to: Bruce Mattson, Lorax Environmental Services Ltd.
Holger Hartmaier, BGC Engineering Inc.
from: Leslie Gomm
date: February 17, 2005
ref: 41013
re: **Preliminary Baseline Water Quality Assessment - Ulu**

As discussed, the following is a preliminary baseline water quality assessment of Ulu Lake, West Lake, East Lake and Ulu Creek. A full summary of the 2004 Baseline Water Quality Assessment is currently being prepared as part of the broader High Lake Project Environmental Baseline Assessment Program.

**Background**

The 2004 Baseline Water Quality Program at Ulu consisted of the collection of lake and stream water data from the various drainages that may be impacted by the proposed mine development. The 2004 sampling program was developed to build on previous work carried out at the site by RL&L Environmental Services Ltd. in 1996 and 1997. This included four key drainages: Ulu Lake and Ulu Creek, West Lake, Reno Lakes and the Frayed Knots River. The majority of the proposed development is within the Ulu Lake and West Lake drainages.

The following provides a summary of the results of the 2004 program for West Lake, East Lake, Ulu Lake, Meadow Lake, Ulu Creek (S500b) and a control lake (Lake UC). The sampling locations are indicated on Figure 1. The results are summarized in Tables 1 to 10. Data were evaluated based on the Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Aquatic Life (2003). Values that exceed the guidelines are highlighted within the data tables. Key water quality indicators: pH, hardness, alkalinity or buffering capacity, and productivity are also discussed in detail.

To provide context for the 2004 general water quality parameters and total metals results, a comparison was made to conditions in the control lake. Where appropriate, the results are also compared to previous data from the 1996 and 1997 programs. These previous programs consisted only of surface water samples collected in the open water season. The 2004 program included under-ice sampling in May and discrete depth sampling in June and August. Therefore, any comparison to previous data is limited to samples collected in 2004 during the summer. Due to limited historical data, natural variability in surface water quality parameters and changes in analytical methods, any comparison to historical samples should be considered as only a rudimentary comparison of water quality conditions. Furthermore, reductions in detection limits for arsenic prevent any direct comparison with previous sampling results.

West Lake was sampled in May and August, East Lake was sampled once in August, Ulu Lake was sampled in May, July and August, and Meadow Lake was sampled in August. In addition to the lakes, four streams were also sampled:

- S505a (inflow to Ulu Lake from West Lake drainage),
- S504b (outflow from Ulu Lake),
- S529b (inflow to West Lake below road crossing), and
- Ulu Creek (S500b).

Samples from S505a and S500b were collected in June, July and August and samples from the remaining streams were collected in August only.

**Ulu Control Lake - UC**

The reference lake for the Ulu site is located southeast of the camp and drains into Ulu Creek below the water quality sampling location S500b. The lake was sampled in May, July and August (Table 1). Generally, the water is very soft[1], highly sensitive to acidity[2] and oligotrophic[3]. The metal levels in the reference lake were low and within the recommended CCME guidelines with the exception of aluminum (due to a calcium < 4 mg/L), and copper and zinc in one sample during under-ice conditions. In this sample, the concentrations of total and dissolved zinc are 0.261 mg/L and 0.0183 mg/l and of total and dissolved copper are 0.00498 mg/L and 0.00131 mg/L, indicating that these elevated concentrations are primarily associated with particulate matter.

**West Lake**

West Lake is located approximately 500 m east of the Ulu Camp and serves as a source of drinking water for the camp. The primary inputs to the lake are from surface runoff and a stream that enters at the south end through a boulder field (Figure 1). This stream originates from a small lake upstream of the road. Previous work carried out by RL&L indicated that this stream was intermittent and only flowed during the initial spring melt, however the stream was found to be flowing out of the culvert at the road crossing during a site visit in July 2004. The stream flows for about 500 m through a large scree field between the culvert and West Lake. Flow out of West Lake is through a boulder-filled channel at the north end of the lake to the headwater stream of Ulu Lake.

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[1] McNeeley, R.N., V.P. Neimanis and L. Dwyer. 1979. *Water Quality Sourcebook – A Guide to Water Quality Parameters.* Inland Waters Directorate, Water Quality Branch, Minister of Supply and Services Canada.

[2] Saffran, K.A. and D.O. Trew. 1996. *Sensitivity of Alberta Lakes to Acidifying Deposition: An Update of Maps with Emphasis on 109 Northern Lakes.* Water Management Division. Alberta Environmental Protection.

[3] Canadian Council of Ministers of the Environment (CCME). 2003. *Canadian Guidance Framework for the Management of Phosphorus in Freshwater Systems.* National Guidelines and Standards Office, Environment Canada.

In 2004, West Lake had near neutral pH and was well oxygenated (Table 2). West Lake can be characterized as soft, with hardness ranging from 45.4 to 55.3 mg/L $CaCO_3$, which are significantly higher than hardness levels in Ulu Lake, Ulu Creek, Meadow Lake and the control lake. Alkalinity levels in West Lake were generally low (< 10 mg/l $CaCO_3$), indicative of high sensitivity to acidic inputs. Sulphate concentrations in West Lake ranged from 36.5 mg/L to 38.2 mg/L under ice and from 21.4 to 21.7 mg/L during open water. These levels were higher than the other lakes, particularly the control lake which exhibited concentrations ranging from 3.2 to 5.3 mg/L. Conductivity and chloride levels in West Lake were elevated in relation to the surrounding lakes. Organic carbon levels in West Lake were low and the low nutrient and chlorophyll levels are indicative of oligotrophic, nutrient poor, surface waters.

Generally, the metal levels were low and within the recommended CCME guidelines with the exception of aluminum in August (due to a drop in pH < 6.5) and copper. Levels of copper were higher during under-ice conditions and above CCME in open water conditions. Aluminum, arsenic and zinc concentrations were similar to the control lake while copper and nickel concentrations were generally higher. A comparison of the 2004 data and previous results from the 1996 sampling program is presented in Table 3. The only notable changes in the water quality of West Lake is a decrease in sodium and strontium concentrations, an increase in sulphate (8.6 mg/L in 1996 to an median in 2004 of 29.1 mg/L), and an apparent increase in total zinc from below detection (<0.0005 to 0.007 mg/L). The elevated levels of strontium seen in 1996 were thought to have originated from past exploration activities in the area. During the summer season, the levels of copper in West Lake are similar to the previous results.

**East Lake**

East Lake is located south east of the ridge on which the exploration camp is located (Figure 1). The primary inputs to East Lake are from surface runoff, the camp's sewage disposal and drainage from the ore and waste rock storage area. Flow out of East Lake is thought to be primarily via subsurface flow to Ulu Lake, although surface flow through boulders at the outlet was evident during peak flow conditions.

East Lake is similar in water quality to Ulu Lake and the control lake, with low hardness and alkalinity and near neutral pH (Table 4). East Lake has a much higher Chlorophyll *a* concentration of 15.3 µg/L compared to typical concentrations in the other lakes, which are below 0.1 µg/L. East Lake is meso-eutrophic, moderately productive, and contains a moderate level of nutrients, primarily due to the loading from the camp sewage discharge. East Lake also has elevated Total Dissolved Solids (49.8 mg/L) and $SO_4$ (20.4 mg/L) concentrations. The metal levels were low and within the recommended CCME guidelines. Aluminum and zinc concentrations were within the range of those in the control lake while arsenic, copper, iron and nickel concentrations were higher.

East Lake was sampled previously in August 1997. A comparison of those results with the August 2004 sample is presented in Table 5. Overall, based on these two surface samples, there is an overall improvement in the water quality in East Lake, particularly with respect to sewage related contaminants such as nutrients and organics. There is also an apparent decrease in other general chemistry parameters, including total dissolved solids, conductivity, chloride and sulphate. Finally, between the 1997 sample and the 2004 sample there was a general decrease in metal levels, specifically aluminum, calcium, magnesium, nickel, sodium, strontium and zinc.

**Ulu Lake, Meadow Lake and Ulu Creek**

Ulu Lake is located east of the exploration site (Figure 1). Input to Ulu Lake is from surface runoff, the West Lake drainage, the East Lake drainage and a third drainage extending southwest towards the airstrip. The majority of the flow to Ulu Lake originates from the West Lake drainage. This inflow to Ulu Lake is a high waterfall over bedrock. This stream was flowing during each field visit in 2004. Ulu Creek, the outflow of Ulu Lake, is through wide scree field of very large boulders at the southeast corner of the lake. In August 2004, the water was shallow and slow moving. Ulu Creek flows through a series of small lakes to Meadow Lake, then east to the Frayed Knots River. Ulu Creek was sampled at the previously established Rescan 4 station downstream of Meadow Lake. Meadow Lake is shallow and was frozen to the bottom in May 2004.

Ulu and Meadow Lakes are near neutral pH and exhibit very soft water and low alkalinity, the latter indicating a high sensitivity to acidic inputs (Table 6 and 7). Typical of the other lakes in the area, they are also oligotrophic. Levels of sulphate in Ulu and Meadow Lakes are low, although Ulu Lake exhibited higher levels of sulphate during under ice conditions than during the open water season, approximately 22.8 mg/L compared to 9 mg/L. Generally, the metal levels in both lakes were low and within the recommended CCME guidelines with the exception of aluminum (due to a calcium < 4 mg/L) and copper in Ulu Lake during under-ice conditions. Ulu Lake exhibited elevated concentrations of copper and nickel compared to the control lake. Concentrations of arsenic and zinc in Meadow Lake were within the range of concentrations in the control lake while aluminum, copper, iron and nickel concentrations were higher.

Ulu Lake was sampled previously in both 1996 and 1997. A comparison of those results with the 2004 data is presented in Table 8. The only notable changes in the water quality of Ulu Lake is a marginal increase in total zinc from below detection to an median of 0.0056 mg/L in 2004.

During the open water season, Ulu Creek (S500b) generally has similar water quality to Ulu Lake (Table 9). Peak concentrations of total suspended solids and turbidity occurred in June during spring freshet. Turbidity levels during the rest of the sampling season are higher at Ulu Creek

than Ulu Lake. Metal levels in Ulu Creek are low and within the recommended CCME guidelines with the exception of aluminum, iron and copper during spring freshet, primarily associated with elevated levels suspended solids during peak flow conditions. During the remainder of the summer, aluminum levels remained above CCME due to the low levels of calcium in the creek (< 4mg/L).

Concentrations of zinc in Ulu Creek were within the range of those in the control lake while aluminum, copper, iron and nickel concentrations were higher. Levels of arsenic were also slightly elevated compared to the control lake. Ulu Creek was sampled previously in both 1996 and 1997. A comparison of those results with the 2004 data is presented in Table 10. The only notable changes in the water quality of Ulu Creek is a marginal increase in total zinc from below detection to a median concentration of 0.0038 mg/L in 2004.

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# Table 1 Water Samples from UC - Ulu Control Lake, 2004

## General Chemistry Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | UC-S | UC-M | UC-B | UC-S | UC-M | UC-B | UC-S | UC-M | UC-B | Summary Statistics | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | | CCME [a] | 05/20/2004 | 05/20/2004 | 05/20/2004 | 07/20/2004 | 07/20/2004 | 07/20/2004 | 08/21/2004 | 08/21/2004 | 08/21/2004 | Minimum | Median | Maximum |
| **Physical Tests** | | | | | | | | | | | | | | |
| Temperature (°C) | | | | | | 7.52 | 7.49 | 6.1 | 8.22 | 8.22 | 8.19 | 6.1 | 7.855 | 8.22 |
| Conductivity (lab) (uS/cm) | 2 | | 35.3 | 34.9 | 34.7 | 24.5 | 24.4 | 24.3 | 25.9 | 24.7 | 24.8 | 24.3 | 24.75 | 34.9 |
| Conductivity (field) (uS/cm) | | | | | | 14 | 14 | 12 | 22 | 22 | 22 | 12 | 18 | 22 |
| Total Dissolved Solids | 10 | | 11 | 11 | 11 | <10 | 10 | <10 | 9.1 | 8.9 | 8.9 | 8.9 | 10 | 11 |
| Hardness CaCO3 | 0.54 | | 12.6 | 12.5 | 11.5 | 8.48 | 10.1 | 8.67 | 8.43 | 8.48 | 8.36 | 8.36 | 8.575 | 12.5 |
| pH (lab) | 0.01 | 6.5-9.0 | 7.29 | 7.91 | 7.44 | 6.65 | 6.51 | 6.57 | *6.12* | 6.86 | *6.46* | 6.12 | 6.61 | 7.91 |
| pH (field) | | | | | | 6.29 | 6.28 | 6.35 | 5.48 | 5.6 | 5.7 | 5.48 | 5.99 | 6.35 |
| Dissolved Oxygen (field) | | 5.5-9.5 | | | | 12.24 | 12.2 | 12.01 | 12.1 | 11.93 | 11.91 | 11.91 | 12.055 | 12.24 |
| TSS | 4 | | <4.0 | <4.0 | <4.0 | <4.0 | <4.0 | <4.0 | <4.0 | <4.0 | <4.0 | | | |
| Turbidity (NTU) | 0.1 | | 0.28 | 0.27 | 0.41 | 1.17 | 0.21 | <0.10 | 1.09 | 0.89 | 1.78 | 0.21 | 0.89 | 1.78 |
| Colour | | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | N/A | N/A | N/A | | | |
| **Dissolved Anions** | | | | | | | | | | | | | | |
| Alkalinity-Gran Total CaCO3 | 1 | | 8.4 | 8.7 | 8.8 | 4.8 | 3.2 | 4.8 | 4.2 | 5.1 | 5.2 | 3.2 | 4.95 | 8.8 |
| Chloride | 0.5 | | 1.16 | 1.17 | 1.07 | 0.72 | 0.72 | 0.72 | 0.71 | 0.67 | 0.64 | 0.64 | 0.72 | 1.17 |
| Sulphate SO4 | 1 | | 5.3 | 5.3 | 5.3 | 3.5 | 3.5 | 3.5 | 3.3 | 3.2 | 3.2 | 3.2 | 3.5 | 5.3 |
| **Inorganic Parameters** | | | | | | | | | | | | | | |
| Sulfide | | | | | | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | | | |
| **Nutrients** | | | | | | | | | | | | | | |
| Ammonia Nitrogen | 0.005 | | 0.0103 | 0.0179 | 0.0151 | <0.020 | <0.020 | <0.020 | <0.0050 | <0.0050 | <0.0050 | 0.0151 | 0.0165 | 0.0179 |
| Total Kjeldahl Nitrogen | 0.05 | | 0.080 | 0.089 | 0.079 | 0.060 | 0.070 | 0.084 | 0.098 | 0.096 | 0.083 | 0.06 | 0.0835 | 0.098 |
| Nitrate Nitrogen | 0.005 | 13 | <0.0050 | <0.0050 | 0.005 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.005 | <0.005 | 0.005 |
| Nitrite Nitrogen | 0.005 | 0.06 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | | | |
| Nitrate/Nitrite Nitrogen | 0.005 | | <0.0050 | <0.0050 | 0.01 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.005 | <0.005 | 0.01 |
| Dissolved ortho-phosphate | 0.001 | | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | | | |
| Total Phosphate | 0.002 | | 0.002 | 0.002 | 0.002 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.002 | <0.002 | 0.002 |
| **Organic Parameters** | | | | | | | | | | | | | | |
| Total Organic Carbon | | | | | | 1.29 | 1.38 | 1.24 | 1.21 | 1.17 | 1.24 | 1.17 | 1.24 | 1.38 |
| Dissolved Organic Carbon | | | | | | 1.40 | 1.51 | 1.37 | 1.14 | 1.08 | 1.16 | 1.08 | 1.265 | 1.51 |
| Chlorophyll a (ug/L) | | | | | | N/A | N/A | N/A | 0.270 | 0.0781 | 0.248 | 0.0781 | 0.248 | 0.27 |

*All units mg/L unless otherwise noted*

*[a] Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment, 1999*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

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# Table 1Water Samples from UC - Ulu Control Lake, 2004

## Total Metals Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | UC-S | UC-M | UC-B | UC-S | UC-M | UC-B | UC-S | UC-M | UC-B | Summary Statistics | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | | CCME[a] | 05/20/2004 | 05/20/2004 | 05/20/2004 | 07/20/2004 | 07/20/2004 | 07/20/2004 | 08/21/2004 | 08/21/2004 | 08/21/2004 | Minimum | Median | Maximum |
| **Total Metals** | | | | | | | | | | | | | | |
| Aluminum | 0.001 | 0.005-0.1[b] | 0.0058 | 0.0097 | 0.0069 | *0.0056* | *0.0109* | 0.0036 | *0.0061* | *0.0060* | *0.0070* | 0.0036 | 0.0065 | 0.0109 |
| Antimony | 0.0001 | | <0.00020 | <0.00020 | <0.00020 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | | | |
| Arsenic | 0.0001 | 0.005 | 0.00022 | 0.00023 | <0.00020 | 0.00015 | 0.00014 | 0.00016 | 0.00023 | 0.00017 | 0.00017 | 0.00014 | 0.00017 | 0.00023 |
| Barium | 0.00005 | | 0.0036 | 0.0039 | 0.00348 | 0.00247 | 0.00250 | 0.00234 | 0.00240 | 0.00241 | 0.00242 | 0.00234 | 0.002445 | 0.0039 |
| Beryllium | 0.0005 | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Bismuth | 0.0005 | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Boron | 0.01 | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | | | |
| Cadmium | 0.00005 | 0.000017 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | | | |
| Calcium | 0.05 | | 2.96 | 2.84 | 2.67 | 2.03 | 2.02 | 2.06 | 1.98 | 2.03 | 2.00 | 1.98 | 2.03 | 2.84 |
| Chromium | 0.0005 | 0.001 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Cobalt | 0.0001 | | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | | | |
| Copper | 0.0001 | 0.002-0.004[c] | 0.00104 | *0.00498* | 0.00143 | 0.00071 | 0.00072 | 0.00059 | 0.00068 | 0.00082 | 0.00079 | 0.00059 | 0.000755 | 0.00498 |
| Iron | 0.03 | 0.3 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | | | |
| Lead | 0.00005 | 0.001-0.007[d] | 0.000054 | 0.000127 | 0.000095 | <0.000050 | <0.000050 | <0.000050 | 0.000082 | <0.000050 | 0.000059 | 0.000059 | 0.0000885 | 0.000127 |
| Lithium | 0.005 | | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | | | |
| Magnesium | 0.1 | | 1.23 | 1.18 | 1.09 | 0.880 | 0.866 | 0.881 | 0.837 | 0.846 | 0.837 | 0.837 | 0.873 | 1.18 |
| Manganese | 0.00005 | | 0.00049 | 0.00159 | 0.00102 | 0.00193 | 0.00208 | 0.000974 | 0.00152 | 0.00152 | 0.00158 | 0.000974 | 0.00155 | 0.00208 |
| Mercury | 0.00005 | 0.000026 | <0.00001 | 0.000013 | 0.000016 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00001 | <0.00005 | <0.00005 |
| Molybdenum | 0.00005 | 0.073 | 0.000172 | 0.00017 | 0.000151 | 0.000108 | 0.000110 | 0.000228 | 0.000100 | 0.000097 | 0.000091 | 0.000091 | 0.000109 | 0.000228 |
| Nickel | 0.0005 | 0.025-0.15[e] | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Phosphorous | 0.3 | | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | | | |
| Potassium | 2 | | <2 | <2 | <2 | 0.311 | 0.311 | 0.316 | 0.314 | 0.319 | 0.314 | 0.311 | 0.315 | <2 |
| Selenium | 0.001 | 0.001 | <0.00050 | <0.00050 | <0.00050 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | | | |
| Silicon | 0.05 | | 0.276 | 0.266 | 0.271 | 0.205 | 0.208 | 0.195 | 0.141 | 0.138 | 0.144 | 0.138 | 0.2 | 0.271 |
| Silver | 0.00001 | 0.0001 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | | | |
| Sodium | 2 | | <2 | <2 | <2 | 0.620 | 0.614 | 0.626 | 0.632 | 0.626 | 0.630 | 0.614 | 0.628 | <2 |
| Strontium | 0.0001 | | 0.00764 | 0.00775 | 0.00716 | 0.00523 | 0.00511 | 0.00520 | 0.00505 | 0.00516 | 0.00511 | 0.00505 | 0.00518 | 0.00775 |
| Thallium | 0.0001 | 0.0008 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | | | |
| Tin | 0.0001 | | 0.00131 | 0.00524 | 0.00539 | 0.00130 | 0.00143 | <0.00010 | <0.00010 | 0.00089 | 0.00223 | 0.00089 | 0.00183 | 0.00539 |
| Titanium | 0.01 | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | | | |
| Uranium | 0.00001 | | 0.000144 | 0.000151 | 0.000128 | 0.000081 | 0.000082 | 0.000062 | 0.000092 | 0.000094 | 0.000094 | 0.000062 | 0.000093 | 0.000151 |
| Vanadium | 0.001 | | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | | | |
| Zinc | 0.001 | 0.03 | 0.0083 | 0.261 | 0.0102 | 0.0064 | 0.0063 | 0.0072 | 0.0056 | 0.0056 | 0.0072 | 0.0056 | 0.0068 | 0.261 |

*All units mg/l unless otherwise noted*

*a) Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment, 2003*

*b) 0.005mg/L at pH < 6.5, [Ca2+] < 4 mg/L, DOC < 2 mg/L: 0.1 mg/L at pH ≥ 6.5, [Ca2+] ≥ 4 mg/L, DOC ≥ 2 mg/L*

*c) 0.002 mg/L at [CaCO3] = 0 - 120 mg/L; 0.003 mg/L at [CaCO3] =120 - 180 mg/L; 0.004 mg/L at [CaCO3] >180mg/L*

*d) 0.001 mg/L at [CaCO3] = 0 - 60 mg/L; 0.002 mg/L at [CaCO3] =60 - 120 mg/L; 0.004 mg/L at [CaCO3] =120 -180mg/L; 0.007 mg/L at [CaCO3] > 180mg/L*

*e) 0.025 mg/L at [CaCO3] = 0 - 60 mg/L; 0.065 mg/L at [CaCO3] =60 - 120 mg/L; 0.110 mg/L at [CaCO3] =120 -180mg/L; 0.150 mg/L at [CaCO3] > 180mg/L*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

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# Table 1 Water Samples from UC - Ulu Control Lake, 2004

## Dissolved Metals Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | UC-S | UC-M | UC-B | UC-S | UC-M | UC-B | UC-S | UC-M | UC-B | Summary Statistics | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | | CCME* | 05/20/2004 | 05/20/2004 | 05/20/2004 | 07/20/2004 | 07/20/2004 | 07/20/2004 | 08/21/2004 | 08/21/2004 | 08/21/2004 | Minimum | Median | Maximum |
| **Dissolved Metals** | | | | | | | | | | | | | | |
| Aluminum | 0.001 | 0.005-0.1[b] | 0.0055 | 0.015 | 0.0042 | 0.0039 | 0.0078 | 0.0042 | 0.0041 | 0.0040 | 0.0042 | 0.0039 | 0.0042 | 0.015 |
| Antimony | 0.0001 | | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | | | |
| Arsenic | 0.0001 | 0.005 | 0.00022 | 0.0002 | 0.00022 | 0.00015 | 0.00016 | 0.00014 | 0.00020 | 0.00017 | 0.00016 | 0.00014 | 0.000165 | 0.00022 |
| Barium | 0.00005 | | 0.00363 | 0.00374 | 0.00374 | 0.00234 | 0.00269 | 0.00244 | 0.00239 | 0.00234 | 0.00234 | 0.00234 | 0.002415 | 0.00374 |
| Beryllium | 0.0005 | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Bismuth | 0.0005 | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Boron | 0.01 | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | | | |
| Cadmium | 0.00005 | 0.000017 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | | | |
| Calcium | 0.05 | | 3.04 | 2.77 | 3 | 2.00 | 2.58 | 2.04 | 2.00 | 2.01 | 1.98 | 1.98 | 2.025 | 3 |
| Chromium | 0.0005 | 0.001 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Cobalt | 0.0001 | | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | | | |
| Copper | 0.0001 | 0.002-0.004[c] | 0.001 | 0.00111 | 0.00131 | 0.00073 | 0.00078 | 0.00074 | 0.00068 | 0.00071 | 0.00076 | 0.00068 | 0.00075 | 0.00131 |
| Iron | 0.03 | 0.3 | - | - | - | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | | | |
| Lead | 0.00005 | 0.001-0.007[d] | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | | | |
| Lithium | 0.005 | | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | | | |
| Magnesium | 0.1 | | 1.22 | 1.12 | 1.21 | 0.848 | 0.887 | 0.865 | 0.834 | 0.838 | 0.827 | 0.827 | 0.8565 | 1.21 |
| Manganese | 0.00005 | | 0.000383 | 0.000422 | 0.000475 | 0.00167 | 0.00188 | 0.00170 | 0.000758 | 0.000768 | 0.000725 | 0.000422 | 0.000763 | 0.00188 |
| Mercury | 0.00005 | 0.000026 | - | - | - | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.00001 | <0.00005 | <0.00005 |
| Molybdenum | 0.00005 | 0.073 | 0.000171 | 0.000146 | 0.000158 | 0.000099 | 0.000103 | 0.000113 | 0.000110 | 0.000106 | 0.000138 | 0.000099 | 0.0001115 | 0.000158 |
| Nickel | 0.0005 | 0.025-0.15[e] | 0.00051 | 0.00056 | 0.00052 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Phosphorous | 0.3 | | - | - | - | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | | | |
| Potassium | 2 | | 0.489 | 0.437 | 0.476 | 0.299 | 0.314 | 0.307 | 0.314 | 0.312 | 0.306 | 0.299 | 0.313 | 0.476 |
| Selenium | 0.001 | 0.001 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | | | |
| Silicon | 0.05 | | - | - | - | 0.191 | 0.203 | 0.194 | 0.135 | 0.137 | 0.135 | 0.135 | 0.164 | 0.203 |
| Silver | 0.00001 | 0.0001 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | | | |
| Sodium | 2 | | - | - | - | 0.613 | 0.646 | 0.626 | 0.640 | 0.634 | 0.631 | 0.613 | 0.6325 | 0.646 |
| Strontium | 0.0001 | | 0.00776 | 0.00707 | 0.00769 | 0.00492 | 0.00553 | 0.00514 | 0.00513 | 0.00507 | 0.00497 | 0.00492 | 0.005135 | 0.00769 |
| Thallium | 0.0001 | 0.0008 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | | | |
| Tin | 0.0001 | | 0.00134 | 0.00475 | 0.00586 | 0.00087 | 0.00092 | <0.00010 | <0.00010 | 0.00161 | 0.00301 | 0.00087 | 0.00231 | 0.00586 |
| Titanium | 0.01 | | - | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | | | |
| Uranium | 0.00001 | | 0.000038 | 0.000076 | 0.000028 | 0.000029 | 0.000029 | 0.000037 | 0.000019 | 0.000020 | 0.000026 | 0.000019 | 0.0000285 | 0.000076 |
| Vanadium | 0.001 | | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | | | |
| Zinc | 0.001 | 0.03 | 0.01 | 0.0103 | 0.0183 | 0.0096 | 0.0268 | 0.0101 | 0.0089 | 0.0091 | 0.0092 | 0.0089 | 0.00985 | 0.0268 |

*All units mg/l unless otherwise noted*

*a) Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment, 2003*

*b) 0.005mg/L at pH < 6.5, [Ca2+] < 4 mg/L, DOC < 2 mg/L: 0.1 mg/L at pH ≥ 6.5, [Ca2+] ≥ 4 mg/L, DOC ≥ 2 mg/L*

*c) 0.002 mg/L at [CaCO3] = 0 - 120 mg/L; 0.003 mg/L at [CaCO3] =120 - 180 mg/L; 0.004 mg/L at [CaCO3] >180mg/L*

*d) 0.001 mg/L at [CaCO3] = 0 - 60 mg/L; 0.002 mg/L at [CaCO3] =60 - 120 mg/L; 0.004 mg/L at [CaCO3] =120 -180mg/L; 0.007 mg/L at [CaCO3] > 180mg/L*

*e) 0.025 mg/L at [CaCO3] = 0 - 60 mg/L; 0.065 mg/L at [CaCO3] =60 - 120 mg/L; 0.110 mg/L at [CaCO3] =120 -180mg/L; 0.150 mg/L at [CaCO3] > 180mg/L*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

*results exceed CCME Aquatic Life Guidelines*

Gartner Lee

# Table 2 Water Samples from L528 - West Lake, 2004

## General Chemistry Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | L528-S | L528-M | L528-B | L528-S | L528-M | L528-B | Summary Statistics | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | | CCME [a] | 05/20/04 | 05/20/04 | 05/20/04 | 08/20/2004 | 08/20/2004 | 08/20/2004 | Minimum | Median | Maximum |
| **Physical Tests** | | | | | | | | | | | |
| Temperature (°C) | | | 1.43 | 2.54 | 2.6 | 7.22 | 7.22 | 7.21 | 1.43 | 4.905 | 7.22 |
| Conductivity (lab) (uS/cm) | 2 | | 185 | 177 | 185 | 142 | 142 | 141 | 141 | 159.5 | 185 |
| Conductivity (field) (uS/cm) | | | Error | 0.098 | 0.099 | 137 | 138 | 139 | 0.098 | 137 | 139 |
| Total Dissolved Solids | 10 | | 89 | 86 | 90 | 67.8 | 67.3 | 66.4 | 66.4 | 76.9 | 90 |
| Hardness CaCO3 | 0.54 | | 53.3 | 52.8 | 55.3 | 45.8 | 45.4 | 45.5 | 45.4 | 49.3 | 55.3 |
| pH (lab) | 0.01 | 6.5-9.0 | 7.27 | 6.99 | 7.09 | *6.16* | *6.37* | *6.43* | 6.16 | 6.71 | 7.27 |
| pH (field) | | | 5.77 | 5.9 | 5.93 | 6.48 | 6.92 | 6.98 | 5.77 | 6.205 | 6.98 |
| Dissolved Oxygen (field) | | 5.5-9.5 | 15.89 | 13.68 | 12.47 | 12.16 | 12.03 | 11.7 | 11.7 | 12.315 | 15.89 |
| TSS | 4 | | <4.0 | <4.0 | <4.0 | <4.0 | <4.0 | <4.0 | | | |
| Turbidity (NTU) | 0.1 | | 0.33 | 0.28 | 0.4 | 2.40 | 1.36 | 1.82 | 0.28 | 0.88 | 2.4 |
| Colour | | | <5.0 | <5.0 | 9.3 | N/A | N/A | N/A | 9.3 | 9.3 | 9.3 |
| **Dissolved Anions** | | | | | | | | | | | |
| Alkalinity-Gran Total CaCO3 | 1 | | 6.8 | 7.4 | 9.4 | 5.2 | 5.0 | 4.8 | 4.8 | 6 | 9.4 |
| Chloride | 0.5 | | 23.4 | 22.4 | 23 | 21.8 | 21.4 | 21.1 | 21.1 | 22.1 | 23.4 |
| Sulphate SO4 | 1 | | 38.2 | 36.5 | 38.2 | 21.5 | 21.7 | 21.4 | 21.4 | 29.1 | 38.2 |
| **Inorganic Parameters** | | | | | | | | | | | |
| Sulfide | | | <0.0020 | <0.0020 | <0.0020 | <0.020 | <0.020 | <0.020 | | | |
| **Nutrients** | | | | | | | | | | | |
| Ammonia Nitrogen | 0.005 | | 0.118 | 0.0199 | 0.0242 | 0.0099 | 0.0073 | 0.0111 | 0.0073 | 0.0155 | 0.118 |
| Total Kjeldahl Nitrogen | 0.05 | | 0.17 | 0.135 | 0.138 | 0.146 | 0.142 | 0.145 | 0.135 | 0.1435 | 0.17 |
| Nitrate Nitrogen | 0.005 | 13 | 0.036 | 0.035 | 0.04 | 0.0060 | <0.0050 | <0.0050 | 0.006 | 0.0355 | 0.04 |
| Nitrite Nitrogen | 0.005 | 0.06 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | | | |
| Nitrate/Nitrite Nitrogen | 0.005 | | 0.04 | 0.04 | 0.04 | 0.0100 | <0.0050 | <0.0050 | <0.005 | 0.025 | 0.04 |
| Dissolved ortho-phosphate | 0.001 | | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | | | |
| Total Phosphate | 0.002 | | 0.002 | <0.002 | <0.002 | 0.0022 | 0.0025 | 0.0021 | 0.002 | 0.00205 | 0.0025 |
| **Organic Parameters** | | | | | | | | | | | |
| Total Organic Carbon | | | N/A | N/A | N/A | 2.14 | 2.10 | 1.60 | 1.6 | 2.1 | 2.14 |
| Dissolved Organic Carbon | | | 2.34 | 2.18 | 2.27 | 2.12 | 2.17 | 1.64 | 1.64 | 2.175 | 2.34 |
| Chlorophyll a (ug/L) | | | 0.307 | 0.856 | 0.583 | 0.369 | 0.221 | 0.284 | 0.221 | 0.338 | 0.856 |

*All units mg/L unless otherwise noted*

*[a] Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment, 1999*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

Gartner Lee

# Table 2 Water Samples from L528 - West Lake, 2004

## Total Metals Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | L528-S | L528-M | L528-B | L528-S | L528-M | L528-B | Summary Statistics | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | | CCME [a] | 05/20/04 | 05/20/04 | 05/20/04 | 08/20/2004 | 08/20/2004 | 08/20/2004 | Minimum | Median | Maximum |
| **Total Metals** | | | | | | | | | | | |
| Aluminum | 0.001 | 0.005-0.1[b] | 0.083 | 0.0087 | 0.0099 | *0.0095* | *0.0215* | *0.0097* | 0.0087 | 0.0098 | 0.083 |
| Antimony | 0.0001 | | <0.00020 | <0.00020 | <0.00020 | <0.00010 | <0.00010 | <0.00010 | | | |
| Arsenic | 0.0001 | 0.005 | <0.00020 | <0.00020 | <0.00020 | 0.00015 | 0.00012 | 0.00013 | 0.00012 | 0.00013 | 0.00015 |
| Barium | 0.00005 | | 0.014 | 0.0138 | 0.0145 | 0.0155 | 0.0150 | 0.0148 | 0.0138 | 0.01465 | 0.0155 |
| Beryllium | 0.0005 | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Bismuth | 0.0005 | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Boron | 0.01 | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | | | |
| Cadmium | 0.00005 | 0.000017 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | | | |
| Calcium | 0.05 | | 12.5 | 12 | 12.4 | 12.0 | 11.9 | 11.7 | 11.7 | 12 | 12.5 |
| Chromium | 0.0005 | 0.001 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Cobalt | 0.0001 | | <0.00010 | <0.00010 | 0.00014 | 0.00014 | 0.00013 | 0.00013 | 0.00013 | 0.000135 | 0.00014 |
| Copper | 0.0001 | 0.002-0.004[c] | *0.00453* | *0.00357* | *0.00451* | *0.00234* | *0.00258* | *0.00218* | 0.00218 | 0.003075 | 0.00453 |
| Iron | 0.03 | 0.3 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | | | |
| Lead | 0.00005 | 0.001-0.007[d] | <0.000050 | 0.00014 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | 0.00014 | 0.00014 | 0.00014 |
| Lithium | 0.005 | | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | | | |
| Magnesium | 0.1 | | 5.68 | 5.51 | 5.74 | 3.93 | 3.80 | 4.00 | 3.8 | 4.755 | 5.74 |
| Manganese | 0.00005 | | 0.00399 | 0.00407 | 0.00864 | 0.0116 | 0.0117 | 0.0111 | 0.00399 | 0.00987 | 0.0117 |
| Mercury | 0.00005 | 0.000026 | 0.000011 | <0.000010 | <0.000010 | <0.000050 | <0.000050 | <0.000050 | 0.000011 | 0.000011 | 0.000011 |
| Molybdenum | 0.00005 | 0.073 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | | | |
| Nickel | 0.0005 | 0.025-0.15[e] | 0.00164 | 0.00146 | 0.00154 | 0.00133 | 0.00131 | 0.00120 | 0.0012 | 0.001395 | 0.00164 |
| Phosphorous | 0.3 | | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | | | |
| Potassium | 2 | | <2.0 | <2.0 | <2.0 | 0.910 | 0.894 | 0.896 | 0.894 | 0.896 | 0.91 |
| Selenium | 0.001 | 0.001 | <0.00050 | <0.00050 | <0.00050 | <0.0010 | <0.0010 | <0.0010 | | | |
| Silicon | 0.05 | | 0.574 | 0.556 | 0.619 | 0.204 | 0.200 | 0.199 | 0.199 | 0.38 | 0.619 |
| Silver | 0.00001 | 0.0001 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | | | |
| Sodium | 2 | | 8.5 | 8.3 | 8.7 | 5.62 | 5.40 | 5.73 | 5.4 | 7.015 | 8.7 |
| Strontium | 0.0001 | | 0.0613 | 0.0594 | 0.0621 | 0.0878 | 0.0877 | 0.0825 | 0.0594 | 0.0723 | 0.0878 |
| Thallium | 0.0001 | 0.0008 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | | | |
| Tin | 0.0001 | | 0.00317 | 0.00264 | 0.00106 | 0.00112 | 0.00292 | <0.00010 | 0.00106 | 0.00264 | 0.00317 |
| Titanium | 0.01 | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | | | |
| Uranium | 0.00001 | | 0.000025 | 0.000023 | 0.000022 | 0.000018 | 0.000019 | 0.000018 | 0.000018 | 0.0000205 | 0.000025 |
| Vanadium | 0.001 | | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | | | |
| Zinc | 0.001 | 0.03 | 0.0049 | 0.0058 | 0.0041 | 0.0026 | 0.0031 | 0.0027 | 0.0026 | 0.0036 | 0.0058 |

*All units mg/l unless otherwise noted*

*a) Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment, 2003*

*b) 0.005mg/L at pH < 6.5, [Ca2+] < 4 mg/L, DOC < 2 mg/L: 0.1 mg/L at pH ≥ 6.5, [Ca2+] ≥ 4 mg/L, DOC ≥ 2 mg/L*

*c) 0.002 mg/L at [CaCO3] = 0 - 120 mg/L; 0.003 mg/L at [CaCO3] =120 - 180 mg/L; 0.004 mg/L at [CaCO3] >180mg/L*

*d) 0.001 mg/L at [CaCO3] = 0 - 60 mg/L; 0.002 mg/L at [CaCO3] =60 - 120 mg/L; 0.004 mg/L at [CaCO3] =120 -180mg/L; 0.007 mg/L at [CaCO3] > 180mg/L*

*e) 0.025 mg/L at [CaCO3] = 0 - 60 mg/L; 0.065 mg/L at [CaCO3] =60 - 120 mg/L; 0.110 mg/L at [CaCO3] =120 -180mg/L; 0.150 mg/L at [CaCO3] > 180mg/L*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

Gartner Lee

# Table 2 Water Samples from L528 - West Lake, 2004

## Dissolved Metals Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | L528-S | L528-M | L528-B | L528-T | L528-M | L528-B | Summary Statistics | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | | CCME* | 05/20/04 | 05/20/04 | 05/20/04 | 08/20/2004 | 08/20/2004 | 08/20/2004 | Minimum | Median | Maximum |
| **Dissolved Metals** | | | | | | | | | | | |
| Aluminum | 0.001 | 0.005-0.1[b] | 0.0036 | 0.0074 | 0.0066 | 0.0050 | 0.0173 | 0.0047 | 0.0036 | 0.0058 | 0.0173 |
| Antimony | 0.0001 | | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | | | |
| Arsenic | 0.0001 | 0.005 | 0.00017 | 0.00017 | 0.00017 | 0.00017 | 0.00021 | 0.00017 | 0.00017 | 0.00017 | 0.00021 |
| Barium | 0.00005 | | 0.0137 | 0.014 | 0.0146 | 0.0150 | 0.0171 | 0.0150 | 0.0137 | 0.0148 | 0.0171 |
| Beryllium | 0.0005 | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Bismuth | 0.0005 | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Boron | 0.01 | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | | | |
| Cadmium | 0.00005 | 0.000017 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | 0.000057 | <0.000050 | <0.00005 | <0.00005 | 0.000057 |
| Calcium | 0.05 | | 12.6 | 12.3 | 12.9 | 11.9 | 12.0 | 11.7 | 11.7 | 12.15 | 12.9 |
| Chromium | 0.0005 | 0.001 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Cobalt | 0.0001 | | <0.00010 | <0.00010 | <0.00010 | 0.00012 | 0.00016 | 0.00012 | 0.00012 | 0.00012 | 0.00016 |
| Copper | 0.0001 | 0.002-0.004[c] | 0.00396 | 0.00413 | 0.00302 | 0.00220 | 0.0178 | 0.00204 | 0.00204 | 0.00349 | 0.0178 |
| Iron | 0.03 | 0.3 | N/A | N/A | N/A | <0.030 | <0.030 | <0.030 | | | |
| Lead | 0.00005 | 0.001-0.007[d] | <0.000050 | 0.000144 | <0.000050 | <0.000050 | 0.000423 | <0.000050 | 0.000144 | 0.0002835 | 0.000423 |
| Lithium | 0.005 | | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | | | |
| Magnesium | 0.1 | | 5.33 | 5.36 | 5.62 | 3.93 | 3.74 | 3.95 | 3.74 | 4.64 | 5.62 |
| Manganese | 0.00005 | | 0.00223 | 0.00091 | 0.00118 | 0.0109 | 0.0171 | 0.0105 | 0.00091 | 0.006365 | 0.0171 |
| Mercury | 0.00005 | 0.000026 | N/A | N/A | N/A | <0.000050 | <0.000050 | <0.000050 | | | |
| Molybdenum | 0.00005 | 0.073 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | 0.000055 | <0.000050 | | | |
| Nickel | 0.0005 | 0.025-0.15[e] | 0.00125 | 0.00164 | 0.00152 | 0.00138 | 0.00196 | 0.00130 | 0.00125 | 0.00145 | 0.00196 |
| Phosphorous | 0.3 | | N/A | N/A | N/A | <0.30 | <0.30 | <0.30 | | | |
| Potassium | 2 | | 1.11 | 1.12 | 1.13 | 0.900 | 0.943 | 0.895 | 0.895 | 1.0265 | 1.13 |
| Selenium | 0.001 | 0.001 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | | | |
| Silicon | 0.05 | | N/A | N/A | N/A | 0.198 | 0.209 | 0.195 | 0.195 | 0.198 | 0.209 |
| Silver | 0.00001 | 0.0001 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | | | |
| Sodium | 2 | | N/A | N/A | N/A | 5.57 | 5.38 | 5.65 | 5.38 | 5.57 | 5.65 |
| Strontium | 0.0001 | | <0.000010 | <0.000010 | <0.000010 | 0.0857 | 0.0882 | 0.0842 | <0.00001 | 0.0421 | 0.0882 |
| Thallium | 0.0001 | 0.0008 | <0.000010 | <0.000010 | <0.000010 | <0.00010 | <0.00010 | <0.00010 | | | |
| Tin | 0.0001 | | <0.000010 | <0.000010 | <0.000010 | 0.00146 | 0.00319 | <0.0001 | 0.00146 | 0.000055 | 0.00319 |
| Titanium | 0.01 | | N/A | N/A | N/A | <0.010 | <0.010 | <0.010 | | | |
| Uranium | 0.00001 | | 0.000016 | <0.000010 | <0.000010 | <0.000010 | 0.000021 | <0.000010 | 0.000016 | 0.0000185 | 0.000021 |
| Vanadium | 0.001 | | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | | | |
| Zinc | 0.001 | 0.03 | 0.0089 | 0.0073 | 0.0051 | 0.0057 | 0.0157 | 0.0061 | 0.0051 | 0.0067 | 0.0157 |

*All units mg/l unless otherwise noted*

*a) Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment, 2003*

*b) 0.005mg/L at pH < 6.5, [Ca2+] < 4 mg/L, DOC < 2 mg/L: 0.1 mg/L at pH ≥ 6.5, [ results exceed CCME Aquatic Life Guidelines*

*c) 0.002 mg/L at [CaCO3] = 0 - 120 mg/L; 0.003 mg/L at [CaCO3] =120 - 180 mg/L; 0.004 mg/L at [CaCO3] >180mg/L*

*d) 0.001 mg/L at [CaCO3] = 0 - 60 mg/L; 0.002 mg/L at [CaCO3] =60 - 120 mg/L; 0.004 mg/L at [CaCO3] =120 -180mg/L; 0.007 mg/L at [CaCO3] > 180mg/L*

*e) 0.025 mg/L at [CaCO3] = 0 - 60 mg/L; 0.065 mg/L at [CaCO3] =60 - 120 mg/L; 0.110 mg/L at [CaCO3] =120 -180mg/L; 0.150 mg/L at [CaCO3] > 180mg/L*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

Gartner Lee

# Table 4 Water Sample from L525 - East Lake, 2004

## General Chemistry Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | L525 |
|---|---|---|---|
| Date | | CCME [a] | 08/22/2004 |
| **Physical Tests** | | | |
| Temperature (°C) | | | N/A |
| Conductivity (lab) (uS/cm) | 2 | | 103 |
| Conductivity (field) uS/cm) | | | N/A |
| Total Dissolved Solids | 1 | | 49.8 |
| Hardness CaCO3 | 0.5 | | 23.9 |
| pH (lab) | | 6.5 - 9 | 6.86 |
| pH (field) | | | N/A |
| Dissolved Oxygen (field) | | | N/A |
| TSS | 4 | | <4.0 |
| Turbidity (NTU) | 0.1 | | 3.1 |
| **Dissolved Anions** | | | |
| Alkalinity-Total CaCO3 | 1 | | 9.9 |
| Chloride | 0.5 | | 8.89 |
| Sulphate SO4 | 1 | | 20.4 |
| **Cyanides** | | | |
| Total Cyanide CN | 0.005 | | <0.0050 |
| **Nutrients** | | | |
| Ammonia Nitrogen | 0.005 | 8 | 0.120 |
| Total Kjeldahl Nitrogen | 0.05 | | 0.400 |
| Nitrate Nitrogen | 0.005 | 13 | 0.0110 |
| Nitrite Nitrogen | 0.005 | 0.06 | <0.0050 |
| Nitrate/Nitrite Nitrogen | 0.005 | | 0.0100 |
| Dissolved ortho-phosphate | 0.001 | | 0.0040 |
| Total Phosphate | 0.002 | | 0.0184 |
| **Organic Parameters** | | | |
| Dissolved Organic Carbon | 0.50 | | 2.62 |
| Total Organic Carbon | 0.50 | | 2.90 |
| Chlorophyll a (ug/L) | 0.012 | | 15.3 |
| **Inorganic Parameters** | | | |
| Total Sulfide S | 0.02 | | <0.020 |

*All units mg/L unless otherwise noted*

*[a] Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment, 19*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

Gartner Lee

# Table 4 Water Samples from L525 - East Lake, 2004

## Total Metals Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | L525 |
|---|---|---|---|
| Date | | CCME [a] | 08/22/2004 |
| **Total Metals** | | | |
| Aluminum | 0.001 | 0.005-0.1[b] | 0.0063 |
| Antimony | 0.0001 | | <0.00010 |
| Arsenic | 0.0001 | 0.005 | 0.00042 |
| Barium | 0.00005 | | 0.00537 |
| Beryllium | 0.0005 | | <0.00050 |
| Bismuth | 0.0005 | | <0.00050 |
| Boron | 0.01 | | <0.010 |
| Cadmium | 0.00005 | 0.000017 | <0.000050 |
| Calcium | 0.02 | | 6.02 |
| Chromium | 0.0005 | 0.001 | <0.00050 |
| Cobalt | 0.0001 | | 0.00015 |
| Copper | 0.0001 | 0.002-0.004[c] | 0.00182 |
| Iron | 0.03 | 0.3 | 0.080 |
| Lead | 0.00005 | 0.001-0.007[d] | <0.000050 |
| Lithium | 0.005 | | <0.0050 |
| Magnesium | 0.005 | | 2.16 |
| Manganese | 0.00005 | | 0.0153 |
| Mercury | 0.00005 | 0.000026 | <0.000050 |
| Molybdenum | 0.00005 | 0.073 | <0.000050 |
| Nickel | 0.0005 | 0.025-0.15[e] | 0.00159 |
| Phosphorous | 0.3 | | <0.30 |
| Potassium | 0.05 | | 1.04 |
| Selenium | 0.001 | 0.001 | <0.0010 |
| Silicon | 0.05 | | 0.235 |
| Silver | 0.00001 | 0.0001 | <0.000010 |
| Sodium | 0.05 | | 8.07 |
| Strontium | 0.0001 | | 0.0127 |
| Thallium | 0.0001 | 0.0008 | <0.00010 |
| Tin | 0.0001 | | <0.00010 |
| Titanium | 0.01 | | <0.010 |
| Uranium | 0.00001 | | 0.000051 |
| Vanadium | 0.001 | | <0.0010 |
| Zinc | 0.001 | 0.03 | 0.0028 |

*All units mg/l unless otherwise noted*

*a) Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment,*

*b) 0.005mg/L at pH < 6.5, [Ca2+] < 4 mg/L, DOC < 2 mg/L: 0.1 mg/L at pH ≥ 6.5, [Ca2+] ≥ 4 mg/L, DOC*

*c) 0.002 mg/L at [CaCO3] = 0 - 120 mg/L; 0.003 mg/L at [CaCO3] =120 - 180 mg/L; 0.004 mg/L at [CaCO3]*

*d) 0.001 mg/L at [CaCO3] = 0 - 60 mg/L; 0.002 mg/L at [CaCO3] =60 - 120 mg/L; 0.004 mg/L at [CaCO3] =120 -180mg/L; 0.007 mg/L at [CaCO3] > 180mg/L*

*e) 0.025 mg/L at [CaCO3] = 0 - 60 mg/L; 0.065 mg/L at [CaCO3] =60 - 120 mg/L; 0.110 mg/L at [CaCO3] =120 -180mg/L; 0.150 mg/L at [CaCO3] > 180mg/L*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

Gartner Lee

# Table 4 Water Samples from L525 - East Lake 2004

## Dissolved Metals Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | L525 |
|---|---|---|---|
| Date | | CCME [a] | 08/22/2004 |
| **Dissolved Metals** | | | |
| Aluminum | 0.001 | 0.005-0.1 | 0.0036 |
| Antimony | 0.0001 | | <0.00010 |
| Arsenic | 0.0001 | 0.005 | 0.00037 |
| Barium | 0.00005 | | 0.00521 |
| Beryllium | 0.0005 | | <0.00050 |
| Bismuth | 0.0005 | | <0.00050 |
| Boron | 0.01 | | <0.010 |
| Cadmium | 0.00005 | 0.000017 | <0.000050 |
| Calcium | 0.02 | | 6.00 |
| Chromium | 0.0005 | 0.001 | <0.00050 |
| Cobalt | 0.0001 | | 0.00014 |
| Copper | 0.0001 | 0.002-0.004 | 0.00170 |
| Iron | 0.03 | 0.3 | <0.030 |
| Lead | 0.00005 | 0.001-0.007 | <0.000050 |
| Lithium | 0.005 | | <0.0050 |
| Magnesium | 0.005 | | 2.17 |
| Manganese | 0.00005 | | 0.0123 |
| Mercury | 0.00005 | 0.000026 | <0.000050 |
| Molybdenum | 0.00005 | 0.073 | <0.000050 |
| Nickel | 0.0005 | 0.025-0.15 | 0.00157 |
| Phosphorous | 0.3 | | <0.30 |
| Potassium | 0.05 | | 1.02 |
| Selenium | 0.001 | 0.001 | <0.0010 |
| Silicon | 0.05 | | 0.243 |
| Silver | 0.00001 | 0.0001 | <0.000010 |
| Sodium | 0.05 | | 8.20 |
| Strontium | 0.0001 | | 0.0125 |
| Thallium | 0.0001 | 0.0008 | <0.00010 |
| Tin | 0.0001 | | <0.00010 |
| Titanium | 0.01 | | <0.010 |
| Uranium | 0.00001 | | 0.000029 |
| Vanadium | 0.001 | | <0.0010 |
| Zinc | 0.001 | 0.03 | 0.0048 |

*All units mg/l unless otherwise noted*

*a) Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment,*

*b) 0.005mg/L at pH < 6.5, [Ca2+] < 4 mg/L, DOC < 2 mg/L: 0.1 mg/L at pH ≥ 6.5, [Ca2+] ≥ 4 mg/L, DOC*

*c) 0.002 mg/L at [CaCO3] = 0 - 120 mg/L; 0.003 mg/L at [CaCO3] =120 - 180 mg/L; 0.004 mg/L at [CaCO3]*

*d) 0.001 mg/L at [CaCO3] = 0 - 60 mg/L; 0.002 mg/L at [CaCO3] =60 - 120 mg/L; 0.004 mg/L at [CaCO3] =120 -180mg/L; 0.007 mg/L at [CaCO3] > 180mg/L*

*e) 0.025 mg/L at [CaCO3] = 0 - 60 mg/L; 0.065 mg/L at [CaCO3] =60 - 120 mg/L; 0.110 mg/L at [CaCO3] =120 -180mg/L; 0.150 mg/L at [CaCO3] > 180mg/L*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

Gartner Lee

# Table 4 Water Sample from L525 - East Lake, 2004

## General Chemistry Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | L525 |
|---|---|---|---|
| Date | | CCME [a] | 08/22/2004 |
| **Physical Tests** | | | |
| Temperature (°C) | | | N/A |
| Conductivity (lab) (uS/cm) | 2 | | 103 |
| Conductivity (field) uS/cm) | | | N/A |
| Total Dissolved Solids | 1 | | 49.8 |
| Hardness CaCO3 | 0.5 | | 23.9 |
| pH (lab) | | 6.5 - 9 | 6.86 |
| pH (field) | | | N/A |
| Dissolved Oxygen (field) | | | N/A |
| TSS | 4 | | <4.0 |
| Turbidity (NTU) | 0.1 | | 3.1 |
| **Dissolved Anions** | | | |
| Alkalinity-Total CaCO3 | 1 | | 9.9 |
| Chloride | 0.5 | | 8.89 |
| Sulphate SO4 | 1 | | 20.4 |
| **Cyanides** | | | |
| Total Cyanide CN | 0.005 | | <0.0050 |
| **Nutrients** | | | |
| Ammonia Nitrogen | 0.005 | 8 | 0.120 |
| Total Kjeldahl Nitrogen | 0.05 | | 0.400 |
| Nitrate Nitrogen | 0.005 | 13 | 0.0110 |
| Nitrite Nitrogen | 0.005 | 0.06 | <0.0050 |
| Nitrate/Nitrite Nitrogen | 0.005 | | 0.0100 |
| Dissolved ortho-phosphate | 0.001 | | 0.0040 |
| Total Phosphate | 0.002 | | 0.0184 |
| **Organic Parameters** | | | |
| Dissolved Organic Carbon | 0.50 | | 2.62 |
| Total Organic Carbon | 0.50 | | 2.90 |
| Chlorophyll a (ug/L) | 0.012 | | 15.3 |
| **Inorganic Parameters** | | | |
| Total Sulfide S | 0.02 | | <0.020 |

*All units mg/L unless otherwise noted*

[a] *Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment, 19*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

Gartner Lee

# Table 4 Water Samples from L525 - East Lake, 2004

## Total Metals Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | L525 |
|---|---|---|---|
| Date | | CCME [a] | 08/22/2004 |
| **Total Metals** | | | |
| Aluminum | 0.001 | 0.005-0.1[b] | 0.0063 |
| Antimony | 0.0001 | | <0.00010 |
| Arsenic | 0.0001 | 0.005 | 0.00042 |
| Barium | 0.00005 | | 0.00537 |
| Beryllium | 0.0005 | | <0.00050 |
| Bismuth | 0.0005 | | <0.00050 |
| Boron | 0.01 | | <0.010 |
| Cadmium | 0.00005 | 0.000017 | <0.000050 |
| Calcium | 0.02 | | 6.02 |
| Chromium | 0.0005 | 0.001 | <0.00050 |
| Cobalt | 0.0001 | | 0.00015 |
| Copper | 0.0001 | 0.002-0.004[c] | 0.00182 |
| Iron | 0.03 | 0.3 | 0.080 |
| Lead | 0.00005 | 0.001-0.007[d] | <0.000050 |
| Lithium | 0.005 | | <0.0050 |
| Magnesium | 0.005 | | 2.16 |
| Manganese | 0.00005 | | 0.0153 |
| Mercury | 0.00005 | 0.000026 | <0.000050 |
| Molybdenum | 0.00005 | 0.073 | <0.000050 |
| Nickel | 0.0005 | 0.025-0.15[e] | 0.00159 |
| Phosphorous | 0.3 | | <0.30 |
| Potassium | 0.05 | | 1.04 |
| Selenium | 0.001 | 0.001 | <0.0010 |
| Silicon | 0.05 | | 0.235 |
| Silver | 0.00001 | 0.0001 | <0.000010 |
| Sodium | 0.05 | | 8.07 |
| Strontium | 0.0001 | | 0.0127 |
| Thallium | 0.0001 | 0.0008 | <0.00010 |
| Tin | 0.0001 | | <0.00010 |
| Titanium | 0.01 | | <0.010 |
| Uranium | 0.00001 | | 0.000051 |
| Vanadium | 0.001 | | <0.0010 |
| Zinc | 0.001 | 0.03 | 0.0028 |

*All units mg/l unless otherwise noted*

*a) Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment,*

*b) 0.005mg/L at pH < 6.5, [Ca2+] < 4 mg/L, DOC < 2 mg/L: 0.1 mg/L at pH ≥ 6.5, [Ca2+] ≥ 4 mg/L, DOC*

*c) 0.002 mg/L at [CaCO3] = 0 - 120 mg/L; 0.003 mg/L at [CaCO3] =120 - 180 mg/L; 0.004 mg/L at [CaCO3]*

*d) 0.001 mg/L at [CaCO3] = 0 - 60 mg/L; 0.002 mg/L at [CaCO3] =60 - 120 mg/L; 0.004 mg/L at [CaCO3] =120 -180mg/L; 0.007 mg/L at [CaCO3] > 180mg/L*

*e) 0.025 mg/L at [CaCO3] = 0 - 60 mg/L; 0.065 mg/L at [CaCO3] =60 - 120 mg/L; 0.110 mg/L at [CaCO3] =120 -180mg/L; 0.150 mg/L at [CaCO3] > 180mg/L*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

Gartner Lee

# Table 4 Water Samples from L525 - East Lake 2004

## Dissolved Metals Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | L525 |
|---|---|---|---|
| Date | | CCME [a] | 08/22/2004 |
| **Dissolved Metals** | | | |
| Aluminum | 0.001 | 0.005-0.1 | 0.0036 |
| Antimony | 0.0001 | | <0.00010 |
| Arsenic | 0.0001 | 0.005 | 0.00037 |
| Barium | 0.00005 | | 0.00521 |
| Beryllium | 0.0005 | | <0.00050 |
| Bismuth | 0.0005 | | <0.00050 |
| Boron | 0.01 | | <0.010 |
| Cadmium | 0.00005 | 0.000017 | <0.000050 |
| Calcium | 0.02 | | 6.00 |
| Chromium | 0.0005 | 0.001 | <0.00050 |
| Cobalt | 0.0001 | | 0.00014 |
| Copper | 0.0001 | 0.002-0.004 | 0.00170 |
| Iron | 0.03 | 0.3 | <0.030 |
| Lead | 0.00005 | 0.001-0.007 | <0.000050 |
| Lithium | 0.005 | | <0.0050 |
| Magnesium | 0.005 | | 2.17 |
| Manganese | 0.00005 | | 0.0123 |
| Mercury | 0.00005 | 0.000026 | <0.000050 |
| Molybdenum | 0.00005 | 0.073 | <0.000050 |
| Nickel | 0.0005 | 0.025-0.15 | 0.00157 |
| Phosphorous | 0.3 | | <0.30 |
| Potassium | 0.05 | | 1.02 |
| Selenium | 0.001 | 0.001 | <0.0010 |
| Silicon | 0.05 | | 0.243 |
| Silver | 0.00001 | 0.0001 | <0.000010 |
| Sodium | 0.05 | | 8.20 |
| Strontium | 0.0001 | | 0.0125 |
| Thallium | 0.0001 | 0.0008 | <0.00010 |
| Tin | 0.0001 | | <0.00010 |
| Titanium | 0.01 | | <0.010 |
| Uranium | 0.00001 | | 0.000029 |
| Vanadium | 0.001 | | <0.0010 |
| Zinc | 0.001 | 0.03 | 0.0048 |

*All units mg/l unless otherwise noted*

*a) Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment,*

*b) 0.005mg/L at pH < 6.5, [Ca2+] < 4 mg/L, DOC < 2 mg/L: 0.1 mg/L at pH ≥ 6.5, [Ca2+] ≥ 4 mg/L, DOC*

*c) 0.002 mg/L at [CaCO3] = 0 - 120 mg/L; 0.003 mg/L at [CaCO3] =120 - 180 mg/L; 0.004 mg/L at [CaCO3]*

*d) 0.001 mg/L at [CaCO3] = 0 - 60 mg/L; 0.002 mg/L at [CaCO3] =60 - 120 mg/L; 0.004 mg/L at [CaCO3] =120 -180mg/L; 0.007 mg/L at [CaCO3] > 180mg/L*

*e) 0.025 mg/L at [CaCO3] = 0 - 60 mg/L; 0.065 mg/L at [CaCO3] =60 - 120 mg/L; 0.110 mg/L at [CaCO3] =120 -180mg/L; 0.150 mg/L at [CaCO3] > 180mg/L*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

Gartner Lee

# Table 2 Water Samples from L528 - West Lake, 2004

## General Chemistry Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | L528-S | L528-M | L528-B | L528-S | L528-M | L528-B | Summary Statistics | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | | CCME [a] | 05/20/04 | 05/20/04 | 05/20/04 | 08/20/2004 | 08/20/2004 | 08/20/2004 | Minimum | Median | Maximum |
| **Physical Tests** | | | | | | | | | | | |
| Temperature (°C) | | | 1.43 | 2.54 | 2.6 | 7.22 | 7.22 | 7.21 | 1.43 | 4.905 | 7.22 |
| Conductivity (lab) (uS/cm) | 2 | | 185 | 177 | 185 | 142 | 142 | 141 | 141 | 159.5 | 185 |
| Conductivity (field) (uS/cm) | | | Error | 0.098 | 0.099 | 137 | 138 | 139 | 0.098 | 137 | 139 |
| Total Dissolved Solids | 10 | | 89 | 86 | 90 | 67.8 | 67.3 | 66.4 | 66.4 | 76.9 | 90 |
| Hardness CaCO3 | 0.54 | | 53.3 | 52.8 | 55.3 | 45.8 | 45.4 | 45.5 | 45.4 | 49.3 | 55.3 |
| pH (lab) | 0.01 | 6.5-9.0 | 7.27 | 6.99 | 7.09 | *6.16* | *6.37* | *6.43* | 6.16 | 6.71 | 7.27 |
| pH (field) | | | 5.77 | 5.9 | 5.93 | 6.48 | 6.92 | 6.98 | 5.77 | 6.205 | 6.98 |
| Dissolved Oxygen (field) | | 5.5-9.5 | 15.89 | 13.68 | 12.47 | 12.16 | 12.03 | 11.7 | 11.7 | 12.315 | 15.89 |
| TSS | 4 | | <4.0 | <4.0 | <4.0 | <4.0 | <4.0 | <4.0 | | | |
| Turbidity (NTU) | 0.1 | | 0.33 | 0.28 | 0.4 | 2.40 | 1.36 | 1.82 | 0.28 | 0.88 | 2.4 |
| Colour | | | <5.0 | <5.0 | 9.3 | N/A | N/A | N/A | 9.3 | 9.3 | 9.3 |
| **Dissolved Anions** | | | | | | | | | | | |
| Alkalinity-Gran Total CaCO3 | 1 | | 6.8 | 7.4 | 9.4 | 5.2 | 5.0 | 4.8 | 4.8 | 6 | 9.4 |
| Chloride | 0.5 | | 23.4 | 22.4 | 23 | 21.8 | 21.4 | 21.1 | 21.1 | 22.1 | 23.4 |
| Sulphate SO4 | 1 | | 38.2 | 36.5 | 38.2 | 21.5 | 21.7 | 21.4 | 21.4 | 29.1 | 38.2 |
| **Inorganic Parameters** | | | | | | | | | | | |
| Sulfide | | | <0.0020 | <0.0020 | <0.0020 | <0.020 | <0.020 | <0.020 | | | |
| **Nutrients** | | | | | | | | | | | |
| Ammonia Nitrogen | 0.005 | | 0.118 | 0.0199 | 0.0242 | 0.0099 | 0.0073 | 0.0111 | 0.0073 | 0.0155 | 0.118 |
| Total Kjeldahl Nitrogen | 0.05 | | 0.17 | 0.135 | 0.138 | 0.146 | 0.142 | 0.145 | 0.135 | 0.1435 | 0.17 |
| Nitrate Nitrogen | 0.005 | 13 | 0.036 | 0.035 | 0.04 | 0.0060 | <0.0050 | <0.0050 | 0.006 | 0.0355 | 0.04 |
| Nitrite Nitrogen | 0.005 | 0.06 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | | | |
| Nitrate/Nitrite Nitrogen | 0.005 | | 0.04 | 0.04 | 0.04 | 0.0100 | <0.0050 | <0.0050 | <0.005 | 0.025 | 0.04 |
| Dissolved ortho-phosphate | 0.001 | | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | | | |
| Total Phosphate | 0.002 | | 0.002 | <0.002 | <0.002 | 0.0022 | 0.0025 | 0.0021 | 0.002 | 0.00205 | 0.0025 |
| **Organic Parameters** | | | | | | | | | | | |
| Total Organic Carbon | | | N/A | N/A | N/A | 2.14 | 2.10 | 1.60 | 1.6 | 2.1 | 2.14 |
| Dissolved Organic Carbon | | | 2.34 | 2.18 | 2.27 | 2.12 | 2.17 | 1.64 | 1.64 | 2.175 | 2.34 |
| Chlorophyll a (ug/L) | | | 0.307 | 0.856 | 0.583 | 0.369 | 0.221 | 0.284 | 0.221 | 0.338 | 0.856 |

*All units mg/L unless otherwise noted*

[a] *Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment, 1999*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

Gartner Lee

# Table 2 Water Samples from L528 - West Lake, 2004

## Total Metals Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | L528-S | L528-M | L528-B | L528-S | L528-M | L528-B | Summary Statistics | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | | CCME* | 05/20/04 | 05/20/04 | 05/20/04 | 08/20/2004 | 08/20/2004 | 08/20/2004 | Minimum | Median | Maximum |
| **Total Metals** | | | | | | | | | | | |
| Aluminum | 0.001 | 0.005-0.1[b] | 0.083 | 0.0087 | 0.0099 | *0.0095* | *0.0215* | *0.0097* | 0.0087 | 0.0098 | 0.083 |
| Antimony | 0.0001 | | <0.00020 | <0.00020 | <0.00020 | <0.00010 | <0.00010 | <0.00010 | | | |
| Arsenic | 0.0001 | 0.005 | <0.00020 | <0.00020 | <0.00020 | 0.00015 | 0.00012 | 0.00013 | 0.00012 | 0.00013 | 0.00015 |
| Barium | 0.00005 | | 0.014 | 0.0138 | 0.0145 | 0.0155 | 0.0150 | 0.0148 | 0.0138 | 0.01465 | 0.0155 |
| Beryllium | 0.0005 | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Bismuth | 0.0005 | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Boron | 0.01 | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | | | |
| Cadmium | 0.00005 | 0.000017 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | | | |
| Calcium | 0.05 | | 12.5 | 12 | 12.4 | 12.0 | 11.9 | 11.7 | 11.7 | 12 | 12.5 |
| Chromium | 0.0005 | 0.001 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Cobalt | 0.0001 | | <0.00010 | <0.00010 | 0.00014 | 0.00014 | 0.00013 | 0.00013 | 0.00013 | 0.000135 | 0.00014 |
| Copper | 0.0001 | 0.002-0.004[c] | *0.00453* | *0.00357* | *0.00451* | *0.00234* | *0.00258* | *0.00218* | 0.00218 | 0.003075 | 0.00453 |
| Iron | 0.03 | 0.3 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | | | |
| Lead | 0.00005 | 0.001-0.007[d] | <0.000050 | 0.00014 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | 0.00014 | 0.00014 | 0.00014 |
| Lithium | 0.005 | | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | | | |
| Magnesium | 0.1 | | 5.68 | 5.51 | 5.74 | 3.93 | 3.80 | 4.00 | 3.8 | 4.755 | 5.74 |
| Manganese | 0.00005 | | 0.00399 | 0.00407 | 0.00864 | 0.0116 | 0.0117 | 0.0111 | 0.00399 | 0.00987 | 0.0117 |
| Mercury | 0.00005 | 0.000026 | 0.000011 | <0.000010 | <0.000010 | <0.000050 | <0.000050 | <0.000050 | 0.000011 | 0.000011 | 0.000011 |
| Molybdenum | 0.00005 | 0.073 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | | | |
| Nickel | 0.0005 | 0.025-0.15[e] | 0.00164 | 0.00146 | 0.00154 | 0.00133 | 0.00131 | 0.00120 | 0.0012 | 0.001395 | 0.00164 |
| Phosphorous | 0.3 | | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | | | |
| Potassium | 2 | | <2.0 | <2.0 | <2.0 | 0.910 | 0.894 | 0.896 | 0.894 | 0.896 | 0.91 |
| Selenium | 0.001 | 0.001 | <0.00050 | <0.00050 | <0.00050 | <0.0010 | <0.0010 | <0.0010 | | | |
| Silicon | 0.05 | | 0.574 | 0.556 | 0.619 | 0.204 | 0.200 | 0.199 | 0.199 | 0.38 | 0.619 |
| Silver | 0.00001 | 0.0001 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | | | |
| Sodium | 2 | | 8.5 | 8.3 | 8.7 | 5.62 | 5.40 | 5.73 | 5.4 | 7.015 | 8.7 |
| Strontium | 0.0001 | | 0.0613 | 0.0594 | 0.0621 | 0.0878 | 0.0877 | 0.0825 | 0.0594 | 0.0723 | 0.0878 |
| Thallium | 0.0001 | 0.0008 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | | | |
| Tin | 0.0001 | | 0.00317 | 0.00264 | 0.00106 | 0.00112 | 0.00292 | <0.00010 | 0.00106 | 0.00264 | 0.00317 |
| Titanium | 0.01 | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | | | |
| Uranium | 0.00001 | | 0.000025 | 0.000023 | 0.000022 | 0.000018 | 0.000019 | 0.000018 | 0.000018 | 0.0000205 | 0.000025 |
| Vanadium | 0.001 | | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | | | |
| Zinc | 0.001 | 0.03 | 0.0049 | 0.0058 | 0.0041 | 0.0026 | 0.0031 | 0.0027 | 0.0026 | 0.0036 | 0.0058 |

*All units mg/l unless otherwise noted*

*a) Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment, 2003*

*b) 0.005mg/L at pH < 6.5, [Ca2+] < 4 mg/L, DOC < 2 mg/L: 0.1 mg/L at pH ≥ 6.5, [Ca2+] ≥ 4 mg/L, DOC ≥ 2 mg/L*

*c) 0.002 mg/L at [CaCO3] = 0 - 120 mg/L; 0.003 mg/L at [CaCO3] =120 - 180 mg/L; 0.004 mg/L at [CaCO3] >180mg/L*

*d) 0.001 mg/L at [CaCO3] = 0 - 60 mg/L; 0.002 mg/L at [CaCO3] =60 - 120 mg/L; 0.004 mg/L at [CaCO3] =120 -180mg/L; 0.007 mg/L at [CaCO3] > 180mg/L*

*e) 0.025 mg/L at [CaCO3] = 0 - 60 mg/L; 0.065 mg/L at [CaCO3] =60 - 120 mg/L; 0.110 mg/L at [CaCO3] =120 -180mg/L; 0.150 mg/L at [CaCO3] > 180mg/L*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

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# Table 2 Water Samples from L528 - West Lake, 2004

## Dissolved Metals Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | L528-S | L528-M | L528-B | L528-T | L528-M | L528-B | Summary Statistics | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | | CCME* | 05/20/04 | 05/20/04 | 05/20/04 | 08/20/2004 | 08/20/2004 | 08/20/2004 | Minimum | Median | Maximum |
| **Dissolved Metals** | | | | | | | | | | | |
| Aluminum | 0.001 | 0.005-0.1[b] | 0.0036 | 0.0074 | 0.0066 | 0.0050 | 0.0173 | 0.0047 | 0.0036 | 0.0058 | 0.0173 |
| Antimony | 0.0001 | | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | | | |
| Arsenic | 0.0001 | 0.005 | 0.00017 | 0.00017 | 0.00017 | 0.00017 | 0.00021 | 0.00017 | 0.00017 | 0.00017 | 0.00021 |
| Barium | 0.00005 | | 0.0137 | 0.014 | 0.0146 | 0.0150 | 0.0171 | 0.0150 | 0.0137 | 0.0148 | 0.0171 |
| Beryllium | 0.0005 | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Bismuth | 0.0005 | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Boron | 0.01 | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | | | |
| Cadmium | 0.00005 | 0.000017 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | 0.000057 | <0.000050 | <0.00005 | <0.00005 | 0.000057 |
| Calcium | 0.05 | | 12.6 | 12.3 | 12.9 | 11.9 | 12.0 | 11.7 | 11.7 | 12.15 | 12.9 |
| Chromium | 0.0005 | 0.001 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | |
| Cobalt | 0.0001 | | <0.00010 | <0.00010 | <0.00010 | 0.00012 | 0.00016 | 0.00012 | 0.00012 | 0.00012 | 0.00016 |
| Copper | 0.0001 | 0.002-0.004[c] | 0.00396 | 0.00413 | 0.00302 | 0.00220 | 0.0178 | 0.00204 | 0.00204 | 0.00349 | 0.0178 |
| Iron | 0.03 | 0.3 | N/A | N/A | N/A | <0.030 | <0.030 | <0.030 | | | |
| Lead | 0.00005 | 0.001-0.007[d] | <0.000050 | 0.000144 | <0.000050 | <0.000050 | 0.000423 | <0.000050 | 0.000144 | 0.0002835 | 0.000423 |
| Lithium | 0.005 | | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | | | |
| Magnesium | 0.1 | | 5.33 | 5.36 | 5.62 | 3.93 | 3.74 | 3.95 | 3.74 | 4.64 | 5.62 |
| Manganese | 0.00005 | | 0.00223 | 0.00091 | 0.00118 | 0.0109 | 0.0171 | 0.0105 | 0.00091 | 0.006365 | 0.0171 |
| Mercury | 0.00005 | 0.000026 | N/A | N/A | N/A | <0.000050 | <0.000050 | <0.000050 | | | |
| Molybdenum | 0.00005 | 0.073 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | 0.000055 | <0.000050 | | | |
| Nickel | 0.0005 | 0.025-0.15[e] | 0.00125 | 0.00164 | 0.00152 | 0.00138 | 0.00196 | 0.00130 | 0.00125 | 0.00145 | 0.00196 |
| Phosphorous | 0.3 | | N/A | N/A | N/A | <0.30 | <0.30 | <0.30 | | | |
| Potassium | 2 | | 1.11 | 1.12 | 1.13 | 0.900 | 0.943 | 0.895 | 0.895 | 1.0265 | 1.13 |
| Selenium | 0.001 | 0.001 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | | | |
| Silicon | 0.05 | | N/A | N/A | N/A | 0.198 | 0.209 | 0.195 | 0.195 | 0.198 | 0.209 |
| Silver | 0.00001 | 0.0001 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | | | |
| Sodium | 2 | | N/A | N/A | N/A | 5.57 | 5.38 | 5.65 | 5.38 | 5.57 | 5.65 |
| Strontium | 0.0001 | | <0.000010 | <0.000010 | <0.000010 | 0.0857 | 0.0882 | 0.0842 | <0.00001 | 0.0421 | 0.0882 |
| Thallium | 0.0001 | 0.0008 | <0.000010 | <0.000010 | <0.000010 | <0.00010 | <0.00010 | <0.00010 | | | |
| Tin | 0.0001 | | <0.000010 | <0.000010 | <0.000010 | 0.00146 | 0.00319 | <0.0001 | 0.00146 | 0.000055 | 0.00319 |
| Titanium | 0.01 | | N/A | N/A | N/A | <0.010 | <0.010 | <0.010 | | | |
| Uranium | 0.00001 | | 0.000016 | <0.000010 | <0.000010 | <0.000010 | 0.000021 | <0.000010 | 0.000016 | 0.0000185 | 0.000021 |
| Vanadium | 0.001 | | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | | | |
| Zinc | 0.001 | 0.03 | 0.0089 | 0.0073 | 0.0051 | 0.0057 | 0.0157 | 0.0061 | 0.0051 | 0.0067 | 0.0157 |

*All units mg/l unless otherwise noted*

*a) Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment, 2003*

*b) 0.005mg/L at pH < 6.5, [Ca2+] < 4 mg/L, DOC < 2 mg/L: 0.1 mg/L at pH ≥ 6.5, [ results exceed CCME Aquatic Life Guidelines*

*c) 0.002 mg/L at [CaCO3] = 0 - 120 mg/L; 0.003 mg/L at [CaCO3] =120 - 180 mg/L; 0.004 mg/L at [CaCO3] >180mg/L*

*d) 0.001 mg/L at [CaCO3] = 0 - 60 mg/L; 0.002 mg/L at [CaCO3] =60 - 120 mg/L; 0.004 mg/L at [CaCO3] =120 -180mg/L; 0.007 mg/L at [CaCO3] > 180mg/L*

*e) 0.025 mg/L at [CaCO3] = 0 - 60 mg/L; 0.065 mg/L at [CaCO3] =60 - 120 mg/L; 0.110 mg/L at [CaCO3] =120 -180mg/L; 0.150 mg/L at [CaCO3] > 180mg/L*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

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# Table 6 Water Samples from L504 - Ulu Lake, 2004

## General Chemistry Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | L504-S | L504-B | L504-S | L504-M | L504-B | L504-S | L504-M | L504-B | Summary Statistics | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | | CCME [a] | 05/19/04 | 05/19/04 | 07/19/04 | 07/19/04 | 07/19/04 | 08/21/2004 | 08/21/2004 | 08/21/2004 | Minimum | Median | Maximum |
| **Physical Tests** | | | | | | | | | | | | | |
| Temperature (°C) | | | 2.03 | 2.85 | 11.43 | 11.36 | 7.55 | 6.78 | 6.77 | 6.73 | 2.03 | 6.775 | 11.43 |
| Conductivity (lab) (uS/cm) | 2 | | 82.6 | 84.3 | 39.9 | 41.0 | 41.1 | 42.1 | 41.2 | 41.5 | 39.9 | 41.35 | 84.3 |
| Conductivity (field) (uS/cm) | | | N/A | N/A | 26 | 26 | 24 | 39 | 39 | 39 | 24 | 32.5 | 39 |
| Total Dissolved Solids | 10 | | 38 | 38 | 20 | 20 | 24 | 19.2 | 18.9 | 19.0 | 18.9 | 20 | 38 |
| Hardness CaCO3 | 0.54 | | 26.1 | 26 | 13.6 | 14.2 | 13.7 | 14.1 | 13.6 | 13.8 | 13.6 | 13.95 | 26.1 |
| pH (lab) | 0.01 | 6.5-9.0 | 7.14 | 7.14 | 6.50 | 6.53 | *6.43* | 6.54 | 6.61 | *6.40* | 6.4 | 6.535 | 7.14 |
| pH (field) | | | 5.54 | 5.61 | 6.04 | 5.97 | 5.97 | 5.8 | 5.9 | 5.95 | 5.54 | 5.925 | 6.04 |
| Dissolved Oxygen (field) | | 5.5-9.5 | 20.09 | 9.82 | 10.9 | 11.01 | 12.61 | 12.63 | 12.5 | 12.49 | 9.82 | 12.495 | 20.09 |
| TSS | 4 | | <4.0 | <4.0 | <4.0 | <4.0 | <4.0 | <4.0 | <4.0 | <4.0 | | | |
| Turbidity (NTU) | 0.1 | | 0.24 | 0.3 | 0.26 | 0.80 | 0.55 | 1.46 | 1.01 | 1.76 | 0.24 | 0.675 | 1.76 |
| Colour | | | <5.0 | 12.5 | 8.5 | 8.9 | 7.8 | N/A | N/A | N/A | 7.8 | 8.7 | 12.5 |
| **Dissolved Anions** | | | | | | | | | | | | | |
| Alkalinity-Gran Total CaCO3 | 1 | | 7 | 6.6 | 5.2 | 1.6 | 4.2 | 3.5 | 3.3 | 2.5 | 1.6 | 3.85 | 7 |
| Chloride | 0.5 | | 3.03 | 3.22 | 1.70 | 1.65 | 1.72 | 1.86 | 1.90 | 1.84 | 1.65 | 1.85 | 3.22 |
| Sulphate SO4 | 1 | | 22.8 | 22.9 | 9.5 | 9.7 | 9.5 | 9.2 | 9.1 | 9.1 | 9.1 | 9.5 | 22.9 |
| **Inorganic Parameters** | | | | | | | | | | | | | |
| Sulfide | | | <0.0020 | <0.0020 | <0.020 | <0.020 | <0.020 | <0.020 | 0.062 | <0.020 | 0.062 | 0.062 | 0.062 |
| **Nutrients** | | | | | | | | | | | | | |
| Ammonia Nitrogen | 0.005 | | 0.0199 | 0.0134 | <0.020 | 0.021 | <0.020 | 0.0079 | 0.0080 | 0.0080 | 0.0079 | 0.0107 | 0.021 |
| Total Kjeldahl Nitrogen | 0.05 | | 0.132 | 0.135 | 0.089 | 0.096 | 0.105 | 0.096 | 0.114 | 0.114 | 0.089 | 0.1095 | 0.135 |
| Nitrate Nitrogen | 0.005 | 13 | 0.089 | 0.091 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.005 | <0.005 | 0.091 |
| Nitrite Nitrogen | 0.005 | 0.06 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | | | |
| Nitrate/Nitrite Nitrogen | 0.005 | | 0.09 | 0.09 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | 0.09 | 0.09 | 0.09 |
| Dissolved ortho-phosphate | 0.001 | | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | | | |
| Total Phosphate | 0.002 | | <0.0020 | 0.002 | 0.0028 | 0.0072 | 0.0059 | 0.0024 | 0.0030 | 0.0030 | 0.002 | 0.003 | 0.0072 |
| **Organic Parameters** | | | | | | | | | | | | | |
| Total Organic Carbon | | | N/A | N/A | 2.33 | 2.28 | 2.35 | 2.15 | 1.83 | 1.84 | 1.83 | 2.215 | 2.35 |
| Dissolved Organic Carbon | | | 2.08 | 2.12 | 2.11 | 2.09 | 2.13 | 2.19 | 1.88 | 1.75 | 1.75 | 2.1 | 2.19 |
| Chlorophyll a (ug/L) | | | 0.879 | 1.36 | N/A | N/A | N/A | 0.606 | 0.412 | 1.52 | 0.412 | 0.879 | 1.52 |

*All units mg/L unless otherwise noted*

*[a] Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment, 1999*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

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# Table 7 Water Samplesfrom L501 - Meadow Lake, 2004

## General Chemistry Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | L501-S | L501-B |
|---|---|---|---|---|
| Date | | CCME [a] | 08/21/2004 | 08/21/2004 |
| **Physical Tests** | | | | |
| Temperature (°C) | | | 5.62 | 5.63 |
| Conductivity (lab) (uS/cm) | 2 | | 40.6 | 22.6 |
| Conductivity (field) (uS/cm) | | | 38 | 38 |
| Total Dissolved Solids | 10 | | 17.6 | 17.7 |
| Hardness CaCO3 | 0.54 | | 13.9 | 14.2 |
| pH (lab) | 0.01 | 6.5-9.0 | 6.50 | *6.44* |
| pH (field) | | | 5.63 | 5.76 |
| Dissolved Oxygen (field) | | 5.5-9.5 | 13.43 | 13.02 |
| TSS | 4 | | <4.0 | <4.0 |
| Turbidity (NTU) | 0.1 | | 2.98 | 2.18 |
| Colour | | | N/A | N/A |
| **Dissolved Anions** | 1 | | | |
| Alkalinity-Gran Total CaCO3 | 1 | | 5.6 | 4.3 |
| Chloride | 1 | | 1.65 | 1.70 |
| Sulphate SO4 | 1 | | 7.6 | 7.5 |
| **Inorganic Parameters** | 1 | | | |
| Sulfide | 0.5 | | <0.020 | <0.020 |
| **Nutrients** | 1 | | | |
| Ammonia Nitrogen | | | 0.0140 | 0.0140 |
| Total Kjeldahl Nitrogen | 0.005 | | 0.124 | 0.118 |
| Nitrate Nitrogen | 0.05 | | 0.0080 | 0.0070 |
| Nitrite Nitrogen | 0.005 | 13 | <0.0050 | <0.0050 |
| Nitrate/Nitrite Nitrogen | 0.005 | 0.06 | 0.0100 | 0.0100 |
| Dissolved ortho-phosphate | 0.005 | | 0.0027 | <0.0010 |
| Total Phosphate | 0.001 | | 0.0047 | 0.0044 |
| **Organic Parameters** | 0.002 | | | |
| Total Organic Carbon | | | 2.22 | 2.15 |
| Dissolved Organic Carbon | | | 2.07 | 2.19 |
| Chlorophyll a (ug/L) | | | 0.569 | 0.606 |

*All units mg/L unless otherwise noted*

[a] *Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment, 1999*

**Average of sample and replicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*

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# Table 9 Surface Water Samples from Ulu Streams - S500b (Ulu Creek) 2004

## General Chemistry Analysis (mg/L)

| Station | Detection Limits | Water Quality Guidelines | S500b | S500b | S500* | S500b Summary Statistics | | |
|---|---|---|---|---|---|---|---|---|
| Date | | CCME[a] | 06/29/2004 | 07/20/2004 | 08/22/2004 | Minimum | Median | Maximum |
| **Physical Tests** | | | | | | | | |
| Temperature (°C) | | | | | | | | |
| Conductivity (lab) (uS/cm) | 2 | | 26.8 | 43.8 | 45.5 | 26.8 | 43.8 | 45.5 |
| Conductivity (field) (uS/cm) | | | | | | | | |
| Total Dissolved Solids | 10 | | 13 | 18 | 17.9 | 13.0 | 17.9 | 18.0 |
| Hardness CaCO3 | 0.54 | | 8.00 | 13.7 | 14.6 | 8 | 13.7 | 14.6 |
| pH (lab) | 0.01 | 6.5-9.0 | 6.52 | 6.79 | 6.58 | 6.52 | 6.58 | 6.79 |
| pH (field) | | | | | | | | |
| Dissolved Oxygen (field) | | 5.5-9.5 | | | | | | |
| TSS | 4 | | 38.7 | <4.0 | <4.0 | <4 | <4 | 38.7 |
| Turbidity (NTU) | 0.1 | | 14.8 | 0.81 | 2.88 | 0.81 | 2.88 | 14.80 |
| **Dissolved Anions** | | | | | | | | |
| Alkalinity-Total CaCO3 | 1 | | 5.4 | 6.1 | 4.0 | 4.0 | 5.4 | 6.1 |
| Chloride | 0.5 | | 0.96 | 1.58 | 1.64 | 0.96 | 1.58 | 1.64 |
| Sulphate SO4 | 1 | | 5.6 | 8.3 | 7.6 | 5.6 | 7.6 | 8.3 |
| **Nutrients** | | | | | | | | |
| Ammonia Nitrogen | 0.005 | | 0.0187 | 0.022 | 0.0204 | 0.0187 | 0.0204 | 0.0220 |
| Total Kjeldahl Nitrogen | 0.05 | | 0.102 | 0.116 | 0.141 | 0.102 | 0.116 | 0.141 |
| Nitrate Nitrogen | 0.005 | 13 | <0.005 | 0.0120 | 0.0120 | <0.005 | 0.0120 | 0.0120 |
| Nitrite Nitrogen | 0.005 | 0.06 | <0.0050 | <0.0050 | <0.0050 | | | |
| Nitrate/Nitrite Nitrogen | 0.005 | | <0.0050 | 0.0100 | 0.0100 | <0.005 | 0.0100 | 0.0100 |
| Dissolved ortho-phosphate | 0.001 | | 0.0253 | <0.001 | 0.0080 | 0.0080 | 0.0080 | 0.0253 |
| Total Phosphate | 0.002 | | 0.0258 | 0.0041 | 0.0050 | 0.0041 | 0.0050 | 0.0258 |
| **Organic Parameters** | | | | | | | | |
| Total Organic Carbon | | | 2.65 | 2.53 | 2.10 | 2.10 | 2.53 | 2.65 |
| Dissolved Organic Carbon | | | 2.04 | 2.41 | 2.04 | 2.04 | 2.04 | 2.41 |

*All units mg/L unless otherwise noted*

[a] *Canadian water quality guidelines for the protection of aquatic life, Council of Ministers of the Environment, 1999*

**Average of sample, replicate and triplicate*

*Italic* *results exceed CCME Aquatic Life Guidelines*