36	6.61	6.61	6.64	6.66	6.57	6.56	6.47	6.47	6.56
Alkalinity (Total as $CaCO_3$)	33.5	32.3	23.6	24	21	22	23	23	41	22	24	22	22	26	24	24	22	22	23	25	23	23	54
Bicarbonate (HCO_3)	40.8	39.4	28.8	29.3	25	26	29	29	51	27	29	27	27	32	30	29	27	27	28	30	28	28	65
Carbonate (CO_3)	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	49	57	96	79	94	71	--	--	73	92	--	--	65	65	61	64	71	69	56	57	59	59	58
Total Hardness ($CaCO_3$)	51.8	60.8	81.3	64.7	87.4	66.1	--	--	63.5	77.6	--	--	65.6	66.7	63.3	64.7	70.5	70.6	60.4	60.9	61.5	61.5	59.5
Turbidity (NTU)	0.9	0.7	3.9	3.0	5.5	2.9	2.4	2.2	2.1	3.1	2.3	1.7	1.9	1.4	1.0	1.2	1.7	1.4	1.1	1.2	1.6	1.6	1.6
Total Suspended Solids (TSS)	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	3.7	2.5	3.3	2.5	1.2	1.9	1.9	2.1	1.3	1.2	1.9	1.7	<1.0	<1.0	1.2	1.2	1.6
Total Metals (mg/L)																							
Aluminum (Al)	0.039	0.024	0.110	0.065	0.070	0.054	0.056	0.054	0.052	0.042	0.046	0.045	0.043	0.054	0.036	0.038	0.038	0.036	0.034	0.030	0.037	0.037	0.042
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00059	0.00058	0.00042	0.00041	0.00041	0.00029	0.00053	0.00037	0.00043	0.00047	0.00025	0.00058	0.00046	0.00041	0.00061	0.00053	0.00051	0.00039	0.00043	0.00053	0.00033	0.00033	0.00034
Barium (Ba)	0.011	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	0.010	0.010	0.012	<0.010	<0.010	<0.010	0.010	0.011	0.011	0.012	0.012	0.011
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.110	0.063	0.340	0.240	0.290	0.200	0.180	0.200	0.160	0.200	0.110	0.120	0.091	0.110	0.088	0.091	0.095	0.096	0.065	0.039	0.071	0.071	0.051
Calcium (Ca)	14	18	25	20	27	20	23	22	19	23	22	22	20	20	19	20	21	21	18	18	18	18	18
Chromium (Cr)	<0.0010	<0.0010	0.0013	<0.0010	0.0013	<0.0010	<0.0010	<0.0010	0.001	0.001	<0.0010	<0.0010	<0.0010	<0.0010	0.001	<0.0010	<0.0010	<0.0010	0.0015	0.0011	<0.0010	<0.0010	0.0015
Cobalt (Co)	<0.00030	<0.00030	0.00051	0.00037	0.00052	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0064	0.0045	0.015	0.011	0.014	0.0088	0.011	0.0094	0.0094	0.010	0.0072	0.0073	0.0061	0.0067	0.0064	0.0065	0.0070	0.0073	0.0052	0.0050	0.0059	0.0059	0.0062
Iron (Fe)	0.19	0.17	1.2	0.73	1.7	0.72	0.83	0.67	0.71	1.0	0.49	0.49	0.35	0.38	0.33	0.31	0.44	0.39	0.23	0.20	0.32	0.32	0.30
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.9	4.1	4.4	3.6	4.8	3.6	4.2	4.0	3.9	4.7	4.1	4.1	3.8	3.9	3.7	3.7	4.2	4.2	3.8	3.8	3.9	3.9	3.8
Manganese (Mn)	0.014	0.0095	0.082	0.064	0.092	0.057	0.049	0.046	0.028	0.035	0.017	0.017	0.011	0.013	0.0098	0.0094	0.014	0.012	0.0082	0.008	0.014	0.014	0.013
Molybdenum (Mo)	<0.00020	<0.00020	0.00039	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.048	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.052
Nickel (Ni)	0.00079	0.00060	0.0020	0.00071	0.0016	0.00070	0.00094	0.00074	0.00080	0.00072	0.00067	0.00075	<0.00050	0.00095	0.00063	0.00076	0.00062	0.00062	0.00072	0.00071	<0.00050	<0.00050	0.00078
Potassium (K)	1.8	2.0	2.2	1.8	2.4	2.0	2.2	2.1	2.0	2.2	2.0	2.1	1.8	1.9	1.8	1.9	2.0	2.1	1.7	1.8	1.8	1.8	1.8
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00027	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	1.6	1.0	1.1	0.99	0.98	0.90	0.94	0.92	0.76	0.78	0.77	0.76	0.63	0.68	0.55	0.58	0.55	0.55	0.48	0.47	0.51	0.51	0.49
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.5	2.6	2.1	2.0	2.0	1.8	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.4
Strontium (Sr)	0.035	0.038	0.037	0.033	0.040	0.034	0.035	0.035	0.033	0.036	0.038	0.037	0.035	0.036	0.035	0.035	0.036	0.037	0.036	0.037	0.039	0.039	0.037
Sulphur (S)	4.7	8.0	20	15	23	15	17	16	14	20	16	16	13	14	13	14	16	16	12	12	13	13	12
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	0.0014	<0.0010	0.0033	0.0013	0.0028	0.0031	0.0019	0.0012	0.0019	0.0011	0.0016	0.0012	0.0010	0.0018	0.0016	0.0015	<0.0010	0.0011	<0.0010	0.0015	0.0016	0.0016	0.0023
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.048	0.029	0.11	0.081	0.10	0.074	0.079	0.068	0.061	0.074	0.044	0.045	0.035	0.039	0.037	0.034	0.036	0.036	0.024	0.023	0.024	0.024	0.024

Table B.17. Continued. Cold Lake Station CL-8 Water Quality - Laboratory Analyses

Sample Date	7-Aug-19	7-Aug-19	14-Aug-19	14-Aug-19	21-Aug-19	21-Aug-19	28-Aug-19	28-Aug-19	4-Sep-19	4-Sep-19	18-Sep-19	18-Sep-19	26-Sep-19	26-Sep-19	2-Oct-19	2-Oct-19	9-Oct-19	9-Oct-19
Parameter/Station	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**
Physical-Chemical (mg/L)																		
pH (pH units)	6.54	6.49	6.49	6.57	6.47	6.46	6.29	6.19	6.40	6.39	6.26	6.27	6.25	6.32	6.81	6.81	6.74	6.77
Alkalinity (Total as $CaCO_3$)	23	24	24	25	24	24	25	23	54	23	23	23	23	23	22	23	22	21
Bicarbonate (HCO_3)	28	29	29	30	29	29	30	29	65	28	28	29	29	29	27	28	27	26
Carbonate (CO_3)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	70	70	62	62	70	71	70	70	--	--	70	67	75	72	74	74	79	79
Total Hardness ($CaCO_3$)	68.3	69.8	62.3	63.4	--	--	69.3	68.7	--	--	76.0	73.6	77.7	79.3	75.6	75.0	71.0	77.2
Turbidity (NTU)	2.3	1.9	1.6	1.5	2.2	2.7	3.2	3.1	2.9	3.5	4.7	3.6	4.0	3.8	3.8	4.0	5.3	5.3
Total Suspended Solids (TSS)	2.1	1.6	<1.0	<1.0	2.5	1.5	1.3	1.3	<1.0	<1.0	2.3	2.2	2.3	2.3	2.5	2.2	3.4	2.6
Total Metals (mg/L)																		
Aluminum (Al)	0.036	0.041	0.037	0.039	0.035	0.033	0.063	0.034	0.033	0.032	0.032	0.030	0.036	0.036	0.028	0.028	0.070	0.034
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.0014	0.00072	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00044	0.00041	0.00057	0.00050	0.00048	0.00027	0.00046	0.00045	0.00041	0.00038	0.00031	0.00040	0.00049	0.00032	0.00040	0.00042	0.00031	<0.00020
Barium (Ba)	0.010	0.011	<0.010	<0.010	0.010	0.010	0.011	0.011	<0.010	<0.010	0.011	0.011	0.012	0.011	0.011	0.011	0.010	0.011
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.026	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.074	0.092	0.073	0.052	0.088	0.072	0.066	0.065	0.057	0.054	0.071	0.075	0.075	0.073	0.043	0.060	0.082	0.076
Calcium (Ca)	20	21	19	19	21	21	21	21	20	19	23	22	24	24	23	23	22	24
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	0.0012	<0.0010	0.0016	0.0015	0.0010	<0.0010	<0.0010	0.0012	0.0072	0.0016	<0.0010	<0.0010	0.0013	0.0012
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0059	0.0060	0.0056	0.0056	0.0066	0.0055	0.0065	0.0061	0.0056	0.0059	0.0064	0.0059	0.0053	0.0055	0.0052	0.0056	0.0078	0.0058
Iron (Fe)	0.47	0.49	0.26	0.25	0.44	0.45	0.54	0.51	0.44	0.40	0.63	0.49	0.58	0.57	0.50	0.49	0.76	0.61
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00022	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	4.2	4.2	3.6	3.7	4.0	4.0	4.2	4.1	4.0	3.8	4.5	4.4	4.5	4.6	4.4	4.3	4.1	4.4
Manganese (Mn)	0.017	0.016	0.014	0.014	0.019	0.020	0.034	0.033	0.026	0.024	0.018	0.016	0.026	0.026	0.024	0.025	0.024	0.025
Molybdenum (Mo)	<0.00020	<0.00020	0.0011	0.0010	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	<0.00050	<0.00050	0.00068	0.00073	0.00074	0.00052	0.0012	0.00080	0.00051	0.00054	0.00052	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00055
Potassium (K)	1.9	2.0	1.7	1.7	2.0	2.0	2.1	2.1	1.9	1.9	2.1	2.1	2.2	2.2	2.1	2.0	2.0	2.2
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	0.55	0.57	0.52	0.52	0.57	0.57	0.64	0.63	0.59	0.57	0.63	0.61	0.73	0.73	0.71	0.70	0.72	0.72
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.3	2.4	2.1	2.1	2.1	2.0	2.3	2.3	2.2	2.1	2.1	2.1	2.4	2.4	2.5	2.4	1.8	2.0
Strontium (Sr)	0.037	0.039	0.034	0.034	0.036	0.036	0.039	0.038	0.036	0.036	0.039	0.039	0.041	0.041	0.039	0.038	0.036	0.04
Sulphur (S)	15	15	12	12	15	15	15	15	14	13	17	16	17	18	17	17	16	18
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	0.0020	0.0012	<0.0010	0.0012	0.0017	0.0018	0.0012	0.0012	0.0014	<0.0010	0.0016	0.0014	0.0011	<0.0010	0.0018	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00014	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.023	0.031	0.021	0.019	0.023	0.024	0.023	0.022	0.019	0.024	0.023	0.019	0.022	0.022	0.014	0.015	0.029	0.022

Table B.17. Continued. Cold Lake Station CL-8 Water Quality - Laboratory Analyses

Sample Date	25-Feb-19	25-Feb-19	28-May-19	28-May-19	4-Jun-19	4-Jun-19	12-Jun-19	12-Jun-19	18-Jun-19	18-Jun-19	26-Jun-19	26-Jun-19	2-Jul-19	2-Jul-19	9-Jul-19	9-Jul-19	15-Jul-19	15-Jul-19	23-Jul-19	23-Jul-19	31-Jul-19	31-Jul-19	31-Jul-19
Parameter/Station	**CL-8 (sfc)**	**CL-8 (sfc)**	**CL-8 (sfc)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (btm)**	**CL-8 (sfc)**
Dissolved Metals (mg/L)																							
Aluminum (Al)	0.0140	0.0056	0.0320	0.0310	0.0240	0.0220	0.0280	0.0310	0.0039	0.0170	0.0180	0.0140	0.0130	0.0120	0.0110	0.0120	0.0120	0.0120	0.0140	0.0130	0.0170	0.0170	0.0160
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00047	0.00042	<0.00020	0.00029	<0.00020	0.00038	0.00036	0.0004	0.00033	0.00022	0.00030	0.00031	0.00035	0.00024	0.00027	0.00030	0.00024	<0.00020	0.00041	0.00036	0.00037	0.00037	0.00035
Barium (Ba)	<0.010	<0.010	0.011	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.066	0.031	0.27	0.21	0.25	0.13	0.16	0.15	0.051	0.15	0.068	0.084	0.067	0.065	0.044	0.055	0.067	0.058	0.041	0.047	0.056	0.056	0.049
Calcium (Ca)	14	16	30	25	29	22	25	24	22	28	23	23	20	20	19	19	21	21	17	17	17	17	17
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	<0.00030	0.00037	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0041	0.0019	0.010	0.0097	0.0091	0.011	0.0087	0.0087	0.0043	0.0080	0.0058	0.0060	0.0063	0.0062	0.0058	0.0064	0.0061	0.0065	0.0051	0.0042	0.0050	0.0050	0.0050
Iron (Fe)	0.14	0.091	0.70	0.50	1.0	0.38	0.46	0.35	<0.060	0.58	0.21	0.20	0.16	0.16	0.14	0.15	0.27	0.25	0.11	0.10	0.12	0.12	0.11
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	3.7	3.8	5.3	4.3	5.1	3.9	4.6	4.4	4.2	5.2	4.2	4.2	3.9	3.8	3.5	3.7	4.2	4.1	3.6	3.6	3.7	3.7	3.7
Manganese (Mn)	0.011	0.0066	0.084	0.061	0.081	0.041	0.013	0.0090	<0.0040	0.018	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00041
Nickel (Ni)	<0.00050	<0.00050	<0.00050	<0.00050	0.0010	0.0014	0.00065	0.00066	<0.00050	0.00065	0.00054	0.00059	0.00066	0.00055	0.00098	0.00055	<0.00050	0.00066	0.00056	0.00057	<0.00050	<0.00050	<0.00050
Potassium (K)	1.8	1.9	2.6	2.2	2.6	2.1	2.3	2.3	2.1	2.4	2.1	2.1	1.9	1.9	1.8	1.8	2.0	2.1	1.7	1.7	1.9	1.9	1.9
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	1.5	0.92	1.1	1.0	0.98	0.92	0.91	0.89	0.70	0.78	0.64	0.64	0.51	0.51	0.46	0.47	0.47	0.48	0.39	0.38	0.41	0.41	0.40
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.4	2.4	2.5	2.3	2.2	2.1	2.3	2.4	2.4	2.5	2.2	2.2	2.2	2.2	2.1	2.1	2.4	2.4	2.1	2.2	3.2	3.2	3.0
Strontium (Sr)	0.033	0.035	0.044	0.039	0.041	0.037	0.037	0.037	0.036	0.040	0.038	0.038	0.035	0.035	0.033	0.033	0.036	0.035	0.034	0.034	0.036	0.036	0.036
Sulphur (S)	4.3	7.8	21	16	25	16	18	17	15	20	16	16	14	14	13	13	17	16	13	11	12	12	12
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.035	0.017	0.088	0.077	0.087	0.064	0.068	0.060	0.039	0.059	0.035	0.035	0.031	0.029	0.034	0.030	0.026	0.025	0.023	0.021	0.020	0.020	0.017

Table B.17. Continued. Cold Lake Station CL-8 Water Quality - Laboratory Analyses

Sample Date	7-Aug-19	7-Aug-19	14-Aug-19	14-Aug-19	21-Aug-19	21-Aug-19	28-Aug-19	28-Aug-19	4-Sep-19	4-Sep-19	18-Sep-19	18-Sep-19	26-Sep-19	26-Sep-19	2-Oct-19	2-Oct-19	9-Oct-19	9-Oct-19
Parameter/Station	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**	**CL-8 (btm)**	**CL-8 (sfc)**
Dissolved Metals (mg/L)																		
Aluminum (Al)	0.0085	0.0077	0.0150	0.0170	0.0081	0.0076	0.0087	0.0087	0.0120	0.0090	0.011	0.0093	0.0076	0.0085	0.0084	0.0064	0.010	0.0093
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00039	0.00030	0.00041	0.00033	0.00027	0.00033	0.00037	0.00039	0.00033	0.00033	0.00033	0.00034	0.00037	0.00028	0.00039	0.00026	0.00032	0.00027
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	0.059	0.045	0.043	0.037	0.034	0.059	0.031	0.036	0.027	0.029	0.035	0.032	0.038	0.039	0.032	0.024	0.039	0.031
Calcium (Ca)	21	21	19	19	21	21	21	21	20	20	21	20	23	22	22	22	24	24
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.0046	0.0042	0.0050	0.0054	0.0043	0.0052	0.0046	0.0045	0.0044	0.0044	0.0044	0.0044	0.0047	0.0043	0.0043	0.0040	0.0042	0.0048
Iron (Fe)	0.21	0.18	0.093	0.11	0.12	0.13	0.11	0.10	0.11	0.10	0.083	0.092	0.12	0.091	0.14	0.15	0.14	0.16
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	4.1	4.0	3.7	3.7	4.1	4.2	4.2	4.2	4.1	4.1	4.2	4.1	4.3	4.2	4.3	4.3	4.5	4.5
Manganese (Mn)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	0.00038	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00052	<0.00050
Potassium (K)	2.1	2.0	1.8	1.7	2.1	2.1	2.0	2.0	2.1	2.1	2.0	1.9	2.1	2.1	2.0	2.0	2.3	2.3
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	0.49	0.50	0.44	0.46	0.52	0.53	0.58	0.58	0.56	0.56	0.54	0.52	0.60	0.58	0.64	0.65	0.69	0.68
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	2.3	2.2	2.2	2.1	1.6	1.7	2.3	2.4	2.3	2.3	2.1	2.1	2.2	2.2	2.4	2.4	2.4	2.4
Strontium (Sr)	0.037	0.037	0.033	0.034	0.036	0.037	0.038	0.038	0.037	0.037	0.037	0.036	0.039	0.037	0.037	0.037	0.039	0.039
Sulphur (S)	15	14	12	12	15	16	15	15	14	14	16	15	17	17	18	18	18	18
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	0.0014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.018	0.020	0.018	0.016	0.016	0.019	0.014	0.014	0.014	0.016	0.016	0.013	0.025	0.012	0.010	0.0091	0.016	0.015

Table A.8. Cold Lake Station Trap Lake / Fox Lake Water Quality - Laboratory Analyses

Lake	Trap Lake				Fox Lake			
Parameter/Sample Date	**27-Feb-19**		**15-Jul-19**		**27-Feb-19**		**15-Jul-19**	
Physical-Chemical (mg/L)								
pH (pH units)	7.50		6.05		7.82		7.94	
Alkalinity (Total as $CaCO_3$)	43.7		1.50		75.2		54.0	
Bicarbonate (HCO_3)	53.4		1.90		91.8		66.0	
Carbonate (CO_3)	<0.50		<1.0		<0.50		<1.0	
Hydroxide (OH)	<0.50		<1.0		<0.50		<1.0	
Hardness ($CaCO_3$)	410		--		300		--	
Total Hardness ($CaCO_3$)	361		358		272		203	
Turbidity (NTU)	2.0		4.3		0.30		0.53	
Total Suspended Solids (TSS)	<4.0		4.3		<4.0		1.6	
Metals (mg/L)	**Total**	**Dissolved**	**Total**	**Dissolved**	**Total**	**Dissolved**	**Total**	**Dissolved**
Aluminum (Al)	0.099	0.025	0.25	0.033	0.0062	0.0050	0.011	0.0075
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	0.00027	<0.00020	0.00027	<0.00020	0.00024	<0.00020	0.00026	<0.00020
Barium (Ba)	0.027	0.030	0.023	0.022	0.022	0.025	0.019	0.019
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	0.025	0.029	<0.020	<0.020	0.022	0.025	0.020	<0.020
Cadmium (Cd)	2.5	2.0	3.4	3.5	<0.020	<0.020	<0.020	<0.020
Calcium (Ca)	120	140	120	110	96	110	71	69
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	0.011	0.0091	0.018	0.019	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	0.026	0.0088	0.019	0.014	0.0018	0.00079	0.0017	0.0021
Iron (Fe)	0.13	<0.060	0.70	<0.060	<0.060	<0.060	<0.060	<0.060
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	13	15	16	16	7.8	9.1	6.2	6.2
Manganese (Mn)	0.22	0.23	0.55	0.52	<0.0040	<0.0040	0.0052	<0.0040
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00024	0.00030
Nickel (Ni)	0.0097	0.0082	0.016	0.015	0.0014	<0.00050	<0.00050	0.00058
Potassium (K)	7.3	8.9	6.0	6.1	6.8	8.3	5.7	5.8
Selenium (Se)	0.00025	<0.00020	<0.00020	<0.00020	0.00026	0.00024	0.00025	<0.00020
Silicon (Si)	2.8	3.1	2.9	2.7	1.6	1.8	0.47	0.44
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	11	13	8.0	7.9	11	13	9.5	9.6
Strontium (Sr)	0.18	0.20	0.16	0.15	0.16	0.18	0.13	0.13
Sulphur (S)	110	130	120	120	70	83	56	54
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	0.0018	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	0.00022	0.00019	0.00014	<0.00010	0.00021	0.00016	0.00015	0.00022
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	0.86	0.73	1.2	1.2	0.010	0.0090	0.0050	0.0051

Table B.19. 2019 QA/QC Sample Analyses - Equipment Blanks

Parameter/Sample Date	25-Feb-19	28-May-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	2-Jul-19	7-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	7-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	3-Sep-19	18-Sep-19	26-Sep-19	2-Oct-19	9-Oct-19
Physical-Chemical (mg/L)																				
pH (pH units)	5.46	5.07	4.58	5.03	4.87	4.80	4.51	4.63	4.93	4.80	5.51	4.67	5.66	4.61	4.33	4.41	4.80	5.35	5.14	5.67
Alkalinity (Total as $CaCO_3$)	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bicarbonate (HCO_3)	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbonate (CO_3)	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness ($CaCO_3$)	<0.50	<0.50	<0.50		<0.50		<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50	
Total Hardness ($CaCO_3$)	<0.50	<0.50	<0.50		<0.50		<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50	
Turbidity (NTU)		0.10					<0.10					<0.10								
Total Suspended Solids (TSS)	<4.0	<4.0	<4.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	1.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Metals (mg/L)																				
Aluminum (Al)	<0.0030	0.0035	0.0034	<0.0030	<0.0030	0.0041	0.0032	0.0038	<0.0030	0.0033	<0.0030	0.0031	0.0039	0.0031	0.0033	0.0057	<0.0030	0.0033	0.0052	<0.0030
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	0.00078	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.0006	<0.00060	<0.00060
Arsenic (As)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.032	<0.020	<0.020	<0.020	<0.020	<0.020
Calcium (Ca)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Chromium (Cr)	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0013	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00089	<0.00030	<0.00030	<0.00030
Copper (Cu)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Iron (Fe)	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Manganese (Mn)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.021	<0.00020	0.021	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.012	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Potassium (K)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Strontium (Sr)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Sulphur (S)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	0.0014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0058	<0.0030	<0.0030

Table B.19. Continued. 2019 QA/QC Sample Analyses - Equipment Blanks

Parameter/Sample Date	25-Feb-19	28-May-19	5-Jun-19	12-Jun-19	19-Jun-19	26-Jun-19	2-Jul-19	7-Jul-19	16-Jul-19	23-Jul-19	31-Jul-19	7-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	3-Sep-19	18-Sep-19	26-Sep-19	2-Oct-19	9-Oct-19
Dissolved Metals (mg/L)																				
Aluminum (Al)	<0.0030	<0.0030	<0.0030	0.004	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.028	<0.020	<0.020	0.025	<0.020
Cadmium (Cd)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.033	<0.020	<0.020	<0.020	<0.020	<0.020
Calcium (Ca)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00024	0.00029	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00021	<0.00020	<0.00020
Iron (Fe)	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	0.073	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Manganese (Mn)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	0.00036	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00052	<0.00020	<0.00020	0.021	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	0.00085	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Potassium (K)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Strontium (Sr)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Sulphur (S)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.51	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	<0.0030	<0.0030	<0.0030	<0.0030	0.0031	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.005	<0.0030	<0.0030

Table B.20. 2019 QA/QC Sample Analyses - Trip Blanks

Parameter/Sample Date	25-Feb-19	28-May-19	4-Jun-19	6-Jun-19	7-Jun-19	12-Jun-19	19-Jun-19	7-Jul-19	16-Jul-19	23-Jul-19	24-Jul-19	7-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	3-Sep-19	18-Sep-19	26-Sep-19	2-Oct-19	8-Oct-19
Physical-Chemical (mg/L)																				
pH (pH units)	5.46	5.09	4.59	5.17	6.50	4.61	5.67	5.27	5.66	4.78	5.66	5.16	6.48	4.65	6.21	7.44	5.97	6.95	6.29	5.67
Alkalinity (Total as $CaCO_3$)									<1.0			<1.0		<1.0						
Bicarbonate (HCO_3)									<1.0			<1.0		<1.0						
Carbonate (CO_3)									<1.0			<1.0		<1.0						
Hydroxide (OH)									<1.0			<1.0		<1.0						
Hardness ($CaCO_3$)	<0.50	<0.50	<0.50		<0.50		<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50		<0.50	
Total Hardness ($CaCO_3$)	<0.50	<0.50	<0.50		<0.50		<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50	<0.50	
Total Metals (mg/L)																				
Aluminum (Al)	<0.0030	<0.0030	0.0038	0.0037	0.0043	0.0043	<0.0030	0.0040	<0.0030	0.0031	<0.0030	<0.0030	<0.0030	0.0032	<0.0030	<0.0030	0.0040	<0.0030	0.0043	<0.0030
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Calcium (Ca)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Chromium (Cr)	<0.0010	<0.0010	<0.0010	0.0019	<0.0010	0.0011	0.0011	0.0019	<0.0010	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0019	0.0011	<0.0010	<0.0010	<0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	<0.00020	0.00022	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00035	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	0.00066
Iron (Fe)	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	0.12	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Manganese (Mn)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00057	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00053	<0.00050	<0.00050
Potassium (K)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.41	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Strontium (Sr)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Sulphur (S)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0039	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030

Table B.20. Continued. 2019 QA/QC Sample Analyses - Trip Blanks

Parameter/Sample Date	25-Feb-19	28-May-19	4-Jun-19	6-Jun-19	7-Jun-19	12-Jun-19	19-Jun-19	7-Jul-19	16-Jul-19	23-Jul-19	24-Jul-19	7-Aug-19	14-Aug-19	21-Aug-19	28-Aug-19	3-Sep-19	18-Sep-19	26-Sep-19	2-Oct-19	8-Oct-19
Dissolved Metals (mg/L)																				
Aluminum (Al)	<0.0030	<0.0030	0.0052	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0050	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Antimony (Sb)	<0.00060	<0.00060	<0.00060	<0.00060	0.00062	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic (As)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Barium (Ba)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cadmium (Cd)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.024	<0.020	<0.020
Calcium (Ca)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Chromium (Cr)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0017	<0.0010
Cobalt (Co)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)	<0.00020	<0.00020	<0.00020	<0.00020	0.00051	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Iron (Fe)	<0.060	<0.060	<0.060	<0.060	0.10	<0.060	<0.060	0.076	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead (Pb)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Manganese (Mn)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Molybdenum (Mo)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00033	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00021	<0.00020	<0.00020	<0.00020	<0.00020
Nickel (Ni)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Potassium (K)	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	1.8	<0.30	<0.30
Selenium (Se)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Silver (Ag)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Strontium (Sr)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Sulphur (S)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.38	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium (Tl)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium (V)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010
Zinc (Zn)	<0.0030	<0.0030	<0.0030	<0.0030	0.0041	<0.0030	<0.0030	<0.0030	<0.0030	0.0041	<0.0030	<0.0030	<0.0030	0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030

RESULTS OF RAINBOW TROUT LC50 MULTI-CONCENTRATION

Client : 7863 TETRA TECH CANADA INC., WINNIPEG Job Number: B943787

Client Project Name & Number: SHERRIDON 705-09240103-ALL

Test Result:

96 hrs LC50 % vol/vol (95% CL): >100% (N/A) Statistical Method: Visual

Sample Name : TOX-WEIR-2019/06/05 Sample Matrix : Water

Description: Orange, clear Sample Number: VV1896-01

Sample Collected: Jun 05, 2019 03:30 PM Sampling Method : N/A Site Collection: N/A

Sample Collected By: M.RANDELL Volume Received: 40 L Temp.Upon Arrival: 4 °C Storage: 2-6°C

Sample Received: Jun 06, 2019 10:49 AM pH: 6.6 Dissolved Oxygen: 10.2 mg/L

Analysis Start : Jun 10, 2019 10:31 AM Temperature : 12 °C Sample Conductance: 306 µS/cm

Concentration	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	Start	Start	Start	Start	24 hrs	24 hrs	24 hrs	24 hrs	48 hrs	48 hrs	48 hrs	48 hrs
0	15	8.0	328	9.2	0	0	0	0	0	0	0	0
6.25	15	8.0	328	9.2	0	0	0	0	0	0	0	0
12.5	15	8.0	325	9.2	0	0	0	0	0	0	0	0
25	15	7.9	322	9.3	0	0	0	0	0	0	0	0
50	14	7.7	319	9.5	0	0	0	0	0	0	0	0
100	15	6.8	325	9.5	0	0	0	0	0	0	0	0

Concentration	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	72 hrs	72 hrs	72 hrs	72 hrs	96 hrs	96 hr	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs
0	0	0	0	0	15	7.5	329	8.2	0	0	0	0
6.25	0	0	0	0	15	7.5	329	8.0	0	0	0	0
12.5	0	0	0	0	15	7.5	330	7.6	0	0	0	0
25	0	0	0	0	16	7.3	330	7.6	0	0	0	0
50	0	0	0	0	16	7.2	333	7.7	0	0	0	0
100	0	0	0	0	16	6.7	340	7.7	0	0	0	0

Comments : None

Culture/Control/Dilution Water City of Edmonton dechlorinated tap water

Hardness: 190 mg/L $CaCO_3$ Other parameters available on request.

Test Conditions Test concentration : 0,6.25,12.5,25,50,100 (% vol/vol)

Organisms per Vessel :	10	Test Temperature :	15 ± 1 °C	Solution Depth :	>15 cm
Total # of Organisms Used :	60	Pre-aeration Time :	120 min.	Rate of Aeration	6.5±1 mL/min/L
Test Volume :	20 L	Vessel Volume :	38L	Test pH Adjusted:	No
Loading Density :	0.3 g/L	Photoperiod :	16:8 (light: dark)		

Test Organism : Rainbow Trout *(Oncorhynchus mykiss)* Source : Spring Valley Trout Hatchery

Culture Temperature :	15 ± 2 °C	Weight (Mean) +- SD :	0.6 ± 0.3 g	Length (Mean) +- SD :	4.18 ± 0.57 cm
Culture Water Renewal :	≥ 1.0 L/min/kg fish	Weight (Range) :	0.4 – 1.2 g	Length (Range) :	3.50 – 5.40 cm
Culture Photoperiod :	16:8 (light: dark)			% Mortality within 7 days :	0.1%
Feeding rate and frequency :	daily: 1-5% biomass of trout.			Acclimation Time:	>14 days

Reference chemical: Phenol Test Date: May 23, 2019

Test Endpoint 96 hrs LC50 (95% confidence interval) : 9.75 (9.00, 10.6)mg/L Statistical Method : Untrimmed Spearman-Kärber

Historical Mean LC50 (warning limits) : 10.5 (8.60, 12.7) mg/L Concentration : 0,8,10,12,15,20 mg/L

RESULTS OF RAINBOW TROUT LC50 MULTI-CONCENTRATION

Client : 7863 TETRA TECH CANADA INC., WINNIPEG Job Number: B951664

Client Project Name & Number: SHERRIDON 705-09240103-ALL

Test Result:

96 hrs LC50 % vol/vol (95% CL): >100% (N/A) Statistical Method: Visual

Sample Name : TOX-WEIR-062619 Sample Matrix : Water

Description: Orange, clear Sample Number: VZ5172-01

Sample Collected: Jun 26, 2019 11:50 AM Sampling Method : N/A Site Collection: N/A

Sample Collected By: ED Volume Received: 40 L Temp.Upon Arrival: 1 °C Storage: 2-6°C

Sample Received: Jun 28, 2019 09:05 AM pH: 6.6 Dissolved Oxygen: 9.8 mg/L

Analysis Start : Jun 29, 2019 12:11 PM Temperature : 13 °C Sample Conductance: 284 µS/cm

Concentration	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	Start	Start	Start	Start	24 hrs	24 hrs	24 hrs	24 hrs	48 hrs	48 hrs	48 hrs	48 hrs
0	15	7.9	376	8.9	0	0	0	0	0	0	0	0
6.25	15	7.9	334	9.0	0	0	0	0	0	0	0	0
12.5	15	7.8	329	9.0	0	0	0	0	0	0	0	0
25	15	7.8	322	9.1	0	0	0	0	0	0	0	0
50	15	7.5	311	8.5	0	0	0	0	0	0	0	0
100	14	6.7	287	9.4	0	0	0	0	0	0	0	0

Concentration	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	72 hrs	72 hrs	72 hrs	72 hrs	96 hrs	96 hr	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs
0	0	0	0	0	15	7.6	398	7.7	0	0	0	0
6.25	0	0	0	0	15	7.7	353	8.2	0	0	0	0
12.5	0	0	0	0	16	7.7	350	8.3	0	0	0	0
25	0	0	0	0	16	7.7	348	8.3	0	0	0	0
50	0	0	0	0	15	7.5	334	8.6	0	0	0	0
100	0	0	0	0	15	7.0	314	8.7	0	0	0	0

Comments : None

Culture/Control/Dilution Water City of Edmonton dechlorinated tap water

Hardness: 190 mg/L $CaCO_3$ Other parameters available on request.

Test Conditions Test concentration : 0,6.25,12.5,25,50,100 (% vol/vol)

Organisms per Vessel :	10	Test Temperature :	15 ± 1 °C	Solution Depth :	>15 cm
Total # of Organisms Used :	60	Pre-aeration Time :	30 min.	Rate of Aeration	6.5±1 mL/min/L
Test Volume :	20 L	Vessel Volume :	38L	Test pH Adjusted:	No
Loading Density :	0.3 g/L	Photoperiod :	16:8 (light: dark)		

Test Organism : Rainbow Trout *(Oncorhynchus mykiss)* Source : Spring Valley Trout Hatchery

Culture Temperature :	15 ± 2 °C	Weight (Mean) +- SD :	0.7 ± 0.2 g	Length (Mean) +- SD :	4.24 ± 0.43 cm
Culture Water Renewal :	≥ 1.0 L/min/kg fish	Weight (Range) :	0.4 – 1.1 g	Length (Range) :	3.60 – 5.00 cm
Culture Photoperiod :	16:8 (light: dark)			% Mortality within 7 days :	0%
Feeding rate and frequency :	daily: 1-5% biomass of trout.			Acclimation Time:	>14 days

Reference chemical: Phenol Test Date: Jun 20, 2019

Test Endpoint 96 hrs LC50 (95% confidence interval) : 10.0 (9.12, 10.9)mg/L Statistical Method : Probit

Historical Mean LC50 (warning limits) : 10.5 (8.73, 12.6) mg/L Concentration : 0,8,10,12,15,20 mg/L

RESULTS OF RAINBOW TROUT LC50 MULTI-CONCENTRATION

Client : 7863 TETRA TECH CANADA INC., WINNIPEG Job Number: B960025

Client Project Name & Number: SHERRIDON 705-09240103-ALL

Test Result:

96 hrs LC50 % vol/vol (95% CL): >100% (N/A) Statistical Method: Visual

Sample Name : TOX-WEIR-072319 Sample Matrix : Water

Description: Orange, Hazy Sample Number: WD8474-01

Sample Collected: Jul 23, 2019 11:20 AM Sampling Method : N/A Site Collection: N/A

Sample Collected By: MATTHEW RANDELL Volume Received: 37 L Temp.Upon Arrival: 3 °C Storage: 2-6°C

Sample Received: Jul 24, 2019 10:30 AM pH: 6.8 Dissolved Oxygen: 8.4 mg/L

Analysis Start : Jul 26, 2019 09:30 AM Temperature : 14 °C Sample Conductance: 322 µS/cm

Concentration	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	Start	Start	Start	Start	24 hrs	24 hrs	24 hrs	24 hrs	48 hrs	48 hrs	48 hrs	48 hrs
0	15	8.1	334	9.0	0	0	0	0	0	0	0	0
6.25	15	8.1	334	9.0	0	0	0	0	0	0	0	0
12.5	15	8.0	334	9.1	0	0	0	0	0	0	0	0
25	15	8.0	334	8.6	0	0	0	0	0	0	Y(3)	30.0
50	14	7.8	333	9.4	0	0	Y(3)	30.0	0	0	Y(5)	50.0
100	15	7.1	339	9.0	0	0	Y(5)	50.0	0	0	Y(7)	70.0

Concentration	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	72 hrs	72 hrs	72 hrs	72 hrs	96 hrs	96 hr	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs
0	0	0	0	0	16	7.8	345	8.0	0	0	0	0
6.25	0	0	0	0	16	7.9	343	8.2	0	0	0	0
12.5	0	0	0	0	16	7.8	343	8.1	0	0	0	0
25	0	0	0	0	16	7.6	345	7.9	0	0	Y(1)	10.0
50	0	0	Y(8)	80.0	16	7.7	347	8.2	0	0	Y(8)	80.0
100	0	0	Y(10)	100	16	7.1	352	8.2	0	0	0	0

Atypical Behaviour Notes : Y=Hyperexcitable

Comments : None

Culture/Control/Dilution Water City of Edmonton dechlorinated tap water

Hardness: 180 mg/L $CaCO_3$ Other parameters available on request.

Test Conditions Test concentration : 0,6.25,12.5,25,50,100 (% vol/vol)

Organisms per Vessel :	10	Test Temperature :	15 ± 1 °C	Solution Depth :	>15 cm
Total # of Organisms Used :	60	Pre-aeration Time :	30 min.	Rate of Aeration	6.5±1 mL/min/L
Test Volume :	17 L	Vessel Volume :	38L	Test pH Adjusted:	No
Loading Density :	0.4 g/L	Photoperiod :	16:8 (light: dark)		

Test Organism : Rainbow Trout *(Oncorhynchus mykiss)* Source : Spring Valley Trout Hatchery

Culture Temperature :	15 ± 2 °C	Weight (Mean) +- SD :	0.7 ± 0.1 g	Length (Mean) +- SD :	4.12 ± 0.24 cm
Culture Water Renewal :	≥ 1.0 L/min/kg fish	Weight (Range) :	0.5 – 0.9 g	Length (Range) :	3.70 – 4.40 cm
Culture Photoperiod :	16:8 (light: dark)			% Mortality within 7 days :	0%
Feeding rate and frequency :	daily: 1-5% biomass of trout.			Acclimation Time:	>14 days

RESULTS OF RAINBOW TROUT LC50 MULTI-CONCENTRATION

Client : 7863 TETRA TECH CANADA INC., WINNIPEG Job Number: B965849

Client Project Name & Number: SHERRIDON 705-09240103-ALL

Test Result:

96 hrs LC50 % vol/vol (95% CL): >100% (N/A) Statistical Method: Visual

Sample Name : TOX-WEIR-08082019 Sample Matrix : Water

Description: Orange, Hazy Sample Number: WG6572-01

Sample Collected: N/A Sampling Method : N/A Site Collection: N/A

Sample Collected By: ED Volume Received: 40 L Temp.Upon Arrival: 12 °C Storage: 2-6°C

Sample Received: Aug 09, 2019 10:29 AM pH: 6.4 Dissolved Oxygen: 9.2 mg/L

Analysis Start : Aug 13, 2019 12:12 PM Temperature : 12 °C Sample Conductance: 362 µS/cm

Concentration	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	Start	Start	Start	Start	24 hrs	24 hrs	24 hrs	24 hrs	48 hrs	48 hrs	48 hrs	48 hrs
0	15	8.0	326	8.9	0	0	0	0	0	0	0	0
6.25	15	7.9	329	8.9	0	0	0	0	0	0	0	0
12.5	14	7.9	331	9.0	0	0	0	0	0	0	0	0
25	16	7.8	353	8.9	0	0	0	0	0	0	0	0
50	15	7.6	362	9.0	0	0	0	0	0	0	0	0
100	14	6.7	380	9.1	0	0	0	0	0	0	0	0

Concentration	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	72 hrs	72 hrs	72 hrs	72 hrs	96 hrs	96 hr	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs
0	0	0	0	0	14	7.4	326	7.3	0	0	0	0
6.25	0	0	0	0	15	7.4	332	7.4	0	0	0	0
12.5	0	0	0	0	15	7.8	340	8.8	0	0	0	0
25	0	0	0	0	15	7.8	349	8.9	0	0	0	0
50	0	0	0	0	15	7.6	358	8.9	0	0	0	0
100	0	0	0	0	15	6.7	393	8.4	0	0	0	0

Comments : None

Culture/Control/Dilution Water City of Edmonton dechlorinated tap water

Hardness: 180 mg/L $CaCO_3$ Other parameters available on request.

Test Conditions Test concentration : 0,6.25,12.5,25,50,100 (% vol/vol)

Organisms per Vessel :	10	Test Temperature :	15 ± 1 °C	Solution Depth :	>15 cm
Total # of Organisms Used :	60	Pre-aeration Time :	30 min.	Rate of Aeration	6.5±1 mL/min/L
Test Volume :	20 L	Vessel Volume :	38L	Test pH Adjusted:	No
Loading Density :	0.2 g/L	Photoperiod :	16:8 (light: dark)		

Test Organism : Rainbow Trout *(Oncorhynchus mykiss)* Source : Spring Valley Trout Hatchery

Culture Temperature :	15 ± 2 °C	Weight (Mean) +- SD :	0.4 ± 0.1 g	Length (Mean) +- SD :	3.57 ± 0.21 cm
Culture Water Renewal :	≥ 1.0 L/min/kg fish	Weight (Range) :	0.2 – 0.5 g	Length (Range) :	3.20 – 4.00 cm
Culture Photoperiod :	16:8 (light: dark)			% Mortality within 7 days :	0.5%
Feeding rate and frequency :	daily: 1-5% biomass of trout.			Acclimation Time:	>14 days

Reference chemical: Phenol Test Date: Aug 21, 2019

Test Endpoint 96 hrs LC50 (95% confidence interval) : 9.56 (8.76, 10.4)mg/L Statistical Method : Untrimmed Spearman-Kärber

Historical Mean LC50 (warning limits) : 10.4 (8.73, 12.4) mg/L Concentration : 0,8,10,12,15,20 mg/L

RESULTS OF RAINBOW TROUT LC50 MULTI-CONCENTRATION

Client : 7863 TETRA TECH CANADA INC., WINNIPEG Job Number: B982703

Client Project Name & Number: - 705-09240103-ALL

Test Result:

96 hrs LC50 % vol/vol (95% CL): >100% (N/A) Statistical Method: Visual

Sample Name : TOX-WEIR-09252019 Sample Matrix : Water

Description: Orange, Hazy Sample Number: WP1456-01

Sample Collected: Sep 25, 2019 Sampling Method : N/A Site Collection: N/A

Sample Collected By: ED Volume Received: 40 L Temp.Upon Arrival: 4 °C Storage: 2-6°C

Sample Received: Sep 27, 2019 11:03 AM pH: 6.4 Dissolved Oxygen: 11.0 mg/L

Analysis Start : Sep 30, 2019 01:00 PM Temperature : 14 °C Sample Conductance: 342 µS/cm

Concentration	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	Start	Start	Start	Start	24 hrs	24 hrs	24 hrs	24 hrs	48 hrs	48 hrs	48 hrs	48 hrs
0	14	8.1	291	9.4	0	0	0	0	0	0	0	0
6.25	14	8.0	291	9.5	0	0	0	0	0	0	0	0
12.5	14	8.0	301	9.2	0	0	0	0	0	0	0	0
25	14	7.9	302	9.7	0	0	0	0	0	0	0	0
50	15	7.7	324	9.6	0	0	0	0	0	0	0	0
100	14	6.5	335	9.8	0	0	0	0	0	0	0	0

Concentration	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	72 hrs	72 hrs	72 hrs	72 hrs	96 hrs	96 hr	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs
0	0	0	0	0	14	7.7	288	8.9	0	0	0	0
6.25	0	0	0	0	14	7.7	291	8.8	0	0	0	0
12.5	0	0	0	0	14	7.6	295	8.7	0	0	0	0
25	0	0	0	0	14	7.5	298	8.5	0	0	0	0
50	0	0	0	0	14	7.5	311	8.8	0	0	0	0
100	0	0	0	0	14	6.6	337	8.8	0	0	0	0

Comments : None

Culture/Control/Dilution Water City of Edmonton dechlorinated tap water

Hardness: 190 mg/L $CaCO_3$ Other parameters available on request.

Test Conditions Test concentration : 0,6.25,12.5,25,50,100 (% vol/vol)

Organisms per Vessel :	10	Test Temperature :	15 ± 1 °C	Solution Depth :	>15 cm
Total # of Organisms Used :	60	Pre-aeration Time :	120 min.	Rate of Aeration	6.5±1 mL/min/L
Test Volume :	20 L	Vessel Volume :	38L	Test pH Adjusted:	No
Loading Density :	0.2 g/L	Photoperiod :	16:8 (light: dark)		

Test Organism : Rainbow Trout *(Oncorhynchus mykiss)* Source : Spring Valley Trout Hatchery

Culture Temperature :	15 ± 2 °C	Weight (Mean) +- SD :	0.5 ± 0.2 g	Length (Mean) +- SD :	3.68 ± 0.46 cm
Culture Water Renewal :	≥ 1.0 L/min/kg fish	Weight (Range) :	0.2 – 0.8 g	Length (Range) :	2.80 – 4.40 cm
Culture Photoperiod :	16:8 (light: dark)			% Mortality within 7 days :	0%
Feeding rate and frequency :	daily: 1-5% biomass of trout.			Acclimation Time:	>14 days

Reference chemical: Phenol Test Date: Sep 18, 2019

Test Endpoint 96 hrs LC50 (95% confidence interval) : 9.99 (9.10, 10.8)mg/L Statistical Method : Probit

Historical Mean LC50 (warning limits) : 9.95 (7.10, 13.9) mg/L Concentration : 0,8,10,12,15,20 mg/L

RESULTS OF RAINBOW TROUT LC50 MULTI-CONCENTRATION

Client : 7863 TETRA TECH CANADA INC., WINNIPEG Job Number: B987725

Client Project Name & Number: SHERRIDON 705-09240103-ALL

Test Result:

96 hrs LC50 % vol/vol (95% CL): >100% (N/A) Statistical Method: Visual

Sample Name : TOX-WEIR-10082019 Sample Matrix : Water

Description: Orange, hazy Sample Number: WR7752-01

Sample Collected: Oct 08, 2019 04:30 PM Sampling Method : N/A Site Collection: N/A

Sample Collected By: ED Volume Received: 38 L Temp.Upon Arrival: 2 °C Storage: 2-6°C

Sample Received: Oct 11, 2019 12:46 PM pH: 6.2 Dissolved Oxygen: 11.1 mg/L

Analysis Start : Oct 12, 2019 02:50 PM Temperature : 15 °C Sample Conductance: 323 µS/cm

Concentration	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	Start	Start	Start	Start	24 hrs	24 hrs	24 hrs	24 hrs	48 hrs	48 hrs	48 hrs	48 hrs
0	15	7.9	304	9.2	0	0	0	0	0	0	0	0
6.25	15	7.9	303	9.2	0	0	0	0	0	0	0	0
12.5	15	7.9	310	9.1	0	0	0	0	0	0	0	0
25	16	7.8	283	9.1	0	0	0	0	0	0	0	0
50	16	7.6	320	9.2	0	0	0	0	0	0	0	0
100	16	6.6	331	9.5	0	0	0	0	0	0	0	0

Concentration	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	72 hrs	72 hrs	72 hrs	72 hrs	96 hrs	96 hr	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs
0	0	0	0	0	15	7.9	311	8.8	0	0	0	0
6.25	0	0	0	0	15	7.7	314	8.6	0	0	0	0
12.5	0	0	0	0	16	7.7	327	8.2	0	0	0	0
25	0	0	0	0	16	7.8	324	8.6	0	0	0	0
50	0	0	0	0	16	7.4	332	8.3	0	0	0	0
100	0	0	0	0	16	6.7	342	8.6	0	0	0	0

Comments : None

Culture/Control/Dilution Water City of Edmonton dechlorinated tap water

Hardness: 190 mg/L $CaCO_3$ Other parameters available on request.

Test Conditions Test concentration : 0,6.25,12.5,25,50,100 (% vol/vol)

Organisms per Vessel :	10	Test Temperature :	15 ± 1 °C	Solution Depth :	>15 cm
Total # of Organisms Used :	60	Pre-aeration Time :	120 min.	Rate of Aeration	6.5±1 mL/min/L
Test Volume :	18 L	Vessel Volume :	38L	Test pH Adjusted:	No
Loading Density :	0.3 g/L	Photoperiod :	16:8 (light: dark)		

Test Organism : Rainbow Trout *(Oncorhynchus mykiss)* Source : Spring Valley Trout Hatchery

Culture Temperature :	15 ± 2 °C	Weight (Mean) +- SD :	0.6 ± 0.2 g	Length (Mean) +- SD :	3.98 ± 0.25 cm
Culture Water Renewal :	≥ 1.0 L/min/kg fish	Weight (Range) :	0.4 – 0.9 g	Length (Range) :	3.70 – 4.50 cm
Culture Photoperiod :	16:8 (light: dark)			% Mortality within 7 days :	0%
Feeding rate and frequency :	daily: 1-5% biomass of trout.			Acclimation Time:	>14 days

Reference chemical: Phenol Test Date: Sep 18, 2019

Test Endpoint 96 hrs LC50 (95% confidence interval) : 9.99 (9.10, 10.8)mg/L Statistical Method : Probit

Historical Mean LC50 (warning limits) : 9.95 (7.10, 13.9) mg/L Concentration : 0,8,10,12,15,20 mg/L