

**Table 3: Additional information on select chemical water quality parameters monitored in 2018.**

Water Quality Parameter	What Is It	Why Measure It	Recommended Limit
<b>Alkalinity</b> (mg/L)	A measure of a lake's "buffering capacity" or its ability to neutralize acids. Alkalinity comes from rocks and soils, salts, plant activities, and industrial wastewater discharges.	It is a measure of a lake's sensitivity to acid inputs, such as rainfall or snowmelt.	Values of 20-200 mg/L are common in freshwater systems; lakes below 10 mg/L are susceptible to acidification.
<b>Calcium</b> (mg/L)	The most commonly found substance in water, normally from bedrock leaching and effluent discharge. An important element for aquatic life and for pH buffering in lakes. It is the main component causing water hardness.	High amounts can cause algae problems and water hardness. Low amounts can cause corrosion, water softness, and affect species diversity.	Water is considered hard at levels above 120 mg/L and soft below 60 mg/L. Muskoka, being on the Canadian Shield, has extremely soft water.
<b>Chloride</b> (mg/L)	A salt compound that results from the combination of chlorine gas and a metal. Small amounts are required for normal cell functions in plant and animal life. Sources include rock, agricultural runoff, industrial wastewater and sewage treatment effluent.	Chloride ion (Cl-) in lake water is considered an indicator of human activity.	High levels (>250 mg/L) affect fish and aquatic communities.
<b>Colour</b> (TCU)	A shade or tint imparted to water that is often caused by organic materials created when vegetation decays. Lakes with high DOC tend to have more colour.	Dissolved mineral matter, such as iron and manganese, may also produce colour.	Aesthetic objective in drinking water is 5 TCU. Lakes naturally range from 0-300 TCU.
<b>Conductivity</b> ( $\mu$ S/cm)	The ability of water to pass an electric current. It indicates the physical presence of dissolved salts (ions) in the water, such as chloride, sulphate, phosphate, sodium, magnesium, calcium, iron and aluminum. Pure water has low conductivity.	The higher the conductivity, the more dissolved solids are in the water. Conductivity increases with increasing temperature.	Natural waters tend to be between 50-1500 $\mu$ S/cm.
<b>Dissolved Organic Carbon (DOC)</b> (mg/L)	The most abundant element found in all organisms. In aquatic environments, organic carbon is produced by plant photosynthesis and bacterial growth. Leaching of humic substances and decomposition of plants and animals are other natural sources.	Water high in DOC tends to be more tea-coloured. In addition to natural sources, human-related sources of DOC include agricultural runoff and municipal and industrial effluents.	Aesthetic objective in drinking water is 5 mg/L. Values above 7 mg/L are considered high for recreational use.
<b>Sodium</b> (mg/L)	A highly soluble metal found everywhere in the water environment. Major sources include road salt, agricultural runoff, geological formations and water softeners.	High levels can cause algae problems and can be toxic to aquatic life.	Aesthetic objective in drinking water is 200 mg/L. Levels over 20 mg/L may affect people on sodium-reduced diets.
<b>Nitrate (NO<sub>3</sub>)</b> ( $\mu$ g/L)	Nitrate is the primary form of nitrogen used by plants as a nutrient to stimulate growth.	Elevated levels may indicate pollution from sewage or agricultural runoff and can lead to increased algal growth and eutrophication.	Natural levels in surface water are typically less than 1 mg/L (1000 $\mu$ g/L). Drinking water objective is a maximum of 10 mg/L.
<b>Total Kjeldahl Nitrogen (TKN)</b> ( $\mu$ g/L)	A measure of both ammonia and organic forms of nitrogen. Major sources include sewage treatment plant effluent, agricultural runoff and development.	Excessive amounts contribute to eutrophication of lakes creating algal blooms that can negatively impact aquatic life.	Lakes with high TKN values and high TP values may be prone to excessive algae growth.
<b>pH</b>	A measure of the hydrogen ion concentration in water, on a scale of 1 to 14 with 7 being neutral. The lower the pH of water, the more acidic it is. Extreme changes in pH impair the reproduction of aquatic life and species diversity.	The distribution of aquatic organisms and the toxicity of some common pollutants are strongly affected by pH.	Provincial water quality objective is between 6.5 and 8.5. pH values below 5 and above 9 are harmful to organisms.
<b>Sulphate</b> (mg/L)	Sulphate is natural in many minerals but is often derived from acidic deposition (acid rain). High amounts that exceed the buffering capacity of a lake can reduce the pH.	High levels can reduce the pH in a lake by increasing the acidity levels.	Drinking water standard is 500 mg/L.

**APPENDIX 2: 2018 Chemical Data for Select Parameters**

Lake Name	Date (dd-mm-yyyy)	Alkalinity mg/L	Calcium mg/L	Chloride mg/L	Colour TCU	Conductivity µS/cm	DOC mg/L	Sodium mg/L	NO <sub>3</sub> µg/L	TKN µg/L	pH	Sulphate mg/L
Ada	14-06-2018	13.60	6.54	39.40	38.0	174.0	5.8	24.60	4	384	6.74	2.20
Atkins	31-05-2018	6.45	4.14	4.97	47.6	41.5	7.0	1.96	20	305	6.58	2.25
Barron's	19-06-2018	19.20	7.68	50.80	62.7	223.0	8.1	35.70	6	515	6.91	2.70
Bass (GR)	16-05-2018	6.32	2.36	2.38	82.6	28.2	7.1	2.00	20	382	6.54	2.10
Bastedo	18-05-2018	7.03	2.84	1.36	19.8	27.8	4.3	1.27	2	281	6.64	2.35
Baxter	14-06-2018	64.70	27.60	30.30	17.2	249.0	4.5	17.90	4	345	7.49	9.35
Bearpaw	18-05-2018	6.07	2.82	1.09	102.0	23.3	9.2	0.94	54	328	6.51	1.25
Bella	29-05-2018	5.74	2.54	1.11	9.4	26.9	2.6	1.16	52	201	6.59	3.30
Bing	29-05-2018	3.90	1.60	0.38	18.4	17.7	4.1	0.73	1	274	6.49	2.35
Bird	11-05-2018	4.05	2.20	1.71	32.2	24.8	3.7	0.93	112	198	6.36	2.60
Black	04-06-2018	5.71	2.74	6.25	63.4	41.4	6.9	4.71	4	336	6.58	1.50
Brandy	07-06-2018	9.14	3.88	6.74	94.2	51.7	9.0	4.90	26	424	6.71	1.55
Bruce	07-06-2018	10.60	4.06	4.76	16.8	48.3	4.0	3.50	2	284	6.80	2.70
Camel	01-06-2018	3.55	2.04	0.86	59.3	19.4	7.6	1.02	2	339	6.41	2.05
Cassidy	14-06-2018	7.53	3.74	13.70	42.7	70.1	5.7	8.55	4	307	6.62	1.70
Clear (BR)	11-05-2018	7.19	2.94	0.53	7.2	25.6	2.1	0.79	76	184	6.58	2.65
Clear (ML)	04-06-2018	9.41	4.24	1.65	6.3	34.5	2.7	1.38	1	251	6.72	2.95
Clearwater (GR)	16-05-2018	6.45	2.68	0.72	16.9	25.6	3.7	0.94	20	223	6.64	2.60
Clearwater (HT)	01-06-2018	7.52	2.98	0.95	8.7	27.2	2.8	1.19	46	200	6.65	2.55
Fairy - Main	22-05-2018	4.77	2.52	5.74	46.8	43.2	5.3	4.03	258	227	6.45	2.85
Fairy - N Muskoka River Bay	22-05-2018	5.57	2.62	6.31	44.2	45.6	5.3	4.29	262	198	6.49	3.00
Fifteen Mile	30-05-2018	4.35	1.76	0.26	12.6	19.1	2.8	0.60	70	211	6.51	2.50
Galla	15-06-2018	5.40	2.16	0.49	29.2	20.9	5.6	0.87	2	315	6.89	2.25
Gibson - North	13-06-2018	5.79	2.78	6.27	54.5	42.2	6.5	4.34	6	333	6.60	1.65
Gibson - South	13-06-2018	5.15	2.38	3.71	57.2	32.0	6.7	2.81	6	334	6.58	1.50
Go Home	13-06-2018	7.30	3.58	7.03	23.0	52.8	3.9	4.77	124	219	6.64	3.35
Gullwing	04-06-2018	5.88	2.60	4.03	47.6	33.2	6.2	3.19	1	308	6.59	1.65
Halfway	15-05-2018	4.44	2.70	13.40	79.5	64.9	7.4	8.93	94	314	6.25	2.00